CHAPTER 5

ENVIRONMENTAL CONSEQUENCES

5.0 ENVIRONMENTAL CONSEQUENCES

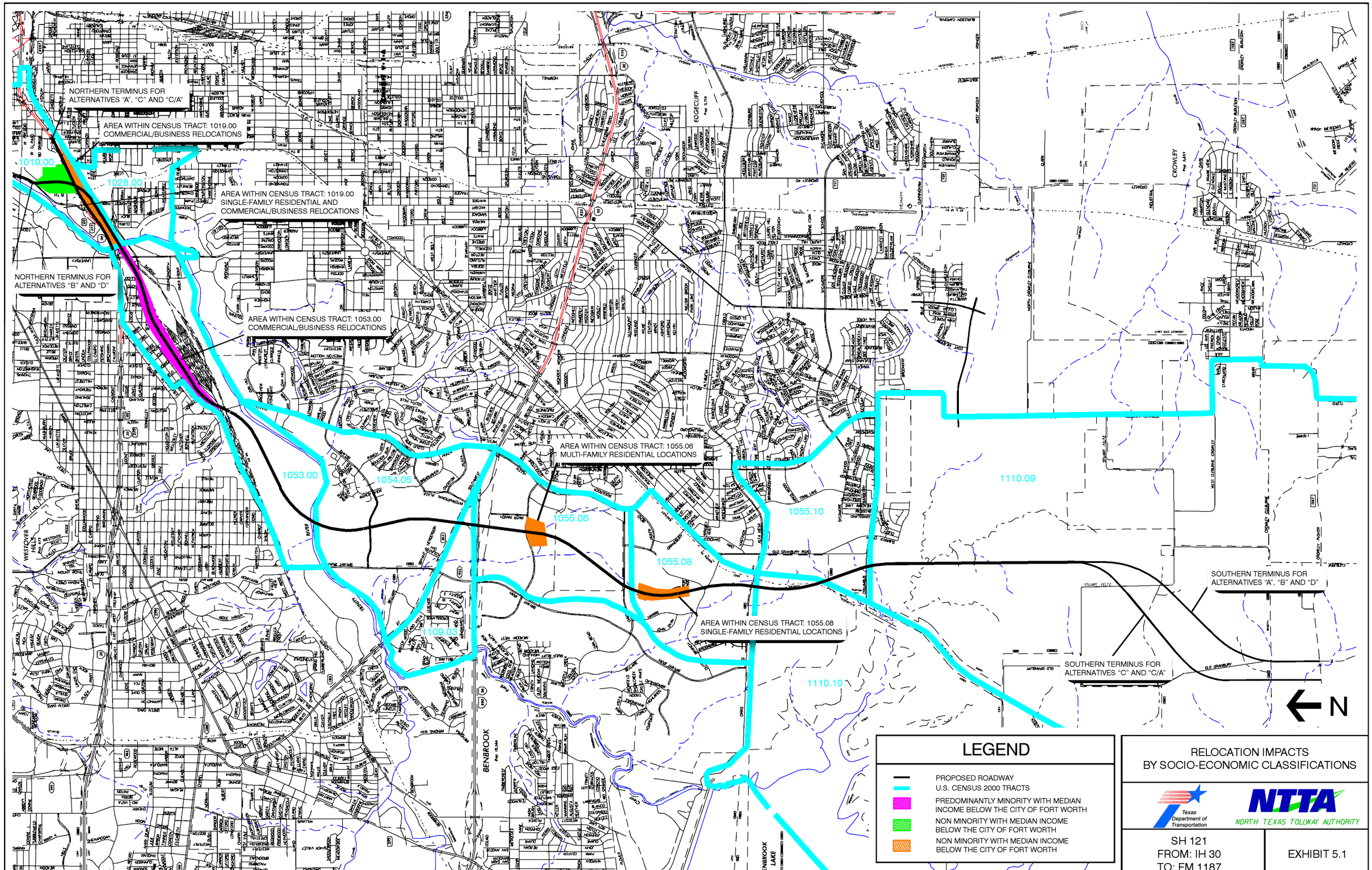
This section includes the potential beneficial and adverse social, economic and environmental effects of the five "Build" Alternatives A, B, C, C/A and D as well as the No-Build Alternative. Because all Build alternatives share a similar horizontal alignment, many of the environmental consequence categories/types are similarly impacted by all five of the Build alternatives (Please see Table 3-1). In the case of the C and C/A Alternatives, the environmental consequences are essentially identical.

5.1. Land Use Impacts

The DFW area is highly suburbanized and the outlying area to central city commute from the southwest area of Fort Worth does not provide for a direct route to the CBD, other than arterials such as Hulen Street, Bryant Irvin Road and Old Granbury Road. The growth in population and employment previously mentioned would increase the continuous development trend of suburban areas in southwest Fort Worth. Travel times, trip frequencies and trip lengths are expected to increase by the year 2025. Without improvements to the existing transportation system, such as the proposed SH 121 project, the existing traffic congestion is expected to increase.

The *2000 Fort Worth Comprehensive Plan*, adopted by the Fort Worth City Council on February 24, 2004, describes the City's proposed land use along the project. Although, according to *Texas Local Government Code* Section, 219.005, "a comprehensive plan should not constitute zoning regulations or establish zoning district boundaries", future land use is based on the Plan's land use policies and land use maps. Often, transportation access influences land use. The purpose of the City's Plan is to guide future land use in order to encourage economic development, promote housing developments, preserve cultural resources and to accommodate transportation routes and publicly owned facilities that would improve and provide the residents quality of life. The Plan includes the proposed SH 121 within the following sectors, as on Exhibit 5.1:

- Sector 1, Arlington Heights: area bounded on the north by the West Fork Trinity River, on the south east by the Clear Fork of the Trinity River and on the west by Bryant Irvin Road.
- Sector 2, Downtown: area bounded on the east by Forest Park Boulevard, on the south by the UP railroad tracks/IH 30 and on the east by railroad tracks west of IH 35W.


