

5.0 ENVIRONMENTAL CONSEQUENCES

This chapter provides a summary of the environmental consequences of implementing the Selected LRT Alternative. For comparison, impacts of the No-Build Alternative and LRT Design Options (Medical Center and Love Field areas) are provided. Specific mitigation measures in response to anticipated impacts are identified in this chapter, and are incorporated into the project as committed actions.

5.1 LAND USE AND ECONOMICS

The Northwest Corridor is a major employment destination for the Dallas region. Land use and economic activities within the corridor are strongly influenced by the availability of transportation resources. The No-Build Alternative, Selected LRT Alternative, and LRT Alignment Design Options would have significantly different impacts on each of these activities. The potential impacts, and related issues, are addressed in the sections below.

5.1.1 Land Use Impacts

Potential land use impacts would be strongly influenced by the land use plans and development policies of the governing cities within the corridor. Given this, the LRT and No-Build Alternatives are evaluated for their consistency with the land use plans and policies of Dallas, Farmers Branch and Carrollton. The alternatives are also reviewed for potential impacts on existing neighborhoods. For regional and corridor levels of analysis, the impacts of the LRT Alternative include the other alignments considered in the Draft EIS. Where applicable (such as neighborhood and station levels), differences in impacts for the Selected LRT Alternative and the other alignments considered are described. The corridor study area is defined as the area within one-half mile of the proposed LRT alignment.

Regional Land Use and Development Impacts

No-Build Alternative

This alternative represents the “status-quo”. There would be no impact on regional land use and development.

LRT Alternative

Transit studies focusing on the relationship between rail transit and land use in urban areas have found that transit systems rarely generate new regional growth.¹ However, with supportive public policies and favorable real estate market conditions, transit systems can be used as a planning tool to redistribute growth.

The proposed project would not generate new growth or development within the region; instead it is designed to serve existing residential and business centers forecast to grow in the corridor. However, the project could also be a catalyst for encouraging development to be more transit-efficient in northwest Dallas County and southeast Denton County. Whether or not this occurs would depend upon the actions of the cities governing development in the corridor and on local real estate market conditions.

Corridor-Level Land Use and Development Impacts

The project corridor experienced double-digit employment growth during the last decade and this trend is projected to continue. By the year 2010, NCTCOG projects that the Stemmons Corridor will contain 31% of total regional employment. Continued population growth is also projected for the corridor. NCTCOG forecasts a Study Area population of 114,000 by 2025 – a 39% increase from 1995. This forecast is supported by the 2000 Census figures. The median population growth

¹ Transit Cooperative Research Program, “An Evaluation of the Relationship Between Transit and Urban Form,” Research Results Digest, June 1995.

rate for census tracts within the corridor was 29% between 1990 and 2000. This growth, combined with employment increases, indicates an increasing burden on existing transportation systems unless improvements are made. There is a significant difference between the No-Build and LRT Alternative in addressing this issue.

The corridor's demographic profile indicates that the area is home to a high number of low-income households, elderly individuals, and persons without automobiles. There is a higher level of transit dependence for residents in the study area than in Dallas County as a whole. The two alternatives vary significantly in serving the needs of these residents. The differences between the No-Build and LRT Alternatives are examined further below.

No-Build Alternative

Under this alternative, current land use trends and development activity would continue. The area would maintain its status as a major employment center; however there would be no incentive for land uses to develop in a more transportation efficient pattern. There would be increased traffic congestion and the desirability of the corridor as an employment destination might decline over time. The quality of life in the residential areas would also be impacted. Increased automobile congestion would place a greater burden on streets through residential areas and increase air quality problems. In addition, the transit dependent residents within the corridor would have more limited transit options, all of which would be subject to the forecasted street and highway congestion.

LRT Alternative

The proposed project would encourage development within the corridor to be more transportation efficient by providing fixed station locations with nodal development opportunities. Transit studies have found that with supportive public policies, transit investments and services can bring about significant and long-term land-use and urban form changes.

The project would also have long-term impacts on the distribution and density of development within the corridor. This would likely be a redistribution of growth rather than new growth (given the high rates already projected for the area). Development would be attracted to property with access to one of the rail stations. Dr. Weinstein and Dr. Clower from the University of North Texas (UNT) have documented the attraction of new development and redevelopment to existing DART stations.² Their study concluded that properties near the existing DART LRT Stations (Mockingbird, Lovers Lane, and Park Lane) had property values approximately 25 percent higher than other areas examined. DART stations have proved to be a catalyst for several major real estate projects along the LRT system. Based upon DART's experience with investment around LRT stations over the past five years, similar development patterns may emerge at some station locations along the project corridor.

By addressing the transportation needs of the corridor, the proposed project would make the area more attractive to future real estate investment and would encourage existing uses to remain in the area. There would be incentives for infill development within the corridor as users take advantage of the availability of rail transit services. In addition, the expanded LRT system and supportive bus system would enhance opportunities for transit dependent residents throughout the DART Service Area.

Consistency With Land Use Plans

The proposed project lies within three municipal jurisdictions: Dallas, Farmers Branch and Carrollton. This section examines each of the alternatives for consistency with the plans and policies of these cities and the other plans discussed in Chapter 3.

² Bernard Weinstein, PhD and Terry Clower, PhD, "The Initial Economic Impacts of The Dart LRT System", University of North Texas, July 1999.

City Of Dallas

No-Build Alternative

This alternative is not consistent with the **City of Dallas Growth Policy Plan**, a citywide policy tool for land use and development planning. The plan recognizes the use of the light rail system for serving the transportation needs of the community and for improving the transportation efficiency of land development patterns. The No-Build Alternative is also not consistent with several subarea plans for the corridor. The City's plans for the Dallas Love Field neighborhoods (**Love Field North Land Use Study** and **Love Field West Land Use Study**) contain a DART LRT alignment and station in these areas. The two studies identified for the Northwest Highway area (**Northwest Highway Area Revitalization/Neighborhood Improvement Study** and **Northwest Highway Urban Design Study**) also include a DART LRT alignment and station in the Northwest Highway area. The studies cite the positive impact of an LRT system on land uses and transportation accessibility in the area. The No-Build Alternative is also inconsistent with the **Stemmons/Harry Hines Corridor Implementation Study**. That study recommends infrastructure improvements to facilitate future growth and development of the business community. The LRT project would locate three stations in this area that extends from Northwest Highway to LBJ Freeway.

LRT Alternative

The proposed project is consistent with the City's **Growth Policy Plan** and the **Dallas Plan**. The project would allow the City to support growth nodes in appropriate locations and to encourage more transportation-efficient land use patterns. The project is also consistent with all of the sub-area plans for the corridor. The LRT stations could be a catalyst for several of the improvement and redevelopment objectives recommended in the plans.

City Of Farmers Branch

No-Build Alternative

This alternative is not consistent with the City's **Comprehensive Plan** or its revitalization plan for the Old Farmers Branch Area. The City promotes public transit use in its Comprehensive Plan. The City has also undertaken extensive planning to prepare for a LRT station in Farmers Branch including the preparation of detailed studies, creation of a Tax Increment Financing District, acquisition of property in the proposed station area and adopting a station area plan.

LRT Alternative

This alternative would provide LRT service to the community, which is consistent with the City's **Comprehensive Plan** and the **Farmers Branch Station Area Conceptual Master Plan** adopted by the City Council in July 2002. Constructing the LRT project would also support the City's efforts to revitalize and redevelop the Old Farmers Branch Area. The rail station is considered a major tool for achieving the City's goals. It would be a major catalyst affecting both the viability and character of the area's redevelopment.

City Of Carrollton

No-Build Alternative

This alternative is not consistent with the City's **Comprehensive Plan** or plans for improving Old Downtown Carrollton. The Comprehensive Plan identifies a future DART rail line along the proposed LRT alignment and LRT service is an element of the City's **Thoroughfare Plan**. The City's **Old Downtown Carrollton Plan** and **Carrollton Renaissance Initiative** support the development of a light rail station that serves Downtown Carrollton.

LRT Alternative

Construction of the proposed project would implement LRT, an improvement recommended in Carrollton's **Thoroughfare Plan**. The LRT stations would support the City's redevelopment efforts for Old Downtown Carrollton as well as the Trinity Mills and Frankford Road areas. The Carrollton

City Council approved the DART LRT Station Areas, with stations as outlined in the Selected LRT Alternative, in June 2002.

Other Land Use or Master Plans

No-Build Alternative

This alternative is not consistent with any version of the **UTSW Medical Center Master Plans** (all three versions provide for LRT service in some location), the **Dallas Love Field Master Plan**, or the **Southwest Airlines Master Plan**. All of the land development plans contained LRT service provided by at least one of the alignment options under consideration.

The No-Build Alternative is also not consistent with the **Dallas Plan**. Several of the Dallas Plan's recommendations include light rail service as part of their implementation strategy. This includes the Plan's strategies for smart growth for a sustainable community, improvements to air quality, and enhancements to the Harry Hines Medical District to support the biotechnology industry.

LRT Alternative

The Selected LRT Alternative and Medical Center Design Options A, B, C, and D are consistent with the updated UTSW Master Plans for years 2012 and 2025. The Harry Hines Base Alignment in the Medical Center area is not consistent with UTSW'S most current Master Plan given the alignment and station conflict with planned facilities, and would require purchase of land from UTSW. (The initial UTSW Master Plan reflected the Harry Hines Base Alignment, however it did not indicate the vertical profile of the light rail corridor. UTSW has since stated that their desire was for an underground LRT alignment.)

The Selected LRT Alternative is also consistent with concepts developed for Parkland Hospital's Master Plan. The Plan proposes expanding Parkland's medical facilities east towards Maple Avenue. The Hospital District has already acquired property immediately east of the UPRR Alignment and Parkland Station towards Maple Avenue and plans to acquire additional property in the vicinity of the station. The location of the Parkland Station under Medical Center Design Option D was not compatible with the hospital's plans for their property. The station's configuration conflicted with planned service tunnels and basement connections between future facilities – prompting the need to reconsider that design option.

The LRT Alternative is consistent with the **Dallas Love Field Master Plan**. While the Love Field Design Option is not part of the Selected LRT Alternative, the proposed project allows for the opportunity to serve Dallas Love Field in the future using a separate alignment. The studies that were conducted during the Draft EIS provide valuable information on providing LRT service to the airport. In addition, ongoing coordination between DART and the City of Dallas will ensure that various options to provide direct rail service to the terminal remain available to support future expansion plans.

The LRT Alternative is consistent with the Southwest Airlines Master Plan. Southwest Airlines has incorporated the layout for the proposed Brookhollow Station into their Master Plan in order to design appropriate connections to the station area and across the LRT alignment. Southwest Airlines supported the Love Field Design Option studied during the Draft EIS because it provided a direct link between their headquarters and the terminal area. Currently, access between these locations is provided via shuttle bus service along Denton, Mockingbird and Cedar Springs. However, Southwest Airlines did not support funding mechanisms proposed by the City of Dallas that would have instituted a Passenger Facility Charge (PFC) on Dallas Love Field tickets.

The LRT Alternative is also consistent with **The Dallas Plan**. The Harry Hines Base Alignment in the Medical Center area more strongly supported implementation of the plan's objectives compared to the Selected LRT Alternative and the other Medical Center Design Options. The

Harry Hines Base Alignment had two stations located in the Harry Hines Medical District – the designated biotech corridor. The alignment also provided a station in close proximity to UTSW's campuses. The Selected LRT Alternative provides for only one station within the Harry Hines corridor, within the Parkland Hospital expansion area. It does however, have a station at Inwood and Denton that can serve UTSW as the university facilities expand eastward along Inwood Road.

Impacts on Neighborhood Integrity and Community Cohesion

Neighborhood integrity focuses on the impact of the alternatives on the physical boundaries of neighborhoods identified in the project area. Community cohesion examines the social aspects, examining how the project might affect interactions among groups and persons in communities along the corridor.

No-Build Alternative

This alternative represents the “status-quo” relative to neighborhood integrity and community cohesion. The physical boundaries of the residential areas would remain unchanged and the social interactions of the residents would not be altered.

Selected LRT Alternative

The majority of the proposed alignment lies within the DART-owned former UPRR right-of-way. In these areas, the project would not impact neighborhood integrity. The neighborhoods have developed around the rail lines and the uses adjacent to the line tend to reflect this historical relationship. The LRT line would not introduce a new boundary but would reinforce the existing corridor.

In one area along the alignment, the Selected LRT Alternative would impact the future development of adjacent properties (even though the alignment is located in existing railroad right-of-way). North of Motor Street, the Selected LRT Alignment passes between properties owned by Parkland Hospital. While the ROW is an existing boundary through this area, the presence of the LRT line would create an additional physical division for future development on either side of the alignment. This impact, however, can be alleviated through the design of automobile and pedestrian connections underneath the aerial guideway. In addition, the LRT Alternative has been reviewed by Parkland Hospital and is compatible with the Master Plan concepts for their property in the area.

The Selected LRT Alternative (although within existing rail ROW) also divides an attendance zone for Hernandez Elementary School. In the DEIS, an at-grade crossing of Maple Avenue was proposed. Based on an updated traffic analysis, the alignment will be grade separated at Maple Avenue. This grade separation will avoid the safety issues associated with school-aged children crossing LRT at-grade since Maple Avenue is a primary walking route. The alignment will also present a physical barrier between the Kimsey Drive neighborhood and Rusk Middle School, which is currently a short-cut for school access. During final design, DART will assess ways to create a safe pathway for children to get to school, rather than requiring them to walk longer distances.

The alignment for the Selected LRT Alternative is located within existing railroad right-of-way with the exception of a line segment north of Webb Chapel Extension. In this area, the alignment and station are located on the west side of Denton Drive (and west of the RR ROW) requiring the acquisition and displacement of several households and businesses. A 170-unit apartment complex, one single-family structure and several businesses would be impacted.

The residential properties to be acquired are in very poor structural condition and are the only housing in the neighborhood located west of Denton Drive. The primary housing for this neighborhood is located east of Denton Drive. Redevelopment of the acquired properties could improve the neighborhood if the displaced residents are relocated according to DART guidelines

and the properties are developed in a manner sensitive to the residential areas to the east. (DART's relocation guidelines require replacement housing that is affordable, safe and sanitary. Most likely this would improve the living conditions of the displaced residents.) Harry Hines Boulevard, a very busy commercial corridor, is located just west of the impacted neighborhood. Redevelopment of the acquired properties could provide a land use buffer between Harry Hines and the residential areas to the east. It could also encourage new investment in the neighborhood due to the presence of the LRT station. In addition, it would provide a much-needed service to a low income, transit dependent community.

Looking at the corridor as a whole, construction of the LRT system would enhance community cohesion in the corridor. Corridor residents have a higher level of transit dependence than the average for Dallas County. The LRT system would provide access to a significant number of community services including medical services, community recreational programs and governmental centers. In addition, the LRT system would provide convenient transportation to a number of major employers in the Dallas area. The LRT system would alter the social interaction of the corridor residents by concentrating transit travel opportunities at the LRT stations. These new activity centers would increase the opportunity for community interaction.

Other Alignments Considered

Several other design options were considered for the LRT alignment – the Harry Hines Base Alignment, the Love Field Design Option and four Medical Center Design Options (A, B, C and D). All of these options would have located the LRT alignment outside of the existing UPRR right-of-way in more areas than the Selected LRT Alternative (some more so than others). Almost all of these alignment design options would have had a greater impact on private property, causing more private property acquisition and displacement than the Selected LRT Alternative. (The exception would have been the Love Field Design Option that, depending on the alignment chosen, would have primarily impacted publicly owned property.)

Assessing neighborhood integrity impacts, the most intrusive options would have been Medical Center Design Options A, B and C. Each of these alignment options would have created a new physical barrier through an old industrial area. The magnitude of the business displacements would have had an adverse impact on the economic viability of the area as a location for industrial uses. Option A would also have had a negative impact on Hernandez Elementary School, passing at-grade adjacent to the school property and creating a physical barrier between the school and its attendance zone east of Denton Drive. While the Selected LRT Alignment also divides an attendance zone for the school, the alignment would be grade separated at Maple Avenue. This avoids the safety issue of school-aged children crossing the LRT at-grade (that would have occurred under previous design options).

