

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.

Construction of the Selected LRT Alternative would not likely impact aquifer resources. The Trinity group, the primary source of groundwater for the upper Trinity River Basin, and the Woodbine Aquifer, a minor aquifer also producing water in this basin, are the two major components of the area's groundwater resources. Although both of these aquifers outcrop west of Dallas County, construction of a tunnel through the Medical Center area would have resulted in contact with groundwater resources. However, the Selected LRT Alternative has only a short cut-and-cover section under Mockingbird Lane so impacts will be minimized, relative to previous alignment alternatives. Along the selected route, four USTs and three LUSTs were identified. Although building portions of the alignment below-grade does provide an opportunity for groundwater contamination, DART's due diligence program and best management practices provide a high level of protection for groundwater resources.

Medical Center Design Options A, B, C, and D had tunnel sections in the Medical Center and would have had a higher potential for impacts. The Harry Hines Base Alignment was aerial and would have avoided such impacts. The Love Field Design Option would have had potential impacts on groundwater.

### **Rail Operating Facility**

The construction and operation of the proposed Northwest Rail Operating Facility at the selected site, or at any of the previous candidates sites, would not impact any groundwater resources.

### **Mitigation of Impacts to Groundwater Resources**

The mitigation measures provided in Sections 5.11, Construction Impacts, and 5.9.1, Surface Water Quality Impacts, would result in minimal impacts to shallow groundwater. Primary and secondary aquifers would not be impacted by project construction.

### **5.9.3 Floodplain Impacts**

#### **No-Build Alternative**

The No-Build Alternative involves no additional construction, excavation or placement of fill material beyond what has been approved for existing and planned projects.

#### **LRT Alternative**

The proposed project crosses or abuts the 100-year floodplain of the Elm Fork of the Trinity River and its tributaries at ten locations, as explained in Section 3.11.3. As final design progresses, the amount of impact at these locations will be quantified. At this time, it is necessary to assume that direct impacts to floodplains would be limited to minor amounts of fill associated with retaining walls and structures associated with the proposed project. **Table 5-16** identifies the designated and suspected floodplains that would be impacted. The remaining portions of the rail line were not shown to be within designated flood zones or within suspected floodplains.

The Federal Emergency Management Agency (FEMA) has regulations governing alterations or development within floodplains shown on Flood Insurance Rate Maps. Under FEMA regulations, no alterations of flood zones can result in an increase in the 100-year base flood elevation or cause an increase in the velocity of floodwaters. In addition, the cities of Dallas, Farmers Branch and Carrollton have their own floodplain ordinances. An EIS and a complete stream rehabilitation program must be approved prior to any relocation or alteration of the natural channel. It would also be necessary to coordinate with the US Army Corps of Engineers (USACE) on the issue of fill in any of the floodplains or wetlands. While a Nationwide permit might suffice for the construction of an aerial structure above the floodplain, an Individual permit may be required if short-term construction impacts occur in more than 0.3 acres of the associated wetlands. This will be determined with the development of engineering details during final design.

**TABLE 5-16  
DESIGNATED AND SUSPECTED FLOODPLAINS  
CROSSED OR BORDERED BY ALIGNMENT**

Name of Floodplain	City
Trinity River Floodplain	Dallas
Turtle Creek Branch Floodplain	Dallas
Cedar Springs Branch Floodplain	Dallas
Knights Branch Floodplain	Dallas
Bachman Branch Floodplain	Dallas
Joe's Creek Floodplain	Dallas
Farmers Branch Creek Floodplain	Farmers Branch
Rawhide Creek Floodplain	Farmers Branch
Cooks Branch Floodplain	Farmers Branch
Hutton Branch Floodplain	Carrollton
Furneaux Creek Floodplain	Carrollton

Source: Wendy Lopez & Associates, 2001

The project spans or borders the following flood zones within the City of Dallas: Trinity River, Turtle Creek Branch, Cedar Springs Branch, Knights Branch, Bachman Branch, and Joe's Creek. Farmers Branch Creek, Rawhide Creek, and Cooks Branch in the City of Farmers Branch may also be impacted, as may Hutton Branch and Furneaux Creek in the City of Carrollton. Each city has specific ordinances governing land alteration within a floodplain, as does the federal government. Federal law requires municipalities that participate in the Federal Flood Insurance Program to adopt floodplain ordinances that prohibit development in the existing 100-year floodplain. In compliance with this program, Section 51A-5.101 of the Dallas City Code, Part II of the Dallas Development Code sets forth floodplain regulations. These regulations include the uses and structures permitted, and the conditions for the development within the floodplain. The deposition or storage of fill, the placement of a structure, or excavation within a floodplain area requires a fill permit. An overview of this permit process is outlined in the *Procedures for Filling in a Floodplain under the Floodplain Management Guidelines*.

Floodplain management guidelines reflect several City of Dallas concerns, including that:

- Storm water be moved naturally rather than relying on extensive and costly channel improvements;
- Fill and development which is not unreasonably damaging to the environment should be permitted where it would not create other flood problems and where public acquisition is not required for environmental protection or recreation purposes; and
- A systematic approach to review fill requests for all floodplains not covered by specific guidelines from adopted management plans should be utilized.

Similar information on permitted uses within floodplains in the City of Farmers Branch can be found within the City's *Comprehensive Zoning Ordinances* as well as the *Code of Ordinances* Part II, Chapter 42, Article II. Any structure to be erected in an area designated as a Floodplain on the City's Zoning District Map must first be approved by the Director of Public Works.

The City of Carrollton does not allow any new construction within floodplain areas. However, construction may take place in areas reclaimed from the floodplain. A Floodplain Alteration Permit must be obtained from the City for floodplain reclamation or alteration. This permit may be granted only if certain criteria are met, including that the alteration does not create erosive water velocity on or off-site, does not significantly increase downstream discharge, and does not cause any additional expense to current or projected public improvements. The City of Carrollton's floodplain regulations can be found in their *Stormwater and Flood Protection Ordinance*, Articles 8 and 9.

### **Rail Operating Facility**

According to the FEMA Maps, a portion of the selected NWROF site is located within the floodplain of Joe's Creek.

### **Mitigation of Floodplain Impacts**

DART and its contractors will comply with all federal, state, and local regulations regarding construction and operation of the project within floodplains. The proposed project will be designed to be above any 100-year floodplain that the alignment will cross. Impacts to floodplains will be limited to piers located in the flood zone or minor amounts of fill associated with retaining walls and other bridge structures. Some fill will also be required at the Northwest Rail Operating Facility site. Mitigation measures may include channel improvements or design modifications to ensure that neither the 100-year base flood elevation nor floodwater velocity is increased. DART will coordinate with the USACE and the cities of Dallas, Farmers Branch and Carrollton during final design, with respect to floodplain impacts. These regulatory agencies will evaluate and approve the project design, including any mitigation measures that may be required.

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.

## **5.10 HAZARDOUS/REGULATED MATERIALS**

This section summarizes potential construction and operational impacts of the No-Build and LRT Alternatives with regard to hazardous and regulated materials. Impacts of the Selected LRT Alternative and other alignments considered are described. Hazardous and regulated materials impacts are anticipated only during construction activities. Thus, additional detail regarding these potential impacts is presented in Section 5.11, Construction Impacts.

### **5.10.1 Impact Assessment**

#### **No-Build Alternative**

The No-Build Alternative consists of existing highway and transit projects currently approved for implementation. Implementation of these projects would include the potential to uncover or disturb hazardous or toxic materials during construction activities.

#### **LRT Alternative**

Excavation activities for the LRT Alternative would be associated with the development of: LRT guideway (i.e. railbed preparation and track installation), LRT station elements (e.g. utilities, platforms, transformers, and elevators), retaining walls, support structures for aerial tracks, grade separations, and tunnel or cut-and-cover structures.

Of the 64 sites identified as a result of the database search and field survey of hazardous materials in the project area, 46 are relevant to the Selected LRT Alternative: 28 of high concern, 18 of moderate concern. The Selected LRT Alternative effectively avoids eight high and nine moderate sites that would otherwise have been encountered by the other alignments considered in the Draft EIS (Medical Center Design Options A, B, C, and D; the Harry Hines Base Alignment; and the Love Field Design Option). The sites encountered by the Selected LRT Alternative consist mainly of leaking petroleum storage tanks associated with small petroleum fuel and oil facilities. Petroleum contamination of soil is the most likely contamination problem to be encountered along the LRT alignment. All other sites found in the database search are considered to be of low risk to the project.

Of the 64 sites originally identified, eight have been identified for acquisition, and an additional 16 sites are located within existing street or railroad ROW that would be used for the project. These sites are identified in **Tables 5-17 and 5-18**.

**TABLE 5-17  
HAZARDOUS MATERIALS OCCURRENCES  
WITHIN THE BOUNDARY OF PROPERTIES TO BE ACQUIRED**

Map No.*	Facility	Address	Level of Concern	Reason for Acquisition
20	Varel Manufacturing Company	9230 Denton Drive	High	Selected Alignment
121	Healthsouth Dallas Rehab.	9713 Harry Hines	Moderate	Construction Staging
138	Bright Truck Leasing	9773 Harry Hines	Low	Bachman Station
28	Diamond Shamrock 775	3003 Lombardy Lane	High	Rail Operating Facility
65	Archer Automotive	10603 Denton Drive	High	Rail Operating Facility
37	Royal Lane FINA	2681 Royal Lane	High	Royal Lane Station
50	Racetrac Petroleum	1001 North Broadway	High	Carrollton Square Station
60	FINA	1013 E. Belt Line	Moderate	Carrollton Square Station

\* See **Figures 3-46** and **3-47**

Source: Wendy Lopez & Associates, 2001

**TABLE 5-18  
HAZARDOUS MATERIALS OCCURRENCES  
WITHIN EXISTING STREET OR RAILROAD ROW**

Map No. *	Facility	Address	Level of Concern
19	TXI Aviation	8350 Denton Drive	High
28	7-Eleven Store #21764	2990 Lombardy Lane	High
30	Glazer's, Inc.	10750 Denton Drive	High
31	J's Aircraft Engines & Parts, Inc.	10819 Denton Drive	High
33	Glass Depot	10845 Denton Drive	High
35	AB Aluminum Brass Foundry	11165 Denton Drive	High
42	Wellmark International	12200 Denton Drive	High
46	241 Co. Chaps L7	13303 Denton Drive	High
65	Archer Automotive	10603 Denton Drive	High
73	Labor Force	4248 Harry Hines Boulevard	Moderate
UM17	Bragg Service Company	1937 Broadway	High
13	Warehouse	6621 Denton Drive	Moderate
14	Williamson Printing Corp.	6700 Denton Drive	Moderate
102	Love Field Auto Service Center	6420 Denton Drive	Moderate
127	Southwest Snacks	6333 Denton Drive	Moderate
173	Unknown (Spill in Street)	6200 Denton Drive	Moderate

\* See **Figures 3-46** and **3-47**

Source: Wendy Lopez & Associates, 2001

Although a site is known or suspected to be contaminated, implementation of the LRT Alternative does not necessarily mean that the LRT project would affect the site. More detailed information regarding project design, to be developed during the final design phase of this project, will be used to determine the appropriate methods(s) to be developed to address hazardous/regulated material sites that will either be acquired or remain in proximity to the LRT project.

### Rail Operating Facility

A database search identified three sites of high concern associated with the selected location for the Northwest Rail Operating Facility: one adjacent to the site and two within the site. The other candidate sites that were not selected were also found to have hazardous materials sites within or directly adjacent to their boundaries. The Webb Chapel site had no hazardous material facilities of high or moderate concern, but a City of Dallas Solid Waste Transfer Facility is located on the site, along with the DART Northwest Bus Operating Facility. The Northwest Highway site was adjacent to one facility of moderate concern.

### 5.10.2 Mitigation Measures

Further investigations will be performed during final design for at-risk areas. The investigations will focus specifically on areas where construction activities involve soil excavation and/or dewatering operations (i.e. utility relocations, LRT stations, park-and-ride facilities, and tunnel locations). In addition, any existing structures will be surveyed for the presence of asbestos-containing materials and lead-based paint prior to their demolition or modification. These investigations will provide a basis for determining construction health and safety specifications, contaminated soil and groundwater remediation and disposal procedures, and asbestos or lead-based paint management and remediation practices. The design and preparation of required monitoring and remediation plans will be coordinated with the Texas Commission on Environmental Quality (TCEQ).

The completed review of hazardous materials occurrences provides a strong basis for predicting which properties pose a risk of contamination. While the DART Environmental Compliance Section (ECS) will address known hazardous or regulated materials prior to construction, unanticipated sources of hazardous or regulated materials may be encountered during construction activities. If this occurs the construction manager or designee will immediately notify the DART ECS. Specific mitigation activities that address the type, level, and quantity of contamination encountered will be immediately implemented.

The most common case encountered would be removal of unanticipated underground storage tanks. If such an “orphan tank” is encountered, it must be addressed as an emergency removal, so as not to delay construction activities. DART ECS will immediately inform the TCEQ and issue a task order for immediate removal of the tank within a 24-hour period. If asbestos is encountered, DART will perform an asbestos survey (via environmental contracts) and abate if necessary, prior to renovation or demolition of the structure. The handling, treatment and the discharge of any wastewater suspected of containing hazardous/regulated materials is prohibited without first obtaining a TPDES Permit or a similar special permit covering the one-time discharge of wastewater containing known and specific hazardous constituents issued by the TCEQ. It will be required to ensure that the sources of any fill material are free of contamination. All ECS activities will be performed according to all applicable Federal, state, and local regulations.

## 5.11 SAFETY AND SECURITY

The construction and operation of public transit projects increases multi-modal traffic and the potential for conflicts with automobiles and pedestrians. The ensuing safety and security issues center around avoiding accidents between competing travel modes and ensuring the daily safety of transit patrons at and near station areas, as well as persons and automobiles who must cross the alignment. Consequently, transit projects can place additional demands on police and fire protection services in the communities they serve. The impacts on safety and security issues for the No-Build and the LRT Alternatives are described below. Except where noted, the LRT Alternative includes impacts for the Selected LRT Alternative and for other alignments considered, but not selected.

The potential safety and security impacts associated with the No-Build and LRT Alternatives address a wide range of considerations including:

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

### 5.11.1 No-Build Alternative

The No-Build Alternative would expand bus services and facilities in the project corridor in accordance with the DART **Five Year Action Plan**. DART Transit Police and the municipal police

departments of Carrollton, Dallas, and Farmers Branch would continue to provide public safety services without the need for significant additional resources beyond those already planned to keep up with growth.

### 5.11.2 LRT Alternative

#### Impacts on Police Protection and Community Safety Services

The proposed project is not expected to cause any impact to demand for municipal police protection or community services. Police protection will be required for project security during both the construction and operation of the proposed project, but DART will take responsibility for project and public security by providing both uniformed and undercover transit police on its vehicles and at station areas. Should it become necessary, DART staff will work with local police to apprehend criminals. One police department division (City of Dallas Northwest Operations) is located within the corridor north of Dallas Love Field near the proposed Bachman Station. No project-related impacts are expected to effect that division. The presence of DART Transit Police and other personnel would serve to reduce the volume of crime at stations. The project will not require increased staffing for local police within any of the affected municipalities.

#### Police Protection and Community Safety Services Mitigation

DART Transit Police provide frequent random patrols of the stations and trains. The LRT vehicles include an operator-controlled silent alarm to alert DART Transit Police to a security problem, radio communications between trains and the central control center and a two-way emergency communication system between the train operator and passengers.

At the Market Center/Oak Lawn Station, where an element of the station would be below-grade, special security measures have been designed. The Market Center security division has stated they will monitor the pedestrian underpass connecting the Market Center/Oak Lawn station to the Market Center by closed circuit television. Should they decide not to, DART will work with them to determine security needs. If Medical Center Design Options A, B, C, or D had been selected, the below-grade Parkland Station would have been equipped with a “panic button” that sounds an alarm and activates a two-way communication device to the DART security headquarters. If the Love Field Design Option would have been selected, similar measures would have been taken for the Love Field Station.

Before start-up, DART will host security sessions with police, fire, schools, emergency response teams, employers, and other interested parties located within the corridor. The information sessions will cover the details of LRT operations, potential security issues and agency responsibilities.

#### Impacts on Fire Protection and Emergency Medical Services

There are currently five fire stations located within the corridor. They are located near the West End, Love Field, Bachman Lake, Northwest Highway, Royal Lane and Valley View Lane. The Selected LRT Alternative may require fire protection services for control of fires in the vehicles and at the substations. However, it is unlikely that a fire would occur in light rail vehicles since all vehicles would be constructed of flame and shatter resistant materials, would have two fire extinguishers per car, and would have an exterior emergency door release for use by police or firefighters. Similarly, light rail stations would be constructed with fire-resistant materials. Because the potential for fire is low, it is not anticipated that the Selected LRT Alternative would necessitate the hiring of additional fire protection personnel in any of the affected communities.

The potential exists for increased demands for emergency medical services due to the concentration of passengers at the LRT stations. In addition, emergency vehicle response time could be slightly impacted by at-grade LRT crossings. These crossings will be provided with gates

that will block access across the tracks while the light rail vehicle passes. Typical gate down time ranges from 35 to 50 seconds depending on the width of the crossing.

### **Fire Protection and Emergency Medical Services Mitigation**

DART will sponsor information sessions for police, fire, emergency response teams, schools and employers in the corridor. These information sessions will cover LRT operations and the potential emergency issues associated with operations.

Alternate routing for fire and police vehicles operating out of facilities near at-grade crossings will be evaluated as part of the final design phase of the project. Consideration will be given to whether alternate routes will create longer response time than the 35-50 second gate down time. The effects of both will be greatest during peak traffic hours. During these times of day, traffic could be a greater detriment to response time than the crossing gates. However, the Selected LRT Alternative preserves ambulance access to the Medical Center hospitals since the alignment is elevated in that area.

The final design of the guideway will be in accordance with the National Fire Protection Association NFPA-130 (Standard for Fixed Guideway Transit and Passenger Railway Systems) and the applicable fire and building codes of the local jurisdictions. Emergency egress provisions will be provided at a maximum spacing of 2,500 feet for tunnel and elevated guideway sections. Tunnel ventilation, fire suppression, lighting, and other Life Safety provisions will be incorporated in accordance with NFPA-130.

### **Impacts on Pedestrian and Vehicle Accidents**

The addition of frequent LRT service adjacent to active freight lines will present safety and security concerns for adjacent residents and businesses. Both types of rail operations along the alignment have the potential to impact vehicular and pedestrian safety at points where the alignment crosses streets at-grade and in areas where corridor residents use informal crossings as short cuts to access neighborhood facilities. The potential for conflict at these informal crossings is especially important around schools and other community facilities. The schools within the corridor are concentrated along Denton Drive near Dallas Love Field.