NORTHERN TERMINUS FOR ALTERNATIVES "A", "C" AND "C/A"
AREA WITHIN CENSUS TRACT: 1019.00 COMMERCIAL/BUSINESS RELOCATIONS
AREA WITHIN CENSUS TRACT: 1019.00 SINGLE-FAMILY RESIDENTIAL AND COMMERCIAL/BUSINESS RELOCATIONS
NORTHERN TERMINUS FOR ALTERNATIVES "B" AND "D"
AREA WITHIN CENSUS TRACT: 1053.00 COMMERCIAL/BUSINESS RELOCATIONS
AREA WITHIN CENSUS TRACT: 1055.06 MULTI-FAMILY RESIDENTIAL LOCATIONS
AREA WITHIN CENSUS TRACT: 1055.08 SINGLE-FAMILY RESIDENTIAL LOCATIONS
SOUTHERN TERMINUS FOR ALTERNATIVES "A", "B" AND "D"
SOUTHERN TERMINUS FOR ALTERNATIVES "C" AND "C/A"
1019.00
1028.00
1053.00
1054.05
1055.06
1055.08
1055.10
1109.03
1110.09
1110.10
EDGECLIFF
CROWLEY
WESTOVER HILLS
BENBROOK
BENBROOK LAKE
N
LEGEND
PROPOSED ROADWAY
U.S. CENSUS 2000 TRACTS
PREDOMINANTLY MINORITY WITH MEDIAN INCOME BELOW THE CITY OF FORT WORTH
NON MINORITY WITH MEDIAN INCOME BELOW THE CITY OF FORT WORTH
NON MINORITY WITH MEDIAN INCOME BELOW THE CITY OF FORT WORTH
RELOCATION IMPACTS BY SOCIO-ECONOMIC CLASSIFICATIONS
Texas Department of Transportation
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
SH 121
FROM: IH 30
TO: FM 1187
EXHIBIT 5.1

- Sector 7, Far Southwest Planning Sector: bounded by single-family residential, agricultural and light industrial to FM 1187, on the south of FM 1187 by single-family residential subdivisions under construction in areas planned for such growth; and the remainder of the sector is open space.
- Sector 14, Texas Christian University (TCU)/Westcliff: bounded on the west by the Clear Fork of the Trinity River and Bryant Irvin Rd, on the east by 8th Avenue, Granbury Road and McCart Avenue; and on the south by IH 20/SH 183.
- Sector 15, Wedgewood: bounded on the north by IH 20/SH183, on the west by the Clear Fork of the Trinity River, on the south by Risinger Road and on the east by the BNSF railroad tracks.

Development strategies recommended by the Plan in relation to the project, include mixed-use growth development, as defined by the City is a highly urbanized area similar to a downtown area. This consists of high employment concentration, housing units, schools, publicly owned facilities, public transportation and pedestrian activity. A similar area is envisioned for north of IH 30 and along the south side of the corridor, west of Hulen Street to the Trinity River. The Plan also recommends light industrial use as a transition between the railyards and the proposed SH 121, from Montgomery Street, to Bryant Irvin Road. It encourages residential development along Hulen Street to the area north of Bellaire Drive and south of Briarhaven Road and compatible development along the proposed corridor, between the Trinity River and Arborlawn Drive. In addition, it encourages major employers, businesses, apartment complexes and single-family residential housing to locate at proposed entryways and exits of the proposed SH 121 facility.

5.1.1. Alternatives A, B, C, C/A and D

As mentioned in Chapter 1.0, Project History, SH 121 has been under study since before 1970. Based on previous studies, the City has planned for a new roadway in southwest Tarrant County and has made zoning decisions to accommodate the new roadway. Therefore, the construction of SH 121 would have minimal effects on land use south of the UPRR yard.

The *2000 Fort Worth Comprehensive Plan*, that includes the project, contains land use policies and strategies upon which zoning, plats, annexations, special exceptions, variances and other land use decisions along the project would be made. SH 121 would potentially help the City achieve its land

use goals of developing multiple growth centers, to promote compact urban land use within designated areas and lower intensities of land use elsewhere in the City.

Improved access to properties in the area would potentially cause an associated value increase of these properties. The expected industrial, commercial and residential developments of the area should encourage new employment and improve the overall economy in the area.

5.1.2. No-Build Alternative

The No-Build alternative would most likely have no effect on the trend of urbanization in the south area. With the projected growth in the area and no alternative route, congestion, travel time and travel miles on existing facilities are expected to increase in future years. Future land use decisions might be influenced by the lack of access that the proposed SH 121 would have provided. The No-Build alternative would not be consistent with the *Mobility 2025 – 2004 Update* for the Metroplex, or the *2000 Fort Worth Comprehensive Plan*.

5.2. Prime and Unique Farmlands

Pursuant to Section 1541(a) of the *Farmland Protection Policy Act* (FPPA), enacted December 22, 1981, USC. 4202 and as required by 1541(b) of FPPA, Federal agencies are: (1) to use the criteria to identify and take into account the impacts of their programs on the preservation of farmland, (2) to consider alternative actions, as appropriate, that could lessen any impacts and (3) to ensure that their program, to the extent practicable, is compatible with State, local government and private programs and policies to protect farmland.

Completion of Form AD-1006, Farmland Conversion Impact Rating, Part VI, for land south of IH 20 resulted in a total site assessment score of 32. If the assessment score is less than 60, no further evaluation is required. There was no prime and unique farmlands found from IH 20 north to the Hulen Street bridge. There is prime farmland that borders the Clear Fork of the Trinity River for approximately 1.7 mi within the PSC, but the designated area has not been under cultivation for some

time and the area containing the soil is zoned for commercial use. The form is on file at the TxDOT Fort Worth District Headquarters.

5.2.1. Alternatives A, B, C, C/A, D and No-Build

The "Build" alternatives, as well as the No-Build alternative, would not result in any impacts on prime and unique farmlands.

5.3. Environmental Justice Impacts

This section analyzes potential Environmental Justice (EJ) concerns of the proposed alternatives to determine if there are low-income or minority populations who would incur disproportionately high and adverse impacts.

5.3.1. Overview

Executive Order (EO) 12898, "Federal Actions to Address 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 substantial delay in the receipt of benefits by minority and low-income populations.

In addition to complying with the EO, 12898, the DOT is committed to Title VI of the *Civil Rights Act of 1964* and the *Civil Rights Restoration Act of 1987*, which provides nondiscrimination programs require that Federal-aid recipients, subrecipients and contractors prevent discrimination and ensure nondiscrimination in all or their programs and activities, whether those programs and

activities are Federally funded or not. The factors prohibited from serving as a basis for action or inaction, which discriminates, include race, color, national origin, sex, age and handicap/disability. The efforts to prevent discrimination must address, but not be limited to a program's impacts, access, benefits, participation, treatment, services, contracting opportunities, training opportunities, investigations of complaints, allocation of funds, prioritization of projects and the functions of ROW, research, planning and design.