Station Vicinity Impacts

No-Build Alternative

The No-Build Alternative represents the “status-quo” position relative to land use and development activity. There would be no station vicinity impacts under this alternative.

Selected LRT Alternative

The LRT Alternative would have direct and indirect impacts on land use in the station vicinities. At some of the station sites, there would be a direct impact due to property acquisition for the station and related facilities. Some of these acquisitions would result in displacement of existing uses. (Acquisitions and displacements are addressed in Section 5.2) Where these impacts occur, they would alter the long-term use of the property. Indirect land use impacts generally occur within one-half mile of LRT stations.³ The amount and scale of development near rail stations is often influenced by the presence and availability of transit services. Transit focused development can

³Institute of Transportation Engineers, Transportation Planning Handbook, 1999.

support revitalization and redevelopment of older neighborhoods and business centers. The University of North Texas (UNT) study found that most properties near the North Central Line Stations increased in value, particularly property with office and retail uses.⁴ Given that the proposed project's station sites are primarily in nonresidential areas, property value enhancements would likely occur. An assessment of the potential impacts for each LRT station associated with the Selected LRT Alternative is provided below.

Victory Station

The proposed location of this station is the east side of the railroad right-of-way near the American Airlines Center. The station has no parking and property was acquired by DART in 2001 for a planned pedestrian plaza to connect the platform to the arena entrance. This station would serve commuter rail and light rail transit operations, significantly enhancing transit availability to a major public facility. It would also be a positive influence on the existing and planned development of adjacent property – the 70-acre mixed-use urban neighborhood known as the Victory Project.

Market Center/Oak Lawn Station (South)

The proposed location of this station is the east side of the railroad right-of-way near the Dallas Market Center. Parking facilities would be located on the east side of Harry Hines. There would be an elevated crosswalk connecting the platform to the parking area. Approximately 2.8 acres would be acquired for a parking lot. This station would provide transit access to the Dallas Market Center, a major employer and visitor destination, thereby supporting their long-term viability. The station would be designed to support a new pedestrian gateway to the Trade Mart, planned by Market Center.

The station's parking lot would impact the residential area east of Harry Hines. The lot would be located between Wycliff Avenue and Vagas Street, east of Harry Hines Boulevard. Three single-family homes on Wycliff and one on Vagas would be acquired. Two motels fronting on Harry Hines would also be displaced (see Section 5.2 for more detail). The parking lot has an entrance on Vagas Street, a two lane single-family residential street. The traffic impacts on Vagas Street could be significant with approximately 120 to 200 trips per day with up to 75 trips cutting through the neighborhood during peak hour. In addition to the traffic, this creates safety issues along the street for pedestrians and bicycles. The lot would also be adjacent to residential properties, causing potential visual impacts. DART has committed to work with the City of Dallas and the neighborhood during final design of the parking lot to determine appropriate traffic control measures to limit impacts on Vagas Street and to address visual impacts on adjacent residential properties.

Parkland Station (UPRR)

This aerial station would be located over Motor Street, providing access to development areas both north and south of Motor Street. While the station itself would be located within DART-owned ROW, the bus transfer area would require the acquisition of approximately 2.8 acres east of the ROW. Development west of the station would remain under Parkland's ownership, but could be coordinated to encourage transit supportive uses. The 2.8 acre acquisition would displace two businesses located on Motor Street, Double E. Inc. and Centex Corporation (see Section 5.2 for more detail).

This station would have positive economic impacts on adjacent properties. Parkland recently purchased 24 acres immediately east of the rail ROW for redevelopment as part of their Master Plan. Their Master Plan, coupled with the new Parkland LRT Station, would serve as a catalyst to create new market opportunities for this area. Development of this site would enhance the station vicinity and provide a convenient connection between the transit station and the medical facilities in the area. DART will continue to coordinate with Parkland to create a pedestrian-oriented

⁴ Bernard Weinstein, PhD and Terry Clower, PhD.

environment that supports connections between the LRT Station and surrounding development. Ambulance operations would continue to function normally.

Inwood Station (South)

This aerial station would be located at the southwest corner of Inwood Road and Denton Drive. Approximately 7.5 acres would be acquired for the station. Most of the property to be acquired is vacant, but there would be one business displaced (Lawns of Dallas). An additional business would be displaced by the alignment just south of the station, S&A Automotive. (See Section 5.2 for more details.) The proposed station layout would provide automobile access to the site from Denton Drive and Inwood Road. The alignment and station would be across from a single-family residential area immediately east of Denton Drive. This would cause some traffic impacts to Cherrywood Avenue; however, the impact was not deemed to be significant (50 trips per day). This would also cause some additional visual impacts to the neighborhood. This issue is addressed in Section 5.6.

The station would also be in the vicinity of Rusk Middle School, but traffic and safety impacts would be minimized because the LRT would be aerial in this area. A single-family residence would be acquired on Kimsey Street due to a vibration impact from the alignment.

Brookhollow Station

This station would be located between Wyman and Burbank Streets. Southwest Airlines has indicated that the company plans to expand their corporate facilities in this area. The station would support their plans while also serving the residential area to the south and west. In addition, there is vacant land in the surrounding area that has the potential to be developed into higher density, transit-supportive uses.

Bachman Station

The LRT line would run parallel to Denton Drive through this area and the proposed station is located at the southwest corner of Denton and Community Drives. There are several direct impacts, both short term and long term, for the station vicinity. Property would be acquired for both the station and the LRT line. Most of this property is improved with existing uses and all of these would be displaced. (See Section 5.2 for more information). Once the station and line were built, any excess developable property would probably be improved with higher density transit-supportive uses. The property would eventually have access to transportation service from two light rail lines (Carrollton and Irving/DFW LRT lines) and proximity to several major thoroughfares.

The properties east of the station are developed with multi-family uses. Some of these properties are in poor structural condition, and according to City reports, several have multiple code violations. The LRT station would create market opportunities for redevelopment or renovation of these properties.

Walnut Hill/Denton Station

The proposed location for this aerial station is east of Denton Drive and the DART railroad right-of-way, and north of Walnut Hill Lane. This station would displace a manufacturing business currently located on the property. The area around the station is developed with a mixture of light industrial, retail and commercial uses. This variety of land uses would likely continue; however, the station would be a catalyst for redevelopment of some of the older more obsolescent properties.

Royal Lane Station

The location of this proposed aerial station is just east of the DART railroad right-of-way and north of Royal Lane. Several properties would be acquired for this station and a number of businesses would be displaced. The area surrounding the station is a wholesale/retail center consisting of several Korean-American and other Asian-American owned businesses. The **Stemmons/Harry**

Hines Corridor Implementation Study contained strategies for creating an “Asian Trade District” in this area. A DART station in this location could contribute to these efforts by creating a transit gateway into the trade district.

Farmers Branch Station

This station would be located south of Valley View Lane along the DART railroad right-of-way. It would be located on property owned by DART and the City of Farmers Branch. The location is within the City of Farmers Branch Tax Increment Financing (TIF) District, which was created to attract transit-supportive development to the Old Farmers Branch Area. In July 2002, the City Council approved a **Conceptual Master Plan** to guide development of residential and commercial uses around the station. The station is considered an integral component of these efforts and would have a major influence on the viability and character of the development.

Carrollton Square Station

The proposed location of this aerial station is north of Belt Line Road and east of the DART railroad right-of-way. Several properties would be acquired, displacing both business and residential uses. In June 2002, the City approved the proposed station location and the **Carrollton Renaissance Initiative** – a plan for commercial and residential redevelopment in Old Downtown Carrollton. The plan proposes a pedestrian connection between the LRT station and Old Downtown Carrollton. The station would support the City’s efforts to implement its redevelopment plan.

Trinity Mills Station

The proposed location of this station is north of the planned Dickerson Parkway Extension, south of the new President George Bush Turnpike and east of the DART railroad right-of-way. Several properties, both residential and light industrial, would be acquired for this station. The City recently approved a station area plan for the station and surrounding property. The plan provides guidelines for the appropriate mix and density of land uses for the area and outlines the street improvements that are required.

Frankford Station

This station would displace a new warehouse/distribution building. It would provide LRT access to the Frankford Trade Center employment center. Over the long term, some of the industrial properties might be redeveloped into higher density uses to take advantage of the station proximity. The City of Carrollton recently approved a station area plan for the station and surrounding properties.

Rail Operating Facility

Three sites were considered in the Draft EIS for the location of the proposed Rail Operating Facility. The selected site is located east of Denton Drive and north of Lombardy Lane. This area is dominated by industrial businesses. A portion of this site was occupied by a lumberyard that is now vacant. The proposed facility would displace as many as 16 small light industrial businesses adjacent to the former lumberyard. Indirect impacts would be minimal as the surrounding land uses are compatible with the facility.

Other Alternatives Considered

Market Center/Oak Lawn Station (North)

During the Draft EIS, an alternative location for parking was analyzed. A parking structure was proposed on 2.1 acres between Wycliff Avenue and Hondo Street, east of Harry Hines. There would have been four single-family residences and three businesses displaced – a similar level to the proposed location. The parking structure would have impacted the remaining residences on Hondo to a much greater degree than the Selected LRT location and would have been more intrusive into the neighborhood. It would have adversely impacted several homes that would have

been located just across the street from the structure, some of which have been recently constructed and/or improved.

Parkland Station (Harry Hines Base Alignment)

During the Draft EIS, several alternative alignments were evaluated for the Medical Center area. The Harry Hines Base Alignment contained an aerial station in the median of Harry Hines Boulevard directly across from Parkland Hospital. There was no parking planned for this station and property acquisition would have been minimal (the only real estate acquired would have been for road improvements). The proposed station would have had a direct connection to the pedestrian bridge over Harry Hines Boulevard.

Parkland Station (Medical Center Design Options A, B, and C)

The alignments for Medical Center Design Options A, B and C proposed an open-cut LRT station at the northeast corner of Lofland and Harry Hines – similar to the service provided by the Parkland Station in the Harry Hines Base Alignment. This station site would have required acquisition of approximately 4 acres of private property. Part of this property would have been acquired for construction staging. Once construction was completed, the property would have been available for joint development opportunities.

Parkland Station (Medical Center Design Option D)

Medical Center Design Option D proposed an open-cut station located east of Harry Hines Boulevard and north of Motor Street. Approximately 3 acres would have been acquired from Parkland Hospital displacing their Support Services Facilities located at 5000 Harry Hines. Ongoing coordination with Parkland revealed that a shallow tunnel and station at this location would have complicated their ability to develop adjacent properties, substantially increasing the project costs. This factor combined with the Hospital's plan to expand their facilities east towards Maple Avenue made the Selected Alternative (UPRR) location a more viable alternative.

UTSW/Exchange Park Station (Harry Hines Base Alignment)

This aerial station would have been located on the east side of Harry Hines adjacent to UTSW's North Campus. No parking was planned at this location. Approximately 4.6 acres of property would have been needed for bus and circulator needs and kiss and ride. This station would have provided LRT service to a major medical campus and employer (UTSW), an adjacent hospital (St. Paul) and the Exchange Park Office Complex. This station would have supported future UTSW expansion by providing additional transportation services to the area. The station would also have been a catalyst for new investment and renovation of Exchange Park. However, the station bus transfer area would have conflicted with recent changes to the UTSW Master Plan.

Inwood Station (North)

This alternative was considered with Medical Center Design Options A, B, C and D. It would have placed an aerial station on approximately 5 acres at the northwest corner of Inwood Road and Denton Drive. It would have displaced five businesses, including one business that would have likely had a significant hardship in relocation. In addition, the north option would have created additional traffic for the businesses remaining on Sadler Circle (an access street to the station). The location also caused potential traffic and safety issues for students attending Rusk Middle School, located at the northeast corner of Denton and Inwood.

Love Field Station (Design Option)

This station was part of the Love Field Design Option studied during the Draft EIS. It would have been located directly on Dallas Love Field property. It would have enhanced access opportunities to the airport and could have reduced parking requirements by providing an alternative mode of access. The below-grade, open-cut station would not have impacted airside facilities but would have required partial or complete demolition of a vacant ticket wing. The vacant ticket wing is the

location of a possible new ticketing and baggage wing as proposed in the Dallas Love Field Master Plan.

5.1.2 Economic Impacts

The economic impact of the No-Build versus the LRT Alternative is significant. The LRT project affects future economic development at both a corridor and regional level. It also has significant implications for labor force accessibility to employment centers. The LRT project would be an economic stimulus to the Dallas area economy while enhancing transportation options for the corridor’s disadvantaged population. In addition, the project would be a catalyst for joint development at some station locations, benefiting both public transit ridership and DART revenue. These impacts and related issues are examined in the following sections.

Regional and Corridor Impacts

No-Build Alternative

The No-Build Alternative represents the “status-quo” position. There would be no change in transportation service, land use or development within the corridor and therefore no impact to economic activity.

LRT Alternative

UNT conducted a study of DART’s economic impact that revealed that local commercial real estate professionals consider the light rail system a positive force for economic development in the Dallas region. DART is seen as a critical factor in Dallas’ long-term growth prospects because of increasing traffic congestion and air quality problems. The transit system gives the region a competitive edge to attract new businesses and business relocations.

The proposed project would have a positive economic impact upon the region and the corridor. It would provide transit service to congested high employment centers such as the Dallas Central Business District and the Medical/Market Center areas. It would also increase accessibility and mobility for the corridor residents – increasing the job opportunities available to this population. There would be other economic benefits as well – construction and operation of the system would have positive benefits to the local economy. These impacts and related issues are examined in the following sections.

Transportation Disadvantaged Population

The corridor contains a high percentage of transportation-disadvantaged households. This includes individuals without automobiles, the elderly, the young and persons with income below the poverty level. **Table 5-1** examines these characteristics for the corridor and Dallas County.

The corridor has a higher percentage of low-income individuals, a higher number of elderly persons, and more individuals without access to an automobile than the population of Dallas County as a whole. The median household income of the project corridor is also much lower than the median for either Dallas County or the DART Service Area.

TABLE 5-1 TRANSPORTATION DISADVANTAGED POPULATION		
Characteristic	Project Corridor	Dallas County
Low Income	16%	13%
Population Under 18	25%	27%
Population Over 64	22%	8%
No Automobile	12%	8%

Source: Wendy Lopez & Assoc. and Renee Perkins
Jaynes/ U. S. Census Bureau, 1990

The median household income in 1990 was \$28,628 compared to \$42,183 for the Service Area and \$31,605 for the County. There are certain portions of the study area that are more transit dependent than the corridor as a whole. In Census Tract 19, 67% of the residents were low income in 1990 and 66% of the population did not have access to an automobile. In Census Tract 4.01, 41% were low income and 32% did not have

access to an automobile. The most transit dependent portion of the corridor in 1990 was concentrated in the inner city areas – from Downtown Dallas to Inwood Road.

No-Build Alternative

The No-Build Alternative would not provide any additional transit opportunities for the transit-disadvantaged population within the corridor or the DART Service Area, nor would it be able to draw forecast Dallas area growth to the corridor.

LRT Alternative

The proposed LRT project would provide four stations accessible to the residents located between Downtown Dallas and Inwood Road. The stations could encourage corridor development and LRT service would enhance resident mobility to further increase their accessibility to employment opportunities. The corridor is projected to add 67,298 jobs by the Year 2025. LRT service could concentrate those jobs along the alignment, which would provide more efficient access to them. In addition, the project is accessible to two of Dallas's largest employers: Parkland Hospital and Southwest Airlines. This employment concentration creates opportunities for all corridor residents, but especially for those who are transportation disadvantaged.

DART's mobility impaired patrons would also benefit economically from increased accessibility. The entire DART system, including the LRT, is accessible to mobility-impaired persons. The proposed project would increase employment accessibility for these individuals as well.