Hernandez Elementary and Rusk Middle School are near the alignment and the proposed Inwood Station. In a letter dated December 5, 2001, DISD noted their opposition to the Medical Center Design Option alignments due to potential safety issues for their students, particularly those attending Hernandez Elementary School. The attendance zone for Hernandez Elementary is largely south of Inwood Road and students that walk to school primarily use Maple Avenue. While the Draft EIS included an at-grade crossing of Maple Avenue, this Final EIS includes a grade separation due to an updated traffic analysis. Furthermore, the Selected LRT Alignment follows the existing rail ROW. This coupled with the grade separation of Maple Avenue, minimizes impacts to this attendance zone. Rusk Middle School students access the school from all directions, primarily the north, east and south. This school is located adjacent to an elevated section of the alignment so potential impacts are less likely. However, public comments received in April 2003 highlighted the need for DART to consider pedestrian access between Kimsey Drive and Rusk Middle School. The Harry Hines Base Alignment would not have divided school attendance zones and DISD stated their support for this design option.

Along the Harry Hines Base Alignment, pedestrian and vehicular conflicts with the LRT system would have been minimal given the mostly aerial alignment. The highest potential for pedestrian accidents would have been where transit patrons had to cross a major street to access a station. This would be the case at most LRT stations along the Harry Hines Base Alignment and all Medical Center Design Options.

Safety concerns at the stations south of Northwest Highway are even more important because a high number of transit-dependent people live between downtown Dallas and Northwest Highway.

### **Pedestrian and Vehicle Accidents Mitigation**

All federal, state and municipal laws regulating safety, design and operating procedures will be followed. The proposed project is designed to provide grade-separated crossings at most major arterials and railroad rights-of-way, so the potential for accidents with other vehicles or freight trains will be minimized at these major intersections. Installing special signage, providing designated street crossings, and employing crossing guards can mitigate the potential for accidents involving pedestrians. Through its public involvement process, DART will continue to identify areas with special safety needs in order to coordinate the most appropriate response for transit patrons.

To reduce the potential for pedestrian accidents near schools, DART will work with DISD to identify appropriate safety features. Where the LRT line separates residential areas from schools in their attendance zones, additional fencing will be used to control informal pedestrian crossings regardless of whether the 45 mph speed criterion is met. This may be necessary where the alignment is at-grade between Inwood Road and Mockingbird Lane. During final design DART will consider design options to provide pedestrian access between Kimsey Drive and Rusk Middle School. Furthermore, DART will construct pedestrian bridges at the Market Center/Oak Lawn and Carrollton Square Stations to enhance pedestrian safety and access.

In addition, in order to accommodate automobile traffic, all crossing approaches will be signed and standard safety and warning signs installed in order to warn drivers of a train's approach. Crossing gates will be installed at all at-grade crossings such that at the approach of any rail vehicle (light rail or freight), the gates will lower and automobile traffic will be stopped until the rail vehicles have cleared the street. Where light rail vehicle speed equals or exceeds 45 miles per hour, the alignment will be fenced to prevent access by pedestrians or automobiles who may be accustomed to "informal" track crossings. As noted above, fences can also be provided where speeds are less than 45 miles per hour, depending on adjacent land uses and pedestrian activity. This will be determined during final design.

Should an accident occur, safety features on all LRT vehicles include emergency manual door releases, a public address system inside and outside the car, an automatic feature that stops the train if operators release control, safety mirrors, sight and sound warning systems, impact resistant windows and windshields, "sensitive edges" on passenger doors to detect possible obstructions, and three brake systems per car—dynamic brakes, disc brakes and magnetic track brakes.

### **Station Area Safety Impacts and Mitigations**

Although the addition of light rail service increases the potential for modal conflict in and around station areas, stations have been designed with safety measures such that no impact to station areas is anticipated. DART incorporates a number of safety considerations into the design of LRT stations. These include measures such as limiting pedestrian access across the tracks to dedicated track crossings, providing adequate lighting, and maintaining good visibility and sight lines throughout the station areas. Furthermore, at the Brookhollow and Walnut Hill/Denton Stations where pedestrians would have to cross a freight line to access the light rail platform, no impacts would be expected because freight operation would not occur during DART's operational hours or at a minimum not during peak hours. Furthermore, this freight service is infrequent and operates at low speeds, about one train per day near the station. Similarly, where bus service would feed light rail station areas, bus bays are designed to allow boardings and alightings from a common rail and bus platform such that pedestrian activity would be separated from buses and automobiles.

## 5.12 CONSTRUCTION IMPACTS

Short-term impacts and mitigations associated with constructing the project are documented in the following section. The construction scenario describes the construction process by line segment and by grade; the other sub-sections analyze short-term construction impacts by impact category.

### 5.12.1 Construction Scenario

It is anticipated that DART would divide the construction of the proposed project into four primary construction contracts: Facilities, Trackwork, Systems and Landscaping. Furthermore, DART would subdivide the Facilities contract into five separate Line Section contracts, enabling DART to effectively manage the construction efforts of the build-out. Facilities construction would progress from south to north with each successive Line Section Contract beginning 6 months after initiation of the preceding Line Section work. Each Facilities contract is expected to last between 2 and 2-1/2 years. An overview of the primary construction contracts follows.

#### Facilities Contracts

DART's implementation plan calls for dividing the corridor into five separate Line Section contracts. The first Line Section (NW-1A) is currently under construction between Houston Street in downtown Dallas and Turtle Creek. This line section has independent utility and is being implemented in advance to meet ridership demands at that location.

1. Line Section NW-1A – Houston Street to Turtle Creek
2. Line Section NW-1B – Turtle Creek to Bomar Avenue
3. Line Section NW-2 – Bomar Avenue to Community Drive
4. Line Section NW-3 – Community Drive to Valley View Lane
5. Line Section NW-4 – Valley View Lane to Frankford Road

Each Line Section would contain at-grade and aerial construction components. Line Section NW-2 would contain below grade components where the alignment crosses below Mockingbird Lane. **Table 5-19** outlines the summary of work for each type of construction by elevation.

The typical construction scenario would start with utility and storm sewer relocations, followed by construction of permanent and temporary facilities to support rerouting of vehicular and rail traffic. Once the utilities are cleared and the permanent / temporary facilities constructed, the contractors would build long duration construction items such as tunnel and bridge sections.

For tunnel construction, the contractor would first construct excavation support and ground water barrier walls at the perimeter of the open-cut areas. Tunnel construction would be staged from these areas and excavation spoil would be removed and disposed of properly. After completion of the tunnel liners, the approach structures would be completed and all disturbed surface areas restored.

Tunnel depths and excavation and mining procedures vary by tunnel location. The cut and cover tunnel beneath Mockingbird Lane would be 35-40 feet below grade. Traffic lanes would be bridged and maintained during the tunnel construction. Had Medical Center Design Option A, B, C, or D been selected shallow mined twin-bore tunnels, 30-35 feet below grade, would have served the below grade Parkland Station. These tunnels would be constructed with an earth pressure-boring machine or by the new Austrian tunneling method.

For bridge structures, the contractors would first construct the substructure / foundations, bridge piers and abutments. Once these items are complete, the contractor would place beams, pour the bridge deck and install parapet railing. Retained earth embankments can be constructed concurrently with the bridges.

**TABLE 5-19  
CONSTRUCTION ELEMENTS BY ELEVATION**

<b>At-Grade LRT Construction</b>		
Clearing and grubbing		1,4,5,6
Storm water and erosion control		6,10,24
Utility and street relocation		4,6,10,11,13,16
Demolition of existing facilities		1,4,5,6,17,26
Drainage and storm water systems		6,10,11,15
Excavation, embankment and subgrade preparation		1,4,11,23
Retaining walls and ballast walls		3,10,22,25
Lime subgrade		4,11,23
Subballast		4,11
Chain link fencing		6,22,24
<b>At-Grade Stations</b>		
Station platform slab and Special Use Platform		3,5,8,11,22,25
Structural steel canopies and roofing systems		2,12,14,15,20
Electrical systems		3,10,11,20
Mechanical systems		3,10,6,12
Architectural finishes		3,14,18
Painting		18,19,20
<b>Street, Driveway and Parking Lot Construction</b>		
Street pavement and LRT street at-crossing headers		3,4,6,11,13,22
Permanent street signage and pavement markings		12,18,24,27
<b>Aerial LRT Construction</b>		
Drilled shaft construction		2,8,21,22
MSE wall construction at bridge approaches		5,6,11,25
Bridge pier construction		2,3,22
Bridge deck and parapet		2,3,9,20,22
Grounding system		3,6
<b>Aerial Stations</b>		
Station platform		2,20,9,12
<b>Cut-and Cover Tunnel</b>		
Street bridging		2,6,11,15,13
U-structure and Double box tunnel section		3,5,6,11,12
Backfill and final grading		4,5,11
1 Dozer	10 Ditcher/trencher	19 Paint Sprayers
2 Tracked crane	11 Compaction equipment	20 Man lift
3 Rubber tired crane	12 Air compressor	21 Water pump
4 Motor grader	13 Paving machine	22 Concrete vibrators
5 Dump trucks, haul trucks	14 Welding machine	23 Tiller (lime manipulation)
6 Loader/Backhoe	15 Rubber tired loader	24 Tractor with hole auger
7 Water truck	16 Excavator	25 Bucket grading machine
8 Drilled pier rig	17 Jackhammer, ramjack	26 Concrete saw
9 Concrete pump	18 Sand blaster	27 Street sweeper

Source: Chiang, Patel and Yerby, November 2000.

At-grade guideway construction can proceed concurrent with tunnel and bridge construction, but would be phased so as not to impede progress on the tunnel and bridge work. In several areas, construction activities would have to be coordinated with on-going commuter and freight rail operations.

All station construction would commence with subsurface utility / drainage and foundation work. This would be followed by platform, canopy and ancillary construction including architectural finishes. Subsurface stations would be constructed in a similar fashion, but would be phased with tunnel construction. Parking lots can be constructed at any time during the contract, but they usually follow the LRT station construction.

### Trackwork Installation Contract

A systemwide contract for trackwork installation would follow substantial completion of the line section contracts. It would include the installation of the fixed guideway elements: ballast, ties, rail, concrete plinths on direct fixated bridges, and special trackwork. DART would provide the rails and ties to the Trackwork Installation contractor. These items would be strategically placed throughout the corridor to minimize haul distances and facilitate construction. It is anticipated that track installation would last approximately one year for each Line Section contract and overlap the Facilities and Systems contracts.

### Systems Contract

A systemwide contract for Systems would follow substantial completion of trackwork installation. This contract would provide for the installation of traction electrification, wayside signals, communication, and fare collection elements. Systems construction and testing is anticipated to last one year for each of the four Line Section contracts and would commence after substantial completion of the Facilities and Trackwork elements.

### Landscape Installation Contract

The Landscaping Contract would install planting materials and irrigation systems at all the station sites and at other selected locations in the corridor. This work would be performed concurrent with the Trackwork and Systems contracts. **Table 5-20** illustrates the anticipated construction schedule.

TABLE 5-20 CONSTRUCTION AND REVENUE SERVICE SCHEDULE		
LINE SECTION	CONSTRUCTION START DATE	REVENUE SERVICE DATE
NW-1B	June 2004	December 2007
NW-2	December 2004	June 2008
NW-3	March 2005	September 2008
NW-4	June 2005	December 2008
Note: Working schedule subject to a 2-3 year delay with additional adjustments to be determined through the DART Financial Plan Process		

Source: DART; November 2002.

### Construction Staging Areas

Several staging areas would be required for the storage of equipment and materials used for the construction of the project. Some preliminary staging areas are identified adjacent to stations. Their final size and location will be determined during final design.

#### Construction Staging Areas Impacts

If exposed to the weather, some construction equipment and materials have the potential to release chemicals during storm events. The storage of construction equipment and materials on the ground also has the potential to disturb the soil and kill or prevent the growth of groundcover, which causes the soil to be susceptible to wind and water erosion. Construction equipment has the potential to leak oil and grease, hydraulic fluid, brake fluid and other petroleum hydrocarbons. There is also the possibility of spillage during fueling operations.

#### Construction Staging Areas Mitigation

The DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560 (Part 1.3 C-6 and G, Construction Facilities and Staging Areas), states that the contractor must store equipment and materials in conformance with applicable local regulations. Unnecessary materials and equipment are not allowed to be stored at the job site. No structure is allowed to be loaded with a weight that would endanger its structural integrity or the safety of persons. Materials are not allowed to be stored on private property without written authorization of the owners of the property. Staging areas cannot be located on any

property listed or eligible to be listed in The National Register of Historic Places without prior approval of the DART Contracting Officer.

DART Construction Guidelines Specifications Section 01560 Part 1.4B, Storm Water Pollution Prevention Plan, states that a Storm Water Pollution Prevention Plan (SW3P) should be developed for the Selected LRT Alternative. It will state that the construction contractor will be required to use best management practices to prevent storm water runoff from construction materials and equipment by covering such materials and equipment with awnings, roofs, or tarps; storing materials on asphalt or concrete pads; surrounding material stockpiling areas with diversion dikes or curbs; and using secondary containment measures such as dikes or beams around fueling areas. The contractor should also be required to mulch and reseed disturbed areas to prevent air and water erosion on the site after termination of construction operations.

### Coordination with Other Scheduled Construction Projects

The construction of the proposed project will be coordinated with Dallas County, Denton County, the City of Dallas, the City of Farmers Branch, the City of Carrollton, Texas Department of Transportation (TxDOT), North Texas Tollway Authority (NTTA), and the City of Dallas Department of Aviation. **Table 5-21** summarizes on-going projects that would influence the design and construction of the light rail project. During Preliminary Engineering, DART has communicated with these entities in order to minimize construction-related impacts to residents, property owners and corridor users. These communication and coordination efforts will continue during final design and construction activities.

TABLE 5-21 CONSTRUCTION COORDINATION		
Related Project or Study	Area of Impact	Issue
Denton Drive improvements	Webb Chapel Extension to IH 635	Timing and coordination of DART reconstruction sections, with ultimate cross-section.
Dallas Water Utilities 66" water line	Carrollton	Requires relocation due to conflicts with proposed DART LRT improvements
Station Vicinity street improvements	Carrollton	Streets must be designed around DART infrastructure
Station Vicinity street improvements	Farmers Branch	Streets must be designed around DART infrastructure
Oak Lawn Avenue	North Tollway to NB IH 35E	Final designs and construction must be coordinated; traffic study completed to mitigate ramp closure from southbound Harry Hines to Oak Lawn Avenue
Double track TRE facilities	West of existing tracks	Coordinate construction activities
IH 35E and IH 635 Interchange improvements	Forest Lane and WB frontage road of IH 635	Coordination with TxDOT for construction timing and future frontage road crossings.
Harry Hines/Motor Street	Harry Hines/Motor Street Intersection	Design and timing coordination
Motor Street- Harry Hines to Maple	Harry Hines to Maple	Design and timing coordination
Inwood-Harry Hines to Lemmon	Harry to Lemmon	Design and timing coordination
Shorecrest widening	At Denton Drive Intersection	Design and timing coordination
Dickerson Parkway crossing	South of Trinity Mills Station	Coordinate allowable clearances
Broadway Street	Carrollton-Whitlock to Trinity Mills (SH190 /EBFR)	Timing and coordination of DART of reconstruction sections with ultimate cross-section.

Source: Chiang, Patel, and Yerby; November 2002

### 5.12.2 Construction Noise Impacts

Construction of the tracks, stations, substations, maintenance facility and the associated parking facilities would result in the generation of noise from construction equipment. Construction noise varies greatly depending on the construction process, type and condition of equipment used and the layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise.

**Table 5-22** summarizes available data on noise emissions of construction equipment that may be used for this project. Impacts from construction noise depend on the sensitivity of the noise receptor, the magnitude of noise during each construction phase, the duration of the noise, the time of day the noise occurs and the distance from the construction activities.

#### No-Build Alternative

Impacts of the No-Build Alternative would be confined to already active and congested highway areas where residents and businesses have already adjusted to highway-related noise. No construction-related noise impacts are expected.

#### LRT Alternative

Using the typical sound emission characteristics given in **Table 5-22**, along with information on the equipment to be used and the utilization factors or duty cycles of the equipment, it is possible to estimate construction noise exposure in the community. Although no standardized criteria have been developed for assessing construction noise impact, guidelines are provided in the FTA Noise and Vibration Impact Assessment guidance document. These guidelines, summarized in **Table 5-23**, are based on land use and time of day and are given in terms of Leq for an 8-hour work shift.

TABLE 5-22 TYPICAL NOISE LEVELS OF CONSTRUCTION EQUIPMENT	
Equipment Type	Typical Sound Level at 50 ft (dBA)
Backhoe	80
Bulldozer	85
Compactor	82
Compressor	81
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Loader	85
Pavement Breaker	88
Paver	89
Pile Driver, Impact	101
Pump	76
Roller	74
Truck	88

Source: Federal Transit Administration, April 1995

TABLE 5-23 FTA CONSTRUCTION NOISE GUIDELINES		
Land Use	Noise Limit, 8-hour Leq (dBA)	
	Daytime	Nighttime
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: Federal Transit Administration, April 1995

The potential for construction noise impact varies by location and land use. Commercial and industrial land uses, which adjoin the majority of the alignment, should not be impacted by construction noise. For residential land uses, the potential for temporary noise impact from daytime construction would be limited to locations directly adjacent to the alignment. However, noise impact from nighttime construction would be much more extensive, which emphasizes the importance of avoiding nighttime construction near residential areas.

### **Construction Noise Mitigation**

Construction activities will be carried out in compliance with all applicable local noise regulations. DART Construction Guidelines Specifications Section 01560 Part 1.9 A-G establishes maximum noise and vibration limits for construction activities. The guidelines also specify appropriate techniques to minimize and mitigate noise and vibration near sensitive land uses. In addition, specific residential property line noise limits would be developed during final design and included in the construction specifications for the project, and noise monitoring would be performed during construction to verify compliance with the limits. This approach allows the contractor flexibility to meet the noise limits in the most efficient and cost-effective manner. Noise control measures that will be applied as needed to meet the noise limits include the following:

- Avoiding nighttime construction in residential neighborhoods;
- Using specially quieted equipment with enclosed engines and/or high performance mufflers;
- Locating stationary construction equipment as far as possible from noise sensitive sites;
- Constructing noise barriers, such as temporary walls or piles of excavated material between noisy activities and noise-sensitive receivers;
- Re-routing construction-related truck traffic along roadways which will cause the least disturbance to residents; and
- Avoiding impact pile driving near noise-sensitive areas, where possible. Drilled piles or the use of other non-impact piling methods are quieter alternatives where the geological conditions permit their use. If impact pile drivers must be used, their use will be limited to periods between 8:00 a.m. and 5:00 p.m. on weekdays.

### **5.12.3 Construction Vibration Impacts**

The most significant source of construction vibration is pile driving. Pile driving would occur in the tunnel section of the alignment under Mockingbird Lane. Other construction activities that could cause intrusive vibration include vibratory compaction, jack-hammering and the use of tracked vehicles, such as bulldozers. If the Love Field Design Option would have been selected, pile driving would also have been required in the tunnel section.