5.3.2. Public Participation

Throughout the study process, NTTA and TxDOT have made every effort to notify affected residents, business owners and stakeholders in the project corridor. All public involvement activities were conducted in accordance with 43 TAC 11.80-11.90, CFR Title 23, Part 771 and *TxDOT Highway Design Operations and Procedures Manual*, Part II-B.

As described in Chapter 6.0, Public Involvement, of this document, approximately 52 meetings were held with members of the community concerning this project. Forty-five of these meetings were general public meetings held within the study corridor. Advertisements for these meetings included a statement that persons interested in attending the meetings who have special communication or accommodation needs are encouraged to contact the Fort Worth District Office at least 72 hours before the meeting and that every reasonable effort would be made to accommodate those needs. Information presented at these meetings included project purpose and need, alternative alignments, highway geometric design criteria and traffic projections within the PSC. Many of the meetings were structured to encourage comment through the use of breakout groups lead by facilitators.

Seven of the meetings held were meetings of the CAC created by Fort Worth City Council Resolution No. 2482 (Appendix F). The CAC members were appointed by the City Council to review proposed and preliminary alternative designs of the proposed project and consisted of 17 community and business leaders. Two of the members were minorities or represented minority groups. Additional meetings and briefings were also held and are documented in Chapter 6.0, Public Involvement.

Several outreach methods were used to notify the public of the aforementioned meetings, including advertisements in *The Fort Worth Star Telegram*, *The Cleburne Times Review* and *The Burleson Star* and notification of property owners by certified mail. All meeting notices included procedures for requesting Spanish translation services at the advertised meeting.

In addition to public involvement efforts completed by NTTA and TxDOT, the Fort Worth Chamber of Commerce hosted two meetings that focused on impacts to the business community. Invitations to the meetings were sent to all owners and business managers including minority and low-income populations. Those in attendance voiced concerns regarding the timing of the proposed project's implementation and the extent of relocation assistance offered by TxDOT. A mailing list was compiled after the meeting of all those interested in receiving brochures on procedures for ROW acquisition and relocation assistance. In general, comments received at public meetings were in support of the project.

5.3.3. Impact Assessment Methodology

The EJ analysis in this document follows guidance provided by the Office of Federal Activities, "Final Guidance for Incorporating EJ Concerns in EPA's NEPA Compliance Analyses" dated April 1998, as well as guidance provided by other FHWA, EPA and CEQ publications. The analysis identifies minority and low-income populations within the project study area and the potential adverse impacts to these populations if the proposed project were implemented. The study area for this analysis included all census tracts/census block groups that are adjacent to the proposed project.

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.

The Department of Health and Human Services (DHHS) for 2004, reflect the low-income threshold median for a family of four to be $18,850.00. For low-income populations, 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." 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, all census tracts within the project corridor were evaluated and assessed.

The EJ analysis in this document utilizes U.S. 2000 Census data to identify high minority and/or low-income/poverty populations located within the project area. The project assessed potential impacts to census tracts 1019.00, 1028.00, 1053.00, 1054.05, 1109.03, 1055.06, 1055.08, 1055.10, 1110.09 and 1110.10, as shown in Exhibit 5.1.

A Geographic Information Systems (GIS) analysis was used to determine populations residing within the study area. Potential adverse impacts of the proposed project were assessed and a GIS analysis was used to determine where these impacts affect minority and low-income populations. Alternatives and mitigation measures to avoid adverse environmental impacts on affected populations were studied and assessed for feasibility. Potential benefits of the proposed project on the affected populations were also evaluated.

5.3.4. Impact Assessment

Census 2000 data shows that the total minority population for the study area is 24 percent; for the City is 53 percent; and, for Tarrant County is 37 percent. (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.)

<u>Areas with High Minority, Hispanic and Low-Income Populations</u>

Table 5-1 shows demographic data for Tarrant County, the project area and the census tracts within the study area.

Table 5-1 – Evaluation of Census Tract in Project Corridor

	Total Population	Percent Minority	Percent of Population Below Poverty Level
Project Area	27,287	24%	8%
Project Area by Census Tract			
1019.00	1120	11%	10%
1028.00	1287	12%	6%
1053.00*	921	88%	14%
1054.05	4124	20%	7%
1055.06	4998	27%	14%
1055.08	4937	28%	7%
1055.10	3722	35%	5%
1109.03	1798	12%	6%
1110.09	3112	14%	4%
1110.10	1268	5%	7%

Source: U.S. Census, 2000
* *Represent tract with high concentrations of minority, Hispanic or low-income populations.*

For this analysis, in adherence to the guidelines, high minority areas include those tracts where over 50 percent of the tract was minority. Census Tract 1053.00 is the only census tract within the SH 121 Corridor that has a predominately minority population. It is within this census tract that EJ concerns were investigated.

According to an analysis of the project area using 2000 Census data and compared to the DHHS poverty guidelines, no low-income populations were identified within the study area.

Impacts to High Minority and Low-Income Areas

All census tracts within the proposed project area were analyzed for impacts related to the alternatives considered. In order to analyze the impacts from an EJ perspective, four impact categories were assessed in census tract 1053.00: acquisitions and displacements; community cohesion; land use and economics; and traffic and circulation. EJ impacts were identified where an environmental impact in that tract was adverse compared to the impacts in the other census tracts and the project area as a whole. Possible adverse impacts are discussed in the following.

Census Tract 1053.00 is bounded by Vickery Boulevard, Valentine Street and IH 30 on the north; the Clear Fork of the Trinity River on the south; and, Bryant-Irvin Road on the western edge, as shown in Exhibit 5.1. The 1,170 ac in this tract contain a mixture of different types of business establishments, residential properties, institutional and public facilities. The following categories were considered in determining potential adverse impacts to the high minority population within this tract.

Acquisition and Displacements

Within Census Tract 1053.00 approximately 40 buildings, representing as many as 80 businesses would be potentially displaced. This number represents as much as 70 percent of the total business displacements throughout the PSC. Some impacts may not represent actual displacements, just easements for ROW. The number of acquisitions and displacements would be refined as a result of detailed information developed during final design.