Regional Accessibility

Regional accessibility examines how many people are provided the opportunity to use transit services. The project corridor has one of the highest employment concentrations in the region. It contains traditional suburb to downtown travel, but also reverse commute travel from the southern portions of Dallas County to employment centers within the corridor. According to NCTCOG, employment in all the census tracts within the corridor grew between 1990 and 1998, and the majority had double-digit growth. Employment is projected to increase to 365,747 by the year 2025. The two alternatives vary significantly in addressing regional transportation needs.

No-Build Alternative

The No-Build Alternative would provide no additional transportation services to the corridor beyond those already planned or programmed. It would contribute to increased traffic congestion and travel time delays in the corridor and the region.

LRT Alternative

Studies have been conducted that estimate the distance most people are willing to travel to reach transit stations.⁵ They reveal that most patrons will walk up to 0.62 mile to reach a stop or station, will use feeder transit up to 4 miles, and will drive up to 6.2 miles to access park and ride facilities. The LRT Alternative will provide improved accessibility to residential areas and employment centers in the corridor.

Employment Impacts

No-Build Alternative

Employment within the Study Area is projected to grow from 298,449 in 1995 to 365,747 by 2025. The No-Build Alternative would not provide light rail transit to service this growth, increasing congestion in this corridor. In addition, there would be no employment generated from design and construction of the LRT project.

⁵ Institute of Transportation Engineers, *Transportation Planning Handbook*, 1999.

LRT Alternative

Construction of the proposed project would have direct and indirect employment impacts in the local economy. Direct impacts would result from construction labor, employment related to the production of the goods and materials for the project, and design, engineering and architectural services employment. Indirect impacts would result from the “multiplier effect” of these expenditures in the local economy. The Texas State Comptroller’s Office maintains an input/output model that estimates direct and indirect employment impacts based on different expenditure types, including civil construction transportation projects.⁶ These multipliers were used to estimate the employment impacts from construction of the project. The employment impacts of the Selected LRT Alignment are provided in **Table 5-2**. Employment impacts for the other alignments considered would be similar, varying with the amount of the construction expenditure for each.

TABLE 5-2 LRT ALTERNATIVE EMPLOYMENT IMPACT				
Alignment	Total Capital Cost¹ (millions)	Direct Jobs	Indirect Jobs	Total Jobs
Selected LRT Alternative	\$715	13,278	13,157	26,435
¹ Hard construction costs and soft costs, such as professional services, have different employment multipliers. All cost estimates were based on 2002 dollars. Costs include a portion of the Rail Operating Facility to be used for Northwest Corridor but do not include real estate, LRT vehicles, or ticket vending machines.				

Source: Renee Perkins Jaynes, Sunland Engineering, April 2003

In addition to new jobs from construction, there would be long-term employment impacts from the additional jobs created to operate and maintain the new LRT service. This new employment would also have a multiplier effect on the local economy resulting in additional expenditures and job creation.

The proposed Northwest Rail Operating Facility would displace a vacant lumberyard and up to 16 small industrial businesses in the Lombardy and Denton Drive area. However this job loss would be offset by the number of jobs created at the facility – estimated to be approximately 225 jobs. This could improve employment opportunities for the nearby work force. There would be a loss of property tax revenue from development of this site – approximately 34.3 acres of developable land would be removed from the tax rolls.

Joint Development Opportunities

Joint development is an opportunity for enhancing revenue and ridership. It is a public/private venture whereby a private development project is physically related to a transit station through either a direct connection from an adjacent location or air rights over the station. The transit authority’s financial benefit from the project can be realized through several means. Often the transit agency receives revenue from the proceeds of the sale or leasing of land or air rights. Revenue can also be generated through connection fees. Sometimes, the private sector makes a contribution of land or offsets a portion or all of the cost of the station.

No-Build Alternative

With the No-Build Alternative, there are no joint development opportunities within the corridor.

Selected LRT Alternative

There are four stations in the Selected LRT Alternative where DART is acquiring property and would have residual land available after construction that could be used for joint development – Bachman, Walnut Hill/Denton, Carrollton Square and Frankford. There are two other station sites where DART has the opportunity to tie into adjacent planned development – Parkland and Farmers Branch. At Trinity Mills, construction of the station would create the opportunity for redevelopment

⁶ Economic Outlook Group, State of Texas Comptroller, August 2002.

of the existing North Carrollton Transit Center (just east of the station). The joint development potential of all of these station sites is examined below. For the remaining station sites, they do not have excess land available – the majority of the site would be needed for parking, kiss and ride or bus access facilities. This includes the Victory, Market Center/Oak Lawn, Inwood, Brookhollow, and Royal Lane Stations. This does not preclude surrounding property owners from working with DART to create a joint development project in the future.

Parkland Station

Approximately 2.8 acres would be acquired for bus transfer areas for the station. Parkland Hospital plans on developing their property adjacent to the station on the east and west sides of the ROW. DART and Parkland will coordinate the final design of the station towards development of a pedestrian plaza or other transit oriented use on Parkland's property west of the station. In addition, there is a large vacant tract just south of Motor Street presenting a potential joint development opportunity with a possible connection of the station to future uses on the site.

Bachman Station

The joint development potential of this site would depend upon the final configuration of the property (the size of development parcels available after the line and station are built). If suitable development sites are available after development of the line, the property could have significant potential for a future joint development project. This site would have future market potential due to the station serving two lines and the high number of boardings projected at this location. On the block bound by Cullum, Community, Harry Hines and Denton, approximately 2.9 acres have been identified for development opportunities/expansion parking once construction is complete. On the block north of Community, there may also be development opportunities. The exact acreage is unknown at this time since this property would also be used for a future Irving/DFW LRT alignment.

Walnut Hill/Denton Station

Given the large size of the property to be acquired for this station site, a portion of this site would be made available for joint development. Approximately 11 acres would be acquired for the station and 3.7 acres has been identified for development/expansion parking. The excess property has frontage along Walnut Hill and is adjacent to the United Parcel Service facility (a major employer in the corridor). However, the existing market around the property is primarily industrial and heavy commercial indicating only a low to moderate potential for joint development.

Farmers Branch Station

Although DART would not be acquiring property at this location, the City of Farmers Branch has developed a station area plan for the area that could create joint development opportunities for DART. An element of their plan includes the future conversion of the surface DART park-and-ride into a parking garage with ground level and other uses to support future development.

Carrollton Square Station

Approximately 6.6 acres would be acquired just north of Belt Line Road. A small amount of that area, about 1.2 acres, has been identified for development/expansion parking. This provides for some small-scale joint development opportunities in the near term. For the future, more broad scale joint development opportunities may become available if the City's station area plan for Carrollton Square becomes a reality. That plan envisions a dynamic commercial and residential area directly adjacent to the station.

Trinity Mills Station

Construction of this station would create joint development opportunities for DART at the North Carrollton Transit Center location, located approximately ¼ mile east of the proposed LRT station. The property, located on Dickerson Parkway, would no longer be needed for transit purposes and

would be vacated once the LRT station is operational. The property is accessible to the new President George Bush Turnpike and could be redeveloped into a higher use. Adjacent to the Trinity Mills Station site, the City has adopted a station area plan that could create future joint development opportunities for DART.

Frankford Station

This station site would be quite large – approximately 17 acres. Of that acreage, approximately 4.8 acres have been identified for development/expansion parking. The City of Carrollton has also adopted a station area plan for the Frankford Station. The vision for this area is to promote mixed-use transit oriented development around the station. If this plan becomes a reality, it could provide substantial joint development opportunities for DART on their 17 acres.

Other Alternatives Considered

Market Center/Oak Lawn Station (North)

The DEIS Station included a structured parking garage that would have been constructed at this location on approximately two acres. There would have been a small amount of residual land fronting on Harry Hines that would have been available for joint development.

Parkland Station (Medical Center Design Options A, B, and C)

Residual land after the construction of this below-grade station would have presented significant joint development opportunities adjacent to and potentially over the station through the use of air rights. Likely uses would have been Medical Center facilities.

Parkland Station (Medical Center Design Option D)

Approximately three acres would have been acquired on the block bound by Harry Hines, Motor, Lofland and Redfield. Initially, it was thought that the design would allow for the development of the air rights over the station creating a joint development opportunity with Parkland Hospital. However, subsequent design reviews with Parkland revealed that a shallow cut tunnel and station on this site would have substantially restricted their ability to develop the property (below-grade) to meet their needs.

Love Field

No joint development opportunities were available for this station.

5.1.3 Mitigation Measures

Representatives of each of the corridor cities, other public agencies and the general public will continue to be involved in the planning and design process to ensure all impacts are identified and to assist in the development of mitigation measures. This includes working with City staff and their consultants to coordinate the design process with local plans currently in place and with those still being developed. Specific mitigation for acquisitions and displacements are discussed in Section 5.2.

5.2 ACQUISITIONS AND DISPLACEMENTS

This section describes the potential acquisitions and displacements associated with the No-Build Alternative and the Selected LRT Alternative. There were a number of design options considered during the Draft EIS and the potential impacts of these options are briefly discussed (a complete outline of impacts is covered in the Draft EIS). The following assessments are based on preliminary engineering drawings representing a ten percent level of design. Because of this, the following impact assessment is not a complete list of all real estate to be acquired for the project. As final design progresses on the alignment and the station areas, there will be refinements, including additions and deletions, to the proposed right-of-way and parcel acquisitions.

5.2.1 Real Estate Acquisitions

Acquisitions of real property (land and buildings) are described in this section. Acquisitions include occupied and vacant structures. Household and business displacements are in Section 5.2.2.

No Build-Alternative

This alternative represents the status quo and there would be no acquisition of property.

Selected LRT Alternative

Most of the properties acquired would be for construction of the LRT stations and related facilities (bus bays, pedestrian areas and parking). Property would also be needed where the alignment is located outside of the railroad right-of-way or where there is insufficient right-of-way width; to construct road improvements made necessary due to the presence of the LRT system; for construction staging, and for the Northwest Rail Operating Facility.

Stations and Rail Operating Facility

Approximately 107.2 acres would be acquired for the construction of LRT stations and the Northwest Rail Operating Facility. Of this 72.9 acres would be acquired for the stations. Eleven of the twelve stations will require acquisition of private property – this includes Victory, Market Center/Oak Lawn, Parkland, Inwood, Brookhollow, Bachman, Walnut Hill/Denton, Royal Lane, Carrollton Square, Trinity Mills and Frankford. The only station that would be located entirely on DART property is the Farmers Branch Station.

The selected location of the Northwest Rail Operating Facility is at Lombardy Lane and Denton Drive. Approximately 34.3 acres would be acquired at this location. A summary of the acquisitions for the stations and the Rail Operating Facility is in **Table 5-3** (displacement information is also included).

TABLE 5-3 STATION AREA AND RAIL OPERATING FACILITY ACQUISITIONS AND DISPLACEMENTS				
LOCATION	AREA TO BE ACQUIRED	LAND USE	CURRENT STRUCTURES	OCCUPANCY STATUS
Victory Station				
East of RR ROW at American Airlines Center	0.9 Acres (acquired 2001)	Institutional (Recreational)	Vacant	N/A
Market Center/Oak Lawn Station				
East of Harry Hines Between Wycliff & Vagas	2.8 Acres	Residential and Commercial	Four Single Family Residences, Two Motels	All occupied
Parkland Station				
Motor St. at UPRR	2.8 Acres	Industrial	Two Light Industrial Firms	All Occupied
Inwood Station				
South of Inwood & West of Denton Dr.	7.5 Acres	Commercial and Industrial	Two Office Buildings and Sheds for Landscaping Business	All Occupied except one office bldg.
Brookhollow Station				
Southwest corner Denton Dr. & Wyman St.	3.0 Acres	Industrial and Commercial	Vacant	N/A
Bachman Station (includes alignment and construction staging adjacent to station)				
West of Denton Drive and south of Community	10.6 Acres	Multi-family, Retail and Commercial	170 apartment units, Nightclub, Manufacturing Firm, Restaurant, Auto Sales, Auto Repair Sers. and Retail Strip Center	All occupied except for nightclub

TABLE 5-3 (Continued)				
STATION AREA AND RAIL OPERATING FACILITY ACQUISITIONS AND DISPLACEMENTS				
LOCATION	AREA TO BE ACQUIRED	LAND USE	CURRENT STRUCTURES	OCCUPANCY STATUS
Walnut Hill/Denton Lane Station				
North of Walnut Hill & East of Denton Dr.	11.0 Acres	Industrial	Manufacturing Business	Occupied
Royal Lane Station				
North of Royal, Between Denton and Grissom	3.4 Acres	Commercial and Industrial	Auto Sales, Carpet Store, Comm. Lawn Equipment Business, Refrigeration Co., Auto Repair	All occupied
Farmers Branch Station				
South of Pike St. & West of RR ROW	None	Park & Ride	N/A	N/A
Carrollton Square Station (includes alignment and street improvements adjacent to station)				
North of Belt Line, East of LRT Line	6.6 Acres	Residential, Commercial and Industrial	4 Single Family Residences, Strip Retail, Restaurant, Electrical Supply, Printing Service, Service Station and RR depot and yard	All occupied except for depot
Trinity Mills Station				
North Dickerson Pkwy. Extension, east of Broadway Street	7.4 Acres	Residential and Industrial	2 single Family Residences, Industrial Supply Firm, Landscape and Irrigation Firm	All occupied
Frankford Station				
South of Frankford Road & East of RR ROW	16.9 Acres	Industrial	Office/Warehouse Distribution Building (containing a business furniture company)	Occupied
Rail Operating Facility				
North of Lombardy Lane & East of Denton Dr.	34.3 Acres	Industrial	Lumber yard, 16 small light industrial businesses	All occupied except for lumber yard
Total Area to be Acquired	107.2 Acres			

Source: Renee Perkins Jaynes; Wallace Roberts & Todd; Wendy Lopez & Associates, April 2003

Alignment and Related Improvements

For engineering and design purposes, the LRT alignment has been divided into five sections. The first line section, NW-1A (Houston Street to Turtle Creek) has independent utility and began construction in 2002. The limits of each remaining line section are the following: NW-1B Turtle Creek to Bomar Avenue; NW-2 Bomar Avenue to Community Drive; NW-3 Community Drive to Valley View Lane; and NW-4 Valley View Lane to Frankford Road. The alignment requires real estate acquisition along all sections. In addition to acquisitions to accommodate the alignment, private property would be needed for street improvements made necessary by the LRT, construction staging and traction power substation locations. (Of the estimated 14 substations along the alignment, 12 are located in existing street or LRT right-of-way. Two impact private property.) Approximately 18.0 acres of private property have been identified for acquisition for these uses as of preliminary design (10 percent).

NW-1B

Approximately 0.7 acres would be acquired for NW1-B. Two properties are impacted – 2727 Kimsey and 2537 Butler. Approximately 0.18 acres would be acquired at 2727 Kimsey due to a vibration impact from the LRT alignment. Approximately 0.51 acres would be acquired at 2537 Butler due to insufficient RR right-of-way width – additional property is required to accommodate the alignment. (See Section 5.2.2 for displacement information).

NW-2

The NW-2 line section requires the acquisition of approximately 2.1 acres. The majority of these acquisitions are small pieces of property (0.25 acre or less) adjacent to existing street or railroad rights-of-way. These would be acquired for street improvements made necessary by the LRT and because of insufficient railroad right-of-way width in some locations. The exception to this is the acquisition of a block bound by Cullum, Community, Harry Hines and Denton (the location of the Bachman Station). In this section of NW-2, the LRT alignment would be located west of Denton Drive (outside of existing railroad ROW). This entire block would be acquired to accommodate the LRT alignment, a station and construction staging. The acreage for this acquisition is not included in the above total for NW-2 – it is included in the total acreage for the Bachman Station.