### **Construction Vibration Mitigation**

Vibration impacts during construction will be avoided through numeric limits and monitoring requirements that will be developed during final design and included in the construction specifications for the project (DART Construction Guidelines Specifications Section 01560 Part 1.9 A-G, Construction Noise and Vibration Control). Measures that will be considered as requirements to meet the vibration limits include the use of alternative equipment or processes, such as the use of drilled piles in place of impact pile driving and avoiding the use of vibratory compactors near vibration-sensitive areas.

### **5.12.4 Disruption of Utilities**

The various utilities within the project right-of-way include electric, natural gas, telephone, water and sanitary sewer. Utility line disruptions would likely occur during the grading, excavation and construction activities of most major roadway and rail projects.

### **No-Build Alternative**

No utility disruptions would be anticipated under the No-Build Alternative.

### LRT Alternative

The construction of the project would cause short-term impacts to area utilities due to line disruptions, relocations and general improvements. U.S. Department of Transportation guidelines for roadway construction recommend that utility disruptions should occur for a period not to exceed 24 hours for residential properties. Alternatives to utility disruptions include construction around existing utility lines and disallowing excavations, removal of fill and grading during construction. However, in order for construction contractors to build around existing utility lines, cost-prohibitive excavations and grading would have to occur.

The locations of the utility lines that would need to be relocated cannot be known until the project progresses to a higher level of design. During final design, DART staff will confirm utilities within the project corridor, and list them by line types, locations, proposed mitigation and the estimated duration of the disruption.

### Disruption of Utilities Mitigation

Contractors will be directed to consider the following items in their construction specifications for mitigation of utilities:

- Prior to construction, all area utility companies and utility agencies will be contacted and requested to provide line location measures and approval of the proposed alteration of utility lines;
- Businesses and residences affected by utility disruptions should be notified of the disruptions at least two weeks in advance;
- Down periods for businesses should occur during off-business hours and never exceed a 24 hour period;
- Businesses such as restaurants, grocery stores or food preparation/manufacturing facilities should be accommodated in order to protect food preparation and storage mechanisms;
- Should utilities be identified during construction that are not identified prior to construction, work will be discontinued and appropriate utility companies and agencies will be contacted to identify the line(s). The newly identified line will not be disrupted until businesses and residences are notified and the utility owner/operator has approved the proposed alteration.
- DART will coordinate with FAA to ensure that FAA facilities are not impacted.

#### 5.12.5 Access and Distribution of Traffic

During the construction of any roadway or rail line project, road and traffic disruption is expected on minor and major roadways. The following sections address traffic impacts due to construction of the project and mitigation measures to alleviate these problems.

### No-Build Alternative

The current railroad and associated right-of-way would remain largely as it is today if the No-Build Alternative is selected. Therefore, no roadway disruptions or closures would be anticipated due to rail construction.

### LRT Alternative

Construction of the LRT Alternative would affect numerous major and minor roadways in the Cities of Dallas, Farmers Branch, and Carrollton. When roadway or lane closures are required during construction of the Selected LRT Alternative, DART and its contractors will coordinate with the appropriate traffic control divisions of the Cities of Dallas, Farmers Branch, and Carrollton to maintain reasonable and safe traffic operations at affected crossings. **Table 5-24** illustrates how crossings and adjacent roadways in the corridor would be impacted by project construction. The streets are listed from south to north.

**TABLE 5-24  
CONSTRUCTION-RELATED TRAFFIC IMPACTS**

Street	LRT Location	Lanes Blocked	Alternate Routes Available
Harry Hines Boulevard (near Lucas Street.)	Over	X	IH 35E; Maple Avenue
Lucas Street	Over	X	Wycliff Avenue
Kendall/Macatee	Over	X	Lucas; Motor
Motor Street	Over	X	Butler Street, Inwood Road
Denton Drive	Over, adjacent	X	Harry Hines; Maple; Lemmon Avenue; IH 35E
Market Center Boulevard	Over	X	Motor Street
Motor Street	Under	X	Butler St., Wycliff Ave.
Maple Avenue	Over	X	Denton Cut-off, Butler St., Cedar Springs Rd.
Inwood Road	Over	X	Motor Street; Mockingbird Lane
Mockingbird Lane	Under	X	Inwood Road, Shorecrest
Webb Chapel Extension	Over	X	Harry Hines; Walnut Hill
Northwest Highway	Over	X	Walnut Hill Lane; Webb Chapel Ext.
Lombardy Lane	Over	X	Northwest Highway; Walnut Hill Lane
Walnut Hill Lane	Over	X	Northwest Highway; Royal Lane
Merrell Road	Over	X	Walnut Hill Lane; Royal Lane
Royal Lane	Over	X	Walnut Hill Lane; Forest Lane
Northaven Road	Over	X	Royal Lane, Forest Lane
Forest Lane/IH635	At-grade	X	Royal Lane; Valley View Lane
IH 635 LBJ Freeway	Under		N/A
Valley View Lane	At-grade	X	LBJ Freeway; Forest Lane; Valwood Parkway
Valwood Parkway	At-grade	X	Valley View Lane; Belt Line Road
Crosby Road	Over	X	Belt Line Road; Valwood Parkway
Belt Line Road	Over	X	Crosby Road; Valwood Parkway
Old Denton Road	Over	X	Whitlock Road
Whitlock Road	Over	X	Jackson Street; Belt Line Road
Jackson Street	Over	X	PGBT Frontage Roads; Whitlock Road
President George Bush Turnpike	Under		N/A
SH 190 Frontage Roads	At-grade	X	Frankford Road; Jackson Street

Source: Parsons Transportation Group; March 2003

### Traffic Mitigation

The Cities of Dallas, Farmers Branch, and Carrollton require notification of all construction activities within city rights-of-way. The construction contractors will identify the appropriate regulations and incorporate mitigation measures in the construction specifications (DART Construction Guidelines Specifications Section 01570, Maintenance and Control of Traffic). **Table 5-25** provides applicable local and state regulation guides for the proposed construction.

All construction specifications, traffic control plans, and mitigation measures must be approved by local traffic engineering authorities prior to initiation of construction. Barricading and flag staff should be used when appropriate. Private business parking areas and driveways will not be used for equipment maneuvering or parking. Construction specifications will include provisions for a maximum number of lanes blocked during peak traffic hours, maintenance and removal of traffic control devices, efficient traffic rerouting measures, and scheduling of construction activities within the roadways for times other than during peak traffic periods.

DART will include the American Red Cross, hospitals, and other affected property owners in traffic control plans and construction coordination efforts. Notification of roadway disruptions will be provided to affected property owners. In particular, hospital and emergency vehicle operators will be notified of planned roadway blockages and provided with descriptions of alternative routes. Alternative routes will also be provided to the American Red Cross as it relates to occasions when its emergency disaster response vehicle fleet is dispatched.

**TABLE 5-25  
ORDINANCES APPLICABLE TO PROJECT CONSTRUCTION  
IN CITY RIGHTS-OF-WAY**

<b>City</b>	<b>Applicable Publications</b>
Dallas	NCTCOG-Standard Specifications for Public Works Construction; TxDOT-Texas Manual on Uniform Traffic Control Devices
Farmers Branch	Farmers Branch-City Code Ordinance, Section 34-284 NCTCOG-Standard Specifications for Public Works Construction; TxDOT-Texas Manual on Uniform Traffic Control Devices
Carrollton	City of Carrollton-General Design Standards (Section 1: Standard Engineering/Construction Procedures); NCTCOG-Standard Specifications for Public Works Construction; TxDOT-Texas Manual on Uniform Traffic Control Devices

Source: Parsons Transportation Group; October 2001

**5.12.6 Air Quality Impacts  
No-Build Alternative**

The No-Build Alternative would indirectly cause construction-related air quality impacts from future roadway construction and expansion due to the failure of this alternative to reduce future automobile traffic on area roadways.

**LRT Alternative**

During the construction phase, there would be short-term impacts on air quality. Construction activities associated with excavations, grading and filling, and other operations disturb the soil, generate dust, and remove groundcover which causes the soil to be susceptible to wind and water erosion. The proposed project would also include a short-term increase in exhaust emissions from construction vehicles.

**Mitigation of Air Quality Impacts**

There are no federal, state, or local regulations concerning the generation of dust from construction activities except as a nuisance complaint; however, the DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560 (Part 1.8, Dust Control) provides dust control measures for construction activities. The regulations state that the contractor will be required to have sufficient equipment at the site to implement dust control measures. The measures will be implemented at all areas of construction at all times including non-working hours, weekends and holidays.

The control of exhaust emissions emanating from various construction equipment will be in accordance with EPA guidelines. To minimize exhaust emissions, contractors will be required to use emission control devices and limit the unnecessary idling of construction vehicles. (It should be noted that, effective October 1, 2001, proposed restrictions on the operation of diesel combustion construction equipment have been repealed from the State Implementation Plan (SIP) by the Texas Legislature.)

**5.12.7 Disruption of Business Activities**

Several businesses within the project corridor would be impacted during construction due to temporary disruption and blocking of nearby roadways.

**No-Build Alternative**

No business disruptions, displacements or inconveniences to patrons would be anticipated under the No-Build Alternative.

**LRT Alternative**

In most cases, construction of the project would cause a short-term impact to area businesses due to access restrictions, general inconveniences to patrons and temporary blocking of adjoining roadway intersections.

**Mitigation for Disruption of Businesses**

Due to availability of alternative routes and the temporary duration of construction periods, the short-term roadway disruptions will cause only minimal disruptions to the businesses along the project corridor. Provisions in project specification plans will require the construction contractors to make every reasonable effort to minimize construction activities within the roadways during peak traffic periods. Abatement measures such as work hour controls and weekend construction will be included in project contracts. Private business parking areas and driveways will not be used for equipment maneuvering or parking. In addition, all possible measures will be taken to avoid blockages and disruption of business access driveways. DART will include the American Red Cross and hospitals in traffic control plans and construction coordination efforts. As a courtesy, notification of roadway disruptions will also be provided to neighboring property owners. In cases of roadway blockages, neighboring property owners will be notified and provided with descriptions of alternative routes.

**5.12.8 Water Quality and Runoff**

Local, state and federal governments monitor and enforce water quality standards. Water quality and runoff issues will be addressed for the construction of the proposed project through the development of a comprehensive Storm Water Pollution Prevention Plan (SW3P). Such a plan must meet the requirements of the Texas Pollutant Discharge Elimination System (TPDES) Storm Water General Permit, as specified in DART Construction Guidelines Specifications Section 01560 1.4 A, B, and C, Storm Water Pollution Prevention.

**No-Build Alternative**

Water quality and surface runoff are currently impacted by rail line maintenance, operations and ground keeping activities, which cause minor overall impacts. Similar impacts are expected to continue under the No-Build Alternative.

**LRT Alternative**

Construction of the rail lines, stations and associated parking facilities could result in the generation of a short term impact to water quality and sediment runoff if not adequately addressed. The construction staging areas could also cause short-term impacts; however, impacts would be greatest in areas that are affected by grading and filling. Mitigation of these potential impacts is addressed below.

**Mitigation of Water Quality and Runoff**

In conformance with the TPDES General Permit, mitigation to protect area water quality will include measures to provide erosion controls and minimization of the introduction of sediments, wastewater and chemicals to surface and subsurface waters. According to the U.S. EPA regulations, cities with populations of 100,000 or greater must maintain and enforce the Municipal Separate Storm Sewer System (MS4) permitting program. The Cities of Dallas, Farmers Branch and Carrollton participate in this program and regulate storm water discharges with regard to various construction projects. This ordinance is enforced by the Storm Water Quality Department. In accordance with the ordinance, project specifications must be reviewed by the Storm Water Quality Department prior to initiation of construction.

Once issued, the TPDES General Permit will provide the following mitigation measures:

- Limit the areas of disruption;
- Temporarily stabilize and protect areas disturbed by construction to minimize erosion;
- Filter or impound sediment laden water from storm water runoff, soil boring/excavation operations, trenching, etc., to remove sediment prior to release of runoff;
- Provide structural erosion control methods where required to treat sediment-laden runoff;
- Provide general housekeeping measures to prevent and contain spills of chemicals, including petroleum hydrocarbons, associated with construction;
- Implement waste management techniques to cover waste materials and minimize ground contacts; and
- Reduce wind blow waste and off-site tracking by vehicles from the construction sites.

DART will perform inspections at least once every seven days and within 24 hours of a storm event that produces ½ inch or a greater amount of rainfall to help ensure each construction contractor's compliance with the approved Storm Water Pollution Prevention Plan.

#### **5.12.9 Excavations, Fill Material, Debris and Spoil**

##### **No-Build Alternative**

The current railroad and associated right of way would remain developed and active if the No-Build Alternative were retained. Therefore, no construction-related excavations fill material or the generation of debris and spoil would be required.

##### **LRT Alternative**

Construction of the project would require grading, excavations and fill material that would result in the generation of debris and spoil. Much of the spoil generated from grading activities and excavations would be used as fill material along the project corridor to bring the rail line to above and below grade; however, additional fill material would probably be required. Debris and spoil would also be generated by the demolition of buildings that are acquired for station area development.

##### **Mitigation of Excavations, Fill Material, Debris and Spoil**

The DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560 (Part 1.5 A, B and C), provides measures concerning disposal of debris and spoil. The regulations state that excess "clean" fill material can be disposed of on the site. Waste will be placed in containers, transferred off site and disposed of in a manner that complies with state and local requirements. No waste material will be burned on-site. The disposal transport areas will be left clean on completion of the project.

Debris and spoil generated during construction of the project within the City of Dallas could be disposed of at the McCommas Landfill. There are no regulations concerning the type of debris and spoil that could be disposed of at this landfill except that hazardous waste is not accepted. No hauling permits are required by the City of Dallas. Debris and spoil generated within the cities of Carrollton and Farmers Branch could be disposed of at other designated landfills.

### **5.13 CULTURAL RESOURCES**

No impacts to cultural resources are expected with the implementation of the No-Build Alternative. This section outlines the effects of the Selected LRT Alternative. DART is in the Section 106 process that led to a Memorandum of Agreement (MOA) between DART, FTA, and the State Historic Preservation Officer (SHPO) for any adverse effects that are determined. The MOA specifies mitigation measures and otherwise resolves impacts. The signed and final MOA is presented in Appendix H.

### 5.13.1 Application of the Criteria of Adverse Effect

In order to comply with Section 106 of the National Historic Preservation Act, any effects of the proposed undertaking on historic properties listed in or determined eligible for inclusion in the National Register must be analyzed by applying the Criteria of Adverse Effect [36 CFR Part 800.5(a)], as follows:

- (1) An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.
- (2) Examples of adverse effects. Adverse effects on historic properties include, but are not limited to:
  - (i) Physical destruction of or damage to all or part of the property; alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
  - (ii) Removal of the property from its historic location;
  - (iii) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
  - (iv) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
  - (v) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
  - (vi) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

### 5.13.2 Effect Determinations and Mitigation for Selected LRT Alternative

#### Determination of No-Effect

Consultation with the SHPO has resulted in a consensus determination that eight of the fifteen properties within the Area of Potential Effects (APE) that are listed in or eligible for listing in the National Register would not be affected by the project. **Table 5-26** lists those properties and a brief discussion as to why the criteria of adverse effect do not apply. SHPO concurrence documentation is included in Appendix D.

In each instance the resource is at least 75 feet away from the rail line; and/or there is either an intervening building or activity (such as a street) between the rail line and the historic resource; or the resource is already adjacent to railroad activities and the proposed project would not constitute

a change in the immediate environment, e.g. no elevated guideways or platforms are proposed in the viewshed of the resource.

**TABLE 5-26  
DETERMINATION OF NO EFFECT**

Map No.*	Common Name	Address	Distance to Track (approx.)	Basis for Determination
1	Dealey Plaza Historic District	Roughly bounded by Pacific Avenue, Market and Jackson Streets, and right of way of Dallas Right of Way Management Company	550'	Previously determined No Effect on April 4, 2001.
2	West End Historic District	Bounded by Lamar, Griffin, Wood, Market and Commerce Streets	550'	Previously determined No Effect on April 4, 2001.
3	Magnolia Petroleum Company City Sales and Warehouse	1607 Lyte Street	500'	This structure is located several parcels and some distance away from the proposed alignment and there are several intervening structures between it and the tracks.
5	Turtle Creek Pump Station	3630 Harry Hines Boulevard	75 – 80'	The Pump Station is located approximately 80 feet east of the railroad, across Harry Hines Boulevard from the rail line and has been in the proximity of noise intrusions from the major thoroughfares that surround it.
8	Obadiah Knight School	2615 Anson Road	500'	The school has at least one structure between it and the alignment and is already subject to noise intrusion due to its proximity to Dallas Love Field.
9	Water Department Purification Plant	2605 Shorecrest Drive	525'	The Purification Plant is a significant distance from the alignment and is further shielded by the mature trees between it and the tracks.
10	Water Department Pumping Station	2525 Shorecrest Drive	820'	This structure is a significant distance from the alignment and there are intervening landscape elements and a building between it and the tracks.
11	Bachman Electric Gen. Station	9500 Denton Drive	350'	This building is some distance from the alignment and is visually obstructed due to the presence of electrical equipment.

\* Refers to **Figures 3-26 through 3-28** (chapter 3).

Source: Myra L. Frank & Associates, 2002

Several of these resources have previously been reviewed by the SHPO as part of other environmental clearances and are included here only for completeness. The initial line section for the proposed project, from downtown Dallas to the Victory Station at American Airlines Center, was the subject of a Categorical Exclusion issued by the FTA on May 16, 2001. As part of that analysis, consultation with the SHPO concluded that there would be No Effect on Dealey Plaza and the West End Historic District. It was determined that there would be an effect on the Continental Avenue Bridge, which required the preparation of a Memorandum of Agreement (see Determination of No Effect section below).

**Determination of No Adverse Effect**

**Table 5-27** shows those four properties listed in or eligible for listing in the National Register of Historic Places where it has been determined that the proposed project would have no adverse effect. The basis for this determination is provided below, including mitigation measures to ensure the finding of no adverse effect. The MOA (Appendix H) provides details on mitigation measures.

TABLE 5-27 DETERMINATION OF NO ADVERSE EFFECT			
Map No.*	Common Name	Address	Distance to Track (Approx.)
6	Old Morton Food Headquarters	6333 Denton Drive	80'
7	T.J. Rusk School	2929 Inwood Road	200'
13	Bingo Theater	2711 Storey Lane	250'
14	Letot School	2727 Lombardy Lane	80'

\* Refers to **Figures 3-26 through 3-28** (chapter 3).  
Source: Myra L. Frank & Associates, 2002

Old Morton Food Headquarters

*Description*

The Old Morton Food Headquarters is part of a larger complex of warehouses built in an industrial area south of the intersection of Denton Drive and Mockingbird Lane. This structure is a good, intact example of 1950s industrial architecture and exemplifies the importance of the railroad to the growth of this area as an industrial and commercial corridor.

