



DART ORANGE LINE DFW AIRPORT EXTENSION IRVING-3 ENVIRONMENTAL ASSESSMENT

FINAL • SEPTEMBER 2011



DART Orange Line DFW Airport Extension Final IRVING-3 Environmental Assessment

Dallas and Irving, Texas



Prepared in Accordance with the

- National Environmental Policy Act of 1969 (42 U.S.C. 4332 et seq.), as amended
- Federal Transit Act (49 U.S.C. 5301 et seq.), as amended
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (Public Law 104-59)

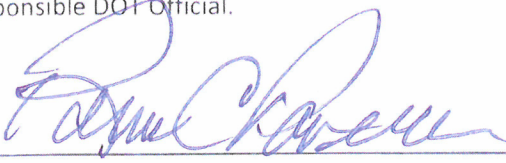
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Dallas Area Rapid Transit

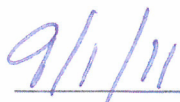
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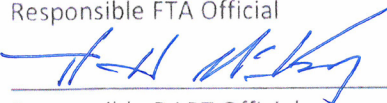
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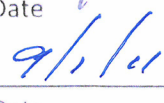
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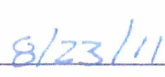
Responsible DART Official



Date



Responsible FAA Official



Date

EXECUTIVE SUMMARY

The subject of this Environmental Assessment (EA) is the design and construction of an extension of the Orange Line Light Rail Transit from Belt Line Station to the Dallas/Fort Worth International Airport (DFW Airport), henceforth the DFW Airport Extension. The *National Environmental Policy Act (NEPA) of 1969* requires that federal agencies prepare an EA for any major federal action to determine if the project would have a significant impact on the environment. An EA was prepared by Dallas Area Rapid Transit (DART) under its responsibilities as the local lead agency to implement the DFW Airport Extension. This EA documents all relevant comments received during public meetings and reflects key decisions made by the DART Board of Directors. This document has been submitted in coordination with the Federal Transit Administration (FTA), the lead federal agency.

Invited to participate as a cooperating agency, the Federal Aviation Administration (FAA) has an interest in the project because it is located within the boundaries of DFW Airport. The federal action for FAA would be approval of a revision to the *DFW International Airport Layout Plan (ALP)*. Pursuant to 49 USC §47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an ALP that FAA believes may adversely affect the safety, efficiency, or utility of the airport before the revision or modification takes effect. The text of this EA includes all elements required for compliance with *FAA Order 5050.4B*; however, for ease of FAA review, a summary of the proposed action's anticipated affects and impacts as they relate to airport operations and FAA environmental impact assessment guidance as prescribed by *FAA Order 5050.4B* has been compiled in Chapter 3 of this EA.

The purpose of the EA is to inform the affected agencies and the public of potential environmental, social, and economic impacts associated with the proposed DFW Airport Extension and the No-Build Alternative. The No-Build Alternative represents the base condition for identifying impacts associated with the proposed project. The EA serves as the primary document to facilitate review of the proposed project by federal, state, and local agencies and the general public. The EA documents the purpose and need for the project and describes the alternatives considered. It addresses in detail the anticipated transportation and environmental impacts of the project and identifies any appropriate mitigation measures that may be required to minimize such impacts.

A series of public meetings was conducted for interested parties including private citizens, community groups, the business community, elected officials, and public agencies. The EA reflects the decisions made by the DART Board of Directors and also includes responses to comments received during the public meetings. It is anticipated that the completion of the Final EA will result in a Finding of No Significant Impact by the FTA, permitting the project to be advanced to final design and construction.

This Executive Summary highlights the most noteworthy findings of the Draft EA relative to the analysis conducted during this study.

- Purpose and Need
- Alternatives Considered
- Affected Environment
- Environmental Consequences

Purpose and Need

The purpose of the DFW Airport Extension is to increase regional connectivity and offer an alternative to single-occupancy vehicle travel, provide a seamless interface to DFW Airport Central Terminal Area (CTA), improve mobility in the northwest region of the DART Service Area, increase the people carrying capacity in the transportation corridor, and support increased economic development opportunities through improved accessibility and regional connectivity as well as linking major activity centers.

The needs fulfilled by the proposed action include needs related to regional connectivity, capacity, economic development, and transportation demand.

Established during the Major Investment Study (MIS) phase of the planning process, the DFW Airport Extension continues to strive toward fulfilling the goals established by the DART Board of Directors for transit service in the Northwest Corridor:

- Enhance Mobility by offering travel choices to and from, and through the corridor
- Provide Additional Capacity for heavily-traveled radial directions
- Reduce Congestion by reducing automobile dependence
- Enhance the Quality and Reliability of Transit Service for existing and potential riders
- Improve Safety and Operating Efficiency of roadways
- Strengthen Economic Conditions in the corridor

Alternatives Considered

Rail service to DFW Airport has been envisioned by DART and regional planners for more than 25 years. Recent planning efforts including both the DART *2030 Transit System Plan (October 2006)* and North Central Texas Council of Governments (NCTCOG) *Mobility 2030 Plan (January 2007)* included light rail transit (LRT) service to the CTA of DFW Airport. These plans envisioned an intermodal station concept at Terminals A and B which would allow for passenger services related to airport needs, as well as transfers between LRT and express rail.

The DFW Airport Extension is a culmination of planning efforts to bring LRT service to DFW Airport that began in the spring of 1998. The first step was the *Northwest Corridor MIS* completed in October 2000. The *Northwest Corridor LRT Line to Irving/DFW Airport Final Environmental Impact Statement (EIS)* was completed in July 2008. This volume documented LRT planning and preliminary engineering for the DART Orange Line from where it diverges from the DART Green Line to an interim terminus at Belt Line Station.

The Fort Worth Transportation Authority (the T) is also planning a passenger rail service on the DART-owned Cotton Belt rail corridor in Tarrant County, the TEX Rail formerly the Southwest to Northeast (SW2NE). When completed, the two rail projects will be incorporated into the overall public transportation program at DFW Airport and would provide service to employees, air passengers, and other commuters in the North Central Texas region.

Coordinating these two capital investments in transportation infrastructure became a topic of regional focus during the spring and summer of 2009. In an effort to respond to transportation needs expressed by the community and political representation and fully consider and provide for regional travel patterns, five alternative concepts were proposed that incorporated the DFW Airport Extension with the TEX Rail project. These concepts proposed various methods of providing system linkages between the TEX Rail project, the DFW Airport Extension, and a future DART Express Rail alignment along the Cotton Belt rail corridor. Concepts that required LRT

passengers to transfer before reaching the CTA were deemed unacceptable by the DART member cities and the community in general. Concepts involving a fixed guideway shuttle were considered to be too expensive. On June 23, 2009 the DART Board of Directors approved a phased approach concept for the alignment combining two of the five alternatives. Only the first phase of this approach is addressed in this EA because the second phase is a future project to be implemented in conjunction with the Cotton Belt rail corridor, providing a future LRT extension to a multi-modal station along the Cotton Belt rail corridor. According to the current transit system plan, this multi-modal station is anticipated in 2030. Chapter 1 of this document further defines the phased approach approved by the DART Board of Directors.

Affected Environment

Professionals qualified in their fields have identified the existing natural and built environmental conditions along the proposed LRT alignment of the DFW Airport Extension. This existing conditions information formed the basis of impact assessment investigations for each category. Impact assessment categories that were analyzed in the EA include:

- zoning and land use
- industrial and commercial activity
- residential and community resources
- demographic characteristics
- political jurisdictions
- visual and aesthetic resources
- noise and vibration
- pedestrian movements
- traffic flow
- parking
- public services, safety, and security
- electrical and magnetic fields
- parklands
- wildlife and threatened or endangered species
- water resources
- air quality
- physiography, geology, and soils
- cultural resources
- environmental justice
- construction impacts
- hazardous materials
- disruption of utilities

Detailed information regarding the affected environment near the proposed LRT alignment is provided in chapters 4 and 5 of the EA.

Environmental Impacts

This EA identifies the potential environmental consequences of the No-Build and Build Alternatives. While the majority of the proposed alignment for the DFW Airport Extension is located within DFW Airport boundaries, some activities located adjacent to the airport would be

affected by the proposed LRT alignment. Although no residential uses are near the alignment, affects to the human environment include businesses near the airport such as cargo operations, parking businesses, and hotels. Human use impacts also include the street network leading to and located around and within DFW Airport. Impacts to the natural environment may occur on DFW Airport property in terms of streams and other water ways, air quality, and soil and water contamination due to existing hazardous materials. Table ES-1 summarizes the potential impacts of the selected alternative and related mitigation measures. The table also identifies impacts that are related to *FAA Order 5050.4B*.

Table ES-1. Summary of Environmental Impacts

| <i>Subject Area</i> | <i>Impacts</i> | <i>Mitigation Approach</i> |
|---|--|---|
| Industrial/Commercial Impacts* ¹ | <p>Full or partial displacement of a logistics facility located at 3010 North Airfield Drive.</p> <p>Business displacement of a portion of Federal Express trailer and employee parking area</p> <p>There would be about an 8-foot penetration of the Chesapeake supervisory control and data acquisition (SCADA) path at Pad Site “AC” because the DART Rail vehicle would block the line-of-sight path at the peak of the elevated rail structure.</p> | <p>Appraisal would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. Relocation benefits would be available to eligible parties.</p> <p>Anticipated mitigation for Federal Express includes reconfiguration of remaining parking area for trailer storage and relocation of employee parking to a newly constructed lot south of North Airfield Drive.</p> <p>The SCADA impact would be mitigated by increasing the antenna tower height to an aeronautically approved height above the planned DART Rail Infrastructure.</p> |
| Visual and Aesthetics* | <p>Potential impacts due to aerial structure and Traction Power Substation (TPSS)</p> <p>Potential impact from storage yard south of Taxiway</p> | <p>Maintain or replace existing vegetative screening.</p> <p>Install chain link fencing with PVC slats to soften views of TPSS #9 through #11.</p> <p>The use of screening should be considered for the storage yard.</p> <p>Comply with DFW Airport Design Criteria</p> |
| Noise and Vibration (created by LRT) | Moderate noise impact to Sleep Inn and Hawthorn Suits, located 50 feet from proposed LRT track centerline. | No mitigation required. |

Table ES-1. Summary of Environmental Impacts

| <i>Subject Area</i> | <i>Impacts</i> | <i>Mitigation Approach</i> |
|------------------------------|--|--|
| Traffic Flow | LRT operations would impose some restrictions to traffic flow on the North Service Road at Crossunder #2 | To address safety concerns, DART proposes that signaling be implemented to stop all traffic on the North Service Road for both lanes upstream of Crossunder #2 during LRT crossing events. |
| Parking | Thirty automobile parking stalls and 50 tractor trailer stalls at the existing Federal Express facility | Parking area is a lease on DFW Airport property. A Memorandum of Agreement between DART and DFW Airport is currently under negotiation to direct mitigation activities. Anticipated mitigation includes reconfiguration of remaining parking area for trailer storage and relocation of employee parking to a newly constructed lot south of North Airfield Drive. |
| Vegetation/Wildlife Habitat* | Project will result in some loss of vegetation | Disturbed vegetated areas would be replanted with replacement vegetation that would utilize native species, yet not create an unacceptable wildlife attractant for aeronautical operations. DART will coordinate with DFW Airport to identify appropriate plant species. |
| Water Resources* | Impact to 0.06 acres waters of the U.S. | DART and its contractors would follow the guidelines of the United States Army Corp of Engineers (USACE) Nationwide Permit 14 |



Table ES-1. Summary of Environmental Impacts

| <i>Subject Area</i> | <i>Impacts</i> | <i>Mitigation Approach</i> |
|---|---|--|
| <p>Hazardous Materials*²</p> | <p>Moderate to High concern - CTA Agreed Order - CTA contains pockets of subsurface petroleum (Light Non-Aqueous Phase Liquid or LNAPL) contamination, which are under active remediation.</p> <p>Moderate concern - Northeast (NE) Cargo Voluntary Cleanup Program (VCP) due to documented contamination within 60 feet of project footprint</p> <p>High concern – Adjacent and proximate pipelines and natural gas well drilling and production activities. Pipelines are located and planned adjacent to and crossing the proposed LRT alignment. Two drilling pad sites are located approximately 75 feet from the alignment.</p> | <p>DFW Airport would be responsible for earthwork within CTA.</p> <p>Appropriate Phase I/II Environmental Site Assessments would be conducted as needed to assess the environmental condition of all properties contemplated for use as right-of-way (ROW) and further to identify and quantify existing hazardous materials contamination so that the decided need for cleanup or mitigation if necessary.</p> <p>DFW Airport would continue to monitor the NE Cargo VCP and soil disturbing activities in the area would conform to a DFW Airport approved soil management plan.</p> <p>Review and approval of construction plans and procedures by the DFW Airport Environmental Affairs Department.</p> <p>Coordination with DFW Airport staff and Chesapeake Energy regarding gas well drilling/operation activities.</p> |

Table ES-1. Summary of Environmental Impacts

| <i>Subject Area</i> | <i>Impacts</i> | <i>Mitigation Approach</i> |
|--|--|---|
| <p>Aeronautical Analysis Impacts</p> | <p>Displacement and relocation of a high-mast tower hosting the Low Level Windshear Alert System (LLWAS) #4 and Airport Surface Detection Equipment (ASDE-X) Remote Unit #2 is necessary because it currently lies within the footprint of the proposed LRT alignment.</p> <p>Presence of the LRT vehicles and infrastructure may negatively impact pilot discrimination and the visual scene.</p> | <p>Maintain continuous operation of FAA equipment through relocation using a “hot cut-over” procedure to re-establish operations. Relocated high-mast tower is being evaluated as a connected action. The termination of an existing lease of the property currently housing the high-mast tower, may require FAA complete an Environmental Due Diligence Audit (EDDA) if a waiver is not deemed appropriate.</p> <p>Place red obstruction lights at the tops of catenary poles and establish a visual screening: fence with PVC slats in selected areas.</p> |
| <p>Construction Impacts*³</p> | <p>Temporary and limited duration impacts due to construction.</p> <p>The construction process will require equipment (cranes, drilling rigs, etc.) that may affect FAA Aeronautical clearance surfaces and associated instrument procedures for the airport.</p> | <p>Comply with all codes and standards as set forth in the reference documents listed in Appendix A of the <i>DART Design Standards Volume 1</i> and institute best management practices (BMPs) provided by the most current Construction Storm water regulations (NPDES or TPDES), Chapter 8 of the <i>Texas Nonpoint Source Management Program, National Menu of Stormwater Best Management Practices</i> developed by the U.S. EPA, and the <i>Integrated Storm Water Management Design Manual for Construction</i> developed by the NCTCOG.</p> <p>Prior to the start of construction, FAA Construction Airspace Studies would be submitted for FAA review, conditional requirements, and approval.</p> |

Source: URS Corporation, 2010.

**Resource Area included in FAA Order 5050.4B.*

¹*FAA Order 5050.4B requires consideration of several factors including acquisition and displacements in determining a Compatible Land Use Impact. The two partial displacements do not constitute a Compatible Land Use Impact.*

²*FAA Order 5050.4B establishes significance thresholds for hazardous material concerns that indicate concern for National Priorities List (NPL) sites only. No NPL sites were found within one mile of the proposed LRT alignment.*

³*The impact cited here does not meet the significance threshold established by FAA Order 5050.4B.*



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ABBREVIATIONS, INITIALISMS, AND ACRONYMS

- AC alternating current
- AFS Air Facility Subsystem
- AIRS Aerometric Information Retrieval System
- ALP Airport Layout Plan
- AMSL above mean sea level
- AOA Air Operations Area
- APAR Affected Property Assessment Report
- APE Area of Potential Effect
- APM automated people mover
- ASDE-X Airport Surface Detection Equipment
- ASTM formerly the American Society for Testing and Materials
- BMPs best management practices
- CAAA Federal Clean Air Act Amendments of 1990
- CERCLIS Comprehensive Environmental Response, Compensation, and Liability Information System
- CFR Code of Federal Regulations
- CO carbon monoxide
- CTA Central Terminal Area
- CWA Clean Water Act
- DART Dallas Area Rapid Transit
- dB decibel
- dBA “A-weighted” decibel unit
- DC direct current
- DCTA Denton County Transportation Authority
- DFW Dallas/Fort Worth
- DFW Airport Dallas/Fort Worth International Airport
- DNPL Delisted National Priorities List
- DOCKETS EPA Docket Data
- DPS Department Public Safety
- DWU Dallas Water Utilities
- EA Environmental Assessment
- EC engineering control
- ED-1 Ephemeral Drainage
- EDDA Environmental Due Diligence Audit
- EIS Environmental Impact Statement
- EMF Electronic and Magnetic Field
- EO Executive Order
- EPA Environmental Protection Agency
- EPCRA Emergency Planning and Community Right-to-Know Act
- ERNS Emergency Response Notification System
- ESA Endangered Species Act
- FAA Federal Aviation Administration
- FEMA Federal Emergency Management Agency

| | |
|------------------|--|
| • FHWA | Federal Highway Administration |
| • FPPA | Farmland Protection Policy Act |
| • FRP | fiberglass reinforced plastic |
| • FRS | Facility Registry System |
| • FTA | Federal Transit Administration |
| • GWCC | Groundwater Contamination Cases |
| • HMIRS | Hazardous Materials Incident Reporting System |
| • ISD | independent school district |
| • IHW | Industrial and Hazardous Waste |
| • ITWS | Integrated Weather Information System |
| • Kph | kilometer per hour |
| • Ldn | measures an average “day-night” sound |
| • Leq | equivalent continuous noise level |
| • LLWAS | Low Level Windshear Alert System |
| • LNAPL | Light Non-Aqueous Phase Liquid |
| • LPIS | Locally Preferred Investment Strategies |
| • LPST | State Leaking Petroleum Storage Tank list |
| • LRT | light rail transit |
| • LRV | light rail vehicle |
| • m | meter |
| • MAP ID | map identification number |
| • MIS | Major Investment Study |
| • Mph | miles per hour |
| • MOA | Memorandum of Agreement |
| • NAAQS | National Ambient Air Quality Standards |
| • NCHRP | National Cooperative Highway Research Program |
| • NCTCOG | North Central Texas Council of Governments |
| • NE EAT | Northeast End-Around Taxiway |
| • NEPA | National Environmental Policy Act |
| • NFRAP | Federal CERCLIS No Further Remedial Action Planned sites |
| • NHPA | National Historic Preservation Act of 1966 |
| • NLRRCRA | Federal No Longer Regulated RCRA Facilities |
| • NOx | oxides of nitrogen |
| • NPDES | Federal National Pollutant Discharge Elimination System |
| • NPL | National Priorities List |
| • NRCS | National Resources Conservation Service |
| • NRHP | National Register of Historic Places |
| • NWP | Nationwide Permit |
| • NWROF | Northwest Rail Operating Facility |
| • O ₃ | ozone |
| • OHWM | Ordinary High Water Mark |
| • PE | Preliminary Engineering |
| • PEM | palustrine emergent |
| • PPP | public-private partnership |
| • PST | State and Tribal Petroleum Storage Tanks Lists |
| • RCRA | Federal Resource Conservation and Recovery Act |

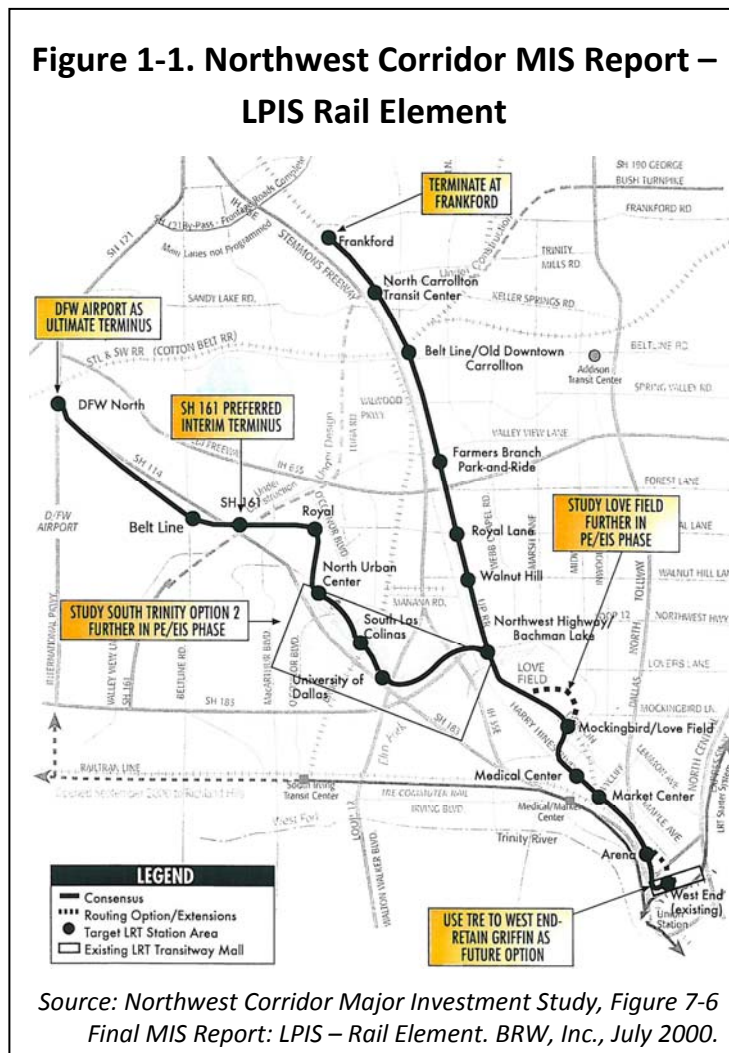
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| • RCRA | Federal RCRA Corrective Action Facilities List |
| • RCRA | Federal Resource Conservation and Recovery Act Generators |
| • RCRA | Federal RCRA Non-Corrective Action Treatment, Storage, and Disposal Facilities list |
| • ROW | right-of-way |
| • RTR | Remote Transmit Receiver |
| • RPZ | runway protection zone |
| • SCADA | Supervisory Control and Data Acquisition |
| • SEL | Source Exposure Level |
| • SF | Superfund |
| • SHPO | State Historic Preservation Officer |
| • S&I | Service & Inspection |
| • SIP | State Implementation Plan |
| • SLRV | super light rail vehicle |
| • SPILLS | State Spills Listing |
| • SUE | subsurface utility engineering |
| • SW3P | Storm Water Pollution Prevention Plan |
| • TDWR | Terminal Doppler Weather Radar System |
| • TASA | Texas Archeological Sites Atlas |
| • TCEQ | Texas Commission on Environmental Quality |
| • TEX Rail | Formerly the Southwest to Northeast Rail Corridor (SW2NE) |
| • THC | Texas Historical Commission |
| • THSA | Texas Historic Sites Atlas |
| • The T | The Fort Worth Transportation Authority |
| • TIER II | Tier II Chemical Reporting Program Facilities |
| • TIP | Transportation Improvement Program |
| • TOD | transit-oriented development |
| • TPDES | Texas Pollutant Discharge Elimination System |
| • TPSS | traction power substation |
| • TPWD | Texas Parks and Wildlife Department |
| • TRE | Trinity Railway Express |
| • TSA | Transportation Security Administration |
| • TxDOT | Texas Department of Transportation |
| • USACE | United States Army Corp of Engineers |
| • USC | United States Code |
| • USDA | United State Department of Agriculture |
| • USFWS | United States Fish and Wildlife Service |
| • USGS | United State Geological Service |
| • USTR06 | Tribal Lands |
| • UST | underground storage tanks |
| • VCP | Voluntary Cleanup Program |
| • VdB | vibration decibels |
| • Vpd | vehicles per day |
| • Vph | vehicles per hour |
| • WHO | World Health Organization |

CHAPTER 1. PURPOSE and NEED

This chapter briefly specifies the underlying purpose and need the Dallas Area Rapid Transit (DART) is responding to by proposing the transportation improvement described by this report. An overview of the conditions in the area near the proposed action, a summary of the planning process and a brief description of the proposed action are also included.

1.1 Introduction

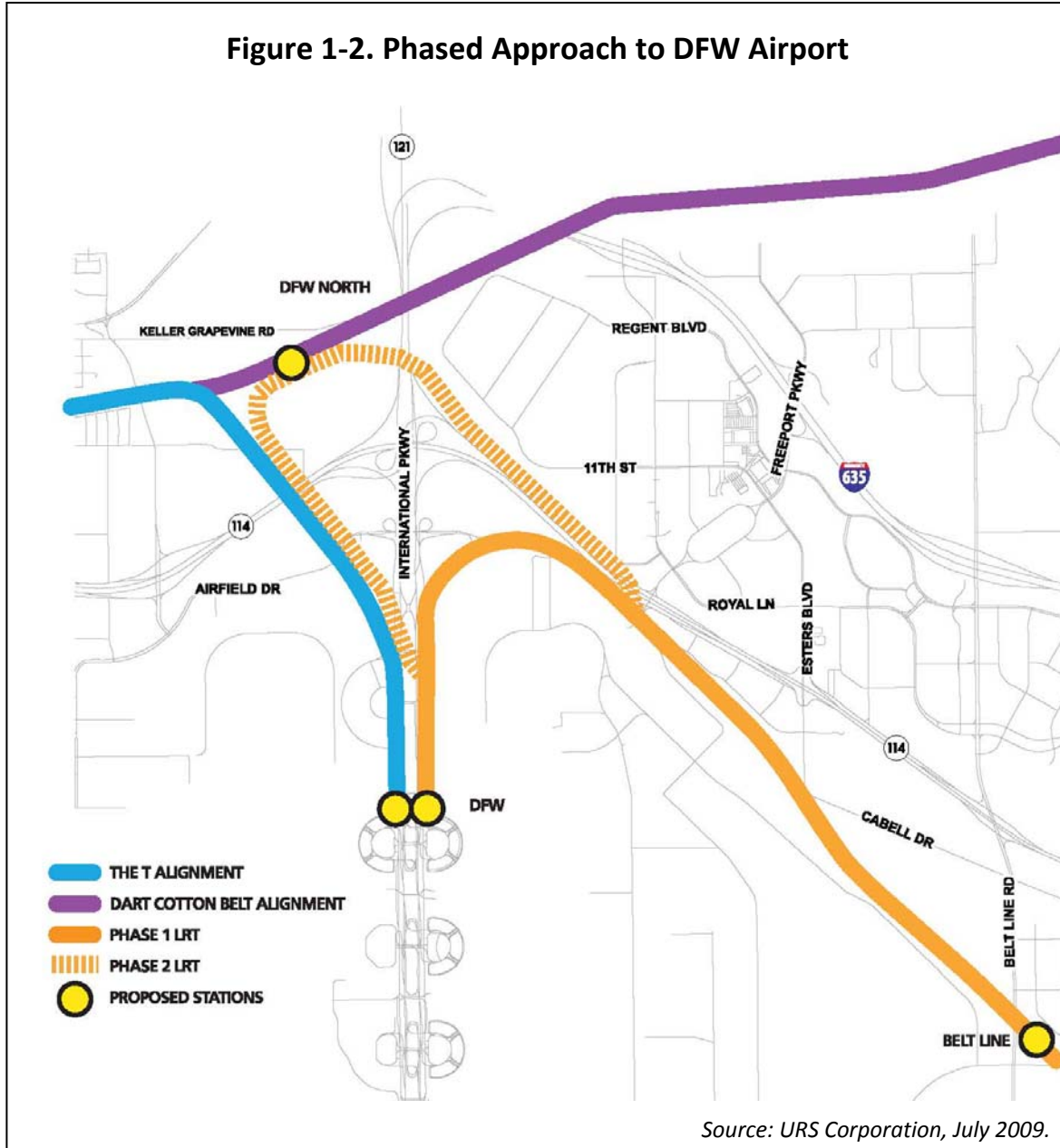
The DART Orange Line DFW Airport Extension is a culmination of planning efforts to bring light rail transit (LRT) service to Dallas/Fort Worth International Airport (DFW Airport) that began in the spring of 1998. The first step was the Northwest Corridor Major Investment Study (MIS) completed in October 2000. This study evaluated mobility options in the northwest region of the DART service area and recommended a variety of locally preferred investment strategies (LPIS) for transportation improvements, including LRT service to DFW Airport and the cities of Farmers Branch and Carrollton as illustrated in figure 7-6 of that document (see figure 1-1). The Northwest Corridor LRT Line to Irving/DFW Airport Final Environmental Impact Statement (EIS) was completed in July 2008. This volume documented LRT planning and preliminary engineering for the DART Orange Line from where it diverges from the DART Green Line to an interim terminus at Belt Line Station. This document will evaluate LRT service for the DART Orange Line as it continues from Belt Line



Station to the Terminal A-B area at DFW Airport.

On June 23, 2009 the DART Board of Directors approved a Phased Approach Concept for the alignment. As shown in figure 1-2, the two phases are planned to operate concurrently once both phases are complete. Phase I would extend 5.17 miles from Belt Line Station to its DFW Airport Terminal A-B area. Phase II would branch off of Phase I near the intersection of Freerport Parkway

and North Airfield Drive then extend north to interface with the future commuter service on the Cotton Belt rail corridor. From there, Phase II would head south into DFW Airport reconnecting with the Phase I alignment after crossing over International Parkway near Crossunder #1. The Phase II alignment measures approximately 4.50 miles. Both phases are described in more detail in Chapter 2 of this document.



As approved by the DART Board of Directors, the Phase II alignment is anticipated to provide a future LRT extension to a multi-modal Cotton Belt interface with Express Rail service. According to the DART 2030 Transit System Plan Update, Express Rail service is anticipated to begin operation on the Cotton Belt rail corridor between years 2025 and 2030. However, this time frame may be considerably shortened. The agency is currently considering a public-private partnership (PPP) to

accelerate the implementation of transit within the Cotton Belt rail corridor. It is anticipated that Phase II of this project would be implemented as a component of the PPP.

Given that Phase II is a future project to be implemented in conjunction with the Cotton Belt rail corridor, Phase II is only evaluated as a cumulative impact project. DART has conducted a preliminary review of the Phase II alignment in order to identify fatal flaws and potential impacts to Phase I operations. Detailed environmental analyses for Phase II would be addressed in subsequent planning and engineering studies.

1.2 Purpose and Need for the Action

DART is proposing to implement the final line section of the Northwest Corridor LRT Line to Irving/DFW (referred to by DART as the DFW Airport Extension) from Belt Line Station, the current terminus of LRT service on the DART Orange Line, to the DFW Airport Terminal A-B area. The purpose of Phase I of the DFW Airport Extension is to increase regional connectivity and offer an alternative to single-occupancy vehicle travel, provide a seamless interface to DFW Airport Central Terminal Area (CTA), and to improve mobility in the northwest region of the DART Service Area. The purpose of Phase II of the DFW Airport Extension is to provide direct opportunities for regional connectivity serving both the western and eastern portions of the Dallas/Fort Worth (DFW) Metroplex. Both phases are intended to increase the people carrying capacity in the transportation corridor and support increased economic development opportunities through improved accessibility and regional connectivity, as well as linking major activity centers.

As previously described, the proposed action consists of the implementation of Phase I. The needs fulfilled by the proposed action include needs related to regional connectivity, capacity, economic development, and transportation demand.

Regional Connectivity

The proposed action would provide a direct link between the airport and the DART Service Area by extending the Orange Line (currently under construction). This link would also enhance regional connectivity. Currently, DART and the Fort Worth Transportation Authority (The T) connect via the Trinity Railway Express (TRE). The Denton County Transportation Authority (DCTA) is constructing a commuter rail line that would interface with DART at the Downtown Carrollton Station. The T is also developing the TEX Rail formerly the Southwest to Northeast (SW2NE) project that would also terminate at the DFW Airport CTA. The proposed action would provide opportunity for patrons to directly transfer between the TEX Rail and DART LRT. The T estimates operation of the proposed TEX Rail to begin in 2015. DCTA is constructing a commuter rail line, scheduled to be operational in December 2010, which would interface with DART LRT at Downtown Carrollton. The proposed action would provide DCTA passengers an opportunity to transfer to the Orange Line to connect to DFW Airport. With this connection, the proposed action provides an interface between the three primary transit providers in the region.

Capacity

The proposed action would increase transit capacity to DFW Airport. Currently, DART bus routes provide service to the periphery of DFW Airport with Terminal Link, an on airport shuttle bus, providing internal circulation between the terminals and ancillary airport facilities. Similarly, the TRE provides service to the CentrePort Station south of the airport. DART buses link this station to the south Remote Parking area and rely on Terminal Link to connect to the CTA.

The proposed action would operate approximately 75 trains per weekday in each direction and 57 trains in each direction on weekend days. Because each super light rail vehicle (SLRV) can hold up

to 150 passengers, the proposed action could carry as many as 11,250 passengers each day in each direction. DART has the ability to increase this capacity by running trains that consist of up to three SLRVs, potentially doubling or tripling capacity.

Economic Development

The proposed project would increase access for residents and visitors to employment, education, and entertainment centers throughout the region. This increased accessibility would strengthen economic conditions at existing activity centers and provide an opportunity for further economic development in the project area.

Transportation Demand

DFW Airport is a destination for a varied group of travelers, including airport and airline employees, business and vacation travelers, and contractors working on airport property. The proposed action provides an alternative to using a single occupancy vehicle to a broad range of people from every social and economic class. By connecting to regional transit services, that choice is also provided to commuters traveling from one side of the DFW Metroplex to the other. Preliminary analysis using the North Central Texas Council of Governments (NCTCOG) new regional transportation model estimates that by the year 2030, 14,600 rail passengers a day would pass through the DFW Airport LRT Station. Approximately 3,680 passengers would transfer between LRT at Terminal A and The T's TEX Rail line at Terminal B.

1.3 Proposed Federal Action

The proposed federal action for the Federal Transit Administration (FTA) would be federal grant assistance for the project from FTA's Urbanized Area Formula Program authorized by 49 USC §5307. Pursuant to FTA regulations, the FTA Administrator must verify that National Environmental Policy Act (NEPA) requirements have been met in order to approve use of federal funding.

The proposed federal action for the Federal Aviation Administration (FAA) would be approval of a revision to the DFW Airport Layout Plan (ALP). Pursuant to 49 USC §47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an ALP that FAA believes may adversely affect the safety, efficiency, or utility of the airport before the revision or modification takes effect. Any FAA determination to approve revision of the ALP to accommodate the proposed alterations to the airport for the LRT project would have to take into consideration the effect such changes would have on the safety, utility, or efficiency of the airport. FAA has been invited to participate as a cooperating agency. It should be noted that the text of this EA includes all elements required for compliance with FAA Order 5050.4B; however, for ease of FAA review, a summary of the proposed action's anticipated impacts as they relate to FAA environmental impact assessment guidance prescribed by FAA Order 5050.4B has been compiled in Chapter 3.

A second proposed federal action for the FAA would be the relocation of a high-mast pole hosting one Low Level Windshear Alert System (LLWAS-NE # 4) and one Airport Surface Detection Equipment (ASDE-X) Remote Unit (RU) #2 in order to accommodate the proposed LRT alignment. The proposed project would require the establishment of a new high-mast pole with associated electronic equipment, tested and operationally integrated into the existing networks, prior to the removal of the existing high-mast pole. This relocation is considered a connected action of the proposed DART Rail project and will be discussed in the environmental documentation. The relocation of the LLWAS and ASDE-X RU #2 will also require changes to the Terminal Doppler

Weather Radar System (TDWR), the Integrated Weather Information System (ITWS). Adequate time must be planned to allow for the development of the Software Adaptation, testing and integration for the LLWAS, TDWR, ITWS and ASDE-X system.

The high-mast pole would be relocated approximately 2,000 feet east southeast of the existing location on North Airfield Drive. The proposed relocation site would be co-located at an existing FAA communications facility, the Remote Transmit Receiver (RTR) 1E, as shown in figure 1-3. The proposed location for the high-mast pole would meet FAA's requirements for wind coverage and detection of wind shears. The existing and proposed sites are along the northeastern boundary of the airport with access from North Airfield Drive. The DART contractor would establish the new high-mast pole infrastructure and have the FAA install and integrate the associated electronic equipment. Because the sensor relocation is a direct result of the DART proposed action, all of the costs incurred as a result of the relocation, including costs associated with mitigating impacts to other airport facilities, systems, equipment and/or their infrastructures will be paid by DART as part of their mitigation commitments under this EA.

1.4 Goals and Objectives

DART is the Dallas area's regional transit agency providing service within a 700-square mile area comprised of 13 member cities. The DART Board of Directors established a set of goals for transportation improvements in the Northwest Corridor during the MIS process. The goals and objectives respond to the underlying transportation needs defined in this chapter. They are based on the goals adopted in May 1983 to guide development of the DART Transit System Plan and goals stated in the DART Mission Statement:

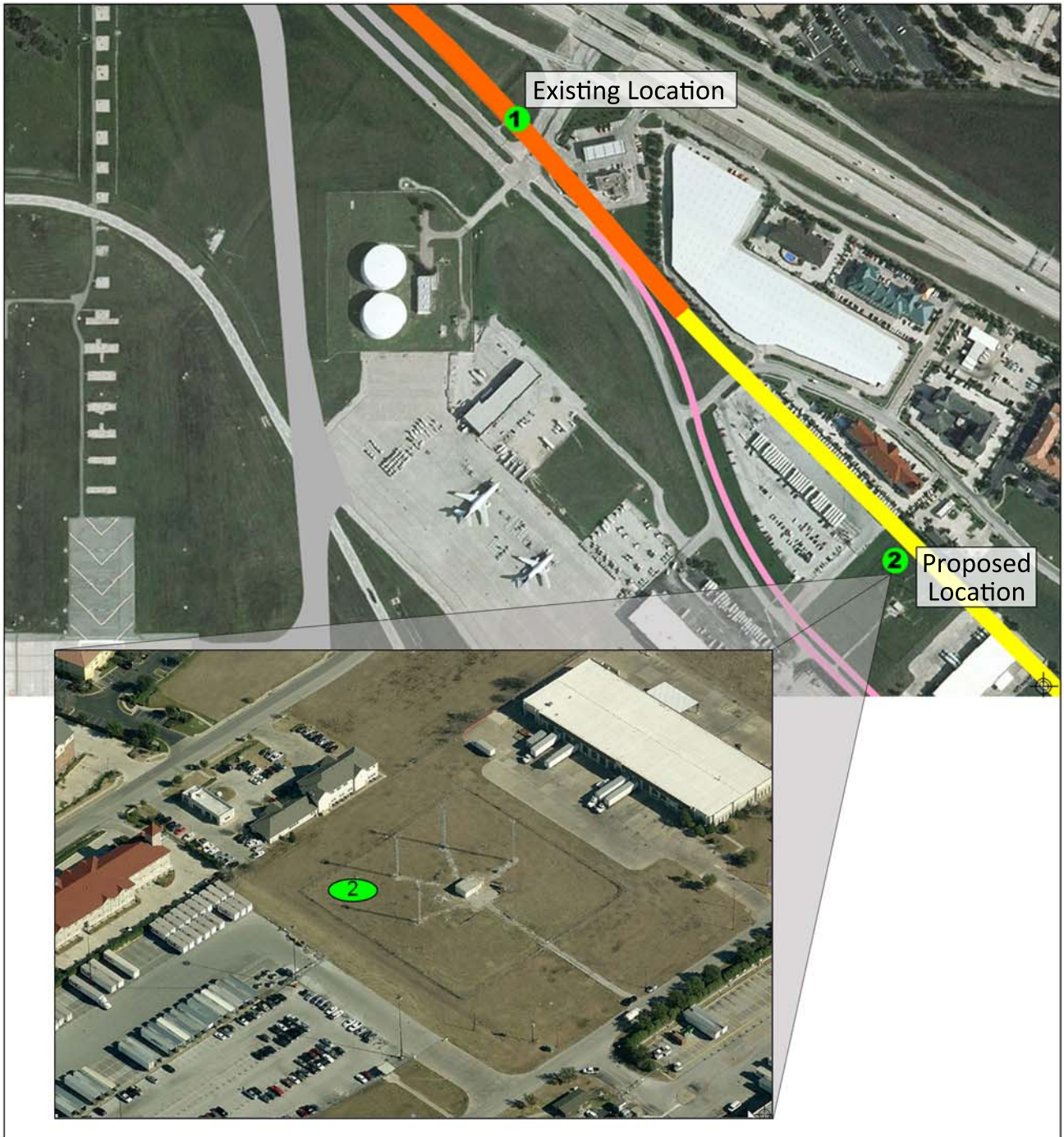
The mission of Dallas Area Rapid Transit is to build and operate an efficient and effective transportation system that, within the DART Service Area, provides mobility, improves the quality of life, and stimulates economic development through the implementation of the DART Service Plan as adopted by the voters on August 13, 1983, and as amended from time to time.

The primary objective of the Northwest Corridor MIS was to identify an LPIS for transportation improvements in the corridor. This study identified the following purposes for transportation improvements in the Northwest Corridor.

- Enhance Mobility by offering travel choices to and from and through the corridor.
- Provide Additional Capacity for heavily-traveled radial directions.
- Reduce Congestion by reducing automobile dependence.
- Enhance the Quality and Reliability of Transit Service for existing and potential riders.
- Improve Safety and Operating Efficiency of roadways.
- Strengthen Economic Conditions in the corridor.

1.5 Study Area

The DFW Airport Extension project focuses specifically on areas of Dallas and Tarrant counties to the north and northeast of DFW Airport near SH 114 as it merges with SH 121. The area analyzed includes areas within the cities of Irving and Grapevine, Texas. The area addressed in this EA focuses on areas adjacent and proximate to the proposed LRT alignment which begins near the DART Belt Line Station, the current terminus of the portion of the DART Orange Line under



Source: *Assessment and Analysis of Potential Operational Impacts from the Proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport*, Jacobs Engineering, June 2010.

FIGURE 1-3

RELOCATION OF HIGH-MAST POLE
DART Irving-3 Environmental Assessment

construction, near the intersection of Belt Line Road and Valley View Lane in Irving, Texas and ends near Terminal A. The DFW Airport LRT Station and its pedestrian linkages are included in the study area. The location of the proposed LRT alignment is shown in figure 1-2, Phase I LRT.

This area is a subset of a larger area originally addressed in the Northwest Corridor MIS.

1.6 Planning History

Rail Service to DFW Airport has been included in DART's long term planning and other regional transportation improvement plans for more than 25 years. A summary of these plans is presented in this section.

DART's 1983 *Final Service Plan* included a 160-mile fixed guideway transit system. This plan included a rail extension north from the TRE line (formerly the Railtran Corridor) through Las Colinas extending to the CTA from the north end of DFW Airport. This service was to be located along various railroad, street, and highway right-of-way.

The 1989 *Transit System Plan*, which reflected a new cost-effective approach, showed a light rail line along the IH 35E Corridor with a branch west to the North Irving Transit Center along the Mañana Spur. DFW Airport was served by a spur north from the TRE commuter rail line. This plan also approved the purchase of the Cotton Belt Railroad corridor for future use as rail line to DFW Airport.

The 1995 *Transit System Plan* updated the 1989 plan to further improve both affordability and cost-effectiveness. The plan changed the IH 35E Corridor/Mañana Spur rail alignments from LRT to commuter rail. DFW Airport was served by a spur north from the TRE commuter rail line and the Cotton Belt was identified as an alternative for future study.

The *Northwest Corridor Needs Assessment* (December 1997) identified travel needs in the Northwest Corridor, resulting in the identification of two subareas within the Northwest Corridor: the Carrollton – Farmers Branch Subarea, which generally parallels IH 35E from downtown Dallas and into Carrollton; and the North Irving Subarea, which generally follows the IH 35E/SH 114 corridor through North Irving to DFW Airport.

The *Northwest Corridor MIS* was initiated in early 1998 and completed in early 2000. It identified LRT on the Union Pacific Railroad alignment from downtown Dallas to Frankford Road in Carrollton. It also identified a branch at Northwest Highway through Irving to DFW Airport. The DART Board of Directors approved the LPIS for the Northwest Corridor on February 22, 2000, and amended the 1995 *Transit System Plan* to reflect these changes. The two lines were to be treated as separate projects.

The NCTCOG developed the *Mobility 2025 Plan* (January 2000) using demographic projections for the year 2025. The plan generally reflected the DART 1995 *Transit System Plan*, except that it showed LRT instead of commuter rail in the Northwest Corridor. Additionally, two alternative alignments near DFW Airport brought rail into either the northern or southern end of the airport to serve the CTA. The *Mobility 2025 Plan* was updated in May 2001, June 2004, and April 2005.

In August 2000, DART conducted a special election requesting voter approval for the agency to issue long-term bonds to finance capital improvements. Previously, DART had funded projects on a "pay-as-you-go" basis. The issue passed overwhelmingly, and permitted DART to accelerate implementation of several projects, including the Orange Line. Under the current schedule, the Orange Line is expected to begin operation to Belt Line Station in December of 2012. The



extension from Belt Line Road to DFW Airport is proposed to begin operation in December of 2014.

In 2002 the *Dallas/Fort Worth International Airport Rail Planning and Implementation Study* was completed. This study, sponsored by NCTCOG, DFW Airport, DART, The Texas Department of Transportation (TxDOT), and the T, explored future rail service options to the airport. The study's goal was "to provide a seamless, customer sensitive, affordable, clearly achievable rail interface between the regional rail system and the DFW Airport Central Terminal Area." The selected alternative identified three possible options for accessing the CTA with LRT. The northern and southern options were elevated or at-grade, while the central option was a tunnel under DFW Airport. Commuter Rail extending south from the Cotton Belt to the CTA was also identified.

Between 2002 and 2009, DFW Airport planning staff investigated various rail terminus locations serving the CTA. Alternatives considered included "The 13th Station" (between terminals D and F), a location at terminals A and B, and a north station concept along the Cotton Belt rail corridor.

In 2005, as a prelude to conducting environmental analysis for the LRT Line to Belt Line Station, the Orange Line underwent an alignment refinement process that modified the alignment through north Irving to its current configuration. This refinement allowed for the three options for accessing the CTA that were identified in the 2002 *Dallas/Fort Worth International Airport Rail Planning and Implementation Study*.

In October 2006, DART finalized the *DART 2030 Transit System Plan*, an update of the 1995 *Transit System Plan*. This plan reflected the year 2030 demographic projections from NCTCOG and identified projects to be undertaken by DART through the year 2030. Recommendations in this plan included the refined Orange Line alignment through Irving, the northern option for LRT service to the CTA, and express rail service along the Cotton Belt rail corridor. The plan included an intermodal station concept at Terminals A and B which would allow for passenger services related to airport needs, as well as transfers between LRT and express rail.

NCTCOG developed the *Mobility 2030 Plan* (January 2007) using demographic projections for the year 2030. *Mobility 2030* describes the Northwest/Irving Rail Corridor as a light rail system from Northwest Highway (Bachman Lake) to DFW Airport.

The *Northwest Corridor LRT Line to Irving/DFW Final Environmental Impact Statement* was published in July 2008. The study documented planning and engineering efforts for the Orange Line, beginning at Bachman Station on the DART Green Line traveling through Irving along the refined alignment to terminate at Belt Line Station. The document received a Record of Decision (ROD) from FTA on September 5, 2008 on January 7, 2009 from FAA. The project was awarded through a Design-Build contract and construction activities began in January 2009. The Orange Line is expected to begin revenue service from Bachman Station to Irving Convention Center Station in December 2011 and to Belt Line Station in December 2012.

CHAPTER 2. ALTERNATIVES CONSIDERED

This chapter includes a description of the No-Build and Build Alternatives and summarizes the evaluation and selection process for the proposed action.

2.1 No Build Alternative

The No Build Alternative would include no additional transportation investments in the corridor. Orange Line LRT service would terminate at the DART Belt Line Station. Transit access to DFW Airport would continue to be provided only by DART's bus service to remote parking lots and the DFW Airport's Terminal Link shuttle service.

The No-Build would not meet the regional connectivity, capacity and transportation demand needs of the corridor.

2.2 Development and Evaluation of Build Alternatives

DART is currently advancing the DFW Airport Extension to its terminus at DFW Airport. The T is also currently advancing the TEX Rail on the DART-owned Cotton Belt rail corridor in Tarrant County. When completed, the two rail projects would be incorporated into the overall public transportation program at DFW Airport and would provide service to employees, air passengers and other commuters in the North Central Texas region.

Coordinating these two capital investments in transportation infrastructure became a topic of regional focus during the spring and summer of 2009. In an effort to respond to transportation needs expressed by the community and political representation and fully consider and provide for regional travel patterns, several alternative concepts were proposed that incorporated the DFW Airport Extension with the TEX Rail project. These concepts proposed various methods of providing system linkages between the TEX Rail project, the DFW Airport Extension and a future DART Express Rail alignment along the Cotton Belt rail corridor. The alternative concepts included:

Terminal A-B Concept

This concept includes an LRT line that connects directly to the DFW Airport Terminal A by traveling roughly parallel to SH 114 before turning south to the terminal. In this concept TEX Rail terminates at the DFW Airport Terminal B.

DFW Airport North Concept

This concept responded to the need for regional connections and proposed that LRT, commuter rail service and DART rail service along the Cotton Belt rail corridor would terminate at a DFW Airport North Station. From this station, passengers and airport employees would access the terminal areas by using a shuttle service provided by DFW Airport. A transfer from LRT or commuter rail service would be required to reach the airport.

DFW Airport North/Terminal B Concept

This concept mirrored the alignments proposed in the DFW Airport North Concept. However, the shuttle connecting passengers from the DFW Airport North Station to the terminal area would include an LRT line which would terminate at Terminal B. Both LRT and commuter rail passengers arriving at the DFW Airport North Station would be required to transfer to the LRT shuttle.

Shuttle Concept

In this option, LRT does not extend all the way to the proposed DFW Airport North Station; rather it terminates on DFW Airport property south of SH 114. A shuttle would connect these two termini to the CTA. In this concept, all passengers would be required to transfer to the shuttle in order to reach the airport. Passengers would also be required to use the shuttle service to transfer between commuter rail and LRT service.

LRT Cotton Belt Approach Concept

This concept proposed one single continuous LRT line that travels from the Belt Line Station northward to the Cotton Belt rail corridor, stopping at the aforementioned DFW Airport North Station. Passengers from TEX Rail and DART Express Rail along the Cotton Belt rail corridor would be required to transfer to LRT service to continue their trip into the airport.

Alternative Selection

From December 2008 through June 2009, several multi-agency meetings were held to discuss the relative merit of the various alternative concepts to serve DFW Airport. Representatives from DART, the T, NCTCOG, DFW Airport, and interested DART member cities attended these meetings. Also during this time, DART also met with FTA and FAA, individually and collectively, to discuss airport service.

Each of the proposed concepts was evaluated based on utility, operational scenarios, and associated costs. Consideration was also given to other issues such as airport development, member city preferences, and public acceptance. The DART Board of Directors was briefed on four occasions and a public meeting was held on June 17, 2009. Representative of member cities and the general public also provided input for a June 23, 2009 DART Board Meeting.

The evaluation concluded that the Terminal A-B Concept met the immediate need of direct service into DFW Airport, but did not adequately address the longer term needs for east-west travel across the north end of the metropolitan area. Concepts that required LRT passengers to transfer (DFW Airport North, DFW Airport North/Terminal B, and Shuttle concepts) before reaching the CTA were deemed unacceptable by the DART member cities and the community in general. Additionally, concepts involving a fixed guideway shuttle were considered to be too expensive. The LRT Cotton Belt Approach appeared to address the deficiencies of the Terminal A-B Concept, but added unnecessary travel time and operational expense in the short term. Ultimately, a concept that would initially provide direct service into DFW Airport while providing for future regional connectivity along the Cotton Belt Corridor emerged. The Phased Approach, described in detail below, best meets the purpose and need for the project by combining elements of the Terminal A-B Concept and the LRT Cotton Belt Approach.

Phased Approach

This is a two phased concept: Phase I includes an LRT line that connects directly to the DFW Airport Terminal A by traveling roughly parallel to SH 114 before turning south to the terminal. TEX Rail terminates at the DFW Airport Terminal B. Phase II spurs from the Phase I alignment near Freeport Road to extend to the Cotton Belt before turning south to rejoin the Phase I alignment before the DFW Airport LRT Station. DART Cotton Belt rail corridor passengers would be required to transfer to LRT service to continue their trip into the airport.

On June 23, 2009 the DART Board of Directors approved a Phased Approach Concept (see figure 1-2), which included portions of the Terminal A-B Concept (Phase I) and the LRT Cotton Belt Approach Concept (Phase II). The two phases are planned to operate concurrently once both phases are complete. This long-term strategy is intended to serve the transportation needs of the

region, today and in the future. Phase I would extend 5.17 miles from Belt Line Station to its DFW Airport Terminal A-B area. The Phase II alignment measures approximately 4.5 miles. Phase II is a future project to be implemented in conjunction with the Cotton Belt rail corridor and not part of the proposed action. A separate environmental review would be prepared for Phase II at the appropriate time. Phase I would be designed to accommodate future implementation of the Phase II project. By providing LRT service both directly into the airport and providing an option for passengers to directly transfer between LRT, TEX Rail and DART Express Rail along the Cotton Belt rail corridor, regional transportation patterns are served and more choices are offered to transit patrons.

2.3 Recommendation for the Proposed Action

Only the first phase of this approach is addressed in this Environmental Assessment (EA) because the second phase is a future project to be implemented in conjunction with the Cotton Belt rail corridor. FTA, with DART, has determined that the two phases have independent utility. Phase II planning and preliminary design and environmental review would be completed in the future with the addition of rail service on the Cotton Belt rail corridor and appropriate funding. Preliminary engineering has been developed for the Phase I project to the 10% design level. This design can be found in Appendix J which is included under separate cover. The engineering design report explaining the design process and several design issues can be found in Appendix I. The impacts identified in this EA are based on these 10% design drawings.

Phase I Horizontal Alignment

The LRT guideway alignment for the proposed action (Line Section I-3 Phase I) would be double track with 15-foot, six-inch track centers and a maximum design speed of 65 mph. Lower design speeds were utilized in areas where existing constraints would not accommodate larger radius curves. The alignment would consist of at-grade, retained earth, cut sections, and aerial structures.

As shown in figure 2-1 and Appendix J, the proposed 5.17-mile LRT alignment would begin west of the proposed Belt Line Station (Orange Line I-2) and stretch in a general northwestern direction to the intersection of Freeport Parkway and Airfield Drive. The alignment would continue in a northwestern direction before turning due west and paralleling Airfield Drive. At this point, it would turn south and terminate at the DFW Airport LRT Station, located between the northbound main lanes of International Parkway and northbound Service Road and beneath the existing DFW Airport Automated People Mover (APM) system.

Phase I Vertical Alignment

The Phase I vertical alignment would start on retained fill and rise to an aerial structure crossing over Belt Line Road. After the crossing, the profile would slope downward to be at-grade, crossing over several drainage channels on a mixture of at-grade, retained fill and aerial structure sections. The alignment would intersect a Navaid Access Road with an at-grade crossing. The alignment would continue at-grade before transitioning to aerial structure to cross over the future East Airfield Drive extension and an existing creek. After spanning the creek, the profile would descend to at-grade and travel parallel to the northern edge of DFW Airport property before increasing in grade to an aerial structure that would bridge over Freeport Parkway. The profile would descend in grade transitioning from a retained fill section to a low-profile, grade separated section to accommodate drainage between North Airfield Drive and SH 114. The alignment would climb to



Source: NCTCOG 2008 and 2000

FIGURE 2-1



0 4,000 8,000 Feet



VERTICAL ALIGNMENT
DART Irving-3 Environmental Assessment

cross over North Airfield Drive and Grapevine Creek. The profile would descend beneath the future DFW Airport taxiway bridges at-grade and continue at-grade until ascending to grade separate at the northbound Service Road. The profile would then decrease in elevation to retain fill and follow the existing grade until it transitions into a retained cut section and travel beneath two existing taxiways and an at-grade crossing of Crossunder #2 to its terminus at the DFW Airport LRT Station.

Station

One station, located at DFW Airport, is planned for the proposed action. As outlined in the DART 2030 Transit System Plan, the intermodal concept for rail service to DFW Airport includes light rail terminating at Terminal A with the T's TEX Rail terminating at Terminal B. A pedestrian corridor would connect the two platform areas and provide bus bays for potential future service or emergency access. Ticketing vending machines for rail passengers would be available at each platform. Additionally, DFW Airport may provide a flight information display system would list arriving and departing flights.

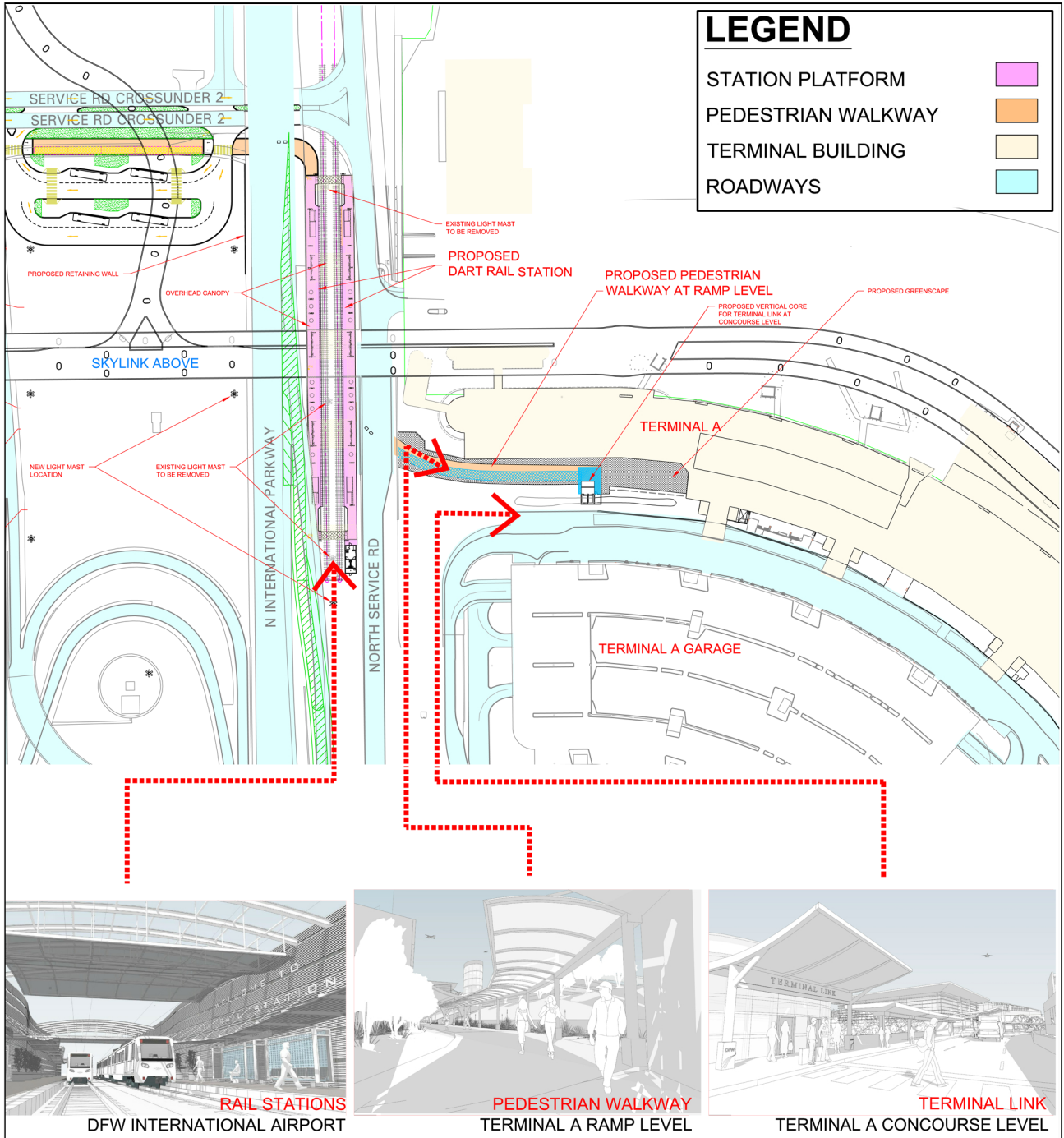
The DFW Airport LRT Station at Terminal A would be configured with side platforms for passenger loading and unloading constructed at ground level. The platform would accommodate a three-car, DART SLRV. Weather protection for patrons would be provided by canopies covering the width of the platform for a minimum of one-third of its length. DART platforms, as well as LRT vehicles, would be fully accessible for elderly and handicapped patrons during all hours of operation. DART platforms and light rail vehicles would meet the requirements of the Americans with Disabilities Act of 1990 and would comply with all city, state, and federal accessibility regulations. To achieve accessibility, DART station platforms are 15 and one-half inches above the top of rail to meet the low floor section of the SLRV. Typical patron amenities at each station include bench seating, leaning rails, windscreens, trash receptacles, newspaper racks, and artwork.