NW-3

Approximately 10.9 acres would be acquired for NW-3. Of that amount, 9.34 acres would be for acquisition of the block bound by Community, Northwest Highway, Jameson and Denton. This block is directly north of the block described above. Acquisition of the block would be for the Carrollton LRT alignment and to accommodate a connection to the future Irving LRT line. The proposed Irving Line would join the Carrollton Line in a Y-configuration on this property. Preliminary design also indicates that the property would be used for a traction power substation and construction staging. The remaining property to be acquired along NW-3, 1.58 acres, would be for street improvements and to provide additional right-of-way adjacent to the railroad corridor.

NW-4

The NW-4 requires the acquisition of approximately 4.3 acres. Almost half of this property is needed to widen the right-of-way just north of the Cotton Belt rail line. Approximately 0.2 acre would be acquired for a traction power substation. The remaining property acquired would be for street improvements and additional right-of-way along the LRT corridor.

Table 5-4 summarizes the acquisitions for all line sections.

TABLE 5-4 SUMMARY OF LRT ALIGNMENT ACQUISITIONS AND DISPLACEMENTS	
LOCATION	AREA TO BE ACQUIRED (ACRES)
Line Section NW-1B Turtle Creek to Bomar Avenue	0.7
Line Section NW-2 Bomar Avenue to Community Drive	2.1
Line Section NW-3 Community Drive to Valley View Lane	10.9
Line Section NW-4 Valley View Lane to Frankford Road	4.3
Total for all Line Sections	18.0

Note: The land acquisition in this table is in addition to that described in **Table 5-3**.
Source: Renee Perkins Jaynes; DART Real Estate; Chiang, Patel & Yerby, Inc; November 2002, April 2003

Other Alignments Considered and Station Areas

Alignments

Six alternative alignment options were evaluated during the Draft EIS. Five of these options focused on the Medical Center area. One of the options proposed an LRT alignment within the right-of-way of Harry Hines Boulevard until the line turned east just south of Mockingbird. This option had minimal impact on private property; most of the alignment would have been in street

right-of-way. The private property that would have been impacted included UTSW property near the North Campus and several commercial properties on the south side of Mockingbird Lane.

Three of the options considered in the Medical Center area (Medical Center Design Options A, B and C) proposed turning the alignment east from Harry Hines just north of Lofland Street. These options had a very significant impact on private property through that area; approximately 23 to 28 acres would have been required. Medical Center Design Option D, developed during the Draft EIS comment period, proposed turning the alignment east from Harry Hines just north of Motor Street, and would have avoided many of the private property impacts associated with Options A, B and C. The LRT line would have been located primarily within DART-owned railroad right-of-way at a point further south in the alignment.

Relocation of the Inwood Station and grade separation of Maple Avenue further avoids some of the property acquisitions due to alignment widening north of Inwood and street reconstruction that was previously associated with the design options.

The fifth alignment option considered during the DEIS was the Love Field Design Option. This alignment had very minimal impact on private property – less than an acre – since the majority of the property impacted was City of Dallas street right-of-way and Dallas Love Field airport property.

Stations

Seven alternative station locations were evaluated during the DEIS. The Harry Hines Base Alignment contained an aerial Parkland Station located within the right-of-way of Harry Hines Boulevard. This alignment option also proposed a station at UTSW's North Campus at Exchange Park Boulevard. The station would have required 4.6 acres of private property. Medical Center Design Options A, B and C proposed a station near Harry Hines and Lofland that would have required 4.0 acres of private property. Medical Center Design Option D proposed a station at Motor and Harry Hines, which required approximately 3.0 acres from Parkland Hospital. The Draft EIS also examined an option for the Inwood Station (north of Inwood) and Market Center/Oak Lawn Station (north of Wycliff Avenue). The Inwood Station would have acquired 5.0 acres of private property, and the Market Center/Oak Lawn Station would have acquired 2.1 acres of property. For the Love Field Option, a station would have been located on airport property, owned by the City of Dallas.

Rail Operating Facility

Two alternative locations were assessed during the DEIS for the Northwest Rail Operating Facility. One site was approximately 36 acres located at Webb Chapel and Denton Drive. This property is the location of the City of Dallas' Solid Waste Transfer Center and DART's Northwest Bus Operating Facility. The second site considered was located at Northwest Highway and Denton Drive. This site would have required the acquisition of 23 acres from private property owners.

5.2.2 Displacements and Impacts

Displacements of existing households and business uses in occupied structures are described in this section. Acquisitions of real property (land and buildings) were described in Section 5.2.1.

No Build-Alternative

This alternative represents the status quo and there would be no displacements.

Selected LRT Alternative

Most of the properties to be acquired have existing occupied structures. The uses range from single-family residential to heavy industrial. For the stations and alignments that have displacements, a brief description of the displaced uses and an assessment of potential impacts are outlined below. Displaced businesses and households are summarized in **Table 5-5**.

**TABLE 5-5
SUMMARY OF BUSINESSES AND HOUSEHOLDS DISPLACED**

LOCATION	Number of Households Displaced	Number of Businesses Displaced
STATIONS AND RAIL OPERATING FACILITY		
Victory	0	0
Market Center/Oak Lawn (South)	4	2
Parkland (UPRR)	0	2
Inwood (South)	0	1
Brookhollow	0	0
Bachman (including alignment and construction staging areas adjacent to station)	163	13
Walnut Hill/Denton	0	1
Royal Lane	0	5
Farmers Branch	0	0
Carrollton Square (includes LRT Alignment and Main Street Improvement)	4	9
Trinity Mills	2	2
Frankford	0	1
Rail Operating Facility	0	16
ALIGNMENT AND RELATED FACILITIES		
NW-1B Turtle Creek Blvd. to Bomar Ave.	1	1
NW-2 Bomar Ave. to Community Dr.	0	4
NW-3 Community Dr. to Valley View Lane	1	10
NW-4 Valley View Lane to Frankford Road	5	0
TOTAL DISPLACEMENTS	180	67

Source: Renee P. Jaynes; DART Real Estate; WRT; Chiang, Patel and Yerby; April 2003

Stations

Market Center/Oak Lawn Station (South)

The park-and-ride for this station would be located east of Harry Hines Boulevard between Wycliff and Vagas. There would be two businesses and four residences displaced. The businesses are the La Casita Motel located at 4300 Harry Hines Boulevard and the Park Crest Inn at 4318 Harry Hines Boulevard. Acquisition of the motels would not negatively impact room availability in this area. There are several motel and hotel facilities located in the immediate area.

Three of the single-family structures displaced are located on Wycliff Avenue. Two of the homes are tenant occupied (2214 and 2218 Wycliff) and were built in the 1950's. The 2214 Wycliff address is the residence for the Park Crest Inn Manager. The third house on the street, 2222 Wycliff, is owner occupied and was recently constructed (2002). The fourth residence impacted is 2231 Vagas Street. It is a tenant occupied structure built in the 1930's.

The values of the properties indicate that lower-income individuals occupy the households. DART Board adopted policies require that affordable, decent, safe and sanitary housing be made available to households that are relocated in accordance with Federal regulations. Section 5.16 provides additional information regarding environmental justice concerns.

Parkland Station (UPRR)

The Parkland Station and associated bus transfer area would displace two businesses north of Motor Street and east of the UPRR right-of-way. Double E, Inc., a manufacturing business, occupies four structures at 2031 and 2039 Motor. The buildings range in size from a 1,800 square foot office building to a 10,420 square foot storage/warehouse structure. The second business impacted is Centex Corporation, which is located at 2201 and 2211 Motor. There are two industrial buildings on these properties.

Inwood Station (South)

This station would displace two commercial structures located at 2722 Inwood Road, all of which are occupied by one business, Lawns of Dallas. An additional vacant commercial building at 2708 Inwood would also be impacted. Both properties impacted are owned by the same investment partnership.

Brookhollow Station

There are no displacements required for the Brookhollow Station. Acquisition of 3.0 acres of vacant property is required.

Bachman Station (including the LRT alignment and construction staging)

For the Bachman Station, the LRT alignment and construction staging area, DART would acquire a block bounded by Harry Hines on the west, Denton Drive on the east, Cullum Lane on the south, and Community Drive on the north. This would displace a number of businesses and one large apartment complex.

The largest impact would occur at the apartment complex located at the southwest corner of Community and Denton. The Willow Wood Apartments consists of 15 buildings containing 170 units. As of October 25, 2001, 163 units were occupied. From visual inspection, the apartments appear to be in poor condition. Relocating these residents according to DART relocation guidelines would likely improve their living conditions. The difficulty may be in finding replacement housing for that large a number of households if they all wish to remain in the immediate area. The relocation process would also require a very lengthy lead-time and multi-lingual relocation specialists. The Willow Wood residents that would be displaced should be able to find replacement housing within a two-mile radius of their current residence. A review of housing data recently released for the 2000 Census reveals that within a one-mile radius of Willow Wood Apartments there were 208 vacant housing units. Within a two-mile radius, there were 565 vacant units. Most of the units within these areas are available for rental occupancy. Approximately 94% of all housing units were renter occupied within the one-mile radius and 79% within two miles. Section 5.16 provides additional information regarding environmental justice concerns.

The businesses displaced on this block include a strip retail center (occupied by four tenants), a tire business, a retail structure (occupied by three tenants), ZINC Manufacturing, two automotive repair businesses (Car Quest and Dallas Alignment), a nightclub, an auto sales business, and a restaurant (BJ's Home Cooking). All properties, except the nightclub, were occupied at the time of the site inspections.

Because of the large number of businesses displaced, it would be difficult for all of them to remain in the immediate area. The project corridor, however, has several areas with vacant commercial and light industrial property available for replacement space. Both the Harry Hines and Northwest Highway corridor are nearby and might provide suitable replacement locations.

Walnut Hill/Denton Station

This station would displace one industrial firm – Peerless Manufacturing. The firm has 11 buildings at this location built between 1940 and 1970. It would be difficult for the firm to remain in this area due to their large land requirements. However the owners have expressed an interest in relocating their business.

Royal Lane Station

There are several industrial and retail businesses that would be displaced by this station. The largest of these, Longhorn Wholesale, Inc., is a commercial lawn equipment sale and service business. It consists of 3 buildings built in the 1960s and 1970s. Along Royal Lane, there is a used-car business (Royal Auto Sales) and a carpet store (Floor Mart) both built in 1970 that would be displaced. Along Grissom Lane, two smaller industrial businesses would be displaced –

Schindler Refrigeration Company and Scott's Automotive. Schindler's building was constructed in 1964 and Scott's in 1985. The smaller firms should be able to relocate in the area without any difficulty. Longhorn Wholesale should be able to remain in the corridor but might have to consider another area due to their sizable space requirements. There are numerous light industrial buildings in the corridor.

Farmers Branch Station

There are no displacements required for the Farmers Branch Station. No additional acquisition of property is required.

Carrollton Square Station (including LRT alignment and Main Street Improvements)

This station area has been approved as part of the City of Carrollton's planning study for the downtown area. The study recommends several thoroughfare changes including closing part of Denton Drive and extending Main Street. This creates a station area that requires the acquisition of several residential and non-residential structures. There are three homes on the west side of Denton Drive that would be displaced. All three structures are occupied. There is one house on the west side of Main Street that would also be displaced. It is also occupied. Two of the homes are owner-occupied according to Dallas County tax records. One of the homes was built in 1932. The others were built in the 1940s. None of these homes were found to be historically significant.

Five business properties would be acquired resulting in a total of nine displacements. At the northwest corner of Belt Line Road and Denton Drive, a strip retail center would be acquired that is occupied by five small businesses (a pawn shop, a small grocery market, a bakery, an electronics store and a hair salon). Just across the street from the strip center, a restaurant would be displaced. Both structures were built in the 1960s. On Denton Drive just north of Oak Street, two industrial businesses would be displaced – Fastway Electrical Supply and Edwards Printing Service. Fastway's building was constructed in 1987 and Edwards' in 1968. On Belt Line Road, a Conoco Service Station built in 1989 would be displaced. At the corner of the DART-owned Cotton Belt railroad ROW and Denton Drive, the vacant Carrollton Crossing Depot would be displaced and relocated in the station area (refer to **Figure 2-15**). A small portion of the Mercer freight yard would be acquired but would not affect freight operations.

The smaller retail businesses should be able to relocate in the area due to the numerous commercial properties along Belt Line Road. The two industrial firms have more specialized space needs and may have to relocate to industrial space elsewhere in the corridor. The Carrollton Crossing Depot, a historic resource, is proposed to be relocated to a more suitable location within the LRT station.

Trinity Mills Station

The proposed location of this station would displace residential and non-residential structures. There are two houses along Broadway Street that would be displaced. Both were built in the 1950s and appear to be occupied. One house was listed for sale by owner. There is a third structure on Broadway that may be an abandoned house. The building was not visible from the street and no record of the structure was found on the tax records. Two businesses would be displaced; both are located along Blanton Street. The first is a light industrial building occupied by Lesco Industrial. The second is an office/light industrial building that is occupied by Evans Landscape and Irrigation. The buildings appear to have been recently constructed or remodeled.

This area is in transition due to recent completion of the President George Bush Turnpike. It is unlikely that the residential structures would remain even if the DART station were not built. There is strong demand for higher intensity uses (such as commercial) in this area. The two businesses should be able to find replacement space in this general area. There are numerous commercial and light industrial sites available.

Frankford Station

This station would displace a new industrial building that appears to be approximately 200,000 square feet. The Herman Miller Company occupies approximately 70 percent of the space. The remaining space was vacant as of September 2001. DART is coordinating with the development company for the Frankford Trade Center to determine the appropriate timing for Herman Miller to be relocated within the Trade Center.

Rail Operating Facility

This site at the Northeast corner of Lombardy and Denton would displace a vacant lumberyard and approximately 16 small light industrial businesses.

Alignment, Street Improvements and Construction Staging

The following describes private property required for the LRT alignment, street improvements made necessary due to the presence of the LRT, construction staging, and power and traction substations. (With the exception of properties directly adjacent to the Bachman and Carrollton Square Stations; they were described in the previous section).

NW-1B Turtle Creek Boulevard to Bomar Avenue

The NW1-B alignment would be located primarily within street and DART-owned UPRR right-of-way. Two displacements would occur along this line section. The first is a business located at 2537 Butler Street, S&A Automotive. This property would be required to widen the right-of-way in this location to accommodate the LRT line. The second displacement is a single-family residence located at 2727 Kimsey. This owner-occupied structure built in the 1930's would be acquired due to a vibration impact from the LRT line.

NW-2 Bomar Avenue to Community Drive

Four businesses would be displaced along this section of the alignment – these properties are needed for the LRT alignment due to insufficient right-of-way. Two are located just north of Mockingbird and west of Denton Drive. AABCO Physical Health Equipment occupies two buildings at the northwest corner of Denton and Mockingbird. Boyer Automotive occupies one building located just north of Mockingbird on Denton Drive.

The remaining two business displacements are just south of Mockingbird and west of Denton Drive. The largest is a 4,214 square foot office building at 2728 West Mockingbird Lane. The second is a 2,424 square foot technical building at 2726 Fielder. Both buildings were occupied at the time of field inspection.

NW-3 Community Drive to Valley View Lane

Ten businesses and one single-family residence are displaced along this line section. All but one of these displacements occurs on the block just north of the Bachman Station. This property is bound by Jameson Drive on the west, Denton Drive on the east, Community Drive on the south and Northwest Highway on the north. On this block, a single-family residence is located at the corner of Denton and Community. The nine business displacements occur along Denton, Jameson, Northwest Highway and Community. These displacements include a trucking business, a nightclub, a construction firm, a motel (Circle Inn), a window tinting business (3M Distribution Window Tinting), two auto repair businesses (Perfect Auto Service and Advantage Auto Body), one furniture store (Corona Furniture Store), and two unknown nonresidential structures that appear to be for one business. All of the structures were occupied at the time of the site inspections.