*Effects*

Along this section, the alignment will be transitioning to below-grade (80' to the east) to grade separate LRT from the intersection of Denton Drive and Mockingbird Lane. The structure will not be removed, altered or physically damaged by the proposed project. The changes in the immediate vicinity of the resource will not be significant, due to the distance to the tracks, the intervening parking lot and landscaping, and the fact that the trains will begin their descent into the tunnel south of the resource. Noise level changes are not expected to be significant. LRT noise will be diminished because all or part of the train will be below grade as it passes the Old Morton Food Headquarters. In addition, none of the current commercial uses of the building is noise sensitive. The building will continue to have a visual connection to a transportation-related corridor, and the introduction of light rail components such as catenary poles and lighting would not significantly affect the integrity of the property and are compatible with its industrial setting. The design of the U-wall structure, likely to be used for the tunnel descent, will include unknown design features, such as low barrier walls for pedestrian safety, which may have adverse effects on the visual environment. Therefore, to ensure a Finding of No Adverse Effect, the design of the project will be developed by DART in consultation with SHPO who will have the opportunity for design review and comment.

### *Mitigation*

DART has agreed to consult with the SHPO on the design of the guideway in the vicinity of the structure in order to minimize potential visual impacts. Mitigation included in the final Memorandum of Agreement includes SHPO review of proposed design plans for the tunnel descent. With this mitigation, the project has been determined to have no adverse effect on the Old Morton Food Headquarters.

### T. J. Rusk School

#### *Description*

The school sits at the northeast corner of the intersection of Denton Drive and Inwood Road, with the primary façade (the south façade) facing Inwood Road. The first story of this school is clad in concrete, while the second story and sections of the first story are clad in brick veneer. Ribbon windows of varying sizes, one-over-one, double hung metal sash are evident throughout. This is a good example of the use of the International style of architecture and represents an early school building of this type.

#### *Effects*

An elevated guideway and transit station are proposed to be constructed on the west side of Denton Drive, with the station at the southwest corner of the Denton Drive and Inwood Road intersection. The DEIS included a station in the northwest corner which was approximately 200 feet west of the western facade of the school. This Final EIS reflects a revised station location south of Inwood Road, which increases the distance of the station from 200 feet to 500 feet from the nearest corner of the school. Relocation of the station also removes it from the primary view of the school. The school will not be removed, altered or physically damaged due to the proposed project. The elevated tracks will create changes in the visual environment, both for the viewers of the school and for those within the school. This includes the LRT structure and tracks and to a lesser extent, station, catenary poles and lights. The west façade of the school is not the primary elevation. Views of the primary elevation would not be substantially changed by the project. Noise levels may improve for a number of reasons. Elevating the railroad tracks at this intersection eliminates the need for sounding train horns or warning bells at the crossing. In addition, traffic will move better through the intersection if it is grade separated from train movements.

### *Mitigation*

DART has agreed to consult with the SHPO on the design of the aerial station and guideway in the vicinity of the school. Mitigation could include landscaping to soften the visual effects of the columns and the station, and designing the station to complement the style of the school. With this mitigation, the project has been determined to have no adverse effect on the school.

### Bingo Theater

#### *Description*

The theater is rectangular in plan with a stepped parapet wall along the east façade. A tall partially engaged circular tower clad in vertically ribbed ceramic tile, rises from the southeast corner of the front facade. A blade sign with exposed neon channel letters projects from the upper portion of the tower. This is a good intact example of late Moderne movie house architecture.

#### *Effects*

This building will not be removed, altered or physically damaged due to the proposed project. The track would be elevated about 20–25 feet high at this point, approximately 240 feet to the east of the Bingo Theater. It is at this point in the alignment that the tracks transfer from the west side of Denton Drive to the east side of Denton Drive. The main views are by drivers on Denton Drive and are considered indirect impacts. Moreover, due to the distance between the theater and the proposed elevated tracks, and the fact that the primary façade faces away from the tracks, this is not considered a significant visual impact. Due to the theater's proximity to two well-used

secondary roads (Harry Hines and Denton Drive) and a highway (Northwest Highway), the introduction of noise associated with the LRT is not considered significant.

#### *Mitigation*

DART has agreed to consult with the SHPO on the design of the guideway in the vicinity of the theater in order to minimize potential visual impacts.

#### Letot School

##### *Description*

The Letot School is constructed of brick with a large rubblestone foundation and a flat roof. Most windows are currently boarded up and there is no active use. There are flat and Roman arched windows with keystones. Over the main facades are large ornate pediments that rise above the roofline. The school's primary façade faces south towards Lombardy Lane. Immediately across Lombardy Lane are several auto-related businesses. On the west side of the school is a store with an associated parking lot that faces Harry Hines Boulevard. To the east is two-lane Denton Drive, which is proposed to be improved to a four-lane undivided street, and a currently vacant commercial complex of buildings known as Carpenters Corner. The school is considered eligible for its significance in education at a local level.

##### *Effects*

The Letot School will not be removed, altered or physically damaged due to the proposed project. It is not currently in use. The Northwest Rail Operating Facility will be located at the northeast corner of Denton Drive and Lombardy Lane. The facility's conceptual site plan would relocate the freight tracks and lay new freight storage tracks on the parcel of land between Denton Drive and the proposed Northwest Rail Operating Facility. These new freight storage tracks would be located across Denton Drive from the northern portion of Letot School, opposite a secondary façade and will permit temporary storage of railroad cars. Existing mainline freight tracks would be located at the eastern edge of these new tracks, paralleling the LRT guideway. No additional lighting has been proposed at this time.

The Northwest Rail Operating Facility would be sited to the east of the school across Denton Drive, east of the existing parcel on which the Carpenters Corner complex stands, and east of the existing freight tracks. After grade separation at Lombardy Lane, the northbound LRT track would remain elevated and the southbound track will return to grade adjacent to the Northwest Rail Operating Facility. A pocket track to move trains from the alignment into the facility would be provided between the northbound and southbound tracks and would have the same vertical profile as the southbound track. A proposed 12 – 16 foot high retaining wall would be necessary on the west side of the tracks in order to bring the pocket track and southbound track back to grade for a distance of approximately 1,200 feet next to the facility.

The introduction of the elevated track and the retaining wall across Denton Drive and east of the school is considered a significant change in the visual environment. However, the introduction of these elements, and the associated lighting, wires and poles would not diminish the integrity of the property's significant historic features because this will occur across Denton Drive and opposite a secondary façade. The existing intersection of Lombardy Lane and Denton Drive is to be straightened and reconfigured as a separate project by the Dallas County Department of Transportation. DART is coordinating with Dallas County on the Denton Drive widening project to provide right-of-way necessary for the road project to avoid direct impact to the Letot School rock wall. The removal of the existing building complex at Carpenters Corner from the visual environment would be considered beneficial in creating a more attractive visual environment for the school.

The removal of various commercial and industrial businesses on the proposed Northwest Rail Operating Facility site would reduce the number and activity levels of trucks in the vicinity. Noise levels within the site are not expected to be substantially higher than current noise levels. Although the environment in the vicinity of the school will change, those changes are not considered adverse to the characteristics that made the school eligible for the NRHP.

*Mitigation*

The DART Board approved the selection of the Northwest Rail Operating Facility site on August 13, 2002 and in its resolution included additional visual mitigation as described in Section 5.6, Visual and Aesthetic Resources (also see Appendix D). The MOA (see Appendix H) provides for this visual mitigation, including screening of the freight storage tracks on the east side of Denton Drive across from the Letot School. The visual mitigation will be developed in consultation with the SHPO during final design of line section NW-3 and the Northwest Rail Operating Facility. This consultation will include design review by SHPO at the 30%, 65%, 95% and 100% intervals in final design. The mitigation supports the finding of no adverse effect.

**Determination of Adverse Effect**

**Table 5-28** shows those properties listed in or eligible for listing in the National Register of Historic Places where it has been determined that the proposed project would have an adverse effect.

<b>TABLE 5-28 DETERMINATION OF ADVERSE EFFECT</b>			
<b>Map No.*</b>	<b>Common Name</b>	<b>Address</b>	<b>Distance to Track (Approx)</b>
4	Continental Avenue Bridge	Continental Avenue Lamar/McKinney Railroad Underpass	0' from NB track
12	Club Schmitz	2900 Webb Chapel Road	32' from SB track
15	Carrollton Crossing Depot	1020 N Broadway Street & MKT Tracks, Carrollton	0'

\* Refers to **Figures 3-26** through **3-28** (Chapter 3).

Source: Myra L. Frank & Associates, 2002

Continental Avenue Bridge

*Description*

The bridge has local, state, and federal significance. It was a contributing element of a discontinuous district associated with the Trinity River flood control measures from the 1930s.

*Effects*

The bridge is scheduled to be demolished during construction of line section NW-1A of the project. This line section has independent utility and was found to be a Categorical Exclusion by FTA in a letter to DART on May 16, 2001.

*Mitigation*

The bridge was photographed and documented in accordance with Historic American Engineering Record (HAER) Level III guidelines according to the stipulations of the separate MOA developed and signed in June 2002 after the FTA's finding. The SHPO concurred with DART's documentation on August 13, 2002. The information will be archived at the Dallas Public Library and displayed publicly by DART at its Monroe Shops museum facility (See Appendix D).

### Club Schmitz

#### *Description*

This restaurant was constructed of concrete block with a flat roof and wide ledge and aluminum horizontal panels above the roofline. The window treatments are plate glass with canvas awnings. This structure was identified as a locally significant resource. In addition, it is one of the few remaining 1930s commercial structures located along the existing railroad corridor.

#### *Effects*

This building will not be removed, altered or physically damaged due to the proposed project. The project will, however, result in several proximity impacts to the property. First, the project will require that a 12 to 16 foot high aerial LRT guideway be located about 32 feet from the Club Schmitz building. There will be an aerial encroachment over the property at the northeast corner of the parking lot of approximately 100 square feet. Second, a guideway column will be placed in a public right-of-way that is not owned by Club Schmitz, but is utilized informally by its patrons. About two parking spaces would be lost. There would be no impaired vertical clearance that would further limit parking under and in proximity to the guideway structure. The column footprint would be approximately eight feet by six feet, or almost 50 square feet. In addition, the project would require closing Cullum Road at its intersection with Denton Drive and creating a cul-de-sac at that location. Cullum Road is currently a primary access road from the north to the Club Schmitz parking lot via Denton Drive. Access to the property from Cullum Road via Harry Hines Boulevard would not be affected by the project. Access from Webb Chapel Extension would also not be affected by the project.

The primary change in the environment would consist of the appearance of the LRT guideway and columns, the reduction in parking and access to the parking lot, and the change to the visibility of the structure both for drivers and patrons. Noise and vibration impacts are not considered significant because Club Schmitz is not a noise sensitive receptor. The nature of its operation means that club activities occur indoors, generating a great deal of internal noise.

DART has indicated that they will be willing to work with the proprietors of Club Schmitz to enhance the existing parking situation by helping them design a more functional parking lot. Other mitigation measures will include additional signage along Denton Drive in order to continue to make sure the restaurant has visual access to drivers using this roadway. This will be particularly important during the construction phase, but DART will assist with permanent signage also. DART has redesigned the guideway support structure to continue the bridge structure north to the north side of Cullum Road, in order to maintain views of Club Schmitz for drivers along Denton Drive. DART had originally planned to build an embankment and retained fill section to support the guideway from the south side of Cullum Road. Maintaining the bridge structure for this additional distance would shift the start of the embankment for the retaining wall about 200 feet north of where it was originally proposed, but it would improve the visibility of the club for drivers along Denton Drive.

#### *Mitigation*

The following mitigation measures are incorporated into the Memorandum of Agreement to minimize impacts on the Club Schmitz:

- 1) Continue the guideway on structure to the north side of Cullum Road, before starting the embankment.
- 2) Assist the Club Schmitz in redesigning their parking lot to reduce the effects of the parking loss.
- 3) Work with the Club Schmitz to install temporary and permanent signage to improve the visibility of the Club from Denton Drive.

- 4) Submit design plans for review by SHPO at the 30%, 65%, 95% and 100% intervals in final design.

The incorporation of the above-listed mitigation measures would reduce adverse effects on Club Schmitz, but the FTA and SHPO have determined that there would still be an adverse effect on this property because of the change in setting created by the project.

#### Carrollton Depot

##### *Description*

This depot has weathered wood siding and a hipped roof with very wide and deep overhanging eaves. There is a loading dock on the west side. The windows are boarded up to prevent vandals and pests from getting inside, but the fenestration appears to be one-over-one, double hung wood sash. This depot, which once served the three railroads whose lines intersect in Carrollton, exemplifies the prominence of the railroad in the growth of the area.

The depot currently faces the intersection of the Cotton Belt and MKT (Katy) railroad tracks. The north façade faces the Cotton Belt, while the west side faces the Katy tracks. According to available information, the depot has always resided in that immediate vicinity, although the City of Carrollton has indicated that it has been adjusted at least three times. It is believed that the depot was only moved within 100 yards of its current position. Sanborn map data indicate little more about the original orientation of the depot. A 1935 Sanborn Map shows the general location, but not sufficient detail of the building to determine its orientation. A drainage map published by the Dallas County Bureau of Engineering in 1949 shows the site of the depot as well, essentially in the same position where it is currently sited.

##### *Effects*

The proposed Carrollton Square LRT station would be constructed on the property where the historic Carrollton Depot now stands. It will be an aerial station, located partially where the existing Depot now stands. DART revised the Carrollton Square station concept to shift the location of the Depot so that it maintains a relationship to an at-grade railroad (Cotton Belt) to the north and to the railroad switching yard to the east (refer to **Figure 2-15**). The historic Carrollton Depot will be relocated to a position east of its current location, but within the station area. The proposed relocation would also have the advantage of making the station both visible and accessible, which is not currently the case.

While the Carrollton Crossing Depot currently retains integrity of design, setting, materials, workmanship, feeling, and association, the structure is currently vacant and inaccessible to the public. Although the suggestion has been made that the station had been moved some time in the past, research has not identified any other location than the one it currently occupies. The longer north façade appears to have been oriented toward the Cotton Belt tracks, at least for the last 50 years. This structure has been determined eligible for listing on the National Register of Historic Places for its association with the role of the railroad in the development of Carrollton. If the structure remains inaccessible to the public, its value to the community as an historic property is limited. While relocation of the structure would adversely affect the structure's integrity of location, the proposed relocation site would essentially maintain its setting, and association with the railroads so important to Carrollton's development. DART has agreed to rehabilitate the station in accordance with the Secretary of Interior's Standards for Rehabilitation. The proposed relocation site and rehabilitation of the structure would largely offset the adverse effect on the structure's integrity.

### *Mitigation*

DART has incorporated the following mitigation measures (not in order of importance) into a Memorandum of Agreement to insure that the adverse effects of the proposed project are minimized:

- 1) Relocation of the structure to a location and in an orientation that maintains the Depot's relationship with the Cotton Belt Railroad. The proposed location will be integrated into the overall Carrollton Square Station site plan, and the Depot will be visible and accessible to the public.
- 2) Rehabilitation of the structure consistent with the Secretary of the Interior's Standards Rehabilitation and applicable guidelines.
- 3) Continued maintenance of the structure while it remains in DART's ownership.
- 4) Consultation with the SHPO if the structure is transferred, sold, or leased to incorporate measures to insure the continued integrity of the structure.
- 5) Station design review by SHPO at the 30%, 65%, 95% and 100% intervals in the final design.
- 6) SHPO review of the proposed new site and orientation.
- 7) SHPO review of proposed treatment and protection if the depot is subsequently transferred to a new owner.

The incorporation of the above-listed mitigation measures would reduce adverse effects on the Carrollton Depot, but the FTA and SHPO have determined that there would still be an adverse effect on this property because of the change in setting created by the project.

### **5.13.3 Differences in Potential Impacts of the Other Alignments Considered**

The Harry Hines Base Alignment from Motor Street to Mockingbird Lane would have avoided impacts to the Morton Foods and Rusk Middle School sites. Medical Center Design Option alignments A, B, C, and D would have had the same effects on these properties as the Selected LRT Alternative (Base Alignment and Medical Center Design Option D). There are no differences in effects on historic properties between the Love Field Design Option and the Selected LRT Alternative.

## **5.14 ARCHEOLOGICAL RESOURCES**

### **5.14.1 Definition of Formal Finding of Effect**

A finding of no historic properties affected is appropriate when the agency has determined during the identification and evaluation step that there are no historic properties in the area of potential effects, or the agency has determined that there are historic properties present but the undertaking would not have any effect on them. [36CFR § 800.4(d)(1)]

An effect does not have to be negative to be an effect. If the undertaking would change the relevant characteristics of the property at all, it would have an effect. The potential alteration of the qualifying characteristics of a historic property does not have to be a certainty; as long as the undertaking may alter the relevant characteristics, it must be found to have an effect. Finally, the agency should consider not only the changes that may occur at the time of the undertaking, but also those reasonably foreseeable effects that may occur later.

### **5.14.2 Finding of Effect**

Archeological investigations conducted thus far have resulted in the recordation of one archeological site, site 41DL404. Site 41DL404 represents the remains of a domestic homestead that likely dates to the mid-twentieth century. Low artifact densities and a general lack of contextual integrity indicate that this site is not eligible for inclusion in the NRHP or for designation as a State Archeological Landmark (SAL).

Given that much of the proposed corridor crosses portions of the current or pre-1930 flood plains of the Elm Fork of the Trinity River or its tributaries, the potential for buried archeological deposits must be considered. Those portions of the corridor located within the current or pre-1930 flood plains of the Elm Fork of the Trinity or its tributaries or on fluvial terraces composed at least in part of terminal Pleistocene or younger sediments have potential for buried cultural materials. However, given the extensive disturbance of the upper 2 to 3 meters of the existing sediments and/or the deposition of considerable amounts of foreign material on top of the natural, preexisting surface, the chance for finding an undisturbed cultural site in the upper few meters of sediment is remote at best. Further, locating any sites that may be buried more deeply than several meters would be extremely difficult.

Railroad and highway construction, the construction of Bachman Lake and Love Field, commercial development, and numerous sand and gravel operations have destroyed any near-surface contexts for archeological deposits. Consequently, the potential for archeological sites in near-surface contexts with good contextual integrity is extremely limited within the proposed project corridor.

Given that there are no archeological sites present within the corridor that are considered eligible for inclusion in the NRHP, the proposed construction would result in no historic properties being affected. The same would be true for all other alignments considered but not selected. The extremely low potential for archeological sites with contextual integrity at the proposed locations of the stations, with the exception of the Carrollton Square Station, would also result in the determination of “no historic properties affected.” Given that the potential of the proposed location of the Carrollton Square Station to contain significant archeological deposits remains to be determined, additional investigations must be conducted once the locations are finalized and access is granted.

#### **5.14.3 Determination of Adverse Effect**

The present data indicate that no historic properties would be affected by the proposed construction; therefore, there is no potential for adverse effect. However, DART does not presently have access to, or ownership of, the property projected for the Carrollton Square Station. DART will conduct an archeological inventory of the proposed property for the Carrollton Square Station when right of access or ownership is accomplished.