As passengers exit the station area, the pedestrian walkway would continue to the non-secure entrances of Terminals A, passing beneath the northbound service lanes. Another pedestrian walkway would be provided at the north end of the LRT platform adjacent to Crossunder #2 which would allow passage beneath International Parkway to the TEX Rail platform and beneath the southbound service lanes to non-secure entrances of Terminal B. Upon reaching the terminals, riders would check baggage and enter the secure area. This same pedestrian walkway also connects to the boarding areas for the Terminal Link shuttle bus. A conceptual design of the T and DART platforms with proposed access is shown in figure 2-2.

DFW Airport is leading the design efforts for this station and would be responsible for construction of most station elements, walkways, and amenities, other than the rail infrastructure and systems components.

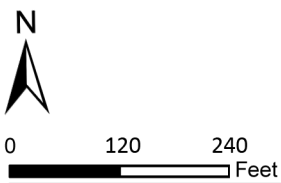
Accommodation for Phase II Alignment

As previously indicated, Phase II is a future project to be implemented in conjunction with DART Express Rail service along the Cotton Belt rail corridor and not part of the proposed action. The Phase I design would not preclude future implementation of the Phase II project. In order to verify the feasibility of the concept and evaluate cumulative impacts, Phase II has been advanced to a 5% level of Engineering Design. To accommodate the Phase II alignment, two junctions are included in the Phase I design. The first junction would be located on the aerial structure over Freeport Parkway. The second is on structure approximately 2,400 feet north of the DFW Airport LRT Station.



Source: DFW Airport Terminal Development Program, February 2010.

FIGURE 2-2



DFW AIRPORT LRT STATION CONCEPT
DART Irving-3 Environmental Assessment

Rail Operating Plan

The proposed action is a planned extension of the Orange Line LRT service, which would operate from the DFW Airport LRT Station, through Irving, to its junction with the Green Line. From this point, the route would run concurrently with the Green Line through downtown Dallas to the Lawnview Station. During peak periods every other train would diverge from the Green Line at Pearl Station to provide additional service on the Red Line north to Parker Road.

The Orange Line would operate every day of the week from 5 a.m. to midnight and provide LRT service every 10 minutes during the peak periods, every 20 minutes during the non-peak periods, and every 30 minutes evenings. Peak period service would occur between 6 a.m. and 9 a.m. and between 3 p.m. and 6 p.m. each weekday. LRT service on the line would have a maximum operating speed of 65 mph. Average train speeds would reach approximately 34 mph. The average dwell time for a terminus station is approximately 12 minutes. The intermodal station concept would provide transfer opportunities between DART LRT and the TEX Rail Line.

Technology

The vehicles and systems technologies to be utilized for this project would be identical to the light rail services currently operating in the DART Service Area. The electrically powered vehicles collect primary electrical power [845 volts-direct current] via a pantograph from an overhead contact system that distributes the power from wayside traction power substations.

Fare Collection

Fare collection for the line would continue to use DART's current self-service, barrier-free concept. Fares would be established in accordance with DART policy. DART currently has a Fare agreement with the T for the TRE that allows transfers between the two systems. A similar agreement would be entered into in order to facilitate transfers between DART LRT and the T's TEX Rail Line at Terminals A and B.

Electric Power Substations

Five traction power substations (TPSS) would be located along the proposed project to supply sufficient power to meet the operating plan. The substations would be 2.5 megawatt prefabricated units. The proposed locations for the TPSSs, as shown in table 2-1, have been identified to avoid potential impacts.

Rail Operating Facility

The current DART fleet of LRT vehicles is being expanded to 160 vehicles with the implementation of the Green and Orange Lines. The proposed action would make use of two existing operating facilities that have previously been environmentally cleared, the original Service & Inspection (S&I) Facility and the Northwest Rail Operating Facility (NWROF) which is currently under construction. Orange Line light rail vehicles would be maintained and stored at NWROF. Heavy maintenance requirements for these vehicles would be performed at the S&I Facility.

Space constraints in the CTA preclude placing tail track at the DFW Airport LRT Station. Therefore a storage yard located approximately 1200 feet north of the station platform is proposed. The storage yard would consist of three tracks of 500 feet each in length. Two of these tracks would be for storage of LRT cars while the third track would be for the storage of track and right-of-way (ROW) maintenance equipment. The yard would also provide a crew room and parking for train operators.



Table 2-1. TPSS Locations

| <i>TPSS #</i> | <i>Location</i> | <i>Civil Station</i> |
|---------------|---|----------------------|
| TPSS#7 | North side of alignment, 600 feet southeast of Mud Springs Creek | 533+00 |
| TPSS#8 | North side of the alignment, under aerial structure spanning future West Airfield Drive | 588+50 |
| TPSS#9 | Under aerial structure spanning Freeport Parkway, 280 feet northwest of existing drainage ditch | 650+50 |
| TPSS#10 | West side of alignment, 600 feet north of Chesapeake access road at-grade crossing | 710+00 |
| TPSS#11 | Near the DFW Airport northbound service road of International Parkway, within footprint of proposed storage yard. | 741+00 |

Source: URS Corporation, 2010.

Bus Operating Plan

The proposed action would not substantially change the Bus Operating Plan for Orange Line. LRT would replace buses circulating from the Belt Line Station to the peripheral areas of the airport. The DFW Airport LRT Station would be served by the airport’s existing Terminal Link bus service that currently operates to distribute passengers between terminals. Airport employees and ticketed passengers would also have access to the existing Skylink people mover which serves the secure side of the terminals.

CHAPTER 3. AIRPORT FACTORS

The EA for DART Orange Line DFW Airport Extension has been prepared in accordance with regulations developed by the Council on Environmental Quality for the NEPA and the U.S. Department of Transportation's FTA. FAA has been invited to participate as a cooperating agency in the proposed project. One of FAA's federal action responsibilities in for this project is the review and approval (as appropriate) for any change to an ALP. If this project is approved, the proposed federal action for FAA would be approval of a revision to the DFW Airport ALP. Pursuant to 49 USC §47107(a) (16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an ALP that FAA believes may adversely affect the safety, efficiency, or utility of the airport before the revision or modification takes effect. Any FAA determination to approve revision of the ALP to accommodate the proposed alterations to the airport for the LRT project would have to take into consideration the effect such changes would have on the safety, utility, or efficiency of the airport.

As a cooperating agency, the FAA assumes responsibility to independently review the environmental documents prepared for the proposed project to assess whether the documentation meets the standards of adequacy under NEPA, including consideration of all actions and impacts, including cumulative impacts. FAA focuses its efforts on those issues and subject areas in the EA pertaining to and related to airport planning and potential effects on the airport. FAA guidance on federal actions as it relates to evaluating environmental impacts can be found in *FAA Order 1050.1E, Environmental Impacts: Policy and Procedures* and *FAA Order 5050.4B, the National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. *FAA Order 1050.1E* allows FAA to adopt another Federal agency's EA. The following sections review the anticipated conditions with regards to airport operations and environmental affects of the proposed action.

3.1 Aeronautical Assessment for Rail Access onto DFW Airport

As part of the planning process for proposed project, DART has conducted an aeronautical assessment for placing LRT on DFW Airport property. The proposed project was assessed and analyzed for various aeronautical aspects to understand potential affects, the resulting impacts and potential mitigation strategies. Conducted by Jacobs Engineering, Inc., the report, *Assessment and Analysis of Potential Operational Impacts from the proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport* (June 2010), assessed the potential impacts of the LRT on airport and FAA systems. The report addressed the following subject areas:

- Airport Design Standards
- Objects Affecting Navigable Airspace
- Terminal Instrument Procedures
- Area Navigation
- Significant Airport Features
- Human Factors, and
- Safety Risk Management



The entire aeronautical assessment has been incorporated into Appendix L of this EA. The analysis made several recommendations that would allow construction and operation of the proposed project to avoid adversely affecting airport or aircraft operations.

3.1.1 Identified Areas of Concern

The aeronautical assessment identified 18 issues that would need to be addressed as design for the proposed action advances. The following table lists the issues identified in the report and the mitigation measures proposed to address each issue. Mitigation measures which will be required as a part of the project approval and implementation are discussed in further detail in Appendix L, Aeronautical Assessment for Rail Access onto DFW Airport.

| Table 3-1. Aeronautical Assessment Areas of Concern | |
|--|--|
| 1. Airspace Feasibility Study | Area of Concern: An Airspace Feasibility Study would be required to allow the FAA to assess and provide conditional comments on the proposed project during the preliminary engineering level of design. |
| | DART Action: DART has completed and submitted an Airspace Feasibility Study to FAA. |
| 2. Runway 17C and 17L runway protection zones | Area of Concern: The proposed LRT alignment would cross through the runway protection zone (RPZ) for runways 17C and 17L (Jacobs 8). Due to the limited and infrequent activity of DART and presence of other transportation infrastructure within these RPZ, the intrusion is considered an acceptable level of risk (Jacobs 9). |
| | DART Action: DART would obtain FAA concurrence that the LRT alignment intrusion would be considered an acceptable level of risk for the Runway 17C and 17L RPZs. DART has submitted an Airspace Feasibility Study to FAA for review and comment. The FAA provided favorable comments (October 2010) on the proposed project noting that they, “do not object with conditions to the construction described in this proposal,” provided several conditions are met. These conditions would be mitigated through the completion and submission of final design plans & specifications, final airspace studies on actual design plans, and the associated construction equipment and associated work areas for the project and FAA analysis and determinations. |
| 3. Terminal Instrument Procedures: Localizer Final Trapezoid | Area of Concern: The Localizer Final Trapezoid related to runway 17C would need to be re-evaluated in a formal airspace review of the final design for the proposed LRT alignment and associated heights in order to determine if related minimums would need to be increased or not. If any small increases are required to runways 17R, 17C and 17L straight-in procedures minimums (LOC only), the increase would constitute a minimal operational impact (Jacobs 22). |

Table 3-1. Aeronautical Assessment Areas of Concern

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|---|---|
| | <p>DART Action: DART has completed a feasibility airspace study, based on preliminary designs, and no aeronautical impacts were found by the FAA. Once final design plans have been completed, a final airspace study will be accomplished to confirm any changes in design, impacts found, and any mitigation required.</p> |
| <p>4. Runway 31R Localizer: Flight Inspection Error Tolerance</p> | <p>Area of Concern: The results of the math modeling scenario of the existing FAA Localizer system for runway 31R showed an approximate error to the propagated signal in the amount of 30% of allowable flight inspection tolerances (Jacobs 30). This error assumed a 'worst case scenario' where the DART light rail vehicles were present along the entire length of the track, creating a continuous modeling wall 14' higher than the elevation of the rail. This modeling wall provided a flat reflective surface and created the error of 30%. At any given time, a light rail vehicle would be present on only 2-4% of the proposed LRT alignment, which would substantially decrease the actual reflective surfaces, and therefore, the error. The FAA currently has scheduled an upgrade to the system to be completed by the summer of 2011. With the completion of the planned upgrade, the math model showed that the 'worst case scenario' would result in an error of only 3.3%.</p> <p>DART Action: DART would continue discussions with FAA regarding the assumptions made during the modeling efforts and proposed real-time operations of the proposed LRT line. Coordination would confirm that the 'worst case scenario' would not be an operational issue, until the FAA completes the Localizer upgrade, scheduled for the summer of 2011. Revenue service operation of proposed LRT alignment is currently scheduled for 2014.</p> <p>In the event that the FAA does not meet the expected timeline for the upgrade, DART and DFW will work with the FAA in developing a mitigation strategy. Any testing of the DART Rail vehicles or operation of DART Rail vehicles on the guideway would be prohibited until the Runway 31R ILS system has been mitigated and approved by the FAA.</p> |
| <p>5. Communication shadowing on the planned North East End Around Taxiway system</p> | <p>Area of Concern: Although the DART proposed LRT alignment is not expected to induce an additional shadowing onto the operational areas of the airport or approach/departure corridors (Jacobs 32), existing communication shadows will require future FAA assessment and mitigation to optimize communication coverage for the proposed North East End-Around Taxiway system.</p> <p>DART Action: No DART action is required.</p> |
| <p>6. Site drainage at Remote Transit Receiver (RTR) facilities 1E and 2E</p> | <p>Area of Concern: FAA Remote Transmit Receiver facilities RTR-1E and RTR-2E are located adjacent to the proposed LRT alignment. Poor drainage conditions currently exist at each site, resulting in up to two inches of standing water for several days after a rain storm</p> |

Table 3-1. Aeronautical Assessment Areas of Concern

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| | <p>(Jacobs 35).</p> <p>DART Action: Constructed within the DART right-of-way, a drainage ditch between the tracks and the two FAA facilities would adequately convey storm water away from the proposed LRT alignment. Construction of the DART rail line would not worsen the existing FAA facility drainage problem. It is likely that FAA facility drainage would improve as a result of the DART project.</p> |
| <p>7. Continuous access to sites and equipment during LRT construction required</p> | <p>Area of Concern: FAA requires continuous access (24 hours per day, 7 days per week) to FAA facilities to perform safety critical functions.</p> <p>DART Action: DART would ensure that all five FAA facilities identified would have continuous access during and after construction. Maintaining this access has been identified as a mitigation item and is discussed in sections 4.9 and 5.1 of this EA.</p> |
| <p>8. Relocation of LLWAS NE #4 and ASDE-X Remote Unit #2</p> | <p>Area of Concern: The proposed LRT alignment would require the relocation of the high-mast pole hosting the LLWAS-NE #4 (Jacobs 37) and the ASDE-X RU #2 (Jacobs 40).</p> <p>Operation of associated FAA systems and other associated systems must be maintained during the relocation process (Jacobs 38) as best as possible and as approved by the FAA.</p> <p>DART Action: The relocation of a high-mast pole and operational acceptance of the systems and services must be accomplished prior to the removal of the existing high-mast pole and associated services. The relocation of the mast pole is considered to be a connected action that is required to be discussed in the environmental documentation. The existing high-mast pole would be relocated approximately 2000 feet east southeast of the existing location on North Airfield Drive. The proposed relocation site would be collocated at an existing FAA communications facility (RTR 1E) as shown in figure 1-3. The proposed location for the high-mast pole has been selected by the FAA and will meet FAA's siting requirements for wind coverage and detection of wind shears. The DART contractor would establish the new high-mast pole infrastructure and have the FAA install and integrate their associated electronic equipment, required software updates, testing and certifications. Because the FAA's sensor would have to be relocated as a result of the DART/FTA project, all of the associated costs incurred as a result of the relocation, including costs associated with mitigating impacts to other airport facilities, systems, equipment and/or their infrastructures, must be paid by DART as part of their mitigation commitments under this EA. Both sites are along the northeastern boundary of the airport with access off of North Airfield Drive.</p> |

Table 3-1. Aeronautical Assessment Areas of Concern

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| | <p>In order to minimize the wind shear detection capability down-time, a “hot cut-over” integration of the new sensor is recommended. A new high-mast pole would be constructed and the FAA systems would be operational prior to the removal of the existing high-mast pole (Jacobs 38).</p> <p>Potential visual impacts of this connected action are discussed in Section 4.6 of this EA.</p> <p>The current location is leased to the FAA by DFW. As a result of this connected action, it is required that FAA conduct an Environmental Due Diligence Audit (EDDA) in accordance with FAA Order 1050.19B. This order addresses the acquiring or disposing of real property. Displacement of the high-mast pole hosting the LLWAS and ASDE-X RU #2 would result in a lease termination between DFW Airport and FAA and site control being transferred to DFW Airport. Because the property was a lease, the requirement for an EDDA may be waived, if deemed appropriate.</p> |
| <p>9. Software Adaptation</p> | <p>Area of Concern: An additional connected action to the relocation of the high-mast pole currently hosting the LLWAS NE #4 and ASDE-X RU #2, a software adaptation to the Integrated Terminal Weather Information System and Terminal Doppler Weather Radar System, would also be required (Jacobs 39). This action is required to maintain all affected systems.</p> <p>DART Action: DART would coordinate with the FAA early in final design to develop a plan to allow the time required for software development, testing, and integration prior to relocation of the high-mast pole.</p> |
| <p>10. DFW Airport West Surveillance Radar</p> | <p>Area of Concern: The proposed LRT alignment is located 1,700 feet away from the West Airport Surveillance Radar and is not located within the 1,500 foot buffer prescribed by the FAA siting guidance for Advisory Circular 150-5300-13 Chapter 6, Airport Surveillance Radar. Additionally, the proposed DART LRT planned elevation (at 2,500 feet from the radar) is more than 50 feet below the radar antenna. Radar system coverage and operation should be monitored by FAA to maintain optimal system performance (Jacobs 41).</p> <p>DART Action: No DART action is required, but DART will coordinate with the FAA as construction activities begin within 2,500 feet of the FAA’s Northwest Airport Surveillance Radar system. Also, DART will request the FAA to monitor their radar system to ensure no construction impacts are being introduced.</p> |



Table 3-1. Aeronautical Assessment Areas of Concern

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| <p>11. DFW Airport East ASDE-X Remote Unit #3 Potential Multi-path Signal Reflections</p> | <p>The proposed LRT alignment has the potential to induce a reflection into the movement area for the ASDE-X RU #3 located on the East Air Traffic Control Terminal. A coordinated project review with the FAA's Systems Engineering Group (AOS-230/ATO-W) of the proposed DART LRT alignment and associated elevations has determined that there may be the potential of multi-path reflections into the ASDE system from aircraft or vehicles on the Northeast Hold Pad, specifically Taxiways EF, EG and EH (Jacobs 43-44).</p> <p>DART Action: DART would coordinate with the FAA when the construction phase begins west of Freeport Parkway or west of the extended centerline of Runway 17C. This coordination, at the recommendation of FAA, AOS-230/ATO-W organization, is to allow the FAA to start monitoring the ASDE system for any potential multi-path issues common for projects similar to the proposed project. In the event that multi-path signal reflections are identified, DART would work with the FAA to mitigate those multi-path issues associated with the proposed LRT alignment. If ASDE-X system optimization would be necessary, such action would be covered under a reimbursable agreement between DART, DFW Airport, and FAA.</p> |
| <p>12. Northeast End Around Taxiway Traffic Control Visibility</p> | <p>Area of Concern: Once the Northeast End Around Taxiway (NE EAT) is in operation, air traffic controllers would view taxiing traffic in close proximity to the proposed LRT alignment and existing roadways. Air traffic controllers' ability to quickly acquire and discriminate activity on the NE EAT could be compromised by high point light sources originating from the transportation infrastructure (Jacobs 47).</p> <p>DART Action: DART would coordinate with FAA early in final design to only include light sources that do not contribute to an adverse visual scene for either air traffic controllers or pilots. Using fixtures with hoods, directing light aim, and using particular colors of light would help minimize negative affects (Jacobs 47).</p> |
| <p>13. Chesapeake Pad Site "AC"</p> | <p>Area of Concern: The elevated guideway of the proposed LRT alignment near Chesapeake Energy's Pad Site "AC" would block the line-of-sight path of the supervisory control and data acquisition (SCADA) communication link system (Jacobs 44).</p> <p>DART Action: Analysis shows there would be an 8 foot penetration of the Chesapeake SCADA path at the peak of the bridge by the DART Rail vehicle. This would be mitigated by increasing the antenna tower height. This impact and mitigation is discussed in section 4.2 as an impact to Industrial and Commercial Activity.</p> |

Table 3-1. Aeronautical Assessment Areas of Concern

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|---|---|
| <p>14. Northeast End Around Taxiway taxiing operation safety – Daytime Visual Screening</p> | <p>Area of Concern: A human factors analysis identified that the presence of DART rail traffic in close proximity to the NE EAT may create a daytime level of distraction and confusion for pilots taxiing near the proposed LRT alignment, thereby rendering end-around taxi operations unsafe (Jacobs 47).</p> <p>DART Action: DART would coordinate with the FAA early in final design to develop acceptable visual screening to assist pilots’ ability to discriminate the presence of the light rail transit system and vehicles near the planned NE EAT system. Visual screening (a fence with red vinyl slats) would be placed between the proposed LRT alignment and the airport operations area to provide a visual cue to pilots that LRT vehicles are not in the same operation space as the taxiway (Jacobs 49). Visual screening is proposed to be placed along the alignment approximately from Civil Station 648+00 through 695+00, as shown in figures 3-1 and 3-3.</p> |
| <p>15. Northeast End Around Taxiway taxiing operation safety – Nighttime Visual Screening</p> | <p>Area of Concern: A human factors analysis identified that the presence of DART rail traffic in close proximity to the NE EAT may create a nighttime level of distraction and confusion for pilots taxiing near the proposed LRT alignment, thereby rendering end-around taxi operations unsafe (Jacobs 47). During nighttime operations any potential similarity between rail headlights and generic aircraft nose/wheel lights might present confusion. The light of an oncoming train might incorrectly signal the approach of an oncoming taxiing aircraft (Jacobs 49).</p> <p>DART Action: DART will coordinate with the FAA early in final design phase to develop acceptable methods to visually screen portions of the DART LRT and Rail vehicles to minimize potential distractions to pilots' taxiing operations on the NE EAT.</p> <p>In addition, DART would establish red obstruction lights at the tops of selected catenary poles to provide additional visual cues to pilots either taxiing, landing or taking off, for the presence of obstructions (catenary poles), thereby improving safety conditions during nighttime operations. Standard FAA approved Red obstruction lights would be placed along the alignment approximately from Civil Station 648+00 through 695+00 and from Civil Station 575+00 to 610+00, as shown in figures 3-2 and 3-3.</p> |
| <p>16. FAA Safety Risk Management Decision</p> | <p>Area of Concern: The FAA is in the process of implementing a Safety Risk Management & Safety Management System that would apply to airport projects such as the proposed action. Such projects would require proactive coordination with the FAA and DFW Airport Staff on the location of the proposed LRT alternative and activities during construction and operational phases. The FAA will evaluate the proposed project information and develop a Safety Risk Decision</p> |

Table 3-1. Aeronautical Assessment Areas of Concern

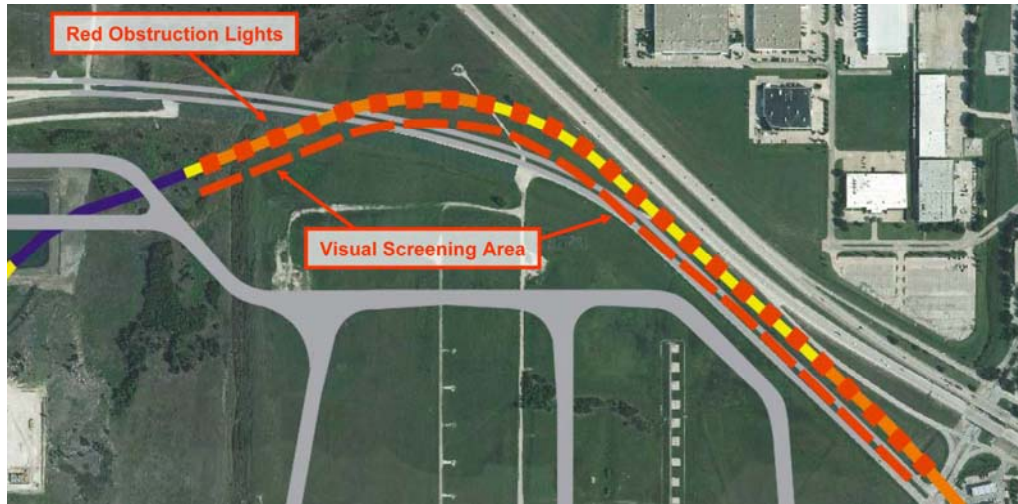
| | |
|--|--|
| | <p>(Jacobs 53-54).</p> <p>DART Action: DART would work with the various FAA offices, such as the Airports Division and the Air Traffic Organization, early in the final design phase of the project, to provide overview briefings, construction and operational process, detailed project information, facilitation of meetings, and assist in the development of mitigation strategies toward the timely completion of an approved Safety Risk Decision for the proposed project.</p> |
| <p>17. Formal Airspace Processing And Approvals</p> | <p>Area of Concern: In compliance with Federal Aviation Regulation Part 77, any construction to occur on an airport, will require an airspace study must be completed (Jacobs 14).</p> <p>DART Action: DART has successfully completed a feasibility airspace study, based on preliminary (10%) design plans, for the entire DART I-3 route. The FAA determination did not object to the proposed plan, with a list of conditions that must be met for a formal approval. To fulfill these conditions, additional airspace studies, based on the final designs, will be required. Copies of the letters of determination resulting from the feasibility airspace study are available upon request. DART would include planning and coordination for formal airspace processing and approvals into the Design-Build and Construction Phases of the project prior to the start of any construction work for any temporary or permanent features.</p> |
| <p>18. FAA Microwave Path Line-of-Sight from 4E RTR to Center ATCT</p> | <p>Area of Concern: The results of the line of sight evaluation, conducted by Jacobs, indicate that the DART light rail vehicles may penetrate the outer limits of the 4E RTR to Central ATCT Microwave Path, Fresnel Zone clearance (Jacobs 35). Preliminary evaluation results show that 60% of the Fresnel Zone will not be penetrated. Depending on the actual amount of penetration, this could impact the operational integrity of the link.</p> <p>DART Action: Once final design plans have been developed, a path assessment would be coordinated with the FAA, using an obstruction, similar in size, to a DART light rail vehicle, to assess the potential impact on the link path. If the results reveal an impact, a mitigation plan will be developed with the FAA.</p> |

3.1.2 Proposed Mitigation Measures

Both the Airspace Feasibility Study and aeronautical assessment discussed above have been submitted to FAA for review and the opportunity to provide formal comments on the proposed project. This review is anticipated to address the issues identified in the report and to constitute early and ongoing FAA coordination for the proposed project. Additionally, FAA construction coordination has been identified as a mitigation measure and is discussed in section 5.1 of this EA.

The proposed action would require extensive coordination with FAA and DFW Airport during final design and construction; however, the proposed mitigation as described above would minimize impacts to airport or aircraft operations created by the construction and operation of the proposed LRT alignment. The identified impacts and connected actions are being addressed in the EA.

Figure 3-1. Human Factors Mitigation Location 1

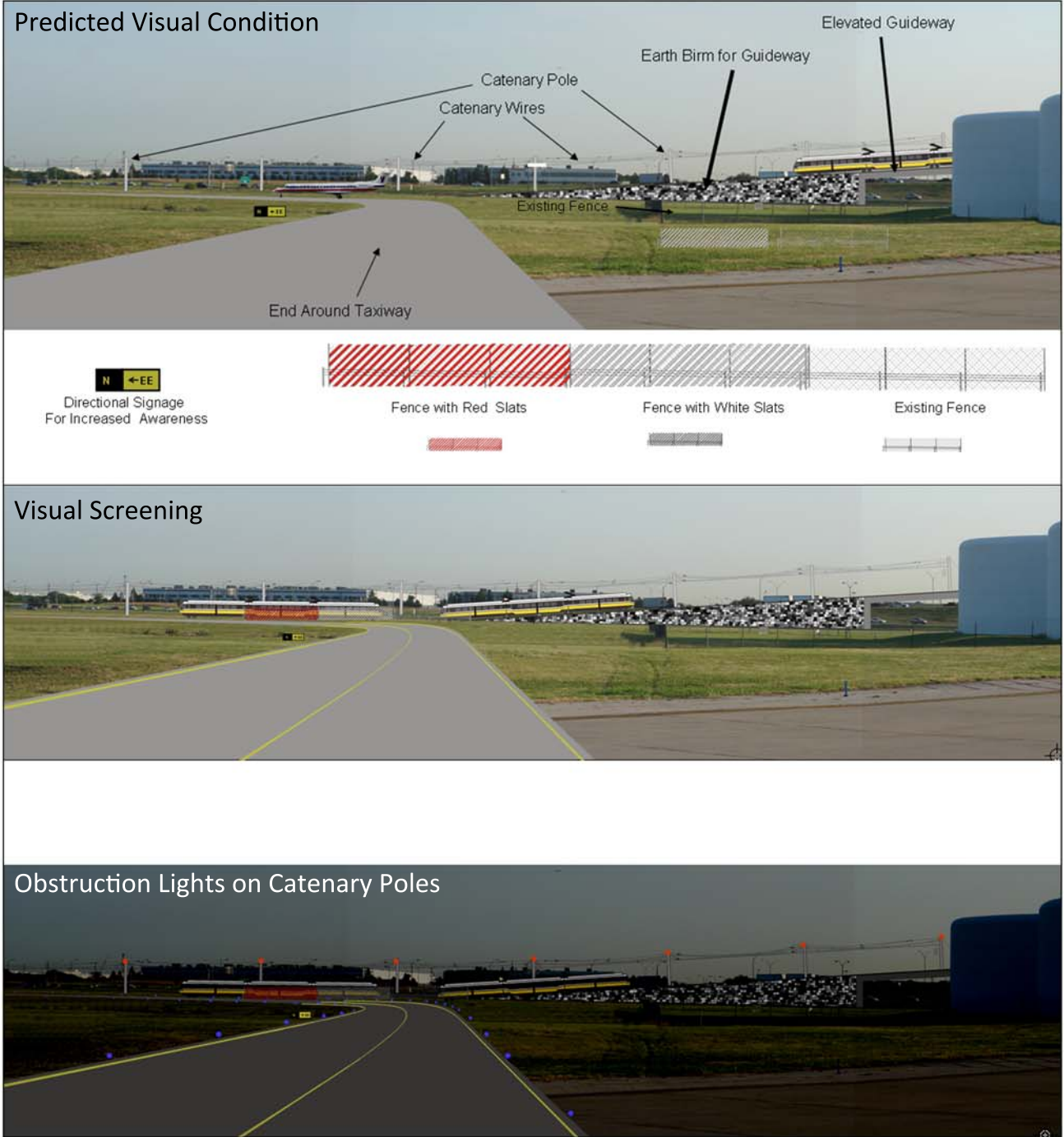


Source: Additions to Assessment and Analysis of Potential Operational Impacts from the Proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport Technical Memorandum, Jacobs Engineering, December 2010.

Figure 3-2. Human Factors Mitigation Location 2



Source: Assessment and Analysis of Potential Operational Impacts from the Proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport, Jacobs Engineering, June 2010.



Source: *Assessment and Analysis of Potential Operational Impacts from the Proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport*, Jacobs Engineering, June 2010.

FIGURE 3-3

3.2 Environmental Summary

This EA has been prepared in accordance with FTA guidance but includes all elements required for compliance with *FAA Order 1050.1E* and *FAA Order 5050.4B*. A detailed description of purpose and need for the project is contained in Chapter 1 of this EA. Chapter 2 describes the proposed action and the alternatives considered. Chapter 4 identifies the impacts and mitigation in accordance with FTA guidance, including an analysis of connected actions and mitigation proposed in response to FAA requirements identified in the aeronautical analysis discussed in section 3.1. Chapter 5 identifies construction impacts and includes a cumulative impacts analysis. Chapter 6 details public involvement and agency consultation.

3.2.2 The Proposed Action and No Build Alternative

As described in Chapter 2, the proposed action is a LRT line that connects the DART Orange Line (currently under construction) directly to the DFW Airport Terminal A by traveling roughly parallel to SH 114 before turning south to DFW Airport Terminal A. A station platform would be located at Terminal A with direct pedestrian access to Terminal B. Access to other terminals would be through the existing terminal circulation systems, Terminal Link, and Skylink. The proposed action includes a rail storage facility north of the station platform and pedestrian connection between the station platform and Terminals A and B. Preliminary engineering has been developed for the project to the 10% design level. This design can be found in Appendix J which is included under separate cover. The engineering design report explaining the design process and several design issues can be found in Appendix I. The impacts identified in this document are based on these 10% design drawings, found in Appendix J.

DART's proposed action would require the relocation of a high-mast pole hosting one Low Level Windshear Alert System (LLWAS-NE # 4) and one Airport Surface Detection Equipment (ASDE-X) Remote Unit (RU) #2. The proposed relocation of the LLWAS and ASDE-X RU #2 is a connected action that must be evaluated in this environmental assessment as part of the Proposed Action. The relocation will additionally require development of Software Adaptation, testing and integration for the TDWR, the ITWS, the LLWAS and ASDE-X system.

A No Build Alternative would include no additional transportation investments in the corridor. Orange Line LRT service would terminate at the DART Belt Line Station. Transit access to DFW Airport would continue to be provided only by DART's bus service to remote parking lots and the DFW Airport Terminal Link shuttle service. In addition, neither the relocation of the high-mast pole hosting the LLWAS #4 and ASDE-X RU #2 and associated changes to the LLWAS, ASDE-X system, TDWR or ITWS would be accomplished under the No Build Alternative.

3.2.2 Affected Environment

FAA environmental impact assessment guidance recommends consideration of impact to the following resource categories in determining the significance of airport-related impacts.

- Air Quality
- Coastal Barriers
- Coastal Zones
- Compatible Land Use
- Construction Impacts
- Section 4(f)

- Farmlands
- Fish, Wildlife, and Plants
- Floodplains
- Hazardous Materials
- Historical, Architectural, Archaeological, and Cultural
- Light Emissions and Visual Effects
- Natural Resources and Energy Supply
- Noise
- Secondary (Induced) Impacts
- Socioeconomic, Environmental Justice, and Children’s Health and Safety Risks
- Water Quality
- Wetlands
- Wild and Scenic Rivers

The No Build Alternative would have no affect effect on any of the resource categories.

The following sections summarize the proposed action’s anticipated impacts as they relate to FAA environmental impact assessment guidance.

Air Quality

Potentially significant air quality impacts associated with an FAA project or action would occur if the project exceeded one or more of the National Ambient Air Quality Standards (NAAQS) for any time periods analyzed. This project has been included in the previous 2006-2008 Transportation Improvement Plan (TIP), and the current TIP conformity analysis. The analysis results indicate the proposed action would not cause or contribute to any new localized air quality violations or increase the frequency or severity of existing violations in the nine-county ozone nonattainment area. Therefore, the proposed action conforms to the goals set forth in the Clean Air Act Amendments of 1990 and is in conformity with the State Implementation Plan (SIP).

Coastal Barriers

No coastal barriers are located within the area affected by the proposed action; therefore no coastal barriers would be impacted as a result of the project.

Coastal Zones

No costal zones are located within the area affected by the proposed action; therefore no coastal zones would be impacted as a result of the project.

Compatible Land Use

FAA Order 5050.4B requires consideration of several factors when analyzing affects on compatible land uses in the area in which the airport is located including changes in airport noise, community disruption, business relocations, induced socioeconomic impacts, wetland and floodplain impacts and critical habitat alteration. Each of these actions would have land use ramifications., As described later in this section, impacts associated with these actions do not meet the significance threshold established by *FAA Order 5050.4B*. There are a few issues that do warrant consideration. The proposed action would result in two moderate transit noise impacts and displacement impacts to two business properties.

As discussed in section 4.7, operation of the proposed LRT alignment would result in an increase in noise that would constitute a moderate noise impact based on FTA criteria to two hotel properties located within 50 feet of the proposed LRT alignment centerline. Table 4-10 details the existing and proposed noise levels.

A portion of two business properties is needed to provide adequate ROW for LRT operations along Airfield Drive between Esters Road and Freeport Parkway. The two properties are a Federal Express facility and a warehouse building located at 3010 North Airfield Drive currently occupied by IAS Air. The cities of Dallas and Fort Worth own the land occupied by these two business facilities. The DFW Airport Board has authority granted by the two cities to enter into long term leases for the properties. The Federal Express facility and warehouse at 3010 North Airfield Drive are under a long term lease to AFCO and AeroTerm, respectively. These two firms specialize in the leasing and management of airport properties. AFCO and AeroTerm have leasehold interests giving them controlling interest in the land and improvements until the lease expiration at which time DFW Airport becomes the owner of leasehold improvements.

AFCO currently subleases its facility to Federal Express and AeroTerm subleases its facility to IAS Air. Federal Express is a logistics service company that uses the impacted property for employee parking and tractor trailer storage. This impact will be mitigated by providing replacement parking. IAS Air is also a logistics service company that has used the 3010 North Airfield Drive property to provide mail handling services to the United States Post Office on a contract basis. IAS Air has informed DART that they currently do not have a contract and the facility is not being used. As discussed in section 4.2, an independent appraisal of the properties will be conducted to determine legal rights and interests of each of the parties involved.

No aviation-related noise changes are anticipated as a result of the propose action. However, as discussed in section 4.7.1, analysis indicates a moderate transit noise impacts to two hotels. Given the location and function of the properties adjacent to the airport, this minimal increase does not require mitigation.

In consideration of the factors with potential to have land use ramification and FAA significance thresholds, the proposed action would not constitute a significant compatible land use impact.

Construction Impacts

Construction activities would conform to all local, state, and federal ordinances and regulations. Construction permitting related to waters would proceed under Nationwide Permit (NWP) 14 for Linear Transportation Projects. Air quality impacts due to construction activities would not exceed NAASQ standards and would conform to the SIP as determined by conformity analysis conducted by NCTCOG during analysis of the regional TIP. More information regarding emissions and air quality control during construction can be found in section 5.1.2. Construction impacts would be temporary and limited in duration. DART would institute best management practices (BMPs) in its construction activities to minimize any undesirable affects. The impact of the individual resources would not meet the significance threshold established by *FAA Order 5050.4B*.

Section 4(f)

No Section 4(f) Resources are located within the area affected by the proposed action; therefore no Section 4(f) Resources would be impacted as a result of the project.

Farmlands

No prime farmlands are located within the area affected by the proposed action; therefore no prime farmlands would be impacted as a result of the project.

Fish, Wildlife, and Plants

The Texas Parks and Wildlife Department (TPWD), the United States Fish and Wildlife Service (USFWS), and DFW Airport have been consulted to advise DART on potential for the proposed action to adversely affect federally-listed threatened and endangered species and State threatened and rare species for the counties where the proposed LRT alignment is located. This communication, combined with field investigations of the area near the proposed LRT alignment, demonstrated that the proposed action is not likely to jeopardize the continued existence of such species and would not result in the destruction or substantial modification of critical habitat for the species. In the instances where field investigations found habitat suitable for state threatened or rare species, the habitat type is considered common and widespread. This habitat would not be disturbed in quantities that would impact population dynamics or sustainability of population. No unique habitat would be disturbed.

Floodplains

Minor encroachment into floodplain by the proposed action would be anticipated. Due to the linear nature of the proposed LRT alignment and the constraints on ROW availability due to the adjacent airfield or the requirements for safe airfield operation, no practicable alternatives were available for connecting the DART Orange Line to the DFW Airport Terminal A. The design of the proposed LRT alignment would ensure that neither the 100-year base flood elevation nor the floodwater velocity is increased by spanning all floodplain areas and placing only support columns within the floodplain. Additional details regarding the location and lengths of floodplain encroachment can be found in section 4.16.3 Impacts to Floodplains. The proposed action would not have a high probability of loss of human life, would have no affect on any vital transportation facility and would not cause substantial impacts to the natural or beneficial values of the floodplain.

Hazardous Materials

Section 4.20 of this EA has identified several hazardous material concerns for the construction of the proposed LRT alignment; however, *FAA Order 5050.4B* establishes significance thresholds for hazardous material concerns that indicate concern for National Priorities List (NPL) sites only. No NPL sites were found within 1 mile of the proposed LRT alignment; therefore no hazardous materials of national concern would be impacted as a result of the proposed action.

FAA Order 1050.19B was developed to provide the FAA a means to comply with applicable federal environmental regulations and best practices associated with property acquisitions and disposals. This order requires that the FAA conduct an Environmental Due Diligence Audit (EDDA) when acquiring or disposing of real property. The relocation of the high-mast pole hosting the LLWAS NE #4 and ASDE-X RU #2 would result in the termination of a lease between FAA to DFW Airport. Because property ownership is not being transferred, the requirement to perform an EDDA could potentially be waived. If required, the EDDA would be performed by FAA and included in a reimbursable agreement between DART, DFW Airport and FAA.

Historical, Architectural, Archaeological, and Cultural

No Historical, Architectural, Archaeological, or Cultural resources would be impacted as a result of the project. The Texas Historical Commission (THC) concurred with these findings on November 11, 2009 (archaeological resources) and December 21, 2009 (historic resources).

Light Emissions and Visual Effects

Light emissions from the proposed project would not create an annoyance to interfere with normal activity. Potential impacts from aerial structure, Traction Power Substations (TPSS), and the storage yard have been identified and are discussed in detail in section 4.6 of this EA. Three areas for visual effects were identified.

- Alternations of the built environment that may constitute a potentially significant visual impact were identified where new elevated structures for LRT infrastructure would be constructed near the Hawthorn Suites hotel. Vegetation is currently employed at that location to screen views of the airfield and any disturbance of the existing screening material would be replaced once construction activities are complete.
- A second area where a potentially significant visual impact would occur is at the location of the rail storage facility adjacent to the northbound service road of International Parkway. Construction of the rail storage facility would constitute a change in visual conditions in the area. DFW Airport has requested that DART provide visual screening of the facility by preserving existing vegetation in the area and incorporating screening methods consistent with DFW Airport guidance. DART will include DFW Airport image elements into the final design and comply with DFW Airport Design Criteria.
- While not considered potentially significant, DFW Airport has requested that DART provide screening of TPSS sites near public areas such as roadways by installing chain link fencing with PVC slats.

Coordination to ensure compliance with DFW Airport development guidelines is ongoing and DFW Airport staff will review the design of the LRT system. Discussion of visual elements will be a focus at the planned public hearing for the proposed action. As described in Chapter 6 of this EA, two community meetings have been held to present information about the proposed action to the public. Except for the requests from DFW Airport identified above, no comments regarding the visual character of proposed LRT alignment have been made.

Natural Resources and Energy Supply

The proposed project would not cause demands that would exceed availability or future natural resources or energy supply.

Noise

FAA Order 1050.1E, Environmental Impacts: Policy and Procedures and FAA Order 5050.4B, the NEPA Implementing Instructions for Airport Actions, states that a significant noise impact would occur if the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 decibel (dB) at or above the DNL 65 dB noise exposure.

According to 2030 ridership forecasts developed by the DART staff, 14,600 trips on the LRT are anticipated to be made daily to and from the DFW Airport LRT Station. Of those trips, 11,200 are anticipated to be arriving at the DFW Airport LRT Station, while 3,400 are departing the station. Out of the total of 11,200 daily trips arriving at DFW Airport LRT Station, approximately 700

transit trips transfer to TEX Rail or bus with 10,500 transit trips terminating at the airport. The NCTCOG Transportation model predicts that only 30 percent of the transit trips terminating at the airport are home-based non-work trips (presumed to be potential airport passengers). Most of the remaining 70 percent would be trips to work. This results in approximately 3,150 potential airport passengers per day (1,150,000 potential passengers annually) arriving at DFW Airport by LRT. The NCTCOG *Mobility 2030 Plan, 2009 Update* estimates that DFW Airport will handle approximately 84 million enplanements in 2030. Transit ridership would account for 1,150,000 of those passengers, which represents approximately 1.3 percent of the projected 2030 boarding passengers.

Even if all of the LRT passengers terminating at DFW Airport are assumed to be new airline passengers, the projected 1.3 percent increase in air passengers would not substantially change the operating environment of the airport. The marginal increase in new air passengers would not represent an increase in aircraft traffic that would result in changes to the existing DNL 65 dB noise contour. Although there is no credible way to estimate how many LRT passengers would be new air passengers, it is unlikely that the availability of LRT would influence new passengers to fly out of DFW Airport. Rail access to DFW Airport will not provide a competitive edge over regional competitors in the DART service area. Both Love Field Airport and Union Station (AMTRAK) will also have LRT access when the proposed project is operational. LRT will provide alternative airport access. Existing air passengers that would have taken a private vehicle or other ground transportation options, such as taxi, shuttle, or bus, to reach DFW Airport will have an alternative mode to the airport. Rather than increasing the demand for commercial air travel, the proposed LRT alignment has more potential to decrease the demand for other ground transportation modes and parking.

Secondary (Induced) Impacts

DART rail stations often involve the potential for induced or secondary impacts on the surrounding community. DART typically works closely with the development community to promote transit oriented development adjacent to rail stations. Local jurisdictions often develop transit overlay districts to encourage denser development around stations areas. As such, rail stations may induce growths in population, increase demands of public services, and change business and economic activity. Rail stations may also create a new destination location for commuter traffic by offering an alternative transportation choice to reach employment centers.

The DFW Airport LRT Station is not a typical station and induced impacts resulting from land use changes are not anticipated. DFW Airport owns all the land and controls all the development in the vicinity of the station. DFW Airport is in the process of renovating its terminals, but has no plans to change the existing land uses in the station area. DFW Airport is designing pedestrian access between the station and the airport terminals. Outside of normal terminal activity, no secondary development is anticipated, planned, or encouraged. Also, no parking will be allowed at the DFW Airport LRT Station and passenger drop off is discouraged due to toll control of all roadway access to the pedestrian facilities near the station. This lack of parking and access would result in no measurable changes to traffic in the area and therefore no anticipated changes to emissions and air quality due to the project.

Socioeconomic, Environmental Justice, and Children's Health and Safety Risks

FAA Order 5050.4B requires consideration of several factors when analyzing affects of the proposed action on socioeconomic issues including residential and community business relocations, loss of community tax base and disruption of local traffic patterns. Environmental

Justice and children's health and safety affects are based on disproportionately high and adverse impacts on specific populations. The proposed LRT alignment is located almost entirely on DFW Airport property. Consequently, there are no residential communities adjacent to the proposed project. NCTCOG 2005 land-use data confirms that there are no residential land uses within one quarter mile of the proposed LRT alignment. No relocation of residents is required. As discussed above, no additional airport noise resulting from the proposed action, which would affect residential communities surrounding DFW Airport.

Although three businesses would be directly impacted as discussed earlier and in section 4.2, these businesses are not community related businesses. The Federal Express facility impact is to parking, which will be replaced; the IAS Air facility is no longer in use; but could operate as a logistics facility in the future; and the Chesapeake Energy impact relates to communications equipment on a site not open to the general public. No changes to tax base would be anticipated by these business impacts.

As discussed in section 4.9, traffic analysis indicates that the proposed action would result in no substantial reduction in level of service and access to area businesses and airport facilities would not be affected. Local traffic patterns will not be disrupted.

As discussed in section 4.21, without a residential population and with minimal business impacts, low-income and minority populations will not experience disproportionately high and adverse affects of the proposed project. Additionally, no schools or parks were identified within one-quarter mile of the proposed LRT alignment and the proposed LRT alignment would not intersect any potential walking or biking routes to schools or parks.

The proposed action would not have an Socioeconomic or Environmental Justice impact nor would it pose a threat to children's health and safety.

Water Quality

The proposed LRT alignment crosses streams or water bodies in six locations as listed in table 4-27 in section 4.16 Water Resources. These six crossings are of three different creeks and primary tributaries of those creeks: Grapevine Creek, Hackberry Creek, and Mud Springs Creek. Coordination with the United States Army Corp of Engineers (USACE) and Texas Commission on Environmental Quality (TCEQ) began during the initial environmental evaluation for the project and has been ongoing through project design. According to information provided by TCEQ, Grapevine Creek is an impaired water body due to bacterial contamination. The proposed action does not include activities which will contribute bacterial materials or nutrients for such organism and therefore will not affect the water quality status of Grapevine Creek.

During construction activities, there would be the potential to create impacts to the three creeks due to runoff from grading activities, other dirt moving activities, or incidental/accidental spills of mechanical fluids. As directed by the DART Design Standards, a baseline Storm Water Pollution Prevention Plan (SW3P) shall be prepared in accordance with the most current Construction Storm water regulations (Federal National Pollutant Discharge Elimination System [NPDES] or Texas Pollutant Discharge Elimination System [TPDES]) and reflect the General Construction Storm Water Permit Checklist, published by the Environmental Protection Agency (EPA). All construction and related activities shall comply with the requirements of NPDES or TPDES. All temporary and permanent erosion controls shall comply with the latest revision of Storm Water Quality Best Management Practices Manual for Construction, prepared by NCTCOG (7-77). These measures for

erosion control, sedimentation control and control of total suspended solids would be incorporated into the project design in order to minimize impacts to water quality.

Once in operation, the proposed LRT alignment would result in impacts to surface water quality due to the creation of impervious surfaces including the track alignment and ballast, bridges and associated support structures, TPSS sites, and one station platform and associated pedestrian areas. Storm water runoff from these areas would be directed by site grading into swales and appropriately dispersed according to BMPs and site conditions.

The proposed action would not threaten any public drinking water supply, sole source aquifers, or waters of national significance. The construction of the proposed project would be conducted with TPDES requirements.

Wetlands

FAA Order 1051.1E requires FAA to make a finding that there is no practicable alternative to construction in wetlands, and that all practicable measures to minimize harm have been included. The proposed project does not encroach into wetlands as defined in 33 Code of Federal Regulations (CFR) 328; therefore, no wetland resources would be impacted as a result of the project. Four waters of the U.S. are crossed by the proposed LRT alignment. Two of those crossings are located nearby areas determined as wetlands. Both wetland areas are associated with crossings of Grapevine Creek. Neither crossing impacts the wetland areas negatively because the areas are avoided completely. In both cases, the water channel is spanned by elevated sections of the LRT infrastructure and support column placement would avoid these areas as shown in the 10% design plans found in Appendix J. The proposed action would not alter the hydrology needed to sustain the functions and values of the nearby wetlands, would not reduce the ability of nearby wetlands to retain floodwaters or storm-associated runoff, would not negatively affect the maintenance of natural systems that support wildlife and fish habitat or other environmental resources within the nearby wetlands.

In one location, a water of the U.S. designated as Ephemeral Drainage 1 (ED-1) on figure 4-15 is impacted. Approximately 0.06 acres of this water would be impacted due to the placement of support columns. As detailed under Mitigation Measures in section 4.16.2, any avoidance alternative would be costly and would likely result in greater environmental impacts. At this highly constrained location, direct impact to ED-1 could not be avoided. Placing the rail on aerial structure minimizes harm by limiting the impact to a few column locations. Additionally, column locations were adjusted during preliminary design in order to further minimize the area of the water impacted. The resulting impacted area is approximately 0.06 acres in size and therefore does not require an individual permit or mitigation. More detail on the impacted area, including the size and location of support columns, is shown in figure 4-16.

Wild and Scenic Rivers

No wild and scenic rivers are located within the area affected by the proposed action; therefore no wild and scenic rivers would be impacted as a result of the project.

3.2.3 Environmental Consequences and Mitigation

As detailed above and in chapters 4 and 5, the DART Orange Line DFW Airport Extension: IRVING-3 EA, there are very few impacts associated with the proposed action. Impacts to most resource categories identified in FAA guidance do not meet the significance threshold established by *FAA Order 5050.4B*.

For visual effects, the established threshold is consultation showing these effects contrast with existing environments where agencies state the contrast is objectionable. Although not stating the visual effects as objectionable, consultation with DFW Airport staff indicated a concern for the visual effects of the proposed project in areas of the airport that visible to the public. DFW Airport has established design criteria and image elements for facilities constructed within the boundaries of the airport. DART would coordinate with DFW Airport staff to incorporate the appropriate elements into the final design of the rail line.

Visual and Aesthetic Mitigation

DFW Airport staff has indicated a desire to soften the views of the TPSS facilities located within high-visibility areas. Specifically, there is a desire to soften the views of TPSS #9, TPSS #10 and TPSS #11. This would be accomplished through chain link fencing with PVC slats. Such mitigation would avoid visual effects to primary viewers by blocking views of the rail infrastructure.

Additionally, if practicable, DART would keep the existing vegetation between International Parkway and the proposed storage yard. DART would coordinate with DFW Airport staff to incorporate the image elements into the design of the storage yard. Various measures can be employed to soften the visual impact of the facility including the use of appropriate lighting materials and finishes and the use of solid visual barriers or vegetation to minimize intrusion into the visual environment for affected viewers.



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CHAPTER 4. AFFECTED ENVIRONMENT and IMPACTS

This chapter describes the existing natural and built environmental conditions within the project area and provides a baseline against which the impacts of the project can be measured. This chapter also details the environmental consequences associated with the No-Build and Build Alternatives as well as related mitigation measures to address potential adverse impacts.

4.1 Zoning and Land Use

This section discusses zoning and existing and planned land uses within the areas proximate to the proposed LRT alignment (see figure 1-2). This area consists of portions of the City of Irving, located in Dallas County and the City of Grapevine, located in Tarrant County. The DFW Airport property is owned by the cities of Dallas and Fort Worth and is located partially within both Dallas and Tarrant counties.

NCTCOG land-use data from 2000 was utilized as a baseline for existing land uses.. Additional information was gathered from recent aerial photography (AE View, 2006) and field reconnaissance performed in October 2009. City of Irving existing land-use data was obtained through interactive mapping tools available on the City of Irving website. Zoning codes for the cities of Irving and Grapevine were obtained from their respective page on the Municode website, which contains municipal codes for many cities and towns throughout the U.S. Future land-use plans for DFW Airport property were obtained from DFW Airport's *DFW Commercial Land Use Plan* published in May 2007.

4.1.1 Zoning

Affected Environment

The DFW Airport Extension project is located almost entirely on DFW Airport property which does not have zoning districts. City of Irving zoning near the proposed LRT alignment consists of S-P-1 (Site Plan-1), S-P-2 (Site Plan-2), C-O (Commercial Office), C-C (Community Commercial), ML-20A (Light Industrial), and FWY (Freeway). The areas adjacent to the proposed LRT alignment are not subject to City of Grapevine zoning.

Mixed-use and transit-oriented development (TOD) plans exist for the area around the Belt Line Station. This development could include a mixture of office, retail, residential, and restaurant/entertainment land uses. The City of Irving has a TOD Overlay District in place to address this potential shift in land use near the Belt Line Station (under construction as part of the Irving-2 project). Land within the city limits of Irving and within a half-mile of any existing light rail station falls within the overlay district. This zoning allows land near current or future stations to shift from commercial/office/industrial to a wider variety of land uses that could include residential, retail, and entertainment. On the portion of the land area that falls within the boundary of DFW Airport, no residential uses would be allowed.

Impacts to Zoning

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no impacts to zoning would be anticipated with the No Build Alternative. Zoning near the Belt Line Station area would not change since the Irving-2 project is currently under construction.

LRT Alternative

DFW Airport, including those areas within the cities of Irving and Grapevine, has no zoning districts; therefore, no impacts to zoning on DFW Airport property would be anticipated. Implementation of the DFW Airport Extension project could enhance the success of the City of Irving's TOD Overlay District.

Mitigation Measures

No mitigation would be required.

4.1.2 Existing and Planned Land Uses

Affected Environment

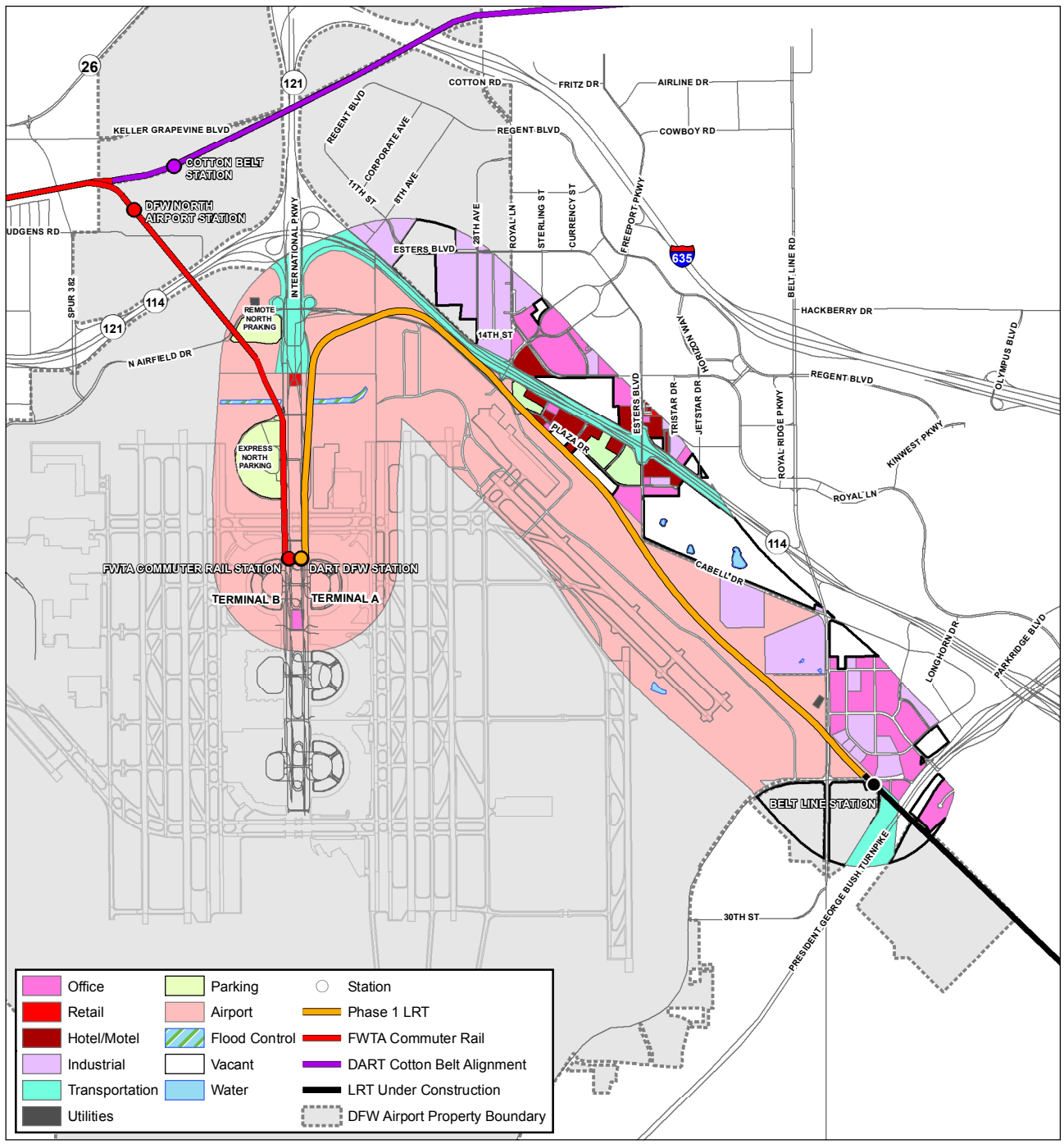
Land uses adjacent to the proposed LRT alignment are designated in 2005 NCTCOG data as either Airport, Vacant, Industrial, Office, Hotel/Motel, Institutional, Parking, Roadway, or Transportation (see figure 4-1). Several areas that are currently open space or vacant land are planned for development as designated in the DFW Commercial Land Use Plan. Those areas near the DART Belt Line Station and near the intersection of Cabell Drive and Esters Boulevard show the most change between the existing and future planned conditions as shown in figure 4-2 and figure 4-3.