The displacements are due to several needs for the property; 1) the alignment for the LRT Line; 2) construction staging; 3) a traction power substation; and 4) the junction for the future LRT alignment to Irving/DFW. The proposed Irving/DFW Line would join the proposed project in a Y-configuration on this block. The tenth business displacement occurs just north of Northwest

Highway and west of Denton Drive. The El Noa Noa Ballroom located at 10011 Denton Drive would be acquired. This structure is approximately 23,522 square feet and was occupied at time of inspection. It is a large facility, however replacement locations might be available elsewhere along Northwest Highway.

NW-4 Valley View Lane to Frankford Road

One multi-family structure and one single-family structure would be displaced along this section of the alignment. The multi-family structure is a four unit residential building located at 1309 Northside Drive just east of the LRT right-of-way. The single-family building is located at 1601 Random Road. Partial acquisitions of these properties are needed for the LRT alignment, which will likely require a full acquisition. Both buildings appeared occupied at time of inspection. It is estimated that five households would be displaced – most renter occupied.

Other Alignments Considered

The Harry Hines Base Alignment would have displaced several businesses and office structures along the south side of Mockingbird Lane between Maple and Denton. Several structures are vacant in this area. Approximately five businesses were occupying buildings at the time of inspection. The Love Field Design Option would have displaced four offices on the south side of Mockingbird, depending on the route into Dallas Love Field. All were occupied.

The Medical Center Design Options (A, B and C) would have displaced 26 to 35 structures depending on the option. Only three of these buildings were residences. The actual number of businesses displaced would likely have been much higher than the number of structures displaced because several of the buildings were multi-tenant facilities. The uses included offices, warehouses, industrial, and medical services. Option C had the highest number of total displacements – up to 80 business displacements were estimated in the Draft EIS. Option B would have displaced a major industry in the area, Olmsted-Kirk Paper, located south of Butler and west of Maple.

Option D, developed during the Draft EIS comment period, would have displaced Parkland Support Services, which would have relocated in the same general area as part of their Master Plan. Two industrial buildings on the south side of Butler Street would have been displaced due to street improvements (the proposed grade separation at Maple avoids these impacts). A single-family home on the south side of Kimsey adjacent to the right-of-way would also have been displaced because the property would have been needed for the LRT alignment.

5.2.3 Summary of Acquisitions and Displacements

The Selected LRT Alternative would require the acquisition of approximately 125.2 acres of private property at various locations along the line. The acquisitions are needed for LRT stations, the rail operating facility, LRT alignment, street improvements, construction staging, and the traction power substations. Approximately 13 single-family structures, one four-plex and one apartment complex would be displaced requiring the relocation of an estimated 180 households. Approximately 67 businesses would be displaced.

5.2.4 Mitigation Measures

All acquisition of property must adhere to the DART Board of Directors' Real Estate Policy and Procedures, adopted August 25, 1987 and modified in October 2000. These policies and procedures adhere to all Federal guidelines regarding acquisition and relocation assistance including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42USC 4601). For all real property acquired, DART compensates the property owner for the fair market value of their property and for damages to any remaining parcel(s).

Relocation benefits are provided for all businesses and residents (owner occupants and tenants) that are displaced by acquisition. Prior to the relocation, DART staff prepare a relocation analysis that determines the availability of (1) adequate, decent, safe and sanitary housing for displaced residents and (2) suitable locations or facilities for displaced businesses. The relocation benefits and services provided to those displaced are determined by eligibility guidelines based on Federal policies. For businesses, these generally include reimbursement of moving expenses and advisory assistance in locating a replacement site. For residents, this includes reimbursement of moving expenses, advisory assistance in locating replacement housing and replacement housing entitlements (if eligibility criteria are met). DART also has a “Last Resort Housing” provision that may be needed for some of the households displaced due to the high percentage of individuals with incomes below the poverty level.

5.3 AIR QUALITY

In this section, the air quality impacts of the future No-Build and LRT Alternative are presented and discussed. Supporting these results, Section 3.4.1 describes the methodology used for both the mesoscale burden analysis and the microscale CO analysis. Section 3.4.2 provides a background on the current status of air quality in the corridor and the region in general.

5.3.1 Impact Assessment

Mesoscale Burden Analysis

Table 5-6 presents the results of the pollutant burden analysis. This analysis includes vehicle emissions from the corridor study area across the four counties of the North Central Texas region (composed of Collin, Dallas, Denton and Tarrant). As **Table 5-6** shows, the LRT Alternative vehicle emissions would be similar to the future No-Build Alternative. This is due to the similar vehicle miles traveled in both alternatives. Since VOCs and NOx are known precursors to the formation of O₃, it is unlikely that O₃ levels will increase as a result of building the project.

It should be noted that the proposed Northwest Rail Operating Facility may cause a slight increase in emissions of VOCs from paints, solvents, and other chemicals utilized for maintenance activities. However, this potential is minimal as no heavy maintenance is proposed for this facility.

TABLE 5-6 2025 PROJECTED CORRIDOR POLLUTANT BURDEN (VEHICLE EMISSIONS POLLUTANTS IN TONS/DAY)			
Measure	No-Build	Build	Percent Change +/-
VMT (× 1,000)	168,601	167,334	-0.75%
CO	1,201	1,217	1.32%
HC (VOC)	149	149	0.07%
NOx	255	256	0.43%

Source: Parsons, 2001

Microscale CO Analysis

While overall CO emissions are similar between the future No-Build and the LRT Alternatives, specific intersections near stations may show an increase in localized emissions. CO is the most common pollutant of concern in localized areas, and vehicles are the primary contributor to local CO “hot spots.” The CO micro-scale analysis examined receptors near the intersection of Valley View Lane and Denton Drive in Farmers Branch, which is expected to be impacted the greatest by building the project. This intersection was selected based on its grade, vehicle volume and speed, receptors, and proximity to a rail park-and-ride station. Intersections that are elevated above grade produce less ground level impacts because of higher air dispersion. Increased vehicle volumes generate more emissions. Vehicles produce less CO emissions as speed increases until approximately 50 miles per hour, at which point emissions increase as engine efficiency is reduced. In general, the closer a receptor is to the intersection the greater the exposure.

Proximity to rail park-and-ride stations will generate additional trips through nearby intersections. Receptors were placed near roadways at distances greater than the mixing zone of 3 meters above grade at the selected intersection location.

The results of the microscale CO analysis are presented in **Table 5-7**. It should be noted that this analysis was performed using the Cal3QHC model. CO concentrations are reported for a receptor with the highest concentration within 1,000 feet of the intersection selected for CO microanalysis. The maximum predicted 1-Hour concentration of 5.2 ppm is predicted to occur at the northbound onramp to the IH 35E frontage road. The maximum predicted 8-hour concentration of 3.6 ppm is also predicted to occur at the northbound onramp to the IH 35E frontage road. The results of the analysis presented in **Table 5-7** indicate that the maximum predicted CO concentrations would be well below the CO ambient air quality standards. The results in **Table 5-7** also indicate that the CO concentration predicted for the LRT Alternative would be similar to the future No-Build Alternative.

TABLE 5-7				
2025 MICRO-SCALE ANALYSIS RESULTS (PPM)				
Site	1-Hour		8-Hour	
	No Build	LRT	No Build	LRT
Valley View Lane and Denton Drive	5.1	5.2	3.6	3.6
Standard	35.5		9.5	

Source: Parsons, 2001

5.3.2 Mitigation Measures

Since no air quality violations are anticipated and overall build project CO emissions are expected to be similar to future No-Build alternative CO emissions, no additional mitigation measures are required.

5.3.3 Conformity Statement

This project is within the boundary of the North Central Texas Council of Governments (NCTCOG) Transportation Management Area (TMA). This area is designated as a serious non-attainment area for ozone, since the federal standard for this pollutant has been exceeded in past years. Other pollutants are predicted to remain below federal and state standards in the future.

Under the provisions of the Clean Air Act, states are required to develop and submit to the EPA a State Implementation Plan (SIP) for each non-attainment area. A SIP for the Dallas-Fort Worth Area has been submitted. This plan includes the proposed project. All projects in the Transportation Improvement Program (TIP) for the Dallas-Fort Worth Metropolitan Area that are proposed for federal funding were initiated in a manner consistent with the Statewide and Metropolitan Planning Final Rule in the federal guidelines, Section 450 of Title 23 CFR and Section 613.2000, Subpart B, of Title 49 CFR and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The ISTEA was reauthorized as the Transportation Equity Act for the 21st century (TEA-21), however the 2000 TIP was prepared under ISTEA guidelines pending publication of the TEA-21 revised planning guidelines. Energy, environmental, air quality, cost and mobility considerations are addressed in the programming of the TIP. The proposed action is consistent with the region's **Mobility 2025**: The Metropolitan Transportation Plan Update adopted in May 2001. EPA published a proposal to approve the Dallas/Fort Worth SIP in the Federal Register on January 18, 2001 (Federal Register, volume 66, Number 12, page 4756). Final approval by the EPA is pending. The next major SIP submittal for the DFW area will be for the mid-course review in 2004.

5.4 NOISE

This section presents the analysis of potential noise impacts due to the operation of the proposed project and discusses mitigation measures to minimize adverse impacts.

5.4.1 Noise Impact Assessment

Noise Impact Assessment Methodology

Noise levels were projected based on the DART LRT vehicle noise specification, the proposed project's Operating Plan and the prediction model specified in the FTA guidance manual. Significant factors are summarized below:

- Based on the DART vehicle noise specification, the predictions assume that a single 93-foot long vehicle operating at 40 mph on ballast and tie track with continuous welded rail (CWR) generates a maximum noise level of 76 dBA at a distance of 50 feet from the track centerline. A noise assessment was not conducted for the Rail Operating Facility due to the fact that the site is not located in close proximity to any Category 2 receptors.
- The operating times of the line would be between 5:30 AM and 12:30 AM. The operating plan for LRT service specifies a peak-hour headway of ten minutes, an off-peak base period headway of 15 minutes and an evening headway of 20 minutes. Two-car trains would operate most of the day, with some three-car trains in peak periods and single-car trains in the evenings.
- Peak hour operations would occur between 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM. Evening operations would occur between 8:30 PM and 12:30 AM, and base service would occur during all other time periods. The average number of cars per train would be 2.5 cars during peak hours, two cars during base service, and one car during evening service.
- Vehicle operating speeds are based on the Train Performance Calculation (TPC) Simulations for the project. The speed limits range from 10 mph to 65 mph along the corridor.
- 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 whistles generate a noise level of 78 dBA 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 at 50 feet for 20 seconds prior to and ten seconds following each train. These operating parameters are consistent with current practice on the Starter System and were designed to minimize community noise exposure to the greatest extent possible within the constraints of safe operations. However, to account for the intrusive character of the whistles and bells, a 5 dBA penalty is applied to noise levels from these sources in accordance with FTA procedures.
- There will be no significant shift of freight rail operations from daytime to nighttime periods due to the implementation of the LRT Alternative. Sporadic nighttime freight service is present today and will continue in the future.

Projected Sound Levels

The No-Build Alternative is not expected to result in any noise impacts.

For the Selected LRT Alternative and other alignments considered, detailed comparisons of the existing and future noise levels are presented in **Table 5-8** and **Table 5-9**. **Table 5-8** includes results for the Category 2 receptors along the alignment with both daytime and nighttime sensitivity to noise (e.g. residences, hotels, and hospitals). **Table 5-9** is a listing of all Category 3 receptors along the alignment, consisting of institutional sites that are not sensitive to noise at night (e.g. schools, churches, parks and medical offices).

**TABLE 5-8
NOISE IMPACTS FOR LAND USE
WITH BOTH DAYTIME AND NIGHTTIME SENSITIVITY (CATEGORY 2)**

Location	Civil Station	Dist to Near Track (ft)	Speed (mph)	Exist. Noise Level ¹	Project Noise Level ¹		Impact Category	Total Noise Level ¹	Noise Level Increase ¹	# of Res. Impacts		
					Predicted ² (rounded to nearest decibel)	Impact Criteria				Imp	Sev	
						Imp						Sev
Selected LRT Alternative (Base Alignment with UPRR)												
Hondo St	204	180	25	70	48	64	70	None	70	0	0	0
Lucas Ave	214	95	45	62	57	59	65	None	63	1	0	0
Maple Ave	255	95	47	67	59	62	68	None	68	1	0	0
Hudnall St	264	130	42	69	54	64	69	None	69	0	0	0
Inwood Rd	278	150	21	72	49	65	71	None	72	0	0	0
Kimsey Dr	290	85	57	73	66	65	72	Imp	74	1	1	0
Empire Central Dr	183	140	64	72	61	65	71	None	72	0	0	0
Lovedale Ave	203	140	65	73	54	65	72	None	73	0	0	0
Bombay Ave	217	140	65	73	54	65	72	None	73	0	0	0
Gilford Ave	222	140	65	73	54	65	72	None	73	0	0	0
Lovers Lane					57	65	72	None	73	0	0	0
Webb Chapel	319	176	27	63	60	60	65	Imp	65	2	52	0
Farmers Branch Lane	556	340	65	65	47	61	66	None	65	0	0	0
Sable	567	160	33	65	55	61	66	None	65	0	0	0
Fruitland	593	80	65	65	58	61	66	None	66	0	0	0
Valwood Parkway	642	168	65	65	62	61	66	Imp	67	2	1 motel	0
Crosby	662	80	65	66	65	62	67	Imp	69	1	24	0
Northside ³												
Severe Impact ⁴	718	25	65	66	68	62	67	Sev	70	4	0	4 ⁴
Mod. Imp. >3dB	721	35	65	66	67	62	67	Imp	69	3	1	0
Mod. Imp. <3dB	722	55	65	66	64	62	67	Imp	68	2	1	0
Donald	730	50	62	66	65	62	67	Imp	68	2	4	0
Whitlock	757	88	63	67	62	62	68	None	68	0	0	0
Jackson	778	80	65	67	57	62	68	None	67	0	0	0
Total											84	4
Other Alignments Considered (Harry Hines Base Alignment, Medical Center Design Option A)												
Lofland (Base)	89	100	37	65	53	61	66	None	65	0	0	0
Lofland (Option A)	53	220	40	70	51	64	70	None	70	0	0	0
Mockingbird (Base)	161	64	35	70	64	69	75	None	71	1	0	0
Redfield St. (Option A)	106	64	40	62	55	59	65	None	63	0	0	0
Empire Central (Base)	196	140	65	73	54	65	72	None	73	0	0	0
¹ Noise levels are based on Ldn and are measured in dBA. ² Predicted levels include a 5dBA penalty applied to audible signal noise, where applicable. ³ One property at this location was considered a noise impact in the Draft EIS, but is now identified as a real estate acquisition for alignment right-of-way. It is therefore not considered a noise impact. ⁴ Four (4) multi-family residences identified with a severe noise impact have also been identified as a real estate acquisition. If acquisition is not ultimately required, then noise mitigation will be required at this location.												

Source: HMMH, 2002

In addition to the civil station, distance to the near track and proposed LRT speed, each table includes the existing noise level, the projected noise level from LRT operations and the impact criteria for each receptor or receptor group. Based on a comparison of the predicted project noise level with the impact criteria, the impact category is listed, along with the predicted total noise level and projected noise increase due to the introduction of LRT service. **Table 5-8** also includes an inventory of the number of impacts and severe impacts at each sensitive receptor location.

**TABLE 5-9
NOISE IMPACTS FOR INSTITUTIONAL LAND USE
WITH NO NIGHTTIME SENSITIVITY (CATEGORY 1 AND 3)**

Location	Civil Stn	Dist. to near track (ft)	Speed (mph)	Exist. Noise Level ¹	Project Noise Level ¹			Impact Category	Total Noise Level ¹	Noise Level Increase ¹
					Predicted ² (rounded to nearest decibel)	Impact Criteria				
						Imp	Sev			
Selected LRT Alternative (Base Alignment with UPRR)										
Medical Clinic	273	150	25	70	49	69	75	None	70	0
School	283	180	30	73	50	70	77	None	73	0
Video Post and Transfer	283	70	30	73	56	70	77	None	73	0
Church	208	120	65	71	61	69	75	None	71	0
Church	227	140	65	65	54	66	71	None	66	1
Park	552	320	65	55	48	60	66	None	56	1
Church	586	88	65	66	57	67	72	None	67	1
Church	665	128	65	71	58	69	75	None	71	0
Church	672	320	63	71	48	69	75	None	71	0
Other Alignments Considered (Harry Hines Base Alignment and Medical Center Design Option A)										
School (Option A)	111	200	40	67	49	62	68	None	67	0
Salvation Army Chapel (Base)	139	224	30	61	48	63	69	None	61	0

¹ Noise levels are based on Peak Hour Leq and are measured in dBA.