#### **5.14.4 Mitigation Measures**

With the exception of the proposed Carrollton Square Station, there would be no need for mitigation measures. Once DART has access to, or ownership of, the property projected for the Carrollton Square Station, an archeological survey will be conducted and coordinated with the Texas SHPO. If potential historic properties are present, DART will develop and implement a plan for further assessment and mitigation in consultation with the Texas SHPO.

### **5.15 SECTION 4(f) EVALUATION**

Section 4(f) of the Department of Transportation Act of 1966, codified at 49 USC 303, declares that “[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that “[t]he Secretary [of Transportation] may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge or site) only if—

- (1) there is no prudent and feasible alternative to using that land; and
- (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

Section 4(f) further requires consultation with the Department of Interior and, as appropriate, the involved offices of the Department of Agriculture and the Department of Housing and Urban Development, and relevant state and local officials, in developing transportation projects and programs that use lands protected by Section 4(f).

The proposed project is a transportation facility that would receive federal funding through the Federal Transit Administration (FTA); therefore, documentation of compliance with Section 4(f) is required.

This Section 4(f) evaluation has been prepared in accordance with the FTA regulations for Section 4(f) compliance codified at 23 CFR 771.135 and the *Section 4(f) Policy Paper* (1989) issued by the U.S. Department of Transportation through the Federal Highway Administration (FHWA).

This section of the FEIS concludes with a discussion of Section 6(f) 3 of the Land and Water Conservation Fund Act and the Texas Parks and Wildlife Code, Chapter 26.

#### **5.15.1 Application of Section 4(f)**

As defined in 23 CFR 771.135(p), the “use” of a protected section 4(f) resource occurs when:

- (1) land is permanently incorporated into a transportation facility through partial or full acquisition (i.e., “direct use”);
- (2) there is a temporary occupancy of land that is adverse in terms of the preservationist purposes of Section 4(f) (i.e., “temporary use”); or
- (3) there is no permanent incorporation of land, but the proximity of a transportation facility results in impacts so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (i.e., “constructive use”).

#### **Direct Use**

A direct use of a Section 4(f) resource takes place when property is permanently incorporated into a proposed transportation project. This may occur as a result of partial or full acquisition of a fee simple interest, permanent easements, or temporary easements that exceed regulatory limits noted below (see 23 CFR 771.135(p)(7)).

#### **Temporary Use**

A temporary use of a Section 4(f) resource occurs when there is a temporary occupancy of property that is considered adverse in terms of the preservationist purposes of the Section 4(f) statute. The FHWA regulations detail the conditions under which a temporary occupancy of property does not constitute a use of a Section 4(f) resource. The following requirements must be satisfied: (1) the occupancy must be of temporary duration (i.e., shorter than the period of construction) and not involve a change in ownership of the property; (2) the scope of work must be minor, with only minimal changes to the protected resource; (3) there are no permanent adverse physical effects on the protected resource, nor will there be temporary or permanent interference with activities or purpose of the resource; (4) the property being used must be fully restored to a condition that is at least as good as that which existed prior to the proposed project; and (5) there must be documented agreement of the appropriate officials having jurisdiction over the resource regarding the foregoing requirements.

### Constructive Use

A constructive use of a Section 4(f) resource happens when a transportation project does not permanently incorporate land from the resource, but the proximity of the project results in impacts (e.g., noise, vibration, visual, access, and/or ecological impacts) so severe that the protected activities, features, or attributes that qualify the resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only if the protected activities, features, or attributes of the resource are substantially diminished. This determination is made through: (1) identification of the current activities, features, or attributes of the Section 4(f) resource that may be sensitive to proximity impacts; (2) analysis of the potential proximity impacts on the resource; and (3) consultation with the appropriate officials having jurisdiction over the resource. As outlined in 23 CFR 771.135(p)(4), a constructive use of a protected Section 4(f) resource occurs under any of the situations below:

- *The predicted noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource, where a quiet setting is generally a recognized attribute of the site's significance.*
- *The proximity of the proposed project substantially impairs the aesthetic features or attributes of a resource, where such features or attributes are considered important contributing elements to the value of the resource.*
- *The project results in a restriction on access which substantially diminishes the utility of a significant publicly-owned park, recreation area, or historic site.*
- *The vibration impact from operation of the project substantially impairs the use of a resource.*
- *The ecological intrusion of the project substantially diminishes the value of wildlife habitat in a wildlife or waterfowl refuge, or substantially interferes with the access to a wildlife or waterfowl refuge when such access is necessary for established wildlife migration or critical life cycle processes.*

The discussion below provides an analysis of public parks and recreation areas and historic sites pursuant to Section 4(f) requirements.

#### 5.15.2 Public Parks and Recreation Areas

A total of 12 publicly-owned parks and recreational areas protected by Section 4(f) are located in the vicinity of the proposed project. The application of Section 4(f) to these resources is described below.

#### Description of Public Parks and Recreation Areas

**Table 5-29** provides a list and descriptive characteristics of the public parks and recreation areas identified in the vicinity of the proposed project.

#### Impacts to Public Parks and Recreation Areas

The No-Build Alternative would largely consist of transit service improvements that would not likely result in any use - direct, temporary, or constructive - of any public parks and recreation areas. Any physical improvements that may occur would be constructed as part of planned and programmed improvements for which separate Section 4(f) evaluations would be prepared as necessary.

**TABLE 5-29**  
**SECTION 4(F) RESOURCES - PUBLIC PARKS AND RECREATION AREAS**

Map No.	Name	Type <sup>1</sup>	City/ Owner	Acres	Facilities
1	Dealey Plaza	Special	Dallas	3.10	Urban open space, historical site
2	Reverchon Park	Community	Dallas	41.26	Recreation center, picnic area, amphitheater, basketball, baseball
3	Weichsel Park	Community	Dallas	13.77	Picnic area
4	Bachman Lake Park	Regional	Dallas	205.50	Recreation center, picnic area, playground equipment, hike/bike trail, boating, boathouse
5	LB Houston Park – Nature Trail	Regional	Dallas	476.06	Hike/bike trails (hard surface and soft surface), picnic area
6	Farmers Branch Historical Park	Special	Farmers Branch	22.00	Historical park containing multiple historic buildings, none of which are located within Cultural Resources APE
7	Gussie Field - Watterworth Park	Neighborhood	Farmers Branch	12.00	Baseball, basketball, playground equipment, tennis, picnic area/grills, horseshoes, museum
8	Francis Perry Park	Neighborhood	Carrollton	3.67	Picnic area, playground equipment, tennis, and rental facility
9	Pioneer Park	Special	Carrollton	0.50	Historical site
10	Downtown Square Park	Special	Carrollton	0.52	Picnic area/gazebo
11	Ken Good Park	Community	Carrollton	20.00	Fishing, picnic area
12	Indian Creek Municipal Golf Course	Regional	Carrollton	415.00	36-hole golf course, clubhouse

<sup>1</sup> As classified by the city in which the park is located.

Source: Myra L. Frank & Associates, 2001

The potential effects of the Selected LRT Alternative on public parks and recreation areas in the Northwest Corridor study area are described below. **Table 5-30** summarizes the effects of the proposed project on public parks and recreation areas subject to Section 4(f). (Note: The application of Section 4 (f) to Dealey Plaza was evaluated as part of a Categorical Exclusion dated May 16, 2001, and is not repeated in this document.) A detailed discussion of the effects on each park follows the table.

The Harry Hines Base Alignment would have had no effect on Weichsel Park. All other alignments considered in the Draft EIS would have had the same effects as the Selected LRT Alternative.

**Direct Use**

None of the elements of the proposed project (i.e., trackwork, stations, parking, traction power substations, etc.) would permanently incorporate any portion of the 12 public parks and recreation areas in the vicinity. Thus, no direct use would result.

**Temporary Use**

As detailed in the construction scenario in Section 5.11, the construction staging and equipment laydown areas necessary to construct the proposed project are all expected to be accommodated

outside the limits of public parks and recreation areas. In addition, no temporary construction easements have been identified that would affect public parks and recreation areas. For these reasons, no temporary use would result.

**Constructive Use**

The potential effects of the proposed project that could result in a constructive use of public parks and recreation areas in the vicinity of the project are described below. For each affected resource, the potential effects are outlined with respect to the impact criteria defined in 23 CFR 771.135(p)(4) (i.e., visual, noise, vibration, and access impacts). This analysis includes those resources where the technical studies conducted for other portions of this document (i.e., noise/vibration, visual/aesthetics, and traffic) indicate that one or more potential proximity impacts are possible. Where the technical studies have documented that there are clearly no potential proximity impacts to certain Section 4(f) resources, then those resources have not been analyzed below. Five park resources had no proximity impacts. Those seven parks with potential proximity issues are discussed below.

<b>TABLE 5-30 EFFECTS ON SECTION 4(F) RESOURCES PUBLIC PARKS AND RECREATION AREAS</b>					
Map No.	Resource	Direct Use	Temporary Use	Constructive Use	Remarks
1	Dealey Plaza	No	No	No	See Categorical Exclusion approved May 16, 2001.
2	Reverchon Park	No	No	No	No proximity impacts identified.
3	Weichsel Park	No	No	No	No visual impacts result from proximity of elevated track.
4	Bachman Lake Park	No	No	No	No visual impacts result from proximity of elevated track.
5	L. B. Houston Park – Nature Trail	No	No	No	No visual impacts from elevated track.
6	Farmers Branch Historical Park	No	No	No	Nearby project elements have a low potential for significant visual impact for park users.
7	Gussie Field - Watterworth Park	No	No	No	No proximity impacts identified.
8	Francis Perry Park	No	No	No	No proximity impacts identified.
9	Pioneer Park	No	No	No	Nearby project elements have a low potential for significant visual impact for park users.
10	Downtown Square Park	No	No	No	Nearby project elements have a low potential for significant visual impact for park users.
11	Ken Good Park	No	No	No	Minor visual impacts from elevated track.
12	Indian Creek Municipal Golf Course	No	No	No	No proximity impacts identified.

Source: Myra L. Frank & Associates, 2002

Weichsel Park

*Visual* - The discussion of potential effects on visual and aesthetic resources in Section 5.6 indicates that a potentially significant impact may have resulted in the vicinity of the proposed DEIS Inwood Station location. Moving the station south of Inwood Road minimizes the impact potential.

This visual assessment unit includes the western portion of Weichsel Park located across Denton Drive and north of Rusk Middle School. The visual impact to the park would be created by the elevated track structures. Station elements and associated lighting would be located nearly 1,000 feet south of the park. This potentially significant visual impact has a low likelihood of resulting in a constructive use of a protected Section 4(f) resource. The portion of Weichsel Park in closest proximity to the project is generally not used for active park purposes and has a more urban, disturbed visual character than the remainder of the park. The active picnic area to the east, where the visual setting is less influenced by urban elements, is somewhat more distant and is shielded from the project by trees. The visual impacts of the project on this Section 4(f) resource are distant enough, and with intervening features, such that a constructive use would not occur.

*Noise/Vibration* – As noted in the analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

*Access* – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

#### Bachman Lake Park

*Visual* – The visual and aesthetic resources analysis in Section 5.6 states that no impact would result in the vicinity of Bachman Lake Park. However, because the track in this area would be elevated, it may create a change in the environment for park users. This would suggest the possibility of a constructive use of the Section 4(f) resource, since this park can be considered to derive some of its value from the relatively undisturbed greenspace in an area otherwise notable for its views of developed commercial and industrial sites. The changes in the visual environment are offset by a significant distance across the lake and the presence of intervening structures (e.g., water department facilities, power transmission lines, power transformers, the DART Northwest Bus Operating Facility, Dallas Solid Waste Transfer Facility, an active freight railroad, and an earthen dam) that would minimize the overall effect of the elevated LRT in the viewshed for most park users. Consequently a constructive use of this resource is not expected to occur.

*Noise/Vibration* - The noise analysis in Section 5.4 notes that the predicted noise level at Bachman Station, just north of Bachman Lake Park and the L. B. Houston Park – Nature Trail, would slightly exceed FTA impact criteria due to an at-grade crossing and crossover track for the future Irving/DFW line. Effects, if any, on the nearby parks are not likely, given the existing ambient noise conditions in this area, which include noise from overflights of jet aircraft at Dallas Love Field, auto and truck traffic on IH 35E and Northwest Highway, and existing freight rail service. Thus, the potential for a constructive use to occur is very low. In addition, the predicted noise level increase would likely be so negligible (i.e., 2dBA) as to be barely perceptible (see 23 CFR 771.135(p)(5)(iii)).

*Access* – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

#### L. B. Houston Park – Nature Trail

*Visual* - The visual and aesthetic resources analysis in Section 5.6 states that no impact would result in the vicinity of the L. B. Houston Park – Nature Trail. As with Bachman Lake Park, there is a possibility that the elevated track in this area may create a visual impact for park users. However, there is very little potential that such visual impacts would result in a constructive use of the Section 4(f) resource. Most park users would be in portions of the park west of Harry Hines Boulevard and IH 35E, at a distance that would be too great, and with too many intervening features, to perceive any adverse effects from the elevated LRT track.

*Noise/Vibration* – As noted above in the discussion of Bachman Lake Park, the noise analysis in Section 5.4 notes that the predicted noise level near the Bachman Station, just north of the L. B.

Houston Park – Nature Trail, would slightly exceed noise impact criteria. Similar to Bachman Lake Park, however, the existing ambient noise environment for park users is already characterized by other noise events. Additionally, the vast majority of the LB Houston Park – Nature Trail is even more distant from the proposed LRT alignment than Bachman Lake Park, with the IH 35E freeway located between the alignment and largest areas of the park. As a result, the likelihood of noise impacts creating a constructive use of this Section 4(f) resource is extremely low.

*Access* – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

#### Farmers Branch Historical Park

*Visual* - The visual and aesthetic resources analysis in Section 5.6 finds that the installation of proposed project elements in this area of mature vegetation and historic architecture could result in a potentially significant impact for park users. While this park has a high quality visual and aesthetic setting, there is a low potential for a constructive use to result from the visual intrusion of project elements, because the alignment will be at-grade within an existing railroad right-of-way. New vegetation and architecturally appropriate design features, as suggested in the visual and aesthetics analysis, would be sufficient to avoid or minimize such a constructive use of this protected Section 4(f) resource.

*Noise/Vibration* – As noted in the analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

*Access* – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

#### Pioneer Park

*Visual* - The visual and aesthetic resources analysis in Section 5.6 states that the visual impact in the area of downtown Carrollton would be potentially significant insofar as the installation of proposed project elements in this area of historic architecture could adversely affect the views experienced by visitors to city parks in the vicinity. This potentially significant visual impact results in a low potential for a constructive use of the nearby protected Section 4(f) resource, especially since the aesthetic quality of the area is currently defined by an active freight railroad and heavy traffic on nearby streets. The incorporation of new vegetation and architecturally appropriate design features, as suggested in the visual and aesthetics analysis, would be sufficient to avoid or minimize a constructive use of the protected resources.

*Noise/Vibration* – As detailed in the analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

*Access* – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

#### Downtown Square Park

Please see discussion of Pioneer Park above. Pioneer Park is just east of the alignment. Downtown Square Park is located west of the proposed project alignment and is separated from the alignment by existing development in the downtown Carrollton area. Thus, potential impacts to this 4(f) resource would be similar to, but less than those to Pioneer Park.

#### Ken Good Park

*Visual* - The visual and aesthetic resources analysis in Section 5.6 indicates no impact in the vicinity of Ken Good Park. This area would include a section of elevated track over Jackson Road, adjacent to the park. Because this park provides only minimal amenities (i.e., picnic area and

fishing), and appears to be patronized primarily by lunchtime visitors from neighboring light industrial facilities, the potential for a constructive use to result is very low. The views in this area are not an important contributing element to the value of this resource. Thus, no constructive use is anticipated.

*Noise* – As detailed in the noise analysis in Section 5.4, the predicted noise and vibration levels at this site would not exceed FTA impact criteria.

*Access* – The transportation analysis in Chapter 4 has not identified any street closures or other access disruptions that would affect this resource.

### **Avoidance Alternatives**

A discussion of the alternatives considered for the proposed project is provided in Chapter 2 of this document. Because no direct, temporary, or constructive uses of protected Section 4(f) park/recreation resources are anticipated, no additional avoidance alternatives have been considered.

### **Measures to Minimize Harm**

Although no constructive use of park/recreation uses is expected, it is anticipated that the provision of measures to minimize harm would be sufficient to further ensure that any potential for proximity impacts that could otherwise result in a constructive use of Section 4(f) park/recreation resources is minimized.

- Minimization Effort 1 – DART will utilize landscaping to provide buffers between LRT facilities, particularly those structures that are elevated above-grade, in order to avoid or minimize adverse effects on the visual and aesthetic qualities of protected Section 4(f) resources. This landscaping will be provided as necessary to avoid or minimize negative aesthetic effects on Farmers Branch Historical Park and Pioneer Park.
- Minimization Effort 2 - DART will utilize capped lights and/or similar light shielding devices at LRT facilities, particularly at those structures that are elevated above-grade, in order to avoid or minimize adverse effects on the visual and aesthetic qualities of protected Section 4(f) resources. These lighting features would have been provided at the DEIS Inwood Station location in order to avoid or minimize negative aesthetic effects on Weichsel Park. The FEIS station location minimizes this impact potential and no mitigation would be necessary.
- Minimization Effort 3 - DART will utilize architecturally appropriate designs for LRT facilities in order to avoid or minimize adverse effects on the visual and aesthetic qualities of protected Section 4(f) resources. These design features will be provided as necessary at LRT facilities adjacent to Weichsel Park, Farmers Branch Historical Park, and Pioneer Park in order to avoid or minimize negative aesthetic effects on those resources.

### **Consultation and Coordination**

The project development process has included consultation with the following parties with regulatory authority over the Section 4(f) resources in the Northwest Corridor study area: Texas State Historic Preservation Officer, City of Dallas Parks Board, City of Dallas Landmark Commission, City of Dallas Urban Design Advisory Commission, Preservation Dallas, City of Farmers Branch, and City of Carrollton. Additional consultation is expected through the final design and engineering phase of the project development process.

### **Determination**

FTA has determined that there is no direct, temporary, or constructive use of Section 4(f) park/recreation uses. Even without any Section 4(f) use, consultation and coordination with local

park and recreation officials has ensured that all possible planning has been undertaken to minimize harm to public parks and recreation areas in the vicinity of the proposed Northwest Corridor LRT Line to Farmers Branch and Carrollton.

### 5.15.3 Historic Sites

A total of 15 significant historic sites protected by Section 4(f) are located in the Area of Potential Effects (APE) for the proposed project. Based upon the analysis of historic sites prepared in compliance with the requirements of Section 106 of the National Historic Preservation Act and 36 CFR Part 800 for proximity impacts of the proposed project, there has been a determination of “no effect” for eight significant historic sites, a determination of “no adverse effect” for four significant historic sites, and a determination of “adverse effect” for three properties. Of the three properties for which a finding of adverse effect is made, the Carrollton Depot would be directly affected because it would need to be relocated to accommodate the project. Club Schmitz would be adversely affected by the constructive use of the project. The third adverse effect associated with this project is the demolition of the Continental Avenue Bridge, which was previously addressed in a Memorandum of Agreement, dated June 2002. In accordance with 23CFR 771(p)(5)(i), there is no constructive use for the 12 historic sites for which a determination of no effect or no adverse effect has been made.