Near the DART Belt Line Station (under construction), existing land uses, according to the NCTCOG 2005 land-use data, are Office, Open Space, and Airport. Another tract just northwest of the Belt Line Station area is shown as Industrial in the *DFW Commercial Land Use Plan*, while its current NCTCOG designation is Airport. From a review of aerial photography, its current use appears to be primarily Open Space/Vacant. Future land-use plans near the proposed LRT alignment include mixed-use tracts surrounding the Belt Line Station (see figure 4-2). Five tracts of land near the station (including the tract of land on which the station is being constructed) are planned for mixed-use development.

One tract of land along the proposed LRT alignment just northwest of the intersection of Cabell Drive and Esters Blvd. (see figure 4-3) is planned by DFW Airport for an industrial land use. Its current NCTCOG land-use designation is Airport. From a review of aerial photographs, its current use appears to be Open Space/Vacant.

The DFW Airport LRT Station would be located at DFW Airport Terminal A. The land-use designation is Airport. Observed adjacent land uses include Roadway, Airport Terminal, and Airport Industrial. It is not anticipated that land use in the station area would change.

In a letter to FAA dated July 27, 2007 (see Appendix E), DFW Airport reconfirmed its support for DART and the proposed project. Furthermore, the letter supported incorporating the rail alignment and station into the ALP. Revisions to the ALP are subject to FAA approval.



Source: NCTCOG 2000, URS Study Team 2009

FIGURE 4-1



0 4,000 8,000
Feet



EXISTING CORRIDOR LAND USE
DART Irving-3 Environmental Assessment

Impacts to Existing and Planned Land Uses

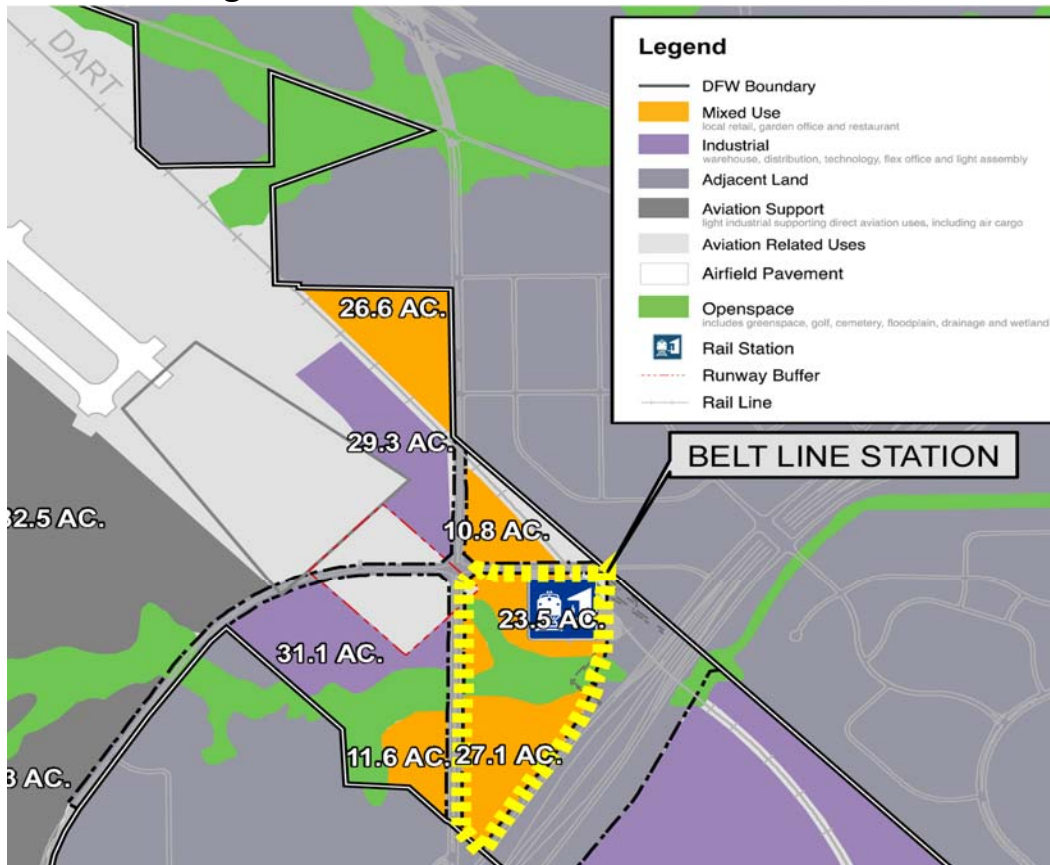
No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative Impacts to Existing and Planned Land Uses

Impacts to existing and planned uses by transit projects have a variety of causes. When considering if an impact exists, the following items are considered:

Figure 4-2. Belt Line Station Area Planned Land Use

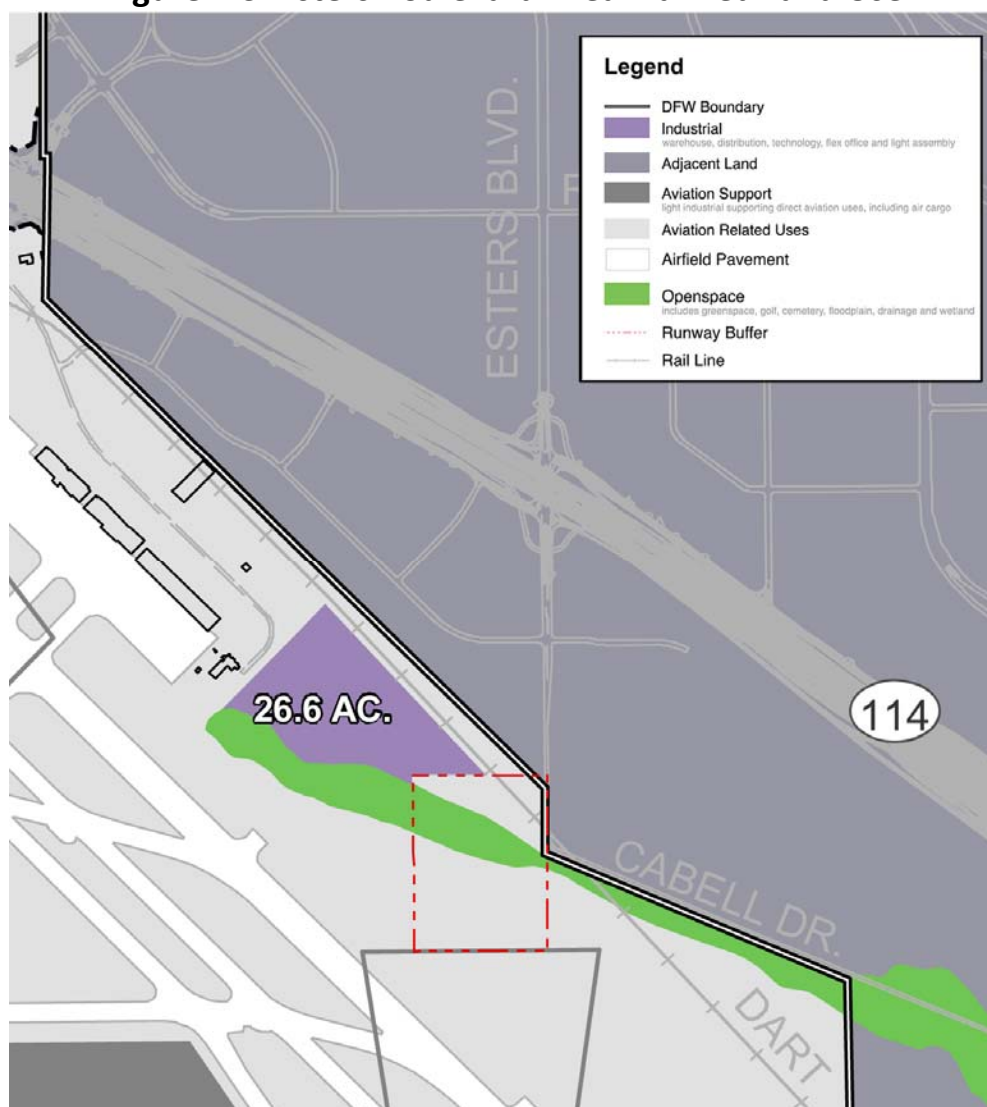


Source: DFW Commercial Land Use Plan, May 2007

- whether an acceptable degree of support for the transit project exists from the local community and municipal planning agencies;
- whether pedestrian, bicycle, and motor vehicle activity generated by the transit facility would be substantially greater than such activity on surrounding land uses under existing conditions and with future development planned for the area;
- whether the project would reinforce the objectives of local land use, economic development, and community service improvement plans;
- whether development would be encouraged, development patterns changed, or densities increased in a manner that would be inconsistent with the character of the existing community or its future development plans;
- whether the project would require zoning changes for implementation;

- whether the project would require the conversion of substantial parcels of land, thus resulting in considerable changes to existing or planned land uses;
- whether a substantial reduction or increase of the local tax base would occur;
- whether the project would induce development and, if so, it should be determined if the secondary impacts on the community would be beneficial or adverse; and
- whether substantial adverse impacts are anticipated during construction. Impacts of the following should be considered: restricted access to businesses and residences; temporary closure of pedestrian or bicycle passageways; temporary disruptions of utility services; and locations of staging sites and haul routes in sensitive areas. Short-term impacts on air quality, traffic flow, and circulation patterns, as well as from noise and vibration due to construction activity, should also be considered.

Figure 4-3. Esters Boulevard Area Planned Land Use



Source: DFW Commercial Land Use Plan, May 2007

Land-use impacts related to the above conditions most often occur due to activity and development near station areas. The proposed LRT alignment does not include station areas where development is possible. Land-use plans near the Belt Line Station were considered during preparation of the EIS for the Irving-1 and 2 line segments which determined that the station location supported planned development. Land-use impacts related to the proposed LRT alignment could occur if zoning changes were required, if the presence of the alignment discouraged development plans, or if construction activities restricted business access or productivity.

No future land-use impacts are anticipated, because the proposed LRT alignment is located primarily on DFW Airport property, and all planned development is industrial in nature. Industrial uses typically create higher levels of noise and activity disturbances than would be expected by DART LRT operations and therefore would not be negatively impacted by the presence of the project. DFW Airport future land-use plans include the proposed LRT alignment. As a result, land-use plans on airport property have been developed to complement and coordinate with the proposed LRT alignment. No adverse impacts to land use and zoning would be anticipated for the proposed project.

The use of airport land needed to build and operate the project would be gained through a lease or license agreement between DART and DFW Airport. A release from federal obligations and land-use requirements would not be anticipated.

Mitigation Measures

No mitigation would be expected to be necessary for existing or planned land uses.

4.2 Industrial and Commercial Activity

Affected Environment - Business Inventory

Many businesses are located adjacent to or nearby the proposed LRT alignment. Table 4-1 provides a list of major employers located within the zip codes the proposed LRT alignment study passes through: 75063, 75261, and 76051. The proposed project is located almost entirely within the 75261 zip code with a small portion of the alignment falling within 75063. The western portion of the airport falls within 76051. Major employers are defined as those employers who have 300 or more employees at a particular site.

In addition to the major employers above, several businesses and hotels are located within the general vicinity of the proposed LRT alignment. Some of these businesses include Credit Union of Texas, Wachovia, Mosaic, Stewart, Verizon, Forward Air, JDA Software, US Customs and Border Protection Port of Dallas-Fort Worth, The Parking Spot, Federal Express, IAS Air, Smart Start, Inc., Capps Van Service, Allflex, DFW Education Center, Fast Track Indoor Valet Parking, Hitachi, Siemens, NEC, DHL, and Trans-Trade, Inc. Hotels near the proposed LRT alignment include Holiday Inn Express, Comfort Suites, Motel 6, Hawthorn Suites, Sleep Inn, Comfort Inn, Homewood Suites, La Quinta, Fairfield Inn, Homestead, Marriott, and Best Western. Ten rental car companies, several airlines, and various concession tenants provide services on DFW Airport property.

AMR Corporation (parent company of American Airlines, Inc. and American Eagle Airlines, Inc.) is the second largest employer in the North Central Texas region. Approximately 11,709 employees are located in the vicinity of the CTA. Most of these employees are concentrated in the terminal areas. Also, the AMR corporate headquarters campus is located in Fort Worth at The Campus at CentrePort office park on Amon Carter Boulevard, just south of DFW Airport. Approximately 7,500

employees are located at the headquarters campus. All American Airlines activities across the world are overseen from this campus. Other AMR facilities on DFW Airport include the American Airlines Training and Conference Center, the American Airlines Flight Academy, and the System Operations Control Center.

Table 4-1. Major Employers in Proximity to the Study Area

| <i>Employer</i> | <i>Zip Code</i> | <i>Number of Employees</i> |
|--|-----------------|----------------------------|
| American Airlines/AMR | 75261 | 11,709 |
| Citigroup | 75063 | 5,000 |
| Allstate Insurance Co. | 75063 | 2,000 |
| DFW Airport Board | 75261 | 1,600 |
| Gaylord Texan Resort Hotel & Convention Center | 76051 | 1,500 |
| Baylor Regional Medical Center at Grapevine | 76051 | 1,230 |
| Atlantic Southeast Airline, Inc. | 75261 | 1,000 |
| Computer Science Corp. | 75063 | 900 |
| Aegis Communications Group, Inc. | 75063 | 900 |
| Verizon Information Services (IDEARC) | 76051 | 888 |
| Verizon Internet Solutions | 76051 | 880 |
| LSG Sky Chefs, Inc. | 75261 | 800 |
| Brinks Home Security, Inc. | 75063 | 800 |
| Aviall Services, Inc. | 75261 | 760 |
| Medco Health Solutions of Irving | 75063 | 750 |
| Nissan Motor Acceptance Corp. | 75063 | 715 |
| Gamestop.com | 76051 | 686 |
| Adea Solutions, Inc. | 75063 | 600 |
| Quest Diagnostics, Inc. | 75063 | 600 |
| Michael's Stores | 75063 | 600 |
| First Horizon Home Loans | 75063 | 576 |
| CAE Simuflite Training | 76051 | 534 |
| Bearingpoint, Inc. | 75063 | 500 |
| Federal Aviation Administration | 75261 | 500 |
| Federal Express Corporation | 76051 | 500 |
| Great Wolf Lodge | 76051 | 500 |
| HCA Patient Account Services | 75063 | 475 |
| Deloitte & Touche | 75063 | 470 |
| Comcast Call Center | 75063 | 450 |
| United States Postal Service | 75261 | 435 |
| Comcast Cable Holdings, LLC | 75063 | 430 |
| Washington Mutual | 75063 | 409 |

Table 4-1. Major Employers in Proximity to the Study Area

| <i>Employer</i> | <i>Zip Code</i> | <i>Number of Employees</i> |
|--|-----------------|----------------------------|
| American Home Mortgage Servicing | 75063 | 600 |
| Total Enterprise | 75063 | 400 |
| Xerox Corporation | 75063 | 396 |
| Four Seasons | 76051 | 385 |
| Devry University, Keller Graduate School of Management | 75063 | 379 |
| Frank Parra Dodge | 76051 | 370 |
| Hyatt Regency DFW | 75261 | 370 |
| Ford Motor Credit | 75063 | 367 |
| ATX Group, Inc. | 75063 | 354 |
| Prime Therapeutics, Inc. | 75063 | 337 |
| Marriott DFW Airport Hotel | 75063 | 335 |
| City of Dallas – Public Safety, DFW | 75261 | 330 |
| Autogrill Group, Inc. | 75261 | 325 |
| Rainforest Café, Inc. | 76051 | 309 |
| Corpus, Inc. | 75063 | 300 |
| JPI Lifestyle Apartment Communities (JPI Management Services; JPI Construction; JPI Leasing) | 75261 | 300 |
| Conexis, Inc. (Conexis Benefits Administrators, LP) | 75063 | 300 |
| Morgan Stanley (Saxon Capital: Morgan Stanley Credit Corp.; Morgan Stanley Capital Holdings) | 75063 | 300 |
| CEVA Logistics | 75261 | 300 |
| Grand Hyatt DFW | 76051 | 300 |
| AMR Eagle Holding Corp. | 76051 | 300 |
| Fidelity Investments (Commercial Printing) | 76051 | 300 |
| City of Grapevine | 76051 | 300 |

Source: NCTCOG, 2010

DFW Airport is located in Foreign Trade Zone 39 (FTZ 39). This trade zone includes a 21-acre business park north of SH 114, two cargo distribution centers, and DFW Airport’s general-purpose public warehouse. Foreign trade zones allow products to be transferred between zones, re-packaged, and other such trade activities without import taxes being levied.

The proposed project would only have one station, which is planned near Terminal A of DFW Airport. This station is considered to be a destination station that would not have parking. The station would primarily serve airport passengers, airport employees, airline employees, and other airport-related businesses that can be served by the Skylink APM or the Terminal Link Shuttle Bus System. These businesses are predominantly located within the 75261 and 76051 zip codes.

Impacts to Industrial and Commercial Activity

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

The proposed action would result in impacts to three business properties. A portion of two of these properties, located along Airfield Drive between Esters Road and Freeport Parkway, is needed to provide adequate ROW for LRT operations. The two properties are a Federal Express facility and a warehouse building located at 3010 North Airfield Drive that was occupied by IAS Air.

The cities of Dallas and Fort Worth own the land occupied by these two business facilities. The DFW Airport Board has authority granted by the two cities to enter into long term leases for the properties. The Federal Express facility and 3010 North Airfield Drive are under a long term lease to AFCO and Aeroterm, respectively. These two firms specialize in the leasing and management of airport properties. AFCO and Aeroterm have leasehold interests giving them controlling interest in the land and improvements until the lease expiration at which time DFW Airport becomes the owner of leasehold improvements.

AFCO currently subleases its facility to Federal Express and Aeroterm was subleasing its facility to IAS Air. Federal Express is a logistics service company that uses the impacted property for employee parking and tractor trailer storage. IAS Air is also a logistics service company that has used the 3010 North Airfield Drive property to provide mail handling services to the United States Post Office on a contract basis. IAS Air has informed DART that they currently do not have contract and the facility is not being used and listed for lease.

Although the LRT line would also occupy other potentially developable property owned by DFW Airport; DFW Airport supports the implementation of LRT and the proposed use of DFW Airport property.

Commercial activity would potentially also be disturbed due to the proposed alignment's proximity to a Chesapeake Energy drilling and operations pad site. Because the proposed LRT alignment would be an elevated guideway next to Pad Site "AC", the SCADA Communication link line-of-sight path would be blocked. The proposed LRT alignment would result in an approximate 8 foot penetration of the Chesapeake SCADA path at the peak of the Bridge by the DART Rail vehicle.

Mitigation Measures

During construction, appropriate measures and actions specified by *Part 6. Temporary Traffic Control* of the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)* and *Part 6. Temporary Traffic Control* of the federal *Manual on Uniform Traffic Control Devices*, would be implemented to prevent, minimize, or mitigate any potential impacts to surrounding land uses and businesses due to construction activities with an emphasis on maintaining access to and signage for businesses during the construction period. Specifics related to these mitigation measures are described later in this document in section 5.1 Construction Impacts.

Typically, for all real property acquired, DART would compensate the property owner for the fair market value of their property and for damages to any remaining parcels. However, for this project, the cities of Dallas and Fort Worth through DFW Airport are the property owners for all potentially displaced properties and would continue to own the land after construction of the

proposed LRT alignment. The use of airport land needed to build and operate the proposed LRT project would be through a lease, license, or easement agreement between DART and DFW Airport.

Given the complex ownership and lease structure of the two impacted business properties, an independent appraisal of the properties will be conducted to determine legal rights and interests of each of the parties involved. This appraisal will be conducted in accordance with the DART Board of Directors' Real Estate Policy and Procedures, as amended, and the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) of 1970 (42USC 4601).

Mitigation measures for displacements resulting from the proposed project would consist of fair compensation for the property acquired, relocation assistance, or other assistance, in accordance with the URA. Relocation benefits would be available to eligible businesses (owner occupants and tenants) that would be displaced by the proposed action. DFW Airport and DART are currently developing a Memorandum of Agreement (MOA) to govern any property displacements or disputes.

A mitigation plan has been developed to alleviate impacts to business operations at the Federal Express facility. DART has devised a recommended plan for reconfiguring the remainder of the existing Federal Express parking area to accommodate all trailer storage needs. Additional parking to accommodate the displaced employee parking would be constructed south of North Airfield Drive, adjacent to the employee entrance to the Federal Express center. The facility is also located on the south side of North Airfield Drive. Any additional impacts associated with this mitigation will be discussed elsewhere in this document as appropriate.

As there is no current activity at 3010 North Airfield Drive facility, no mitigation plan has been developed for the business impact. DART will work with DFW Airport to ultimately determine the practicality of salvaging a portion of the structure.

Finally, mitigation for the blockage of the SCADA line of site due to an approximate 8 foot penetration of the Chesapeake SCADA path at the peak of the Bridge by the DART Rail vehicle would be mitigated by increasing the antenna tower height to a height that would be over the DART Rail Infrastructure.

4.3 Residential Areas and Community Resources

This section discusses community resources near the proposed LRT alignment including neighborhoods, schools, places of worship, community centers, and emergency facilities.

4.3.1 Neighborhood Integrity and Community Cohesion

Affected Environment

The proposed LRT alignment is located almost entirely on DFW Airport property. Consequently, there are no residential communities adjacent to the proposed project. NCTCOG 2005 land-use data confirms that there are no residential land uses within one quarter mile of the proposed LRT alignment. Field reconnaissance efforts did not identify any structures near the proposed LRT alignment that appear to be residential in form or function. The closest residential community is over one mile away from the proposed project. City of Irving zoning designations near the proposed LRT alignment do not allow residential uses.

Neighborhoods or residential areas are located in Irving to the north, south, and east of the Belt Line Station, as well as to the east and northeast of DFW Airport. There are several neighborhood associations active in Irving but none are near the proposed LRT alignment.

Impacts to Neighborhood Integrity and Community Cohesion

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

The proposed action would not have any impact on residential areas, nor would it impact neighborhood integrity or community cohesion. The LRT line would not introduce new boundaries but would reinforce existing ones.

Mitigation Measures

No mitigation measures would be required.

4.3.2 Community Resources

Community Resources often provide opportunities for social interaction, as well as affect community character and cohesion. According to the DART *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*, transit projects should not disrupt established neighborhoods or create physical or social splits within communities. Access to resource facilities such as schools, places of worship, outdoor assembly areas, or other community focal points should not be disrupted. Also, services provided to communities such as emergency services should not be disrupted (DART 2009). Impacts could occur if these conditions are created which effectively separate residents from community facilities.

Affected Environment - Community Resource Inventory

Schools, Places of Worship, and Outdoor Assembly Areas

NCTCOG 2005 land-use data indicates that there are no hospitals or outdoor assembly land uses within one-quarter mile of the proposed LRT alignment. Although the proposed LRT alignment passes through several Independent School District (ISD) boundaries (Irving ISD, Carrollton-Farmers Branch ISD, and Coppell ISD), no schools were identified within one-quarter mile of the proposed LRT alignment.

According to on-line research and field reconnaissance, one place of worship falls near the proposed LRT alignment. Heartland World Ministries Church is located at 6300 North Belt Line Road, less than one quarter-mile from the proposed LRT alignment and less than one half-mile northwest of the DART Belt Line Station.

Emergency Facilities

DFW Airport's Department of Public Safety (DPS) includes police, fire, and emergency medical services. Five public safety stations exist on DFW Airport property, with a sixth set for completion in 2011. One DPS station, Station #3, providing fire and emergency medical services, is located within one-quarter mile of the proposed LRT alignment. Construction and operation of the proposed LRT alignment would not impede access to or from this facility. (See section 4.11 Safety and Security). No other emergency facilities or hospitals fall within one-quarter mile of the proposed LRT alignment. Irving Fire Station #7 is approximately 1.75 miles south of the proposed LRT alignment.

Children's Health and Safety Risks

The proposed LRT alignment does not fall within residential areas, is not in the vicinity of any schools and would not intersect any potential walking or biking routes to schools. The proposed action would, therefore, pose minimal threat to children's health and safety.

Impacts to Community Resources

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

As described above, no hospitals, schools, outdoor assembly areas, walking or biking routes, or residential areas occur within one quarter mile of the proposed LRT alignment. The proposed LRT alignment does not separate any of the community facilities identified in the inventory section above from nearby residential areas; therefore, no impact would occur to community resources.

The two community resource sites located within one quarter mile of the proposed LRT alignment, Heartland World Ministries Church and DFW Airport DPS Station #3, would not be affected by the proposed LRT alignment because the project does not separate these sites from existing residential areas or activity centers. Also, with the proposed grade separation of Belt Line Road, the proposed LRT alignment would not impede automobile access to or from these facilities.

DFW Airport future land-use plans include the proposed LRT alignment. As a result, land-use plans on airport property, including the mixed-use and TOD plans near the Belt Line Station, have been developed to complement and coordinate with the proposed project. No adverse impacts to community facilities would be anticipated for the proposed project.

Mitigation Measures

No mitigation measures would be required.

4.4 Demographic Characteristics

This section provides the demographic characteristics of populations within one quarter mile of the proposed LRT alignment and larger community. Demographic characteristics include population statistics and economic statistics.

U.S. Census data from the 2000 Census was utilized as the baseline data for the analysis in this section. Geographic information systems tools were utilized to perform calculations and analysis of the portions of census units that occur within one quarter mile of the proposed LRT alignment, which is used as the study area for the demographic analysis.

Affected Environment – Census Inventory

Study Corridor Census Data

As previously indicated, the DFW Airport Extension project is located almost entirely on DFW Airport property; therefore, there are no residential communities adjacent to the proposed project. The closest residential community is located more than one mile away from the proposed project.

Portions of the one quarter mile area surrounding the proposed LRT alignment fall within four census tracts: 141.03, 141.12, 141.24, and 1137.06. However, only one census tract (141.12) is populated per the 2000 U.S. Census data within the study area boundaries. Due to development trends and their location on and around airport property, these tracts are very large and sparsely populated.

Census tract 141.12 is subdivided into census blocks, three of which are populated. These three census blocks have a combined population of five individuals. Closer scrutiny reveals that there are no single-family or multi-family dwelling units within these census blocks. These five individuals have apparently identified a hotel/motel as their primary residence. Table 4-2 below provides demographic data for the populated census blocks in the study area.

Census blocks within a study area usually provide the most accurate depiction of the demographic composition and economic status of the area; however, the area near the proposed LRT alignment is too sparsely populated for census data to provide meaningful demographic information.

| <i>Census Unit</i> | <i>Total Population</i> | <i>White</i> | <i>Black</i> | <i>Asian</i> | <i>Other</i> | <i>Hispanic</i> |
|---------------------------------|-------------------------|--------------|--------------|--------------|--------------|-----------------|
| Census Tract 141.12, Block 1001 | 1 | 100% | 0 | 0 | 0 | 100% |
| Census Tract 141.12, Block 1015 | 2 | 100% | 0 | 0 | 0 | 0 |
| Census Tract 141.12, Block 1016 | 2 | 100% | 0 | 0 | 0 | 0 |

Source: US Census Bureau, 2009; 2000 U.S. Census data

Regional Census Data

The proposed project does not serve nor impact a residential community, but would provide access to DFW Airport from the entire DART Service Area. As such, it is useful to understand the demographics of the larger community. Table 4-3 provides a demographic profile of the DART Service Area, Dallas County, and the City of Irving.

The transportation needs of the DART Service Area are as diverse as its population. The implementation of the DFW Airport Extension project would further enhance regional connectivity.

Impacts to Demographic Characteristics

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

Since the study area is largely unpopulated, the LRT alternative would have no impact to the demographic characteristic of the LRT corridor. For the community at large, the LRT Alternative would provide access to DFW Airport and its employment center to the diverse population of the DART Service Area.

Mitigation Measures

Since no adverse impacts to demographic characteristics would be anticipated, no mitigation measures would be required.

**Table 4-3. Demographic Profile
 DART Service Area, Dallas County & City of Irving**

| <i>Demographic Characteristics</i> | <i>DART Service Area</i> | <i>Dallas County</i> | <i>City of Irving</i> |
|--|--------------------------|----------------------|-----------------------|
| Total Population 2000 | 2,149,381 | 2,218,899 | 191,615 |
| Median Household Income ¹ | \$47,799 | \$43,324 | \$44,956 |
| % Persons Low Income ² | 12.8% | 13.2% | 10.6% |
| % Racial Minority ³ | 39.8% | 41.6% | 35.8% |
| % Hispanic Origin | 28.6% | 29.9% | 31.2% |
| Median Age of Residents | 32.4 | 31.1 | 30.3 |
| % Population Under 18 | 27.1% | 27.9% | 25.2% |
| % Population Over 64 | 7.7% | 8.1% | 6.1% |
| % Occupied Housing Units with no vehicle available | 7.8% | 8.1% | 5.7% |

Source: 2000 U.S. Census

¹ For the DART Service Area, this number is a Weighted Average Median Household Income for the 13 DART Member Cities.

² Individuals with incomes below the poverty level in 1999 as reported in the 2000 Census.

³ Racial Minority is defined as the population identifying themselves as non-white in the 2000 Census.

4.5 Political Jurisdictions

This section provides the various political districts that have jurisdiction within areas adjacent to the proposed LRT alignment. Political jurisdiction data was collected from the Texas House of Representatives and Texas Legislative Council websites that provide political district information by zip code, as well as maps of Texas Congressional districts and U.S. House of Representatives districts. Political jurisdictional boundaries are displayed in figure 4-4.

Affected Environment

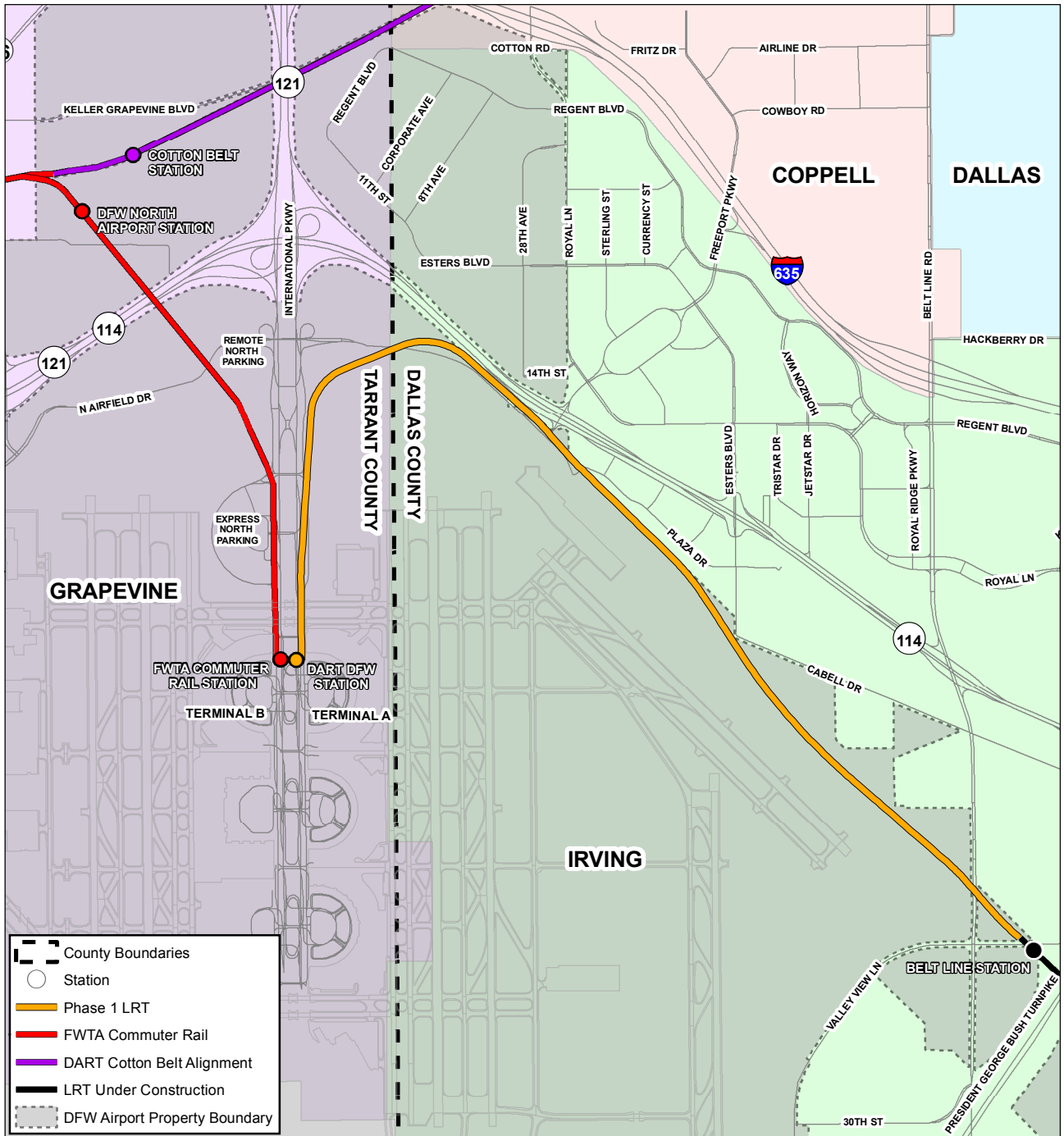
DFW Airport property is located partially within both Dallas and Tarrant counties. The area adjacent to the proposed LRT alignment consists of portions of the City of Irving, located in Dallas County and the City of Grapevine, located in Tarrant County. The airport is owned by the cities of Dallas and Fort Worth. DFW Airport's Board of Directors is composed of 12 members, 11 of whom are appointed by the city councils of the airport's owner cities. A 12th, non-voting board position representing one of the airport's four neighboring cities (Irving, Grapevine, Euless, or Coppell) is filled on an annual, rotating basis. The proposed LRT alignment falls within several state and federal political jurisdictions including two Texas Senate Districts (9 and 12), three Texas House Districts (98, 105 and 115), and two US Congressional Districts (24 and 26).

The DFW Airport Board is a semi-autonomous body charged with governing DFW Airport. Within its boundaries, DFW Airport has jurisdiction authority over public safety and airport operations.

Impacts to Political Jurisdictions

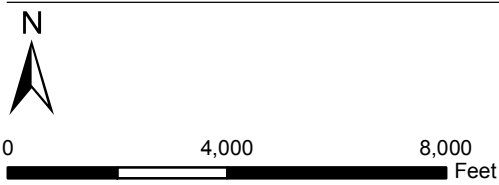
No Build Alternative

No adverse impacts to political jurisdictions would be associated with the No Build Alternative.



Source: NCTCOG 2008 and 2000

FIGURE 4-4



POLITICAL JURISDICTIONS
DART Irving-3 Environmental Assessment

LRT Alternative

Political jurisdictions are legal entities of the state and would not be adversely impacted or benefited by the implementation of the proposed project.

Mitigation Measures

No mitigation measures would be required.

4.6 Visual and Aesthetic Resources

This section presents the visual and aesthetic impacts of implementing the proposed project. The purpose of this section is to identify changes in visual resources and the effect of such changes on the experience of the primary viewers. The primary focus of this section is the general public not the visual impact to aircraft. The visual impact to aircraft is being addressed as part of the aeronautical analysis discussed in section 3.1.2. Results and recommendations of that study are included in Chapter 3. This section does include the visual impact resulting from the connected action relocating of the mast pole for the LLWAS #4 and ASDE-X remote unit #2. Additionally, mitigation recommendations that address other impact categories but also may result in visual impacts are included. and mitigation recommendations resulting from aeronautical analysis. These connected actions are the relocation of the mast pole for the LLWAS #4 and ASDE-X remote unit #2, and These mitigation recommendations include adding red lights to catenary poles in selected areas, adding PVC slats in fencing in selected areas, increasing the height of a Chesapeake Energy communications tower.

Methodology and Background

This section includes a visual inventory to provide an overview of the existing visual quality of the proposed LRT alignment and document the visual and aesthetic resources adjacent to the proposed LRT alignment that would be potentially impacted by the proposed action. This inventory was used to assess if impacts would occur to views, vistas, existing developed areas and natural areas due to the proposed LRT alignment.

The proposed LRT alignment was divided into visual inventory units by grouping together areas of similar land uses and visual characteristics. The inventory units were then verified as appropriate through field observation.

Each inventory unit was assessed to determine the existing nature of the visual quality and visual sensitivity within the inventory unit. An inventory of the sensitive receptors and visual assets, if any, was also collected. The primary viewers of each unit were also determined through field observations and aerial mapping. The visual sensitivity of each unit was determined by analyzing visual features such as residential areas, areas of scenic beauty, parks and recreational areas, historic and/or culturally noteworthy features, entry to urban areas, water bodies, and public facilities.

It should be noted that DFW Airport has established design criteria and image elements for facilities constructed within the boundaries of the airport.

Visual and Aesthetic Inventory

The proposed LRT alignment consists of five visually distinct visual inventory units along the corridor. The DFW Airport LRT Station is considered to be a sixth unit.

Visual Inventory Unit #1

The first visual inventory unit begins near the Belt Line Station, the terminus of the Irving-2 line segment. This unit crosses Valley View Lane and travels adjacent to an industrial/commercial area, then crosses Belt Line Road and terminates near Civil Station 540+00 adjacent to the western edge of a developed parcel. Within this unit, the alignment is at-grade and rises to an aerial structure to cross Belt Line Road. Located at approximately 533+00, TPSS #7 is included in this unit. The surrounding topography undulates gradually, ranging from elevation 480 to 520. This topography, combined with the dense Mesquite-scrub vegetation in the undeveloped areas, would result in limited views of the proposed LRT alignment. The unit is comprised of vacant land and low-density development such as warehouses, industrial facilities and distribution centers. From the adjacent areas, the proposed LRT alignment would be viewed by employees and customers of several buildings within the industrial areas near the alignment and motorists traveling on Valley View Lane and Belt Line Road. Motorists on West Campus Circle, a road within the industrial area, would have access to views of the alignment in two locations, because a vacant lot lies between the alignment and the road and a parking lot is located between the alignment and the road. The visual quality in this area is low, because the unit does not contain any remarkable views, architecture, or aesthetic character. The visual sensitivity of the unit is also low, because the introduction of new lines, forms, shapes, and structures would have little to no impact on the aesthetics of the area as observed by the primary viewers.

Figure 4-5. Visual Inventory Unit #1



View towards the Proposed LRT Alignment from West Campus Circle

Visual Inventory Unit #2

Visual inventory unit #2 represents an area of undeveloped land on airport property that extends from unit #1 to Civil Station 580+00 where the alignment crosses over Hackberry Creek and its floodplain adjacent to the intersection of Cabell Drive and Esters Boulevard. Views of the alignment in this unit from publicly accessible areas, such as Cabell Drive, are restricted due to dense vegetation between Cabell Drive and the alignment. However, views of the alignment from the airport operations area are open and clear. In this unit, the alignment runs roughly parallel to runway 13L-31R and the associated airport service road. The human factors analysis discussed in section 3.1.2, suggests placing red obstruction lights at the tops of catenary poles beginning at Civil Station 675+00 within this unit. TPSS facilities would not be located within this unit.

The visual assessment unit consists of gently undulating fields ranging from 490 to 520 feet in elevation. The majority of dense vegetation surrounds Hackberry Creek, which lies predominately to the east of the proposed LRT alignment. The visual quality for this unit is low, because it does not contain any noteworthy views, architecture, or character. The visual sensitivity for the unit is low due to the lack of viewers and the high speeds and short duration that the primary viewers, airline passengers, would see the area. No consequential views occur within visual inventory unit #2.

Visual Inventory Unit #3

This visual inventory unit begins at the crossing of Hackberry Creek and travels through a developed area to terminate just west of the intersection of North Airfield Drive and Freeport Parkway. The proposed LRT alignment would easily be seen from the developed areas because few barriers or obstructions to the views exist. The areas adjacent to the proposed LRT alignment in this unit are primarily developed parcels consisting of retail businesses, hotels, off-airport parking, and distribution facilities. The surrounding undeveloped areas are fields of mowed grasses and parcels containing airport navigation equipment and storage tanks. Through this inventory unit, the proposed LRT alignment transitions from an at-grade alignment to a grade-separated structure as it crosses over Freeport Parkway. TPSS #8 (588+50) would be included in this unit. A mast pole for two FAA instruments is proposed to be relocated at the existing FAA communications facility (RTR 1E) within this visual inventory unit, as shown in figure 3-1. The mast pole would hold the LLWAS-NE #4 and one ASDE-X remote unit #2 as described in Section 3.1.2.

The mast pole would be relocated approximately 2000 feet east southeast of the existing location on North Airfield Drive. The proposed relocation site would be co-located at an existing FAA communications facility (RTR 1E) as shown in figure 3-1. The mast pole is a 100-foot tall aluminum pole resembling a cell phone tower or light standard. The existing FAA communications facility within this unit consists of four lattice towers. Chesapeake Pad Site "AC" is also located within this visual assessment unit. Also, red obstruction lights at the tops of catenary poles suggested as mitigation in the human factors

Figure 4-6. Visual Inventory Unit #3



View towards the North from North Airfield Drive

analysis discussed in section 3.1.2, which began in Visual Inventory Unit #2, would continue until Civil Station 610+00.

Primary viewers of the proposed LRT alignment within this unit consist of motorists traveling on Plaza Drive, Freeport Parkway, North Airfield Drive, and SH 114. Other primary viewers include hotel guests, patrons of the parking facilities and retail businesses, and employees of the parking facilities and retail businesses. The visual quality of the unit is low, because no noteworthy views or aesthetic elements occur within the unit. The visual sensitivity of the unit is moderate, because viewers would have a long time period to view the trains and tracks due to open views of the proposed LRT alignment. Some vegetative screening of the airport, the background element to

any view of the alignment, is currently in place. The presence of this screening indicates that users in the area are cognizant of existing view quality. Existing views include chain link fencing, airport equipment, and commercial trucking activities. There are no remarkable features or views within this visual assessment unit.

Visual Inventory Unit #4

Beginning west of the intersection of North Airfield Drive and Freeport Parkway, visual inventory unit #4 extends to Civil Station 705+00, where the proposed LRT alignment turns southward to parallel the northbound service road to International Parkway. Through this unit, the proposed LRT alignment parallels SH 114 and North Airfield Drive. Views of the proposed LRT alignment would be relatively open to motorists on those roadways. The human factors analysis, discussed in section 3.1.2, suggests placing both visual screening and red obstruction lights along the alignment approximately from Civil Station 648+00 through 695+00. TPSS #9 (650+50) would be located within this inventory unit.

The surrounding land is largely undeveloped and contains only airport equipment, utility access locations, and natural gas drilling operation sites. The visual quality of the unit is low due to the absence of any visually interesting development character or aesthetic elements. The visual sensitivity of the unit is low, because the primary viewers, motorists, travel at high speeds through or adjacent to the unit and have little exposure to visual elements within the unit. No consequential features or views exist within Visual Inventory Unit #4.

Figure 4-7. Visual Inventory Unit #4



View of Airport Operation Area (north of Runway 17C-35C) from North Airfield Drive West of Freeport Parkway (looking west)

Visual Inventory Unit #5

Visual Inventory Unit #5 parallels the northbound service road of International Parkway terminating at the station platform. From the unit’s beginning at Civil Station 705+00 to the Terminal A area, the unit is in clear view of the service road and within 80 to 120 feet of the service road. Within this unit, the alignment transitions from at-grade, to grade-separated as it crosses the northbound service road, then back to at-grade. TPSS #10 (710+00) and TPSS #11 (741+00) would be included in this unit. DART also proposes a rail storage track yard within this unit. This facility would be situated between the northbound service road and International Parkway, between Civil Stations 740+00 and 754+00. Elements in the yard would include: three sets of tracks, a crew room, TPSS #11, and parking for DART personnel.

In this unit, the surrounding landscape is composed of undeveloped areas and primarily low, grassy vegetation. Natural gas drilling operation sites and airport utility facilities are also visible

Figure 4-8. Visual Inventory Unit #5



View of International Parkway from Northbound Service Road near American Airlines Cargo Facility

are also visible from within this unit. Trees are sporadically planted in the islands between parking lots and the service road. The median between International Parkway and the northbound service road contains berms and is landscaped with grassy vegetation. Trees have been planted to break up the views of motorists on International Parkway. The abandoned guideway for the former airport people mover traverses this area. The storage yard would occupy this landscaped area.

The alignment would be within view of motorists on the service road and International Parkway. Other viewers include employees at three American Airlines cargo service buildings located to the east of the northbound service road. Although there is a presence of utility and industrial items including the former people mover guideway, the visual quality of this unit is rated as moderate because of the landscaped island. The presence of several tree lines indicates that DFW Airport is cognizant of existing view quality. The visual sensitivity of the unit is moderate, because the introduction of new elements in this area would be noticeable and have the potential to change the aesthetic quality of the unit. Changes to the unit would have to be large in order to produce an aesthetic impression on primary viewers. Also, a lack of investment in aesthetic conditions by cargo service employees makes them less sensitive to changes within the unit. No remarkable features or views exist within Visual Inventory Unit #5.

Figure 4-9. Visual Inventory Unit #5 – Typical Vegetation



View of Chesapeake Drilling area and Typical Vegetation from Northbound Service Road (looking east)

Visual Inventory Unit #6

Visual Inventory Unit #6 is the DFW Airport LRT Station, situated south of DFW Airport Crossunder #2 between International Parkway and its northbound service road. Because the station would be considered a signature station for the airport, DFW Airport has expressed an interest in the visual appeal of the station. Currently, the station area is within view of motorists on the service road and on International Parkway. Future primary viewers would also include airline passengers and employees using the DART LRT system. The current visual quality of this unit is rated as low because of the presence of roadway features, industrial items and the lack of any visually interesting development character or aesthetic elements. The visual sensitivity of the unit is high, because it is located in the terminal area and viewers may spend extended periods of time waiting at the station.

DFW Airport is responsible for the design and construction of the station area. DART would construct rail and systems elements for the station, but DFW Airport would be responsible for station aesthetics of platform, its amenities and access to the terminals.

| Table 4-4. Visual and Aesthetic Inventory | | | | | |
|--|---------------------------|--|-----------------------|---------------------------|---------------------------|
| <i>Inventory Unit</i> | <i>Limits/Description</i> | <i>Primary Viewers</i> | <i>Visual Quality</i> | <i>Visual Sensitivity</i> | <i>Key Features/Views</i> |
| Unit 1 | 495+00 to 540+00 | motorists, industrial tenants | low | low | none |
| Unit 2 | 540+00 to 580+00 | others (air passengers) | low | low | none |
| Unit 3 | 580+00 to 650+00 | motorists, commercial tenants, others (hotel guests) | low | moderate | none |
| Unit 4 | 650+00 to 705+00 | motorists | low | low | none |
| Unit 5 | 705+00 to 764+00 | motorists, industrial tenants | moderate | moderate | none |
| Unit 6 | 764+00 to 769+00 | airline passengers, airline employees, transit riders, motorists | low | high | none |

Source: URS Corporation, 2009

Visual Quality Key: High = Inventory unit or portions thereof is of high visual quality to the primary viewers; Moderate = Inventory unit is of average visual quality to primary viewers; Low = Inventory unit is of low visual quality to primary viewers

Visual Sensitivity Key: High = Introduction of new elements could significantly impact the aesthetic quality of the inventory unit as observed by the primary viewer; Moderate = Introduction of new elements may impact the aesthetic quality of the inventory unit 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 inventory unit as observed by the primary viewers.

Visual and Aesthetic Impacts

No Build Alternative Visual and Aesthetics Impacts

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no visual and aesthetic impacts would be anticipated with the No Build Alternative

LRT Alternative Visual and Aesthetics Impacts

For the proposed LRT alignment, connected actions, and required mitigation, a series of subjective observations were used to assess perceived visual changes introduced by transit projects, as outlined below. The proposed DFW Airport Extension project is composed of individual elements that could have an impact on the identified primary viewers and perceived visual and aesthetic elements within the project corridor. Those project elements include:

- proposed track alignment and associated catenary infrastructure,
- TPSS locations,
- proposed bridges and other elevated structures,
- relocated mast tower (Unit 3 only),
- human factors mitigation: red lights on catenary poles and PVC slats in fencing,
- storage track (Unit 5 only), and
- station and station elements (Unit 6 only).

Each visual inventory unit was assessed to determine if a visual impact would occur due to any of the project elements affecting the aesthetic quality of the visual environment as described below.

- Features are lost that are important to existing views.
- Existing views are blocked that are valuable or desirable.
- A change is introduced in line, form, color, texture, lightness, darkness, dominance, scale, diversity, or continuity by transit project components and whether they complement or conflict with existing visual elements.
- Undesirable views of existing urban features are opened or private spaces exposed, including both the views of transit patrons and the views from wayside land uses.
- The project affects community activities for which the character of their setting or a particular view is important.
- The transit project features do not meet municipal ordinances for lighting, screening, open storage, landscaping, neighborhood protection, or signs.
- The transit project features do not meet airport design criteria for lighting, screening, open storage, or landscaping.

These conditions and project elements were assessed and rated as significant, potentially significant, or generally not significant based on the factors listed above. It was assumed that the design and construction of the project would be consistent with current DART design standards and any applicable municipal ordinances or airport regulations. The severity of the impact was determined in terms of distance, number of viewers, existing visual quality and sensitivity, duration of exposure, and the speed of viewer. Table 4-5 summarizes the results of the analysis for each visual inventory unit.

Visual Inventory Unit #1

The track alignment through Visual Inventory Unit #1 would not block or open views, conflict with existing visual elements, or affect community activities.

TPSS #7 would not be located in an area where it would be visible to the general public.

Bridges and elevated structures within Unit #1 include the grade-separated crossing of Belt Line Road. This bridge structure would be viewed only briefly by motorists traveling at moderate speeds on Belt Line Road. The structure would not block or open views, conflict with existing visual elements, or affect community activities.

Visual Inventory Unit #2

The track alignment through this unit would not block or open views, conflict with existing visual elements, or affect community activities.

The human factors analysis conducted as part of the aeronautical analysis recommends placing red lights at the tops of catenary poles in Unit #2. This recommendation helps to alert pilots of the presence of the light rail transit system. These recommended features would not block views, conflict with existing visual elements, or affect community activities. Also, the lights would only be visible from above by departing and approaching aircraft and airline passengers. Due to the very short duration of those views, no impact is anticipated.

No TPSS is located in this unit.

Bridges and elevated structures within Unit #2 would not block or open views, conflict with existing visual elements, or affect community activities. Structures in this unit occur only at stream or drainage-way crossings and are not in view of the public.

Visual Inventory Unit #3

The track alignment through Visual Inventory Unit #3 would not block or open views, conflict with existing visual elements, or affect community activities.

TPSS #8 would not be located in a high-visibility area.

Bridges and elevated structures within Unit #3 would not block or open views, conflict with existing visual elements, or affect community activities. A portion of primary viewers (hotel guests) in the area would have a constant view of structures. These structures, however, are not incompatible with the existing views nor do they necessarily constitute an obnoxious land use; therefore, impacts could be moderate. Some screening is currently in place to shield views of airport property and industrial activities adjacent to Hawthorn Suites hotel. If this screening vegetation is disturbed by construction of the proposed LRT alignment, it would be replaced with similar vegetation that, once mature, would fulfill the same function.

A connected action of the proposed project is the relocation of a mast pole as described in Section 3.1.2. . Both the current and proposed sites for the mast pole are within Visual Inventory Unit #3; however, the relocated tower will be situated closer to both the Sleep Inn and the Hawthorn Suites hotels. Although taller, the relocated mast pole has a more slender profile than the four lattice communications towers already on the site. The relocated tower would not be incompatible with existing vertical elements located within the visual inventory unit or elsewhere on the airport. The relocated mast pole would not be considered an obnoxious land use. Due to its height, it would be impractical to provide visual screening of the relocated mast pole.

A consideration in this inventory unit is mitigation at Chesapeake Pad site "AC" where there would be about an 8 foot penetration of the Chesapeake SCADA path at the peak of the aerial rail structure by the DART Rail vehicle. This would be mitigated by increasing the antenna tower height 20 feet so that the height would be over the DART Rail Infrastructure as discussed in Section 3.1.2. This visual change will not result in a visual impact for several reasons: 1) the lattice tower is not being relocated only elevated, 2) the DART aerial structure will be situated between the tower and potential sensitive receptors, and 3) the elevated tower is compatible with existing airport elements and will not block any consequential views.

Red obstruction lights at the tops of catenary poles are also recommended in Unit #3. As discussed previously, these recommended features would not block views, conflict with existing

visual elements, or affect community activities, combined with their limited viewers and very short duration of view, result in no anticipated impacts.

Visual Inventory Unit #4

The track alignment through this unit would not block or open views, conflict with existing visual elements, or affect community activities.

TPSS #9 would be located in a high-visibility area adjacent to the alignment near Freeport Parkway, but is not incompatible with the existing industrial elements of the area.

Bridges and elevated structures within Unit #4 include the grade-separated crossing of North Airfield Drive. This bridge structure would be viewed only briefly by motorists traveling at moderate speeds on North Airfield Drive and motorists traveling at high speeds on SH 114. The bridge structure would be consistent with the numerous other highway bridge structures in the area. The structure would not block or open views, conflict with existing visual elements, or affect community activities.

The human factors analysis conducted as part of the aeronautical assessment, recommends placing red lights at the tops of catenary poles and adding PVC slats to the light rail fencing in Unit #4. These recommended actions help to alert pilots of the presence of the light rail transit system. These features would not block views, conflict with existing visual elements, or affect community activities. Additionally, the proposed features are compatible with DFW Airport Image Elements.

Visual Inventory Unit #5

The track alignment through Visual Inventory Unit #5 would not block or open views, conflict with existing visual elements, or affect community activities.

TPSS #10 would be located along the alignment in the vicinity of the North Tollgate entry to DFW Airport. TPSS #11 would be included in the rail storage area. Both are high-visibility areas.

Bridges and elevated structures within Unit #5 include a bridge structure over the northbound service road of International Parkway. This bridge structure would be of consistent character with ramp structures used for accessing International Parkway and therefore would not conflict with existing visual elements. Also, the structure would not block or open views, or affect community activities.

The rail storage facility represents a potentially significant visual change to the area. The additional tracks, catenary wire, and vehicles increase the scale and clutter the area.

Visual Inventory Unit #6

The track alignment and rail in Visual Inventory Unit #6 would not block or open views, conflict with existing visual elements, or affect community activities. There would be no bridge structures in this unit.

The DFW Airport LRT Station represents a potentially significant visual change to the area that would be considered an enhancement. The station would be designed to DART's design standards and would incorporate art and design features to enhance the aesthetic value of the station. Ensuring compliance with DFW Airport design standards and image elements, DFW Airport would take the lead in the design of the station and its access.

Visual and Aesthetic Mitigation

In Visual Unit #3, if existing screening vegetation is disturbed by construction, it would be replaced with similar vegetation that, once mature, would fulfill the same function.

Table 4-5. Visual and Aesthetic Impacts

| <i>Inventory Unit</i> | <i>Track Alignment</i> | <i>Bridges and Elevated Structures</i> | <i>Other (storage track /station)</i> | <i>Duration of exposure/Speed of Viewer</i> | <i>Impact</i> |
|-----------------------|------------------------|--|---------------------------------------|---|--|
| Unit 1 | not significant | not significant | N/A | short duration | none |
| Unit 2 | not significant | not significant | N/A | short duration | none |
| Unit 3 | not significant | potentially significant | N/A | some viewers have potentially long duration/moderate speeds | potential impact - replace screening vegetation |
| Unit 4 | not significant | not significant | N/A | high speeds | none |
| Unit 5 | not significant | not significant | potentially significant | high speeds | potential impact – mitigation should be considered |
| Unit 6 - Station Area | not significant | not significant | positive impact | up to 20 min. / pedestrians | positive impact |

Source: URS Corporation, 2009

DFW Airport has established design criteria and image elements for facilities constructed within the boundaries of the airport. DART would coordinate with DFW Airport staff to incorporate the appropriate elements into the final design of the proposed LRT alignment.

DFW Airport staff has indicated a desire to soften the views of the TPSS facilities located within high-visibility areas. Specifically, there is a desire to soften the views of TPSS #9 located within Unit #3; and TPSS #10 and TPSS #11 located within Unit #5. This would be accomplished by installing chain link fencing with PVC slats.

In Visual Unit #5, DART would, if practicable, keep the existing vegetation between International Parkway and the proposed storage yard. DART would coordinate with DFW Airport staff to incorporate DFW Airport image elements into the design of the storage yard. Various measures can be employed to soften the visual impact of the facility including the use of appropriate lighting materials and finishes and the use of solid visual barriers or vegetation to minimize intrusion into the visual environment for affected viewers.