The number of displacements within this Census Tract represents an adverse impact from a community impact perspective relative to the entire project but not an EJ impact. During field reconnaissance a survey of potentially impacted businesses was undertaken to determine the extent of minority ownership, employment and patronage within the census tract. Based on this survey, only four businesses were positively identified as being minority owned (five percent). Representative businesses surveyed identified that approximately 33 percent of the employees of the potentially displaced businesses were minority. This percentage is consistent with the minority population of Tarrant County (37 percent) and substantially lower than the minority population within Census Tract 1053.00 (88 percent). Based on observation, the diverse mix of businesses located within the census tract serve a wide range of clientele from all socioeconomic levels. While the number of business displacements may be disproportionate, the impacts to the minority community do not appear adversely disproportionate. Table 5-2 enumerates the estimated number of displaced businesses, employees and minority employees by business sector type.

Table 5-2 – Impacted Employees by Business Sector

Business Sector	Total Employees	Minority Employees*	Percent of Minority Employees
Commercial	339	149	44%
Hotel	21	5	24%
Industrial	52	17	33%
Office	23	8	35%
Office Complex	320	50	16%
Public Facilities	2	0	0%
Retail	32	18	56%
Service	100	47	47%
Service/Retail	10	0	0%
Warehouse	0	0	0%
Totals	**906**	**300**	**33%**

Source: LOPEZGARCIA GROUP, 2004
* *Estimates were based on field and telephone surveys*

The impact of the loss of these businesses to the residents of the adjacent neighborhood would be minimal because there are similar businesses located north of Vickery Boulevard, which would not be impacted by the proposed project. To date, those businesses that have participated in the planning process support the proposed project and understand the need to relocate. NTTA and TxDOT would make effort to relocate persons and businesses in the immediate area to minimize disruption.

Community Cohesion

According to 2000 Census data, there are a total of 270 households within Census Tract 1053.00. These households, consisting of single-family residences, located north of Vickery Boulevard would not be displaced. The construction of SH 121 would not split the residential neighborhood in Census Tract 1053.00. The proposed ROW lies between the UPRR yard to the south and Vickery Boulevard to the north. This would impact businesses along Vickery Boulevard, but would not separate residents from community facilities, churches or recreation areas.

Community cohesion would not be adversely affected by the construction of SH 121. Three related church properties on Lovell Avenue and Pulido Street are adjacent to the proposed ROW. However, access to these properties by the surrounding community would not be adversely impacted.

The construction of SH 121 would not negatively impact school districts, recreation areas, churches, police and fire protection nor would the project disproportionately adversely impact any social groups such as the elderly or handicapped.

Land Use and Economics

The area directly impacted by the proposed project consists of a predominately commercial and light industrial land use mix. The area contains a diverse mix of commercial and office business, much of which has been converted from warehousing and housing stock. Additionally, the businesses located on the south side of Vickery Boulevard are adjacent to an active UPRR freight railyard. The proposed project is compatible with the existing rail facility.

There are numerous areas in Census Tract 1053.00 and within the vicinity, where displaced businesses could relocate. Additionally, the west end of the census tract and areas east of Montgomery Street and north Vickery Boulevard are transitioning to higher density land use including several office complexes. Many buildings including hotels and highway related services, would be better served by the proposed roadway,

The recommended alignment of SH 121 has been selected based on the availability of undeveloped land throughout the corridor and has been established to reduce the possible impacts of relocation, community cohesion and special populations.

Traffic and Circulation

The dominant mode of travel through and within the community is automobile using local and arterial streets. According to census data, only 12 households in Census Tract 1053.00 have no

access to a vehicle. Vickery Boulevard is the primary east-west arterial through this area and Montgomery Avenue is the primary north south arterial. Both of these streets are heavily traveled. The majority of businesses are located on or adjacent Vickery Boulevard and Montgomery Avenue. The proposed project would provide increased access to services and areas of employment outside of the community.

There are few sidewalks along Vickery Boulevard and Montgomery Street. In addition, the types of business found here generally would not be frequented by pedestrians or bicyclists l. Although there are sidewalks in front of some of the businesses, these tend to be disjointed and only provide access between the front door of the business and a side parking area. Pedestrian circulation would not be adversely impacted by the construction of the proposed project.

There is minimal transit service available within the PSC. The FWTA provides limited local bus service east of Montgomery Street along Vickery and Lovell. The majority of the area in Census Tract 1053.00 is not directly served by public transit. The construction of SH 121 would enable the FWTA to provide express bus service from the suburbs in the southern portion of the PSC to the CBD.

5.3.5. Alternatives A, B, C, C/A and D

Public input related to the proposed project's benefits and impacts has been solicited throughout the proposed project development which has attracted low-income and minority community members at a number of public meetings as discussed in Chapter 6.0, Public Involvement. Adverse impacts identified would be mitigated using measures described in this EIS. In view of this and the benefits and local support for implementing the proposed project, the adverse impacts would not be disproportionate to the positive benefits that the proposed project would offer minority populations within the PSC - including increased accessibility to much needed services and employment opportunities.

There would be overall benefits to EJ populations from the proposed project as a whole. Some of these benefits include increased access to education, medical and governmental services - all of which are located within the PSC. The project would also strengthen economic conditions within the PSC.

EO 13166, entitled "Improving Access to Services for Persons with Limited English Proficiency (LEP)," mandates that Federal agencies examine the services it provides and develop and implement a system by which LEP persons can meaningfully access those services consistent with and without unduly burdening, the fundamental mission of the agency. Each agency shall also work to ensure that recipients of Federal financial assistance (recipients) provide meaningful access to their LEP applicants and beneficiaries (65 Federal Register 50123, August 16, 2000). TxDOT complies with EO 13166 by offering to meet the needs of persons requiring special communication accommodations in all public involvement activities and notices.

5.3.6. No-Build Alternative

The No-Build alternative would maintain the existing transportation network. Existing businesses and residents would not be displaced or impacted and redevelopment of the area along Vickery Boulevard would continue at its current pace.

5.4. Social Impacts

5.4.1. Community Cohesion Impacts

Community cohesion impacts can occur if the proposed action splits neighborhoods, isolates a portion of a neighborhood or ethnic group, generates new development, changes property values, or causes the separation of residences from community facilities and services.

Alternative A

From the northern terminus (Summit Avenue along IH 30 to Hulen Street) Alternative A would follow along the property line of the existing UPRR Yard and would require the relocation of two residences located in a commercially zoned area north of IH 30, east of Forest Park Boulevard. Located just south of the Holly Water Treatment Plant, this neighborhood represents an area in which previously residential buildings have been replaced by commercial and industrial use structures. Within this neighborhood, there is one church, eleven houses, over thirty commercial vacant lots, office space and warehouses. There are no grocery stores, convenient stores, laundry mats, or gas stations. The small community is served by one church and it would not be displaced by this alternative. The predominant land use of this area is commercial and industrial.