The application of Section 4(f) to these resources is described below.

#### Description of Historic Sites

**Table 5-31** provides a list and descriptive characteristics of the 15 significant historic sites identified in the vicinity of the proposed project.

#### Impacts to Historic Sites

The No-Build Alternative would largely consist of transit service improvements that would not likely result in any use - direct, temporary, or constructive - of any significant historic sites. Any physical improvements that may occur would be constructed as part of planned and programmed improvements for which separate Section 4(f) evaluations would be prepared as necessary.

#### Direct Use

##### Carrollton Crossing Depot

The proposed project would permanently incorporate all of this significant historic site. This site is discussed below.

##### *Description and Significance of the Section 4(f) Historic Resource*

A description of the Carrollton Crossing Depot is provided in Section 3.8 and is summarized above in **Table 5-31**.

The Selected LRT Alternative would result in direct use of one historic resource (Carrollton Crossing Depot), the temporary use of one historic resource (Old Morton Food Headquarters), and the constructive use of another historic site (Club Schmitz). **Table 5-32** summarizes the effects of the proposed project on significant historic sites subject to Section 4(f). The last column of the table, Remarks, reports the Section 106 Effect Determinations for information purposes. *(Note: The application of Section 4(f) to Dealey Plaza and the West End Historic District was evaluated as part of a Categorical Exclusion dated May 16, 2001, and is not repeated in this document. The application of Section 4(f) to the Continental Avenue Bridge has also been assessed as part of a separate environmental process, and is not repeated here).*

**TABLE 5-31  
DESCRIPTION OF SECTION 4(f) RESOURCES  
SIGNIFICANT HISTORIC SITES**

Map No.*	Name	Location	Significance
1	Dealey Plaza	Roughly bounded by Pacific Avenue, Market and Jackson Streets, and right-of-way of Dallas Right-of-Way Management Company	Listed: 04/19/1993 Listed also as National Historical Landmark
2	West End Historic District	Bounded by Lamar, Griffin, Wood, Market and Commerce Streets	Listed: 11/14/1978
3	Magnolia Petroleum Company City Sales and Warehouse	1607 Lyte Street	Listed: 12/23/1994
4	Continental Avenue Bridge/Lamar-McKinney Underpass	Continental Avenue	Local, state and federal significance. Contributing element of a discontinuous district associated with the Trinity River flood control measures from the 1930's.
5	Turtle Creek Pump Station	3630 Harry Hines Boulevard	Listed: 02/09/2001
6	Old Morton Food Headquarters	6333 Denton Drive	Local significance. Good example of 1950's industrial architecture.
7	T. J. Rusk Middle School	2929 Inwood Road	Local, state significance, Good example of 1920's public school architecture.
8	Obadiah Knight School	2615 Anson Road	Local, state and federal significance. Good example of 1920's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
9	Water Department Purification Plant	2605 Shorecrest Drive	Local, state and federal significance. Good example of 1920's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
10	Water Department Pumping Station	2525 Shorecrest Drive	Local, state and federal significance. Good example of 1920's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
11	Bachman Electric General Station	9500 Denton Drive	Local, state and federal significance. Good example of 1930's utilities construction. Exemplifies the usage of the railroad corridor as a utility corridor.
12	Club Schmitz	9911 Denton Drive	Identified as locally significance community resource. One of the few remaining 1930's commercial structures along the railroad corridor. Commercial variation of Art Deco/Moderne style.
13	Bingo Theater/Circle Theater	2711 Storey Lane	Local, state significance. Good example of the late Moderne movie house architecture.
14	Letot School	2727 Lombardy Lane	Identified as a locally significant educational resource.
15	Carrollton Crossing Depot	1020 N. Broadway Street and MKT tracks	Local, state and federal significance. The depot, which once served the three railroads in Carrollton, exemplifies the prominence of the railroad in the growth of the area.

\* Refers to **Figures 3-26 through 3-28** (Chapter 3).

Source: Myra L. Frank & Associates, October 2002.

**TABLE 5-32  
EFFECTS ON HISTORIC SITES**

Map No.*	Resource	Direct Use	Temporary Use	Constructive Use	Remarks
1	Dealey Plaza	No	No	No	No effect - See also Categorical Exclusion approved May 16, 2001.
2	West End Historic District	No	No	No	No effect - See Categorical Exclusion approved May 16, 2001.
3	Magnolia Petroleum Company City Sales and Warehouse	No	No	No	No effect
4	Continental Avenue Bridge/ Lamar-McKinney Underpass	No	No	No	Adverse effect. MOA signed June 2002. Photo and documentation done; SHPO concurrence Aug., 13, 2002.
5	Turtle Creek Pump Station	No	No	No	No effect
6	Old Morton Food Headquarters	No	Yes	No	No adverse effect
7	T.J. Rusk Middle School	No	No	No	No adverse effect
8	Obadiah Knight School	No	No	No	No effect
9	Water Department Purification Plant	No	No	No	No effect
10	Water Department Pumping Station	No	No	No	No effect
11	Bachman Electric Gen. Station	No	No	No	No effect
12	Club Schmitz	No	No	Yes	Adverse effect
13	Bingo Theater/ Circle Theater	No	No	No	No adverse effect
14	Letot School	No	No	No	No adverse effect
15	Carrollton Crossing Depot	Yes	No	No	Adverse effect

\* Refers to **Figures 3-26 through 3-28** (Chapter 3).  
Source: Myra L. Frank & Associates, October 2002.

**Application of Section 4(f) Criteria for Use**

The proposed project would involve the construction of the Carrollton Square Station on the site that the historic Carrollton Depot currently occupies. The station would be an aerial facility crossing over much of the existing Depot, constituting a direct use of this Section 4(f) resource. The Depot would be relocated within, and incorporated into the design of, the new station area. Relocation would adversely affect the integrity of location of the structure. Though consultation with historic preservation officials has suggested that the Depot may have been moved in the past, no evidence can be found to suggest any prior relocation. Tempering the adverse effects of relocating the Depot is the fact that it is presently vacant and inaccessible to the public. It would be moved in such a way that it could be reused and better appreciated by the public as part of the proposed new Carrollton Square Station.

**Avoidance Alternatives**

An alternative that shifts the aerial guideway to the west would substantially reduce or eliminate the adverse effects on the Depot. By doing this, however, it is very likely that a large number of other

commercial structures in Old Downtown Carrollton would be displaced. Such an alignment would also have some potential to interfere with, or even eliminate use of, Broadway Street. As a result, this alternative is not considered to be feasible or prudent.

#### *Measures to Minimize Harm*

DART has agreed to relocate and rehabilitate the Carrollton Depot as part of the Carrollton Square Station. Relocation and rehabilitation would be in accordance with the Secretary of Interior's Standards for Rehabilitation. Two relocation concepts have been studied, with the current proposal being a new location for the Depot along the Cotton Belt tracks to the north, about 380 feet east of its current location. This site maintains the relationship of the Depot to the Cotton Belt tracks and the railroad switching yard to the east. Relocation to this site would also make the Depot more visible and accessible to the public, arguably increasing its value as an historic resource. DART has also agreed to the following additional measures to minimize harm to the Depot: (1) continued maintenance of the facility while it remains in DART's ownership; (2) consultation with the SHPO if the structure is transferred, sold, or leased in order to incorporate measures that will ensure the continued integrity of the structure; and (3) station design review by the SHPO at the 30, 65, 95, and 100 percent intervals in the final design.

#### *Consultation and Coordination*

DART staff and the project consultants met with SHPO staff on July 24, 2002 to discuss the effects of the proposed project on this site and the potential means available to minimize adverse impacts. The SHPO, in a letter dated September 26, 2002 has concurred in the determination of "adverse effect" for Carrollton Depot and the measures proposed to minimize harm to this historic resource.

#### *Determination*

The FTA, in consultation with the SHPO, has determined that there is no feasible or prudent alternative to the direct use of Carrollton Depot by the proposed project. All efforts to minimize harm have been taken, including a relocation and rehabilitation plan that meets the Secretary of Interior's Standards for Rehabilitation.

### **Temporary Use**

#### Old Morton Food Headquarters

As detailed in the construction scenario in Section 5.12, the construction staging and equipment laydown areas necessary to construct the proposed project are all expected to be accommodated outside the limits of significant historic sites. It is possible, however, that a temporary construction easement may be necessary at the Old Morton Food Headquarters site in the parking lot along Denton Drive. The easement would be acquired in order to permit construction of a tunnel entry and associated U-walls. The easement will be up to 480 feet long and 10-15 feet wide. Aside from a temporary displacement of approximately 10 parking spaces, the easement would not otherwise interfere with other activities at this site on either a temporary or permanent basis. The easement will be needed for up to 18 months during construction. A change in the legal ownership of the easement land would not occur. When construction is completed, DART will restore the parking lot to its pre-construction condition. The Harry Hines Base alignment would have avoided this possible temporary use of this historic resource.

### **Constructive Use**

#### Club Schmitz

##### *Description and Significance of the Section 4(f) Historic Resource*

A description of this site is provided in Section 3.8 and is summarized above in **Table 5-31**.

##### *Application of Section 4(f) Criteria for Use*

The proposed project will not remove, alter, or otherwise physically damage the Club Schmitz building. The project will, however, result in several proximity impacts to the property. First, the

project will require that a 24 foot high aerial LRT guideway be located about 32 feet from Club Schmitz. Second, a guideway column will be placed in a public right-of-way that is not owned by Club Schmitz, but is utilized informally by its patrons for parking. About two parking spaces would be lost. Third, the project would involve the permanent closure of Cullum Road at its intersection with Denton Drive, with a cul-de-sac remaining. Cullum Road presently provides access to the north side of Club Schmitz.

The most substantial effect on this property from the changes described above would be the alteration of the exterior visual and aesthetic setting of the Club Schmitz building. The proposed aerial guideway would partially obstruct views of this building, primarily from Denton Drive. This effect is offset to some extent by the fact that the activities associated with this building are essentially inward-directed as a nightclub and lounge.

The loss of about two parking spaces would not substantially impair access to Club Schmitz. These spaces are located on public property. More importantly, the remaining parking spaces, whether on public land or actually owned by Club Schmitz, will be sufficient to permit continued operation of this business.

Closure of Cullum Drive at Denton Drive would impair, but not eliminate, access to Club Schmitz. Patrons will be able to access Club Schmitz from Webb Chapel and Harry Hines Boulevard, as well as from Cullum Drive via Harry Hines.

#### *Avoidance Alternatives*

An alignment shifted to the east (perhaps on the east side of Denton Drive) would likely eliminate or substantially reduce the visual quality and access impacts of the project as proposed. In fact, DART considered several alternatives in this area as part of the planning process for the nearby Bachman Station (see Section 5.16.4). Two aerial alternatives on the east side of Denton Drive were considered and rejected because: (1) they would displace a large number of apartment buildings, most of which are occupied by minority and/or low-income residents; (2) they would not have satisfied freight separation requirements due to right-of-way constraints; and (3) they would have introduced a large, complex, and costly aerial structure in order to allow future connections to the proposed Irving/DFW corridor. For these reasons, these alternatives can be considered neither feasible nor prudent.

#### *Measures to Minimize Harm*

DART has taken steps in the planning process to minimize harm to Club Schmitz from the proposed project. Project engineers redesigned the aerial guideway by moving retaining walls about 200 feet further to the north and continuing the structure as a bridge north of Cullum Road, thereby improving the visibility of Club Schmitz from Denton Drive. DART has also committed to working with Club Schmitz to provide additional signage in this area, should it be desired to minimize the visual and access impacts of the proposed project.

#### *Consultation and Coordination*

DART staff and the project consultants met with SHPO staff on July 24, 2002 to discuss the effects of the proposed project on this site and the potential means available to minimize adverse impacts. The SHPO, in a letter dated September 26, 2002, has concurred in the determination of "adverse effect" for Club Schmitz and the measures proposed to minimize harm to this historic resource.

#### *Determination*

The FTA, in consultation with the SHPO, has determined that there is no feasible or prudent alternative to the constructive use of Club Schmitz by the proposed project. All efforts to minimize harm have been taken, including the design of the aerial guideway and a commitment to work with the proprietors of the site to provide additional signage.

#### 5.15.4 Section 6(f)(3) Considerations

Section 6(f)(3) of the Land and Water Conservation Fund Act (LWCF Act) (16 USC 460I-4) contains strong provisions to protect federal investments in park and recreation resources and the quality of those assisted resources. The law is firm but flexible. It recognizes the likelihood that changes in land use or development may make some assisted areas obsolete over time, particularly in rapidly changing urban areas. At the same time, the law discourages casual "discards" of park and recreation facilities by ensuring that changes or "conversions from recreation use" will bear a cost - a cost that assures taxpayers that investments in the "national recreation estate" will not be squandered. The LWCF Act contains a clear provision to protect grant-assisted areas from conversions:

*SEC. 6(f)(3) - No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.*

This "anti-conversion" requirement applies to all parks and other sites that have been the subject of LWCF grants of any type, whether for acquisition of parkland, development or rehabilitation of facilities. Since there is no parkland being acquired for this project, no LWCF funded property would be affected.

#### 5.15.5 Texas Parks and Wildlife Code, Chapter 26

Chapter 26 of the Texas Parks and Wildlife Code was established to protect parks, recreation and scientific areas, wildlife refuges, and historic sites from being used or taken by state or local agencies for public projects. Chapter 26 is similar to Section 4(f) of the Department of Transportation Act of 1966 in its requirements, except that the Texas law requires a public hearing on any use or taking of protected land.

Because the project will require relocation of the Carrollton Depot, the provisions of Chapter 26 would be triggered. The discussion above outlines the reasons why there is no prudent or feasible alternative to the use of the site on which the Depot is currently located and identified the planning to minimize harm that has been incorporated into the project.

### 5.16 ENVIRONMENTAL JUSTICE

This section analyzes potential environmental justice concerns of the Selected LRT Alternative to determine if there are low-income or minority populations who would suffer disproportional high and adverse impacts.

#### 5.16.1 Overview

Executive Order 12898, "Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations" was signed in February 1994. It requires Federal agencies to ensure that disproportionately high and adverse human health or environmental effects of proposed Federal projects on minority and low-income communities are identified and addressed. The general principles required under EO 12898 are as follows:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

In addition to complying with the Executive Order, the Department of Transportation is committed to Title VI of the Civil Rights Act, which provides that no person in the United States shall, on the grounds of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance.

### 5.16.2 Public Participation

Throughout the Draft EIS, PE/EIS and prior planning phases, DART has made every effort to notify affected residents, business owners and stakeholders in the project corridor. Special efforts were made to notify and inform the low-income, Hispanic and predominantly minority areas along the corridor.

Five rounds of general public meetings (December 2000, March 2001, September 2001, December 2001, April 2002), and a special public meeting to discuss the Medical Center Design Options (August 2001) were held in the corridor. Each round of public meetings included a meeting in Dallas, and a meeting in the Farmers Branch/Carrollton area. During July 2002, DART conducted three Draft EIS public hearings throughout the corridor to receive verbal comments on the proposed project and DART Service Plan amendments. One of the hearings was held at the Bachman Recreation Center – located in an identified EJ census tract (72.01). In addition to these meetings and hearings, DART made the Draft EIS available to members of the community and organizations for review and comment during a 45-day review period (June 14 through July 30, 2002). Given low participation from Hispanic community members, DART held a special meeting conducted in Spanish on August 22, 2002 at Saldivar Elementary School in the Bachman area. However, attendance was very limited. Due to project changes and refinements in the Medical Center area after the DEIS public hearings, DART held an additional public meeting (April 3, 2003) and a formal public hearing (April 10, 2003) to obtain public comment prior to publishing this Final EIS. Both of these meetings were held in identified Environmental Justice Census Tract 4.01. Several additional meetings and briefings were held and are documented in Chapter 6.

Several outreach methods were used to notice the above meetings, including:

- 60,000 to 75,000 brochures were printed and distributed for each meeting. All brochures included information for Spanish-speaking individuals so they could contact a DART representative for more information.
- Brochures (for the December 2001, April 2002 and July 2002 meetings) were printed in both Spanish and English. Those brochures were used for special door-hangings at the Willow Wood apartments (proposed to be acquired and displaced for the Bachman Station), and sections of the Love Field West neighborhood. Both locations have a high concentration of Hispanic residents. A door hanging in the Arlington Park Heights neighborhood (largely African-American) was also done for the December 2001 meeting.
- Brochures were also placed on corridor bus routes, area transit centers (via windshield distribution), and on LRT and TRE trains. Direct mailings to households and businesses within 600 feet of the alignment was also done. City staff and elected representatives were also provided brochures for their distribution.
- Notices on the DART web-site.

- Meeting notifications were printed in several papers, including the Spanish newspaper, *El Extra*, which has the widest circulation in the area, *Dallas Morning News*, and the *Korea News*. *Korea News* did an article on the project for their readers.
- Outreach through the Community Work Group, which includes minority Chambers of Commerce, including the Hispanic Chamber of Commerce, on the mailing list. However, participation from Chambers was limited.

In general all comments received at public meetings and neighborhood briefings were positive and support the project. In particular, the Bachman community supports the location of the Bachman Station despite the proposed displacement of the Willow Wood apartments. Many area residents view the apartments as old, substandard, and in disrepair; no apartment residents attended the meetings. However, some agencies, neighborhoods and residents representing low-income and minority interests had specific concerns related to the project, including:

- Some low-income, transit-dependent persons stated their opposition to the Medical Center Design Options at the August 2001 meeting, and prefer the Harry Hines Base Alignment as it has more direct service to hospitals and clinics in the Medical Center district.
- A briefing to members of the Love Field West Homeowners Association was held in August 2001. Residents indicated their concerns related to safety (train speed) and traffic (opposition to proposed street closures to minimize the number of at-grade crossings) should the Base Alignment along Denton Drive near Dallas Love Field be implemented. The Love Field Design Option would have potentially avoided these impacts.
- A briefing to the Arlington Park Heights community was held in September 2001. Some residents stated their support for the Harry Hines Base Alignment through the Medical Center area, stating it provides better access to medical facilities for the general community. Subsequent coordination between DART, the hospitals, and Arlington Park community members resulted in that community's support for the Medical Center Design Option D, particularly as it relates to UTSW's commitment to provide shuttle service to hospitals and adjacent neighborhoods from the Parkland LRT station. UTSW will continue to coordinate with Arlington Park regarding service to this community under the Selected LRT Alternative.
- A letter received from DISD on December 5, 2001 stated their opposition to the Medical Center Design Options as they pass adjacent to Hernandez Elementary School. About 700 of the school's students live east of the alignment and would have to cross the LRT tracks at-grade at Maple Avenue, viewed as a severe safety hazard by DISD. The residential areas to the east are predominantly Hispanic and in the area known as Little Mexico along Maple Avenue. DISD supports the Harry Hines Base Alignment through the Medical Center area, as it does not divide attendance zones. While the DEIS reflected an at-grade crossing of Maple Avenue, updated traffic analysis indicate a grade separation is necessary. This will minimize any safety issues associated with the Selected LRT Alignment. Safety and Security and proposed mitigation measures are discussed in Section 5.11.2.