In Unit #6, DFW Airport’s desire to develop a signature station at the airport would be accomplished through DART’s Design Standards for stations and existing Art and Design Program. DFW Airport would take the lead in the design of the station and station access.

4.7 Noise and Vibration

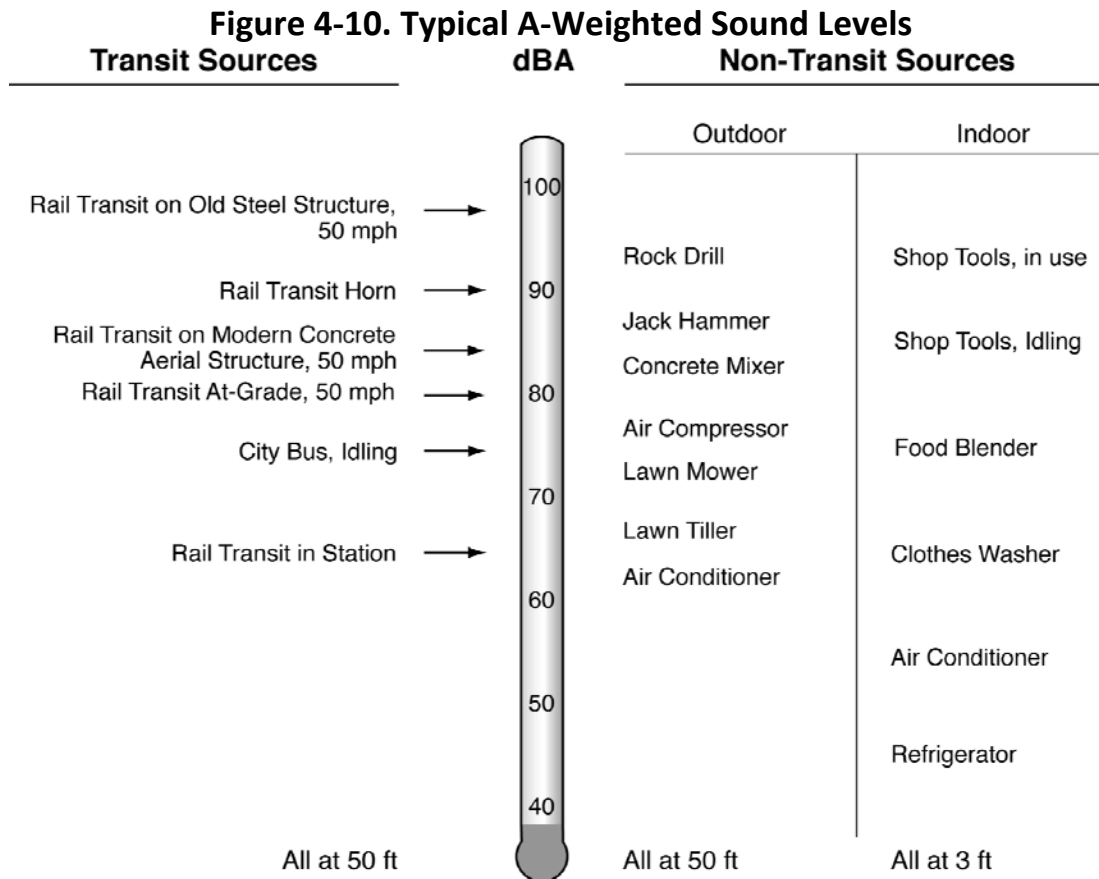
The noise and vibration assessment was performed according to the procedures set forth in the second edition of the FTA *Transit Noise and Vibration Impact Assessment*, released in May of 2006, as well as DART *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*, January 2009.

4.7.1 Noise

Noise Fundamentals and Descriptors

“Noise” is defined as “unwanted sound.” Sounds are described as noise if they interfere with an activity or disturb the person hearing them. Sound is measured in a logarithmic unit called a decibel (dB). Since the human ear is more sensitive to middle and high-frequency sounds than it is to low-frequency sounds, sound levels are weighted to reflect human perceptions more closely. These “A-weighted” sounds are measured using the decibel unit dBA. Typical sound levels from common noise sources are shown in figure 4-10. Noise that is transmitted through the air is referred to as “airborne noise.”

Sound levels fluctuate with time depending on the sources of the sound audible at a specific location. In addition, the degree of annoyance associated with certain sounds can vary by time of day, depending on other ambient sounds affecting the listener and the activities of the listener. Because the time-varying fluctuations in sound levels at a fixed location can be quite complex, they typically are reported using statistical or mathematical descriptors that are a function of sound intensity and time. A commonly used descriptor of noise is the Leq, which represents the equivalent of a steady, unvarying level over a defined period of time containing the same level of sound energy as the time varying noise environment. In areas where sleep activity takes place, the Ldn which measures an average “day-night” sound is the most commonly used measure. The Ldn is a 24-hour Leq average calculated from hourly Leq measurements, with a 10 dBA added to nighttime levels to account for heightened noise-sensitivity at night.



Source: FTA 2006

Transit Noise

Transit noise not only includes noise from moving vehicles, but also supporting services such as maintenance facilities. The perceptible transit noise generated from LRT systems typically include: 1) LRT operations, 2) a yard and shop location, 3) associated feeder bus service, and 4) park-and-ride lots at transit stations. Table 4-6 and figure 4-10 identify some of the most common noises generated from LRT operations. The intensity of the noise event varies due to a number of factors. Examples include the distance of the receiver from the tracks or the station locations, presence of intervening terrain or buildings, and specific train-related parameters such as vehicle speed, vehicle length, vehicle equipment (e.g. air conditioning systems), and the type and condition of the running surfaces (e.g. rails and wheels). In addition, the guideway structure can also radiate noise as it vibrates in response to dynamic loading of the vehicle. Stationary vehicles generate noise as well. Auxiliary equipment, such as cooling fans, radiator fans, and air-conditioning pumps, often continue to run after vehicles have stopped. Because many of these conditions concerning receiver location and LRT vehicle operation vary throughout the corridor, the noise impacts due to LRT can be expected to vary.

| Table 4-6. Sources of Transit Noise for LRT | | |
|--|---|--|
| <i>Transit Component</i> | <i>Source of Noise</i> | <i>Comments</i> |
| Light rail vehicle in motion | Wheel rolling on rail | Increases with speed; depends upon condition of wheels and rails; can be controlled by regular system maintenance |
| | Vehicle propulsion system | Increases somewhat while accelerating and at higher speeds; can be controlled by vehicle procurement specification; force ventilated system generally quieter than self-ventilated system when operating on embedded track |
| | Auxiliary equipment for vehicle and ventilation | Usually not substantial source of noise; can be controlled by vehicle procurement specification |
| | Wheel squeal | Can occur on tight curves of less than 1000 feet radii;. can be controlled by wheel and rail treatments |
| | Special trackwork | Impact noises occur when wheels encounter discontinuity in tracks such as rail joints, turnouts, or switches used at crossovers. |
| | Brakes | Occasional squeal when stopping |
| | Horns and whistles | Used infrequently as warning device for pedestrians and at intersections |
| | Bells | Used sometimes as warning device at grade crossings |
| Light Rail Vehicle stopped | Auxiliary equipment for vehicle and ventilation | Dominant source for stationary vehicle; controlled by vehicle procurement specification |
| Traction Power Substation | Transformers | Usually not substantial source of noise for LRT |

Source: Wilson, Ihrig & Associates, Inc., 1995

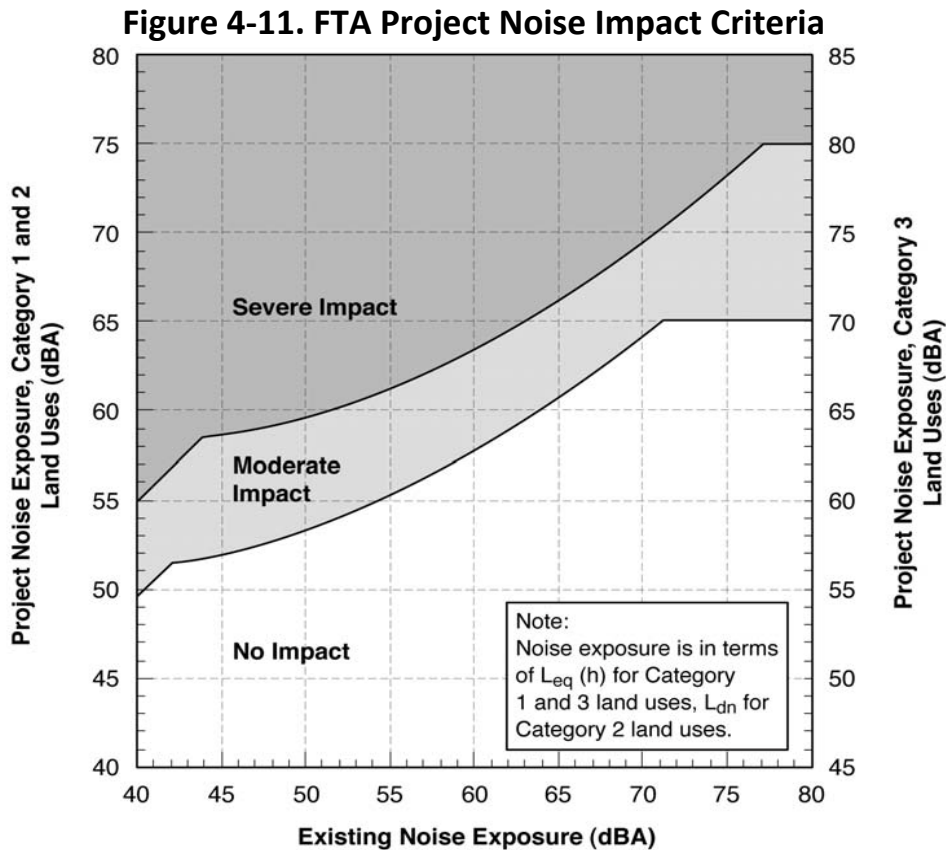
Affected Environment

This section discusses the methodology used to determine where impacts may result from increased levels of noise. It also includes a screening analysis and identifies noise sensitive receptors.

Noise Impact Criteria

FTA's noise impact criteria, shown in figure 4-11, is based on comparing the existing noise levels to future project-related noise levels. The criteria are defined by two curves, figure 4-11, which designate different levels of project noise which result in "no impact," "impact", and "severe impact" conditions. According to the FTA Guidance Manual, mitigation should be considered if the project falls within an "impact" range and should be implemented if the project would result in a severe impact. The basis of noise impact criteria is the percentage of people that would be highly annoyed by measured noise levels in their living environment. As a result, criteria reflect a range of annoyance associated with different human activities that occur in such areas as homes, businesses, and parks.

Criteria are applied to three categories of land use with varying degrees of sensitivity to noise. Generally, in evaluating the potential for a noise impact from a proposed project, the Leq is established for the peak traffic hour when noise levels are expected to be the highest. Where there is nighttime occupancy of noise sensitive buildings such as residences, hotels, and hospitals, the "Day-Night" sound level (Ldn) is more appropriate for assessing noise impacts than the peak hour Leq.



Source: FTA, 2006

The noise criteria and descriptors used in impact analysis depend on whether the land use is designated within Category 1, 2, or 3. The following is a description of the categories of noise-sensitive land uses for which those noise criteria apply:

Category 1: This category includes buildings and parks where quiet is an essential element in their intended purpose. Land uses include open space set aside for serenity and quiet (e.g., wilderness areas) and areas for outdoor concert pavilions.

Category 2: This category includes residences and buildings where people normally sleep. Land uses include homes, hospitals, nursing homes, and hotels where nighttime sensitivity to noise is assumed to be of utmost importance.

Category 3: This category includes institutional land uses with primary daytime and evening use. Land uses include schools, libraries, places of worship, museums, historically noteworthy sites, and active parks where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. For Category 3 uses, however, the entire use may not be designated as a sensitive receptor; rather, only those areas typically used for quiet activities are designated as sensitive receptor areas. Buildings with interior spaces where quiet is important, such as medical offices and conference rooms. Recording studios and concert halls are also included in this category.

The criteria do not apply to most commercial and industrial uses because these activities generally are compatible with higher noise levels. They do apply to business uses that depend on quiet as an important part of operations, such as sound and motion picture recording studios.

Noise Impact Evaluation Procedure

The first step in the transit noise impact analysis is to identify all noise sensitive land uses within the screening distance of the proposed project. The screening distance for different transit technologies is defined in the FTA Transit Noise and Vibration Impact Assessment guidance. If any noise-sensitive land uses are found within the prescribed screening distance, 350 feet for unobstructed views or 175 feet with intervening rows of buildings, a general noise assessment must be made.

Sensitive land uses that fall within the prescribed screening distances for this project are shown in figure 4-12 and listed in table 4-7. Two noise sensitive receptors were identified along the proposed LRT alignment: Sleep Inn DFW North and Hawthorn Suites DFW North. These hotels are Category 2 (both daytime and nighttime sensitivity) receptors located along Plaza Drive in the northwest section of the airport. Both properties would be directly adjacent to the proposed LRT alignment. As previously noted, there are no residential land uses near the proposed LRT alignment.

| Site No. | Receiver Site/Civil Station | Land Use | FTA Noise Category | Distance to Centerline (feet) |
|----------|-----------------------------|----------|--------------------|-------------------------------|
| 1 | Sleep Inn DFW/618+00 | Hotel | 2 | 50 |
| 2 | Hawthorn Suites/630+00 | Hotel | 2 | 60 |

Source: URS Corporation, September 2009

Existing Noise

The FTA Transit Noise and Vibration Impact Assessment allows several ways of predicting existing noise, including noise monitoring or using typical values from the FTA typical values table. The

approaches have varying degrees of accuracy, with the typical values table being the most conservative and noise monitoring for a full 24 hours being the most accurate.

The dominant noise source for these receptors is the existing airport runway, located approximately 3,000 feet from the proposed LRT alignment, and the traffic noise from the SH 114, located between 700 and 900 feet from the receptors. Additionally, FedEx trucking operations and employee parking takes place directly adjacent to the Hawthorn Suites. For this noise analysis, the typical values table was evaluated but set aside because it does not include noise from existing airports. As a result, existing noise levels were measured between the two sensitive receptor areas (see figure 4-12) in October 2009, using a Metrosonics dB3080 Statistical Sound Level Analyzer. Monitoring was conducted in 30-minute time periods during the morning peak (6:00am to 9:00am), midday (10:00am to 3:00pm), evening peak (3:00pm to 6:00pm), and late night (10:00pm to 12:00am) periods during the week. These 30-minute measurements were extrapolated to 1-hour Leq and 24 hours for the Ldn equivalents. For the computation of the Ldn, the lowest measurement was used in order to ensure a conservative methodology. The monitored existing noise levels are shown in table 4-8.

| Table 4-8. Monitored Existing Noise Levels (dBA) | | | | | | |
|---|------------|------------|------------|-------------|----------------|-----------------------------------|
| <i>Monitoring Site</i> | <i>AM</i> | <i>MID</i> | <i>PM</i> | <i>NITE</i> | <i>24-hour</i> | <i>Primary Noise</i> |
| | <i>Leq</i> | <i>Leq</i> | <i>Leq</i> | <i>Leq</i> | <i>Ldn</i> | <i>Sources</i> |
| Sleep Inn DFW | 64 | 67 | 66 | 67 | 71 | Multiple airplanes, trucks, horns |
| Hawthorn Suites | 74 | 67 | 67 | 67 | 71 | Multiple airplanes, trucks, horns |

Source: URS Corporation, November 2009

Impacts to Noise Sensitive Receptors

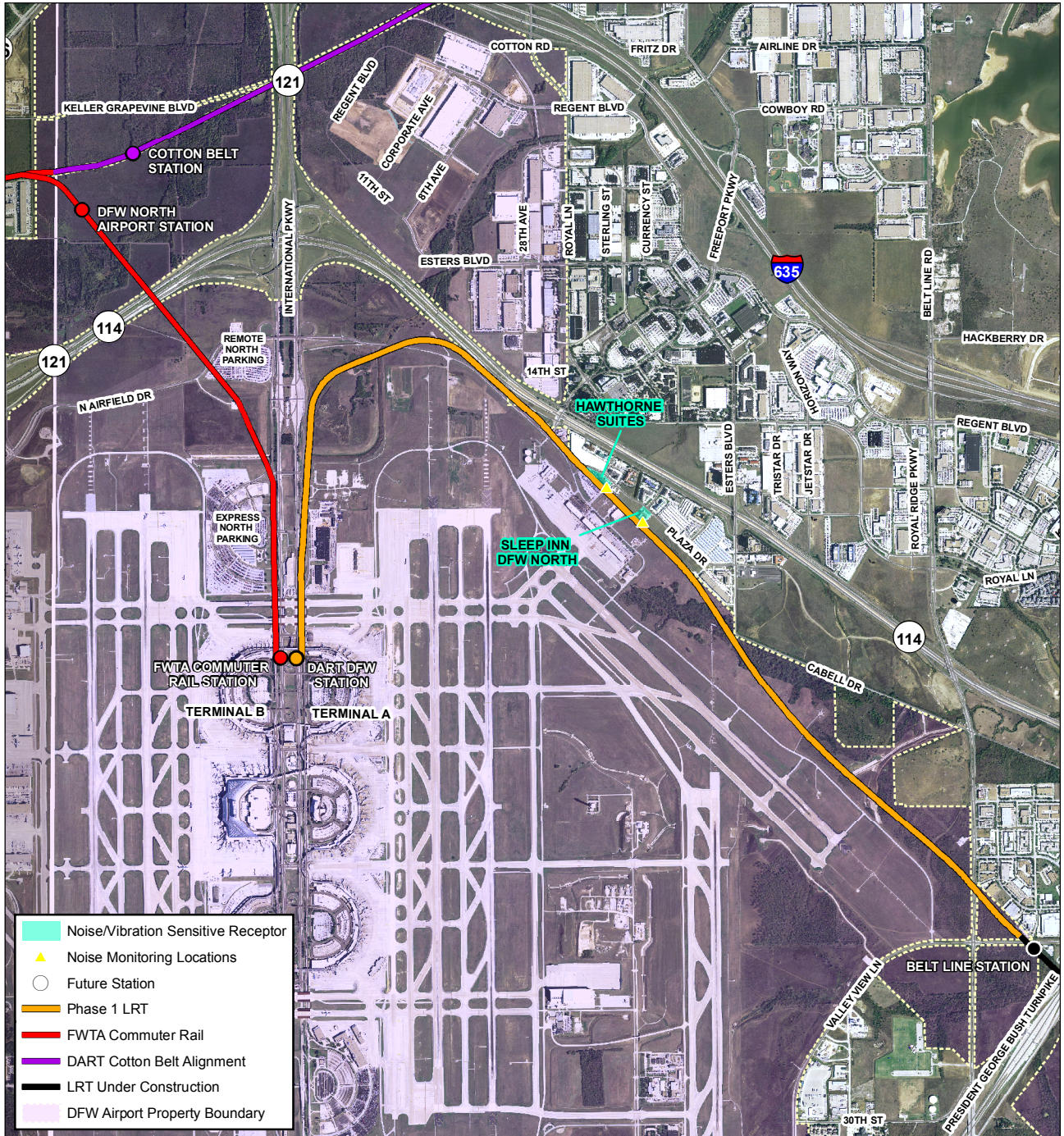
A noise impact is assessed based on the comparison of the existing noise levels and the predicted noise level at a given noise sensitive receptor in terms of either the Ldn or Leq descriptors assigned for the appropriate land-use category.

Based on the potential for the proposed project to impact nearby noise-sensitive areas, a general noise assessment was conducted using the FTA methodology. The general assessment evaluates the proposed LRT operating plan and other project characteristics relative to the distance between the noise source and receptors. The output is then compared to the existing noise levels to determine the incremental noise that would result directly from the project.

Project-Related Noise Levels

Future project-related noise levels were computed by using conservative noise levels generated from the general LRT operating characteristics, vehicle speed and track characteristics. The following project characteristics, defined in table 4-9, serve to define the potential sources of noise:

- Vehicle Storage and Maintenance Facility - The project would use an existing vehicle storage and maintenance facility that has previously been evaluated for noise impacts. Implementation of this project would not require any capacity enhancements; therefore no additional noise would be generated by the facility.



Source: NCTCOG 2008, URS 2009

FIGURE 4-12



0 4,000 8,000 Feet

NOISE AND VIBRATION SENSITIVE RECEPTORS
AND NOISE MONITORING LOCATIONS

DART Irving-3 Environmental Assessment

- **Storage Track** – Constraints at the terminal station preclude the placement of tail track. To serve this function, storage track would be located approximately 1,500 feet north of the terminal station. This facility would allow for the temporary storage of trains and permanently house some maintenance equipment. The facility would be in an industrial/institutional setting between International Parkway and the northbound service road, immediately south of an airport taxiway. Noise would be generated from the switching operations, however, there are no noise sensitive receptors in the vicinity
- **Stations and Parking Facilities** – The proposed LRT extension would begin at the DART Belt Line Station (under construction) and travel to an end-of-line station at the DFW Airport. No additional parking would be provided at the Belt Line Station and no new parking would be provided at the new end-of-line station.
- **Bus Operations** – The proposed project would not include any additional bus service.
- **LRT Operations** – During peak periods, the LRT would operate at ten-minute headways with three-car trains. During the off-peak operating period (mid-day, evening, and weekend), the route is planned to operate on 20-minute headways with two-car trains. LRT service on the line would have a maximum operating speed of 65 mph. While average train speed would be about 34 mph including approximately 20 seconds for each station stop, travel speeds at each of the noise sensitive receptors would be 65 mph.
- **Track Design and Characteristics** – The projected noise levels are based on operations of revenue trains on well-maintained, standard at-grade track. Embedded track sections would be used for the at-grade crossing at Plaza Drive. Where the track has curves or there is special track work, such as switches, the noise levels can be higher. At tighter curves, noise levels can be substantially higher than indicated due to a phenomenon referred to as "wheel squeal." Wheel squeal is generally not a concern where track curve radii are greater than 1,000 feet. While the proposed track would include such curved sections, these would only be located on airport property and not near noise sensitive receptors.
- **Grade Crossings** – The projections near grade crossings include noise from train whistles and crossing bells. Based on DART audible warning signal equipment and policy, the estimates assume that the LRT whistles generate a noise level of 78 dBA (L_{max}) at 50 feet from the track for a five second period as trains approach each crossing. The bells are estimated to generate a noise level of 72 dBA (L_{max}) at 50 feet for twenty seconds prior to and ten seconds following each train. These operating parameters are consistent with current DART practice and were designed to minimize community noise exposure to the greatest extent possible within the constraints of safe operations.

General Transit Noise Assessment Results

The noise levels resulting from the actions of the proposed project were modeled using the FTA General Noise Assessment model. The LRT noise assessment at 50 feet assumed a speed of 65 mph and a three-car train. The whistle and bell noise analysis also assumed a 65 mph speed which resulted in the whistle and bell noise affecting Hawthorn Suites while only the bell noise would affect Sleep Inn due to its distance from the at-grade crossing of Plaza Drive, the duration of the whistle, and the speed of the train.

| Table 4-9. Assumptions for LRT Operations | |
|---|-----------------------------------|
| Type of Source | Line |
| Source Exposure Level (SEL) at 50 ft | 82 dBA |
| Alignment | At-grade |
| Track | Continuous welded rail on ballast |
| LRT Daytime Hourly Volumes (7:00 AM-10:00 PM) | 8.0 Trains (both directions) |
| LRT Nighttime Hourly Volumes (10:00PM –7:00 AM) | 3.3 Trains (both directions) |
| Number of Cars per Train | 3 |
| Hours of Operation | 5:00 am- 12:00 am |
| Normal Operating Speed | 10-65 mph depending on location |
| Maximum Speed | 65 mph |
| Embedded Track | at grade crossings |
| Aerial Structure | +4 dBA |
| Wheel Squeal SEL at 50 feet | 136 dBA |

Source: URS Corporation, September 2009

Table 4-10 identifies the existing and projected project noise level for the two identified sensitive receptors along the alignment. Both the Sleep Inn DFW North and Hawthorn Suites DFW North are Category 2 (both daytime and nighttime sensitivity) receptors. The existing noise level (Ldn) for both hotels was measured to be 71 dBA. The projected project noise level (Ldn) is 67 dBA at Sleep Inn and 67 dBA at Hawthorn Suites. Under FTA criteria, see table 4-11, a project noise impact would occur if the projected noise level was 66 dBA. A severe impact would occur at 71 dBA. Therefore, neither property is projected to have severe impact; however the projected noise meets the threshold for a moderate impact. With implementation of the proposed LRT alignment, the total noise level at these properties would be 72 dBA. This represents a one decibel increase over the existing conditions.

| Table 4-10. Summary of Noise Levels for Proposed Project | | | | | | | |
|--|-----------------|--------------------|-----------------------------------|----------------------------------|------------------------------|---------------|----------|
| # | Receptor | FTA Noise Category | Existing Noise Level ¹ | Project Noise Level ¹ | Impact Criteria ¹ | | Impact |
| | | | | | Impact | Severe Impact | |
| N1 | Sleep Inn DFW | 2 | 71 | 67 | 66-70 | >70 | moderate |
| N2 | Hawthorn Suites | 2 | 71 | 67 | 66-70 | >70 | moderate |

¹ Ldn measured in dBA

Source: URS Corporation, November 2009

Table 4-11. Noise Levels Defining Impact for Transit Projects

| Existing Ambient Noise Level Leq or Ldn (dBA) | PROJECT NOISE IMPACT LEVELS Leq or Ldn (dBA) | | | | | |
|--|--|--------|---------------|------------------|--------|---------------|
| | Category 1 or 2 Sites | | | Category 3 Sites | | |
| | No Impact | Impact | Severe Impact | No Impact | Impact | Severe Impact |
| 60 | <58 | 58-63 | >63 | <63 | 63-68 | >68 |
| 61 | <59 | 59-64 | >64 | <64 | 64-69 | >69 |
| 62 | <59 | 59-64 | >64 | <64 | 64-69 | >69 |
| 63 | <60 | 60-65 | >65 | <65 | 65-70 | >70 |
| 64 | <61 | 61-65 | >65 | <66 | 66-70 | >70 |
| 65 | <61 | 61-66 | >66 | <66 | 66-71 | >71 |
| 66 | <62 | 62-67 | >67 | <67 | 67-72 | >72 |
| 67 | <63 | 63-67 | >67 | <68 | 68-72 | >72 |
| 68 | <63 | 63-68 | >68 | <68 | 68-73 | >73 |
| 69 | <64 | 64-69 | >69 | <69 | 69-74 | >74 |
| 70 | <65 | 65-69 | >69 | <70 | 70-74 | >74 |
| 71 | <66 | 66-70 | >70 | <71 | 71-75 | >75 |
| 72 | <66 | 66-71 | >71 | <71 | 71-76 | >76 |
| 73 | <66 | 66-71 | >71 | <71 | 71-76 | >76 |
| 74 | <66 | 66-72 | >72 | <71 | 71-77 | >77 |
| 75 | <66 | 66-73 | >73 | <71 | 71-78 | >78 |
| 76 | <66 | 66-74 | >74 | <71 | 71-79 | >79 |
| 77 | <66 | 66-74 | >74 | <71 | 71-79 | >79 |
| >77 | <66 | 66-75 | >75 | <71 | 71-80 | >80 |

Note: Ldn is used for land uses where nighttime sensitivity is a factor, and Leq during the noisiest transit-related hour is used for land use involving only daytime activities.

Source: FTA Transit Noise & Vibration Impact Assessment, U.S. DOT, May 2006

Noise Mitigation

FTA criteria require that severe impacts be mitigated unless there are no practical means to do so. At the moderate impact level, more discretion may be used, and other project-specific factors may be considered. These other factors include the type and number of noise-sensitive land uses affected, the predicted increase over existing noise levels, and the noise sensitivity of the property. Additionally, proposed mitigation must represent a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures (Hanson, Towers and Meister 2006, 3-11).

Based on the results of the General Noise Assessment, the proposed project would result in moderate noise impacts to the identified receptors. The predicted increase over the existing noise levels is one decibel, which is typically not perceptible to the human ear. Both hotels were constructed directly adjacent to a major airport and within 1000 feet of a major freeway. Given

this, hotel windows are generally in the closed position and air conditioning units are running in every room.

Daytime activity at the Sleep Inn is limited as it does not provide an outdoor pool, restaurant, business center, or meeting space. These factors tend to reduce the overall sensitivity of the property. The Hawthorn Suites does have an outdoor pool, however the project noise levels increase would not result in an impact, as defined by the FTA methodology.

At Hawthorn Suites, the implementation of LRT will result in a slight noise increase over the existing conditions; however, the proposed project would, in part, displace one of the existing sources of noise. Federal Express operates a 24-hour logistics facility on the airport grounds adjoining Hawthorn Suites. Trucks are parked directly adjacent to the hotel property. Much of the trucking activity takes place at night. The proposed project would relocate this activity and employee parking further away from the hotel. The 80-foot LRT ROW would provide a buffer between the hotel and FedEx facility.

During evening and late night hours when transit demand is lower DART generally reduces the frequency of trains and number of cars per train, which consequently reduces the generated noise. Concurrently both air traffic and highway traffic are reduced. Fed Ex trucking activity increases at night, but this activity would be relocated away from the hotels. Therefore, it is not anticipated that the implementation of the proposed project would disrupt sleeping conditions.

Sound walls are impractical and inadequate means of mitigating noise generated by the grade crossing signals at Plaza Drive. Additional soundproofing of structures constructed within 3,000 feet of an airport is also impractical. Given the minimal increase in noise, the ambient conditions, the location and function of the property, and the rail operating plan; mitigating these isolated, moderate impact locations does not represent a reasonable public expenditure. No mitigation is proposed.

Preliminary planning is underway for a hotel on a vacant parcel adjacent to the proposed LRT alignment, southeast of the Sleep Inn at 4700 Plaza Drive. A public hearing for zoning modifications was held by the City of Irving on May 5, 2011. Due to the location and intended use for the property, it is assumed that the proposed hotel would experience a moderate noise impact similar to the Sleep Inn property. Given the conditions described above, no mitigation is proposed.

During the zoning modification proceedings, DART notified the City of Irving and the applicant of the proposed LRT alignment and the ongoing EA by a letter dated April 22, 2011 (see appendix E) addressed to the City of Irving Planning and Zoning Commission. The letter specified where the draft EA could be accessed and the dates of the DART public hearing for the project and comment period. Contact information for comments and questions was also provided.

4.7.2 Vibration

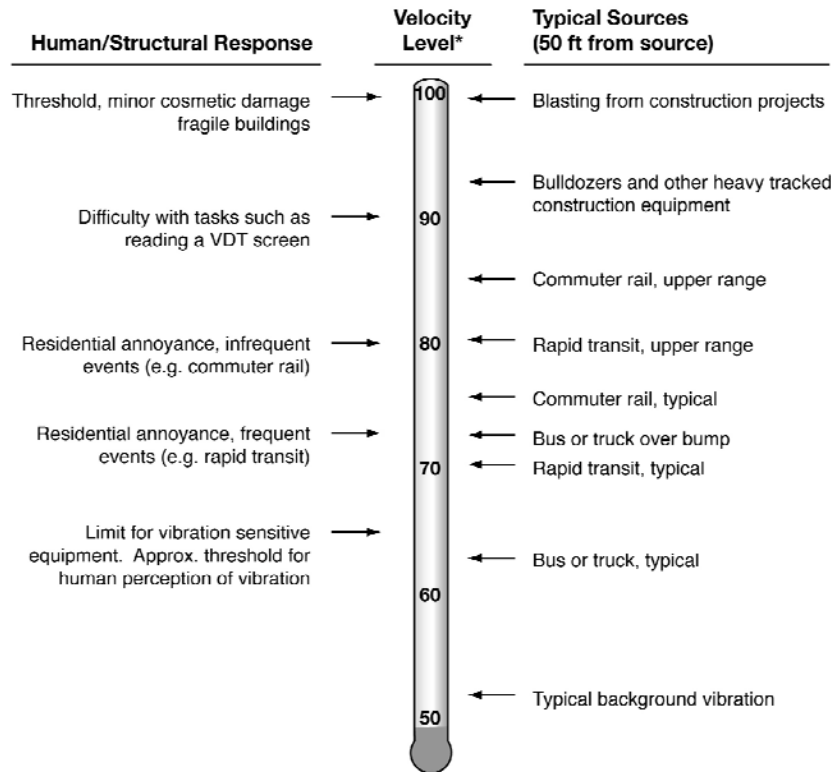
Transit systems have the potential to create ground-borne vibration impacts. In contrast to airborne noise, ground-borne vibration is not a common environmental issue. Ground-borne vibration is the transmission of energy through the earth. Ground-borne vibration, if strong enough to be perceptible, is sensed as motion of the floors or walls inside a building.

The vertical motion due to ground-borne vibration is described in terms of vibration velocity levels, measured in vibration decibels (VdB), dB re (relative to) 10⁻⁶ in/sec (2.6 x 10⁻⁸ m/sec). Like sound, vibration is expressed in decibels and identified with the abbreviation of VdB. The threshold of human perception for vibration is on the order of 60 to 70 VdB.

Problems with ground-borne vibration from LRT operations are highly dependent on local geology and structural details of associated buildings. When light rail vehicle (LRV) speeds are moderate, less than 30 mph (49 kph), vibration impacts are usually limited to buildings within 50 feet of the proposed LRT alignment. When LRV speeds are higher, the zone of ground-borne vibration impacts may extend further. A substantial percentage of complaints about ground-borne vibration can be attributed to the proximity of switches, rough or corrugated track, or wheel flats.

The effects of various levels of ground-borne vibration differ among vibration-sensitive activities. The land uses which are most sensitive to vibration include those which conduct precision research and manufacturing, hospitals with highly sensitive equipment, and university research operations. Typical vibration levels from common sources are shown in figure 4-13. Residential land uses and buildings where people sleep, like hotels and hospitals, are also a concern, more than schools and other institutions.

Figure 4-13. Typical Levels of Ground-Borne Vibration



* RMS Vibration Velocity Level in VdB relative to 10⁻⁶ inches/second

Source: FTA 2006

Vibration Impact Criteria

In its guidance manual, the FTA developed criteria for assessing vibration impacts related to LRT projects. The criteria are based on community reaction to transit-related vibration and the potential for adverse effects on vibration-sensitive activities and processes. The criteria identify

intensities of ground-borne vibration that may be considered significant and, thus, require consideration of mitigation and abatement measures.

As shown in table 4-12, some land use activities are more sensitive to vibration than others. For example, certain research and fabrication facilities, TV and recording studios, and concert halls are more vibration-sensitive than residences and buildings where people normally sleep, which are more sensitive than institutional land uses with primarily daytime use. At those locations where vibration sensitive equipment is used, such as hospitals, medical facilities, and high tech manufacturing and testing sites, there may be the potential for additional or more severe ground vibration impacts from transit operations. The FTA assigns sensitive land uses to the following three categories:

- Vibration Category 1: High Sensitivity - Buildings where low ambient vibration is essential for the interior operations in the building. Vibration levels may be below the level of human perception.
- Vibration Category 2: Residential - Residences and buildings where people normally sleep. This includes private dwellings, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance. It also includes some special uses such as auditoriums or theaters.
- Vibration Category 3: Institutional - Land uses with primarily daytime use including schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment.

Table 4-12 also contains the FTA criteria thresholds used for this project for two classes of vibration sources, frequent and infrequent. Where vibration is intermittent (i.e., a transit train pass-by) human annoyance from ground vibration and noise is dependent on the number of vibration events that occur during a typical 24-hour period. "Frequent" is defined as more than 70 vibration events per day. The FTA impact criteria for "frequent" are 65 VdB, 72 VdB, and 75 VdB for land-use categories 1, 2, and 3, respectively.

| Table 4-12. Criteria for Impact for Human Annoyance and Interference to Use of Vibration-Sensitive Equipment | | | | | |
|--|-----------------------------------|---|------------|--|------------|
| | | Ground-borne Vibration(VdB re 1 micro in/sec) | | Ground-borne Noise(dBA re 20 micro Pa) | |
| Land Use | Category Comment | Events* | | | |
| Category | | Frequent | Infrequent | Frequent | Infrequent |
| 1 | Low interior ambient is essential | 65 | 65 | n/a | n/a |
| 2 | Residential & sleep | 72 | 80 | 35 | 43 |
| 3 | Institutional & daytime | 75 | 83 | 40 | 48 |

Source: FTA Transit Noise and Vibration Impact Assessment, 2006

Notes: * Frequent is defined as greater than or equal to 70 events per day.

Certain uses such as concert halls, TV/recording studios, auditoriums, and theaters do not fit into any of these categories. See section 12.2.2 of FTA Manual.

Vibration impacts for this project were determined using two methods, the Vibration Screening Procedure and the General Vibration Assessment methods contained in the aforementioned FTA

Manual. Using this two-tiered approach, the FTA’s Vibration Impact Criteria were used to identify locations where impacts might occur based on existing land-use activities.

Ground vibration is generated by the wheel/rail interface and is influenced by wheel/rail roughness, transit vehicle suspension, train speed, track construction, location of switches and crossovers, and the geologic strata underlying the track. The vibration levels likely to be generated by the project are based on data contained in the FTA Manual in figure 10-1, *Generalized Ground Surface Vibration Curves*. Vibration from a passing LRT train moves through the geologic strata into building foundations, causing the building to vibrate. The main concerns are annoyance to building occupants and interference with vibration-sensitive operations/equipment. Any damage from LRT rail ground vibration, including cosmetic damage to buildings, is highly unlikely.

The FTA vibration propagation data provide an estimate of vibration levels as a function of distance from the tracks. The FTA Screening Procedure distance criteria are shown in table 4-13. No adjustments were utilized in the screening procedure. The Screening Criteria are very conservative and were used to exclude land uses from further analysis.

| Table 4-13. Distance Criteria for Vibration Screening Procedure | | | |
|--|---|-------------------|-------------------|
| <i>Type of Project</i> | <i>Critical Distance from Track to Structure for Land Use</i> | | |
| | <i>Category 1</i> | <i>Category 2</i> | <i>Category 3</i> |
| Light Rail Transit | Within 450 feet | Within 150 feet | Within 100 feet |

Source: FTA Transit Noise and Vibration Impact Assessment, 2006

Only two potentially affected sites, listed in table 4-14, were identified along the proposed project: Sleep Inn DFW North and Hawthorn Suites DFW North. These hotels are Category 2 (buildings where people normally sleep) sites located along Plaza Drive in the northeast section of the airport. Both properties would be directly adjacent to the proposed LRT alignment. As previously noted, there are no residential land uses near the proposed LRT alignment. These sites are displayed on figure 4-12.

For potentially affected sensitive land uses located within the Screening Procedure Criteria distance, FTA’s more detailed, second-tier General Vibration Assessment was performed. In this analysis, adjustments to the impact criteria (level vs. distance) are used to account for train speed, soil type, building/foundation type, and track characteristics.

| Table 4-14. Vibration Sensitive Receptors | | | | |
|--|----------------------------------|-----------------|------------------------------------|--------------------------------------|
| <i>ID</i> | <i>Description/Civil Station</i> | <i>Land Use</i> | <i>Vibration Land-use Category</i> | <i>Distance to Centerline (feet)</i> |
| 1 | Sleep Inn DFW/618+00 | Hotel | 2 | 50 |
| 2 | Hawthorn Suites/630+00 | Hotel | 2 | 60 |

Source: URS Corporation, September 2009

Affected Environment - Existing Vibration

The areas near the proposed LRT alignment currently have very low vibration levels. The adjacent freeway is more than 500 feet away so vibration from trucks is not apparent. Similarly, airports and airplanes typically do not generate consequential vibration levels.

Impacts to Vibration Sensitive Receptors

No Build Alternative

No adverse impacts to ground-borne vibration would be associated with the No Build Alternative.

LRT Alternative

An analysis was done according to *FTA Transit Noise and Vibration Impact Assessment* guidance manual to assess potential vibration impacts. The methodology included conducting a general vibration assessment, the first of three stages of assessment outlined by FTA. If impacts are determined to exist during the general vibration assessment stage, a detailed analysis would be performed during the final engineering and design stage of the project to determine whether impacts exist and any mitigation measures that need to be taken.

The general vibration assessment uses generalized data to develop a curve of vibration level as a function of distance from the track. The vibration levels at specific buildings are estimated by reading values from a standard curve developed by FTA (FTA, figure 10-1) and applying adjustments to account for factors that affect the source (speed, suspension, and track), the vibration path (geology and coupling to foundation), and the receptor (floors above grade). Adjustment values are supplied in the FTA Manual.

The specific adjustments made to the vibration values obtained from the curve for the proposed LRT project are summarized below:

| <i>Source Factor</i> | <i>Adjustment to Propagation Curve</i> | <i>Comment</i> |
|--|--|---|
| Speed | 65 mph (+2.3 VdB) | Vibration level is approximately proportional to $20 \cdot \log(\text{speed}/\text{speedref})$. |
| Floor-to-floor attenuation | 1-2 Story Masonry (-7 VdB) | This factor accounts for dispersion and attenuation of the vibration energy as it propagates through a building. |
| | 3-4 Story Masonry (-10 VdB) | |
| | Basement to 2nd Floor Attenuation (-4 VdB) | |
| Amplification due to resonances of floors, walls, and ceilings | Floor/Wall/Ceiling Amplification (+6 VdB) | The actual amplification would vary greatly depending on the type of construction. The amplification is lower near the wall/floor and wall/ceiling intersections. |

Source: URS Corporation, November 2009.

*Source FTA Manual, Table 10-1. Adjustment Factors for Generalized Prediction of Ground-Borne Vibration and Noise.

Depending on the combination of factors, the range of possible adjustments is -2.7 VdB for a 1-2 Story Masonry building to -5.7 VdB for a 3-4 story Masonry building. Other assumptions included continuously-welded track and no worn wheels or corrugated track. The results of the General Vibration Assessment are included in table 4-16.

Using the ground-borne vibration levels defined in the base curve and assigning the adjustments to each receptor, ground-borne vibration levels were predicted for the project as shown in table 4-16. The adjusted final vibration level projected at Sleep Inn and Hawthorn Suites is 71 VdB and 66 VdB, respectively. Under FTA criteria, a project vibration impact would occur if the final

projected vibration level was 72 VdB. Therefore, no project vibration impact would be anticipated.

Mitigation Measures

Based on the results of the General Vibration Assessment, the proposed project would not result in any adverse vibration or ground-borne noise impacts. Therefore, no mitigation would be required. Also, a detailed analysis would not be necessary during the final engineering and design stage of the project.

| Table 4-16. Results of General Vibration Assessment | | | | | | |
|--|----------------------|-------------------------|--------------------------|------------------|------------------------|---------------|
| <i>Rec. No.</i> | <i>Receptor Name</i> | <i>Base Curve (VdB)</i> | <i>Adjustments (VdB)</i> | <i>Final VdB</i> | <i>Impact Criteria</i> | <i>Impact</i> |
| Ground-Borne Vibration | | | | | | |
| N1 | Sleep Inn DFW | 74 | -2.7 | 71 | 72 | No |
| N2 | Hawthorn Suites | 72 | -5.7 | 66 | 72 | No |

Source: URS Corporation, November 2009

4.8 Pedestrian Movements

This section presents effects to pedestrian movements resulting from implementing the proposed project. The analysis includes identifying existing and future pedestrian movements that would be affected by the proposed action.

Affected Environment

Existing Pedestrian Movements

As currently conceived, there are very few locations where pedestrians can or would desire to cross the proposed LRT alignment. As discussed in section 4.3, there are no adjacent residential communities and much of the project is adjacent to the airport operations area. The partial impact to two businesses identified in section 4.1 would not create any new barriers to pedestrian movements. Twelve roadway crossings, described in section 4.9, would be associated with this project, eight of which would be grade-separated. Of the four proposed at-grade crossings, three currently have very little pedestrian traffic. Only the at-grade crossing of Crossunder #2 currently has a substantial amount of pedestrian traffic, as many American Airlines employees traverse this area on a daily basis.

Future Pedestrian Movements

By the year 2030, it is projected that 14,600 trips a day would pass through the DFW Airport LRT Station. Because this would be a terminus station, all passengers would be alighting or boarding the LRT for other destinations. Approximately 3,680 passengers would transfer between the LRT at Terminal A and the T's TEX Rail at Terminal B. Another 5,930 passengers would walk to or from airport gates or employment. The remaining 4,990 passengers would transfer between the LRT and the Skylink APM or the Terminal Link Shuttle Bus System. Of the 14,600 passengers, approximately 2,900 would pass through the station during the peak hour. All of these movements would create considerable pedestrian patterns in the platform and terminal areas. These ridership projections have been conducted using the NCTCOG new regional transportation model.

Impacts to Pedestrian Movements

No Build Alternative

There would be no adverse impacts to pedestrian movements generated by the No Build Alternative.

LRT Alternative

With peak period train frequencies, DART's station platform could accommodate the projected number of passengers. DFW Airport is taking the lead in station design and access for both the proposed DFW Airport Extension project and the T's TEX Rail project. DFW Airport is designing a pedestrian way that would safely facilitate pedestrian movement between the two rail platforms and Terminal A and Terminal B. This pedestrian walkway would also accommodate access to the Skylink People Mover or the Terminal Link Shuttle Bus System. Pedestrians would be channeled to safely cross the LRT line at the station platform. A below grade crossing of both the northbound and southbound service roads of International Parkway would also be provided. The new pedestrian walkway would serve existing pedestrian movements by American Airlines employees and eliminate at-grade crossings of the service road.

Mitigation Measures

Since no adverse impacts to pedestrian movements would be anticipated, no mitigation measures would be required.

4.9 Traffic Flow

This section presents traffic impacts of implementing the proposed project. The purpose of this section is to identify changes in traffic flow, traffic circulation, and accessibility.

Affected Environment - Inventory of Roadway Crossings

The first step in the analysis of traffic flow was to create an inventory of each roadway to be crossed by the proposed LRT alignment. The inventory includes the name, functional class, and proposed crossing type for each roadway. The specific function of the roadway is important when considering the level of impact. Some roadways serve local traffic with short trips and relatively low travel speeds, other roadways serve traffic for trips of longer duration with intermediate travel speeds and still other roadways serve traffic primarily for intrastate or interstate trips with limited access and relatively high travel speeds. To determine the functional classification of each roadway, the DFW Airport Master Thoroughfare Plan Figure No. 1 (2009) and Irving Comprehensive Plan Master Thoroughfare Plan, Exhibit A, revised in 2004 were reviewed.

Another step used to develop the respective inventories was to obtain information relating to the number of lanes for each roadway. The number of lanes for roadways with proposed crossings was obtained through electronic observation of aerial photography.

Lastly, collection of existing traffic data was conducted using data from the NCTCOG website and conducting tube counts during a 72-hour period in November 2009 on selected roadways. To predict future traffic volumes, a two percent growth rate was applied per year to the 2009 daily counts out to the years 2013 and 2030. A growth rate of two percent per year is in accordance with current engineering standards.

The inventory consists of a list of roadways that the proposed LRT alignment is planned to cross. The proposed project would cross ten existing roadways and two future roadways. One collector

road, seven local roads (six existing), and four maintenance roads were identified. Collector roads are defined as those roadways that provide service to communities, serve travel needs for primarily intra-county travel as opposed to travel of regional or statewide importance and are posted typically with more moderate speed limits. Local roads are defined as those roadways that primarily provide access to land adjacent to the collector network and feature lower speed limits. Maintenance roads provide access to a specific facility but are not traveled by the general public.

Seven of the roadway crossings are proposed to be grade-separated (LRT line elevated over the roadway) and access to one maintenance road would be relocated to cross under a proposed aerial structure. Four crossings are proposed to be at-grade crossings of existing roadways. Table 4-17 lists the planned roadway crossings of the proposed LRT alignment.

In addition to the roadway crossings, the proposed project would cross under other existing and future non-roadway transportation infrastructure. These non-roadway crossings include two existing airport taxiways, two future airport taxiways and an APM guideway. Each of these non-roadway crossings are required to be grade-separated. Table 4-18 lists the non-roadway crossings.

| Table 4-17. Inventory of Proposed Roadway Crossings | | | |
|--|-------------------------------|--|--|
| <i>Street Name/Civil Station</i> | <i>Proposed Crossing Type</i> | <i>Functional Classification</i> | <i>Number of Lanes</i> |
| Belt Line Road/506+00 | Elevated | Major Arterial | 6 divided |
| Navaid Road/558+00 | At-Grade | Restricted Access Airport Maintenance Road – access to RTR 4E | 1 |
| Future East Airfield Drive Extension/583+00 | Elevated | Major Arterial | 4 divided |
| 17L Navaid Drive/586+00 | Elevated | Restricted Access Airport Maintenance Road – access to RWY 17L Approach Light Stations | 1 |
| Plaza Drive/633+00 | At-Grade | Local Road | 2 |
| Freeport Parkway/644+00 | Elevated | Minor Arterial | 4 - divided + dedicated left turn lane |
| Maintenance Road/678+00 | Relocated to Elevated | Airport Maintenance Road | 1 |
| North Airfield Drive/686+00 | Elevated | Major Arterial | 4 divided |
| Chesapeake Energy Access Road/716+00 | At-Grade | Restricted Access Maintenance Road | 1 |
| North Service Road/727+00 | Elevated | Major Arterial | 2 |
| Future Crossunder #1 Extension /727+00 | Elevated | Collector | 2 - divided |
| Crossunder #2 /761+00 | At-Grade | Collector | 2 - divided |

Source: URS Corporation, 2009

| <i>Name/Civil Station</i> | <i>Proposed Crossing Type</i> | <i>Functional Classification</i> | <i>Number of Lanes</i> |
|---------------------------------|-------------------------------|----------------------------------|-----------------------------------|
| Future Taxiway Extension/697+00 | Below Grade | Airport Taxiway | 1 aircraft Lane |
| Future Taxiway Extension/702+00 | Below Grade | Airport Taxiway | 1 aircraft Lane |
| Taxiway Y/755+00 | Below Grade | Airport Taxiway | 1 aircraft Lane |
| Taxiway Z/757+00 | Below Grade | Airport Taxiway | 1 aircraft Lane |
| DFW Skylink APM/766+00 | Below Grade | Automated People Mover | Two-directional Elevated Guideway |

Source: URS Corporation, 2009

Impacts to Traffic Flow

For all proposed mass transit projects, three individual traffic impacts could occur and should be investigated. The potential impacts include the following:

- impacts to traffic flow on roadways crossed by an LRT alignment,
- impacts to traffic circulation patterns for surrounding local and collector roadways, and
- impacts to accessibility to surrounding land uses.

Impact minimization objectives include the following:

- keep traffic delays to a minimum,
- avoid disruption to local traffic patterns,
- keep access to adjacent properties open,
- do not cause excessive delay to traffic on adjacent streets, and
- do not cause excessive queuing of vehicles such that an adjoining street intersection could be blocked.

An impact is most likely to occur when a proposed LRT alignment would cause excessive queuing or delay on the surrounding roadway system. Queues resulting from LRT crossing activity are considered excessive when they extend upstream to the next intersection. Delay is measured using Level of Service at the crossing. Level of Service (LOS) is the industry standard for describing transportation service quality. It is expressed as a letter grade ranging from A (best) to F (worst). Delay resulting in LOS E or F is considered “excessive” for the purpose of defining an impact. Crossing level of service was estimated using the method described in Transportation Research Board Special Report 209, the Highway Capacity Manual. This method ascribes LOS grades based on the average delay encountered by automobiles desiring to cross the rail tracks. LOS grades are assigned to delay ranges as shown in table 4-19 at right. Delay and LOS were computed for

| <i>LOS Grade</i> | <i>Delay Range*</i> |
|------------------|---------------------|
| A | 0 to 10.0 |
| B | 10.1 to 20.0 |
| C | 20.1 to 35.0 |
| D | 35.1 to 55.0 |
| E | 55.1 to 80.0 |
| F | 80.1 or More |

* Seconds per vehicle

Source: TRB Special Report 209 (HCM), 2000 Edition

the AM and PM Peak Hour periods using the widely used software program Synchro, version 7, a product of Trafficware. Delay estimates were based on the volumes shown previously and the assumption that the crossing would be closed to automobile traffic for 30 seconds every 5 minutes on average (representing trains every 10 minutes in each direction).

Delay and queuing impacts are only measured at the two at-grade crossings that are open to the general public (Plaza Drive and Crossunder #2).

No Build Alternative

There would be no adverse impacts generated by the No Build Alternative.

LRT Alternative

As shown previously in table 4-17, four at-grade LRT crossings are proposed. They include a restricted access airport maintenance road, Plaza Drive, a Chesapeake Energy access road and Crossunder #2. Each of these at-grade crossings would be protected by gates and flashing lights in accordance with DART design standards.

Airport Maintenance Road

The Navaid Road that would be crossed at-grade is an airport access road restricted to airport vehicles only. This roadway provides access to the RTR 4E. Access to this site must be maintained throughout construction and operation phases of the proposed project. Because the road is used infrequently, the impacts to the restricted access airport maintenance road would be minimal. There could be approximately 30 seconds of delay to an airport vehicle should a Light Rail Vehicle (LRV) be crossing at the same time as the roadway is in use by airport personnel. No impacts are anticipated.

Chesapeake Energy Access Road

Chesapeake Energy Corporation signed a lease with DFW Airport in 2006 to explore for and produce natural gas on DFW Airport property. An access road leading to a well drilling pad would be crossed by the proposed LRT Alternative. Gas production is currently underway and future drilling may occur at this pad site. This road provides the only access to the pad site and must be maintained. Traffic would be limited to Chesapeake-approved vehicles which include maintenance personnel who make regular visits to the pad site. Although the number of crossings at this location would increase considerably during periods of drilling activity, no impacts are anticipated because those crossings would still be limited to Chesapeake-approved vehicles. Future drilling activity is not currently scheduled at this site, but could occur depending on market conditions and other resource availability throughout DFW Airport.

Plaza Drive

Plaza Drive is located between SH 114 to the northeast and North Airfield Drive to the southwest, and between Freeport Parkway to the northwest and Esters Boulevard to the southeast. Plaza Drive primarily serves a number of hotels and parking facilities east of the DFW Airport and connects to North Airfield Drive southeast of Freeport Parkway.

Daily traffic counts indicated that, on average, approximately 3,000 vehicles use Plaza Drive east of North Airfield Drive during a typical weekday. In 2013, traffic volumes on Plaza Drive east of North Airfield Drive would be approximately 3,300 vehicles per day (vpd). Daily traffic volume at this location is estimated to reach 4,500 in 2030.

At this location, traffic volumes and the direction of travel varied substantially by time of day during the counts taken during November 2009. For example, during the AM peak hour (7:30am to 8:30am), an average of 215 vehicles per hour (vph) were counted for the 3-day count period. During the PM peak hour (5:00pm to 6:00pm), 455 vph were counted. Traffic on Plaza Drive east of North Airfield Drive was approximately 55 percent in the eastbound direction and 45 percent in the westbound direction during the AM peak hour. During the PM peak hour, the directional split was much different with over 90 percent of the traffic traveling in the westbound direction, and slightly less than 10 percent traveling in the eastbound direction. This strong westbound orientation results from the fact that the SH 114 frontage road is one-way eastbound, Plaza Drive is therefore the only route for vehicles leaving the parking facility and hotels to reach the SH 114/Freeport Parkway interchange.

Traffic patterns by time of day and direction by 2013 are expected to be similar to those counted during November 2009. However, substantial growth in the immediate area would need to occur in order for the projected 2030 traffic volume to be realized. This growth could reasonably be expected to result in a more balanced directional split in the PM peak hour than the 90 percent westbound observed in the traffic counts. For the purposes of this analysis, a 70 percent split was assumed for 2030.

Based on these counts, and the assumed blockage time of 30 seconds for an LRT crossing, the maximum number of queued vehicles at the gated crossing in 2013 would be approximately one vehicle in either the eastbound or westbound direction during the AM peak hour. During the PM peak hour, the maximum number of queued vehicles at the gated crossing would be less than one vehicle in the eastbound direction and about four vehicles in the westbound direction. In 2030, the queues from the crossing are expected to reach five vehicles eastbound and four vehicles westbound in the AM peak hour and five vehicles eastbound and twelve vehicles westbound in the PM peak hour.

Queuing impacts at the planned crossing on Plaza Drive would be minimal in 2013, and manageable in 2030. Although LRT headways would be 10 minutes (twelve train crossings per hour) during the peak hours for both the morning between 6:00am and 9:00am and afternoon between 3:00pm and 6:00pm, it is highly likely that all vehicle queues would fully dissipate between LRV arrivals.

The distance between where the proposed LRT alignment would to cross Plaza Drive and the intersection of North Airfield Drive and Plaza Drive is approximately 200 feet. The distance between where the planned LRT alignment would cross Plaza Drive and Dulles Drive, the first roadway that intersects Plaza Drive east of the planned crossing on Plaza Drive, is approximately 450 feet.

The average automobile length as defined for design purposes is assumed to be 25 feet. Vehicle storage between the planned crossing on Plaza Drive and the intersection of North Airfield Drive and Plaza Drive would therefore be approximately 8 vehicles. Between the planned crossing at Plaza Drive and Dulles Drive, vehicle storage would be approximately 18 vehicles. Daily traffic on Plaza Drive would need to reach approximately 17,000 vpd (many times more than projected 2013 traffic volume levels) before a crossing event would be expected to block the intersection of North Airfield Drive and Plaza Drive. Traffic volume projected for 2030 (4,500 vpd) would be well below the 17,000 vpd required to create an impact to adjacent street intersections. Traffic volume and queuing estimates for Plaza Drive are shown in table 4-20. As shown in the table, all of the queue estimates are below the capacity to accommodate them before the next intersection upstream is impacted.

| Table 4-20. Plaza Drive Traffic Volume and Queuing Estimates | | | |
|---|----------------------------|------------------------------|------------------------------|
| <i>Volume</i> | <i>Existing</i> | <i>2013</i> | <i>2030</i> |
| Daily Traffic Volume | 3000 | 3300 | 4500 |
| AM Peak Hour | 215 | 233 | 323 |
| Eastbound (55%) | 122 | 132 | 184 |
| Westbound (45%) | 93 | 101 | 140 |
| PM Peak Hour | 455 | 493 | 683 |
| Eastbound (10%) | 40 | 44 | 68 |
| Westbound (90%) | 415 | 449 | 615 |
| <i>Queue</i> | <i>Capacity (Vehicles)</i> | <i>2013 Queue (Vehicles)</i> | <i>2030 Queue (Vehicles)</i> |
| AM Peak Hour | | | |
| Eastbound | 8 | 1.1 | 1.5 |
| Westbound | 18 | 0.8 | 1.2 |
| PM Peak Hour | | | |
| Eastbound | 8 | 0.4 | 0.6 |
| Westbound | 18 | 3.7 | 5.1 |

Source: URS Corporation, 2009

Level of service analysis indicates that the proposed LRT service would not impose excessive delay at on Plaza Drive during either the AM or PM peak hours. LOS results for both crossing studied are presented for Year 2013 and Year 2030 conditions in table 4-21.

| Table 4-21. Level of Service at Key At-Grade Crossings | | | |
|---|------------------|------------------|------------------|
| <i>Crossing</i> | <i>Peak Hour</i> | <i>Year 2013</i> | <i>Year 2030</i> |
| Plaza Drive | AM | A (2.2) | A (3.2) |
| Plaza Drive | PM | A (3.0) | B (17.9) |
| Crossunder #2 | AM | A (2.0) | A (2.2) |
| Crossunder #2 | PM | A (2.1) | A (2.2) |

(Numbers in parenthesis represent delay in seconds per vehicle)
 Source: URS Corporation, 2010

Crossunder #2

Crossunder #2 is located just north of the DFW Airport Terminal A and serves as a connection between the northbound and southbound lanes of the service roads that run below and parallel to International Parkway within DFW Airport. A conceptual diagram of the proposed LRT trackway location relative to the Crossunder#2/Northbound Service Road intersection is shown in figure 4-14.