² Predicted levels include a 5dBA penalty applied to audible signal noise, where applicable.

Source: HMMH, 2002

The results in **Table 5-8** identify noise impacts for a total of 88 receptors (76 apartment units, 11 single-family homes, and one motel). Four of these impacts meet severe impact levels. The FTA definition of severe impact and impact is found in Section 3.5.1. The following are brief discussions of each impacted Category 2 land use area:

Selected LRT Alternative

Kimsey Drive: Noise impact is projected at one residence, located at 2722 Kimsey Drive on the south side of the street, due to a planned crossover adjacent to this site.

Webb Chapel: The impacted apartment complexes in this area are located to the east of the tracks opposite the Bachman Station. Due to the grade crossing at Community Drive and the crossover for the Irving/DFW line, four buildings comprised of 52 units are projected to experience noise impact.

Valwood Parkway: There is a Red Roof Inn Motel located west of the alignment north of Valwood Parkway. Noise impact is due to the two grade crossings at Burning Tree Lane and at a private drive.

Crosby: The Crosby Creek Apartments are located to the east of the alignment south of Crosby Road. Due to the high speed of the LRT operations (55-65 mph) and to the change from at-grade to an aerial structure, 24 units in two buildings are projected to have noise impact.

Northside: This area includes several residences located to the east of the alignment. The noise environment is characterized by traffic on North Broadway Street and the alignment would be on an aerial structure through this area. Due to the close proximity (60 feet) and the LRT speed of 55-65 mph, one residence was projected to have noise impact in the Draft EIS. This property is now identified as a real estate acquisition for alignment right-of-way for the project, based on a minor alignment shift, and therefore is not considered a noise impact. Due to the alignment shift, impact is now projected at six other residences, with severe impact at four multi-family residences located as close as 25 feet from the near track. However, the four residences with severe impact have been identified as a real estate acquisition. If acquisition is avoided during the real estate negotiation process, mitigation will be provided by constructing a noise barrier wall. There is a moderate impact of more than 3dB at one single-family residence, and a moderate impact of 2dB at one other.

Donald: Due to the alignment shift from the location assumed in the Draft EIS, moderate noise impact is now projected at four residences in this area (two duplexes), located 50 feet instead of 112 feet from the nearest LRT track.

Similar to the Category 2 analysis, an assessment of noise impact for Category 3 receptors was also conducted. This assessment was based on a comparison of the existing ambient noise level with the predicted project noise levels in terms of the peak transit hour Leq. As indicated in **Table 5-9**, no impact is predicted at any of these locations. **Figures 5-1 and 5-2** show the locations of potential noise impact discussed above.

Other Alignments Considered

As shown in **Tables 5-8 and 5-9**, the noise impacts would be the same as for the Selected LRT Alternative. No additional sensitive uses would be affected.

5.4.2 Noise Impact Mitigation

As discussed in Section 3.5.1, FTA states that in implementing noise impact criteria, severe impacts should be mitigated unless there are no practical means to do so. For the proposed project, there are no severe impacts (since the severe impact building is proposed to be acquired). At the moderate impact level, more discretion should be used, and other project-specific factors should be included in the consideration of mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-to-indoor sound insulation and the cost-effectiveness of mitigating noise to more acceptable levels.

Mitigation Options

Potential mitigation measures for reducing noise impacts from LRT operation for the proposed project are described below.

Noise Barriers - This is a common approach to reducing noise impacts from surface transportation sources. The primary requirements for an effective noise barrier are that:

- the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver;
- the barrier must be of an impervious material with a minimum surface density of 4 lb/sq. ft.;
and
- the barrier must not have any gaps or holes between the panels or at the bottom.

Figure 5-1 Projected Noise Impact Areas – Vicinity of Community Drive, Valwood Parkway, Crosby Road, and Northside Drive/Donald Avenue

Figure 5-2 Projected Noise & Vibration Impact Areas– Vicinity of Kimsey Dr.

Because numerous materials meet these requirements, the selection of materials for noise barriers is usually dictated by aesthetics, durability, cost and maintenance considerations. Depending on the proximity of the barrier to the tracks and on the track elevation, transit system noise barriers typically range in height from between four and eight feet.

Building Sound Insulation - Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction has been widely applied around airports and has seen limited application for transit projects. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable, and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to the windows, by sealing any holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air-conditioning so that windows do not need to be opened.

Special Trackwork at Crossovers - Because the impacts of LRT wheels over rail gaps at track crossover locations increases LRT noise by about 6 dBA, crossovers are a major source of noise impact when they are located in sensitive areas. If crossovers cannot be relocated away from residential areas, another approach is to use moveable point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.

LRT Speed Reductions in Sensitive Areas - Speed reductions will always lower community noise levels, but they are not often implemented for noise control because of the negative impact on the LRT operating schedule. Thus, their impact on the operating schedule would need to be evaluated with respect to their potential noise mitigation benefits.

Recommended Mitigation

Based on the results of the noise assessment, mitigation measures have been identified to address four severe and two moderate impacts at Northside Drive. The primary mitigation measure would be the construction of sound barrier walls to shield areas where impact is projected. **Table 5-10** indicates the approximate noise barrier location, length, and side of tracks as well as the number of moderate and severe impacts that would be reduced. Typical barrier height is about eight feet, and can be somewhat less on elevated structures. Exact height and configuration depend on specific conditions, and will be determined during final design. Mitigation for other moderate noise impacts is not recommended due to intervening features such as freight tracks or a street, as well as projected noise increases of less than 3 dB.

TABLE 5-10 RECOMMENDED NOISE BARRIER MITIGATION TREATMENT						
SEGMENT	Side of Track	Civil Station	Length (Feet)	Impacts		Total
				Moderate	Severe	
Northside Drive						
Moderate Impact	NB	720+50 to 723+50	300	2	0	2
Severe Impact*	NB	716+50 to 720+50	400	0	4	4
* The 4 severe impacts at 1309 Northside Drive are to be acquired for right-of-way purposes. If acquisition is avoided during the real estate negotiation process, noise mitigation will be provided at this location.						

Source: HMMH, 2002

5.5 VIBRATION

5.5.1 Ground Vibration Impact Assessment Vibration Impact Assessment Methodology

The potential vibration impact from LRT operation was assessed on an absolute basis using the FTA criteria. The same representative sensitive receptors identified in **Table 3-15** in Chapter 3 were considered for the vibration impact assessment. The following factors were used in determining potential vibration impacts along the project corridor:

- Vibration source levels were based on measurements previously conducted on vehicles operating on the existing Starter System. A vibration assessment was not conducted for the Northwest Rail Operating Facility due to the fact that the proposed site is not located within 200 feet of any sensitive receptors. The Brockbank Apartments are located approximately 550 feet from the northeast corner of the Northwest Rail Operating Facility site; however, based on the conceptual site layout, no LRT would operate within 750 feet of the apartments.
- Vibration propagation tests were conducted at five sites along the corridor near sensitive receptors. These tests measured the response of the ground to an input force. The results of these tests were combined with the vibration source level measurements to provide projections of vibration levels from vehicles operating on the project corridor.
- Vehicle operating speeds are based on the TPC Simulations for the project corridor. The speed limits range from 10 mph to 65 mph along the corridor.

Projected Vibration Levels

The No-Build Alternative is not expected to result in any ground-borne vibration impacts. Traffic, even heavy trucks and buses, rarely creates perceptible ground-borne vibration unless they are operating very close to buildings or there are irregularities, such as potholes or expansion joints, in the roadway. The pneumatic tires and suspensions systems of normal automobiles, trucks and buses are sufficient to eliminate most ground-borne vibration forces.

With regard to the LRT Alternative, the estimated root mean square (RMS) velocity levels (VdB re 1 micro-in./sec.) for sensitive receptors at representative distances are provided in **Tables 5-11** and **5-12**. These tables summarize the results of the analysis in terms of anticipated exceedances of the FTA criteria for “frequent events” (defined as more than 70 events per day). The criteria are discussed in more detail in Section 3.6.1.

Vibration levels for the Love Field Design Option are not projected at this time. Should this Design Option be reconsidered in the future, vibration testing for potential impacts to sensitive airport equipment would be conducted based on the detailed alignment and construction method.

Vibration-sensitive locations along the Selected LRT Alignment and other alternatives considered are listed in **Table 5-11** for Category 2 land use and in **Table 5-12** for Category 1 and 3 land use. Each table lists the locations, the civil station, the distance to the near track, and the projected LRT speed at each location. In addition, the predicted project vibration level and the impact criterion level are indicated along with the number of impacts projected for each receptor or receptor group.

Table 5-11 identifies one potential Category 2 vibration impact as follows.

Kimsey: This area is a single-family residential street located to the west of the tracks north of Inwood Road. Vibration impact is due to the close proximity of the residence (2727 Kimsey Drive) to the tracks (20 feet). This impact is shown in **Figure 5-2**.

**TABLE 5-11
LAND USE CATEGORY 2 VIBRATION IMPACTS**

Location	Civil Stn.	Distance to Near Track (ft)	Speed (mph)	Project Vibration Level ¹	Vibration Impact Criterion ¹	No. of Res. Impacts
Selected LRT Alternative (Base Alignment with UPRR)						
Hondo St	204	180	25	29	72	0
Lucas Ave	214	95	45	49	72	0
Maple Ave	255	95	47	49	72	0
Hudnall St	264	130	42	41	72	0
Inwood Rd	278	150	21	31	72	0
Kimsey Dr	290	20	57	93	72	1
Empire Central Dr	183	140	64	55	72	0
Lovedale Ave	203	140	65	56	72	0
Bombay Ave	217	140	65	56	72	0
Gilford Ave	222	140	65	56	72	0
Lovers Lane	238	136	65	54	72	0
Webb Chapel	319	176	27	49	72	0
Farmers Branch Lane	556	340	65	46	72	0
Sable	567	160	33	47	72	0
Fruitland	593	80	65	63	72	0
Valwood Parkway	642	168	65	52	72	0
Crosby	662	80	65	65	72	0
Northside	721	25	65	64	72	0
Donald	730	50	62	61	72	0
Whitlock	757	88	63	63	72	0
Jackson	778	80	65	63	72	0
Total:						1
Other Alignments Considered (Harry Hines Base Alignment and Medical Center Design Option A)						
Lofland (Base)	89	100	37	43	72	0
Lofland (Option A)	53	220	40	29	72	0
Mockingbird (Base)	161	64	35	70	72	0
Redfield St (Option A)	106	64	40	67	72	0
Empire Central (Base)	196	140	65	56	72	0

¹Vibration levels are measured in VdB referenced to 1 µin/sec.

Source: HMMH, 2002

**TABLE 5-12
LAND USE CATEGORY 1 AND 3 VIBRATION IMPACTS**

Location	Land Use Cat.	Civil Stn.	Distance to Near Track (ft)	Speed (mph)	Project Vib. Level ²	Vib. Impact Criterion ²	No of Impacts
Selected LRT Alternative (Harry Hines Base with UPRR)							
Medical Clinic	3	273	150	25	33	75	0
School	3	283	180	20	30	75	0
Video Post & Transfer	1	283	70	30	52	65	0
Southwestern Gage	1	286	30	37	70	65	1
Church	3	208	120	65	60	75	0
Church	3	227	140	65	55	75	0
Church	3	586	88	65	61	75	0
Church	3	665	128	65	45	75	0
Church	3	672	320	63	41	75	0
Total:							1
Other Alignments Considered (Harry Hines Base and Medical Center Design Option A)							
School (Option A)	3	111	200	40	41	75	0
Salvation Army Chapel (Base)	3	139	224	30	26	75	0

¹Assessment is for vibration-sensitive buildings only; park lands are not included.

²Vibration levels are measured in VdB referenced to 1 µin/sec.

Source: HMMH, 2002

Similar to the Category 2 analysis, an assessment of vibration impact for Category 1 and 3 receptors was also conducted. As shown in **Table 5-12**, one potential impact was identified as follows:

Southwestern Gage: This vibration-sensitive business is located to the west of the proposed LRT tracks north of Sadler Circle. Vibration impact is due to the close proximity of the building to the tracks (30 feet) and the nearby crossover.

5.5.2 Ground-Borne Noise Impact Assessment

As indicated in Section 3.6.1 (Ground-Borne Vibration Criteria), airborne noise tends to mask ground-borne noise for above ground (i.e. at-grade or elevated) rail systems, and therefore ground-borne noise impact was assessed only at Video Post and Transfer, a business with well-insulated, noise-sensitive interior spaces. The projected ground-borne noise level inside this building is 20 dBA, which is below the 25 dBA FTA criterion for this Category 1 receptor. Therefore, no ground-borne noise impact is anticipated.

5.5.3 Ground-Borne Vibration Mitigation

Ground-borne vibration impact has been identified at one residential receptor along the project corridor, the single-family residence at 2727 Kimsey Drive on the north side of the street. Because the projected vibration level of 93 VdB is more than 20 decibels above the FTA criterion (72 VdB) at this site, vibration isolation will not be practical and the only feasible mitigation measure is to acquire this property.

Potential vibration impact has also been identified at one vibration-sensitive business, Southwestern Gage. Possible mitigation approaches at this site include crossover relocation, alternative crossover frog designs, resilient track isolators, and vibration isolation of sensitive equipment inside the building. A detailed analysis will be conducted during final design to refine the vibration projections and to determine the most appropriate mitigation measure, if warranted.

5.6 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 affect of such change on the experience of the primary viewers.

5.6.1 Methodology

To assess visual and aesthetic impacts, each of the Corridor Assessment Units described in Section 3.7.3 (Corridor Assessment Unit Descriptions) were analyzed. Each sensitive receptor/asset was assessed to determine which project characteristics would potentially have an impact. The characteristics of the project which could have an impact on the resource include:

- Station Areas, including platform, bus transfer, and parking areas
- Elevated Structures/Bridges
- Elevated Stations
- Other vertical elements (i.e., catenary poles, light standards, safety fencing).
- Rail Operating Facility

For each of the sensitive receptors/assets where impacts are anticipated, mitigation measures are specified. Mitigation measures are intended to be consistent with those employed for other sections of the DART LRT system, as appropriate.

5.6.2 Impact Assessment and Mitigation

The potential impact of each of the project characteristics was rated as either significant, potentially significant, or generally not significant based on the sensitive receptors/assets. It was assumed

that the design and construction of the project would be consistent with current DART design standards. The assessment for each of the Corridor Assessment Units is summarized in **Table 5-13** and the nature of those impacts which are either potentially significant or significant are described below.