The neighborhoods' quality of community life was identified through field observation and interviews with the City of Fort Worth Planning Department. The community is presently located north of a major highway, with limited access and surrounded by City utility facilities and railroad tracks. The alternative would not split the neighborhood by isolating any of the residences or disrupting community cohesion.

Alternative A would traverse, for the most part, undeveloped parcels of land from the Hulen Street bridge up to the IH 20 interchange. South of the IH 20, the proposed ROW would take portions of housing units at the Hunters Ridge, Marina Club and Hunters Green multi-family residential developments located near Overton Ridge Boulevard. Although the apartment building units along the east and west boundaries of the proposed SH 121 would be impacted, the apartment community would not be split or divided. The remaining apartment units would continue to experience the multi-family community atmosphere they currently do because of the improved accessibility to major highways and other facilities and services.

From Overton Ridge to just south of Oakmont Boulevard, the project would cross-undeveloped land until approximately 530 ft south of Oakmont Boulevard. The eastern ROW line would take an 80 ft strip from the Hulen Bend Addition, approximately 2,390 ft long parcel. Thirty-five existing single-

family residences would be relocated along Stockton Drive. South of Dutch Branch Road and west of Lomo Alto Drive, ROW relocations would cause the loss of approximately seven single-family residences located on the outskirts of a large single-family development. These properties are adjacent to the alignment and their displacement would not impact the integrity of the remaining houses or the overall neighborhood. From here, south to FM 1187, the project would traverse undeveloped properties, eliminating any negative impacts associated with community cohesion in this area.

Although Alternative A involves the impact to apartment units and single-family units, no particular neighborhood or social group would be affected by the relocation of these properties. The alignment would not isolate a portion of a neighborhood, ethnic group or cause the separation of residences from community facilities and services. Alternative A would not have a negative impact on the cohesiveness of neighborhoods.

Alternative B

From the northern terminus (Forest Park Boulevard) to IH 30, Alternative B would require the relocation of five single-family residences. The only church serving the area would not be displaced. As mentioned previous, this community already lacks strong community cohesion due to its location within a commercial zone, proximity to IH 30, limited access and lack of recreational areas, schools, grocery stores and service stations. From IH 30 to Hulen Street, Alternative B would follow along the property line of the existing UPRR Yard, traversing some commercial properties and would not have an impact on any communities along this section. Alternative B would traverse, for the most part, undeveloped parcels of land from the Hulen Street bridge to FM 1187 eliminating any negative impacts associated with community cohesion in this area. No particular neighborhood or social group would be affected by relocation of the properties. The alternative would not split the neighborhood by isolating any of the residences. For these reasons Alternative B would not negatively impact the cohesiveness of neighborhoods.

Alternative C and C/A

From the northern terminus, west of Summit Avenue along IH 30 to Hulen Street, Alternative C and C/A would follow along the property line of the existing UPRR Yard and would require relocation of two residences located in a commercially zoned area north of IH 30. This neighborhood lacks recreational areas, schools, grocery stores and gas service stations. Located north of a major highway, with limited access and surrounded by City utility facilities and railroad tracks, the small residential community would not experience a further degradation of community cohesion because of the project. Alternative C and C/A would also traverse commercial property located along IH 30. None of the communities along this section would be impacted. Alternative C and C/A would then traverse, for the most part, undeveloped parcels of land from the Hulen Street bridge south to the IH 20 interchange. From IH 30 to Hulen Street, Alternative C and C/A would follow along the property line of the existing UPRR Yard, traversing some commercial properties and would not have an impact on any communities along this section. These alternatives would not split the neighborhood and therefore not isolate any of the residences.

Alternative C and C/A would traverse, for the most part, undeveloped parcels of land from Hulen Street to FM 1187 and would eliminate any negative impacts associated with community cohesion in this area. No particular neighborhood or social group would be affected by relocation of properties. For these reasons, Alternative C and C/A would not negatively impact the cohesiveness of neighborhoods, reducing ROW width that would displace residential units as discussed in Alternative A.

Alternative D

From the northern terminus (Forest Park Boulevard) to IH 30, Alternative D would require the relocation of nine single-family residences and the Greater Friendship Baptist Church in a commercially zoned area. The neighborhood is located south of the Holly Water Treatment Plant and is one in which formerly residential buildings have been replaced by buildings for commercial and industrial uses. Within this neighborhood, there is one church, eleven houses, over thirty commercial vacant lots, office space and warehouses. There are no grocery stores, convenient stores,

laundromats, or gas stations. The small community is served by one church. The predominant land use of this area is commercial and industrial.

This alternative would disrupt the community cohesion because one house would be isolated on each side of the proposed route and the Greater Friendship Baptist Church would be displaced. Therefore the community's tenuous cohesion would be further strained.

From IH 30 to Hulen Street, Alternative D would follow along the property line of the existing UPRR Yard, traversing some commercial properties and would not have an impact on any communities along this section. Alternative D would traverse, for the most part, undeveloped parcels of land from the Hulen Street bridge to FM 1187 and would eliminate any negative impacts associated with community cohesion in this area. While no particular group would be affected by relocation because of this alternative, community cohesion would be impacted by this alignment because it splits the only two houses remaining in the neighborhood north of IH 30, east of Forest Park. The neighborhood is located within census tract No. 1019.00.

No-Build Alternative

As the Metroplex, southwest Tarrant County and northern Johnson County continue to grow, the increased number of people, jobs and other activities would overburden the existing transportation infrastructure. Widening of thoroughfares, streets, highways and arterials would be needed to accommodate the increased traffic demands. These expansion projects could impact community cohesion through displacements of businesses and residences.

5.5. Public Safety Impacts

5.5.1. Alternatives A, B, C, C/A and D

The Build alternatives are expected to improve highway and public safety. By relocating through traffic on existing arterials onto a controlled access facility, the opportunity for pedestrian/vehicle accidents would be diminished. The opportunity for access-conflict accidents (vehicle striking

vehicle while attempting to turn) also would decrease on the existing roadways because of reduced traffic volumes.

Construction of the proposed facility would improve access to schools, hospitals, churches and other public facilities along the project. Fire protection and other emergency services would be improved because of the ease of travel afforded by completion of this project. The public safety services provided by these facilities would be enhanced by an expected decrease of congestion within the PSC.