There would be gates and lights for both the northbound and southbound LRT alignments. The location of these signals would be just east of the northbound alignment on Crossunder #2 to halt automobiles making left hand turns into Crossunder #2 from the northbound service road and just west of the southbound alignment to halt cars traveling eastbound through Crossunder #2. Estimated wait time for each LRT crossing event would be 30 seconds.

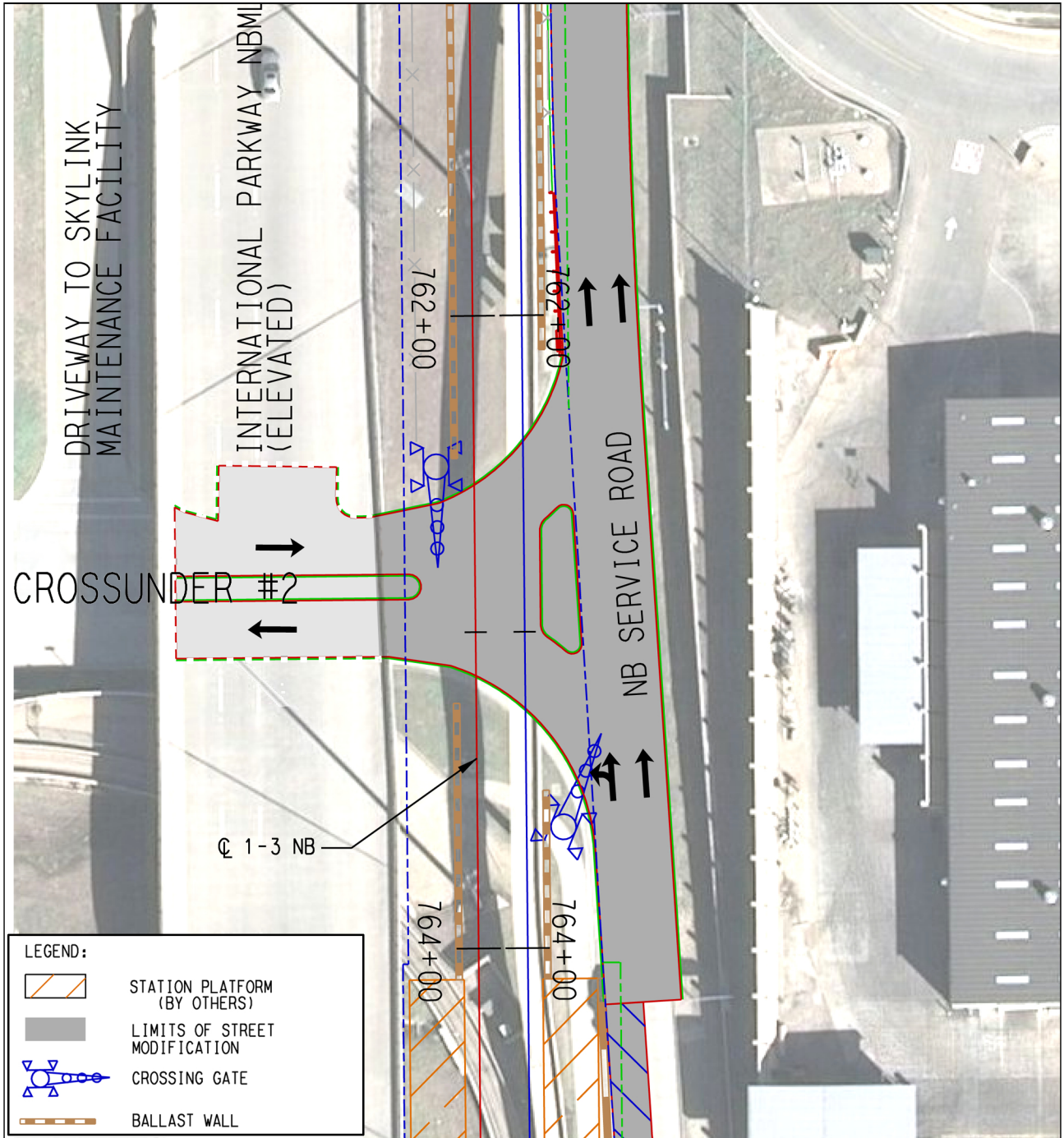
Queuing Impacts at Crossunder #2 would include minimal delay to eastbound vehicles traveling on this roadway while waiting at the crossing for an LRT vehicle to pass. Analysis determined that the average number of queued eastbound vehicles during PM peak hour conditions at the gated crossing would be just under one vehicle in 2013 and slightly more than one vehicle in 2030. Morning queues would average less than one vehicle in both directions for both study years.

These estimates assume that automobile delay at the gated crossing would be 30 seconds, the estimated PM peak hour volume would be approximately 150 vph in 2013 and 230 vph in 2030 and that during the peak hours approximately 65 percent of the vehicles would be traveling in the eastbound direction. Traffic volume and queuing estimates for Crossunder #2 are shown in table 4-22.

When vehicles have a green light on the northbound service road at this intersection, those desiring to turn left onto Crossunder #2 could be stopped in through traffic on the northbound service road during an LRT crossing event by gates and lights placed at Crossunder #2. Consequently, the proposed project could also impact traffic flow on the northbound service road during LRV crossing events.

Daily counts indicated that approximately 10,600 vehicles currently use the northbound service road of International Parkway roadway just south of Crossunder #2 on average during a typical weekday. Using a growth rate of two percent per year, traffic volumes on the northbound service road just south of Crossunder #2 would be approximately 11,500 vpd in 2013 and 16,100 in 2030. There are currently two traffic lanes at this location on the northbound service road with no planned widening between now and 2030. Traffic volumes were assumed to be split evenly between both lanes. Unlike Crossunder #2 traffic, volumes on the northbound service road are heavier in the AM peak hour than in the PM peak hour.

Automobiles desiring to turn left on to Crossunder #2 represent about 3.2 percent of the total northbound service road traffic in the AM peak hour and about 5.6 percent in the PM peak hour. These left turning vehicles represent a very low volume—an average of about one vehicle per minute in the AM peak hour and about one vehicle every 45 seconds in the PM peak hour. At these low volumes (and recalling the estimated crossing blockage time of only 30 seconds), a northbound left-turning vehicle waiting for a train to cross and therefore blocking the northbound service road is not expected to be a frequent occurrence. When it does occur, the blockage is likely to be very brief, and is not expected to have substantial delay for northbound service road traffic.



Source: URS Corporation, 2009.

FIGURE 4-14



0 40 80 Feet

CROSSUNDER #2 AT-GRADE CROSSING
 DART Irving-3 Environmental Assessment

| Table 4-22. Crossunder #2 Traffic Volume and Queuing Estimates | | | |
|---|----------------------------|------------------------------|------------------------------|
| <i>Volume</i> | <i>Existing</i> | <i>2013</i> | <i>2030</i> |
| Daily Traffic Volume | 1500 | 1600 | 2300 |
| AM Peak Hour | 110 | 120 | 170 |
| Eastbound (65%) | 72 | 78 | 111 |
| Westbound (35%) | 39 | 42 | 60 |
| PM Peak Hour | 150 | 160 | 230 |
| Eastbound (65%) | 98 | 104 | 150 |
| Westbound (35%) | 53 | 56 | 81 |
| <i>Queue</i> | <i>Capacity (Vehicles)</i> | <i>2013 Queue (Vehicles)</i> | <i>2030 Queue (Vehicles)</i> |
| AM Peak Hour | | | |
| Eastbound | 22 | 0.7 | 0.9 |
| Westbound | 1 | 0.4 | 0.5 |
| PM Peak Hour | | | |
| Eastbound | 22 | 0.9 | 1.2 |
| Westbound | 1 | 0.5 | 0.7 |

Source: URS Corporation, 2009

Although delays are not expected for northbound through traffic on the service road as a result of LRT crossing events, the roadway environment and lighting conditions could create a situation in which the risk of a rear-end accident is increased. When an automobile is waiting to turn left onto Crossunder #2 and blocking the left lane of the northbound service road, it could be rear-ended by a northbound vehicle not expecting this lane blockage condition. A potential mitigation measure for this impact is described in the next subsection.

Level of service analysis at Crossunder #2 indicates that the proposed LRT service would not impose excessive delay during either the AM or PM peak hours. LOS results for Crossunder #2 are presented for Year 2013 and Year 2030 conditions in table 4-21.

DFW Airport LRT Station at Terminal A

The DFW Airport LRT Station is the only station associated with the proposed project and is considered to be a destination station. There would be no parking and DART would not be providing DART bus service to the station. DFW Airport would construct pedestrian access between the station and Terminals A and B, from which connections to other terminals can be made through the existing secure side Skylink APM or through the existing Terminal Link Shuttle Bus System. The station is not expected to generate vehicular traffic that would impact property access in the station area.

Summary

It is anticipated that the proposed project’s interface at the four at-grade crossings would result in minimal impacts to queuing and LOS. Access to area businesses and airport facilities would not be affected. Additionally, the alignment itself would not block property access. It is anticipated that there would be no excessive delay to traffic on adjacent streets caused by operations of the proposed LRT alignment.

In addition to the grade crossing and access impacts described above, a minor roadway realignment would be required. The northern end of the ramp from the eastbound Terminal B-to-Terminal A access road to North International Parkway would be shifted slightly west to make room for the station platform. This on-ramp relocation would be minor and would not affect traffic speeds or volumes, except during ramp reconstruction.

Mitigation Measures

Mitigation should be considered with an at-grade crossing if delay or queuing is likely to be significant, or if circulation or access impacts are likely.

No excessive vehicle delay or excessive frequency or duration for queuing for vehicular traffic would be expected during operations of the proposed LRT alignment. LRT operations would impose some restrictions to traffic flow on the north service road at Crossunder #2. In order to increase safety conditions during such delays, DART proposes that signaling be implemented to stop all traffic on the north service road for both lanes upstream (south) of Crossunder #2 during LRV crossing events.

There is currently signal control at the intersection of the northbound service road and Crossunder #2. The assumption was made that the existing signal control would still be in place under 2013 and 2030 conditions. This signal, which currently alternates between Crossunder #2 traffic and northbound service road traffic, could also be used to control traffic during an LRV crossing event. This measure would increase delay for northbound traffic on the north service road, but LOS for the intersection would still be excellent, even during peak hours. Table 4-23 compares the average intersection LOS and delay for AM and PM peak hour conditions with and without the proposed mitigation.

| Table 4-23. Level of Service at Crossunder #2/North Service Road | | | |
|---|------------------|------------------|------------------|
| <i>Crossing</i> | <i>Peak Hour</i> | <i>Year 2013</i> | <i>Year 2030</i> |
| LRT Alternative | AM | A (6.6) | A (8.1) |
| With Mitigation | AM | A (9.3) | B (12.8) |
| LRT Alternative | PM | A (9.8) | B (10.9) |
| With Mitigation | PM | B (14.8) | B (16.9) |

(Numbers in parenthesis represent delay in seconds per vehicle)

Source: URS Corporation, 2010

4.10 Parking

This section presents effects to parking resulting from implementing the proposed project. The analysis includes creating an inventory of parking that would be affected by the proposed action.

Affected Environment – Parking Inventory

Parking areas which may be affected by the proposed LRT alignment were inventoried through a review of the *Irving/DFW Corridor Belt Line Road to Terminal A Station Line Section I-3 Phase I Preliminary Engineering 10% Design* document. Supplementary data was collected through observation of aerial photography and onsite visits.

One parking area was identified adjacent to the proposed LRT alignment. The Federal Express facility parking lot located directly southeast of the junction of Plaza Drive.

The DFW Airport LRT Station is considered a destination station without parking and there would be strict prohibitions on parking in the vicinity of the station. The Belt Line Station was designed to accommodate any additional parking demand introduced by the proposed DFW Airport Extension project.

Impacts to Parking

No Build Alternative

There would be no adverse impacts to parking conditions generated by the No Build Alternative.

LRT Alternative

One parking area was identified adjacent to the proposed LRT alignment as being affected by the proposed LRT alignment. The proposed LRT alignment is planned to run through part of the Federal Express facility parking lot located directly southeast of the junction of Plaza Drive and North Airfield Drive. The number of employee parking stalls affected could be as many as 30. In addition about 50 tractor trailer stalls would also be displaced; therefore, an impact would occur. The Federal Express facility is under a long term lease to AFCO, a firm that specializes in the leasing and management of airport properties. AFCO subleases its facility to Federal Express.

No free public parking is allowed in the vicinity of the DFW Airport LRT Station.

Mitigation Measures

Proposed mitigation is planned to alleviate impacts to business operations at the Federal Express facility. DART has developed a recommended plan for reconfiguring the remainder of the existing Federal Express parking area to accommodate all trailer storage needs. Additional parking to accommodate the displaced employee parking would be constructed south of North Airfield Drive, adjacent to the employee entrance to the Federal Express facility. The facility is also located on the south side of North Airfield Drive. As described in Chapter 4, construction of the proposed parking area would require the review and approval of the DFW Airport Environmental Affairs Department. This is of particular concern because the proposed site is located within the Northeast Cargo VCP site. This site is undergoing active remediation for subsurface petroleum and chlorinated solvents contamination and may have special permitting conditions, as well as specific requirements for soil testing, monitoring and management during construction. DFW Airport and DART are currently developing a MOA to govern any property issues.

4.11 Public Services, Safety and Security

This section provides a discussion of existing public services, safety and security conditions, and potential impacts for public safety and security services that have jurisdiction near the proposed LRT alignment. Information in this section was obtained from the DFW Airport DPS website and The Transportation Security Administration (TSA) website. This information has been verified by examination of aerial photography (AE View, 2006) field reconnaissance and agency coordination.

Affected Environment – Inventory of Public Safety Facilities

DFW Airport's DPS includes police, fire, and emergency medical services. Five public safety stations exist on DFW Airport property, with a sixth set for completion in 2011. Police services are comprised of investigations, patrol, and special operations services. The Special Operations Division includes a bicycle patrol unit, traffic control unit, canine/explosives unit, and a special weapons and tactics unit. DFW Airport Fire Services are comprised of fire prevention, fire suppression/rescue, and emergency medical services. The DFW Airport Operations Center, the main DPS station, and DPS Station #3 are all located on the east side of the airport. One DPS station, Station #3, is located near the proposed LRT alignment. It provides fire and emergency medical services. No other emergency facilities or hospitals are located near the proposed LRT alignment.

TSA is a division of the Department of Homeland Security created to strengthen the security of the nation's transportation systems while ensuring the freedom of movement for people and commerce. TSA is responsible for security at the nation's airports and for screening all commercial airline passengers and baggage.

The DFW Airport LRT Station would be located in a non-secure section of the airport and represents additional public access to the airport. DFW Airport would be responsible for creating the interface between the station and DFW Airport terminals. TSA would continue to screen passengers at its various check points.

Impacts to Public Services, Safety, and Security

This section discusses any potential impacts to public services, safety, and security that would result from the LRT Alternative and the No Build Alternative.

No Build Alternative

No adverse impacts to public services, safety, and security would be associated with the No Build Alternative.

LRT Alternative

No adverse impacts would be anticipated for public services, safety, and security.

DFW Airport has jurisdiction for fire protection and emergency medical services on airport property. DFW Airport and DART are currently developing a MOA to govern any safety and security issues along the DART alignment and at the DFW Airport LRT Station. It is assumed that DART police personnel would have jurisdiction over DART trains and the station platform. In the event of a fire or medical emergency on-board an LRV or along the alignment, however, assistance from both DFW Airport fire and police personnel could be necessary. It is not anticipated that the introduction of the DART rail to the airport would require additional DFW Airport police personnel for daily service. DART's Financial Plan provides for expansion of the DART police force to accommodate rail expansion.

DFW Airport DPS has reviewed the DART 10% Design to determine impacts to safety and security. It is not anticipated that the four proposed at-grade crossings would adversely affect emergency service along the alignment. The Navaid Road and Chesapeake Energy Access Road have restricted access. The proposed at-grade crossing at Plaza Drive also divides the jurisdictional responsibilities between DFW Airport and the City of Irving. Emergency vehicles typically are not required to cross this boundary.

The proposed at-grade crossing of Crossunder #2 would not adversely affect emergency access to properties on either side of the alignment. DPS stations are located both east and west of the proposed alignment where it would cross Crossunder #2 at grade. The proposed traffic mitigation at the intersection of the northbound service road and Crossunder #2 has been coordinated with DFW Airport DPS (see Section Traffic 4.9).

The majority of the proposed LRT alignment would occur within the boundary fence of DFW Airport; however, no portion of the proposed LRT alignment would fall within the Airport Operations Area (AOA) fence. All rail infrastructure would be fenced.

Mitigation Measures

Since no adverse impacts to public services, safety, and security would be anticipated, no specific mitigation measures would be required. However, in order to ensure safety and security, the final design would be conducted in accordance with the National Fire Protection Association NFPA-130 (*Standard for Fixed Guideway Transit and Passenger Railway Systems*) and the applicable fire and building codes of DFW Airport. Additionally, the DART Fire/Life Safety Committee will continue to coordinate with DFW Airport DPS through design, construction, and operation of the LRT line. DART and DFW Airport will finalize the MOA that outlines roles and responsibilities for safety and security along the proposed DART alignment and at the proposed DFW Airport LRT Station.

4.12 Electrical and Magnetic Fields

Electrical and magnetic fields (EMF) are the fields of energy surrounding electric power wires and other current-carrying devices. These fields are generated by objects such as electric power lines, household wiring, and electric appliances. According to the World Health Organization (WHO), “Current public concern focuses on possible long-term health effects caused by exposure to electromagnetic fields” (WHO). Concerns have also been expressed by businesses with a heavy reliance on technical equipment, computer systems, and communication infrastructure that EMF generated by the operation of DART LRV may impact operation of such equipment.

Sources of EMF created by the proposed LRT alignment include: catenary wires, TPSS locations, and LRVs.

Affected Environment

The proposed LRT alignment would travel adjacent to businesses and parking areas although the entire length of the alignment is located on DFW Airport property. Businesses are within proximity to the alignment where it crosses Belt Line Road, Esters Blvd., Plaza Drive, Freeport Parkway, and where the proposed LRT alignment would run parallel to the northbound service road of International Parkway.

Impacts from EMF

No Build Alternative

No adverse impacts resulting from EMF would be associated with the No Build Alternative.

LRT Alternative

Catenary Wires

Catenary lines are suspended above the track where they are utilized by the light rail vehicles to supply vehicles with direct current (DC) electricity. The conversion from alternating current (AC) supplied by the power grid to DC occurs at TPSSs, which would be located along the rail corridor. Catenary wires occur throughout the entire length of the proposed LRT alignment.

With regard to human health effects, it is generally accepted that DC poses little to no risk. Alternating current fields induce weak electric currents in conducting objects, including humans; whereas, DC fields do not, unless the DC field changes in space or time relative to the person in the field. Entire track assembly is insulated on a bed of concrete which grounds the electrical circuit and does not cause any direct ground current.

No adverse impacts resulting from EMF would be associated with catenary wires transmitting DC in the LRT Alternative.

TPSS Locations

The location and number of TPSSs required is typically determined by headway requirements and other operational factors. Designers of the proposed LRT alignment have estimated that five TPSS locations would be required. The location of each TPSS is detailed in table 4-24. The numbering of the TPSS locations is continued from the I-1 and I-2 line sections and starts with TPSS #7.

Although research is ongoing regarding the potential for AC to pose a risk to human health, no direct evidence currently exists linking low-level exposure to negative health effects. According to a statement published on their website, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low-level electromagnetic fields (WHO). Therefore, no adverse impacts resulting from EMF created by TPSS locations would be expected from the implementation of the proposed project.

A recently conducted study by ScanTech for St. John's Consulting Group, Inc. titled *EMF Survey Phase I Baseline Testing before Utility Deployment with Evaluation*, October 30, 2009 determined that operation of DART vehicles near businesses did not generate changes in EMF sufficient to interfere with computer systems.

Readings were taken by ScanTech at distances of 35 feet and 40 feet from the centerline when trains passed. Resulting measurements showed, "only a small amount of change in both the DC & AC magnetic fields (85 milliGauss DC and 0.32 milliGauss AC)." ScanTech also notes that computer equipment is generally rated to withstand up to 100 Gauss before possible degradation could occur.

Table 4-24. Traction Power Substation Locations

| # | Location | Potential exposure |
|----|---|--|
| 7 | Civil Station 533+00 – at the rear of an industrial development | Employees of industrial/business site - located in the rear of site. Customers would not have access to this area. |
| 8 | Civil Station 588+50 – near the intersection of Esters and Cabell | Employee parking for industrial/business site – located in the rear of site, located ~450’ from TPSS location. |
| 9 | Civil Station 650+50 – north of Airfield Drive west of Freeport Parkway | No human activity |
| 10 | Civil Station 710+00 – east of service road, just after alignment turns south | No human activity |
| 11 | 741+00 – northern edge of planned storage track/yard | AA Cargo building within ~300’ of TPSS location. Parking for the facility that is regularly used by employees and occasionally by contractors and customers lies within 150’ of the TPSS location. Employees at the Skylink Maintenance and Storage Facility work within 300’ of the TPSS location. |

Source: URS Corporation, 2010

No adverse impacts resulting from EMF created by LRVs would be expected from the implementation of the proposed project.

Mitigation Measures

Since no impacts result from EMF exposure, no specific mitigation measures would be required.

4.13 Parklands

This section describes the project’s effect on parks and recreational areas and identifies mitigation measures to avoid or reduce adverse effects.

Section 4(f) of the Department of Transportation Act of 1966 became law on October 15, 1966 as set forth in Title 49 United States Code (U.S.C.), Section 303. This law was developed in order to safeguard the natural beauty of recreational lands, public parks, wildlife and waterfowl refuges, and historic sites. In this law, the Secretary of Transportation has the obligation to consult with the secretaries of Agriculture, Housing and Urban Development, the Interior, and the states to develop transportation plans that would include measures to maintain the natural beauty of lands crossed by transportation projects. As authorized by Section 4(f), the Secretary may approve certain transportation projects that would utilize publicly owned lands of wildlife and waterfowl refuges; national or state parks; public parks; recreational areas; or other areas of national, state, or local significance only if there is no feasible and prudent alternative to the use of land and the action includes all possible planning to minimize harm to the property resulting from use.

Affected Environment

No parkland is located at the airport. This includes refuges, national and state forests, and recreational areas. According to the City of Irving, no designated parkland is located within one quarter mile of the proposed LRT alignment and the closest park would be W.O. Harrington Park located approximately 0.5 miles southeast of the proposed LRT alignment.

DFW Founders Plaza is the only public gathering place located on DFW Airport property. Located in the northwest quadrant of DFW Airport property, DFW Founders Plaza is used as an airport observation area and can be accessed by Texan Trail and North Airfield Drive. DFW Founders Plaza is not located near the proposed LRT alignment.

Impacts to Parklands

No Build Alternative

No adverse impacts to refuges, national and state forests, parks, or wilderness areas would be associated with the No Build Alternative.

LRT Alternative

No adverse impacts to refuges, national and state forests, parks, or wilderness areas would be associated with the proposed action because there are no parkland areas near the proposed LRT alignment.

Mitigation Measures

Since no adverse impacts to parklands would be anticipated, no mitigation measures would be required.

4.14 Vegetation

This section describes the project's effect on vegetation and identifies mitigation measures to avoid or reduce adverse effects.

Affected Environment

On August 11 and 12, 2009, biologists conducted a vegetation survey of the area within one-quarter mile of the proposed LRT alignment. According to the Natural Regions of Texas Map provided by the Texas Parks and Wildlife Department, the eastern portion of the proposed LRT alignment (within Dallas County) is situated within the Blackland Prairie natural region while the western portion of the proposed LRT alignment (within Tarrant County) is situated within the Oak Woods and Prairies natural region. Within these natural areas, the TPWD states that crops are the primary vegetation found along the eastern portion of the proposed LRT alignment while other native and/or introduced grasses are the primary vegetation along the west side of the proposed alignment.

At the time of the site reconnaissance, three vegetation associations were observed along the proposed LRT alignment. Within the upland woody portions of the proposed project which occurred mostly on the southeast side of the alignment, early successional *Prosopis glandulosa* (honey mesquite) dominated with a minor amount of *Celtis laevigata* (sugarberry), and *Morus rubra* (mulberry). Herbaceous vegetation that dominated in these woods included *Helianthus annuus* (common sunflower), *Sorghum halepense* (Johnson grass), and *Ambrosia trifida* (great ragweed). Along the creeks and wet areas of Hackberry Creek, sugarberry dominated the plant communities. Herbaceous vegetation such as *Typha latifolia* (broad-leaf cattail) dominated in

Grapevine Creek with only minor woody vegetation. The remaining portions of the proposed LRT alignment traverse fields that are either maintained or were once agricultural. Low-lying herbaceous vegetation dominated these fields including *Cynodon dactylon* (Bermuda grass) in the maintained areas, and *Solidago canadensis* (goldenrod), annual sunflower, *Festuca arundinacea* (Kentucky fescue), Johnson grass, and *Lolium multiflorum* (rye grass) in the areas that once appeared as agricultural land. Representative photographs of the various vegetation types are presented in Appendix F.

Impacts to Vegetation

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

The primary direct effect of implementing the LRT Alternative would be the short-term and long-term loss of vegetation and subsequent wildlife habitat. The project would be located on airport property where the establishment of wildlife habitat is generally discouraged.

Mitigation Measures

Long-term impacts would be mitigated through re-vegetation. Disturbed vegetated areas would be replanted with replacement vegetation that would utilize native species. The amount of vegetation removed, trampled, or disturbed would be minimized to the greatest extent possible through the use of BMPs as suggested by Chapter 8 of the *Texas Nonpoint Source Management Program*, a document produced jointly by the TCWQ and the Texas State Soil and Water Conservation Board in December 2005, and BMPs developed for Urban Areas by the U.S. Department of Agriculture Natural Resource Conservation Service for tree protection and restoration. After final grading, all plant communities would be replanted with the expectation of being restored to the original condition once replacement vegetation matures. These measures would be included in DART's construction specifications and would be applied during and after construction of the project. As the proposed project would be located on airport property, the establishment of wildlife habitat is discouraged.

4.15 Wildlife and Threatened or Endangered Species

This section describes the project's effect on wildlife and threatened or endangered species and identifies mitigation measures to avoid or reduce adverse effects.

4.15.1 Wildlife

Overall, urban areas would provide potential habitat for a large variety of birds, mammals, snakes, lizards, turtles, and amphibians. However, the proposed alignment is located on airport grounds where the settling of wildlife is generally discouraged. This is especially true for large mammals and birds that pose a risk to aviation activities. Additionally, much of the area around the proposed LRT alignment is regularly disturbed with business activity, ground transportation activity, and ongoing airport operations.

On August 11 and 12, 2009 biologists conducted a wildlife survey of an area within one-quarter mile of the proposed LRT alignment. Signs of the following wildlife were observed during the field survey: *Odocoileus virginianus* (whitetail deer), *Sciurus niger* (fox squirrel), *Cyanocitta cristata*

(blue jay), *Spizella pusilla* (field sparrow), *Zenaida macroura* (mourning dove), *Columba livia* (rock dove), *Canis latrans* (coyote), *Tyrannus forficatus* (scissor-tailed flycatcher), *Hirundo rustica* (barn swallow), *Egretta caerulea* (little blue heron), and *Procyon lotor* (raccoon). More specifically, one set of tracks were observed for the raccoon and the coyote near water along the proposed LRT alignment. The barn swallow was observed where ever there was a large culvert and water, which was at approximately three locations. The scissor-tailed flycatcher, field sparrow, and blue jay were observed approximately twice each along the proposed LRT alignment. The mourning dove and rock dove were observed throughout the proposed LRT alignment at numerous locations. The fox squirrel was heard once while conducting the site visit and the dung of the whitetail deer was observed in one location along the proposed LRT alignment.

During this site reconnaissance, aquatic animals appeared to be very limited. Where the proposed LRT alignment crosses Hackberry Creek, *Notemigonus* spp. (shiner) was observed in this clear creek. In addition, *Procambarus* spp. burrows were observed along a vegetated tributary to Mud Springs Creek in one location on the far south end of the proposed LRT alignment. No other aquatic species or signs of aquatic species were observed at the time of the site reconnaissance. Other aquatic species could exist within the various streams that would be crossed (elevated crossings only) with the proposed LRT alignment, but most crossings were heavily vegetated at the time of the reconnaissance and aquatic species could not be observed in these streams.

Airport activity appears to have limited the amount of wildlife in this area, with the exception of the large number (10-15 observations) of rock dove and mourning dove. However, these species are ubiquitous around urban populations and could easily relocate to a more desirable locale.

Impacts to Wildlife

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

In response to information requests submitted to TPWD that can be found in Appendix E, the TPWD provided a several recommendations for limiting impacts to wildlife resources. These recommendations include:

- minimizing the amount of riparian vegetation that is to be disturbed,
- design 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 should be planted as mitigation for trees removed), and
- the usage of native vegetation beneficial to fish and wildlife should be used for all landscaping areas.

The TPWD also provided several examples of where impacts to wildlife habitat may occur on transportation projects such as a new light rail alignment. The disturbance of riparian vegetation during construction, the presence of structures related to bridge spans across the streams, and the resulting usable vertical and horizontal space beneath the structures for wildlife to cross

under, disturbance and destruction of existing mature native trees and shrubs were listed as potential impacts.

As outlined in federal regulation and DART policy, impacts to wildlife habitat should be avoided, minimized, or mitigated. While the proposed alignment evaluated in this document is considered to be the alignment that would best satisfy the need for and purpose of transportation improvements in the corridor, it has potential to impact habitat that may support wildlife. Under the No Build Alternative, wildlife impacts would be avoided. However, it is not considered to be a feasible and prudent alternative because it does not meet the purpose and need established for the project. The project planning and development process has sought to utilize every available feasible design technique to minimize or eliminate impacts to wildlife habitat.

Working with DFW Airport, DART has identified a very narrow corridor that allows for implementation of LRT on DFW Airport property that minimizes environmental impacts and does not impact airport operations. The configuration of the alignment extending northwest from the Belt Line Station before turning south to Terminal A, has been influenced by many factors and is severely constrained. These factors include topography, availability of land, existing and future development, roadway infrastructure, airport infrastructure, airport operations, aeronautical considerations, and light rail operational constraints. Nevertheless, efforts were made during preliminary engineering to cross the streams in the narrowest sections, to minimize the amount of vegetation and potential habitat disturbed by the proposed LRT alignment and associated construction activities.

Although TPWD suggests that all stream crossings be perpendicular to the stream course, the aforementioned design constraints preclude fully implementing this recommendation. Adjusting the alignment to cross streams perpendicularly would be operationally inefficient, would add substantial costs, and would have would increase land use and infrastructure impacts. Airport operations and aeronautical considerations further encumber this concept. Given the design constraints, crossing streams perpendicularly does not appear to be a feasible and prudent alternative. As suggested by TPWD, bridge spans across streams have been designed to allow usable vertical and horizontal space beneath the structures for wildlife to cross under. The preliminary engineering documents demonstrate that each crossing provides sufficient space for the passage of local terrestrial wildlife.

The proposed 5.17-mile project would occupy an 80-foot wide corridor, much of which is regularly influenced by human activity. Most of the project is located in previously disturbed areas and in areas adjacent to existing transportation infrastructure. The narrow footprint of proposed LRT alignment represents only a small percentage of potential habitat indicated in table 4-26 that is found on DFW Airport property. Areas most advantageous to wildlife, such as previously undisturbed streams and riparian areas will be crossed on aerial structure. Field reconnaissance has determined that the areas affected by the proposed LRT alignment would support a limited number of species and other biotic resources commonly occurring in the general area.

Mitigation Measures

All wildlife present within the proposed LRT alignment are subject to an environment that is regularly disturbed. Due to their mobile nature, wildlife, including any rare species, would most likely relocate in the event of habitat disturbance. Re-vegetation to re-establish habitat is not recommended on airport grounds where the settling of wildlife is generally discouraged. No mitigation would be required. However, at the request of the TPWD, site planning should be designed to preserve existing native mature trees and shrubs if at all possible. Where not possible, native replacement trees should be planted as mitigation for mature trees removed. Any

new landscaping required by the project should utilize native species with higher values as food and cover for wildlife resources. DART will work with DFW Airport to identify plant species that would not provide habitat for wildlife that may be harmful to aviation operations.

4.15.2 Federally-Listed Threatened & Endangered Species

The analysis of the impact to threatened or endangered species includes the review of existing documentation to determine which species have been known to occur in Dallas and Tarrant counties; contacting responsible agencies to request information regarding specific occurrences along the proposed LRT alignment; and conducting a field reconnaissance to assess potential for these species and their associated habitats to be located along the proposed LRT alignment.

According to the 1973 Endangered Species Act (ESA), it is unlawful for any person subject to the jurisdiction of the United States to take or violate any regulation pertaining to any endangered species of fish or wildlife within the U.S. or territorial seas of the U.S. "Take" is defined in this Act as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. This also includes habitat modification that would result in the death or injury of a federally-listed endangered species. In addition, the ESA states that it is unlawful for any person to remove and reduce to possession any endangered species of plants from areas under federal jurisdiction; to maliciously destroy or damage such species; or to remove, cut, dig up, damage, or destroy any such species. The controlling agencies for the administration of the ESA are the USFWS and the National Marine Fisheries Service (NMFS).

An information request regarding specific occurrences within the project area of potential federally-listed and state-listed threatened and endangered species, as well as a listing of any candidate and rare species was submitted to the USFWS and the TPWD on August 7, 2009. On January 20, 2010 a similar request was submitted to DFW Airport Environmental Affairs Department. A reply from the USFWS stated that information regarding federally-listed threatened and endangered species can be found on their website. In a response letter from the TPWD dated September 11, 2009, the TPWD stated that there are no known occurrences of rare resources within five miles of the project area. Correspondence with these agencies can be found in Appendix E. DFW Airport responded immediately that there have been no known sightings of federally-listed species at DFW Airport.

The USFWS current list of federally-listed threatened, endangered, and candidate species for Dallas and Tarrant counties was reviewed to determine which species have the potential to occur along the proposed action. The federal listing of the reported USFWS species for these counties includes six bird species that have been reported to occur in Dallas and Tarrant counties. All six of these species are also listed as rare species by the TPWD. These species are:

- *Haliaeetus leucocephalus* (bald eagle),
- *Vireo atricapilla* (black-capped vireo),
- *Dendroica chrysoparia* (golden-cheeked warbler),
- *Sterna antillarum* (interior least tern), *Charadrius melodus* (piping plover), and
- *Grus americana* (whooping crane).

On August 11 and 12, 2009, a field reconnaissance was performed to assess the potential for the listed species and their associated habitats to be located along the proposed LRT alignment. Known habitats for each of the listed species were reviewed and compared to the habitats

encountered within each phase during the site reconnaissance. The comparison was based upon ecological characteristics including soils, terrain, hydrology, and vegetation. Critical habitat designations that had been reported in each species account were also reviewed to assess the potential for critical habitats of listed species to be located along the proposed action. The overall objective of this assessment was to evaluate potential impacts that could occur to listed and candidate species within the vicinity of construction activities within the proposed LRT alignment.

The assessment along the proposed LRT alignment did not reveal evidence of critical habitat for the six federally-listed threatened and endangered species that are reported to exist in Dallas and Tarrant counties by the USFWS. No known sightings of the listed species have been reported at DFW Airport or along the proposed LRT alignment. Table 4-25 summarizes these findings.

Table 4-25. USFWS Endangered Species List for Dallas & Tarrant Counties

| <i>Common Name</i> | <i>Scientific Name</i> | <i>County Found</i> | <i>Status</i> | <i>Suitable Habitat</i> | <i>Habitat Found</i> |
|------------------------|---------------------------------|---------------------|---------------|--|----------------------|
| Bald Eagle | <i>Haliaeetus leucocephalus</i> | Dallas/ Tarrant | DM | Near rivers and large lakes where fish are abundant and trees are at least 60 feet in height | No |
| Black-capped Vireo | <i>Vireo atricapilla</i> | Dallas | E | Oak-juniper woodlands with shrub foliage reaching the ground and open grassy areas | No |
| Golden-cheeked Warbler | <i>Dendroica chrysoparia</i> | Dallas | E | Oak-juniper woodlands with mature Ashe Junipers | No |
| Interior Least Tern | <i>Sterna antillarum</i> | Dallas/ Tarrant | E | Nests along sand and gravel bars within braided streams and rivers | No |
| Piping Plover | <i>Charadrius melodus</i> | Dallas | E,T | Sparsely vegetated shores and islands of shallow lakes, ponds, rivers, or impoundments | No |
| Whooping Crane | <i>Grus americana</i> | Dallas/ Tarrant | E | Dense emergent vegetation (sedges, bulrushes) in shallow ponds, freshwater marshes, wet prairies, and along lake margins. Depends on highly productive wetland ecosystems. | No |

Source: USFWS Endangered Species List for Dallas & Tarrant Counties, accessed August 2009

NOTES: DM - delisted taxon, recovered, being monitoring first five years; E - federally endangered; T - federally threatened

Impacts to Federally-listed Threatened & Endangered Species

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

Based on a review of existing documentation and field reconnaissance, the proposed LRT alignment would not involve a federally-listed species or its critical habitat. There have been no

sightings of federally-listed species at DFW Airport and the airport grounds do not provide the critical habitat for listed species. Additionally, much of the area around the proposed LRT alignment is regularly disturbed by human activity.

Mitigation Measures

No mitigation measures are anticipated for federally-listed species.

4.15.3 State Endangered and Threatened Animals

In addition to the previously mentioned coordination with TPWD, the TPWD Annotated County List of Rare Species for Dallas and Tarrant counties was also reviewed to determine which species have the potential to occur within the project area. Thirty-one rare species were identified for Dallas and Tarrant counties. In addition to the six federally-listed species, the bald eagle, black-capped vireo, golden-cheeked warbler, interior least tern, piping plover, whooping crane, the state list of rare species includes: *Falco peregrinus* (peregrin falcon), *Ammodramus henslowii* (Henslow's sparrow), *Athene cunicularia hypugaea* (western burrowing owl), *Plegadis chihi* (white-faced ibis), *Mycteria americana* (wood stork), *Scaphirhynchus platyrhynchus* (shovelnose sturgeon), *Lordithon niger* (Black Lordithon rove beetle), *Canis lupus* (gray wolf), *Canis rufus* (red wolf), *Spilogale putorius interrupta* (plains spotted skunk), *Myotis velifer* (cove myotis bat), *Truncilla donaciformis* [fawnsfoot (mollusk)], *Villosa lienosa* [little spectaclecase (mollusk)], *Pleurobema riddellii* [Louisiana pigtoe (mollusk)], *Tritogonia verrucosa* [pistolgrip (mollusk)], *Arcidens confragosus* [rock pocketbook (mollusk)], *Lamplilis satura* [sandbank pocketbook (mollusk)], *Potamilus amphichaenus* [Texas heelsplitter (mollusk)], *Fusconaia flava* [wabash pigtoe (mollusk)], *Macrochelys temminckii* (alligator snapping turtle), *Thamnophis sirtalis annectens* (Texas garter snake), *Phrynosoma cornutum* (Texas horned lizard), *Crotalus horridus* (timber/canebrake rattlesnake), *Yucca necopina* (Glen Rose yucca), and *Hexalectris warnockii* (warnock's coralroot).

Although state endangered and threatened animals and rare species are not afforded protection under the ESA, their presence/absence was included in the evaluation during field reconnaissance and is reported here for informational purposes. Potential habitats for six of the 31 TPWD listed rare species that are reported to exist in Dallas and Tarrant counties were found through a field reconnaissance performed on August 11 and 12, 2009. A summary of the species whose habitat was found during the field survey is found in table 4-26.

Water bodies impacted by the proposed LRT alternative are several creeks as discussed in section 4.16 and identified in table 4-27. These creeks include: Mud Springs Creek (in two locations), Hackberry Creek, an ephemeral drainage, and Grapevine Creek (in two locations).

Impacts to Endangered and Threatened Animals of Texas

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore, no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

Although potential habitats for these rare species were found, no known sightings of the listed species have been reported at DFW Airport or along the proposed LRT alignment. In addition, the area around the proposed LRT alignment is regularly disturbed with business activity and ongoing airport operations.

| Table 4-26. TPWD Annotated County List of Rare Species for Dallas and Tarrant Counties | | | | | |
|--|--------------------------------------|--------------------|-----------|---|---------------|
| Common Name | Scientific Name | County Found | Status | Habitat Required | Habitat Found |
| Birds | | | | | |
| Peregrine Falcon | <i>Falco peregrinus</i> | Dallas/ Tarrant | DM, ST | Occupies wide range of habitats during migration, including urban areas (this includes the American and Arctic Peregrin Falcon) | Yes |
| Western Burrowing Owl | <i>Athene cunicularia hypugaea</i> | Dallas/ Tarrant | R | Open grasslands, including prairie, plains, savanna, and open areas such as vacant lots near airports | Yes |
| Insects | | | | | |
| Black Lordithon Rove Beetle | <i>Lordithon niger</i> | Dallas | R | Only historically known to exist in Texas. Defined habitat requirements unknown. | Unknown |
| Mammals | | | | | |
| Plains Spotted Skunk | <i>Spilogale putorius interrupta</i> | Dallas/ Tarrant | R | Found in open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands. Prefers wooded brushy areas and tallgrass prairie. | Yes |
| Reptiles | | | | | |
| Texas Garter Snake | <i>Thamnophis sirtalis annectens</i> | Dallas/ Tarrant | R | Prefer wet or moist microhabitats, but is not restricted to them. Hibernates underground. | Yes |
| Timber/ Canebrake Rattlesnake | <i>Crotalus horridus</i> | Dallas/ Tarrant | ST | Found in swamps, floodplains, upland pine and deciduous woodlands, riparian zones, and abandoned farmland. | Yes |

Source: TWPD Annotated County List of Rare Species for Dallas and Tarrant Counties, Texas, July 16, 2009

NOTES: DM - delisted taxon, recovered, being monitoring first five years; E - federally endangered; T - federally threatened; ST - state threatened; SE - state endangered; R - rare species only

Mitigation Measures

Like all wildlife present within the proposed LRT alignment, state- or federally-listed threatened or endangered species are subject to an environment that is regularly disturbed. Due to their mobile nature, these species would most likely relocate in the event of habitat disturbance. No mitigation measures are anticipated for state-listed species other than those measures applied for all wildlife throughout the proposed LRT alignment.

4.16 Water Resources

This section addresses water resource issues associated with the proposed action. These issues include impacts to wild and scenic rivers, waters of the United States, floodplain impacts, and water quality. Additionally, information relating to the minimization of impacts to these resources is discussed.

Section 404 of the 1977 Clean Water Act Amendments authorizes the Secretary of the Army to issue permits for the discharge of dredged or fill material into water of the United States. “Waters of the United States,” in general, are all waters which are used or could be used for interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters which could affect interstate or foreign commerce; and, all tributaries to the above-mentioned waters (EPA 1985). However, the USACE issued changes to what constitutes “Waters of the United States” in 2001 based on the result of a January 9, 2001 ruling by the U.S. Supreme Court (*Solid Waste Agency of Northwestern Cook County v. United States Army Corps of Engineers et al.*; hereafter referred to as the SWANCC decision). According to information provided by the USACE, “Waters of the United States” are now defined to include non-wetland waterways, streams, and tributaries to these waters. This is in addition to wetlands that are connected to navigable waters. For non-tidal (not associated with ocean water) “Waters of the United States,” the limits of jurisdiction under the category is the “ordinary high water mark.” This mark is defined as the line on a shore or bank that is established by water fluctuations. This mark is identified through field observation of features such as soil changes, shelving, destruction of terrestrial vegetation, and the presence of debris deposits. According to this ruling, where wetlands occur above the high water marks, they are considered “adjacent wetlands,” and are included within USACE jurisdiction (USACE 2001).

4.16.1 Wild and Scenic Rivers

Congress created the National Wild and Scenic Rivers System in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers within the United States that have outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. This Act safeguards the special character of the designated rivers, while also recognizing the potential for their appropriate use and development. The Act encourages river management that promotes public participation in developing goals for river protection.

Affected Environment

No national wild and scenic rivers exist within the vicinity of the proposed LRT alignment.

Impacts to Wild and Scenic Rivers

No Build Alternative

No adverse impacts to wild and scenic rivers would be associated with the No Build Alternative.

LRT Alternative

No adverse impacts to wild and scenic rivers would be associated with the proposed action.

Mitigation Measures

Since no adverse impacts to wild and scenic Rivers would be anticipated, no mitigation measures would be required.

4.16.2 Streams, Wetlands, and Other Waters of the U.S.

Affected Environment

This section identifies streams and waters crossed by the proposed LRT alignment and summarizes the reconnaissance and analysis to determine if those streams are waters of the U.S. and if any wetlands are associated with them.

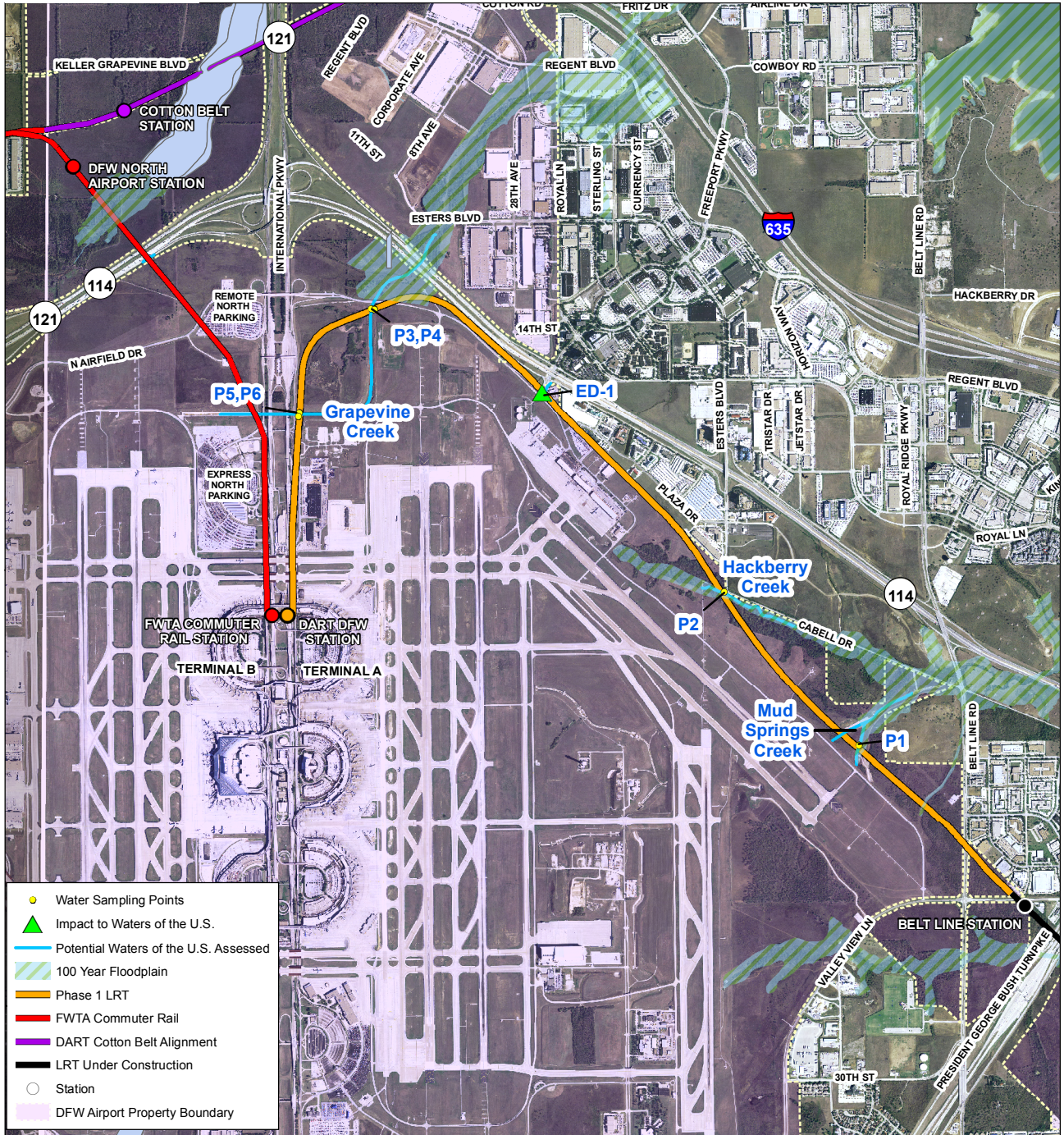
The following documents were reviewed to assist in evaluating the jurisdictional waters and wetlands along the proposed LRT alignment: USFWS National Wetland Inventory (NWI) Map for Carrollton and Grapevine, Texas; United States Geological Service (USGS) 7.5-Minute Topographic Map for Carrollton and Grapevine, Texas; the United States Department of Agriculture (USDA) Soil Survey of Dallas and Tarrant counties; and the Hydric Soils List for Texas produced by the National Resources Conversation Service (NRCS). In addition, a field reconnaissance was conducted on August 11 and August 12, 2009 by a biologist to assess the presence of jurisdictional waters and wetlands within the limits of the proposed LRT alignment.

According to information provided by the EPA and the USACE, wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987). According to information provided in this manual, “those areas” must meet three criteria in order for them to be classified as a wetland – hydrology, hydrophytic vegetation, and hydric soil, as provided in the USACE *Wetland Delineation Manual* (USACE 1987).

As identified in figure 4-15, four potentially jurisdictional waters of the U.S. were identified during field reconnaissance. Out of the four waters of the U.S. identified, one is classified as a potential wetland (this wetland would be crossed in two locations at Grapevine Creek along the proposed LRT alignment). A summary of the information collected and determinations made for each potentially jurisdictional water are found in table 4-27. Detailed descriptions and photographs are included in Appendix G. The length and area of these waters of the U.S. falling near the proposed LRT alignment are presented in table 4-27.

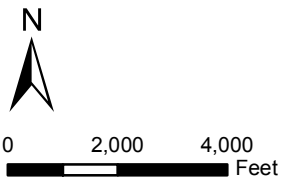
Mud Springs Creek

In between Stations 538+00 and 545+00, two segments of Mud Springs Creek exist. The southern segment is just north of Civil Station 538+00 and the northern segment, located just south of 545+00, is removed from further discussion since the proposed LRT alignment crosses entirely over land at this location (northern segment runs underground where it crosses the proposed LRT alignment). The proposed LRT alignment would cross over Mud Springs Creek, which is mapped as an intermittent creek on the USGS Carrollton, Texas 7.5-Minute Topographic Map (USGS, 1959a). This drainage area appears to have been man-made based on the linearity of this segment. Mud Springs Creek was full of herbaceous vegetation and several inches of relatively clear water as observed at the time of the August 11, 2009 site reconnaissance. The water was not flowing over a muddy substrate.



Source: NCTCOG 2008 and URS Field Survey 2009

FIGURE 4-15



WATER RESOURCES
 DART Irving-3 Environmental Assessment

Table 4-27. Streams and Water Crossings

| <i>Name</i> | <i>Location</i> | <i>Condition during field reconnaissance</i> | <i>Wetland Present</i> | <i>Water of the U.S.</i> |
|--------------------------------------|--|--|------------------------|--------------------------|
| Mud Springs Creek – southern segment | Civil Station 538+00 | Stream segment is channelized, contained herbaceous vegetation and several inches of water | no | Yes |
| Mud Springs Creek – northern segment | Civil Station 545+00 | Segment is contained in underground pipe | n/a | n/a |
| Hackberry Creek | Civil Station 585+00 | Natural stream, shale substrate with water and aquatic life | No | Yes |
| Ephemeral Drainage 1 | between Civil Stations 643+00 and 645+00 | Concrete lined with water and vegetation | No | Yes |
| Grapevine Creek | Civil Station 692+00 | channelized, heavily vegetated with several inches of water | Yes | Yes |
| Grapevine Creek | Civil Station 723+00 | channelized, heavily vegetated with several inches of water | Yes | Yes |

Source: URS Corporation, 2009

Based on an assessment of Mud Springs Creek, the impacted area does not meet all three criteria to be designated as a wetland. However, an ordinary high water mark (OHWM) was observed along this intermittent creek. Therefore, this intermittent stream would appear to be waters of the U.S. as described in 33 CFR Part 328.3(a) and, therefore, under the jurisdiction of the USACE. The OHWM of this creek is approximately 20 feet wide (width of the cattails within the channel).

Hackberry Creek

The proposed LRT alignment crosses Hackberry Creek at Civil Station 585+00. According to information provided on the USGS Grapevine, Texas 7.5-Minute Topographic Map, this creek is designated as a perennial stream (USGS, 1959b). This stream appears to have not been modified. At the time of the site reconnaissance, Hackberry Creek was observed with a shale substrate and clear water that was not flowing. The shale was approximately four feet high from the base of the channel. Aquatic life, such as minnows and other small fish, was observed. The banks along this creek were very steep with an approximate slope of 40 percent. Bars or islands of soil were observed within the creek channel.

Based on an assessment of Hackberry Creek, the impacted area does not meet all three criteria to be designated as a wetland. However, an OHWM approximately 15 feet wide was observed within the banks of this perennial stream. Therefore, this stream would appear to be waters of the U.S. as described in 33 CFR Part 328.3(a) and, therefore, under the jurisdiction of the USACE.

Ephemeral Drainage 1

Ephemeral Drainage (ED-1), which is concrete-lined, appears to originate from a tributary of Grapevine Creek that is reported to exist approximately 0.5 miles downstream of this location (USGS, 1959b). This ephemeral drainage was not mapped on the USGS 7.5-Minute Grapevine Topographic Map and appears to contain water only during storm events. ED-1 runs north/south across the proposed LRT alignment just south of Freeport Parkway on the south side of SH 114 and is located between Civil Stations 643+00 and 645+00. Based on an assessment of this drainage, the impacted area does not meet all three criteria to be designated as a wetland. It appears that the estimated OHWM for ED-1 was 14 feet wide. Therefore, this drainage would appear to be waters of the U.S. as described in 33 CFR Part 328.3(a) and, therefore, under the jurisdiction of the USACE.

Grapevine Creek

The proposed LRT alignment crosses Grapevine Creek in two locations: Civil Station 692+00 and Civil Station 723+00.

According to information provided on the USGS Grapevine, Texas 7.5-Minute Topographic Map, the creek at Civil Station 692+00 is designated as a perennial stream and is located just northeast of SH 114. However, this stream has been channelized to flow a certain way through the airport (USGS, 1959b). At the time of the site reconnaissance, this portion of Grapevine Creek was heavily vegetated with several inches of water in the channel. The water was relatively clear with little to no turbidity. Based on an assessment of wetlands within the boundaries of the site, it appears that an approximately 57-foot wide palustrine emergent (PEM) wetland exists within the limits of construction in the area near Civil Station 692+00.

The proposed crossing at Civil Station 723+00 is located immediately east of the International Parkway northbound service road. This perennial stream is a major drainage area and has been channelized to minimize impacts to airport operations (USGS, 1959b). At the time of the site reconnaissance, this portion of Grapevine Creek was heavily vegetated with several inches of water in the channel. The water was relatively clear with little to no turbidity. Based on an assessment of wetlands within the boundaries of the site, it appears that an approximately 40-foot wide PEM wetland exists within the limits of construction near Civil Station 723+00. This width also appears to be the width of the OHWM within this portion of the creek.

Impacts to Streams, Wetlands & Other Waters of the U.S.

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario, therefore no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

The proposed project would have minimal impact on waters of the U.S. 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 (see table 4-28).

Within the proposed LRT alignment, there are four bodies of water that could be considered potentially jurisdictional waters of the U.S., while only one out of the four waters of the U.S. would potentially include wetlands. Based on the 10 percent design plans, the proposed alignment would span all water resources except for ED-1. At this location, approximately 2,632 square feet of waters of the U.S. (0.06 acres) would be impacted due to the placement of support columns within this water (columns would be located at Civil Stations 643+00, 644+00 and 645+00 as

shown in figure 4-16). This area is an ephemeral drainage area and not a wetland. Due to the small area of the impact (less than one half of an acre), construction activities can proceed following the guidelines of NWP 14 for Linear Transportation Projects.

Indirect impacts could occur via surface water runoff, which may transport sediment into these water bodies. During construction activities, potential erosion from soil disturbance would be reduced by the implementation of a baseline SW3P shall be prepared in accordance with the most current Construction Storm water regulations (NPDES or TPDES) and reflect the General Construction Storm Water Permit Checklist, published by EPA. All construction and related activities shall comply with the requirements of NPDES or TPDES. All temporary and permanent erosion controls shall comply with the latest revision of Storm Water Quality Best Management Practices Manual for Construction, prepared by the North Central Texas Council of Governments (7-77). These construction and mitigation measures would minimize and/or alleviate any potential negative effects resulting from erosion and subsequent sedimentation.

Table 4-28. Impacts to Potential Jurisdictional Waters of the U.S.

| <i>Project Area / ID</i> | <i>Classification¹</i> | <i>Crossing Type</i> | <i>Civil Station No.</i> | <i>Crossing Width (ft.)</i> | <i>Impacts (sq. ft.)</i> |
|---------------------------------------|-----------------------------------|----------------------|--------------------------|-----------------------------|--------------------------|
| Mud Springs Creek | NA | B | 538+00 to 540+00 | 20 | NA |
| Hackberry Creek | NA | B | 585+00 | 15 | NA |
| Ephemeral Drainage ¹ | NA | B* | 643+00 to 645+00 | 14 | 2,632 |
| Grapevine Creek (2 wetland locations) | R4SBCx | B | 692+00 and 723+00 | 97 | NA |

Source: URS Corporation, 2010.