DART also held tours as requested for minority groups. At the request of Korea News and area Chambers of Commerce, DART held a tour of the LRT Starter System for approximately 125 interested Asian Americans so they could get a first-hand look at what the proposed project would bring to their community. The Asian community has a significant business interest in the area surrounding the proposed Royal Lane Station and supports the project.

To supplement the above efforts, DART plans to use a special outreach service that targets Spanish-speaking households for future meeting notices and education efforts. This would ensure

that those populations are kept informed during final design and construction as the project design progresses and mitigation measures are finalized and implemented.

### 5.16.3 Impact Assessment Methodology

The environmental justice analysis in this document follows guidance provided by the Office of Federal Activities, “Final Guidance for Incorporating Environmental Justice Concerns in EPA’s NEPA Compliance Analyses” dated April 1998, as well as guidance provided by other FHWA, FTA, EPA and CEQ publications. The analysis identifies minority and low-income populations within the project corridor Study Area and the potential adverse impacts to these populations if the LRT Build Alternative were implemented. The Study Area is defined as a one-mile cross-section centered on the LRT alignment that stretches the length of the project. If adverse impacts of the LRT project fall disproportionately on minority and low-income populations, mitigation measures or alternatives are identified (where possible).

For this evaluation, definitions of minority and low-income areas were established based on guidance provided by the Office of Federal Activities publication. The guidance states that, “...a minority population may be present if the minority population percentage of the affected area is “meaningfully greater” than the minority population percentage in the general population or other “appropriate unit of geographic analysis”. A minority population is also present if the numeric measure is over 50 percent of the affected area. For low income population the guidance states that, “...low income populations in an affected area... should be identified with the annual statistical poverty thresholds from the Bureau of Census’ Current Population Reports, Series P-60 on Income and Poverty.” The reports state that the use of national decennial census data in depicting the low-income/poverty and minority statistics is one of the most prevalent methods used to define affected communities. For this analysis, Dallas County is used as the geographic unit of comparison.

The environmental justice analysis in this document utilizes U.S. 1990 Census data to identify high minority and/or low-income/poverty populations located within the Study Area. The 2000 Census data was examined but not used in this analysis due to the fact that income and poverty data was not yet available at the tract level. However, demographic changes between 1990 and 2000 were assessed for the Study Area (population, Hispanic origin and ethnicity) and are noted where pertinent to the analysis.

A Geographic Information Systems (GIS) analysis was used to determine a census tracts’ population residing within the Study Area. The percentage of land area lying within the Study Area was calculated and that portion of the population was allocated to the Study Area population. Before this allocation was made, aerial photographs of the census tract’s land use were examined to evaluate population distribution across each tract (such as location of housing, apartments, etc.).

Potential adverse impacts of the proposed project were identified and a GIS analysis was used to identify where these impacts affect minority and low-income populations. Possible alternatives and/or mitigation measures to avoid and mitigate disproportionate and adverse environmental impacts on affected populations were identified and assessed for feasibility. Potential benefits of the proposed LRT project on the affected populations were also identified.

### 5.16.4 Impact Assessment

Dallas County had a population of 1,852,810 in 1990 according to the 1990 U.S. Census. Approximately 33% of the population was minority, 17% Hispanic and 13% had incomes below poverty level. (The Minority category includes individuals identified as belonging to a racial category other than white. Hispanic refers to individuals of Hispanic origin, which includes all racial categories.)

**Areas With High Minority, Hispanic and Low-Income Populations**

**Table 5-33** outlines demographic data for Dallas County, the Study Area and the census tracts within the Study Area. (As noted above, this usually does not represent the entire census tract, but only that portion found within the Study Area boundaries.)

<b>TABLE 5-33 ENVIRONMENTAL JUSTICE EVALUATION OF CENSUS TRACTS IN PROJECT CORRIDOR</b>				
	<b>Total Population</b>	<b>Percent Minority</b>	<b>Percent Hispanic</b>	<b>Percent Below Poverty</b>
<b>Dallas County</b>	1,852,810	33%	17%	13%
<b>Study Area</b>	40,692	46%	41%	20%
<b>Study Area by Census Tracts <sup>1</sup></b>				
4.01 <sup>2</sup>	3,743	77%	76%	40%
4.03	4,874	53%	76%	25%
4.04 <sup>2</sup>	205	41%	42%	30%
4.05	475	80%	33%	52%
5 <sup>2</sup>	2,442	30%	40%	34%
6.01	132	51%	50%	25%
17.02	47	46%	10%	17%
18	477	15%	13%	11%
19 <sup>2</sup>	830	73%	30%	55%
21	0	0%	0%	0%
31.01	862	65%	7%	0%
32.01	0	64%	7%	75%
71.02	346	77%	10%	15%
72.01	4,460	62%	53%	26%
72.02	400	63%	48%	20%
96.05	0	0%	0%	0%
96.06	876	32%	34%	12%
97.01	1,069	20%	26%	4%
98.01	4,489	53%	43%	17%
99	279	52%	27%	24%
100	2,188	68%	9%	9%
137.02	4,195	32%	30%	13%
137.07	4,265	23%	21%	9%
137.08	0	0%	0%	0%
139	2,372	18%	21%	4%
140.01	1,668	16%	14%	6%
140.02	0	0%	0%	0%
141.01	0	0%	0%	0%
141.08	0	0%	0%	0%
216.01	0	0%	0%	0%
216.03	0	0%	0%	0%
217.1	0	0%	0%	0%

Note: Shaded areas represent tracts with high concentrations of minority, Hispanic or low-income populations.  
<sup>1</sup> Only the population within the census tract that resides in the Study Area  
<sup>2</sup> Census Tracts within a State Empowerment Zone or Enterprise Community

Source: Renee Perkins Jaynes; U.S. Census Bureau 1990 Data; January 2002

For this analysis, a “meaningfully greater” percentage has been defined as a percentage twice as high as the Dallas County percentage for low-income, minority and Hispanic. Also in adherence to the guidelines, high minority and Hispanic areas also include those tracts where over 50 percent of the tract was minority or Hispanic. The shaded areas on **Table 5-33** represent tracts with high concentrations of minority, Hispanic or low-income populations. For the Hispanic category, this represents tracts with a percentage of 34% or higher Hispanic and for the poverty category this represents tracts with a percentage of 26% or higher. (These thresholds are twice the County percentages therefore “meaningfully greater”.) For minority, the threshold was set at 50% in compliance with Federal guidelines.

**Table 5-34** below outlines the tracts that were examined for adverse impacts.

<b>TABLE 5-34 ENVIRONMENTAL JUSTICE CENSUS TRACTS WITH HIGH POVERTY, MINORITY OR HISPANIC POPULATIONS</b>				
Census Tract	Total Population	Percent Minority	Percent Hispanic	Percent Below Poverty
4.01	3743	77%	76%	40%
4.03	4874	53%	76%	25%
4.04	205	41%	42%	30%
4.05	475	80%	33%	52%
5	2442	30%	40%	34%
6.01	132	51%	50%	25%
19	830	73%	30%	55%
31.01	862	65%	7%	0%
32.01	0	64%	7%	75%
71.02	346	77%	10%	15%
72.01	4460	62%	53%	26%
72.02	400	63%	48%	20%
96.06	876	32%	34%	12%
98.01	4489	53%	43%	17%
99	279	52%	27%	24%
100	2188	68%	9%	9%

Note: Shaded areas represent tracts with high concentrations of minority, Hispanic or low-income populations.

Source: Renee Perkins Jaynes; U.S. Census Bureau 1990 Data; January 2002

The Study Area has a high percentage of Hispanics – approximately 41% of the residents. An analysis of the 2000 Census data for the Study Area reveals that the corridor has increased its Hispanic population during the last decade. Some census tracts had an increase of 76% or higher. **Figure 5-5** depicts the location of the census tracts that qualified as having a high percentage of minority, Hispanic or low-income populations. Thirteen of the tracts have a high percentage of minority persons, nine a high percentage of Hispanics and seven have a high percentage of persons below poverty level. Four of the tracts are located in a State of Texas designated Empowerment Zone or Enterprise Community.

**Impacts on High Minority and Low Income Areas**

All census tracts within the Study Area were analyzed for impacts related to the Selected LRT Alternative and the other alternatives considered. In order to analyze the impacts from an environmental justice perspective, five key impact categories were assessed in each tract with greater than average minority, Hispanic or low income populations: acquisitions and displacements, land use and economics, visual, safety and security, and traffic and circulation. Environmental justice impacts were identified where an environmental impact in that tract was adverse compared to the impacts in the other census tracts and the Study Area as a whole.



**FIGURE 5-5** Environmental Justice Analysis by Census Tract

An examination of the sixteen census tracts with high minority, Hispanic or low-income populations concludes that adverse impacts from the Selected LRT Alternative could potentially occur in four census tracts: 4.01, 4.03, 4.04 and 72.01. A brief description of these areas and a discussion of the possible adverse impacts are outlined below. Mitigation measures for these impacts were identified during the Draft EIS. DART's commitment to specific mitigation measures is addressed for each impact identified. **Table 5-35** summarizes the type of impact attributable to the Selected LRT Alternative for each of the four census tracts.

Impacts to Census Tract 4.01

This tract is generally bounded by Inwood Road, the Dallas North Tollway, Harry Hines Boulevard and Maple Avenue. Most of the residential areas within this tract are located in the southern portion of the tract in the Oak Lawn and Little Mexico neighborhoods. Area residents met all three of the environmental justice criteria (higher than average percentage Hispanic, low income and minority populations). Residents located adjacent to the Market Center/Oak Lawn Station would be adversely impacted by the Selected LRT Alternative .

<b>TABLE 5-35 ADVERSE IMPACTS WITHIN CENSUS TRACTS WITH HIGH POVERTY, MINORITY OR HISPANIC POPULATIONS</b>				
<b>Category</b>	<b>High Minority and Low-Income Census Tracts</b>			
	<b>4.01</b>	<b>4.03</b>	<b>4.04</b>	<b>72.01</b>
<b>Acquisitions &amp; Displacements</b>	Yes	Yes	Yes	Yes
<b>Land Use &amp; Economics</b>	Yes	No	No	Yes
<b>Visual</b>	Yes	No	Yes	Yes
<b>Noise/Vibration</b>	No	No	No	No
<b>Safety &amp; Security</b>	Yes	No	No	No
<b>Traffic &amp; Circulation</b>	Yes	No	Yes	No

Source: SR Beard & Associates; Renee Perkins Jaynes; January 2002

Parking for the Market Center/Oak Lawn Station would be directly adjacent to single-family homes and would have access off of Vagas, a residential street; the primary entrance would be on Wycliff. The parking would displace residential and non-residential uses and would create visual, traffic and safety issues for the adjacent residential structures.

During the Draft EIS, several other options were considered for the parking. The first site plan proposed parking north of the current site, between Wycliff Avenue and Hondo Street. This plan located a surface lot on 3.5 acres that would have displaced eight residential structures (ten households) and one motel. To reduce the number of residential displacements, an alternative plan was proposed at this location – a three-level parking garage that required 2.0 acres of property. This avoided four residential displacements including a recently constructed home at 2206 Hondo. This option still had traffic, visual and safety impacts on Hondo, a residential street.

The Selected LRT Alternative shifts the platform for this station south by approximately 400 feet to locate the alignment within DART-owned UPRR ROW. This change made it necessary to shift the parking lot for the Market Center/Oak Lawn Station south of Wycliff. The number of displacements is similar to the parking garage option – four single-family residential structures and two motels. This option minimizes the safety impacts of a parking garage, although some visual impacts remain to adjacent residential properties. There would also be traffic impacts to Vagas, which is a narrow residential street. The traffic impacts on Vagas would be significant. Approximately 120 to 200 trips per day could cut through on this street, translating into 50 to 75 trips cutting through the

neighborhood during peak hour, possibly more than one car per minute. In addition to the traffic, this creates safety issues along this street for pedestrians and bicycles.

Mitigation of these impacts will be determined during final design of the project in coordination with the City of Dallas, adjacent property owners, and residents. For the visual impacts, features reflective of a residential setting will be incorporated into the parking lot design, 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 views. All mitigation will conform to DART Rail Design Criteria, Chapter 19.2 (Landscaping) and 26 (Lighting). Further analysis of access to the parking garage and localized effects on neighborhood traffic, including safety, will be done during final design to reduce or minimize traffic impact.

#### Impacts to Census Tract 4.03

This tract is bounded by Webb Chapel Extension/Northwest Highway, Inwood Road, Harry Hines, and Lemmon Avenue and lies just north of tract 4.01. It contains the Love Field West neighborhood, the Dallas Love Field airport, the Mockingbird commercial corridor and part of the Inwood commercial corridor. The primary residential areas are located west of Dallas Love Field; however there are a few small pockets of residential uses north of Inwood Road. In 1990, the tract was 76% Hispanic and 53% minority (low income was 25%, just below the 26% threshold). By the 2000 Census, it had changed to 40% minority and 89% Hispanic.

The only impact in this tract is a vibration impact at 2727 Kimsey from the LRT alignment. The impact would be mitigated by the acquisition of this residence. This would displace one single-family household. Residents also suggested incorporation of a pathway for children to get to Rusk Middle School since the alignment will be descending to grade and will block access. Such access will be explored during final design.

#### Impacts to Census Tract 4.04

This tract, bounded by Inwood Road, Kings Road, Maple Avenue, and Cedar Springs, is just east of 4.01 and is primarily residential, with single family and multifamily uses. In 1990, the tract was 42% Hispanic and 30% low-income (percentage of minority was 41%, below the 50% threshold). By the 2000 Census, the Hispanic population had increased to 56%.

The aerial alignment and station in this tract would have adverse impacts to the single-family residential area just southeast of the Denton Drive/Inwood Road intersection, particularly to the residents along Cherrywood Avenue. The station site plan proposes access to the station off of Denton Drive. This creates some minor traffic impacts to Cherrywood residents from cut through traffic. A bus entrance into the station would be located immediately west of Cherrywood and this, combined with the aerial LRT alignment, creates visual impacts to the residential area. Mitigation of these impacts will be developed during final design and will include, but not be limited to, the use of vegetation in the area between Denton Drive and station/bus transfer area to soften views and create a visual screen wall along Denton Drive.

#### Impacts to Census Tract 72.01

This tract, located north of 4.03 and Bachman Lake, and bounded by Lombardy Lane, Webb Chapel Extension/Northwest Highway, Harry Hines/Denton Drive, and Timberline, is a mix of residential (primarily multi-family), industrial and commercial land uses. The residents of this area met all three of the environmental justice criteria. In 1990, the population was 62% minority, 53% Hispanic and 26% low-income. By the 2000 Census, the population changed to 91% Hispanic and 54% minority.

One of the largest areas of impact would be in the Bachman Station area and the block north of Community Drive, where several businesses and the Willow Wood apartment complex would be displaced. Approximately 164 households (163 apartments at Willow Wood and one single-family residence) and 23 businesses would be displaced. DART met with the manager of the Willow Wood apartments on March 12, 2002. Management indicated that the majority of residents are Spanish-speaking and low to moderate-income. A few families also live in the complex in separate apartments to maintain close proximity to one another. DART has provided door hangings in Spanish to encourage residents to attend meetings; however, it appears that no residents have attended meetings. As the project progresses and relocation efforts are initiated for the proposed project, DART will make every effort and emphasize the need to begin the relocation process early given the characteristics of the residents.

Several (23) businesses would also be displaced by the proposed project. The uses vary from industrial to service businesses. Among those displaced are a restaurant, convenience store, automotive uses, a club and a local firm, ZINC. This is a smaller commercial area in the Bachman community; the larger, more diverse commercial and retail areas are located less than ½ mile to the east along Webb Chapel Extension and Northwest Highway. These businesses would still be within easy walking distance to remaining apartments on the east side of Denton Drive. The impact of the loss of these businesses to the residents of the neighborhood would be minimal. To date, those residents and businesses that have participated in the planning process support the station and the project, and understand the need to relocate. DART will make an effort to relocate persons and businesses in the immediate area to minimize any disruption. Furthermore, as the relocation efforts begin, a resident or business owner's willingness to sell can change once they understand relocation benefits.

This area also has noise impact (all moderate, none severe) to apartment complexes located 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 moderate noise impacts. Mitigation of these moderate noise impacts is not recommended because the projected noise increase is less than 3 dB.

Another potential impact of the LRT project is a visual impact to multi-family residences across Denton Drive that are parallel to and face the alignment in this area. Possible mitigation measures 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. Final mitigation measures will be evaluated during final design of the LRT project.

### **Other Alignments Considered**

Six alternative alignments were considered during the Draft EIS, five options through the Medical Center District and the Love Field Design Option. The Selected LRT Alternative minimizes property acquisitions and displacements compared to the other options considered. The Medical Center Design Options A, B and C would have required a greater number of displacements (primarily non-residential), with approximately 75 business displacements under Option C. Option A also had a safety impact to Hernandez Elementary School, affecting approximately 700 students. There are some visual impacts with the Selected LRT Alternative that would have been avoided with the Harry Hines Base alignment. However, most of these impacts can be mitigated during the final design process.

Several alternative station locations were also considered during the Draft EIS. The parking garage alternative for Market Center/Oak Lawn north location would have displaced six additional single-family residences. The Inwood Station north location would also have had additional displacements (four businesses and one single-family residence). There are traffic, visual and safety impacts with the Market Center South location (as there also were with the north location). However, they are

less severe than the other design options considered. These impacts will be mitigated during final design of the station working with the adjacent property owners and residents.

#### 5.16.5 Conclusion

The Selected LRT Alternative would potentially adversely impact environmental justice populations at the Bachman and Market Center/Oak Lawn Stations and the along the LRT alignment adjacent to Kimsey Drive and Cherrywood Avenue. These impacts are not considered disproportionately high due to DART's commitment to mitigate the impacts that have been identified. In addition, there are substantial overall benefits to environmental justice populations from the LRT project as a whole that should be considered.

The project corridor as a whole has higher percentage of minority, Hispanic, low income, and transit-dependent residents than the Service Area as a whole. These populations are even more concentrated in the EJ Census Tracts where adverse impacts have been indentified. The residents of these areas need the LRT project to improve their access to employers located within the corridor and elsewhere in the DART system. The corridor is linked to the Dallas Central Business District with its 120,000 jobs, and a variety of other employment centers. The LRT project will provide additional transit access to education, medical and governmental services (all of these uses are located within the corridor). The project will also strengthen economic conditions within the corridor, particularly at stations with joint development potential.