Access to the roadways leading to the medical center would be maintained and remain open during construction. The only exception would be during the placement of bridge beams, reconstruction of the Rosedale bridges or during short-term, temporary closures, but even during these actions, adequate access would be maintained on other routes to the medical center. County and local public safety officials would be notified of any road closure resulting from the project construction. Detour timing and necessary rerouting of emergency vehicles would be coordinated with the proper local agencies.

The construction of SH 121 would temporarily affect the use of the hike and bike trail along the Clear Fork of the Trinity River. The effects would be construction related and are considered to be short-term (refer to Section 5.8, Pedestrian and Bicycle Impacts). Elevated bridge structures would cross the river and would not affect the existing facilities. Site investigation of the proposed route corridor and coordination of information with applicable public agencies indicate that the route would not permanently impact any existing public park or recreation area. A short-term detour would be needed while beams are placed overhead during bridge construction.

5.5.2. No-Build Alternative

The No-Build alternative would not decrease traffic volumes on existing roadways and would likely result in increased traffic accidents and increased response time for emergency providers as future traffic volumes rise.

The No-Build alternative would cause no impact on recreational facilities.

5.6. Relocation Impacts

According to the Real Estate Center at Texas A&M University and the United States Census Data, building permit activity data indicates an increase in single-family housing of 120 percent in 2000 compared to 1990 in the Fort Worth/Arlington metropolitan area and 108 percent in Tarrant County. Multi-family housing increased by 85 percent in the City and 102 percent in Tarrant County for the same year. The NCTCOG's *Profile of General Demographic Characteristics for Tarrant County, Texas: 2000* reports that from a total of 565,830 housing units, 533,864 are occupied and 31,966 are vacant. The City alone has a total of 211,165 housing units of which 195,146 (92.4 percent) are occupied and 16,019 (7.6 percent) are vacant.

The TaxNetUSA: Tarrant County Property Information database, city maps and visual field inspections were the main tools used to determine the total number of displacements for each land use category for each alternative. Information for each of the alternatives is presented in the following: The majority of the properties located within each of the proposed alternatives' ROW requirements consist of vacant commercial lots, lots containing warehouses and offices/retail locations and City/State property, as well as abandoned buildings. These were not included on the tables detailing each alternative's relocation displacements. Exhibit 5.1 depicts the relocation impacts by socio-economic classifications.

5.6.1. Alternative A

The relocation of residential and commercial property would be required for approximately three miles along the northern section of Alternative A. One of the affected areas would be from the northern terminus, at Summit Avenue, to just west of Hulen Street. This area is located within census tract 1019.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population of this area is predominantly non-minority and the median income is below that of the City. Alternative A's varying ROW requirements north and south of IH 30 and to the west along Vickery Boulevard would cause the relocation of a motel, several businesses and a few residences as

described in the following. This area is located within census tract 1053.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population for this area is predominantly minority and the median income is below that of the City.

The area south of IH 20 to just south of Overton Ridge Boulevard would impact the housing units of three apartment complexes. This area is located within census tract 1055.06. Based on the census data (Please see Table 4-1 and Table 4-2), the population for this area is predominantly non-minority and the median income is above that of the City. The three impacted complexes would be Hunters Ridge Apartments, Hunters Green Apartments and Marina Club Apartments. Hunters Ridge Apartments, located on River Ranch Boulevard, contains 248 units with approximately 245 units occupied. The proposed ROW would require the relocation of three apartment unit buildings, including 28 apartments and several covered parking structures. Hunters Green Apartments, located on Overton Ridge Boulevard, contains 248 units with approximately 239 units occupied. ROW requirements would require the relocation of three apartment unit buildings, including 48 apartments. Marina Club Apartments, located on Overton Ridge Apartments, contains 387 units in its complex with a varying number of vacancies. The ROW requirements would require the relocation of two apartment unit buildings, including 32 apartments, within the complex.

Between Oakmont Boulevard and Altamesa Boulevard, the ROW requirements could require the relocation of several single-family residences. This area is located within census tract 1055.08. Based on the census data (Please see Table 4-1 and Table 4-2), the population for this area is predominantly non-minority and the median income is above that of the City. The estimated 400 ft to 600 ft of ROW to the west of Stockton Drive, near the Hulen Bend Addition, would require the relocation of several single-family residences. A number of homes that were under construction would also be impacted in the Hulen Bend area. The estimated 500 ft of ROW to the west of Lomo Alto Drive would require the relocation of seven single-family residences.

The total number of displacements, for Alternative A, per land use category is listed on Table 5-3. A total of 154 displacements were estimated within the project ROW. These displacements include 42 single-family, six single-family residences under construction at the time of the site investigation, one

Table 5-3 – Total Displacements for Alternative A

Land Use	No. Of Displacements
Residential	
Single-family Residential	42
Single-family Being Constructed as of 5/02	6
*Multi-Family Residential	3
Business/Commercial	
Retail	11
Warehouse	27
Office	34
Auto Service	6
Motel	1
Auto Dealership	2
Misc.	1
Total	**133**

* *Applies to actual number of apartment complexes potentially affected for which at least one apartment building unit is displaced.*

motel, three multi-family residential areas (apartment complexes) and 81 businesses, which include retail shops, warehouses, manufacturers, offices, auto dealerships and auto service businesses. A total of 21 billboards would also be affected.

5.6.2. Alternative B

The relocation of residential and commercial property would be required along approximately three miles of the proposed SH 121. This area is located within census tract 1019.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population of this area is predominantly non-minority and the median income is below that of the City. One of the affected areas would be from the beginning of the project, at Forest Park Boulevard (the northern terminus), to just north of IH 30. The estimated 180 ft of ROW required for this section, would cause the relocation of commercial properties and private residences and land conversion of both City and private land. The area just north and south of IH 30 and east of Forest Park Boulevard, would require relocation of several businesses and commercial properties. This area is located within census tract 1019.00 and 1028.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population of tract 1019.00 is predominantly non-minority and the median income is below that of the City. The population of

tract 1028.00 is predominantly non-minority and the median income is above that of the City. The proposed ROW requirements south of IH 30 and west along Vickery Boulevard would cause the relocation of one motel, several businesses and commercial properties as described in the following. This area is located within census tract 1053.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population of tract 1053.00 is predominantly minority and the median income is below that of the City.