¹ Based on the USFWS classification (Cowardin et al. 1979) as modified for National Wetland Inventory Mapping Convention, table 3-30.

NA = Not Applicable.

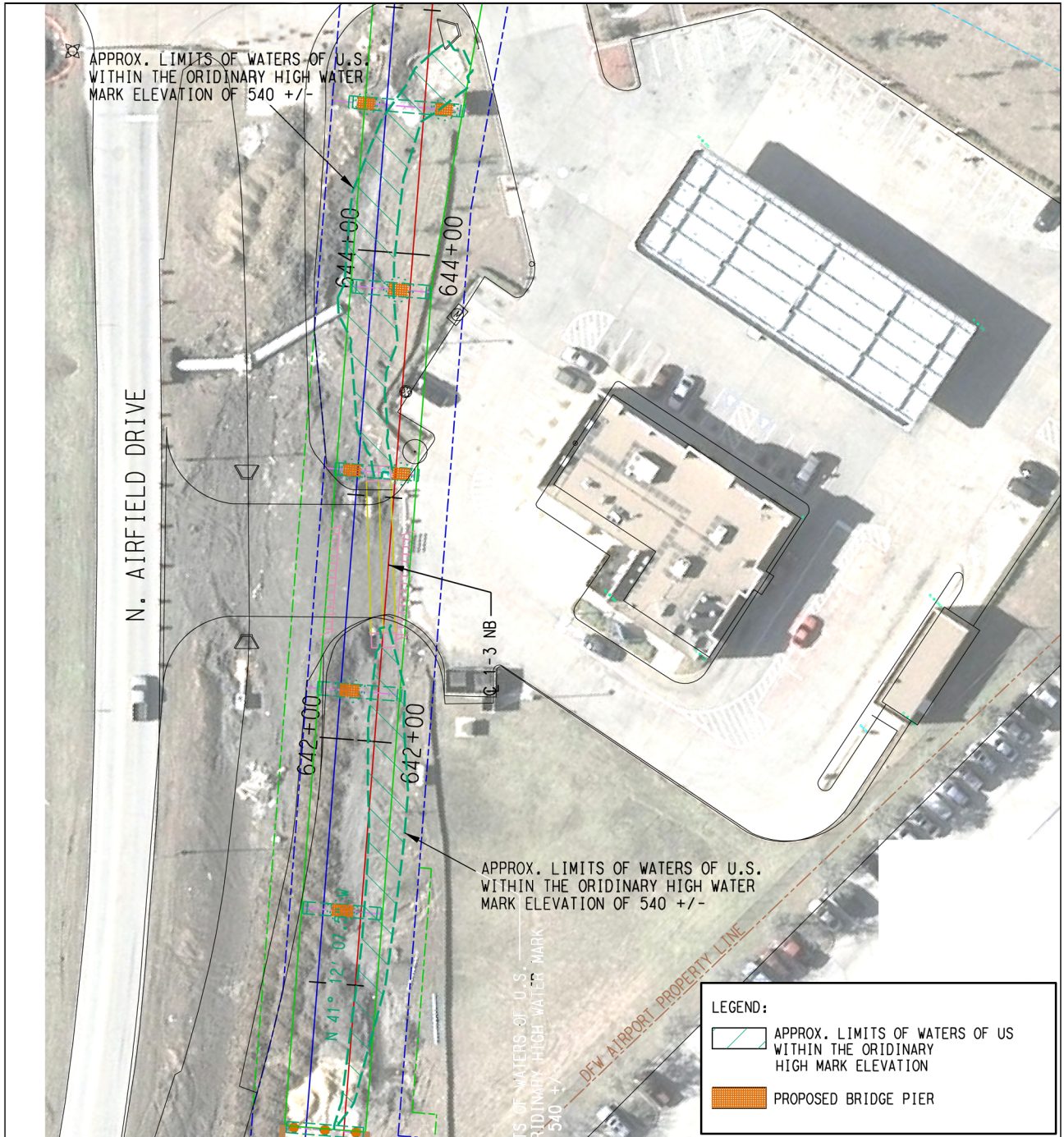
B = Bridge without columns in crossing (clear span); B * = Bridge crossing with columns placed in the crossing.

C = Existing culvert to be crossed, no impacts; C * = Culvert.

Mitigation Measures

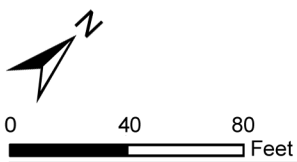
As outlined in Federal regulations, water impacts must be avoided, minimized, or mitigated. While the proposed alignment evaluated in this document is considered to be the alignment that would best satisfy the need for and purpose of transportation improvements in the corridor, it would nonetheless impact waters of the United States. Under the No-Build Alternative, water impacts would be avoided. However, it is not considered to be a feasible and prudent alternative because it does not meet the purpose and need established for the project

As discussed in section 2.2, several alternative LRT concepts linking the Belt Line Station to the CTA were considered. As each of these alternatives share a common segment, they would not avoid the 0.06 acre impact to ED-1. Working with DFW Airport, DART has identified a very limited corridor that allows for implementation of LRT on DFW Airport property that minimizes environmental impacts and does not impact airport operations.



Source: URS Corporation, 2009.

FIGURE 4-16



WATER IMPACT
 DART Irving-3 Environmental Assessment

The configuration of the alignment extending northwest from the Belt Line Station before turning south to Terminal A, has been influenced by many factors and is severely constrained. These factors include topography, availability of land, existing and future development, roadway infrastructure, airport infrastructure, airport operations, aeronautical considerations, and light rail operational constraints.

As depicted in figure 4-15, the identified alignment represents the only unencumbered linear route to Terminal A. The alignment in the vicinity of ED-1 is the extremely constrained as future taxiway extensions and SH 114 provide a very narrow corridor that will be occupied by LRT, Airfield Drive, a Chesapeake pipeline and various utilities. Taking into consideration cost, existing technology, and logistics in light of overall project purposes; any alternative providing rail service to the CTA would not be practicable. Alternatives attempting to avoid the ED-1 crossing by shifting the alignment would impact airport infrastructure, TxDOT infrastructure, or airport navigation. Additionally, no practicable, linear corridor alternative off of airport property could be reasonably obtained or utilized in order to fulfill the basic purpose of the proposed action. Any avoidance alternative would be costly and would likely result in greater environmental impacts, including impact to other waters.

The project planning and development process has sought to utilize every available feasible design technique to minimize or eliminate impacts to waters of the U.S. However, at ED-1, an impact to this water of the U.S. is unavoidable. DART has incorporated design features to reduce or minimize impacts to waters of the U.S. These include minimizing the number of piers/columns to the greatest extent possible and locating the piers/columns such that they do not conflict with waters of the U.S. or wetlands.

The impact to ED-1 should be reassessed and quantified with the development of engineering details during final design. DFW Airport has the jurisdictional responsibility for construction on airport property.

Coordination with USACE is an extensive and ongoing process that will continue through final design and construction. On August 14, 2009, DART initiated USACE coordination with a letter addressed to Mr. Wayne Lea, notifying him of DART's intention to construct the project and the types of activities expected during construction. This initial contact resulted in the project being assigned USACE permit number 2009-00339. The USACE was also invited to participate in the October 19, 2009 Interagency Scoping Meeting. As preliminary engineering advanced and the minimal extent of the impact to jurisdictional waters was understood, coordination continued with a series of phone conversations between DART representatives and the USACE. These conversations with Mr. Wayne Lea and Mr. Fred Land took place on March 10, 2010 and May 11, 2010, respectively. These discussions indicated the project would be able to proceed under NWP 14 for Linear Transportation Projects. In a letter dated May 19, 2010, DART provided the USACE a written description of the proposed action, its impacts and a delineation of impacted waters of the U.S. In a letter dated July 12, 2010, the USACE provided written confirmation that the proposed action appears to qualify for NWP 14. Records of these communications can be found in Appendix E.

As stipulated in the July 12, 2010 USACE letter, DART will comply with all the terms and conditions of NWP 14. The nationwide permit is valid until March 18, 2012. Because the project impact falls below the 1/10th acre threshold, a pre-construction notification will not be required. Additionally, project impacts below the 1/10th acre threshold do not require compensatory mitigation. During final design, DART would continue to investigate reducing both the direct and indirect impacts to

waters of the U.S. Any changes developed during final design can be tracked and adjusted through DART's Mitigation Monitoring Program.

4.16.3 Floodplains

Affected Environment

Executive Order 11988 - Floodplain Management from 3 CFR 117 states that a federal funding or licensing agency must justify in writing any project that is proposed for placement in a floodplain. For projects that have the potential to be located in a floodplain, a statement indicating whether the action conforms to applicable state and local floodplain protection standards must be included. If the agency approves potential construction activities within the floodplain, then alternatives must be considered to avoid adverse effects and/or incompatible development in floodplains.

According to information provided by the Federal Emergency Management Agency (FEMA) and additional research, four areas of the proposed LRT alignment fall within Zone AE of the floodplain (FEMA 2001). Zone AE are areas that are inundated by 100-year flooding for which base flood elevations have been determined. The first area consists of a drainage ditch and unnamed tributary of Hackberry Creek located at Civil Station 520+00 on the south end of this proposed LRT alignment. This drainage area is not considered a water resource (see Section 4.11.1) since it is not an ephemeral drainage, stream, wetland, or other water of the U.S. The second area surrounds Mud Springs Creek (also a tributary to Hackberry Creek) on the south side of the proposed LRT alignment around Civil Station 539+00. The third area surrounds Hackberry Creek on the central portion of this phase in between Stations 585+00 to 586+00. The fourth area crosses the Grapevine Creek floodplain located between Stations 678+00 and 687+00 (the creek is not crossed in this area). Figure 4-15 depicts the floodplain areas along the proposed LRT alignment.

Impacts to Floodplains

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario, therefore no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

Current design proposes that all four floodplain crossings be spanned, limiting direct impacts to the floodplain to minor amounts of fill associated with retaining walls and structures associated with the proposed project. No relocation or alteration of any natural channel is proposed.

FEMA has regulations governing alterations or development within floodplains shown on Flood Insurance Rate Maps. 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. FAA guidance on federal actions also requires coordination with FEMA during the environmental process to address any anticipated impacts to floodplains.

FAA Order 1050.1E requires that any proposed action minimize potential harm to or within the base floodplain. Specifically, the project must not create a "significant encroachment" by causing one or more of the following impacts:

1. The action would have a high probability of loss of human life.

2. The action would likely have substantial, encroachment-associated costs or damage, including interrupting aircraft service, loss of a vital transportation facility (e.g., flooding of a runway or taxiway; important navigational aid out of service due to flooding, etc.).
3. The action would cause adverse impacts on natural or beneficial floodplain values.

The proposed project has avoided floodplains where possible. In the case of the four floodplain areas crossed on airport property, the design minimizes encroachment into these floodplains. Impacts would be limited to placement of support columns within the floodplain. Based on the preliminary 10 percent design plans, the floodplain with the crossing of the unnamed tributary of Hackberry Creek at Civil Station 520+00 would be approximately 45 feet long and would require the placement of no support columns within the floodplain. The crossing of the Mud Springs Creek (Civil Station 539+00) would be approximately 190 feet long and would require the placement of two support columns (approximately nine feet by five feet). The crossing of the Hackberry Creek (Civil Station 585+00) would be approximately 100 feet long and would require the placement of two support columns. The crossing of the Grapevine Creek floodplain where the creek is not present (Civil Stations 678+00 to 687+00) would be approximately 840 feet long and would require the placement of nine support columns. According to the most current information from FEMA, no other floodplains exist within the proposed LRT alignment.

Final design of the project will determine the final size, number, and placement of any columns. Hydrologic studies would be conducted to ensure that neither the 100-year base flood elevation nor floodwater velocity is increased. Final design plans will be submitted to the USACE for review and appropriate nationwide permit approvals. DFW Airport will be actively involved in the final design review process and would be responsible for issuance of construction permits on airport property. Based on this, the design would not have a high probability of loss of human life, would have no effect on any vital transportation facility and would not cause adverse impacts to the natural or beneficial values of the floodplain.

Executive Order (EO) 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. As part of the NEPA process, and in compliance with this EO, several alternatives for the proposed project were investigated. Based on an assessment of a variety of factors described in Section 2.2, the alignment presented in this EA was selected as the preferred Build Alternative. As directed by the EO, the following steps have been (or will be) taken during the EA preparation and review process:

- Impacts to floodplains that would result from the proposed action and No Build Alternatives have been identified and quantified and are presented in this EA.
- Measures have been proposed to minimize impacts to the floodplains (e.g. by bridging the floodplains).

These impacts, along with all the findings of the EA, have been presented to the public during a public meeting and will be presented at a public hearing for the proposed project. The EA has also been provided to regulatory agencies for their review and comment.

It should be noted that Grapevine Creek floodplain in the vicinity of the proposed LRT alternative is not a regulatory FEMA floodplain. Hydraulic modeling was conducted for the project and the results of that modeling were used to minimize any impacts to flood water storage in the vicinity of the project. Further consideration of the modeling results would be made during final design.

Mitigation Measures

The proposed project would be designed to be above any 100-year floodplain that the alignment would cross. Impacts to floodplains would be limited to support columns located in the flood zone or minor amounts of fill associated with retaining walls and other bridge structures. Mitigation measures would be developed through consultation with the USACE and may include channel improvements or design modifications to ensure that neither the 100-year base flood elevation nor floodwater velocity is increased. Consultation with the USACE will continue through final design to establish actions required in this proposed undertaking.

4.16.4 Water Quality

Affected Environment

Section 303(d)(1) of the Clean Water Act (CWA) directs the State of Texas to identify waters within its jurisdiction for which effluent limitations are not rigorous enough to implement any applicable water quality standard and to establish a priority ranking for the applicable waters, taking into account the severity of the pollution and the uses to be made of the applicable waters. In general, the quality status of Texas' natural waters based on historical data and identified water bodies that are not meeting standards set for their use are provided on the 303(d) List of Impaired Water Bodies for the State of Texas. The section 303(d) listing requirement applies to waters impaired by point and/or non-point sources.

The proposed LRT alignment crosses three creeks – Grapevine Creek, Hackberry Creek, and Mud Springs Creek (a tributary of Hackberry Creek). At the time of the site reconnaissance on August 11 and 12, 2009, Mud Springs Creek, located at Civil Station 535+00 was heavily vegetated with a few inches of water. The water was clear, non-turbid and not flowing in Mud Springs Creek at the time of the site reconnaissance. A few inches of water was also observed in Hackberry Creek located at Civil Station 585+00. This water was also very clear, non-turbid and not flowing at the time of the site reconnaissance. This proposed LRT alignment crosses Grapevine Creek in two places. Approximately six inches of clear, non-turbid, algae-filled, non-flowing water was observed in Grapevine Creek during the site reconnaissance and this water was reported to be impaired.

According to information provided by the TCEQ, Grapevine Creek, located in between Civil Stations 692+00 and 723+00 qualifies as an impaired water body. This impaired water body consists of an approximately 5.5 mile stretch of Grapevine Creek from Coppell Road in Coppell, Dallas County to 1.5 miles upstream of SH 121 in Tarrant County. This creek was listed as impaired with bacteria beginning in 2006. A Total Maximum Daily Load study is currently underway for this impaired water body (TCEQ 2008). Hackberry Creek and Mud Springs Creek, which are both situated within the proposed LRT alignment, are not on the 303(d) list of impaired water bodies (TCEQ 2008).

Impacts to Water Quality

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario, therefore no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

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 addition of fill material and incidental/accidental spills of mechanical fluids. As directed by the DART Design Standards, a

baseline SW3P shall be prepared in accordance with the most current Construction Storm water regulations (NPDES or TPDES) and reflect the General Construction Storm Water Permit Checklist, published by EPA. All construction and related activities shall comply with the requirements of NPDES or TPDES. All temporary and permanent erosion controls shall comply with the latest revision of Storm Water Quality Best Management Practices Manual for Construction, prepared by the North Central Texas Council of Governments (7-77). These measures for erosion control, sedimentation control, and control of total suspended solids would be incorporated into the project design, in order to minimize impacts to water quality.

Operation of the LRT on the proposed LRT alignment would result in minimal impacts to surface water quality. Potential impacts to water quality could result from the impervious surfaces. These surfaces would include bridges, TPSS sites, and one station platform. There is no station parking proposed that could result in run-off containing petroleum hydrocarbons associated with automobiles.

The amount of non-point source contaminants that automobiles contribute to the surface water in the project area should be reduced, since implementation of the proposed project would reduce the number of automobiles on area roadways. Water quality and runoff during construction is discussed in more detail in section 5.1.

Potential impacts to groundwater resources would be minor. The water table is very low in the project area. Construction of the proposed LRT alignment would not likely 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 of these aquifers outcrop west of Dallas County. Construction of below-grade sections of the alignment would not be expected to contact groundwater resources.

Mitigation Measures

Throughout the final design and construction phases of the project, coordination with the USACE would continue to allow the USACE to evaluate potential channel impacts and mitigation options. Additionally, DART would be required to obtain the necessary permits to proceed with construction. The issuance of storm water discharge permits under the TPDES is administered by the TCEQ. Under TPDES' General Permits for Storm Water Discharges from Construction Activities, the TCEQ requires the development and implementation of a SW3P. The plan is designed to reduce pollution at the source before it can bring about environmental problems. A SW3P would be prepared by DART prior to final design submittal. Also, construction activities on DFW Airport property would also require an erosion control plan that adheres to DFW Airport policies.

Consultation with the USACE began as part of this EA and is detailed in Section 4.16.2, Mitigation Measures. Because the project is expected to be constructed under NWP 14, final design and construction activities for the project would fulfill all requirements, general conditions, and specific conditions as specified by 33 CFR Part 330 as amended in order to meet the requirements for Section 401 Water Quality Certification from TCEQ, which is also required by the CWA. For use of NWP 14, these requirements include .soil stabilization to prevent the introduction of sediment to adjacent wetlands or water bodies, isolating the project area from other wetlands and water bodies, and controlling total suspended solids. Coordination with the USACE would continue as design progresses, in order to establish actions required in final design. During final design, DART would continue to investigate reducing both the direct and indirect impacts to waters of the U.S. Any changes developed during final design can be tracked and adjusted through DART's Mitigation Monitoring Program.

4.17 Air Quality

This section provides an overview of the airborne pollutants of interest, standards and regulatory setting, existing air quality and NAAQS compliance, regional attainment and conformity status, and the air quality impact criteria for determining the potential impacts of the proposed project.

Affected Environment

Air Quality Standards and Regulatory Setting

The Federal Clean Air Act Amendments of 1990 (CAAA), regulated by the U.S. EPA, sets NAAQS that identify pollutant concentrations that are not to be exceeded over specified time periods. In some cases, more stringent secondary standards have been established to protect the public welfare from the adverse effects of air pollutants. Compliance is required for both primary and secondary standards.

Ambient air quality is a function of many factors, including climate, topography, meteorological conditions, and the production of airborne pollutants by natural or artificial sources. Major airborne pollutants of interest (see table 4-29) near the proposed LRT alignment include the following:

- Carbon Monoxide – Carbon monoxide (CO) is an odorless, colorless gas formed by the burning of fuels containing carbon. Motor vehicles are the principal source of CO emissions in urban areas. Maximum concentrations usually occur near intersections and other areas of traffic congestion and decrease rapidly with distance from the source.
- Particulate Matter – Particulate matter enters the air from industrial operations, vehicular traffic, and other sources, including fireplaces. Most of the particulate matter generated by motor vehicles consists of resuspended road dust. Measurements of particulate matter concentrations include total suspended particulates, PM10 (particles with a diameter less than or equal to 10 micrometers), and PM2.5 (particles with a diameter less than or equal to 2.5 micrometers).
- Ozone – Ozone (O₃) in the lower atmosphere is a harmful air pollutant and contributes to the formation of smog. It is a secondary pollutant formed by the reaction of volatile organic compounds and oxides of nitrogen in the presence of strong sunlight. Thus, ozone levels are reduced by minimizing emissions of those precursor pollutants.
- Volatile Organic Compounds – Volatile organic compounds are a key component in the formation of ozone. These hydrocarbons are emitted or evaporate into the atmosphere from a variety of sources, particularly the storage and combustion of fuels in motor vehicles.
- Oxides of Nitrogen – Oxides of nitrogen (NO_x) are another precursor to the formation of ozone. They are produced as the result of high-temperature fuel combustion and subsequent atmospheric reactions. Major sources of NO_x include diesel engines, power plants, refineries, and other industrial operations.

| Table 4-29. National Ambient Air Quality Standards | | | | |
|--|-----------------------------|------------------------------------|------------------------------------|--|
| Criteria Pollutant | Averaging Times | Primary Standard | Secondary Standard | Threshold for Standard |
| Carbon Monoxide (CO) | 8-hour | 9 ppm (10 mg/m ³) | None | Not to be exceeded more than once a year |
| | 1-hour | 35 ppm (40 mg/m ³) | None | Not to be exceeded more than once a year |
| Nitrogen Dioxide (NO ₂) | Annual (Arithmetic Mean) | 0.053 ppm (150 µg/m ³) | Same as Primary | N/A |
| Ozone (O ₃) | 1-hour Average | 0.12 ppm | Same as Primary | Areas not attaining the 1-hour standard by the end of 1997 must attain that standard before demonstrating attainment with the 8-hour standard. |
| | 8-hour Average | 0.08 ppm | Same as Primary | 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. |
| Lead (Pb) | Quarterly (Arithmetic Mean) | 1.5 µg/m ³ | Same as Primary | N/A |
| Particulate <10 micrometers (PM ₁₀) | Annual (Arithmetic Mean) | 50 µg/m ³ | Same as Primary | 3-year average of the weighted annual mean PM ₁₀ concentration at each monitor within an area must not exceed 50 µg/m ³ |
| | 24-hour Average | 150 µg/m ³ | | 3-year average of the annual 98th percentile values not to be exceeded more than once a year |
| Particulate <2.5 micrometers (PM _{2.5}) | Annual (Arithmetic Mean) | 15 µg/m ³ | Same as Primary | 3-year average of the weighted annual mean PM _{2.5} concentrations from single or multiple community-oriented monitor within an area must not exceed 65 µg/m ³ |
| | 24-hour Average | 65 µg/m ³ | None | N/A |
| Sulfur Dioxide (SO ₂) | Annual (Arithmetic Mean) | 0.03 ppm | None | N/A |
| | 24-hour Average | 0.14 ppm | None | Not to be exceeded more than once a year |
| | 3-hour Average | N/A | 0.50 ppm (1300 µg/m ³) | N/A |

Source: <http://www.epa.gov/air/criteria.html>, accessed September 2009.

Attainment Status

The EPA designates geographic areas in a state with respect to meeting the NAAQS as attainment, nonattainment, or unclassifiable. Areas transitioning from nonattainment to attainment are

termed maintenance areas. The nonattainment areas are designated based on the degree of violation of the NAAQS. For ozone, the designations are extreme, severe, moderate, or marginal.

On June 15, 2004, EPA designated several counties in the North Central Texas area as nonattainment under the new 8-Hour NAAQS for ozone as mandated by Section 181(b)(2)(A) of the CAAA. The newly designated nine-county ozone nonattainment area for North Central Texas covers all of Collin, Dallas, Denton, and Rockwall counties and portions of Ellis, Johnson, Kaufman, and Parker counties. Based on the magnitude of ozone pollution in these nine counties, the nonattainment area was classified as "Moderate." The DFW Airport Extension lies entirely within the designated nonattainment area.

On October 16, 2008, the EPA published final notice in the Federal Register, that the DFW one-hour ozone nonattainment area was currently attaining the one-hour ozone NAAQS. This determination was based upon certified ambient air monitoring data that show the area has monitored attainment of the one-hour ozone NAAQS for the 2004-2006 monitoring period.

Similarly, the DFW nonattainment area is currently classified as moderate nonattainment for the 1997 8-hour ozone standard, with an attainment date of June 15, 2010. In response, the TCEQ submitted an eight-hour ozone attainment plan to achieve these reductions by June 15, 2007. The DFW Eight-Hour Ozone Attainment Demonstration and DFW Reasonable Further Progress SIP revisions were adopted on May 23, 2007 and submitted to the EPA in June 2007. On January 14, 2009, the EPA published a final rule, effective February 13, 2009 conditionally approving the DFW 1997 Eight-Hour Ozone Attainment Demonstration. As of this date, all control measures and reductions relied upon to demonstrate attainment have been reviewed and approved by the EPA.

Conformity

Transportation projects in nonattainment areas are coordinated with the SIP under what is called conformity process. On July 1, 2004 the EPA published 40 Code of Federal Register Part 93 Transportation Conformity Rule Amendments for the new 8-Hour Ozone and PM2.5 NAAQS and Miscellaneous Revisions for Existing Areas in the Federal Register. Adoption of Section 176 (1)(A) of the CAAA 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*
- (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 Long Range Transportation Plan.

Impacts to Air Quality

This section provides an assessment of air quality impacts. The analysis, which is consistent with the *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects* (DART 2009) and the TxDOT Environmental Manual (TxDOT 2004), includes the following components:

- Regional Emissions Assessment
- Microscale Carbon Monoxide Analysis

- Conformity
- Construction Impacts Assessment

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative; however, this scenario does not help to reduce the regional emission burdens nor does it help in achieving the regional attainment goals.

LRT Alternative

Regional Emissions Assessment

Air quality impacts from transportation projects generally focus on changes in motor vehicle-related pollution. The introduction of a transit system into a region can reduce the reliance on automobile use because it replaces automobile trips with transit trips, in turn, reducing emission burdens. Current ridership on DART buses serving DFW Airport is less than 100 riders per day. By the year 2030, LRT ridership at the airport is projected to be 7,300 riders per day.

The proposed project includes only one additional station at the end of the line. No additional bus service is proposed and some planned and existing service would be replaced by LRT. The Airport Terminal Link Shuttle Bus System would continue to circulate through the CTA, but no expansion of service is anticipated. A portion of the current Route 319, serving DFW Airport would be eliminated. With the Orange Line extension, a planned shuttle that would operate from the temporary Orange Line terminus at Belt Line Station to the CTA would no longer be required. While the LRT operations would require a minimal amount of energy generation, the proposed project would result in a net benefit to regional air quality.

Microscale Carbon Monoxide Analysis

According to the TxDOT Environmental Manual, 2004, projects adding capacity, resulting in travel lanes being closer to the ROW line, or having a design year average daily traffic of 20,000 or more, require an air quality analysis.

The proposed project includes one station that would not provide parking, drop-off areas, or new bus service. Therefore, the DFW Airport LRT Station would not generate bus or automobile traffic.

Traffic impacts (see section 4.9 Traffic Flow) resulting from the project that would have the potential to result in air quality impacts include at-grade crossings at Plaza Drive (M.P. 220+00) and Crossunder #2. At Plaza Drive, the at-grade crossing at this location would stop north and southbound traffic for approximately 30 seconds every 10 minutes. As the roadway currently operates at an acceptable level of service, impacts to traffic are expected to be negligible. Furthermore, the impact to air quality would be negligible. An at-grade crossing at Crossunder #2 would include minimal delay to eastbound vehicles traveling on this roadway while waiting at the crossing for an LRV to pass. The northbound service road of International Parkway would also be potentially impacted due to cars queuing in the left lane of this roadway when the crossing gates are closed on Crossunder #2. Estimated wait time for each LRV crossing would be 30 seconds at this location. The minimal traffic delay would result in a minimal impact to air quality.

Two other at-grade crossings are planned (see table 4-17), but each of these are restricted access roads used only by authorized personnel. Traffic delays would not be expected at these crossings; therefore, no impacts to air quality would be anticipated.

Following the TxDOT guidelines above, an air quality analysis is not required for this project.

Transportation Conformity

The proposed project is in a moderate ozone nonattainment area. Under the requirements of the CAAA, the impact of certain transportation projects on air quality must be studied to determine if they conform to the purpose of the SIP, which is the attainment of the NAAQS. The transportation conformity regulation, "Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded, Developed or Approved Under Title 23 U.S.C or the Federal Transit Act" (40 CFR Parts 51 and 93), was used for conformity determinations.

Based on the results of the analysis, the project would not cause or contribute to any new localized air quality violations or increase the frequency or severity of existing violations in the nine-county ozone nonattainment area. Therefore, the proposed action conforms to the goals set forth in the CAAA and is in conformity with the SIP.

This project is an extension of the larger Northwest Corridor LRT Line to Irving and DFW Airport that has been included in the previous 2006-2008 TIP and the current TIP conformity analysis. The project is consistent with the policies and purpose of the conforming transportation plan and would not interfere with other projects in the transportation plan. The 2008–2011 TIP and the 2030 Metropolitan Transportation Plan for the DFW Area were found to conform by the NCTCOG on April 2009 and by the U.S. Department of Transportation in July 2009.

Mitigation Measures

Since no adverse impacts to air quality would be anticipated, no mitigation measures would be required.

4.18 Physiography, Geology, and Soils

Information concerning a proposed project area's physiographical setting, including its topographical, geological, and hydrological features, can be useful to project engineers and architects planning safe and cost-effective construction practices and structurally stable and durable facilities. Also, an understanding of the area's physiological setting aids environmental professionals and project planners in their understanding of the environmental pathways by which potential hazardous materials contamination, if any exists may migrate onto, under, or away from the proposed project.

4.18.1 Physiography and Geology

Various sources were consulted in order to establish the physiographical setting of the project area. Documents reviewed include physiographic maps, geologic atlases, topographic contour maps, tectonic maps, aquifer maps, surface water atlases, river basin maps, land-resource, agricultural region and soil maps, and related surveys and readings. From these documents, the project area's topographical, geological, and hydrological features were determined; the specific soils that underlie the route of the proposed LRT alignment were identified; and the characteristics of those soils, including their potentials and limiting features, were evaluated and documented. Field reconnaissance was conducted in August and October 2009 to verify general surface topography and hydrological features throughout the proposed project area.

Affected Environment

Regional Physiographical and Geological Setting

Traversing the county line between Dallas and Tarrant counties in North Central Texas, the project area lies within the physiographic region identified according to the University of Texas Online Library Physiographic Map of Texas as the Texas Blackland Prairies Level III EcoRegion, which is a sub-province of the Gulf Coastal Plains. The Blackland Prairies are geologically underlain by beds of chalk and marls tilting south and east to create a low rolling terrain with topographic elevations that range from 450 feet to 1000 feet above mean sea level (AMSL). The proposed LRT alignment more specifically lies within the Grapevine and Carrollton quadrangles of the USGS, and a topographic contours map of the proposed LRT alignment confirms a terrain that is gently sloping to gently undulating, with a general northeastern/eastern gradient.

The geological beds that underlie the project area consist predominantly of a rock stratigraphic unit associated with the Eagle Ford formation, which arose during the late Cretaceous period (145.5 to 65.5 million years ago) within the Mesozoic era (University of Texas 1987). The Eagle Ford formation is comprised of soft shale, with some sandstone and limestone, and consists mainly of a dark, blue-gray marine shale (fissile clay) with a thickness ranging between 200 feet to 475 feet. This marine shale weathers to an unstable, highly plastic clay that is very susceptible to slumping and sliding.

The region is also underlain by the Barnett Shale, which is an older geological formation beneath the cities of Dallas and Fort Worth (TCEQ 2009). The Barnett Shale is comprised of sedimentary rocks of the Mississippian epoch (359.2–318.1 million years ago), Carboniferous period and Paleozoic era.

According to the Texas Seismic Hazard Map and Tectonic Map of Texas, the project area lies within the Fort Worth Basin of the Ouachita Tectonic Front, which is not a seismically-active area of the United States. According to the website of the University of Texas' Institute of Geophysics, "The region is at risk from very large, distant earthquakes which might occur in Missouri-Tennessee, or Oklahoma; [however,] the earthquakes that pose such a hazard are rare, probably occurring only once per 500 years or less." The website also discusses major earthquakes that last emanated from those areas in 1811-12 and 1882.

Localized Physiographical and Geological Features

The proposed LRT alignment lies over the Eagle Ford and Barnett Shale geological formations, with Alluvium and Quaternary deposits along the stream channels of Hackberry Creek and Mud Springs Creek. These stream channels are associated with Alluvium and Quaternary deposits that arose more recently during the Holocene epoch (between 11,400 years ago and today) during the late Quaternary period of the Cenozoic era (University of Texas 1987).

The topographic elevations across the proposed 5.17-mile LRT alignment range from approximately 587 feet AMSL at its western terminus, to approximately 508 feet AMSL at its eastern terminus. The topographic gradient generally slopes from the west to the northeast and east.

The proposed LRT alignment lies with the Trinity (subcrop) major aquifer (University of Texas 2006) and Woodbine minor aquifer (University of Texas 1990). Most of the area's drinking water, however, is procured from surface water reservoirs.

With regional rainfall averaging 30 to 40 inches per year, stormwater in the proposed LRT alignment drains within the Trinity River Basin watershed, flowing into Grapevine Creek,

Hackberry Creek and Mud Springs Creek, which cross the proposed alignment in multiple locations (University of Texas 2004). These waters proceed to flow northeasterly, converging with the southeastern flowing West Elm Fork Trinity River before it joins the Trinity River on its journey to the Gulf of Mexico.

Groundwater flow typically follows surficial topography, as well, and likely flows toward and along each of the aforementioned water ways. Additional information concerning the proposed LRT alignment's water resources is presented in section 4.12.

Physiographical and Geological Features Impacts

No Build Alternative

Under the No Build Alternative, the existing physiographical resources, including topographical, geological and hydrological features, would not be disturbed, and there would be no impact upon these resources.

LRT Alternative

The proposed activities are not anticipated to substantially impact the topographical features. Minor cut and fill would be required to maintain transition of the vertical alignment. No impacts to geological formations along the proposed LRT alignment would occur. Hydrological features are discussed in section 4.12.

Proposed Mitigation

No mitigation for any topographical or geologic impacts would be required.

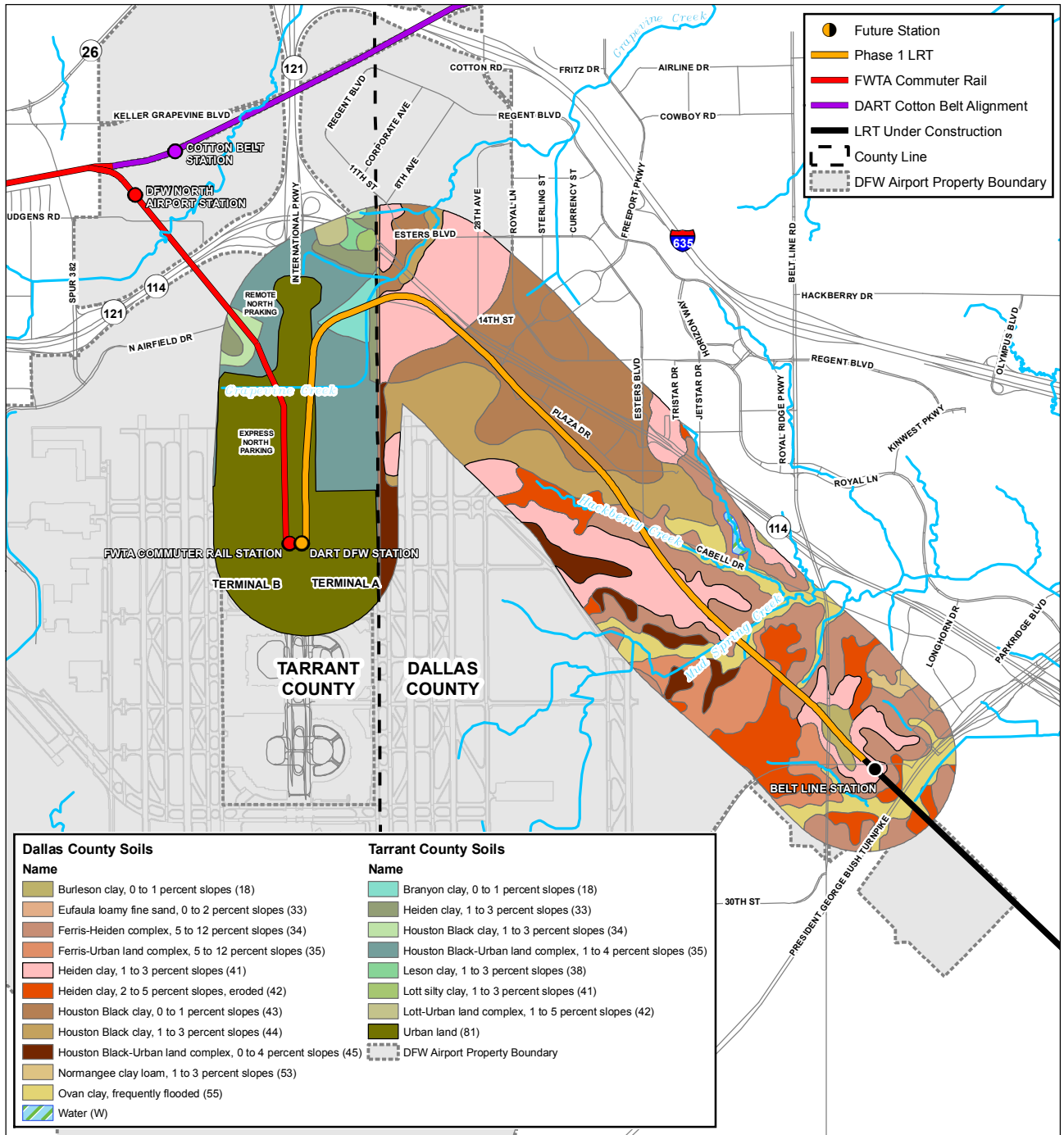
4.18.2 Soils

Affected Environment

According to the NRCS National Cooperative Soil Survey, there are ten mapped soil units that directly underlie the route of the proposed LRT alignment (NCTCOG 2008; and NRCS 2009). These soils include:

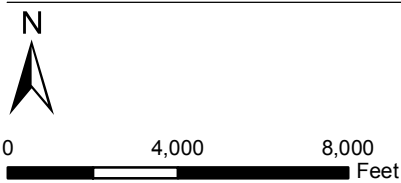
- Branyon clay, 0 to 1 percent slopes;
- Burleson clay, 0 to 1 percent slopes;
- Ferris-Heiden complex, 5 to 12 percent slopes;
- Ferris-Urban land complex, 5 to 12 percent slopes;
- Heiden clay, 1 to 3 percent slopes;
- Heiden clay, 2 to 5 percent slopes, eroded;
- Houston Black clay, 0 to 1 percent slopes;
- Houston Black clay, 1 to 3 percent slopes;
- Ovan clay, frequently flooded; and
- Urban land.

A detailed description of each soil type, including its setting, source and composition, as well as its soil characteristics, which are defined in part by its potential and limiting features, is presented in tabular format in Appendix F. The locations of these soils along the proposed alignment are mapped in figure 4-17.



Source: USDA NRCS 2007 and NCTCOG 2008

FIGURE 4-17



SOILS

DART Irving-3 Environmental Assessment

The majority of the proposed LRT alignment is underlain by clay soils associated with Blackland Prairies. The chinks and marls associated with the Texas Blackland Prairies weather to form deep, black, fertile clay soils (University of Texas 1996), predominantly of the Houston Black-Heiden-Wilson soil series (University of Texas – Bureau of Economic Geology 2008). The area is associated with a flat to low, hilly prairie comprised of expansive clay and mud that is locally silty and locally calcareous. The area’s stream channels, on the other hand, are associated with a flood-prone valley terrace, comprised of an alluvium of sand, mud, and sparse gravel (University of Texas – Bureau of Economic Geology 1999).

The Urban Land soil type, which is of variable composition from zero (0) to 40 inches, underlies the far western portion of the proposed alignment. The water table throughout the proposed LRT alignment is anticipated to lie more than 80 inches below surface. There is no zone of water saturation within the top 72 inches.

With the exception of the Urban land, which has not been directly characterized due to its variable composition, the majority of soils that underlie the proposed LRT alignment are moderately well to well drained. None of the soils that underlie the proposed LRT alignment are classified as hydric. With the exception of Ferris soils, which exhibit a densic bedrock restrictive feature within 40 to 60 inches of ground surface, the soils within the proposed LRT alignment typically exhibit more than 80 inches to any root restrictive feature. Water movement within the most restrictive layer of these soils is low.

Impacts to Soil Resources

A preliminary investigation of the project area’s soils was undertaken as part of the proposed project’s EA, with a threefold purpose: 1) to identify and document the underlying soils and geological features proximal to the proposed alignment, 2) to identify and evaluate any related concerns that could impact, or be impacted by, the proposed project’s implementation, and 3) to compare the potential impacts of implementing of the proposed LRT alignment versus its No Build Alternative.

No Build Alternative

Under the No Build Alternative, the proposed phased LRT alignments would not be constructed. Existing physiographical resources, including soils, would not be disturbed, and there would be no impact upon this resource.

LRT Alternative

Construction-related activities for the proposed LRT alignment would include excavation for the development of: LRT guideway (i.e., railbed preparation and track installation), retaining walls, support structures for aerial tracks, grade separations, culverts, and a cut-section.

Each of the soil types identified proximal to the proposed LRT alignment was evaluated to determine its potential of presenting a concern to the planning and implementation of the proposed project. Some of the soil properties considered in the evaluation included: drainage, stability (slope, shrink-swell potential, strength, and erosion potential), and corrosivity. These soil features and limitations were compared to the NRCS development categories: construction of local roads and streets and shallow excavations.

An inventory of the soils identified throughout the proposed LRT alignment, determined that the Urban Land soil type underlies approximately 15 percent of the proposed project area. This soil is confined to the far western portion of the proposed LRT alignment and has not been characteristically rated by the NRCS for its potential or limiting features, due to its variable

composition. However, the remaining soils that underlie the proposed LRT alignment are comprised predominantly of clay soil types. Clay soils resist wind and water erosion better than silty and sandy soils, because the particles are more tightly joined to each other.

When undisturbed, clay-based soils are also generally more effective than most other soil types at restricting the migration of subsurface environmental contamination. Once the soils are disturbed, however, environmental contamination, if it exists, may become exposed and/or migrational pathways may be opened or facilitated. Personnel safety during exposure and/or the proper disposal of contaminated soils could also present an issue.

The majority of soils underlying the proposed LRT alignment have been classified by the NRCS as very limited for the construction of local roads and streets and as very limited for shallow excavations. The “very limited” designation indicates that the soil has, “one or more features that are unfavorable for the specified use,” which “generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected (NRCS 2009).” The clay soils are of low strength as based upon their American Association of State Highway and Transportation Officials (AASHTO) group number index, and have a high shrink-swell potential; both features that adversely affect the soils’ traffic-supporting capacity. According to the NRCS, during any excavation/trenching activities along the proposed alignment, there is a high risk of cutbanks caving-in. Other limiting features for the majority of soils along the alignment include a high risk of corrosion to uncoated steel. The Burleson clay, with zero to one percent slopes, also exhibits a moderate risk of corrosion to concrete. And, as its name suggests, the Ovan clay, frequently flooded, soil type exhibits a high risk of flooding. The Ferris soils, on the other hand, are only somewhat limited by their five to 12 percent slope.

Soil Mitigation

Concerns associated with short-term increased soil erosion potential would be reduced through the establishment and implementation of a baseline SW3P prepared in accordance with the most current construction storm water regulations (NPDES or TPDES) and reflect the General Construction Storm Water Permit Checklist, published by EPA. All construction and related activities shall comply with the requirements of NPDES or TPDES. All temporary and permanent erosion controls shall comply with the latest revision of Storm Water Quality Best Management Practices Manual for Construction, prepared by the North Central Texas Council of Governments (7-77). These measures for erosion control, sedimentation control and control of total suspended solids would be incorporated into the project design in order to minimize impacts to water quality during and following construction. Requirements of the SW3P may actions such as the maintenance of existing protective vegetative cover for as long as possible in areas where construction has not yet started and the installation of vegetative seeding to generate protective cover in both inactive and completed construction zones as quickly as possible following the land disturbance, the use of silt fences, mulch blankets, diversion ditches, or rock dams and related measures to prevent wind and water erosion.

Advance hazardous materials evaluation helps to identify and plan for the mitigation of concerns associated with the potential presence of environmental contamination in soils. A preliminary hazardous materials evaluation conducted in association with this EA has been detailed in section 4.20 of this report.

Most soils associated with the proposed LRT alignment are very limited for the construction of local roads and streets and for shallow excavations. Major soil reclamation, special design, and expensive installation procedures, followed by high maintenance, may be required to mitigate

these concerns. A professional geotechnical survey is recommended in order to more precisely identify the potential risks to the proposed project and to determine the most appropriate engineering techniques and maintenance practices to be implemented for their mitigation.

4.18.3 Prime, Unique, or Other Farmland

Title 7 from the U.S.C., Chapter 73, Section 4201 of the Farmland Protection Policy Act (FPPA) was enacted by Congress in order to minimize the “extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.”

As part of this law, farmland is defined as prime, unique, or farmland other than these two. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed and other agricultural crops with minimum inputs of fuel, fertilizer, pesticide and labor without intolerable soil erosion. Unique farmland, on the other hand, is land other than prime farmland that is used for production of specific high-value food and fiber crops (U.S.C., FPPA, 1981).

Affected Environment

Six of the ten soil types that underlie the proposed LRT alignment (see section 4.18.2) have been categorized by the USDA’s NRCS as prime farmland soils. However, the proposed LRT alignment lies entirely within urban areas consisting of airport and transportation land uses (figure 34-1). The NRCS Acres of Prime Farmland map also shows that the proposed LRT alignment is not situated within areas of prime, unique, or other farmland of state or local importance (USDA, 2000). And, according to Ms. Laurie Kiniry, Soil Scientist with the NRCS, this land on airport property was most likely converted out of any prime or unique farmland category at the time that it was purchased by the airport, since the property is now used for airport activities (Kiniry 2009). For these reasons, the land that underlies the proposed alignment does not qualify as prime, unique, or other farmland, despite its NRCS soils classifications, and is not subject to the FPPA.

Impacts

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario, therefore no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

According to information provided by the NRCS on their Acres of Prime Farmland map, the proposed LRT alignment is not situated within prime, unique, or other farmland of state or local importance (USDA, 2000). In addition, this land was most likely converted out of any prime or unique farmland category when purchased by the airport since the airport property is now used for airport activities.

Mitigation

Because no impacts occur to this resource, mitigation measures, including NRCS coordination under the FPPA, would not be required.

4.19 Cultural Resources

This section discusses cultural resources that could potentially be affected by the proposed project. Cultural Resources is an inclusive term that consists of the sub-set of historic resources,

historic properties, archaeological resources and traditional cultural properties. Historic resources consist of all properties that are primarily non-archaeological in nature and can include such diverse properties as residential buildings, farmhouses, sheds, barns, industrial structures, mills, commercial buildings, objects, markers and bridges. Archaeological resources can be either prehistoric or historic in nature. Historic properties specifically refer to those properties that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Archaeological resources are those properties that require excavation or in-depth study to obtain data. Traditional cultural property is a term that refers to any prehistoric or historic neighborhood, community, location, or object generally defined as associated with cultural practices or beliefs.

4.19.1 Historic Resources

All historic structures fieldwork and research was conducted by an architectural historian meeting the Secretary of the Interior's Professional Qualifications Standards for Architectural History.

Historic Structures Investigation Methods

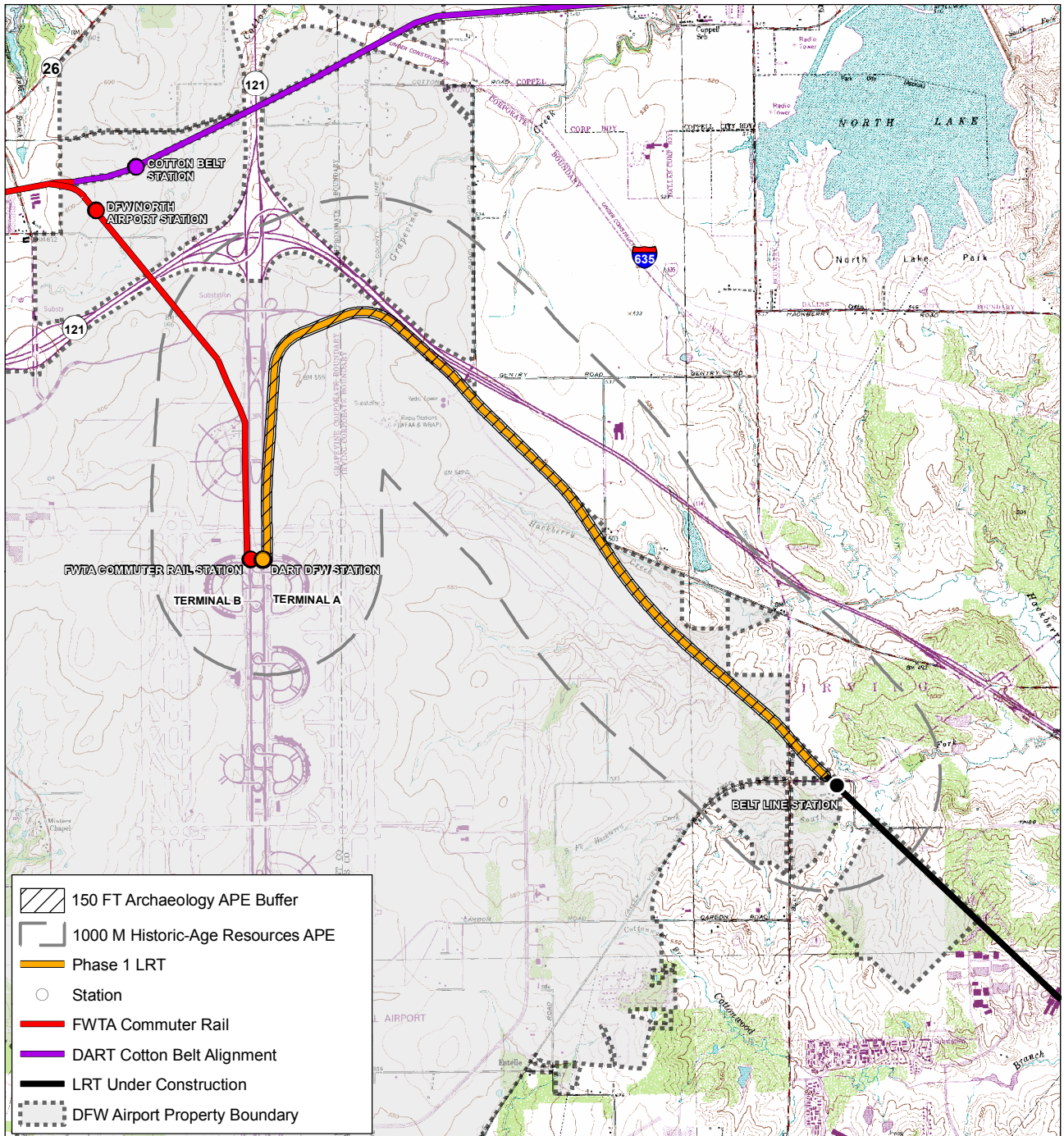
As put forth in Section 106 of the National Historic Preservation Act of 1966 (NHPA), an Area of Potential Effect (APE) was established for the project. The APE of a project consists of "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" (36 CFR §800.16[d]). For the purposes of the current study, an APE of 150 feet on either side of the proposed ROW was investigated to determine if any unrecorded historic age resources could be affected by the proposed project. This APE was developed in coordination with the History Programs Division of the THC. Figure 4-18 shows the extent of the Historic Resources APE.

Initially, researchers reviewed existing data and previously completed reports to gain an understanding of resources in the project area. A search for archival documentation on the project area was performed. Archival research was conducted to identify resources requiring initial or further investigation as well as to locate previously evaluated historic resources, districts, markers, cemeteries, bridges and culverts, Recorded Texas Historic Landmarks, NRHP and State Archeological Landmarks. Reports, records, maps and aerial photographs were examined and were available through the following institutions:

- the Texas Historic Sites Atlas (THSA);
- online maps of the Texas State Library & Archives Commission; and
- the Handbook of Texas Online.

The THSA was consulted to determine if any NRHP-listed or previously documented buildings, structures, objects, or state historic markers lie within or near the proposed APE.

A reconnaissance survey was performed on December 10, 2009. During historic resources surveys, all resources identified by the application of archival and field research are evaluated by applying the four NRHP criteria of eligibility. The four criteria are defined in the Secretary of the Interior guidelines published under the authority of the NHPA. To be considered eligible for inclusion in the NRHP, a resource must meet at least one of the four criteria. The Secretary of the Interior guidelines state that:



Source: 1981 USGS 7.5' series topographic maps, Carrollton, Irving, Euless, and Grapevine quadrangles and The Texas Historic Commission.

FIGURE 4-18



0 4,000 8,000
Feet

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

(a) that are associated with events that have made a significant contribution to the broad patterns of your history; or

(b) that are associated with the lives of persons significant in your past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history [36 CFR § 60.4].

Evaluation of the Seven Aspects of Integrity

In historic resources surveys, the seven aspects of integrity defined by the National Park Service for use in assessing National Register eligibility are applied to the evaluation of the integrity of historic-age resources. These seven aspects are integrity of location, design, setting, materials, workmanship, feeling and association.

The level of integrity required for NRHP eligibility is different for each of the four NRHP Criteria of Significance. If a resource is being assessed for significance because of its association with an event, then integrity of setting, feeling and association are more important. If being assessed for significance as an example of design, then integrity of location, design, materials and workmanship are more important. These criteria have been discussed at length in previous documents. See How to Apply the National Register Criteria for Evaluation (National Park Service 1997) for a full explanation of how the criteria are applied.

Historic Resources Affected Environment

The reconnaissance survey of historic-age resources resulted in the identification of no historic-age resources within the project APE. The buildings and structures located within the project APE are contemporaneous to the construction of DFW Airport (1971-1974), or are later. These buildings and structures consist of airport terminal facilities, bridges and roadways, parking facilities and non-historic warehouse buildings. No historic-age resources are located within or immediately adjacent to the project study APE, which was 150 feet on either side of the proposed LRT alignment. Furthermore, DFW Airport is not of historic age. The THC concurred on December 21, 2009 with the assessment that identified no historic resources and recommendation that no further historic resource investigations are necessary. THC correspondence may be found in Appendix E.

Historic Resources Impacts

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore no impacts to Historic Resources would be anticipated with the No Build Alternative.

LRT Alternative

There are no historic resources that would be impacted for the proposed LRT alignment.

Mitigation

There would be no impacts to historic resources as a result of the proposed project. Therefore, no mitigation measures would be required.

4.19.2 Archaeological Investigations

All archaeological resources fieldwork was supervised by archaeologists who fulfill the Council of Texas Archaeologists' professional requirements for archaeologists and the Secretary of the Interior's Professional Qualifications Standards for Historic Preservation Projects (Department of the Interior, Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines).

Archaeological Investigation Methods

The project APE for archaeology was established as the area that would be impacted by the project and its construction, which for this project was determined to be the footprint of the LRT infrastructure.

A review of the Texas Archeological Sites Atlas (TASA) for previously-recorded archaeological sites and surveys within 1,000 meters of the project APE was conducted for archaeological resources investigations. No previous surveys were located within the project APE.

Archaeological Affected Environment

There were three archaeological sites identified by review of available data that are known to lie within 1,000 m of the project undertaking. All of the sites were disturbed and all were recommended as ineligible for inclusion in the NRHP. No prehistoric archaeological sites were listed as being located within 1,000 m of the project APE (TASA 2009).

On October 26, 2009, archaeologists working on the project requested concurrence of the THC that no further archaeological resources investigations within the proposed LRT alignment APE were necessary due to the highly disturbed nature of the area, and the low probability of finding any undisturbed archaeological sites, and that DART may proceed with the project. The THC concurred on November 17, 2009 with URS's assessment and recommendation that no archaeological survey need be conducted for the project. THC correspondence may be found in Appendix E.

Archaeological Resources Impacts

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario; therefore no impacts to archaeological resources would be anticipated with the No Build Alternative.

LRT Alternative

There are no known archaeological resources that would be impacted for the proposed LRT alignment.

Mitigation

There would be no impacts to archaeological resources as a result of the proposed project. Therefore, no mitigation measures would be required.

4.20 Hazardous Materials

A hazardous material is any substance or mixture of substances capable of having adverse effects on human health and safety or the environment. The presence of hazardous materials within proximity of a proposed project can pose health, safety, liability and cost concerns to the project's implementation – not only during its construction, but also throughout its operating lifetime and eventual decommission. Hazardous materials interests are thus carefully considered throughout the project planning and development process in order to address these concerns as early as possible, as well as to ensure compliance with federal, state and local environmental health and safety regulations.

Affected Environment

A preliminary investigation was conducted for the proposed project. The purpose of the investigation was: 1) to identify the potential presence of hazardous materials and/or known sources of environmental contamination proximal to the proposed alignment and 2) to determine the relevance and relative risk thereof.