**TABLE 5-13
VISUAL AND AESTHETIC IMPACTS**

				Characteristics				
Unit	Name	Sensitive Receptors/Assets	Primary Viewers	Station Areas	Elevated Structures/Bridges	Elevated Stations	Other Vert. Elements	Rail Operating Facility
1	West End/Arena	West End properties, American Airlines Center	A E G	N/A	N/A	N/A	○	N/A
2	Market Center	Reverchon Park, Turtle Creek Pump Station, Market Center, offices, hotels SF residences to east,	A C E	○	○	N/A	○	N/A
			B	●	○	N/A	●	N/A
3*	Medical Center	Hospitals, MF residences, offices, Harry Hines Blvd. Landscaping	A C E H	●	●	●	●	N/A
3A	Inwood	Low rise industrial, schools, parks, SF to west SF to east	A F	○	○	○	○	N/A
			B D G	●	●	●	●	N/A
			B G	N/A	●	N/A	●	N/A
4	Love Field	SF residences to west, Knight School, Bachman Lake Park	A B C D F	○	N/A	N/A	○	N/A
5	Northwest Hwy/ LBJ Freeway	MF residences to east, offices	A E F	○	○	○	○	●
			C	○	●	●	●	N/A
6	Farmers Branch	Low rise industrial uses, park and government buildings	A B D E G	●	●	N/A	●	N/A
7	North Farmers Branch	Low rise industrial uses and MF to the east	A F	○	○	○	○	N/A
			C	○	●	○	●	N/A
8	Downtown Carrollton	Old downtown Carrollton, SF and MF residences, historic properties and parks	A E G	●	●	●	●	N/A
9	Carrollton/ Frankford	SF residences, offices, Ken Good Park	A B C D F	○	○	○	○	N/A
Primary Viewers				Impacts				
A = Arterial Motorist				● = Significant				
B = Single Family Residents				● = Potentially Significant				
C = Multi-Family Residents				○ = Not Significant				
D = Recreational Users				N/A = Not Applicable				
E = Commercial/Office Tenants								
F = Industrial Tenants								
G = Pedestrians								
H = Others								
*Visual Unit 3 is not included in the Selected LRT Alignment.								

Source: S. R. Beard & Associates, 2002

The measures to be utilized for each of the affected visual and aesthetic resources are described immediately following the description of the impact. Various mitigation measures will be employed to address the adverse impacts of the Selected LRT Alternative.

All mitigation of visual impacts will conform to DART Rail Design Criteria, specifically Chapter 19.2 (Landscaping) and Chapter 26 (Lighting).

Unit 1 - West End/Arena

The visual impact of the project on the West End/Arena assessment unit is not significant. The architectural character of the West End is unique to the region and the introduction of the system elements, such as catenary poles and trackway, have been designed to complement the character of the area as seen by arterial motorists, downtown pedestrians, and office tenants. Improvements in the West End Historic District have received design review by the Dallas Landmark Commission and the West End Task Force. A Certificate of Appropriateness has been issued by the City of Dallas for the proposed improvements by DART.

Unit 2 - Market Center

The impact of the project on the Market Center assessment unit is significant, especially to the residential area adjacent to the proposed station parking lot. The removal of four residences, two motels, and introduction of a parking lot significantly alters the character and views for the remaining residences. The remaining residences, once afforded views of neighborhood residences, would have views of the Market Center/Oak Lawn Station parking lot and views of the aerial station and Market Center Complex to the west. Light standards and associated night-time lighting of the parking lot would result in a significantly changed environment for the remaining neighborhood residents.

Mitigation of these impacts will be further explored during final design and will require close coordination with adjacent property owners and residents. Features reflective of a residential setting will be incorporated on the north (Wycliff Avenue), south (Vagas Street) and east sides of the parking lot, where residences are adjacent to or face the parking lot. Lighting in the parking lot will be shielded to minimize light pollution impact to the adjacent residential areas. Landscaping will also be incorporated to soften the view of the parking lot. These impacts are less than those associated with the Draft EIS station option which included a 3-level parking structure between Hondo and Wycliff Avenue.

Unit 3 - Medical Center (not included in Selected LRT Alternative)

During the Draft EIS, consideration was given to an alignment along Harry Hines Boulevard, turning east along Treadway (Harry Hines Base Alignment). This alignment would have created significant visual impacts in the Medical Center area. As the alignment approached Parkland Hospital from the south, it would have been elevated to a vertical clearance of more than 34 feet as it passed over the pedestrian bridge connecting the hospital with the parking garage on the east side of Harry Hines Boulevard. The view of arterial motorists and pedestrians of the hospitals, their facades, landscape and major entrances would have been affected by the elevated structure in the median of the roadway, as shown in **Figure 5-3**. Much of the existing median landscaping and trees would have been removed and replaced. Some views by those inside the hospital facilities to the outside would also have been impacted by the elevated structure and station in this location.

Mitigation of the impacts at this location would have been further explored during final design and may have included the “softening” of the long, linear structure with landscaping, streamlined structural features, architectural enhancements, or the lowering of the structure to provide minimum vertical clearance, thus requiring the raising or reconstruction of the pedestrian overpass. These features were discussed with the Medical Center area stakeholders, who indicated that the visual impacts would have been unacceptable.



Figure 5-3 **Visual Simulation – Parkland Station**

Unit 3A - Inwood (Selected LRT Alternative and Medical Center Design Options A, B, C, D)

The impact of the Selected LRT Alternative (as well as Medical Center Design Options A, B, C, and D) on the Inwood unit is potentially significant. As the alignment heads north from the Market Center Station, it would be elevated to cross over Motor Street, Maple Avenue and Inwood Road with an aerial station south of Inwood Road. This could create visual impacts for residents living in the single-family residential area (particularly Cherrywood Avenue) southeast of the Inwood/Denton Drive intersection as well as for future residents of new apartments under construction between Maple Avenue and the LRT alignment. Potential visual impacts to Rusk Middle School (eligible for the NRHP) may also occur.

While the Cherrywood residences do not directly face the LRT alignment, they would see the new LRT structure and aerial station from the street and potentially from rooms that face west toward Denton Drive. The Draft EIS included a station north of Inwood Road so the residents would only view the aerial LRT guideway. With the station south of Inwood, a bus drop-off area will be provided adjacent to the station off of Denton Drive. Mitigation of the impacts to residents along Cherrywood will be further explored during final design and will include, but not be limited to, the use of vegetation in the area between Denton Drive and the bus drop-off area to soften views and to create a screen wall along Denton Drive towards the residential area.

New apartments are under construction west of Maple Avenue, adjacent to the LRT alignment. These units will be four stories high with one building facing the alignment but set back from the alignment by parking. The top of the rail will be approximately 25 feet high in this area. Potential visual impacts may occur to those apartments facing out toward the LRT structure. During final design, the use of a screening element on the structure or landscaping will be assessed as methods to address visual impacts.

Mitigation measures to avoid an adverse effect on Rusk Middle School are addressed in the Section 106 Memorandum of Agreement with the Texas State Historic Preservation Officer (SHPO), and include design review by the SHPO of the 30%, 65%, 95% and 100% final design plans (see Appendix H). The potential for visual impacts to Weichsel Park are low. Mitigation measures to minimize any impacts of the LRT project are addressed in Section 5.15.2. Neither DISD nor the City of Dallas have indicated any concerns relative to visual impacts at the school or park.

Potential impacts would also have been associated with the Draft EIS station location north of Inwood. The station and parking area would have been adjacent to single-family residences, and across the street from Rusk Middle School and an area of Weichsel Park, creating potential visual impacts related to vertical elements, lighting, and station features. However, residences immediately adjacent to the station have been converted to commercial uses so impacts to residents would have been minimal. Moving the station to the south minimizes these impacts.

Unit 4 - Love Field

The proposed project would result in LRT operations along an existing rail right-of-way west of Dallas Love Field that is actively used for freight deliveries to customers along the alignment. This alignment would not eliminate freight storage between Mockingbird and Burbank. This would have no change to the visual environment of the neighborhood to the west, which currently experiences lengthy periods of blocked views created by freight cars on these siding tracks. The LRT catenary system will be a new visual element but freight will remain to the west of the LRT and will largely block views of the LRT. No impacts are anticipated for L. B. Houston Park either, as most use occurs west of Harry Hines Boulevard, several hundred feet from the proposed project.

Unit 5 - Northwest Highway/LBJ Freeway

The impact of the project is potentially significant to the residents of multi-family housing in the vicinity of Denton and Community Drives. The introduction of system elements in this location would affect the views that apartment residents have from their residences which are located across Denton Drive, but that are parallel to and face the alignment.

Based upon public comments received during the Draft EIS public comment period, nearby residents indicated that the selected site for the Northwest Rail Operating Facility (at Lombardy and Denton) would create potentially significant visual impacts to adjacent uses and potentially hinder redevelopment opportunities in the area, particularly because Lombardy Lane is a main entrance from Denton and Harry Hines in that area of Dallas.

Mitigation will be further explored during final design and would include the use of vegetation, appropriate lighting and other design features to respond to the residential character of the adjacent areas, particularly in the vicinity of the Bachman Station.

As part of the August 13, 2002 resolution approving the Northwest Rail Operating Facility, the DART Board required visual mitigation to address community concerns. During final design, DART will develop mitigation including an enhanced retaining wall along Lombardy Lane between Denton Drive and Abernathy to incorporate landscaping and a cost-effective screening wall. Along Denton Drive, particularly further south near the Letot School, mitigation will include additional landscaping to screen both freight and LRT. The remainder of the site will be treated with appropriate landscaping and security fencing. In accordance with the Section 106 Memorandum of Agreement (see Appendix H), this area will require design review by the SHPO during final design.

Unit 6 - Farmers Branch

The impact in the area of downtown Farmers Branch is potentially significant. The system elements to be constructed adjacent to an area of mature vegetation and historic architecture could affect the views as experienced by arterial motorists, pedestrians, residents and visitors to the city's park.

Mitigation of the impacts in Farmers Branch will include the use of vegetation along the alignment near Farmers Branch Historical Park. DART will also explore the use of architectural and design elements in the station area which are more consistent with the goals and objectives of Farmers Branch's redevelopment plans. This could include paving the platform track area and using complementary bus shelter designs.

Unit 7 - North Farmers Branch

The impact to residents at the northern end of this visual unit is significant. Residents of multi-family housing immediately adjacent to the right-of-way, south of Crosby Road, would view the elevated structure from patios and balconies facing west.

Mitigation will include, but not be limited to, design of a screening element as part of the structure as it crosses Crosby Road, and the use of vegetation to screen views of the LRT structure over the existing privacy fence of the apartments. The screening element can be designed as an integral part of the LRT guideway structure that can also address moderate noise impacts at this location. Structural features that can be used to minimize the mass and scale of the proposed bridge structure will also be explored.

Unit 8 - Downtown Carrollton

The impact of the project on this visual unit is potentially significant. The elevated structure may impede views of the historic downtown area and the pedestrian environment may be less desirable when overshadowed by the structure, as shown in **Figure 5-4**.

Figure 5-4 Visual Simulation - Carrollton Square Station

Mitigation of the impacts to downtown Carrollton will be further explored during final design and will include, but not be limited to, use of materials and finishes consistent with the historic character of the area. In accordance with the Section 106 Memorandum of Agreement (See Appendix H), the Carrollton Square Station will require design review by the SHPO during final design, specifically as it relates to the relocation of the Carrollton Crossing Depot.

Unit 9 - Carrollton/Frankford

The proposed project would not create any visual impacts in this assessment unit. The area is characterized by industrial warehouses, many of which are served by freight rail service. While there is a public park in this vicinity, Ken Good Park, it is surrounded by industrial warehouse uses, and by Broadway Street and IH-35E to the west. Thus, there are no nearby areas which contribute visual elements to the park. No impact is anticipated in this visual unit.

5.7 ECOSYSTEMS

This section describes the potential impacts that could result from implementation of the No-Build or LRT Alternatives. Except where noted, the impacts are the same for the other alignments considered, but not selected. The information used to analyze potential impacts included site surveys and a literature review (including a review of previous environmental documents).

5.7.1 Wetlands

All waters of the U.S. were delineated in February and March of 2001 by certified wetland biologists. Section 3.9.1 identifies the waters of the U.S. present within the project corridor. 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.

No-Build Alternative

The No-Build Alternative would not impact any wetlands or other waters of the U.S. because this alternative would not have any ground disturbance. The waters of the U.S. would remain as described in Section 3.9.1.

LRT Alternative

Within the project study area there are 38 bodies of water; of these, 34 are considered to be potentially jurisdictional waters of the U.S. Several of these water resources lie adjacent to the proposed construction corridor, but will be avoided. All potential jurisdictional waters of the U.S. within this alternative that cannot be avoided will be bridged to minimize filling the water resources.

Preliminary engineering designs indicate that 15 water bodies (IDs 1, 2, 3, 3B, 4, 6, 8, 9, 10, 12, 13, 14, 20, 21, and 24) would be crossed by the Selected LRT Alignment. The Medical Center Design Options A, B, C, and D or Love Field Design Option would also cross the same 15 water bodies. Potential impacts would be restricted to bridge supports and would be minimal (**Table 5-14**).

Total impacts to these water bodies would be dependent upon the size and number of support columns placed within the ordinary high water mark for each individual water body. Despite placing support columns into these water bodies, significant impacts are not expected.

The remaining water bodies lie adjacent to the proposed construction area and would not receive any direct impacts. However, indirect impacts could occur via surface water runoff, which may transport sediment into these water bodies. During construction activities, potential erosion from soil disturbance will be reduced by the implementation of standard engineering best management practices, such as silt fences and hay bales around the site perimeter. These construction and mitigation measures will minimize and/or alleviate any potential negative effects resulting from erosion and subsequent sedimentation.

**TABLE 5-14
IMPACTS TO WATERS OF THE U.S.**

PROJECT AREA/ID	Name	Crossing Type	Civil Station No.	Crossing Width (in feet)	Impacts ² (sq. ft.)
RAIL LINE					
Selected LRT Alignment					
1	Turtle Creek	B	160+75	30	NA
2	Cedar Branch	B	209+00	20	NA
3	Unnamed tributary to Knights Branch	B	287+20	25	NA
3 B	Unnamed tributary to Elm Fork	B	250+70	10	NA
4	Bachman Creek	B	278+00	43	NA
6	Joe's Creek	B	356+00	37	NA
8	Unnamed Tributary of Joe's Creek	B	430+00	20	NA
9	Unnamed Tributary of the Elm Fork	B	454+00	10	NA
10	Unnamed Tributary of the Elm Fork	B	494+00	20	NA
12	Farmers Branch of the Elm Fork	B	552+00	43	NA
13	Rawhide Creek	B	556+50	25	NA
14	Cook's Branch	B	606+80	18	NA
20	Hutton Branch of the Elm Fork	B	707+00	37	NA
21	Unnamed Tributary of the Elm Fork	B	771+00	5	NA
24	Furieux Creek	B	817+00	15	NA
STATIONS					
No impacts relative to stations.					
B = Bridge NA = Currently Not Available at 10% design; limited to bridge pier placement ¹ See Section 3.9 for location maps and site descriptions ² Based on Global Positioning System survey					

Source: Geo-Marine, Inc. 2001

Stations

There are no station-related impacts to jurisdictional waters of the U.S.

Rail Operating Facility

The selected site for the proposed Northwest Rail Operating Facility will not impact any jurisdictional waters of the U.S.

Wetlands Mitigation

DART and its contractors will follow the guidelines of the USACE Nationwide Permit 14, *Linear Transportation Crossings*. The guidelines stipulate that mitigation is required for any activity that impacts greater than 0.5 acre or 200 linear feet of stream channel for any single and complete project. For linear projects, the "single and complete project" (i.e., single and complete crossing) will apply to each crossing of a separate water of the U.S. (i.e., single water body) at that location, except that for linear projects crossing a single water body several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate water bodies. Additionally, a pre-construction notification must be given to the USACE under General Condition 13 of the permit if an area greater than 0.1 acre is to be impacted.

Station impacts will follow guidelines of the USACE Nationwide Permit 39, *Residential, Commercial, and Institutional Developments*, which require mitigation for any activity that impacts more than 0.5 acres of waters of the U.S. or 300 linear feet of stream bed for a single and complete project. A pre-construction notification must be given to the USACE under General Condition 13 of the permit if an area greater than 0.1 acres is to be impacted or if any open waters, including perennial or intermittent streams (below the ordinary high water mark) will be lost.

Under General Condition 13 of Nationwide Permits 14 and 39, a pre-construction notification would be given to the USACE for all bridged crossings and stations impacting stream channels that are either intermittent or perennial in nature. The notification will include a compensatory mitigation proposal to offset permanent losses of waters of the U.S. to ensure that those losses result only in minimal adverse effects to the aquatic environment and a statement describing how temporary losses of waters of the U.S. will be minimized to the maximum extent practicable. Additionally, based on the final design, any necessary mitigation plan and permit pursuant to USACE waters of the U.S. regulations will be implemented.

