procedures adhere to all Federal guidelines regarding acquisition and relocation assistance including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42USC 4601). For all real property acquired, DART compensates the property owner for the fair market value of their property and for damages to any remaining parcel(s).

Relocation benefits are provided for all businesses and residents (owner occupants and tenants) that are displaced by acquisition. The project will not displace any residents. Prior to the relocation of businesses, DART staff will prepare a relocation analysis that determines the availability of suitable locations or facilities for displaced businesses. The relocation benefits and services provided to those displaced are determined by eligibility guidelines based on Federal policies. For businesses, these generally include reimbursement of moving expenses and advisory assistance in locating a replacement site.

5.3 AIR QUALITY

The purpose of this analysis is to determine potential air quality impacts of the proposed Northwest Corridor LRT Line to Irving and DFW International Airport project. The impact assessment was performed by comparing the predicted ambient air pollutants concentrations, for the proposed project alternatives, to the National Ambient Air Quality Standards (NAAQS). Section 3.4 of this DEIS includes information on current status of air quality in the project area, the applicable air quality standards, and the impact criteria.

5.3.1 Impact Assessment

5.3.1.1 Methodology

To assess the proposed project's air quality impacts, a mesoscale as well as a microscale analysis was performed based on the procedures established in the Texas Department of Transportation ***Air Quality Guidelines*** (Texas DOT, 1999). A mesoscale pollutant burden analysis was performed to assess air quality impacts of the proposed project, on a regional level. The 2025 pollutant emissions associated with the various alternatives were calculated for carbon monoxide (CO), volatile organic compounds (VOC), and oxides of nitrogen (NO_x). The latter two pollutants are precursors of ozone (O_3) and serve as an indicator of the ozone impact in the area. Because O_3 formation reactions take place over a period of several hours, maximum concentrations of O_3 are often found far downwind of the precursor sources. Thus, ozone is a regional problem and not a localized condition.

The analysis and evaluation of long-term air quality impacts of the proposed project are based on the traffic analysis completed for the project (*Parsons, 2006).* The analysis evaluated the change in traffic operations and transportation circulation, as well as the passenger rail vehicle operations in the year 2025. Emissions analyses were evaluated for the proposed project corridor for the horizon year 2025 and for No-Build and Build scenarios.

Regional Emissions

Regional operational emissions evaluated for the project Build scenario include the following:

- direct emissions from operation of trains within the new LRT corridor;
- indirect emissions from passenger vehicles traveling to the park-and-ride stations, as compared to the decrease in emissions resulting from commuters using trains rather than driving to their destinations.

Impact to the regional air quality is analyzed by comparing the future (2025) air quality conditions with and without the project. The 2025 No-Build conditions reflect development, growth and infrastructure improvements that have already been accounted for in regional planning documents. Project-related impacts were identified based on the net difference in future Build and No-Build Alternatives (i.e., how the proposed project would affect future traffic patterns that already consider

regional growth). Assumptions about future traffic conditions are described in detail in Chapter 4, Transportation Impacts.

For conformity determination, the 2025 Build conditions were compared to 2025 No-Build conditions and the net differences were compared to the DFW emission budgets, which indicate the significance thresholds.

Localized Emissions

In accordance with EPA's ***Guideline for Modeling Carbon Monoxide from Roadway Intersections*** (*EPA, 1992*), the three intersections with the highest traffic volumes and the three intersections with the worst LOS under Build condition were selected to be modeled. Traffic information was provided by the project traffic study (*Parsons, 2006*). Since the three intersections with the highest traffic volume are also those with the worst LOS, this overlap reduced the number of the intersections required analysis to three; however, four intersections were analyzed. These intersections were selected based on their vehicle volume and LOS, receptors, and proximity to a rail park and ride station. **Table 5-3** lists the locations of the modeled intersections.

TABLE 5-3
MICRO-SCALE CO ANALYSIS SITES

Site Number	Intersection Site Location	Nearby Station/ Park-and-Ride Lot
1	Belt Line Road and Valley View Lane	Belt Line Station park-and-ride lot
2	Walnut Hill Lane and Brangus Drive	North Lake College Station park-and-ride lot
3	Mac Arthur Boulevard and Hidden Ridge	North Lake College Station park-and-ride lot
4	Riverside Drive and Spur 348 (NW Hwy)	Lake Carolyn Station; and North Las Colinas Station park-and-ride lot

Source: Parsons, 2006

As discussed in the ***Final Environmental Methodology Report*** (DART, 2006), CAL3QHC microscale dispersion model was used to calculate CO concentrations for the horizon year 2025 No-Build and Build conditions. CO emissions were estimated using emission factors provided by the North Central Texas Council of Governments (NCTCOG, 2006).