The most adverse impact that was identified in the EJ analysis would occur at the Bachman Station and along the LRT alignment in this area – approximately 164 households and 23 businesses would be displaced. DART considered several other alignment and station options in the Bachman Station area in order to avoid this impact and minimize acquisitions and displacements, while still attempting to design it to fit into the context of the community and be cost-effective. Several constraints in the area affected the options considered:

- DART-owned rail right-of-way is 30 feet wide and freight operations to customers north of that point would still be required. In a shared LRT/freight corridor, DART requires a 25 feet separation from freight for safety and maintenance.
- Denton Drive is planned to widen from its 2-lane configuration to a 4-lane undivided cross-section, further constraining the right-of-way.
- Multi-family apartments immediately abut both sides of the existing railroad/Denton Drive right-of-way.
- The future junction with the proposed LRT line to Irving/DFW would take place just south of Northwest Highway, north of community Drive.
- Webb Chapel Extension would need to be grade-separated and a new bridge would need to be built across Northwest Highway.

Initially, DART considered three station areas in the immediate area. One at-grade station was proposed as the currently preferred location west of Denton, and two aerial stations were proposed on the east side of Denton Drive. These two station options would be aerial because the LRT alignment would continue north in an elevated configuration from the Webb Chapel grade separation in order to cross over Denton Drive (as the existing rail alignment does) and then provide an aerial junction that would allow the alignment to continue north over Northwest Highway as well as cross back over Denton Drive to continue west into the Irving/DFW corridor. Both alternative station locations would have displaced apartment complexes east of Denton Drive for the park-and-ride facility, and the freight separation requirements would have impacted property to the west of Denton Drive due to right-of-way constraints. Furthermore, these alternatives would

have introduced a large aerial structure through the area with a complex and costly elevated junction to the Irving/DFW corridor.

Selecting the station site west of Denton Drive and south of Community would allow for the both the station platform and the Irving/DFW junction to be at-grade, thus minimizing cost and the visual and noise impacts to adjacent land uses. Based on input received at public meetings during the station location decision process, community members active in the Bachman area supported the at-grade station west of Denton Drive because it fit best into the community and had the fewest direct and indirect impacts to surrounding land uses. This option also provides for a separation of LRT and freight, as freight would remain in the existing right-of-way east of Denton Drive. By placing the alignment and the station on the west side of Denton Drive, DART could locate the station and alignment to best accommodate the Denton Drive widening while achieving a cost-effective design that fit into the Bachman community.

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.

It is very likely that the displaced residents are low income and minority (this is based upon a review of Census data, discussion with Apartment Managers, and a visual inspection of the property). DART 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. According to DART staff, the agency’s replacement housing policies provide up to three and one-half years of rental assistance when necessary (based upon the displacees’ income and the cost of replacement housing). This ensures that the displaced residents will have decent, safe and sanitary housing that is affordable for a number of years.

The non-residential displacements, 23 businesses, may have a more difficult time in finding replacement space within the area. To mitigate this impact, DART relocation staff would provide individual assistance to each displaced business, both tenants and property owners, to assess their needs and assist in finding a suitable replacement location.

In addition, all acquisition of property will adhere to the DART Board of Directors’ Real Estate Policy and Procedures, adopted August 25, 1987 and modified in October 2000. These policies and procedures adhere to all Federal guidelines regarding acquisition and relocation assistance including the Uniform Relocation Assistance and Real Property Acquisition Policies Act 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). In addition, relocation benefits are provided for all businesses and residents (owner-occupants and tenants) that are displaced by acquisition.

Most of the adverse impacts identified will be mitigated using measures described in this EIS through adherence to adopted DART Board policies. In view of this and the considerable project benefits and local support for implementing the Selected LRT Alternative, the adverse impacts would not be disproportionate to the positive benefits that the project would offer low income, Hispanic and minority populations within the corridor – including increased accessibility to much needed services and employment opportunities. Public input related to the project’s benefits and impacts has been solicited throughout the study attracting many low income, Hispanic and minority community members at a number of public meetings as discussed in Section 5.16.2 and in Chapter 6.

### 5.17 LIST OF REQUIRED FEDERAL PERMITS

The permits and approvals shown in **Table 5-36** will be required to implement the proposed project.

<b>TABLE 5-36 REQUIRED PERMITS AND APPROVALS</b>	
<b>Regulatory Program or Proposed Action</b>	<b>Agency</b>
Section 404 Nationwide Permit	USACOE
Texas Pollutant Discharge Elimination System (TPDES) General Permit for Storm Water Discharges Associated with Construction Activities	EPA
Development permit to perform construction activities in a flood zone	FEMA, Municipality
Storm Water Management	Municipality
Sewer Modification	Municipality
Section 4(f)	USDOT
Section 106 (Historic)	ACHP THC (SHPO)
ACHP – Advisory Council on Historic Preservation USACOE – US Army Corps of Engineers THC – Texas Historical Commission SHPO – State Historic Preservation Officer	EPA – Environmental Protection Agency FEMA – Federal Emergency Management Agency USDOT – US Department of Transportation TCEQ – Texas Commission on Environmental Quality

Source: S.R. Beard & Associates, Inc., 2002

### 5.18 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the natural, physical, and built environment would be required in order to implement the proposed project. Such uses are minimized because of the proposed use of an existing railroad right-of-way for the majority of the project. Short-term uses are also considered temporary since they are principally associated with the construction period. The tradeoff with the short-term use requirements is a long-term benefit associated with the implementation of the project. These tradeoffs are identified in the following discussion.

Short-term uses of the environment that would be required to implement the Selected LRT Alternative include the following:

- Some loss of soils during construction through erosion
- Some loss of vegetation during construction due to site clearing
- Temporary changes to visual quality due to construction activities
- Traffic disruptions during construction
- Temporary disruptions to freight rail service during construction
- Displacement of residences
- Displacement of economic activities
- Disruption of economic activities for non-displaced businesses during construction
- Temporary air quality, noise, and vibration effects during construction

Long-term productivity that would either be maintained or enhanced by the proposed project include the following:

- Alternative choice of transportation throughout the region
- Enhanced transit and traffic capacity within existing right-of-way
- Improved access to employment opportunities
- Reduced congestion at key roadway intersections
- Improved safety conditions along corridor
- Improved and alternative use of energy consumption
- Replacement of aging infrastructure

- Long-term improvements in economic conditions
- Enhanced potential for high-density, transit-oriented development

### **5.19 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES**

Implementation of the Selected LRT Alternative would involve a commitment of a range of natural, physical, human, and fiscal resources. Land required for the proposed project would be considered an irreversible commitment. The majority of the land required for the project alignment is currently owned by DART and would, therefore, represent an efficient use of already committed property. Additional property requirements would be necessary at station locations and where the proposed project alignment would depart from DART-owned right-of-way.

The acquisition of property and associated displacement of residences and businesses in order to construct the proposed project and its stations would represent an irreversible commitment of real property. Owners, residents, or tenants of these properties would be afforded opportunities to relocate (as discussed in Section 5.2 Acquisitions and Displacements), but their existing properties would be converted to transit uses necessary to support the project.

Considerable amounts of fossil fuels, labor, and construction materials would be expended in the construction of the proposed project. Large amounts of labor and natural resources would also be used in the fabrication and preparation of construction materials. These materials are generally considered irretrievable. However, their availability is not limited and their use would not have an adverse impact on continued availability of these resources. The construction of the proposed project would also require substantial expenditure of local and federal funds, which once spent, would not be retrievable.

### **5.20 CUMULATIVE IMPACTS**

Cumulative impacts are the combined effects of independent projects and the Northwest Corridor LRT Line to Farmers Branch and Carrollton on the environment. Cumulative impacts refer to those effects that "...result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7). The anticipated cumulative impacts of the Selected LRT Alternative and all of the design options in the Medical Center and Love Field areas that were previously considered, but not selected, are anticipated to be similar. Therefore, the discussion of cumulative impacts presented below, even though referring to the Selected LRT Alternative, generally applies to all of the LRT design options.

The information presented in Chapters 3, 4, and 5 of the Final EIS provides information on the past, present, and reasonably foreseeable future anticipated actions for 2025. These projects include: 1) ongoing development of the area's transit system; 2) other planned roadway improvements; and 3) area land use plans and projects. Projects identified within the immediate vicinity of the proposed project include:

- Denton Drive/Broadway Street Widening project
- Southwest Airlines campus expansion
- Dallas Love Field improvements
- UTSW and Parkland Hospital campus expansion

#### **5.20.1 Transportation**

Several development projects planned in the corridor, such as the build-out of the Southwest Airlines headquarters near Dallas Love Field, landside and airside development at Dallas Love Field itself, UTSW and Parkland Hospital improvements in the Medical Center area, and transit-supportive land use development planned by the Cities of Farmers Branch and Carrollton will

benefit from increased transit service with a light rail system. The transit trips generated by these new development projects will contribute to the operational success of the LRT system. These impacts will be considered beneficial because they will benefit the transit system as a whole by increasing ridership.

If the Selected LRT Alternative is implemented, travel opportunities by transit would be enhanced, transit trip times would be reduced to some locations, transit mode share would be increased, and patronage would be increased. These would all be considered beneficial cumulative effects.

The recently-formed Denton County Transit Authority, responsible for transit in the area just north of the Selected LRT Alternative terminus at Frankford Road, is currently considering plans to provide rail transit service that would tie in with the proposed Frankford Station or with the planned Carrollton Square Station. If this were to occur, cumulative impacts would again be beneficial because transit access and mobility to additional portions of the region would be achieved and transit ridership would increase.

Cumulative traffic impacts associated with the Selected LRT Alternative are expected to be limited and not adverse when mitigation measures are implemented. In general, new trips would not be generated by the transit alternatives, but would be beneficially redistributed toward transit because of the increased availability of transit improvements. In addition, the No-Build Alternative was used as the basis for the traffic forecasts for the Selected LRT Alternative. The No-Build forecast volumes were based on the NCTCOG Travel Forecasting Model, which includes projected levels of new development throughout the corridor by 2025. In this manner, all cumulative development projects are accounted for in the traffic analysis of the No-Build and Selected LRT Alternatives.

With regard to impacts on traffic during construction, several roadway improvement projects are planned in the project area as described in Section 2.3.1; however, only one is anticipated to affect or be affected by the proposed project. The widening planned along Denton Drive in Dallas and Broadway Street in Carrollton may result in cumulative impacts if that project occurs simultaneously with the construction of the LRT alignment along and adjacent to that street. The schedule for the roadway improvements has not been finalized; however, it is probable that it may occur simultaneously or just after construction of the LRT project. DART will work closely with Dallas County (the jurisdiction responsible for the road improvements) as well as with the two municipalities during final design and construction to develop and implement specific traffic control plans that will minimize impacts and will take into account the timing of both projects. As noted below in Section 5.20.2, this is a short-term impact that, upon completion, would no longer affect the community. The long-term benefits of an improved parallel street would outweigh short-term impacts that may occur.

### **5.20.2 Land Use and Economics**

The Selected LRT Alternative has been developed in conjunction with planned public transportation and roadway improvements, and area land use plans and projects. The proposed LRT project would tend to integrate the communities in the corridor and encourage transit-oriented development and would also strongly support the area's land use plans and projects. The land uses surrounding potential LRT station locations are compatible with and would support the implementation of the proposed station development. The proposed action would not contribute to cumulative adverse local land use impacts that could result from development of the surrounding areas, but rather would benefit corridor communities by supporting more efficient land use development. Construction activities would contribute to community disruptions resulting from other development projects occurring simultaneously in the area. This may result in a longer duration of noise and dust from construction, and greater traffic delays and traffic obstructions. The combined impact may heighten the perception of disruption experienced by the local community. These impacts may be concentrated in some locations at different times during

construction but would diminish as the project concludes, and upon completion would no longer affect the community.

With regard to economic effects, the Selected LRT Alternative would have long-term benefits over the years for the communities it traverses and would further goals and policies for revitalization and investment within the study area. The fiscal benefits of operation would have a long-term impact for the communities. The loss of tax revenue would be offset by increased development near stations and along the LRT alignment. The Selected LRT Alternative would not result in a cumulative adverse impact during operation and would be economically beneficial to its surrounding communities.

As previously noted, construction activities would contribute to community disruptions resulting from other development projects in the area. This may result in temporary, short-term economic impacts on local businesses. Construction may result in overall beneficial impacts on tax revenues with increases in employment and spending that help offset any short-term economic impacts.

### **5.20.3 Acquisitions and Displacements**

Required property acquisitions (both full and partial takings) would be relatively minor for the Selected LRT Alternative, considering its 17.8 mile length. The required takings may occur in some areas in which other related projects may also be taking property, but implementation of the LRT project would not enlarge the area of property acquisition or result in broader displacement of persons and businesses. The Selected LRT Alternative would produce a slight adverse cumulative impact in the sense that it would contribute to property acquisition.

The LRT project would contribute to the displacement of some residents and employees. It is reasonable to assume that the employees subject to relocation would be able to either relocate with the affected business or find other suitable employment in the general area. Few of the jobs to be displaced are of such a unique type that relocation would be prohibitive. This displacement would not be concentrated to threaten any one industry or economic sector. In the sense that these displacements would be additive to displacements possibly resulting from other related projects, it would contribute to an adverse cumulative impact. However, because the number of persons potentially displaced would be moderate, and it is reasonable to expect that most relocation would occur in the area, the degree of the cumulative impact would not be substantial.

### **5.20.4 Air Quality**

The cumulative effect of the Selected LRT Alternative as well as related projects in the study area may result in modest decreases in regional emissions and have limited positive air quality impacts. However, the cumulative effect of the No-Build Alternative would also contribute to this effect since vehicle emissions of the Selected LRT Alternative and the No-Build Alternative are anticipated to be similar. The Selected LRT Alternative would not result in violations of state or federal standards for CO. For the Selected LRT Alternative, calculated CO concentrations were found to be similar to the No-Build Alternative at the one location, which is expected to be impacted the greatest by building the project. The LRT project would be supportive of the related land use plans and projects; and, to the extent that it facilitates access by transit rather than the private automobile, cumulative effects are anticipated to be beneficial.

### **5.20.5 Noise and Vibration**

Noise levels in the corridor would be modestly increased with the Selected LRT Alternative, which would involve operating transit vehicles. The related projects would also likely increase noise, because they all result in increased travel. The Selected LRT Alternative was found to not produce significant adverse noise impacts, however, after mitigation. The level of increased noise would not be significant because it would not involve violations of FTA noise guidelines. The possible future *Dallas Love Field Master Plan* improvements may result in noise increases at some

locations within the DART project area. However, the Airport would adhere to FAA noise guidelines for airport noise and mitigation for significant adverse effects. There are no other known LRT project locations at which related projects may produce substantial noise increases.

#### **5.20.6 Visual and Aesthetic Resources**

The elevated portions of the Selected LRT Alternative would contribute to the number of above ground structures in the project area. That would result in limited adverse impacts since most of the project is located within an industrial/commercial setting. However, a few areas with sensitive land uses, including residential neighborhoods, will experience an adverse impact. DART will work closely with nearby residents and other property owners during final design to develop strategies to ensure that the structures will be designed to integrate, as appropriate, into the surrounding environment. There are no other known LRT project locations at which related projects would substantially contribute to the number of above ground structures.

#### **5.20.7 Ecosystems**

With regard to wetlands or other waters of the U.S., potential impacts of the Selected LRT Alternative would be restricted to bridge supports and would be minimal. Construction activities are not expected to result in significant cumulative impacts because they will be conducted in accordance with all applicable laws, statutes, and regulation. No endangered species habitats would be affected by the proposed project. The USFWS has indicated a “may affect” designation for the interior least tern, although no preferred habitat is found within the project corridor for this opportunistic species that is capable of surviving in disturbed urban environments. Coordination with the USFWS during final design and construction will result in development and implementation of preventative/mitigative measures in accordance with applicable laws and regulations to lessen the effect on this species to a level that is discountable or insignificant. In summary, no cumulative impact on ecosystems would occur.

#### **5.20.8 Geology**

The Selected LRT Alternative impact on geology and soils would occur at various locations and areas in the project corridor. However, none of the potential impacts would produce additive effects on general geology and soil conditions in the Dallas metropolitan area. As a result, it is concluded that no cumulative impacts would occur for this category.

#### **5.20.9 Hydrology/Water Quality**

The Selected LRT Alternative could produce increased runoff, which could result in additional sedimentation entering surface water resources downstream of the project. The magnitude of expected adverse effects would be small because the area is largely urbanized and also because appropriate design provisions will be incorporated, including adequate drainage facilities to handle runoff. LRT related runoff would be added to existing or potential runoff from other related projects.

The LRT route crosses floodplains only in a few places. The project would not result in the displacement or modification of floodplains to the extent that properties not currently in a floodplain would be impacted. Therefore, the cumulative impacts are anticipated to be small and localized. The project will follow all Federal, state, and local regulations with regard to construction within the floodplain to further minimize potential impacts.

#### **5.20.10 Hazardous/Regulated Materials**

The Selected LRT Alternative has the potential to affect or be affected by hazardous waste sites, both known and unknown. The related projects would also have this same potential. No adverse impacts will occur with proper mitigation in accordance with applicable hazardous waste laws, statutes, and regulations. Hazardous materials that may be encountered during construction of the

Selected LRT Alternative will be removed or treated in place, thus reducing the potential for cumulative impacts.

#### **5.20.11 Safety and Security**

The number of vehicular accidents may increase in the corridor due to the increased number of vehicles traveling to station locations due to and background growth. The potential cumulative effect of increased vehicle trips in the Corridor may be counterbalanced by a slight mode shift away from autos toward public transportation. This latter effect could be argued to reduce cumulative accident potential, rather than add to it. The addition of new LRT stations may add to the number of locations in the corridor where crimes could occur. However, the additional activity concentrated around the stations may actually reduce crime. In any case, with proper surveillance, the possible number of increased crimes occurring at such locations is expected to be small. Even with planned development in the corridor, the magnitude of additional criminal activities is not expected to be significant on a cumulative basis. The LRT Alternative could cause a slight increase in demand for additional fire or police personnel. This increase, if it occurs, would be characterized as a cumulative impact, although the magnitude is not considered significant. Given that construction of the Selected LRT Alternative would happen over a period of years and in different phases, impacts on fire and police services from this project and in conjunction with other development projects in the area may result in short-term cumulative impacts that would be less than significant due to advanced notices on traffic detours and closures.

#### **5.20.12 Historic and Archaeological Resources**

All project-related impacts on historic and archaeological resources will be mitigated through application of NEPA and Section 106 of the National Historic Preservation Act regulations. All other projects will evaluate their potential impact to historic and archeological resources separately, particularly those projects using federal funds, which require the application of NEPA and Section 106 of the National Historic Preservation Act regulations. One area where project sponsors have coordinated is near Letot School. The Dallas County Denton Drive widening project would have previously impacted the rock wall surrounding this historic resource. However, DART has designed the project such that excess DART right-of-way can be used to re-align the Denton Drive/Lombardy Lane intersection and avoid any direct impacts to the school's rock wall. The Selected LRT Alternative will not cause a cumulative impact on cultural resources.

#### **5.20.13 Public Parks and Recreation Areas**

The Selected LRT Alternative has no direct or constructive use impacts on public parks and recreation areas within the study area. Therefore, the Selected LRT Alternative will not cause any cumulative impact on these resources.