The total number of displacements per land use category is listed on Table 5-4. A total of 104 displacements were estimated within the project ROW. These displacements include five single-family residences, one motel, City owned facility and 76 businesses, which include retail shops, warehouses, offices, auto dealerships and auto service businesses. A total of 21 billboards would also be relocated.

Table 5-4 – Total Displacements for Alternative B

Land Use	No. Of Displacements
Residential	
Single-family Residential	5
Business/Commercial	
Retail	11
Warehouse	25
Office	33
Auto Service	5
Motel	1
Auto Dealership	2
City Facility	1
Total	**104**

5.6.3. Alternative C and C/A

The relocation of residential and commercial property would be required along approximately three miles of the proposed SH 121. The area containing the most relocations would be from the beginning of the project, at Summit Avenue (the northeast terminus), to just west of Hulen Street. This area is located in census tracts 1019.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population of tract 1019.00 is predominantly non-minority and the median income is below that of the City. The area just south and north of IH 30 and east of Forest Park Boulevard,

would require relocation of several businesses, commercial properties and a few residences. This area is located within census tract 1028.00. The population of tract 1028.00 is predominantly non-minority and the median income is above that of the City. The proposed ROW requirements to the west along Vickery Boulevard would cause the relocation of one motel, several businesses and commercial properties as described in the following. This area is located within tract 1053.00. The population of tract 1053.00 is predominantly minority and the median income is below that of the City.

The total number of displacements per land use category is listed on Table 5-5. A total of 85 displacements were estimated within the project ROW. These displacements include three single-family residences, one motel and 81 businesses that include retail shops, warehouses, offices, automobile dealerships and automobile service businesses. A total of 21 billboards would also be relocated.

Table 5-5 – Total Displacements for Alternative C and C/A

Land Use	No. of Displacements
Residential	
Single-family Residential	3
Business/Commercial	
Retail	11
Warehouse	27
Office	34
Auto Service	6
Motel	1
Auto Dealership	2
Misc.	1
Total	**85**

5.6.4. Alternative D

The relocation of residential and commercial property would be required along approximately three miles of the proposed SH 121. One of the affected areas would be from the beginning of the project, at Forest Park Boulevard (the northern terminus), to just north of IH 30. This area is located in census tracts 1019.00. Based on the census data (Please see Table 4-1 and Table 4-2), the population of tract 1019.00 is predominantly non-minority and the median income is below that of the City. The

estimated 220 ft of ROW required for this section, would cause the relocation of commercial properties and private residences and land conversion of both county and private land including a church located just west of 11th Avenue and east of 15th Avenue. The area just south of IH 30 would require relocation of several businesses and commercial properties. This area is located within census tract 1028.00. The population of tract 1028.00 is predominantly non-minority and the median income is above that of the City. The proposed ROW requirements south of IH 30, to the west along Vickery Boulevard, would cause the relocation of a motel, several businesses and residences as described in the following. This area is located within tract 1053.00. The population of tract 1053.00 is predominantly minority and the median income is below that of the City.

The total number of displacements per land use category is listed on Table 5-6. A total of 84 displacements were estimated within the project ROW. These displacements include 10 single-family residences, one church, one motel, City owned facility and 71 businesses that include retail, warehouses, manufacturers, offices and auto service businesses. A total of 21 billboards would also be relocated.

Table 5-6 – Total Displacements for Alternative D

Land Use	No. Of Displacements
Residential	
Single-family Residential	10
Places of Worship	1
Business/Commercial	
Retail	10
Warehouse	22
Manufacturing	2
Office	31
Auto Service	4
Motel	1
Auto Dealership	2
City Facility	1
Total	**84**

The church that would be relocated serves a community that, because of its location in an industrial/commercial zone and in such close proximity to the highway, is already suffering poor

community cohesion. An interview with an employee of the church revealed that attendance is poor. Minimum impacts on its membership and the community that it serves are expected.

The 2000 census data for the census tracts located within Camp Bowie Southwest Boulevard, Clear Fork of the Trinity River and Henderson Street (census tracts #1019, 1020, 1024.01,1024.02, 1025, 1026, 1027, 1028, 1053and 1054.05), shows there is a total of 1,572 vacant housing units. Additionally, there are 387 vacant housing units within the area encompassed by Bryant Irvin Road, IH 20, Hulen Street, Old Granbury Road and Altamesa/Dirks Road (census tracts 1055.08 and 1055.06). Included in this number of vacant houses reported, are units for lease and for sale, of comparable price and quality, which could meet the needs of those that would be displaced because of the project. Most of the relocated businesses are commercial warehouses and offices. There are enough vacant commercial lots in the area outside the proposed corridor for relocation of these businesses. The May 2001 Fort Worth Introduction: A statistical profile of Fort Worth and the Fort Worth-Arlington Metropolitan Area by Fort Worth Chamber of Commerce reports that 13.2 percent of Class "A" office space, 30.8 percent of Class "B" office space, 6.7 percent of Suburban Class "A" office space, 14.7 percent of Suburban Class "B" office space and 5.9 percent of warehouse/industrial space is vacant in the project area. Class "A" office space is considered to be of good to excellent quality, outlay and appearance, good workmanship and materials. Exterior trim is good, more detailed. Class "B" is considered to be of average to good quality built with good quality materials and outlay. Exterior trim is simple.

5.6.5. No-Build Alternative

No relocation measures would be needed if the No-Build alternative were implemented.

5.7. Economic Impacts

This section compares the economic, employment and tax revenue effects and public cost-benefit potential of the No-Build and Build Alternatives for SH 121. This analysis assesses the potential for market-driven development opportunities that would be created by the proposed SH 121 project. The economic analysis would have similar results for any of the Build alternatives.

5.7.1. Analysis Methodology

Key project components were evaluated for a Build alternative, including:

- Public Investments - Public expenditures by NTTA, TxDOT, City of Fort Worth and its other funding sources for design, engineering, construction, remediation and ROW requirements,
- Private Investments - Expenditures of private capital due to enhanced development potential created along the route's newly created visibility and access corridor.

Private commercial development opportunities were evaluated for the size, type and timing of land uses that could be reasonably expected for each. Ample acreage would be available to accommodate market-driven development over the period of the study. The study area for the purposes of economic impact analysis was defined as a quarter-mile on either side of the proposed ROW. Based on this definition, the analysis included 4,560 ac of development. Calculations for jobs, employment, development and taxes are economic effects generated within that area only. Only those changes in the character of land use that could clearly be related to the SH 121 public investment were used for computing new opportunity. No residential uses were included as these uses are expected to continue to be strong in the study area regardless of the presence of SH 121 given current development trends.