The analysis of CO impacts followed the protocol recommended in the ***Transportation Project-Level Carbon Monoxide Protocol***, (*UC Davis, 1997*). Pursuant to the guidelines of the protocol, receptor locations for the 1-hour analysis were located 3 meters from each intersection corner. In addition, other variables used in CAL3QHC model, were selected based on the guidelines of the protocol. These variables and their value are summarized below.

- Ambient Temperature: 46 ºF (average of the last 3 years minimum temperature, as recorded in Dallas/Fort Worth International Airport Monitoring Station)
- Stability Class: 6 "F" (stable atmosphere)
- Wind Speed: 0.5 meter/second (minimum speed of model)
- Wind Direction: Worst case (all wind directions in 10 degree increments)
- Mixing Height: 1,000 meters
- Surface roughness: 321 (Dallas County)
- Settling Velocity: 0 meters/second
- Deposition Velocity: 0 meters/second
- Background CO: 4.2 ppm (1-hour) and 3.7 (8-hour) from 1415 Hinton Street Monitoring Station
- 8-hour Persistence Factor: 0.7

5.3.1.2 Project Impacts

Regional Impacts

The LRT Alternative, with its associated park-and-ride lots and feeder bus network, would provide incentive for commuters to use transit and therefore decrease automobile travel on area roadways. As discussed in Chapter 4, Transportation Impacts of this DEIS, with the LRT Alternative fully operational in the horizon year (2025), there would be decreases in ADT on several freeway segments, many arterials would experience the same daily traffic levels compared to the No-Build Alternative, however, more arterials would experience small increases in ADT. As the Project transportation study concluded, the reductions in ADT that would occur on the regional freeway network are greater than those that would occur on the arterial road network in the project corridor. The level of pollutants emission is related to the ADT or the vehicle miles traveled, therefore, it is anticipated that the regional emission level of pollutants would be reduced compared to the No-Build Alternative.

Table 5-4 presents the results of the pollutant regional burden analysis from vehicle emissions along the corridor study area within Dallas Fort Worth. As **Table 5-4** shows, implementation of the proposed Project would result in a reduction of the annual commuter (passenger) vehicle miles traveled (VMT) of approximately 0.02%, and increase in VMTs of the transit bus and LRT by approximately 6.55% and 40.4%, respectively. Overall, the total annual regional VMT would be reduced by approximately 0.01 percent.

TABLE 5-4
2025 PROJECTED CORRIDOR POLLUTANT BURDEN (DFW)

		No-Build	Build	Percent Change [1]
Regional VMT (thousands) [2]				
Annual Commuter Vehicle VMT		29,214,890	29,208,080	- 0.02
Annual Bus VMT		33,328	35,510	6.55
Annual Light Rail VMT		5,065	7,110	40.37
Annual Commuter Rail VMT		595	595	0
Total Annual VMT		29,253,879	29,251,296	**- 0.01**
Criteria Pollutant Emissions (tons per day)				
CO	Roadway [3]	327.30	327.26	- 0.01
	Train [4]	0.05	0.07	40.37
	Total Regional	327.35	327.33	**- 0.01**
NO_x	Roadway [3]	13.66	13.66	- 0.02
	Train [4]	0.24	0.34	40.37
	Total Regional	13.90	14.00	**0.67**
Exceed Threshold [5] (37.9 tons/day)?		**NO**	**NO**	
VOC	Roadway [3]	17.68	17.67	- 0.04
	Train [4]	0.01	0.02	40.37
	Total Regional	17.69	17.69	**- 0.01**
Exceed Threshold [5] (45.3 tons/day)?		**NO**	**NO**	

NOTES: VMT = vehicle miles traveled

[1] The percentage data are based on calculated values, while the No-Build and Build data are rounded to include 2 decimal digits.

[2] VMT data obtained from Dallas Area Rapid Transit (DART).

[3] Calculated based on the projected VMT, fleet mix, and emission rates of different types of vehicles using data from MOBILE6 model runs, as reported in the Appendices 9.10 and 9.11 of the Transportation Conformity, Mobility 2025.

[4] Calculated based on projected train VMT, estimation of emission factors using: "Technical Highlights of Emission Factors for Locomotives" (EPA, 1997) and the data published on Bureau of Transportation Statistics (BTS) Website as "Rail Profile" (BTS, 2002).

[5] The significance thresholds of pollutants are based on the estimated emissions budgets for 2025, as reported in the ***Transportation Conformity for the Dallas-Fort Worth Nonattainment Area*** (NCTOG, 2005).