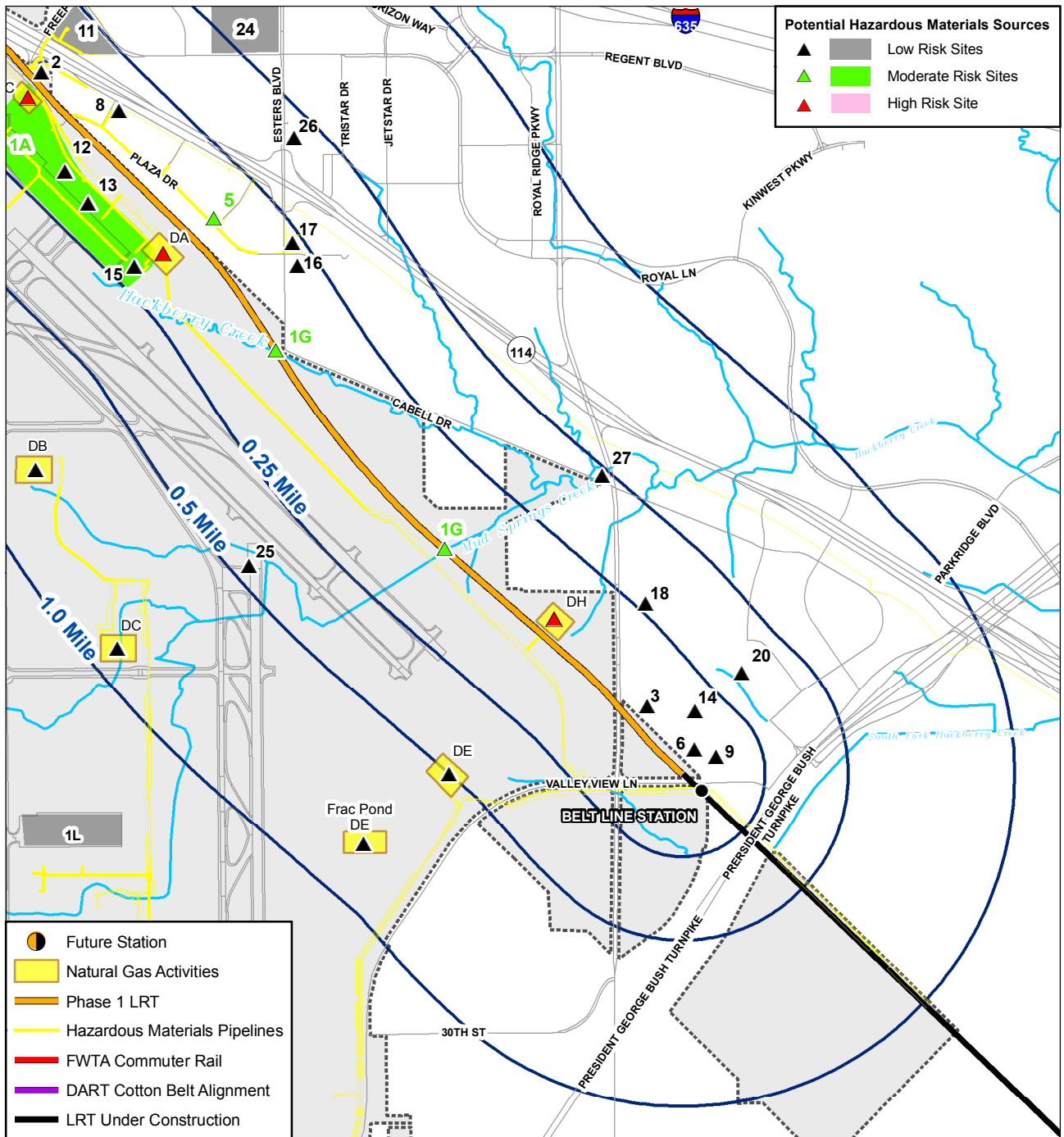
ASTM International (formerly the American Society for Testing and Materials) Practice E 1527-05 outlines a list of standard environmental records sources (regulatory databases and related registries) that should be utilized as part of an effective search for potential recognized environmental conditions that may exist at and/or surrounding a subject property, prior to its acquisition. The ASTM practice further prescribes a suggested search distance (radius) from the subject property as relevant to each type of database and registry. Table 4-30 provides a list of the standard environmental records sources and their corresponding ASTM-prescribed radial search distances. Additional record sources may also be evaluated during the course of a hazardous materials site assessment.

The preliminary hazardous materials investigation for the proposed project consisted of a search, review and evaluation of relevant findings contained within the assorted environmental regulatory databases and registries as listed in table 4-30, and other related and readily-available environmental records sources, along with selective field reconnaissance and interviews, followed by the classification of potential risks associated with each site exhibiting the possibility to affect or be affected by the proposed project.

The preliminary hazardous materials investigation included the 5.17 mile long proposed LRT alignment, along with its estimated 80-foot wide ROW. The maximum search radius extended one mile beyond the alignment's centerline.

For reference purposes and ease of review, a brief summary of each finding identified within the report has been prepared in tabular format and is presented in Appendix H. Along with each finding's brief summary, this table includes a description of each finding's geo-physical location in relation to the proposed LRT alignment, and other related factors, such as topographic contours and elevations data, which were gleaned from USGS maps to establish effective gradients for the potential migration of contaminants, and soils data, which was gathered from a combination of NRCS sources to determine the likelihood of such migration. The findings presented within the table in Appendix H have been grouped by the entity with which each is associated, and are sorted by geographic locations (where known). Each geographically-locatable entity has also been assigned a map identification number (MAP ID), and has been plotted for reference purposes in the maps presented as figures 4-19 and 4-20.

Based upon the initial records review, selective field reconnaissance was conducted via vehicular and pedestrian surveys in August and October 2009. This reconnaissance provided additional information that might assist in the risk evaluation for each entity that appeared to pose a potentially high or moderate risk to the proposed project by observing and documenting any visual and olfactory evidence suggesting potential contamination. Similarly, additional information was also collected via informal interviews with personnel likely to possess reliable information concerning certain potential findings. The additional information gathered through field reconnaissance and informal interviews has been reflected in the final risk determinations presented in the table.

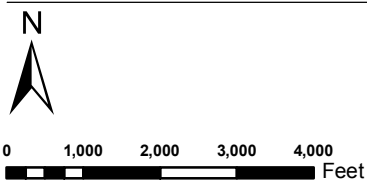


Source: NCTCOG 2008, GeoSearch 2009, and URS study team, 2009.

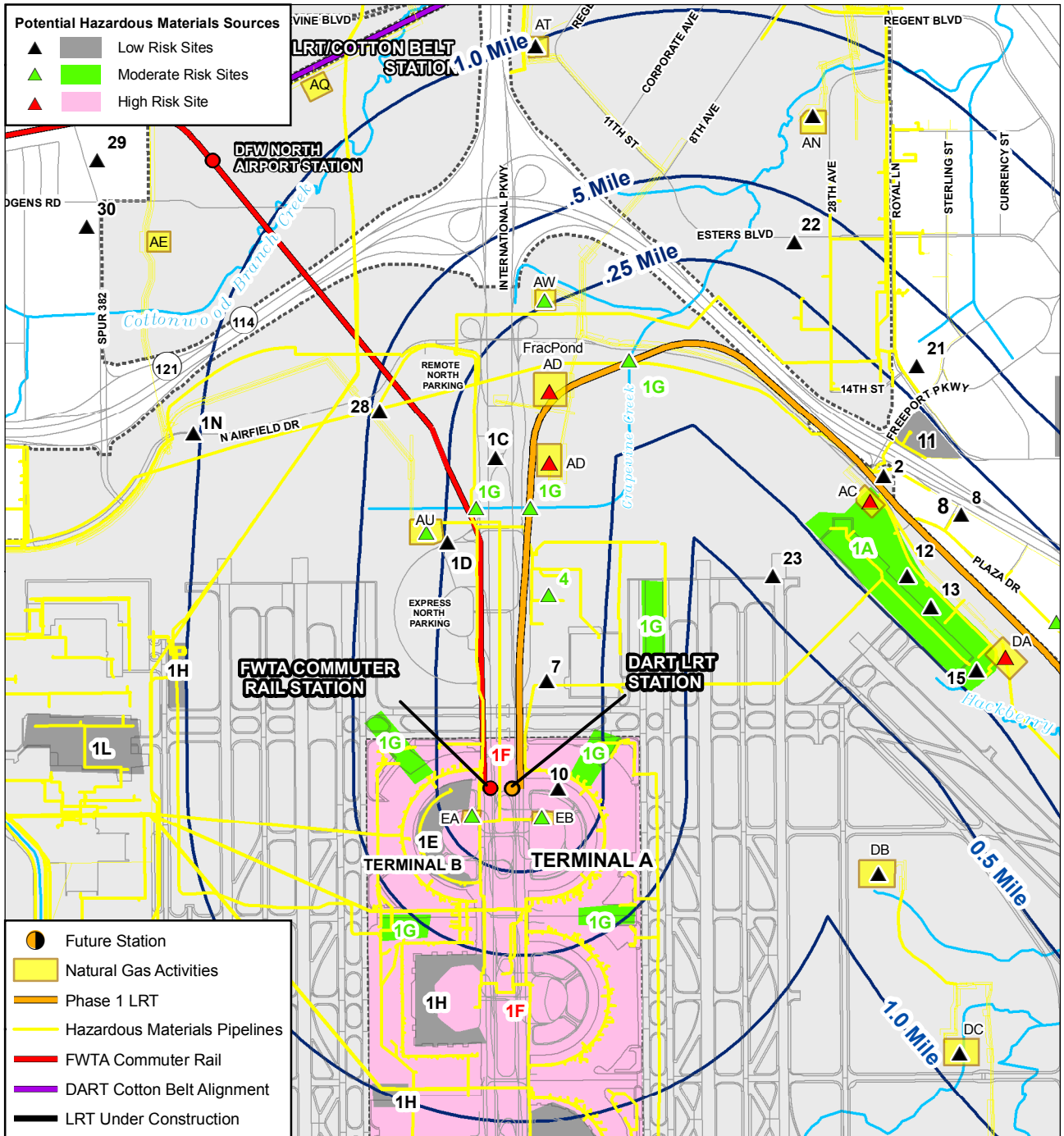
FIGURE 4-19

POTENTIAL HAZARDOUS MATERIALS SOURCES

DART Irving-3 Environmental Assessment



MAP A



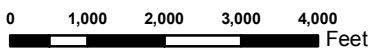
Source: NCTCOG 2008, GeoSearch 2009, and URS study team, 2009.

FIGURE 4-20

POTENTIAL HAZARDOUS MATERIALS SOURCES

DART Irving-3 Environmental Assessment

MAP B



| Table 4-30. Standard Environmental Records Sources* | |
|---|---|
| <i>Environmental Records Source</i> | <i>Search Radius (miles)</i> |
| Federal Records | |
| National Priorities List (NPL) sites | 1.0 |
| Delisted National Priorities List (DNPL) sites | 0.5 |
| Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list | 0.5 |
| CERCLIS No Further Action Planned (NFRAP) sites list | 0.5 |
| Resource Conservation and Recovery Act (RCRA) Corrective Action facilities (RCRAC) list | 1.0 |
| RCRA Non-Corrective Action Treatment, Storage and Disposal facilities (RCRAT) list | 0.5 |
| RCRA generators (RCRAG) list | Subject Property and adjoining properties |
| Institutional control/ engineering control (EC) registries | Subject Property only |
| Emergency Response Notification System (ERNS) list | Subject Property only |
| State and Tribal Records | |
| Equivalent NPL (list of hazardous waste sites identified for investigation or remediation) | 1.0 |
| Equivalent CERCLIS (list of hazardous waste sites identified for investigation or remediation) | 0.5 |
| Landfill and/or solid waste disposal site lists | 0.5 |
| Leaking storage tank lists | 0.5 |
| Registered storage tank lists | Subject Property and adjoining properties |
| Institutional control/ engineering control registries | Subject Property only |
| Voluntary cleanup sites | 0.5 |
| Brownfield sites | 0.5 |

Source: * ASTM Practice E 1527-05

Inventory of Sites of Concern

The search of environmental records sources (henceforth referred to as database search report) yielded 129 listings within the ASTM-prescribed search radii, which included the estimated 80-foot wide ROW for the proposed LRT alignment as the Subject Property, and up to an additional one-mile search radius beyond the alignment’s centerline. The 129 findings were more specifically associated with 27 facilities or areas of concern (henceforth referred to as potential hazardous materials sources or sites), most of which had multiple listings.

Because of the limitations of the database search report, MAP ID 1 is considered the entire property of DFW Airport. DFW Airport property is actually comprised of 18,076 acres of land, a very small portion of which underlies most of the proposed LRT alignment and its ROW. However,

because many findings on DFW Airport property could not be precisely located based upon the limited address information provided within the database search report, Map ID 1 represents the entire bounds of DFW Airport property and contained 86 listings. Careful analysis of the individual database and registry listings, however, revealed that some of the listings could be more accurately located and eliminated from concern. For example, because DFW Airport has seven aircraft runways and fueling and deicing areas, an incident recorded as occurring within one these areas may not be precisely locatable. However, adequate information would exist in this situation to confirm that the incident did not occur within the ROW of the proposed LRT alignment. With the assistance of airport personnel who were informally interviewed in October 2009, sufficient information was found to subdivide the individual findings associated with DFW Airport MAP ID 1 into Map ID 1A through 1N and eliminate 55 listings from further consideration.

The database search report also identified one orphan site. This orphan site did not have adequate address information to be located geographically. Because insufficient information was provided in the database search report to determine the precise location of the orphan listing, the site was not included in map figures 4-19 and 4-20.

The database search report yielded no findings within the ASTM-prescribed search radii surrounding the estimated 80-foot wide ROW of the proposed LRT alignment, for the following standard environmental regulatory databases and registries:

- Federal NPL
- Federal DNPL sites
- Federal CERCLIS
- Federal RCRA facilities list
- Federal RCRA facilities list
- Federal EC registry
- State Superfund (SF) list
- State Permitted Industrial and Hazardous Waste sites
- State Municipal Solid Waste Landfills
- State Closed and Abandoned Landfills
- Open Dump Inventory on Tribal Lands
- State Radioactive Waste Sites
- Tribal Leaking Petroleum Storage Tank registry
- Underground storage tank (UST) on Tribal Lands (USTR06) registry
- State Institutional/Engineering Control registry
- Railroad Commission Voluntary Cleanup Program and Brownfield Sites
- Brownfields Site Assessments

The database search report did yield listings within the typical ASTM-prescribed search radii surrounding the estimated 80-foot wide ROW of the proposed LRT alignment for the following standard environmental regulatory databases and registries. Supplementary detail concerning each of these database listings is presented in Appendix H.

- **Federal CERCLIS NFRAP sites**
NFRAP sites are those sites which have been removed from the CERCLIS, which otherwise contains data on potential hazardous waste sites that have been reported to the EPA by states, municipalities, private companies and private persons, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act Section 103. NFRAP sites include those sites where, following an initial investigation, no contamination

was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal SF action or NPL consideration.

One NFRAP site (MAP ID 19) was identified within 0.5 mile of the proposed LRT alignment.

- **Federal RCRA list**

The RCRA database includes selective information on registered sites that generate, transport, store, treat and/or dispose of wastes defined as hazardous under the RCRA regulations.

Two RCRA facilities were identified within or adjoining the proposed LRT alignment ROW, including one large quantity generator of RCRA hazardous waste (RCRA-LQG) (MAP ID 3) and one small quantity generator of RCRA hazardous waste (RCRA-SQG) (MAP ID 10).

- **Federal ERNS**

The ERNS records and stores information on reported releases of oil and hazardous substances. The list includes data collected from the U.S. Coast Guard/EPA National Response Center.

Sixteen ERNS incidents were initially identified within the estimated 80-foot wide ROW of the proposed LRT alignment according to the database search report. However, this number was lowered to four incidents once the location of eleven of those listings was confirmed to lie outside the proposed project ROW and thus outside the ASTM-prescribed search radii. The four remaining ERNS sites are all associated with MAP ID 1 (specifically: 1, 1G and 1H).

- **State Industrial and Hazardous Waste (IHW) sites**

Industrial waste is that which results from or is incidental to operations of industry, manufacturing, mining, or agriculture. Hazardous waste is defined as any solid waste listed as hazardous or which possesses one or more hazardous characteristics as defined in federal waste regulations. Owner and facility information is included in the IHW database of permitted and non-permitted industrial and hazardous waste sites.

Nine IHW sites were identified within 0.5 mile of the proposed LRT alignment, including: MAP ID numbers 1 (specifically: 1, 1C and 1D), 3, 6, 9, 12 and 14.

- **State Leaking Petroleum Storage Tank (LPST) lists**

The LPST database is maintained by TCEQ and contains an inventory of reported leaking UST incidents.

Nine LPST sites were identified within 0.5 mile of the proposed LRT alignment, including: MAP ID numbers 5, 6, 11, 15, 16, 24, 26 and 27.

- **State and Tribal Petroleum Storage Tank (PST) lists**

Petroleum storage tanks are regulated under RCRA Subtitle I and locations of PSTs are collected in a PST database maintained by the TCEQ. This database contains an inventory of registered UST and aboveground petroleum storage tanks. U.S. EPA Region 6 separately maintain list for USTR06.

Of the original 18 PST sites identified by the database records search, 17 were located within 0.25 mile of the proposed LRT alignment. Of these 17 sites, five PST sites were located within and/or immediately adjoining the LRT alignment ROW (MAP ID 1); six PST

sites were identified within 0.125 mile (660 feet) of the LRT alignment (MAP ID numbers 2 and 5 through 8); and, six PST sites were identified between 0.125 and 0.25 mile (1,320 feet) of the LRT alignment (MAP ID numbers 11, 12, 13, 16 and 17). The one orphan site was also listed as a PST site. It lies somewhere within the same zip code as the proposed Belt Line Station; however, the orphan site's precise location could not be determined based upon the information available within the database search report.

Twenty-nine individual tanks were reported at the abovementioned 17 sites. Of those, a total of 11 tanks are considered active, 14 were removed, one was filled and 3 are reported as inactive. Supplementary details concerning the database listings for these sites are presented in Appendix H.

No USTR06 sites were identified within or adjacent to the proposed Phase I alignment ROW.

- **Voluntary Cleanup Program (VCP) sites**

The Texas VCP was established to provide administrative, technical and legal incentives to encourage the cleanup of contaminated sites in Texas. Since all non-responsible parties, including future lenders and landowners, receive protection from liability to the State of Texas for cleanup of sites under the VCP, most of the constraints for completing real estate transactions at those sites are eliminated. As a result, many unused or underused properties may be restored to economically productive or community beneficial uses.

One VCP site (MAP ID 5) was identified within 0.5 mile of the proposed LRT alignment. MAP ID 1A, which is another VCP site that lies near the proposed alignment, did not appear in the database search report as such¹.

The following additional environmental records sources were evaluated and yielded listings within the typical ASTM-prescribed search radii surrounding the estimated 80-foot wide ROW of the proposed LRT alignment. Table 4-31 summarizes this information. Supplementary detail concerning these database listings is also presented in Appendix H.

- **Federal Aerometric Information Retrieval System (AIRS)/ Air Facility Subsystem (AFS)**

AFS is the EPA-modified AIRS database, which exclusively tracks the compliance of stationary sources of air pollution with EPA regulations. The management of the AIRS/AFS database has been assigned to EPA's Office of Enforcement and Compliance Assurance since the change, which took place in 2001.

One AIRS/AFS site (MAP ID 1) was identified within the proposed LRT alignment ROW.

- **Federal EPA Docket Data (DOCKETS)**

The EPA Docket Data lists: Civil Case Defendants, with filing dates as far back as 1971; laws broken including section; violations that occurred; pollutants involved; penalties assessed; and SF awards by facility and location.

One DOCKETS site (MAP ID 1) was identified within the proposed LRT alignment ROW.

¹ **MAP ID 1A**, also known as the Northeast Cargo Area VCP, is a contaminated VCP site that did not appear directly in the database search report as such. This site, which is located on airport property and immediately adjacent to the proposed alignment, was alternately documented as an Affected Property Assessment Report (APAR) site. An APAR is a type of report prepared for the TCEQ in order to delineate the bounds of, and details associated with, contamination generated by a given property. As confirmed during interview with airport personnel, **MAP ID 1A** is a VCP site.

- **Federal Facility Registry System (FRS)**

The FRS, managed by the EPA's Office of Environmental Information, is the centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest.

Eight FRS sites, all associated with MAP ID 1 (specifically: 1 and 1E), were identified within the proposed LRT alignment ROW.

- **Federal Hazardous Materials Incident Reporting System (HMIRS)**

The HMIRS database contains information regarding unintentional hazardous materials releases as reported to the U.S. Department of Transportation.

Although 34 HMIRS sites were identified within the estimated 80-foot wide ROW of the proposed LRT alignment according to the database search report, the locations of all 34 sites (all of which are associated with MAP ID 1) were subsequently confirmed to lie outside the bounds of the LRT alignment ROW.

- **Federal No Longer Regulated RCRA (NLRRCRA) Facilities**

The NLRRCRAG database includes RCRA facilities (former hazardous waste generators) that are no longer regulated by the EPA or do not meet other RCRA reporting requirements.

One NLRRCRAG facility (MAP ID 9) was identified within or adjacent to the ROW of the proposed LRT alignment.

- **Federal National Pollutant Discharge Elimination System (NPDES)**

Information in the NPDES database is extracted from the Water Permit Compliance System (PCS) database which is used by the EPA to track surface water permits issued under the CWA.

One NPDES site (MAP ID 1) was identified within the proposed LRT alignment ROW.

- **State APAR**

An APAR is required by the TCEQ when an entity is addressing a release of chemical of concern under 30 TAC Chapter 350, the Texas Risk Reduction Program.

Two APAR sites were identified within 0.5 mile of the proposed LRT alignment, including MAP ID numbers 1A and 4.

- **State Groundwater Contamination Cases (GWCC)**

The database search report contains a listing of GWCC which were documented for the 2007 calendar year. The agencies reporting these cases include the TCEQ, Railroad Commission of Texas, Texas Alliance of Groundwater Districts, and Department of State Health Services.

One GWCC site (MAP ID 1F) was identified within the ROW of the proposed LRT alignment.

- **State Spills Listing (SPILLS)**

The SPILLS database, maintained by the TCEQ, includes releases of hazardous or potentially hazardous materials into the environment.

Of the 12 SPILLS sites initially identified within the estimated 80-foot wide ROW of the proposed LRT alignment according to the database search report, five of the incidents were subsequently determined to more accurately lie outside of the proposed project

ROW. The remaining seven SPILLS are all associated with MAP ID 1 (specifically: 1, 1G and 1N).

- **State Tier II Chemical Reporting Program Facilities (TIER II)**

TIER II is the state repository for Emergency Planning and Community Right-to-Know Act (EPCRA) required Emergency Planning Letters, which are one-time notifications to the state from facilities that have certain extremely hazardous chemicals in specified amounts. It is also the state repository for annual EPCRA/state-required hazardous chemical inventory reports.

Twelve TIER II sites were identified within 0.5 mile of the proposed LRT alignment, including: MAP ID numbers 3, 9, 12, 18, and 20 through 25.

Not identified within environmental records sources, was the presence of numerous utility crossings that exist throughout the proposed project area, including pipelines carrying such materials and/or waste products as fuel, natural gas, and sanitary sewage, as well as electrical utilities, which may include the presence of oil-filled transformers. These utilities present unique hazardous materials concerns to the proposed project. Additional information concerning the type, location and size of these utilities is presented in section 5.2.

In addition, extensive natural gas exploration and production activities have been taking place throughout the DFW Airport property since approximately August 2006 and numerous well pad sites (each containing multiple wellheads), frac ponds (which hold water for use in hydraulic fracturing activities), natural gas pipelines, and possibly brackish water pipelines, are currently situated and/or are planned within one mile of the proposed LRT alignment. To the extent known, these activities are mapped in figures 4-19 and 4-20.

Approximately one to four million gallons of brackish waters are also generated during drilling/development activities for each natural gas well. Brackish waters are collected and disposed of in two ways: they may be routed through pipelines to a saltwater disposal well for underground injection or otherwise collected and transported offsite for disposal via trucks, or any combination thereof. When brackish waters are routed through pipelines on DFW Airport property, the lines may follow and/or cross the proposed alignment in various locations, and would run parallel to the natural gas pipelines. Waste collection and transport via trucks, if such occurs, may also take place at centralized points whereat brackish water pipelines gather, and/or within immediate proximity of the various individual pad sites.

Brackish waters include flowback and produced waters, both of which are associated with natural gas exploration and production activities. Flowback is the water (frac water) recovered following the subsurface-injection of amended water as utilized for the hydraulic fracturing of underground geological formations to access/release subsurface pockets of natural gas.. Brackish waters may also contain other wastes generated during natural gas exploration activities.

Impacts

As previously described, a preliminary hazardous materials investigation was undertaken as part of the proposed project's EA, with a threefold purpose: 1) to identify and document potential hazardous materials sources proximal to the proposed alignment, 2) to evaluate each potential hazardous materials source for concerns that could impact construction activities and/or that might present longer-term liabilities associated with past, present, or future activities and 3) to compare implementation of the proposed alignment to its No Build Alternative.

Table 4-31. Hazardous Materials Database Search Results Within Search Radius of Project ROW

| <i>Map ID</i> | <i>Database</i> | <i>Location</i> |
|---------------|--|---|
| 1 | ERNS, IHW, PST, VCP, AIRS/AFS, DOCKETS, FRS, NPDES, APAR, GWCC, SPILLS | DFW Airport Property |
| 2 | PST | 2900-2901 North Airfield Drive, Dallas, TX 75261 |
| 3 | RCRAG, IHW, TIER II | 6125 West Campus Circle Drive, Irving, TX 75063 |
| 4 | APAR | American Airlines Ground Service Equipment, Dallas, Dallas County, TX |
| 5 | LPST, PST, VCP | 4505 Plaza Drive, Irving, TX 75063 |
| 6 | IHW, LPST, PST | 6001 Campus Circle Drive, Irving, TX 75063 |
| 7 | PST | Airmail Automotive, DFW Airport, TX 75261 |
| 8 | PST | 4950 John Carpenter Freeway, Irving, TX 75063 |
| 9 | IHW, NLRRCRA, TIER II | 5931 Campus Circle Drive, Irving, TX 75063 |
| 10 | RCRAG | American Eagle Airlines Inc., DFW Airport Terminal A, DFW Airport, TX 75261 |
| 11 | LPST, PST | 8440 Freeport Parkway, Irving, TX 75063 |
| 12 | IHW, PST, TIER II | 2963 North Airfield Drive, DFW Airport, TX 75261 |
| 13 | PST | 2967 North Airfield Drive, DFW Airport, TX 75261 |
| 14 | IHW | 6025 Commerce, Suite 500, Irving, TX 75063 |
| 15 | LPST | 3131 North Airfield Drive, DFW Airport, TX 75261 |
| 16 | LPST, PST | 7650 Esters Boulevard, Irving, TX 75063 |
| 17 | PST | 7700 Esters Boulevard, Irving, TX 75063 |
| 18 | TIER II | 6425 Campus Circle Drive West, Irving, TX 75063 |
| 19 | NFRAP | 4829 Royal Lane, Irving, TX 75063 |
| 20 | TIER II | 2477 Gateway Drive, Irving, TX 75063 |
| 21 | TIER II | 8505 Freeport Parkway, Irving, TX 75063 |
| 22 | TIER II | 2700 Esters Road, Irving, TX 75261 |
| 23 | TIER II | Runway 17C System, DFW Airport, TX 75261 |
| 24 | LPST, TIER II | 4525 Royal Lane, Irving, TX 75063 |
| 25 | TIER II | 4529 Royal Lane, Irving, TX 75063 |
| 26 | LPST | 7902 Esters Boulevard, Irving, TX 75063 |
| 27 | LPST | 6921 North Belt Line Road., Irving, TX 75063 |
| Orphan site | PST | unknown |

Source: GeoSearch, Radius Report: DART I-3 Phase I, 09/08/2009; GeoSearch, Radius Report: DART I-3 Phase II, 09/08/2009; and URS Corporation Study Team, 2009

Each potential hazardous materials source was evaluated to determine its potential, or risk (high, moderate, or low), of presenting a concern to the proposed project. The factors considered in the evaluation of each site included: the type of environmental record source listing(s) associated

with the site and its regulatory status, the status of any environmental contamination associated therewith, if known, and the geo-physical location and characteristics of the site in relation to the proposed LRT alignment.

The geo-physical location and characteristics of each site were considered for the role they may play in facilitating or impeding the migration of any existing or potential environmental contamination toward the proposed LRT alignment. The considered geo-physical factors included: the distance of the site from the proposed LRT alignment, the site's elevation, surface topography, underlying geological formations, soil types, hydrological features, potential utility pathways, other physical constraints and the site's topographical and hydrological gradients in relation to the proposed LRT alignment. Data sources for this evaluation included street and structure maps, topographical contour maps, hydrological maps, geological maps, soils maps, utility maps and direct site reconnaissance, in conjunction with the address and related information provided in the environmental records sources.

The risk determination for each potential hazardous materials source was based largely, but not solely, upon the following more specific criteria.

- **Low Risk:** A potential hazardous materials site is classified as a low risk site, if: 1) its environmental records source listing was not directly associated with potential environmental contamination, regardless of the site's location, or 2) the site's historical environmental contamination has been confirmed as resolved to regulatory agency satisfaction and the site is located down-gradient beyond any property immediately adjacent to the proposed alignment. The likelihood of contamination migrating to the proposed alignment from such a site, and/or for the proposed project to affect such a site, is considered a low risk.
- **Moderate Risk:** The moderate risk classification is somewhat more subjective and may depend upon a number of factors, including past versus present contamination, current regulatory status, geo-physical positioning and the type of hazardous materials concern being evaluated. Therefore, traditional moderate risk sites may be moved to lower risk or higher risk status, depending upon each site's specific combination of factors.

Typically, moderate risk sites include those sites: 1) located within the ASTM-prescribed search radius, having confirmed existing environmental contamination that has been documented as confined down-gradient and outside of the proposed alignment ROW, or 2) whose historical environmental contamination has been confirmed as resolved to regulatory agency satisfaction, and which may be located at any position (up-, down-, or cross-gradient) within the proposed ROW and/or its immediately adjacent properties. The likelihood of contamination migrating to the proposed alignment from such sites, and/or for the proposed project to affect such sites, is considered a moderate risk.

- **High Risk:** A potential hazardous materials source is classified as a high risk site if its environmental records source confirms the existence of environmental contamination without direct documentation that it is well-contained and/or resolved to regulatory agency satisfaction, while the site itself is situated directly within the proposed alignment's 80-foot ROW. A contaminated site might also be deemed a high risk site if it is located up-gradient and adjacent to the proposed project, whether or not the contamination is reportedly contained. The likelihood of contamination migrating to the proposed alignment from such sites, and/or for the proposed project to affect such sites, would be considered a higher risk.

The comparative impacts of the No Build Alternative versus implementation of the proposed LRT alignment are presented as follows.

No Build Alternative

Under the No Build Alternative, the proposed LRT alignment would not be constructed. Existing hazardous materials sites would not be disturbed, and they would pose no greater risk to the proposed project area than that which is already present. The lack of site disturbance would aid in confining the impact of these hazardous materials sites to their present locations by not opening new, or contributing to, existing environmental pathways for exposure or contaminant migration.

LRT Alternative

Construction-related activities for the proposed LRT alignment would include excavation for the development of: LRT 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 disturb existing hazardous materials sites that exist within and immediately adjacent to the proposed LRT alignment. The disturbance may expose previously contained hazardous materials within the construction zone to construction personnel, passers-by and/or other environmental receptors (e.g., animals), and/or may create new pathways for the migration of associated contaminants through disturbed soils, along utility lines, and/or via modified storm drainage pathways, etc.

After carefully evaluating each environmental records source finding, it was determined that 24 of the 27 potential hazardous materials source sites identified within and surrounding the proposed LRT alignment present a low risk of potential hazardous materials contamination within a proximal geo-physical location potentially affecting the proposed LRT alignment and/or its estimated 80-foot wide ROW. The key factors influencing each low risk determination are discussed within the risk evaluation commentary for each individual finding included in the table in Appendix H.

Low to Moderate Risk Sites

Of the remaining three sites, two sites have been determined to present a low to moderate risk of potential hazardous materials contamination within a proximal geo-physical location potentially affecting the proposed LRT alignment and/or its ROW. These sites are not located within the footprint of the rail alignment and are mapped in figures 4-19 and 4-20.

- **MAP ID 4:** The American Airlines Ground Service Equipment area has been identified as an APAR/IHW corrective action site. The site is situated cross-gradient with, and within 420 feet of, the west side of the proposed LRT alignment. Corrective action at the site is reported to have been completed, although it is unknown precisely what subsurface contaminants were involved and/or how they were corrected. MAP ID 4, thus, presents a low to moderate risk of potential hazardous materials encounter to the proposed LRT alignment. Preliminary vehicular field reconnaissance conducted in October 2009 noted no obvious surficially-visible concerns around this location.
- **MAP ID 5:** Key Park Airport Parking has been identified as a former VCP site, presenting a low to moderate risk of potential hazardous materials encounter to the proposed LRT alignment. The site is situated 475 feet north/northeast of, and up-gradient to, the proposed LRT alignment, approximately half-way between the proposed alignment's eastern and western (central airport) termini. The site is reported to have been cleaned to non-residential standards, with receipt of a final certificate from the TCEQ in 2002. However, this level of cleanup implies that some conditionally-acceptable level of

contamination may remain. The original contaminants of concern were recorded as benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. In addition to the VCP site, this same location is the reported site of a former LPST. An active 8,000-gallon double-wall fiberglass reinforced plastic (FRP) double-wall diesel UST was installed at the site in 1994. A LPST was then reported in 1998, with noted groundwater impact, although there were no apparent threats or impacts to receptors. The case was closed as the TCEQ issued final concurrence. Two other USTs were also reported to have been installed at this site in 1994. One matches the aforementioned tank description, while the other was reported as a 4,000-gallon double-wall FRP gasoline UST. Preliminary field reconnaissance noted no obvious visible concerns around this location in August 2009.

- **Map ID 1G** is considered a low to moderate risk and represents multiple locations on DFW Airport property where airplane deicing activities have historically occurred and where downstream waters that received the related discharges subsequently cross the proposed LRT alignment (i.e., Grapevine Creek, Hackberry Creek and Mud Springs Creek). These areas were associated with numerous glycol-related releases as recorded between the years 1997 and 2000, in quantities ranging from 143 gallons to 6,296 gallons per incident. Winter deicing activities no longer discharge glycols directly to the environment, as the glycols now generated during these activities are captured by a drainage system that feeds to collection ponds on the south side of DFW Airport property. Each water crossing downstream of the airport's deicing locations was closely inspected (but not directly sampled) during the preliminary field reconnaissance conducted in August 2009. No concerns were observed at that time. Although prior subsurface contamination has not been confirmed at or downstream of the identified deicing sites, the potential presence of residual byproducts resulting from the large volumes of glycol previously released presents a low to moderate risk of hazardous materials encounter near those water crossings where adjacent excavation might occur to facilitate the construction of structural supports for elevated spans of LRT line and/or for the planned construction or modification to storm water drainage features. Areas requiring excavation near the affected water courses are of special concern.

Moderate to High Risk Sites

The third potential hazardous materials source site is the single listing of DFW Airport property (MAP ID 1). Within the confines of the DFW Airport property, three more precisely identified potential hazardous material sources were determined to present a moderate or higher risk of potential hazardous materials contamination within a proximal geo-physical location potentially affecting the proposed LRT alignment and/or its ROW. These sites, MAP ID numbers 1A, 1F and 1G, are mapped in figures 4-19 and 4-20, and are further described below.

- **MAP ID 1A** is considered a moderate risk and has been identified as a 53-acre APAR site located on the northeast side of the DFW Airport property, around the Air Cargo Freight area. It is also known as the "Northeast Cargo VCP." The site is currently not undergoing active remediation and airport personnel report that the contamination is currently contained on airport property, within a site footprint that lies south of and is bounded by North Airfield Drive. This VCP location is situated up gradient of, and nearly contiguous to, the proposed LRT alignment. A narrow buffer or corridor of land runs between this VCP and the LRT alignment's southern ROW, for approximately 4,100 linear feet. The buffer is approximately 460 feet wide at the south end of the VCP and narrows to approximately

60 feet wide at the northernmost corner of the VCP. The Northeast Cargo VCP site is monitored quarterly, with wells for chlorinated solvents located at a 12- to 25-foot depth, and wells for petroleum products at an eight-foot depth. The site's proximity to the proposed LRT alignment, its gradient, and chemicals of concern combine to generate the determination that the site represents a moderate risk of potential (present or future) hazardous materials encounter to the proposed alignment. Preliminary field reconnaissance conducted in August 2009 noted no surficially-visible concerns associated with the site.

- **MAP ID 1F²**, considered a moderate to high risk site, is a GWCC site according to the database search report, has been identified as the "Central Terminal Area Agreed Order" by DFW Airport personnel. The CTA site polygon encompasses the five airport terminals, their gates and associated tarmac approaches. During preliminary field reconnaissance, as conducted in publicly-accessible areas of the airport in August and October 2009, it was noted that the CTA is predominantly covered in impervious surfaces (airport terminals and related buildings, roads, runways, etc.) interrupted by grassy roadside banks. No surficially-visible concerns were noted within the proposed LRT alignment ROW during the reconnaissance. According to DFW Airport personnel, the CTA contains pockets of subsurface petroleum (Light Non-Aqueous Phase Liquid, or LNAPL) contamination, which are under active remediation. A former chlorinated solvents contamination plume was also separately discovered and remediated in the area of Terminal D, and its case was closed by the TCEQ in 2003. The remaining active remediation systems are located inside the AOA at both Terminal B South and Terminal C South. Although the remaining active LNAPL contamination zones are reported to lie within the AOA, which is outside the bounds of and predominantly south of the proposed LRT alignment, the airport continues to utilize up to 2.5 million gallons of fuel per day on the AOA, and there are inherent risks associated with this activity. Inherent risks associated with large-scale fueling activities include those rare incidents that may occur through human error, equipment failure, and/or acts of nature, but which are generally controlled or minimized through proper employee training, equipment maintenance, and general regulatory compliance (i.e., risk of surface leak or spill, risk of fire or explosion, or risk of subsurface leak and associated contaminant migration). The LRT alignment's terminus is proposed to enter the northern bounds of the CTA site polygon. The topographic gradient associated with the CTA runs in multiple directions throughout the site polygon, but runs predominantly north toward the LRT alignment from the north end of the polygon. MAP ID 1F presents a moderate to high risk of potential (present or future) hazardous materials encounter to the proposed LRT alignment.

Also, numerous utility crossings are present throughout the proposed project area, including pipelines carrying such materials and/or waste products as fuel, natural gas, brackish water and sanitary sewage, as well as electrical utilities, which may include the presence of oil-filled transformers. Running roughly parallel to the proposed LRT alignment, and/or directly crossing the LRT line in multiple locations, these utilities present a moderate risk of hazardous materials encounter to the proposed project should leaks be discovered and/or impact to the utility occur during construction. Additional information concerning these utilities is presented in section 4.2.

In addition to the sites identified above, natural gas well drilling and production activities occurring throughout DFW Airport property also present a moderate to high risk of hazardous materials encounter for the proposed LRT alignment. As of January 2010, two well pad sites (pads “AC” and “AD”), are located within 75 feet of the alignment. Both Pad “AC” and “AD” have wells in active production. Two additional well pad sites (“DH” and “DA”) are planned within 75 feet of the alignment. Two more well pad sites (“AW” and “AU”) with wells in active production are located within 0.25 mile of the proposed LRT alignment, and two pad sites (“EA” and “EB”) are planned within 0.25 mile.

Other natural gas drilling and operation related concerns include: one frac pond (frac pond AD), reported to contain approximately 11.7 million gallons of water, located directly within the route of the proposed alignment; multiple natural gas gathering lines are located (and/or are planned) within 600 feet of and roughly paralleling almost the entire length of the proposed LRT line, crossing the alignment in multiple locations. Potential facilities of concern include brackish water pipelines that may also run parallel to and/or within proximity of the natural gas pipelines in many locations. Potential (present or future) hazardous materials encounters that could be associated with these activities include: pipeline leaks or rupture (i.e., natural gas or brackish waters), air emissions at wellheads during well development and/or during production (e.g., natural gas, benzene, etc.), spills of brackish waters and/or related wastes during collection and/or transport, leaks from production and storage equipment at pad sites (e.g., compressors and generators, separators, tank batteries, etc.), and in the rare case, a wellhead blowout (safety/explosion hazard, with potential air emissions and brackish waters release).

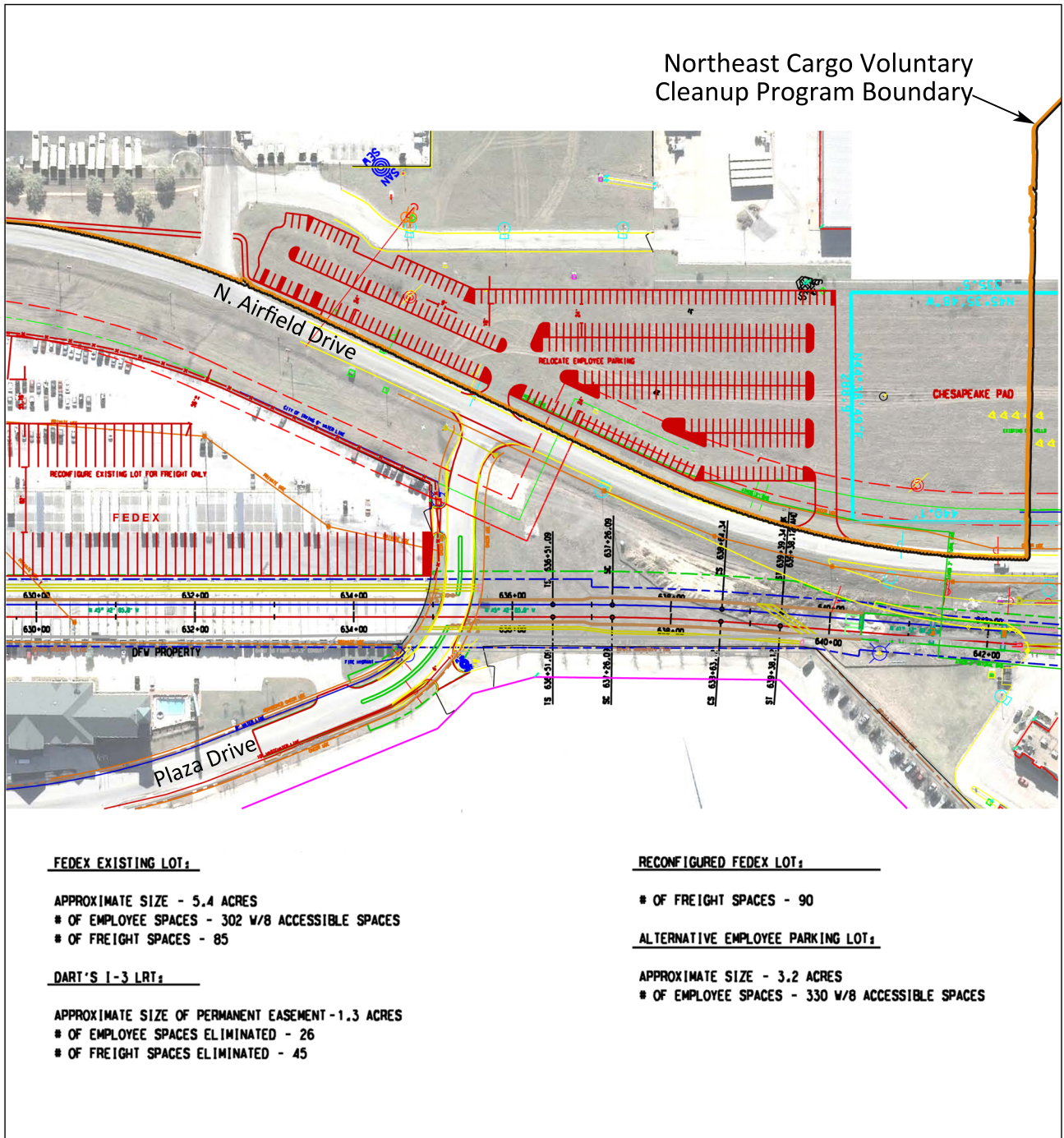
Relocation and construction of a new parking facility is proposed to mitigate parking impacts and acquisition impacts to Federal Express resulting from the proposed LRT alignment. The proposed location of the new parking facility is within the Northwest Cargo VCP (MAP ID 1A). The location of the proposed new parking facility in relation to the VPC is shown in figure 4-21.

Mitigation Measures

Although a given site may be known as contaminated, or suspected to be such, implementation of the proposed LRT alignment does not necessarily mean that the site would be adversely affected by the project, or vice versa. Various preventative mitigation measures are available to address potential present or future liabilities associated with hazardous materials sites, including the moderate and higher risk sites previously identified.

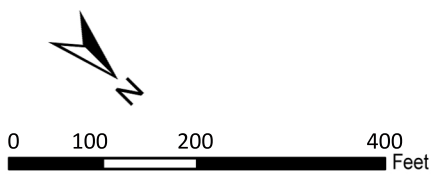
For the proposed project, the current property owner, DFW Airport, would continue to retain ownership of the property to be occupied by the LRT line. DFW Airport and DART are currently developing a MOA to govern issues related to hazardous materials.

In addition, as part of its advance project planning processes, DART has in place an on-going policy and program to assess the environmental condition of all properties contemplated for use as ROW or for the siting of transit facilities. Under this program, a Phase I Environmental Site Assessment (ESA) of each parcel will be conducted to assess its specific likelihood of contamination. If necessary, a Phase II ESA may also be undertaken to further identify and quantify existing hazardous materials contamination so that the decided need for cleanup or mitigation (Phase III ESA) can be factored into the use agreement/or the long-term environmental liability associated with acquiring use of the property.



Source: URS Corporation, March 2010.

FIGURE 4-21



NEW PARKING MITIGATION
 DART Irving-3 Environmental Assessment

For example, although DART would not be acquiring property in conjunction with the proposed project, Phase I ESAs (basic hazmat assessment) and Phase II ESAs (sampling of soil, and/or potential asbestos and lead-containing paint materials, etc.) will be conducted for sites whereat existing buildings and developed property would be disturbed by the proposed project. The revised ASTM E 01527-05 standard for conducting Phase I ESA requires that a Phase I ESA be conducted within six months of acquisition of the property. DART will not acquire use of the property until just prior to construction. The findings of a Phase I ESA will indicate when a Phase II is appropriate, and if so, what parameters should be investigated. DFW Airport's Environmental Affair Department (EAD) would be involved in all aspects of the ESA process once the project is ready to move forward. Any recommended remediation or safety procedures would be included in the MOA between DART and DFW Airport governing use of the property.

- More specifically, Phase I ESA(s) would be conducted at the Federal Express facility parking lot, 3010 North Airfield Drive, and new Federal Express parking location, prior to site demolition/modification and re-construction.
- Phase II asbestos and/or lead-based paint survey(s) may also be conducted, if/as appropriate, at the warehouse building located at 3010 North Airfield Drive prior to site demolition/modification and re-construction.
- Phase II soil testing would also be conducted in the NE Cargo Area VCP, in accordance with DFW Airport requirements, prior to earth disturbance as well as during construction, if/as required.
- Additional soil testing would be conducted during earth-disturbing activities, promptly upon the discovery or exposure of potential additional and heretofore unforeseen hazardous materials.

These investigations would, in turn, provide a basis for determining construction health and safety specifications, asbestos or lead-based paint management or remediation practices, contaminated soil and groundwater remediation, and appropriate disposal procedures. The design and preparation of any required monitoring and remediation plans would be coordinated with the TCEQ and TDSHS if necessary.

The following additional mitigation measures would be undertaken in conjunction with the proposed project to address concerns, to the extent possible, associated with the moderate and higher risk sites previously identified as potential present or future hazardous materials sources within and surrounding the proposed LRT alignment.

First, all major construction on DFW Airport property requires the review and approval of the DFW Airport EAD. The construction plan approvals and/or associated permits for construction issued by DFW Airport, typically detail setbacks [as may be required for construction around the Northeast Cargo VCP (MAP ID 1A)], as well as specific requirements for soil monitoring and management, hazardous materials management, storm water management and related environmental protection tasks throughout the duration of proposed construction and operation. DART would comply with DFW Airport's requirements throughout the project, in accordance with the terms of the negotiated MOA. These requirements would also apply to construction of non-rail related construction components, such as the parking mitigation site for Federal Express.

It is through DFW Airport's various codes, permitting and management processes that many of the inherent risks associated with natural gas exploration and production activities are also controlled on airport property, to the extent possible. The drilling/production company is

responsible for maintaining compliance with its agreements with DFW Airport, and for complying with all applicable federal, state and local regulations. As part of the DFW Airport requirements, the drilling/production company procures permits for each well, frac pond and pipeline it installs. Not only do these permits detail setback requirements, but they also contain standard operation and closure requirements. For example, several airport documents specify that the drilling/production company would be required to close and remediate frac pond AD, relocate an access road for pad site AD, reduce the size of pad site AD and relocate associated electrical and water lines, etc. prior to construction of the DART LRT line, should these items conflict with the final LRT alignment plans. The airport's various codes, permits and management processes, and the drilling/production company's regulatory compliance commitments, assist to reduce but do not eliminate, the inherent risks associated with the natural gas exploration and production activities in proximity to the proposed LRT alignment.

Next, to minimize DART's exposure to potential subsurface contamination within the CTA site polygon (MAP ID 1F), DFW Airport has committed to handling all earthwork, site preparation and subsurface construction for the proposed LRT line, extending from the alignment's central airport terminus, planned to be located between Terminals A and B, northward to a point approximately 150 feet north of the aircraft taxiways bridge crossing over International Parkway. Within the CTA, DART's construction activities would be limited to aboveground items, such as rails, ties, catenary structures, etc.

The proposed project is also being designed such that the plane of the proposed LRT alignment would be elevated to widely span each water crossing. This would not only minimize the project's potential disturbance of waters of the U.S., wetlands and their associated floodplains, but would also minimize its potential exposure to subsurface residual glycol byproducts that may, or may not, be present in soils surrounding each water crossing (MAP ID 1G).

Careful construction planning is also being undertaken to avoid damage to existing utilities, especially those carrying hazardous materials.

Finally, if any unanticipated sources of hazardous or regulated materials are encountered during construction activities, DART Technical Specifications Section 01560 Environmental Protection part 1.6 requires the construction manager or designee immediately notify DART's Environmental Compliance Division and suspend any work in the area of suspected contamination. Appropriate mitigation activities, which address the type, level and quantity of contamination encountered, would be developed by DART and immediately implemented. The handling, treatment and disposal of any hazardous materials would also occur in full compliance with all federal, state and local requirements and include coordination with appropriate regulating agencies and DFW Airport EAD.

In conclusion, while all potential hazardous materials impacts associated with the implementation of the proposed LRT alignment can not be entirely abated, the impacts would be minimized with the implementation of the aforementioned preventative mitigation measures: advance negotiations and agreement(s) to govern issues related to hazardous materials, advance site investigation, sound project planning and the utilization of BMPs during construction as detailed in the most current construction storm water regulations (NPDES or TPDES), Chapter 8 of the *Texas Nonpoint Source Management Program, National Menu of Stormwater Best Management Practices* developed by the U.S. EPA, and the *Integrated Storm Water Management Design Manual for Construction* developed by the NCTCOG. Following through with responsible long-term care and management of developed facilities, it is possible that the implementation of the proposed LRT alignment, itself, would help to lessen hazardous materials impacts from other

forms of transportation in the area, by providing a mass transit means that helps to reduce the number of vehicles on the road while providing a controlled/managed entity responsible for its own care and maintenance, including ongoing compliance with environmental health and safety regulations and long term utilization of best environmental management practices.

4.21 Environmental Justice

This section analyzes potential environmental justice concerns of the proposed project. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, calls for federal agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of federal programs on minority and low-income populations.

The general principles required under EO 12898 are as follows:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process;
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

In addition to complying with EO 12898, the Department of Transportation is committed to Title VI of the Civil Rights Act, which provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of or be subject to discrimination under any program or activity receiving federal financial assistance.

Typically, environmental justice analysis involves collecting demographic information within the area where the project has potential to cause significant adverse effects; identifying low-income and minority populations in that area using census data; and identifying whether the project's adverse effects are disproportionately high on the identified low-income and minority populations in comparison with those on other populations. If adverse impacts of the LRT project fall disproportionately on minority and low-income populations, mitigation measures would be identified.

As detailed in sections 4.1 and 4.2, this atypical transit corridor is located almost entirely on DFW Airport property and there are no populations (minority/low-income nor non-minority/non-low-income) within proximity to the proposed project. Therefore, there are no environmental justice populations.

Public Outreach

Throughout the EA and prior planning phases, DART has made every effort to notify community residents, business owners and stakeholders. Throughout 2009, design and construction meetings for the Northwest Corridor to the DART Orange Line included a discussion of the DFW Airport Extension project. Project-specific public meetings were held on June 17, 2009 and October 20, 2009 (Scoping Meeting). A third public meeting will be conducted on April 28, 2010. It is anticipated that a formal public hearing to receive comments on the EA will be conducted in May 2010.

Special efforts were made to notify and inform the low-income and predominantly minority community. These outreach methods included:

- Brochures were placed on targeted bus routes, area transit centers (via windshield distribution) and on LRT and TRE trains. Direct mailings and door hangings to households, businesses and schools near the Orange Line were also distributed.
- Notices were posted on the DART web-site (www.dart.org), the project website (www.dart.org/dfwextension) as well as the City of Irving website, the Irving Chamber website and the DART Spanish Language website (www.transporteDART.org).
- Meeting notifications were printed in several papers, including The Dallas Morning News, which has the widest circulation, as well as the Irving Journal and Irving Rambler. Ads were placed in weekly minority publications such as El Extra, El Sol de Texas, Al Dia, Korea News, Dallas Chinese News, Dallas Weekly, Dallas Examiner and Elite News.
- Project Newsletters were made available in Spanish through the DART Spanish Language website (www.transporteDART.org).

DART uses a special outreach service that targets Spanish-speaking households for corridor meeting notices and education efforts. One new approach has been to advertise DART public meetings on Spanish television stations during the evening news broadcast with what is known as the “Calendario Comunitario,” or Community Calendar, which lists upcoming public events free of charge. DART’s Spanish website is completely separate from DART’s English website. The Spanish website is designed to get the Hispanic community more involved in all DART corridors, projects and issues.

Environmental Justice Impacts

No Build Alternative

No changes to existing conditions would occur in the No Build Alternative scenario, therefore no adverse impacts would be anticipated with the No Build Alternative.

LRT Alternative

No environmental justice impacts would be anticipated to result from the proposed action. The nearby area is unpopulated, due to the project’s location within DFW Airport property boundaries. No impacts to any populations, neither minority/low-income nor non-minority/non-low-income, would be anticipated to occur as a result of the LRT Alternative.

As detailed throughout this document, there would be very few adverse environmental impacts including social and economic effects, associated with the proposed action. There would be no residential displacements, no adverse impacts to neighborhood integrity or community cohesion and no adverse impacts to community facilities or parklands. The proposed LRT line would not introduce new boundaries, but would reinforce existing ones.

The proposed action would displace two businesses. An existing warehouse building located at 3010 North Airfield Drive, currently occupied by IAS Air, would be displaced by the proposed project. The property is owned by DFW Airport. Also, a portion of the Federal Express trailer storage and employee parking lot will be required as ROW for operation of the proposed LRT alternative. Despite these displacements, no adverse impacts are anticipated to be borne by environmental justice populations that would not be equally borne by other populations within the project area.

The proposed action would provide benefit to low-income and minority populations as part of the broader community as a whole by improving traffic flow and access within the project area and providing the infrastructure necessary for the future growth of the area. The project would provide transit access to DFW Airport for both travel and employment opportunities. Therefore, no disproportionately high and adverse impacts on minority (Hispanic or Latino, Black or African-American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander) and/or low-income populations appear to be associated with the project. In addition, DART staff has documented their efforts to ensure full and fair participation by all potentially-affected communities in the transportation decision-making process.

Mitigation Measures

No mitigation measures would be required.

CHAPTER 5. CONSTRUCTION RELATED AND CUMULATIVE IMPACTS

5.1 Construction Impacts

Short-term impacts and mitigations associated with constructing the DFW Airport Extension project are documented in the following section. The construction scenario describes the construction process while the other sub-sections analyze short-term construction impacts by impact category.

5.1.1 Construction Scenario

It is anticipated that DART would award the construction contract for the DFW Airport Extension as one primary design/build contract. An overview of the anticipated construction activities (Facilities, Trackwork, Systems, and Landscaping) follows. Discussion of necessary staging areas and coordination with other construction projects is also included.

Facilities Construction

The proposed LRT alignment would contain aerial, at-grade, and cut construction components. Table 5-1 outlines the summary of work for each type of construction by elevation.

| Table 5-1. Construction Activities and Equipment by Elevation | |
|--|--|
| <i>Construction Location and Activities</i> | <i>Typical Construction Equipment Used</i> |
| At-Grade LRT 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 |

Table 5-1. Construction Activities and Equipment by Elevation

| <i>Construction Location and Activities</i> | <i>Typical Construction Equipment Used</i> |
|--|---|
| 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 LRT 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 LRT 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 Environmental Impact Statement Northwest Corridor LRT Line to Irving and DFW Airport, 5-54.

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 precede concurrent with open cut and bridge construction, but would be phased so as not to 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 corridor 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.

Systems Construction

Systems construction would follow substantial completion of trackwork installation. This would provide for the installation of traction electrification, 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 LRT alignment. This work would be performed concurrent with, but towards the end of, the trackwork and systems contracts.

LLWAS NE #4 Mast Relocation

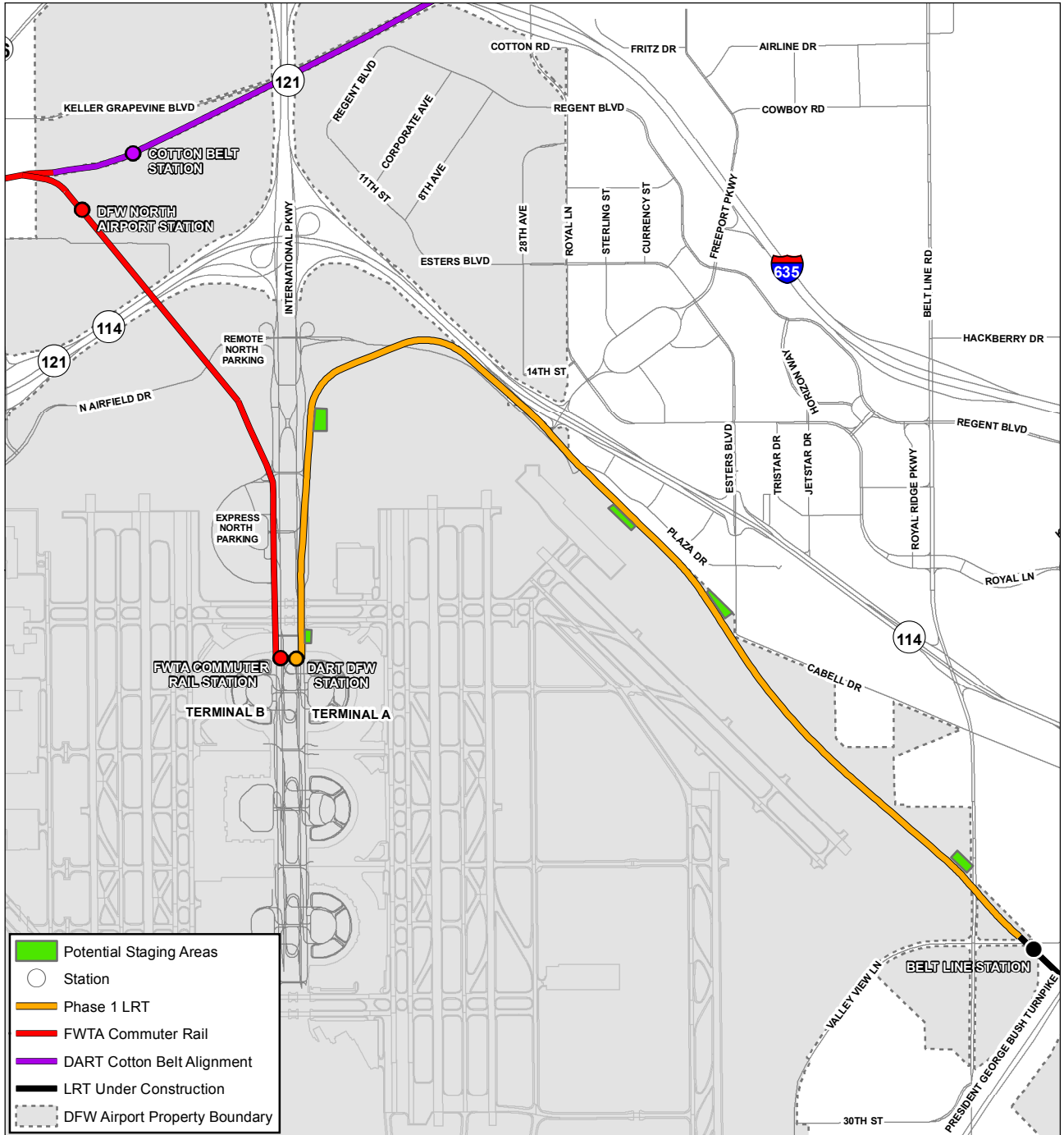
Construction activities related to the relocation of a mast pole holding the LLWAS-NE # 4 and ASDE-X RU #2 would involve a hot cut-over to minimize wind shear detection capability downtime. The hot cut-over would best be achieved by construction of a new mast pole with the required infrastructure and associated electronic equipment at the new site and then cut over to the new system at a predetermined FAA timeline. Installation would require clearing and grubbing, minor grading, construction of an access or maintenance driveway to the tower, a drilled shaft foundation, and shallow trenching for necessary wiring. The FAA systems would be operational prior to the removal of the existing mast pole.