The USACE requires that all mitigation efforts be conducted at a minimum ratio of 1:1 (USACE 2000) to ensure that there is no net loss of functions and values. Mitigation efforts that could be implemented include stream channel/wetland enhancement and implementation of native vegetation buffers along the fringe of the water resource. Other mitigation efforts may include reducing the size of the project, establishing an upland vegetated buffer, and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed. Other mitigation options include the in-lieu fees program and mitigation banking.

Consultation with the USACE has been initiated in order to document the expected impacts, permits, and mitigation needs. This consultation is documented in Appendix D and will continue after completing the Final EIS to establish actions required in final design to conform to all USACE requirements.

5.7.2 Long-term Vegetation Impacts

The entire corridor has been previously impacted by various construction projects, and is predominantly vegetated with ornamental or disturbance species. Potential impacts to vegetation are estimated based on the number of acres of vegetation to be permanently replaced by structures.

Both the cities of Dallas and Carrollton have tree ordinances that protect certain tree species of certain sizes. The Dallas Landscape & Tree Regulations (Part II of the Dallas Development Code) generally prohibits the felling of protected trees of diameters greater than six inches without replacement. DART is exempt from the City of Dallas tree ordinance within the DART right-of-way. The Tree Preservation Ordinance for the City of Carrollton generally requires replacing protected trees greater than four inches in diameter.

No-Build Alternative

Implementation of the No-Build Alternative would result in no direct or indirect impacts to the vegetation. The plant communities would remain as described in Section 3.9.2

LRT Alternative

During field surveys, there were four distinct plant communities delineated throughout the project area. The primary direct effect of implementing the LRT Alternative would be the loss of vegetation and subsequent wildlife habitat. A maximum of 21.1 acres of habitat, including 12.9 acres of vegetation, would be permanently removed by the Selected LRT Alternative not including the stations (**Table 5-15**). The impacts of other alignments considered are shown for comparison. However, these plant communities, and those of higher quality, are abundant throughout the north-central region of Texas (McMahan et al. 1984).

**TABLE 5-15
IMPACTS TO PLANT COMMUNITIES**

Project Area/Option	Urban (acres)	Grassland (acres)	Shrubland (acres)	Woodland (acres)	Total (acres)
RAIL LINE					
Selected LRT Alignment (UPRR)	8.2	10.6	1.3	1.0	21.1
Other Alignments Considered					
Harry Hines Base Alignment	8.0	11.0	1.3	1.0	21.3
Base Alignment with Medical Center Design Options A, B,C, or D	3.3	10.6	1.3	1.0	21.2
Base Alignment with Love Field Design Option	3.1	11.0	1.3	1.0	16.4
Base Alignment with Love Field and Medical Center Design Options A, B, C, or D	3.4	10.6	1.3	1.0	16.3
STATIONS (Platform and Parking)					
Selected LRT Alignment					
Market Center/Oak Lawn (South)	2.9	0.0	0.0	0.0	0.0
Parkland (UPRR)	3.6	0.0	0.0	0.0	3.6
Inwood (South)	4.2	3.2	0.0	0.0	7.4
Brookhollow	0.6	5.9	0.0	0.0	6.5
Bachman	6.1	1.0	0.0	0.0	7.1
Royal Lane	3.7	0.7	0.0	0.0	4.4
Walnut Hill	10.4	1.1	0.0	0.0	11.5
Farmers Branch	4.3	0.2	0.0	0.0	4.5
Carrollton Square	6.3	0.0	0.0	0.0	6.3
Trinity Mills	2.3	6.0	0.0	0.0	8.3
Frankford	0.7	15.5	0.1	2.5	18.8
Other Alignments Considered					
Parkland (Medical Center Design Option A, B, C)	2.8	0.0	0.0	0.0	2.8
Parkland (Medical Center Design Option D)	2.9	0.0	0.0	0.0	2.9
Market Center/Oak Lawn (North)	4.8	2.1	0.0	0.2	7.1
Inwood (North)	4.7	0.0	0.0	0.0	4.7
UTSW/Exchange Park (Harry Hines Base)	3.7	0.0	0.0	0.0	3.7

Source: Geo-Marine, Inc., 2001

The selected Northwest Rail Operating Facility site has been used for retail or industrial purposes and is now devoid of natural habitat.

Vegetation Mitigation

After final grading, all plant communities would be restored to the original condition. The cities of Carrollton and Dallas tree ordinances would be followed. A survey would be conducted during the final design phase to determine whether the felling of any protected trees is necessary. Based on this survey and the final design, any necessary mitigation plan and permit pursuant to the tree regulations would be implemented. Although not bound by the City of Dallas tree ordinance within the DART right-of-way, DART would preserve existing vegetation and trees to the greatest extent possible.

5.7.3 Wildlife Impacts

Potential impacts to biological resources are estimated based on the amount and type of wildlife habitat disturbed.

No-Build Alternative

Implementation of the No-Build Alternative would result in no ground disturbance and therefore no alteration/disturbance of the landscape. As a result, wildlife and their associated habitat in the area would not be affected.

LRT Alternative

Under the LRT Alternative, there would be no significant impacts to wildlife or their associated habitat within the project areas. Wildlife communities within the project areas include the wildlife commonly associated with the floodplain areas of north-central Texas and species adapted to urbanization. Other than a few areas in the northern half of the project corridor and a small number of riparian corridors, the LRT Alternative contains very little wildlife habitat. Correspondence with TPWD indicated that the Biological and Conservation Data System (BCD) data did not provide a definitive indication as to the presence, absence, or condition of special species, natural communities, or other significant features in the project area. TPWD also made note of two colonial waterbird rookeries as being documented within one mile of the proposed project route. One of the rookeries was confirmed as being located in Carrollton more than one mile from the project area and separated from the project area by several city blocks, streets, and a large number of buildings. No direct or indirect impacts would occur to this rookery as a result of the proposed alternative. The other rookery is located near the University of Texas Southwestern Medical Center. This rookery is separated from the Selected LRT Alternative by a distance of 2,900 linear feet. No direct impacts to the rookery are expected. Minor indirect impacts such as disturbance from noise may occur to the nesting birds. However, biologists noted that the rookery was located in an area of high pedestrian and vehicle use. Therefore, the impacts to these birds would be minimal, considering the already occurring disturbances.

Wildlife Mitigation

All animals present within the project area are already subject to an environment that is regularly disturbed. Due to the animals' mobile nature, they would relocate in the event of habitat disturbance. Construction activities would temporarily disturb these animals' habitat; however, long-term impacts would be mitigated through re-vegetation. Existing vegetation or habitat would be replanted along the disturbed project areas.

5.7.4 Protected Species

Four species have a low to moderate potential of occurring within the project areas - Arctic peregrine falcon, interior least tern, migrant loggerhead shrike, and Texas garter snake. Although species-specific surveys were not performed, a peregrine falcon and several loggerhead shrike were identified within the project area. These species were unable to be identified as the protected varieties. On April 8, 2002, informal consultation was initiated with the USFWS in order to determine what, if any, effects this project may have on protected species, as well as to provide an opportunity to alleviate those effects early in the planning process. On April 23, 2002, the USFWS responded, with a "may affect" designation for the interior least tern.

No-Build Alternative

The No-Build Alternative would not result in any ground disturbance or alterations to the potential habitat for the Arctic peregrine falcon, interior least tern, migrant loggerhead shrike, or Texas garter snake within the project areas. Therefore, the No-Build Alternative would not have any impacts on protected species.

LRT Alternative

Although no impacts are anticipated with the Selected LRT Alternative, the USFWS has indicated during informal consultation that the interior least tern could potentially be affected. While preferred habitat of the interior least tern is not found within the project corridor, they are a highly opportunistic species capable of surviving in disturbed urban environments. They are also believed to utilize the Trinity River and its tributaries, some of which cross the project corridor, as a nesting/migratory route.

Protected Species Mitigation

All four protected species that would potentially utilize the project corridor are subject to an environment that is already repetitively disturbed (i.e., mowing, road construction projects, bridge maintenance, and traffic noise). Due to the animal's mobile nature, they would relocate in the event of habitat disturbance. Construction would temporarily disturb the animal's habitat; however, long-term impacts will be mitigated through re-vegetation. Existing vegetation or habitat will be replanted along the disturbed project areas. Additionally, through coordination during final design with the USFWS, preventative/mitigative measures in "sensitive areas", as determined by the USFWS, will be developed in order to lessen the effect on this species to a level that is discountable or insignificant; and, thus, will not adversely affect the interior least tern. Appropriate coordination with USFWS will be conducted during final design.

5.7.5 Aquatic Habitat Impacts

The acreage or linear distance of surface water features quantifies the potential impacts to aquatic habitat. The area of potentially affected aquatic habitats is presented below.

No-Build Alternative

This alternative would not result in any disturbance to aquatic habitats. The existing conditions identified in Section 3.9.5 would remain undisturbed.

LRT Alternative

The preliminary designs indicate all aquatic habitats would be bridged. Despite placing support beams into these aquatic habitats, no substantial impacts to these aquatic habitats are expected.

Aquatic Habitat Mitigation

Due to the poor species composition and highly disturbed nature of the existing aquatic habitats, no long-term impacts are anticipated. Potential aquatic habitat may be indirectly impacted as a result of construction-related surface water runoff. Potential construction-related erosion will be minimized by implementation of standard engineering best management practices (i.e., silt fences and hay bales around the construction limits). These construction and mitigation measures will minimize and/or alleviate any potential negative effects to the aquatic habitat resulting from erosion and subsequent sedimentation.

5.8 GEOLOGY

No-Build Alternative

The No-Build Alternative involves no additional construction or excavation. No significant geological impacts are expected with this alternative.

LRT Alternative

The majority of soils in the project area (75%) have a high to moderate potential for urban development. Those areas containing soils with a low potential for development lie mostly within floodplains. Impacts will be limited to minor amounts of fill associate with project-related retaining walls and structures (see Section 5.9.3).

Direct impacts to soils would include the removal of vegetation, exposure of the soil, mixing of soil horizons, loss of topsoil productivity in areas which are not currently paved, and short-term increased susceptibility to wind and water erosion. These construction activities can lead to an increased potential for erosion and sedimentation during the construction process.

The underlying geology in the region of Love Field and the Medical Center, where the below-grade segments of the alignment would have been located, consists primarily of Fluvial terrace deposits. The only below-grade section of the Selected LRT Alternative is under Mockingbird Lane. The Eagle Ford group and Austin Chalk are also found in the Love Field area. These latter two

formations could contain paleontological remains. Care should be taken during trenching activities to protect archeological resources. Appendix F contains more detailed information on geological conditions in the Love Field area.

Mineral maps show that the Love Field/Medical Center area is covered in sand and gravel terraces and floodplain deposits, from the time the Trinity River flowed freely. The presence of sand and gravel deposits should be considered in the design process and in developing tunnel construction methods in this area.

Impacts for other alignments considered are similar to the Selected LRT Alternative.

Geology Mitigation

Increased runoff and erosion will be reduced with the establishment of protective vegetation and the use of best management practices (BMP's). Some relevant BMP's include silt fences, strawbale dikes, diversion ditches, rip-rap channels, water bars, and water spreaders.

Potential impacts to geological resources are not expected to be significant. Mitigation measures enacted to protect floodplain resources would also protect floodplain soils categorized as having low potential for urban development (see Section 5.9.3).

5.9 HYDROLOGY/WATER QUALITY

Section 3.11 describes several hydrologic and water quality issues that must be addressed prior to construction. These issues include surface water quality impacts, impacts to groundwater resources, and floodplain impacts. The following section provides information relating to the minimizing of impacts to these areas. Except where noted, impacts described apply to the Selected LRT Alternative and to the other alignments considered, but not selected.

5.9.1 Surface Water Quality Impacts

As mentioned in Section 3.11.1, Surface Water Quality, the Selected LRT Alignment does not cross any major river channels. The existing freight railroad alignment identified in the No-Build Alternative, however, crosses ten streams and creeks. Because the majority of the proposed alignment is within an existing transportation corridor, the proposed project would generally rehabilitate or rebuild existing bridges crossing affected water resources. Project construction has the potential to cause minor, short-term impacts to these water bodies due to runoff from grading activities, removal or additions of fill materials and incidental/accidental spills of mechanical fluids. Erosion control measures, such as gabion channel linings, would have minimal impact to water quality.

No-Build Alternative

Surface water quality has been degraded for many years due to stormwater runoff from the rail line containing minor amounts of creosote, oil and grease, hydraulic fluid and other chemicals associated with railroad activities.

Implementation of the No-Build Alternative would indirectly impact surface water quality because this alternative would fail to reduce the automobile traffic on area roadways. Automobiles generate significant amounts of non-point source contaminants (petroleum products, rubber, etc.) that are deposited on roadways. This material is washed from the roadways to local drainages during storm events via the storm sewer system where it affects surface water quality.

LRT Alternative

The impact to surface water quality from the rail line of the Selected LRT Alternative would be less than that of the No-Build Alternative. All rail bed ties will be concrete instead of wood, thereby

ensuring that no creosote runoff will occur. Additionally, the trains will be electric, thus reducing the amount of petroleum hydrocarbons required for operation of the trains.

Potential impacts to water quality could result from the impervious surfaces of station platforms and parking areas associated with the project if not adequately addressed. Stormwater run-off from platforms could contribute to erosion and sedimentation problems adjacent to station sites. Runoff from parking areas could contain anti-freeze, lubricating fluids, gasoline and other petroleum hydrocarbons associated with automobiles. Mitigation of these potential impacts through appropriate design measures is addressed below. Water quality and runoff during construction is discussed in more detail in Section 5.12.8.

Rail Operating Facility

The Northwest Rail Operating Facility has the potential to impact water quality due to incidental/accidental spills from mechanical fluids, paints, solvents and other maintenance materials. No significant increase in impervious surfaces is anticipated with the proposed site.

Surface Water Quality Mitigation

Prior to construction, coordination with the USACE will be initiated to allow the USACE to evaluate potential channel impacts and mitigation options. Additionally, DART will be required to obtain the necessary permits to proceed with construction. The issuance of storm water discharge permits under the Texas Pollutant Discharge Elimination System (TPDES) is a major part of the Environmental Protection Agency's efforts to restore and maintain the water quality of the nation. Under TPDES' General Permits for Storm Water Discharges from Construction Activities, the Texas Commission on Environmental Quality (TCEQ) requires the development and implementation of a Storm Water Pollution Prevention Plan (SW3P). The plan is designed to reduce pollution at the source before it can bring about environmental problems that cost the public and private sectors resources and the expense of environmental restoration activities. A SW3P will be prepared by DART prior to final design submittal.

Consultation with the USACE has been initiated in order to document the expected permits and mitigation needs. This consultation is documented in Appendix D and will continue after the Final EIS and during Final Design.

5.9.2 Impacts to Groundwater Resources

Potential impacts to groundwater resources are expected to be less than significant. Due to over-development in the Dallas/Fort Worth Metroplex, the water table is low in the project area, dropping at times to as much as 1,200 feet below the surface.

No-Build Alternative

The No-Build Alternative would not significantly impact groundwater quality. Minor impacts have occurred due to storm water runoff from the existing freight rail line containing minor amounts of creosote, oil and grease, hydraulic fluid and other chemicals associated with railroad activities that have leached into the ground. No significant groundwater impacts are expected under the No-Build Alternative.

LRT Alternative

Construction of the Selected LRT Alternative should reduce the amount of non-point source contaminants automobiles contribute to the groundwater by reducing the number of automobiles on the roadways. Contaminants from the existing rail alignments would also be reduced, since the LRT trains run on concrete bed ties, rather than wooden ones, and are powered by electricity, rather than petroleum hydrocarbons. After years of stormwater runoff from commercial and residential developments and transportation facilities, it is unlikely that the shallow groundwater within the project corridor will be adversely affected by the project.