Source: DART, NCTOG and Parsons, 2006

Localized CO Impacts

While overall CO emissions are similar between the future build and No-Build scenarios, specific intersections near stations may show an increase in localized emissions. Within an urban setting, vehicle exhaust is the primary source of CO and its localized concentrations. To assess the potential for CO hot-spots, microscale analysis was performed to estimate CO concentrations in the immediate vicinity of the proposed stations and associated park-and-ride lots that are located within sensitive receptors areas. The highest CO concentrations are generally found within close proximity to congested intersection locations. Under typical meteorological conditions, CO concentrations tend to decrease as distance from the emissions source (i.e., congested intersection) increase. For purposes of providing a conservative, impact analysis, CO concentrations are typically analyzed at congested intersection locations, because if impacts are less than significant in close proximity of the congested intersections, impacts will also be less than significant at more distant sensitive receptor locations.

The proposed project's CO concentrations for 1 and 8-hour CO levels during the peak travel period (the higher of A.M. or P.M. values) are presented in **Table 5-5**. As shown, the CO concentration predicted for both scenarios would be either similar or would increase slightly by a maximum of 0.1 ppm for the Build scenario compared to the No-Build scenario. As such, the proposed project would not have a significant impact upon 1-hour or 8-hour local CO concentrations due to mobile source emissions.

Table 5-5
YEAR 2025 CARBON MONOXIDE CONCENTRATIONS

Intersection	1-hour Concentration (ppm)				8-hour Concentration (ppm)			
	No-Build		Build		No-Build		Build	
	Model Value	Ambient Conc.	Model Value	Ambient Conc.	Model Value	Ambient Conc.	Model Value	Ambient Conc.
Belt Line Road and Valley View Lane	1.4	**5.6**	1.5	**5.7**	1.0	**4.7**	1.1	**4.8**
Walnut Hill Lane and Brangus Drive	0.9	**5.1**	1.0	**5.2**	0.6	**4.3**	0.7	**4.4**
Mac Arthur Boulevard and Hidden Ridge	1.0	**5.2**	1.1	**5.3**	0.7	**4.4**	0.8	**4.5**
Riverside Drive and Spur 348 (NW Hwy)	1.4	**5.6**	1.5	**5.7**	1.0	**4.7**	1.1	**4.8**
Federal Standard	**35**				**9.0**			

CO concentrations include 1–hour and 8–hour concentrations of 4.2 and 3.7 ppm, respectively, based on three year average monitoring data at Hinton Street monitoring station.

Source: Parsons, 2006.

As significant impacts would not occur at the intersections with the highest traffic volumes that are located adjacent to sensitive receptors, no significant impacts are anticipated to occur at any other locations in the study area as the conditions yielding CO hotspots would not be worse than those occurring at the analyzed intersections. Consequently, nearby sensitive receptors would not be significantly affected by CO emissions generated by the net increase in traffic which would occur under the proposed project.

5.3.2 Project Conformity Assessment

According to USEPA Transportation Conformity Rule 40 CFR Part 93.102, conformity determinations are required for projects that require the approval, funding, or implementation of FHWA/FTA projects. Since the Project needs to be approved by FTA, it would be required to conform with the EPA Transportation rules. A project-level conformity determination is also required for the Project because it is a nonexempt project in a non-attainment area for ozone. FTA cannot approve funding for project activities beyond preliminary engineering unless the Project

meets EPA transportation conformity regulations at the project level. The criteria that the project must satisfy are discussed below.

- *§93.110 The conformity determination must be based on the latest planning assumptions.* The North Central Texas Council of Governments (NCTCOG) serves as the Metropolitan Planning Organization (MPO) responsible for determining area-wide population and employment forecasts, modeling regional travel demand, and formulating the ***Metropolitan Transportation Plan*** (MTP) and the ***Transportation Improvement Program*** (TIP). Assumptions used in the transportation and traffic analysis for this Project, upon which the microscale CO and regional criteria pollutant analyses are based, are derived from NCTCOG's most recently adopted population, employment, travel, and congestion estimates. Travel forecasts are based on Texas Department of Transportation (TxDOT) travel demand model.

- *§93.111 The conformity determination must be based on the latest emission estimation model available.* Emission estimates are based on EPA MOBILE6.2 model and UC Davis CAL3QHC dispersion model for CO modeling at roadway intersections. MOBILE6.2 and CAL3QHC models are the most recent models approved by EPA as of 2007.