The mast pole would be relocated approximately 2000 feet southeast of the existing location on North Airfield Drive. The proposed relocation site would be co-located at an existing FAA communications facility (RTR 1E) as shown in figure 3-1. The proposed location for the mast pole would meet FAA's requirements for wind coverage and detection of wind shears. Both sites are along the northeastern boundary of the airport with access off of North Airfield Drive. Operation of both FAA systems must be maintained during the construction of the proposed project.

The relocation will additionally require changes to the TDWR, the ITWS, and ASDE-X RU #2. Coordination with the FAA will be needed during the relocation of the LLWAS NE #4 and associated elements. Adequate time would be planned for to allow for the development of required software adaptations, testing, and integration.

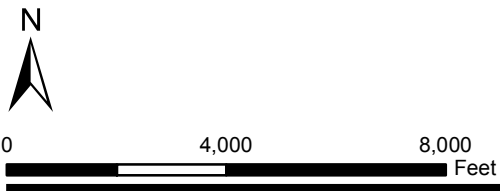
Construction Staging Areas

Several staging areas may be required for the storage of equipment and materials used for the construction of the project. Potential staging areas are identified in figure 5-1. All of these areas would be located adjacent to the proposed LRT alignment. Their final size and location would be determined by the selected design/build contractor as the project progresses through final design. Five areas currently under consideration include:



Source: NCTCOG 2008 and 2000

FIGURE 5-1



POTENTIAL CONSTRUCTION STAGING AREAS

DART Irving-3 Environmental Assessment

- property located at the northeast corner of Belt Line Road and Valley View Lane;
- a linear site located northwest of Hackberry Creek near Esters Road;
- the current site of the warehouse building located at 3010 N. Airfield Drive (depending on the measures decided upon to mitigate displacement of parking and a portion of the building) and the adjacent vacant lot;
- the area near Civil Station 700+00 currently used as a Chesapeake Energy staging and “frac pond”; and
- the future site of the proposed rail storage track yard.

Construction Staging Areas Impacts

If exposed to the weather, some 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:

- the 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 (01560-2,3).

The *DART Facilities Standard Specifications Section 01560 Part 1.3E, Water Resources* states that a SWPPP should 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 storm water 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 (7-77). 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 proposed project would be coordinated with Dallas County, the City of Irving, TxDOT, North Texas Tollway Authority (NTTA) and DFW Airport. Table 5-2 summarizes on-going projects that would influence the design and construction of the light rail project.

FAA facilities impacted include utility crossings as described in table 4-4. 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 5.2.

Table 5-2. Construction Coordination

| <i>Related Project or Study</i> | <i>Area of Impact</i> | <i>Issue</i> |
|---------------------------------|---|---|
| DART I-2 | Belt Line Station area and tail track | It is likely that the Belt Line Station area would not be fully constructed when the I-3 contract is initiated in 2011. |
| DFW Connector | SH 114 | Timing and coordination of concurrent construction activities near the “pinch point.” |
| FAA Infrastructure Improvements | Areas where FAA utilities will be relocated | The implementation of the LRT project would impact FAA infrastructure in a few locations. The DART contractor would have to coordinate with the DFW Airport/FAA contractor. |

Source: URS Corporation, 2010

5.1.2 Impact Categories

No Build Alternative

The current condition of airport property would remain largely as it is today if the No Build Alternative is selected. Therefore, no construction impacts are anticipated, because no rail construction would occur.

LRT Alternative

Short-term impacts and mitigation associated with constructing the proposed LRT 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, substations, 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. At the two sensitive land uses identified in section 4.7 and in figure 4-12, noise impacts from nighttime construction would be much more extensive, which emphasizes the importance of avoiding nighttime construction near these receptors.

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 (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 ROW. Other construction activities that could cause intrusive vibration include vibratory compaction, jack hammering, and the use of tracked vehicles, such as bulldozers.

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.



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 LRT Alternative would affect several major and minor roadways in the City of Irving and within DFW Airport. When roadway or lane closures would be required during construction of the LRT Alternative, DART and its contractors would coordinate with the traffic control divisions of the City of Irving and DFW Airport to maintain reasonable and safe traffic operations at affected crossings. Table 5-3 illustrates how crossings and adjacent roadways in the corridor would be impacted by project construction.

| Table 5-3. Construction-Related Traffic Impacts | | | |
|---|---------------------|--|--|
| <i>Street</i> | <i>LRT Location</i> | <i>Lanes Blocked During Construction</i> | <i>Alternate Routes Available</i> |
| Belt Line Road/506+00 | over | 1-2 | SH 161 |
| Navaid Road/558+00 | at-grade | 1 | none |
| 17L Navaid Drive/586+00 | over | 1 | none |
| Plaza Drive/633+00 | at-grade | 1 | none |
| Freeport Parkway/644+00 | over | 1-2 | Esters Road |
| Maintenance Road/678+00 | over | None | none |
| North Airfield Drive/686+00 | Over | 1-2 | SH 114 |
| Chesapeake Energy Access Road/714+00 | at-grade | 1 | none |
| North Service Road/727+00 | under | 1 | none |
| Crossunder #1 /727+00 | over | 1 | none |
| Crossunder #2 /761+00 | at-grade | 1 | none |
| North Service Road/760+50 to 764+00 | adjacent | 1-2 | none |
| Ramp from the eastbound Terminal B-to-Terminal A access road to North International Parkway/765+75 to POE | adjacent | 1 | South International Parkway to numerous U-turn locations |
| North Service Road/760+50 to 764+00 | adjacent | 1-2 | none |

Source: URS Corporation, 2010

Traffic Mitigation

The City of Irving and DFW Airport require notification of all construction activities within their jurisdictional boundaries. The construction contractors should 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*).

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 should be used when appropriate. Private business parking areas and driveways should not

be used for equipment maneuvering or parking. Construction specifications should 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.

For airport roads, coordination with DFW Airport would be required. Access to five FAA facilities would be maintained during construction activities as described in the *Assessment and Analysis of Potential Operational Impacts from the proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 route, onto the Dallas/Fort Worth International Airport* report (see appendix L) written by Jacobs Engineering Group, in June 2010. These facilities include the RTR 1E, 2E, and 4E locations, RWY 17L and 17R approach light station, and LLWAS-NE #4. The mast pole holding the LLWAS-NE # 4 and ASDE-X RU #2 would be relocated during the construction process from its current location to a portion of the RTR 2E site. The relocation operation would be coordinated with DFW Airport and FAA in order to ensure continuous operation of the equipment in what is described as the “hot cut-over” method. The contractors would follow the same DART Construction Guidelines. An MOA between DART and DFW Airport will detail the governing procedures for traffic control.

Public Services, Safety, and Security

DFW Airport has jurisdiction for fire protection and emergency medical services on airport property.

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 Airport LRT Station during construction and operation phases of the project.

Wildlife and Threatened or Endangered Species

Wildlife, including threatened, endangered, and rare species, are mobile in nature and would most likely relocate away from disturbances during construction activities. However, avoidance of habitat destruction, especially in riparian areas, is an important consideration. Construction techniques should be designed to avoid and preserve existing mature native trees and shrubs.

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” (25). 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.

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.

Water Resources

Construction activities within the ordinary high water mark at Ephemeral Drainage-1 (see figure 4-16) 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 LRT 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 4.16, 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.

Ephemeral Drainage-1 and other 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 should 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 should 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 4.17, the proposed LRT alignment is located within the nine-county ozone nonattainment area for North Central Texas and has been included current 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 5-1.

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 of Air Quality Impacts

For the proposed LRT 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.

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 should 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 LRT alignment would include excavation for the development of: LRT 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

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 (7-77), 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.

5.2 Disruption of Utilities

Inventory

An inventory of utility crossings by the proposed LRT alignment was conducted by the PE team and consists of various utilities within the proposed project ROW including communication, electric distribution and service lines, water supply, storm drain and sanitary sewer lines, fuel and natural gas lines, and various underground duct banks. More than 100 utility crossings have been documented at this time.

Existing utility information was collected by gathering record drawings and other documents from DFW Airport, Dallas Water Utilities (DWU), the City of Irving, Oncor Electric Delivery, Atmos Energy, Chesapeake Energy, Verizon, Qwest, AT&T, and other utility companies. Approximate locations of existing utilities are shown on the I-3 Existing Utility Composite Sheets and must be verified by the contractor prior to the commencement of construction activities. The completeness and/or accuracy of the utility information cannot be guaranteed except by field measurement.



In an effort to begin the verification of existing utilities as soon as possible, preliminary subsurface utility engineering (SUE) investigations of “critical” utilities were initiated during the 10% preliminary design effort. Existing utilities in approximately 45 locations were selected to be potholed and surveyed. Potholing consists of localized excavation of the utility line with a vacuum truck allowing the exact horizontal and vertical location of the existing utility line to be identified and documented. In addition to potholing, existing utility lines were located horizontally in many areas of the corridor using available methods such as electromagnetic and acoustic technologies or the survey of above ground features associated with the utility lines. Approximately 18,000-feet of existing utility lines were horizontally designated and documented within the corridor. The preliminary SUE information is included with the project Design Report found in Appendix I.

Impacts

No Build Alternative

There would be no adverse impacts generated by the No Build Alternative.

LRT Alternative

Construction of the proposed LRT alignment would cause short-term impacts to area utilities due to line disruptions, relocations, and general improvements. The most important utility crossings or potential utility modifications that may be required for the design and construction of the proposed LRT alignment are included in table 5-4. Each utility is defined by owner, type, and approximate engineering station along the proposed LRT alignment.

The locations of utility lines that may need to be relocated cannot be precisely known until the project progresses to a higher level of design. During final engineering design or prior to construction, the designer of the DFW Airport Extension and/or contractor should verify and obtain accurate horizontal and vertical information for all existing utilities using additional SUE investigations or other methods as required to obtain appropriate information necessary for the final design and construction of the project. The preliminary SUE efforts described above are only the beginning of the recommended utility investigation efforts required for the successful completion of this project.

Table 5-4. Proposed LRT Alignment – Utility Crossings / Potential Utility Modifications

| <i>Owner</i> | <i>Type of Utility</i> | <i>Civil Station</i> |
|---------------------|--|----------------------|
| Verizon | Underground Duct Bank | 506+00 |
| AT&T | Underground Duct Bank | 507+50 |
| Oncor / Time Warner | Overhead Electric Cables | 507+60 |
| Oncor | Underground 138 KV Electric Conduits | 513+75 |
| FAA | Underground 2,400 Volt Direct Electric Cable | 557+90 |
| FAA | Underground 100 Pair Copper Cables | 559+80 |
| Verizon | Underground Telephone Duct Bank | 587+50 |
| Oncor | Overhead Electric Distribution Line | 604+00 to 612+00 |
| Qwest | Underground Fiber Optic Cable | 611+75 to 626+25 |
| Qwest | Underground Fiber Optic Cable | 638+50 to 647+00 |
| DWU | 30-Inch Water Main | 644+50 |
| DFW Airport | 30-Inch Water Main | 645+00 |
| Time Warner | Underground Fiber Optic Cable | 646+25 |

Table 5-4. Proposed LRT Alignment – Utility Crossings / Potential Utility Modifications

| <i>Owner</i> | <i>Type of Utility</i> | <i>Civil Station</i> |
|---------------------|---|----------------------|
| Chesapeake Gas | 8-Inch Fuel Line | 646+50 to 655+00 |
| Chesapeake Gas | 8-Inch Natural Gas Line | 648+00 to 669+00 |
| Oncor | Overhead Electric Distribution Line | 676+70 |
| DFW Airport | 24-Inch PVC Water Main | 686+10 |
| DFW Airport | 16-Inch Water Main Stub | 686+20 |
| Qwest | Underground Fiber Optic Cable | 686+20 |
| Time Warner | Underground Fiber Optic Cable | 686+40 |
| Oncor | Underground Electric Conduit | 688+00 |
| Chesapeake Gas | 8-Inch Fuel Line | 692+30 |
| Chesapeake Gas | 8-Inch Natural Gas Line | 701+80 |
| Oncor | 4-Inch Underground Electric Service Conduit | 718+60 |
| DFW Airport | 84-Inch Storm Sewer Line | 723+75 |
| DFW Airport | 36-Inch Water Main Line | 727+70 |
| DFW Airport | 21-Inch Water Main Line | 729+15 to 733+20 |
| DFW Airport / Oncor | 10 E 6 Underground Electric Duct Bank | 730+00 to 735+00 |
| Verizon | Underground Telephone Conduit | 748+30 |
| DFW Airport | 24-Inch Storm Sewer Line | 748+95 |
| DFW Airport | 10 E 6 Underground Electric Duct Bank | 749+50 to 750+20 |
| DFW Airport | 30-Inch Storm Sewer Line | 751+75 |
| DFW Airport | 12-Inch PVC Water Main Line | 752+15 |
| DFW Airport | 8-Inch Sanitary Sewer Line | 752+30 |
| DFW Airport / Oncor | 10 E 6 Underground Electric Duct Bank | 753+00 to 762+00 |
| DFW Airport | Various Storm Sewer Lines | 753+48 to 760+54 |
| Verizon | 6-Way Underground Telephone Conduit | 761+30 |
| FAA | Telephone Conduit | 761+65 |
| DFW Airport | Storm Sewer Line | 761+70 to 763+10 |
| DFW Airport | Storm Sewer Line | 763+40 to 766+80 |
| Oncor | Underground Electric Duct Bank | 763+90 |
| Verizon | 6-Way Underground Telephone Conduit | 767+90 |
| DFW Airport | Multiple 8-Inch Water Lines Inside Utility Tunnel | 767+98 |
| DFW Airport / Oncor | Underground Electric Duct Bank | 768+20 |

Source: Utility crossing data was obtained from the Irving/DFW Corridor Belt Line Road to Terminal A Station Line Section I-3 Phase I 10% Utility Modifications Design Report

Mitigation Measures

No Build Alternative

No mitigation would be required as a result of the No Build Alternative.

LRT Alternative

Alternatives to utility disruptions include limiting construction around existing utility lines and disallowing excavations, removal of fill, or grading during construction. However, in order for construction contractors to build around existing utility lines, substantial excavations and grading

may be unavoidable. Contractors would be directed to consider the following items in their construction specifications for mitigation of utilities:

- Prior to construction, all proposed alterations of utility lines on airport property will be coordinated with DFW Airport staff and FAA. This coordination will establish procedures for maintaining services that are vital to airport and FAA operations. Certain utilities cannot be disrupted for even a short duration.
- Prior to construction, all area utility companies, utility agencies, DFW Airport, and FAA will be contacted and requested to provide line location measures and approval of the proposed alteration of utility lines.
- Off-airport businesses and residences affected by utility disruptions should be notified of the disruptions at least two weeks in advance.
- Down periods for off-airport businesses should occur during non-business hours and never exceed a 24-hour period.
- Businesses such as restaurants, grocery stores, or food preparation/manufacturing facilities should be accommodated in order to protect food preparation storage mechanisms.
- During construction, should utilities be identified that were not identified prior to construction, work will be discontinued and appropriate utility companies and agencies will be contacted to identify the line(s). The newly identified line(s) will not be disrupted until businesses and residences are notified and the utility owner/operator has approved the proposed alteration.

5.3 Cumulative and Indirect Impacts

Cumulative effects are the combined impacts of independent projects and the DFW Airport Extension on the environment. Cumulative effects refer to those effects that “...result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

Indirect impacts are defined by federal law as 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 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” (40 CFR 1508.8).

The Council on Environmental Quality has provided guidance for evaluating indirect impacts. Guidance can also be found in the National Cooperative Highway Research Program (NCHRP) Report entitled: *NCHRP Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*.

5.3.1 Inventory of Related Projects

The discussion of cumulative effects presented below relates to the proposed LRT alignment and other past, present and reasonably foreseeable future actions planned by DART, DFW Airport, TxDOT, the City of Irving, the City of Dallas, the T, and the NCTCOG. Table 5-5 lists the relevant projects addressed in this document (see figure 5-2).

These projects fall within a geographic boundary determined appropriate by evaluating natural boundaries such as water sheds, landscapes, human communities, and natural barriers. The time frame for “reasonably foreseeable future actions” included all airport planning activities listed in the ALP regardless of whether they are funded and programmed. This extremely broad timeframe was determined appropriate because of the limitations presented for airport improvements from both a funding perspective as well as a development timeframe.

Table 5-5. Past, Present and Reasonably Foreseeable Future Actions

| <i>Project Name</i> | <i>Description</i> | <i>Timeframe</i> | <i>Implementing Agency</i> |
|---|---|--|----------------------------------|
| Irving-2 LRT | The Orange Line LRT diverging from the Green Line and connecting to downtown Dallas. Belt Line Station is on airport property and within the project area. | Currently under construction. Expected to open in 2012. | DART |
| Irving-3 LRT Phase II | LRT line diverging from the proposed LRT alignment at Freeport Parkway to serve the proposed DFW Airport North Station along the Cotton Belt rail corridor | TBD – This project may be implemented in conjunction with Cotton Belt Express Rail service | DART/public-private partnership |
| Cotton Belt Express Rail | Passenger rail service along the existing Cotton Belt rail corridor from the DFW Airport North to the DART’s Red Line | 2030 or earlier, dependant on funding through PPP | DART/public/private partnership |
| TEX Rail | Commuter rail service from Sycamore School Road in SW Fort Worth through downtown Fort Worth then terminating at DFW Airport Terminal B | 2015 | the T |
| DFW Connector Project | 14.4-mile project to rebuild SH 114 and SH 121 corridor through Southlake, Grapevine, and the north edge of DFW Airport. At its widest point on SH 114, the DFW Connector will have up to 24 lanes, including 14 main lanes, four toll-managed lanes, and six frontage road lanes. | Construction underway, anticipated completion in 2014 | TxDOT/public/private partnership |
| Northeast Perimeter Taxiway Extension | An end-around taxiway will be created and existing taxiways J, M & N will be extended to connection the perimeter taxiway. This project would allow access between the terminals and the runways without crossing arrival and departure traffic. | Dependent on funding. | DFW Airport |
| East Airfield Drive/ North Airfield Drive Extension | This project would expand existing East Airfield Drive to four lanes and extend the road to the north under the east diagonal runway. This would complete the Airfield Drive loop around the airport and increase the development potential on the east side of the airport. The project would begin on existing Airfield Drive north of the American Airlines hangar. Two north bound lanes would be constructed to the end of the existing Airfield Drive | Planning currently underway. No timeframe set for construction or completion. | DFW Airport |



Table 5-5. Past, Present and Reasonably Foreseeable Future Actions

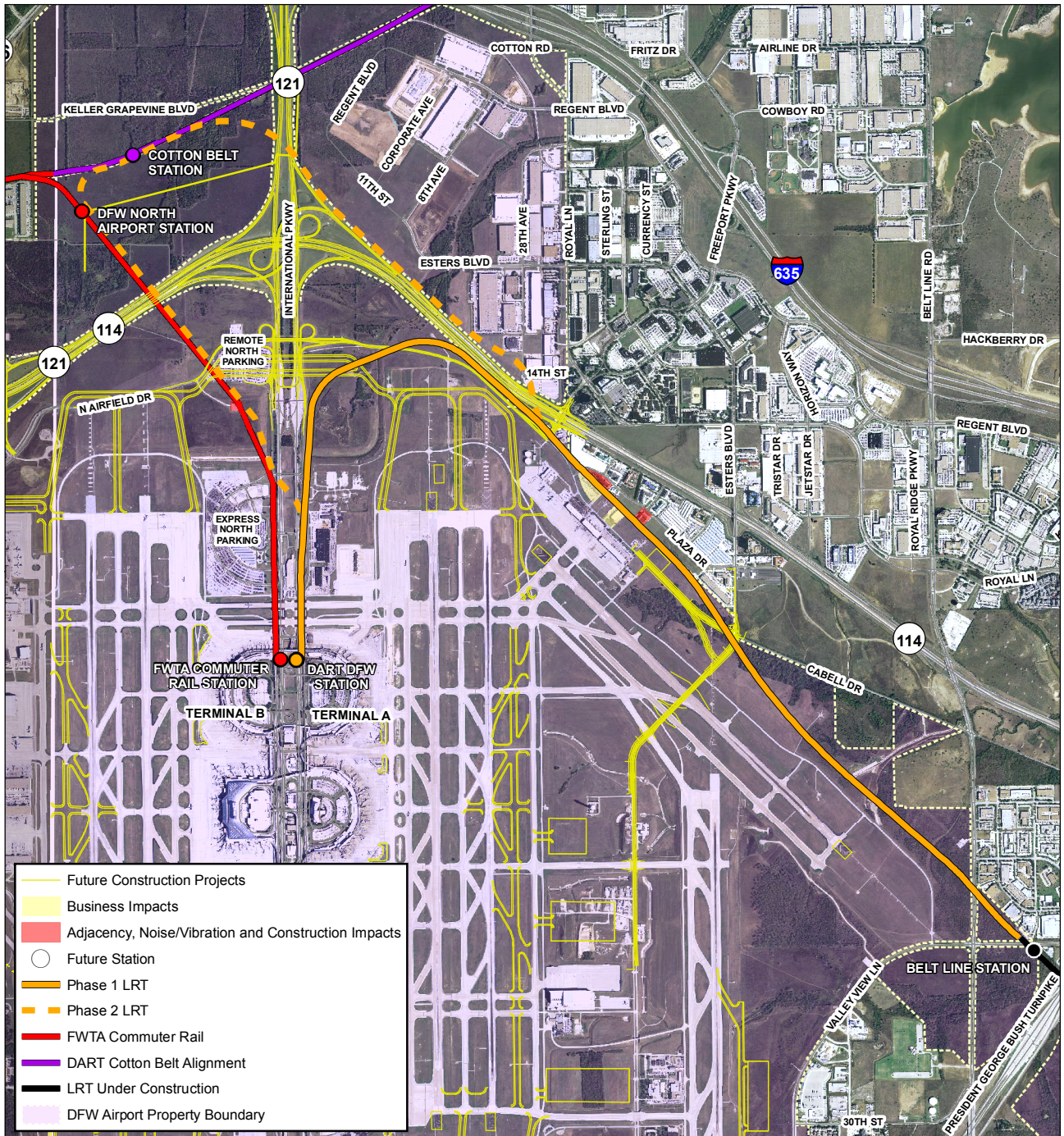
| <i>Project Name</i> | <i>Description</i> | <i>Timeframe</i> | <i>Implementing Agency</i> |
|--|---|--|------------------------------------|
| | and from that point four lanes of construction would continue under the diagonal runway toward the intersection of Cabell Road and Esters Blvd. | | |
| Terminal Link Route Revisions | Construct seven bridges between revenue and non-revenue areas to reduce counter clockwise terminal link route by 43%. | construction: 2012 opening date: 2013 | DFW Airport |
| DFW Airport Commercial Land Use Plan | DFW Airport has developed a Commercial Land Use Plan for several areas on its property. The development of these parcels is based on need. | Ongoing | DFW Airport/ Private Developers |
| Gas Well Exploration, Drilling, and Site Operations activities | Remaining Gas Pads are located on the east side and south of the central terminal area. Existing operation sites are located on the north and west sides of the central terminal area. | Construction of new wells will resume when gas prices allow for additional production. | Chesapeake Energy |
| Cottonbelt Trail Expansion | Eastward continuation of the existing trail along the Cotton Belt railroad ROW. | Unknown | City of Grapevine |
| Natural Gas Pipeline Construction | Construction of a new transmission line to connect the existing and proposed gas pad sites to the compression station and to create a loop for redundancy. The majority of the remaining pipeline is on the east and northeast side of the airport. Small segments of the pipeline remain south of the central terminal area. | Dependant on construction of new wells. | Chesapeake Energy |

Source: Gregory Royster, DFW Airport; <http://txdot.gov/>; <http://www.sw2nerail.com/>; and John Hoppie, DART Cotton Belt Project Manager

5.3.2 Impact Areas

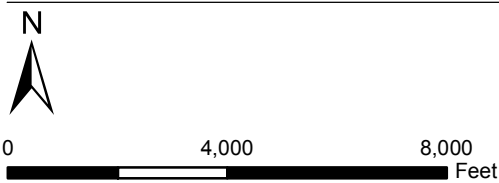
Airport Impacts

Future planned construction of the Perimeter Taxiway Bridges over International Parkway may be affected by the proposed LRT Alternative. Final design of the LRT alignment will incorporate modifications to DART’s standard design and clearances for catenary wires in order to allow DFW Airport more flexibility for the design of the Perimeter Taxiway Bridges. The proposed LRT alignment will occur in an open cut in order to provide for a bridge with a more gradual slope for



Source: NCTCOG 2007

FIGURE 5-2



REGIONAL PLANNING PROJECTS
 DART Irving-3 Environmental Assessment

airplane use. Structural supports may be added near the proposed LRT alignment if the Perimeter Taxiway Bridge project is constructed.

Impacts due to vibrations created by train operations may occur as a result of the TEX Rail project as it passes the ASR-9 tower located west of International Parkway. DART's Irving-3 Phase II LRT project may increase the vibration levels, or frequency, at that location. However, the proposed DFW Airport Extension would have no cumulative effect on this airport tower. Current studies conducted by the T are evaluating the potential impacts to this facility.

Zoning and Land Use

Future land use would very likely be affected by the Irving-3 LRT Phase II, TEX Rail project and by the *DFW Commercial Land Use Plan*. Other entities with jurisdiction over land within the area include the City of Grapevine, City of Coppell and the City of Irving.

Induced (indirect) economic growth would likely result from the introduction of light rail, commuter rail, and any transit stations in the project area. This growth could affect land-use patterns in the project vicinity, particularly around station locations. Mixed-use development, higher density development, and TOD would likely be attracted to available land within a quarter-mile of the proposed station locations. The City of Irving has a TOD Overlay District in place to address this potential shift in land use near the future Belt Line Station from commercial/office/industrial to a wider variety of land uses that could include residential, retail, and entertainment. There is also a development plan for the area near the TEX Rail DFW Airport North Station. On the portion of the land area that falls within the boundary of DFW Airport, no residential uses would be allowed.

The DFW Connector project would convert approximately 192 acres of primarily undeveloped land to transportation ROW.

Acquisitions and Displacements

Because the proposed LRT alignment is located on DFW Airport property, no acquisitions of property would be required. DART would not own the property, but use the property under a use agreement. Impact to two businesses including displacement is discussed in section 3.2.

The DFW Connector project would displace 16 businesses and remove a portion of surface parking lots at approximately 22 others. The types of businesses that would be displaced by the project are fairly common within the project area. They include fast-food restaurants, a gas station, convenience store, retail stores, small offices, a motel, and an automotive service shop.

Industrial and Commercial Activity

The *DFW Commercial Land Use Plan* (May 2007) calls for changes in land use for the DFW Airport property located north of SH 114. NCTCOG 2005 land-use data designates the airport land north of SH 114 as Institutional, Vacant, and Industrial. Analyses of aerial photographs show that existing land uses in this portion of the study area include Open Space/Vacant and Industrial/Aviation Related Uses. The majority of the land north of SH 114 is currently vacant. The DFW Airport plan includes changes to Industrial, Aviation Related Uses, Freeway Commercial, and Mixed Use for land uses within the Phase II study area. DFW Airport's International Commerce Park is located north of SH 114, south of IH 635, and east of SH 121. DFW Airport property west of SH 121 and south of SH 26 has been designated in the *DFW Commercial Land Use Plan* as a Hospitality/Entertainment area.

As previously noted, construction activities would contribute to community disruptions resulting from other development projects in the area. This may result in temporary, short-term economic impacts on local businesses. Construction may result in overall beneficial impacts on tax revenues with increases in employment and spending that help offset any short-term economic impacts.

Residential Areas and Community Resources

Although few residential neighborhoods exist in the general area and there are no communities adjacent to the proposed project or within the boundary of DFW Airport, construction activities would contribute to community disruptions resulting from other development projects occurring simultaneously in the area, especially the TxDOT DFW Connector project. This may result in a longer duration of noise and dust from construction, and greater traffic delays and traffic obstructions. The combined impact may heighten the perception of disruption experienced by the local community. These impacts may be concentrated in some locations at different times during construction but would diminish as the project concludes, and upon completion would no longer affect the community.

Political Jurisdictions

With regard to economic effects, the proposed action would have long-term benefits over the years for the jurisdictions it traverses and would further goals and policies for revitalization and investment within the study area. The fiscal benefits of operation would have a long-term impact for those communities. The loss of tax revenue would be offset by increased development near the Belt Line Station along the LRT alignment and the stations planned in the DFW Airport North area along the Cotton Belt and TEX Rail alignments. The proposed action would not result in a cumulative adverse impact during operation and would be economically beneficial to surrounding jurisdictions.

Visual and Aesthetic Resources

The elevated portions of the LRT Build Alternative would contribute to the number of above-ground structures in the project area, which would result in a limited adverse cumulative impact in those few areas with sensitive land uses, including the hotels in the vicinity of Plaza Drive. Related projects will be reconstructing and adding to the number of above-ground structures throughout the project area. However, the general visual identity of the area is characterized by transportation infrastructure and structures emphasizing horizontal planes, such as bridge overpasses.

The TEX Rail project is planned to terminate in a station platform located at Terminal B on DFW Airport property. Design efforts for this station are also being directed by DFW Airport staff; therefore, the station platforms have the potential to implement a cohesive design theme that would integrate the platforms, the pedestrian connection between them, and other terminal components.

Noise and Vibration

Noise and vibration levels in the corridor would be minimally increased with the proposed action, which would involve operating transit vehicles. The related projects would also likely increase noise and vibration, because they all result in increased travel. The proposed action was found to not produce adverse noise or vibration impacts. The level of increased noise would not be significant, because it would not involve violations of FTA noise guidelines. The possible future *Dallas/Fort Worth International Airport Development Plan* improvements may result in noise increases at some locations within the DART project area. However, the airport would adhere to

FAA noise guidelines for airport noise and mitigation for significant adverse effects. There are no other known LRT project locations at which related projects may produce substantial noise increases.

The TEX Rail project, along with the DART Irving-3 Phase II project, may impact the ASR-9 radar tower located north of Terminal B. Current studies conducted by the T are evaluating the potential impacts to this facility.

Pedestrian Movement

2030 ridership projections for both the T's TEX Rail project and DART's LRT have been considered in the development of a pedestrian way that will connect the two rail platforms to Terminals A and B. Implementation of the Phase II LRT Line prior to the year 2030 would relocate much of the transfer activity out of the CTA, therefore reducing the pedestrian movements through the DFW Airport LRT Station. DART would work with DFW Airport and the T in the design of the pedestrian way to ensure that future pedestrian movements are facilitated.

During construction activities, the existing DFW Airport employee pedestrian activity through the area would be allowed only in designated pathways. These pathways would be well marked and accessible from currently used building access points. Pedestrian safety considerations would determine the barrier types used and the pathways would change location during construction to limit hazards.

Traffic Flow

If the proposed action is implemented, travel opportunities by transit would be enhanced, transit trip times would be reduced to some locations, transit mode share would be increased, and roadway capacity would not need to accommodate this portion of the traveling public. These would all be considered beneficial cumulative effects.

Cumulative traffic impacts associated with the proposed action are expected to be limited and not adverse when mitigation measures are implemented. In general, new trips would not be generated by the proposed LRT alignment, but would be beneficially redistributed toward transit because of the increased availability of transit improvements.

The restrictions to traffic flow imposed by LRT operations on the north service road at Crossunder #2 will be duplicated on the south service road by the T's TEX Rail operations. The mitigation developed at this location took into account both rail lines.

While the DART station at Belt Line Road has previously been determined as not having a significant impact on the surrounding roadways, the planned TOD that will be built next to the station will generate a substantial amount of traffic and will have an impact on the area roadways. Depending on the amount of development that is open in each year, various geometric mitigation measures will be necessary to accommodate this additional traffic. Once the plans for this development are finalized, another detailed analysis should be conducted to determine the specific traffic impacts and what mitigation would be necessary in each year to maintain acceptable levels of service. This process is independent of the DART station. The proposed LRT alignment would be grade-separated where it crosses Belt Line Road near the station, and therefore should not contribute to delays in the area.

With regard to impacts on traffic during construction, several roadway improvement projects are planned in the project area. Several highway and local roadway projects are anticipated to require close coordination with the proposed LRT project. Improvements to SH 114 are scheduled to occur simultaneously with the proposed construction of the LRT alignment along SH 114 and may

result in localized congestion. DART would work closely with TxDOT, as well as any affected municipalities, during final design and construction to develop and implement specific traffic control plans that would minimize impacts and take into account the timing of both projects. These are short-term impacts that, upon completion, would no longer affect the community.

The DFW Connector project plans no off-site construction detours. Staged construction would allow traffic to utilize the existing route during construction. A traffic control plan would be developed that allows for the proposed improvements to be constructed while the project facilities remain open to traffic.

Parking

Cumulative parking impacts are limited to the implementation of the DFW Airport Extension (as described in this report), the TEX Rail, and subsequent Irving-3 Phase II extension. The TEX Rail project would traverse (in an open cut) the DFW Airport north employee parking lot. Approximately 300 parking spaces would be eliminated. The T, in conjunction with the DFW Airport and DART, is developing a proposed parking mitigation plan to replace the loss of employee parking.

Public Services, Safety, and Security

Increased traffic, particularly near the Belt Line and DFW Airport North stations, and induced development sites, have the potential to increase traffic incidents; however, rail access provides an alternative to the automobile. Corridor-wide, the potential cumulative effect of increased vehicle trips may be counterbalanced by a slight mode shift away from autos toward public transportation, especially for travel on SH 114 with DFW Airport as a destination. This effect could be argued to reduce cumulative accident potential, rather than add to it.

The proposed LRT Alternative could cause a slight increase in response time for fire or police personnel due to the anticipated timing of construction concurrently with the DFW Connector SH 114 improvements. Because construction would happen over a period of years and in different phases, impacts on fire and police services from this project, in conjunction with other development projects, may result in short-term cumulative impacts that would not meet the threshold of significant due to advanced notices on traffic detours and closures.

Due to the distance from any DFW Airport activity centers, the inventoried related projects are not anticipated to present any additional airport security issues. Section 3-11 addresses the safety and security of the proposed LRT alternative as it relates to the impacts of connecting the entire DART LRT system to the airport's central terminal area. Related projects expected to occur within the AOA by DFW Airport have their own security measures in place and are not expected to negatively affect the security condition of DFW Airport.

Electrical and Magnetic Fields

No additional EMF would be generated beyond the implementation of the DART project.

Parklands

One planned City of Grapevine trail has been identified in the study area. An expansion of the Cottonbelt Trail eastward along the Cotton Belt railroad ROW is planned by the city. The existing Cottonbelt Trail is a hard-surface trail paralleling the railroad ROW from Pool Road to William D. Tate Avenue. No other parklands would appear to be impacted by the cumulative implementation of the listed projects.

Vegetation, Wildlife, and Threatened or Endangered Species

It is highly unlikely that any threatened or endangered species would be adversely impacted by the proposed project. Coordination with the USFWS would continue during final design and construction in accordance with applicable laws and regulations to monitor for the presence of any threatened or endangered species or effects on those species' habitat. In summary, no cumulative impact on wildlife or threatened or endangered species would occur.

According to the *Environmental Assessment – DFW Connector – April 2009*, only small areas of each vegetation type would be removed for construction of the proposed project, relative to the total amount of vegetation occurring in the general vicinity. Undisturbed areas near the proposed project area could provide suitable habitat for any displaced species. Approximately 93% of land disturbed by the project is considered urban/developed.

Water Resources

With regard to waters of the U.S. including wetlands, potential impacts of the LRT Build Alternative would be restricted to bridge supports and would be minimal. The cumulative impacts of construction activities would not meet the threshold of significant because construction would be conducted in accordance with all applicable laws, statutes, and regulations. The DFW Connector project's current design plans indicate that the streams in the project area are to be spanned and existing vegetation under bridge structures will be left in place as much as is practicable.

The LRT route crosses four floodplain areas, but would not result in the displacement or modification of floodplains to the extent that properties not currently in a floodplain would be impacted. The TxDOT DFW Connector project estimates a total of 53 acres of floodplain occur within the project's existing and proposed ROW; however, only one of approximately nine areas where the proposed ROW is within floodplain areas is also within the general vicinity of the proposed LRT alignment. In accordance with current TxDOT design policy and standards, the hydraulic design practices for this project would permit conveyance of the 100-year flood levels, inundation of the roadway being acceptable, without causing substantial damage to the highway, stream or other property. The DFW Connector project would not increase the base flood elevation to a level that would violate the applicable floodplain regulations or ordinances (EA – DFW Connector 59); therefore, cumulative impacts would not be anticipated. The DFW Airport Perimeter Taxiway Bridge project is also located within the floodplain area. This project has not yet undergone conceptual design, therefore no assessment of its potential to impact floodplain capacity or impacts is possible; however, it is anticipated that DFW Airport's design for this project would not increase downstream flows. In accordance with FAA Order 1050.1E, the cumulative impact to floodplains is not anticipated to have a high probability of loss of human life, would have no affect on any vital transportation facility and would not cause adverse impacts to the natural or beneficial values of the floodplain.

The proposed LRT alternative could produce increased runoff, which could result in additional sedimentation entering surface water resources downstream of the project. The magnitude of expected adverse effects would be small, because the area is largely urbanized, and also because appropriate design provisions would be incorporated, including adequate drainage facilities to handle runoff. LRT-related runoff would be added to existing or potential runoff from other related projects, especially in areas where the *DFW Airport Commercial Land Use Plan* indicates future commercial land uses where vacant land now exists. Surface permeability would be greatly reduced in the areas near the proposed LRT alignment and Esters Road and Belt Line Road. In

these areas, adequate drainage facilities would be required to mitigate increased levels of surface drainage.

Additional increases in impervious surfaces would also be created by the proposed TEX Rail and DART Irving-3 Phase II alignments as they enter the airport west of International Parkway. Surface drainage from this area would drain into the Grapevine Creek which is where surface draining from the proposed LRT alignment also flows. The DART Irving-3 Phase II alignment surface draining would contribute to volumes in an ED-1 north of SH 114 near Esters Blvd. This drainage then flows into Grapevine Creek as well.

Air Quality

The LRT project would be supportive of the related land use plans and projects; and, to the extent that it facilitates access by transit rather than the private automobile, long-term cumulative effects are anticipated to be beneficial due to modest decreases in regional emissions. The proposed project, along with others in the fiscally-constrained plan, is included in regional air quality analyses and in the Regional Plan. All of the proposed projects have received a finding of conformity. Short-term air quality impacts due to construction activities would be anticipated, but these would be temporary in nature.

Physiography, Geology, and Soils

The LRT Alternative would have no impacts on physiography, geology or soils within the project corridor. Likewise, the addition of this project to the past, present, and foreseeable future transportation network would not produce additive effects on general geology and soil conditions in the DFW metropolitan area. As a result, it is concluded that no cumulative impacts would occur for this category.

Cultural Resources

No project-related impacts on historic and archaeological resources were identified. All other projects will evaluate their potential impact to historic and archeological resources separately, particularly those projects using federal funds, which require the application of NEPA and Section 106 of the NHPA regulations. The proposed project would not contribute to a cumulative impact on cultural resources.

Hazardous Materials

Construction of any of the projects listed in table 5-5 have the potential to affect or be affected by hazardous waste sites, both known and unknown. No adverse impacts would be anticipated with proper mitigation in accordance with applicable hazardous waste laws, statutes, and regulations. DART will employ BMPs, as detailed in the most current construction storm water regulations (NPDES or TPDES), Chapter 8 of the *Texas Nonpoint Source Management Program, National Menu of Stormwater Best Management Practices* developed by the U.S. EPA, and the *Integrated Storm Water Management Design Manual for Construction* developed by the NCTCOG, and applicable pollution control standards during construction when activities involve hazardous materials, hazardous wastes or other hazardous substances. Hazardous materials that may be encountered during construction of the proposed LRT alignment would be mitigated and monitored in accordance with agreed upon procedures outlined in the MOA between DART and DFW Airport, thus reducing the potential for cumulative impacts. In the event previously unknown contaminants are discovered during construction, or a spill occurs during construction, work should stop until the National Response Center is notified. The NRC number is (800) 424-8802.



Summary

The incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions would not meet the threshold of significant. In general, the implementation of a light rail transit system tends to have a very positive impact on existing and proposed projects, thus offsetting many impacts. Some of the direct benefits of transit include improved access and reduced traffic congestion. This results in positive impacts on air quality and water quality. Light rail construction has also been demonstrated to have a very positive impact on land use and land value. Environmental impacts are minimal and mitigable. DART reduced the potential for incremental impact to other past, present, and reasonably foreseeable future actions by working closely with DFW Airport, TxDOT, and the T to develop a transit line that fits well within the existing and future environment. Additionally, the proposed action utilizes 2030 traffic projections and demographic forecasts, accounting for much of the foreseeable development and associated impacts. Any future DART projects, such as Phase II of the DFW Airport Extension, will require additional environmental documentation.

CHAPTER 6. PUBLIC INVOLVEMENT

Active public and agency involvement is critical to the success of any project with the potential to significantly affect the community. The ultimate goal of the public and agency involvement process is to have an informed local community and government leadership making decisions regarding the impacts and implementation of a locally preferred alternative. The following chapter describes public involvement efforts completed during planning, NEPA documentation, and preliminary engineering for the DFW Airport Extension of the DART Orange Line.

6.1 Public Involvement Plan

A plan to guide public involvement efforts for the DFW Airport Extension project was developed by DART before the preliminary engineering design portion of the project began. This section explains the purpose of the plan and describes activities and timelines of public involvement efforts for the duration of the PE/EA stage of the project.

6.1.1 Purpose of Plan

The purpose of the DFW Airport Extension Public and Agency Involvement Plan is to support the DART decision-making process over the course of the project by:

- articulating the goals and objectives of the public and agency outreach activities;
- identifying the target audiences of the study;
- establishing a framework for the structure of and schedule for program activities;
- using specific methods or activities that reach target audiences while achieving desired results;
- describing how public and agency issues and concerns will be documented and addressed;
- developing evaluation and monitoring techniques to measure program effectiveness; and
- identifying methods to maintain public support through subsequent stages of project development.

The DFW Airport Extension Public and Agency Involvement Plan is intended to facilitate public engagement in the project by outlining the specific activities, milestones, and timelines to create meaningful opportunities for the public and interested agencies to participate in planning and design activities.

6.1.2 Summary of Plan

The DFW Airport Extension Public and Agency Involvement Plan divides the project into four milestones. A newsletter was planned for development and distribution during each milestone, for a total of four newsletters.

- Milestone 1 includes project inception through the scoping process.
- Milestone 2 includes the 5% design and administrative draft EA. In this milestone, two public meetings were planned to facilitate engagement in the planning process.

- Milestone 3 includes the 10% design and public comment period for the draft PE/EA. During this milestone, a formal public hearing will be held to inform the public of the contents of the draft EA and provide an opportunity for interested parties to comment on the project. A 45-day comment period will also be offered during Milestone 3.
- Milestone 4 includes the finalization of the EA document. The final EA will be distributed for final review and comment during this milestone.

6.1.3 Discussion of Actual Activities to Date as They Relate to Planned Activities

Overall, the public involvement efforts during the planning process have adhered to the intent of the Public and Agency Involvement Plan. The dates of the milestones have shifted slightly over the course of the project from the estimates that were used in the plan. All activities planned for each milestone to date have occurred, except in two instances: two public meetings were planned in Milestone 2, but it was determined that one public meeting would be sufficient for the project; and, an associated newsletter was not produced during milestone 2. All activities listed in the plan for Milestones 3 and 4 are set to occur before finalization of the EA document.

6.2 Summary of Public Participation

Public Meetings held or anticipated include:

- 06.17.09 – DART Public Meeting held at DART HQ
- 10.20.09 – DART Public Scoping Meeting held at the DFW Airport Marriott
- 04.28.10 – DART Public Meeting to be held at the DFW Airport Marriott
- Spring 2011 – Public Hearing anticipated

Public involvement efforts are intended to reach a wide range of demographic and socio-economic segments of the community, including groups that are traditionally under-represented in the public involvement process. This section provides an overview of past and future opportunities for members of the general public to learn about and comment on the DFW Airport Extension project.

6.2.1 Public Scoping

The public scoping process provides opportunities for the general public to become engaged in a project in its early stages of development. Ideas, concerns, preferences, and issues brought forth by the public during the scoping process should help shape the concept and scale of a project.

Purpose

During the public scoping process, the primary purpose of the public involvement activities is to inform the public and interest groups about the purpose of and need for the proposed project and to present the proposed actions, alternatives, and issues for public review. The scoping process provides opportunities for all interested parties to obtain information and provide input on the project to help shape the project's course and direction. Scoping is not any one event or meeting, but rather a process that continues throughout a project, with the scope of the project modified as new issues surface.

Scoping includes active consultation and participation of the public and all interested agencies. By requesting the input of citizens, agencies, community groups, and developers early in the process, DART will ensure that:

- all interested parties are involved in setting the direction of the study;
- all potentially significant impacts are known and are examined from the beginning of the process;
- insignificant issues and impacts are eliminated early in the process; and
- the roles of appropriate agencies are identified at the beginning of the EA.

The input from the scoping process will be considered in the final scope of the EA. This will provide the setting for a work plan that fully incorporates all the EA activities to be performed.

Public Scoping Meeting

One public scoping meeting was held for the DFW Airport Extension project on October 20, 2009. It was held in Irving, Texas at the Marriott Hotel-DFW North located at 8440 Freeport Parkway. A total of 28 individuals attended and 11 verbal or written comments were received during the meeting.

Summary of Comments Received During Scoping Period

The scoping comment period was open from October 1 to October 30, 2009. During this time, 15 individuals offered verbal or written comments. Eleven comments were received at the public scoping meeting and four written comments were submitted directly to DART. The comments that were pertinent to the DFW Airport Extension project included questions for clarification purposes and questions/comments regarding at-grade/elevated sections of the alignment; reasonable DART passenger access to Terminal A and other airport facilities/amenities; transit parking at DFW Airport and Belt Line Station; and Irving-3 construction bids and contracts.

6.2.2 Other Public Meetings

Throughout the planning process, the public must have opportunities to learn about the progress of the project and to review and comment on the draft document. One general public meeting was held to serve as an update on project progress. Also, a public hearing is anticipated to occur before the finalization of the EA document.

Public Meeting – April 2010

One public meeting was held on April 28, 2010 at the DFW Airport Marriot in Irving, Texas. The meeting was attended by approximately thirty members of the public or other interested parties. The meeting consisted of a presentation summarizing the project and potential impacts, followed by a question and comment period. Plan view drawings of the proposed LRT alignment and maps related to environmental impacts were available for review. Comments related to the importance of not delaying the project, the positive economic impact the project would provide for nearby communities and the City of Irving's willingness to cooperate with DART in order to complete the project.

Public Hearing – June 2011

One public hearing was held on June 2, 2011 at the DFW Airport Marriot in Irving, Texas. the hearing was conducted during the public comment period for the draft EA, which occurred from

May 16 to June 17, 2011 (see appendix D for a record of comments submitted). Approximately 54 members of the community or interested parties attended the hearing. An open house was held for 30 minutes prior to a presentation explaining the project details, potential impacts and proposed mitigation measures. The presentation was followed by a question and answer period and then by formal comments on the draft EA. These comments can be found in Appendix C Public Hearing Transcript.

6.3 Summary of Agency Participation/Coordination

Agencies also play a significant role in the planning and design of transportation infrastructure projects. Agencies directly involved in the project as either participating or cooperating agencies play an integral role in the planning process and other interested agencies may have jurisdiction over resources to be protected or affected during construction or operation of the project. These agencies are also important to the process and are encouraged to participate in the planning and design efforts.

6.3.1 Agency Scoping

Scoping was also conducted for interested local, state, and federal agencies. The scoping process offered an opportunity for agencies to learn about the DFW Airport Extension project, ask questions about the project, and provide comments on the project.

One informational presentation was given to the FAA on October 14, 2009. The presentation consisted of the information that was planned to be presented at the agency scoping meeting on October 19, 2009.

One agency scoping meeting was held for the DFW Airport Extension project on October 19, 2009 at DART Headquarters, 1401 Pacific Avenue, in downtown Dallas. A total of 15 individuals representing eight agencies attended the agency scoping meeting. Four questions were asked for clarification and one verbal comment was received during the meeting. No written comments were received from agencies during the meeting or the comment period, which lasted through October 30, 2009.

6.3.2 Meetings Held Before Scoping Period

Agency coordination meetings were held before the scoping process began. Coordination began early in the project to help advance the project concept to the PE/EA stage. A meeting was held at DART Headquarters in June 2009 to present the Orange Line options into DFW Airport to the public, interest groups, and agencies.

- 12.17.08 – Coordination meeting between NCTCOG, the T, DFW Airport and DART held at DFW Airport Administration Building
- 02.03.09 – Coordination meeting between FTA and DART held at FTA HQ
- 03.03.09 – Coordination meeting between FAA and DART held at FAA HQ
- 04.07.09 – Coordination meeting between NCTCOG, the T, DFW Airport, and DART held at DFW Airport Administration Building
- 04.07.09 – Coordination meeting between DFW Airport and DART held at DFW Airport's Business Center
- 04.20.09 – Coordination meeting between DFW Airport and DART held at DFW Airport's Business Center

- 04.21.09 – Coordination meeting between FTA, FAA, the T, and DART held at FTA HQ
- 05.18.09 – Coordination meeting between DFW Airport and DART held at DFW Airport’s Business Center
- 06.11.09 – Coordination meeting between NCTCOG, the T, DFW Airport, and DART held at DFW Airport Administration Building
- 06.26.09 – Coordination meeting between DFW Airport and DART held at DFW Airport’s Business Center
- 07.14.09 – Coordination meeting between FTA and DART held at FTA HQ
- 07.17.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 07.31.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 08.06.09 – Coordination meeting between FAA and DART held at FAA HQ
- 08.06.09 – Coordination meeting between FAA and DART held at FAA HQ
- 08.10.09 – DART Irving-3 Coordination Meeting with TxDOT held at the URS Dallas office
- 08.14.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 08.28.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 09.02.09 – Coordination between DFW Airport Engineering and DART held at DFW Airport ADE
- 09.04.09 – FWTA/DART Interagency Staff Meeting held at the URS Fort Worth office
- 09.11.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 09.25.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 09.28.09 – DART Irving-3 Coordination Meeting with TxDOT held at the TxDOT HQ
- 10.09.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center

6.3.3 Meetings Held After Scoping Period

Coordination among cooperating agencies has been on-going throughout the DFW Airport Extension project. The cooperating agencies for the DFW Airport Extension project have standing project meetings and also meet on an as-needed basis to discuss issues and share ideas. For example, meetings between DFW Airport and DART occur on a bi-monthly basis, as described in Section 5.4.1.

- 10.19.09 – DART Agency Scoping Meeting held at DART HQ
- 10.23.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 10.29.09 – Coordination meeting between FAA and DART held at FAA HQ
- 11.04.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 11.20.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 12.04.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center

- 12.18.09 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 01.15.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 02.12.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 03.26.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 03.12.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 04.09.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 04.15.10 – Coordination meeting between FTA and DART held at FTA HQ
- 04.15.10 – Coordination meeting between FAA and DART held at FAA HQ
- 12.02.10 – Coordination between FAA and DART (Telcon)
- 05.05.11 – DART/DFW Airport/FAA/the T: Reimbursable Agreement Meeting

DFW Airport LRT Station Design Meetings

- 01.15.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 01.29.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 02.26.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 03.12.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 03.26.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 04.09.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 05.21.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 06.04.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 07.02.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 07.30.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 08.27.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 09.10.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 09.21.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport Development & Engineering Building
- 09.24.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center

- 10.22.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 11.19.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 12.17.10 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 01.14.11 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 02.11.11 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center
- 04.08.11 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center

06.03.11 – Coordination meeting between the T, DFW Airport, and DART held at DFW Airport’s Business Center

DART Board Meetings

- 03.24.09 – DART Planning Committee Briefing held at DART HQ
- 04.09.09 – DART Board Briefing held at DART HQ
- 04.28.09 – DART Planning Committee Briefing held at DART HQ
- 05.26.09 – DART Planning Committee Briefing held at DART HQ
- 06.09.09 – DART Board Briefing held at DART HQ
- 06.23.09 – DART Board Briefing held at DART HQ
- 03.23.10 – DART Planning Committee Briefing held at DART HQ
- 03.23.10 – DART Planning Committee Briefing held at DART HQ
- 04.13.10 – DART Board Briefing held at DART HQ
- 06.21.11 – DART Planning Committee Briefing held at DART HQ
- 07.12.11 – DART Board Briefing held at DART HQ

6.3.4 Tribal Coordination

Coordination for the DFW Airport Extension project occurred with four tribes. Chairpersons for the Caddo, Comanche, Tonkawa, and Wichita tribes were contacted via U.S. mail. The letter informed the tribes of the project and requested that the tribes make contact with DART with concerns about cultural land or sacred sites in the project area. One response was received from the tribal nations. The initial letter, list of contacts, and response letter can be found in Appendix E.

6.3.5 Cultural Resources Coordination

Coordination with the THC and State Historic Preservation Officer (SHPO) was required for the DFW Airport Extension project. A letter was sent to the SHPO informing the THC of the project, requesting concurrence with the proposed APE, proposed survey, and report methodology for historic resources and DART’s finding that no archeological survey would be necessary for Phase I of the proposed DFW Airport Extension project. DART received SHPO concurrence with these requests in November 2009. Further coordination occurred once DART completed a historic resources reconnaissance survey for the project and identified no historic resources. The SHPO

concurrent with this finding in December 2009. These letters of concurrence can be found in Appendix E.

6.3.6 Other Federal Agency Coordination

Coordination letters were sent to other state and federal agencies, including USFWS, TPWD, and USACE. The purpose of the coordination is to inform agencies of the project, afford agencies an opportunity to comment on the project and ensure that all regulatory requirements of the project are fulfilled to the satisfaction of each agency. The above three agencies acknowledged receipt of DART's coordination letters and follow-up with each agency will occur, as necessary.

6.4 Summary of Other Meetings

Additional coordination efforts occurred through periodic or as-needed meetings to update DFW Airport Extension stakeholders and discuss potential issues and solutions throughout the project process. Below is a summary of other coordination meetings.

6.4.1 Bi-Weekly DFW Airport Meetings

DFW Airport Extension coordination meetings have occurred on a bi-monthly basis to discuss issues and keep cooperating agencies abreast of project progress. The meetings are held at DFW Airport and include representatives from DART, DFW Airport, the T, FAA, and project consultants.

6.4.2 Meetings with Potentially-Affected Businesses

DART and DFW Airport met with businesses that have the potential to be adversely affected by the proposed LRT alignment. Meetings with Sprint, Qwest, Oncor, Aeroterm, and Federal Express provided the involved parties the opportunity to discuss issues and reach solutions that are amenable to DART, DFW Airport, and each affected business.

Stakeholder Meetings

- 09.23.10 – Meeting with Federal Express and DFW Airport held at Federal Express DFW Airport
- 10.07.10 – Meeting with lease holder and DFW Airport held at Aeroterm DFW Airport
- 10.14.10 – Meeting with lease holder and DFW Airport held at Aeroterm DFW Airport

Oncor Electric Delivery

- 01.8.10 – Meeting to coordinate electric delivery held at DFW Airport ADE
- 01.21.10 – Meeting to coordinate electric delivery held at DFW Airport ADE
- 02.04.10 – Meeting to coordinate electric delivery held at URS Dallas office
- 03.14.10 – Meeting to coordinate electric delivery held at URS Dallas office

6.5 Public Meeting and Public Hearing Notification

A variety of methods were utilized to notify the public of project progress, meetings, and the public hearing. Newspaper advertisements, meeting notice brochures, project newsletters, website news releases, and e-mail notices were all employed as notification methods. Notification efforts for the DFW Airport Extension project are described below.

6.5.1 Newspaper Notices

Advertisements were developed in English and Spanish to inform the public about the public meeting and public hearing. These advertisements were published in several newspapers, including *The Dallas Morning News*, *Irving Journal*, *Irving Rambler*, *Al Dia*, *Dallas Weekly*, *Dallas Examiner*, *Dallas Chinese News*, and *News Korea*.

6.5.2 Meeting Notice Brochures

Meeting brochures and advertisements were available at various DART transit centers, on-board DART vehicles, and at the DART headquarters building in downtown Dallas. Advertisements were also placed on vehicles parked in DART parking lots and left on doors of homes in the project area.

6.5.3 Press Releases

DART news releases are published periodically on the DART website to update the public on current events.

6.5.4 Electronic Project Information

The DART website contains information about the DFW Airport Extension on its Orange Line page (www.dart.org and www.dart.org/about/expansion/orangeline.asp). A copy of the project newsletters are available there, along with public meeting and public hearing presentations and notices. Public comment were also collected through the DART website.

Meeting notices and newsletters are also sent out via e-mail to individuals who have signed up on the DART website to receive updates regarding the Orange Line or who are in the Community Affairs database. Advertisements for public meetings and hearings were also added to the scrolling LED message boards, located on all trains and buses, for two weeks prior to the meeting.



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