- *§93.112 Conformity determination must be made according to the consultation procedures of this rule and in the applicable implementation plan, and according to the public involvement procedures established in compliance with 23 CFR Part 450.* All projects in the 2006-2008 TIP for the Dallas Fort Worth Metropolitan Area that are proposed for federal or other types of funding were initiated in a manner consistent with the Statewide and Metropolitan Planning Final Rule in the federal guidelines, 23 CFR Part 450, and Section 613.2000, Subpart B, of Title 49 CFR and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The Texas Commission on Environmental Quality (TCEQ) is in the process of developing an 8-Hour Ozone Attainment Demonstration SIP for the Dallas-Fort Worth nonattainment area.

- *§93.114 There must be a currently conforming transportation plan and TIP at the time of Project approval.* The currently conforming transportation plan is the ***Mobility 2025: The Metropolitan Transportation Plan*** *(MTP*), which was adopted on April 14, 2005, by the Regional Transportation Council of the NCTCOG, and the air quality conformity determination was approved on June 16, 2005. The currently conforming TIP is the 2006-2008 TIP*,* which was also adopted on April 14, 2005 by the Regional Transportation Commission.

- *§93.115 The proposed Project must come from a conforming transportation plan and TIP.* The proposed Project is part of the currently conforming transportation plan (MTP) and the currently conforming TIP (2006-2008 TIP). The proposed project includes several components as provided in the 2006-2008 TIP. These are listed as follows:

  IRV-1 LRT to South Las Colinas; MPO project ID: 83076
  IRV-2 LRT to SH 161; MPO project ID: 83077
  IRV-3 LRT to DFW; MPO project ID: 83078

Based on the above, the proposed Project satisfies EPA's project-level conformity requirements (40 CFR Part 93).

Table 5-6 shows a summary of the conformity analysis findings. The Modeled Emissions values consist of roadway-based emissions calculated using the Texas Mobile Source Emission Software. The Final Emissions Including MoSERS are the emission results after consideration of the benefits from transportation improvement measures for emission reduction. Benefits have been quantified for the 2007 and 2010 analysis years, but were not credited for 2025, in order to provide a conservative estimate. As **Table 5-6** shows, the final emissions are below the maximum allowable

level set by the proposed Five Percent Increment of Progress plan MVEBs for both VOC and NO_x and as such, the conformity requirements for the proposed project are satisfied.

TABLE 5-6
CONFORMITY ANALYSIS FINDINGS (9-COUNTY NONATTAINMENT AREA)
VEHICLE EMISSION SUMMARY

Year	VOC [1] (tons/day)		MoSERS [2] Benefits effect (tons/day)	NOx [1] (tons/day)		MoSERS [2] Benefits effect (tons/day)
	Modeled Emissions	Final Emissions including MoSERS		Modeled Emissions	Final Emissions including MoSERS	
2007	**104.14**	101.21	2.93	**201.32**	198.18	2.14
2010	84.22	83.97	0.25	14.13	147.98	0.15
2025	45.30	45.30	<0.01	37.90	37.90	<0.01

[1] Motor Vehicle Emission Budgets (MVEB) for the nine-county nonattainment area, are the 2007 modeled emissions (based on the proposed 5% increment of progress demonstration MVEB) .
[2] MoSERS are transportation programs/projects identified as emission reduction benefits. These include: transportation control measures (TCM), voluntary mobile emissions programs (VMEP), or transportation emission reduction measures (TERM). Including in the TERM category are the programs such as intersection improvements, extension of HOV facilities, new rail transit routes, and park-and-ride facilities.

Source: ***Transportation Conformity, Mobility 2025: The Metropolitan Transportation Plan***, Amended April 2005, and 2006-2008 ***Transportation Improvement Program***, Section 5.

5.3.3 Air Quality Mitigation

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

5.4 NOISE

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

5.4.1 Noise Impact Assessment

Noise Impact Assessment Methodology

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

- Based on the DART vehicle noise specification, the predictions assume that a single vehicle operating at 40 mph on ballast and tie track with continuous welded rail (CWR) generates a maximum noise level of 76 dBA at a distance of 50 feet from the track centerline.

- The operating times of the line would be between 5:30 AM and 12:30 AM. The operating plan for LRT service specifies a peak-hour headway of ten minutes, an off-peak base period headway of 15 minutes and an evening headway of 20 minutes. Two-car trains would operate most of the day, with some three-car trains in peak periods and single-car trains in the evenings.

- Peak hour operations would occur between 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM. Evening operations would occur between 8:30 PM and 12:30 AM, and base service would occur during all other time periods. The average number of cars per train would be 2.5 cars during peak hours, two cars during base service, and one car during evening service.