Under the No-Build Alternative, all properties would remain in their current taxable status, with no further ROW acquisition or road improvement planning done in conjunction with SH 121. In the No-Build Alternative, only those commercial market-driven opportunities that are likely to occur within the available areas of the designated study corridor were forecast using growth rates in population and employment as forecast by the NCTCOG.

All land use estimates were verified using a 20-year history of local real estate absorption, demography, and economic performance. Projections were also reviewed for consistency with each community's master plans and with the traffic forecast models in use by NCTCOG. A consensus on the reasonableness of development issues and an assumptions of use, land availability, improved access and visibility was reached through a review of the engineering assumptions and meetings with the project engineers, property owners and local planning staffs. The impacts were examined and

results compared over a 27-year development period (2004 to 2030) using state-of-the-art econometric models to analyze various aspects of the total project's capital and operating costs.

The types of effect examined included economic impact, direct and indirect employment and direct and indirect tax impact. The net public cost-benefit effect includes new sales and hotel taxes, new property taxes, jobs, new developable property and ROW reinvestment, as well as costs for construction, ROW purchases and assessed value losses. Total public cost is compared to total benefit to provide the net public cost-benefit impact, or difference.

Positive impacts include reinvestment, or re-spending, of the dollars paid for ROW acquisition as well as dollars spent for professional services and construction.

Negative impacts include the permanent loss of taxable values of properties removed from the tax rolls, which are offset against the positive ROW values of replacement purchases (where applicable).

5.7.2. Assumptions

The assumptions used in the development of economic effects models and analyses are as follows:

- Total economic impact of the development would extend throughout the four-county Fort Worth Primary Metropolitan Statistical Area (PMSA).
- Economic impact does not include other cost or benefit calculations typically associated with engineering analyses, including other required delay savings or business interruption losses.
- Employment of any part-time workers has been reduced to "full-time equivalent" positions using a standard workweek and benefits.
- Tax revenue impact includes sales taxes on-premise retail sales, private construction purchases, equipment and ordinary operating expenses. Sales taxes are excluded for private industry-specific products or services which may be sales taxable and are the work product of the business, such as on-site software development.
- Tax impact does not include Federal income tax or State franchise tax on the activities of individual businesses, which are determined as a tax on annual net profits or book values.
- For purposes of analysis, "like kind" ROW reinvestments are assumed to be made in the city and county where the ROW was relinquished.
- No tax deferrals, incentives, or abatements are included in these calculations.
- Models use a "constant dollar" analysis for 2004, with no property value or tax increases, no depreciation and no Consumer Price Index or Cost of Living Adjustment increases assumed.

- Any material changes in the assumptions with regard to project timing or funding levels would change the outcome of the findings.

5.7.3. Results

Calculations for jobs, employment, development and taxes are economic effects within the study area only. The economic effect includes the construction and operation of public and private investments over 27 years. It is driven by all areas of purchasing, employment and operating functions. The economic impact of SH 121 from 2004 to 2030 on the 4,560 ac project study area would be $24.76 billion for the No-Build Alternative and $49.75 billion for Build Alternative. Employment effects of the alternatives are presented in Table 5-7. Direct jobs and work years refer to public jobs associated with the construction of the SH 121 and private sector jobs from development. Indirect jobs and work years refer to supporting and service jobs that are generated by the purchase of goods and services by public and private development entities and their employees.

Table 5-7 – Cumulative Employment Impact, 2004-2030

	Jobs			Work Years		
	Direct	**Indirect**	**Total**	**Direct**	**Indirect**	**Total**
No-Build Alternative	11,339	11,343	22,682	190,248	199,790	390,038
SH 121 Build	19,387	20,919	40,306	376,793	410,524	787,317

Building SH 121 could generate over 40,000 jobs because it would provide access to more acre of land with a higher potential of development for commercial and retail uses, which results in higher number of projected jobs.

Tax revenues for the alternatives from 2004 to 2030 vary as well and are shown in Table 5-8. Tax revenue for the No-Build is estimated to be approximately $2.0 billion where as building SH 121 could generate $3.7 billion in total tax revenue. The difference in projected tax revenue reflects the amount of land with development potential and the number of direct and indirect jobs created under each alternative, resulting in differences in land value and retail, sales potential and ultimately in projected tax revenue.

Table 5-8 – Cumulative Direct and Indirect Taxes, 2004-2030

Jurisdiction	No-Build Alternative	SH 121 Build
City of Fort Worth	$363,318,000	$615,762,000
Tarrant County	$232,761,000	$463,725,000
Fort Worth ISD	$340,569,000	$542,825,000
Crowley ISD	$40,159,000	$154,254,000
Regional Water District	$7,192,000	$12,817,000
Emergency Services District	$0	$2,391,000
FWTA	$47,867,000	$76,955,000
State of Texas	$964,099,000	$1,840,654,000
TOTAL	**$1,995,965,000**	**$3,709,383,000**

Capital projects of all types generate costs as well as benefits. Table 5-9 lists the benefits, costs and net public cost-benefit of the alternatives. Costs include construction and ROW costs plus the lost revenue of the land removed from the tax rolls to be used for ROW. Tax benefits are based on the tax generated by new development and economic growth. The net cost-benefit of the No-Build Alternative would be approximately $2.0 billion and building SH 121 would have a net tax cost-benefit of approximately $3.3 billion.

Table 5-9 – Net Public Cost-Benefit

	No-Build Alternative	Build Alternative
Total Direct and Indirect Taxes	$1,995,964,000	$3,709,383,000
Taxes on ROW Reinvestment	$0	$39,615,000
Subtotal - Total Tax Benefit	$1,995,964,000	$3,748,998,000
Minus Construction Costs	$0	$342,216,000
Minus ROW Purchase	$0	$58,477,000
Minus Tax Loss from ROW Acquisition	$0	$24,801,000
Subtotal - Costs	$0	$425,494,000
Net Tax Cost-Benefit	**$1,995,964,000**	**$3,323,504,000**

Projected economic benefits of this project reflect improved access to areas designated for commercial and retail development by the City.

5.8. Pedestrian and Bicycle Impacts

According to *Mobility 2025 – 2004 Update*, as drafted by the MPO for the DFW Metropolitan Area, bicycle and pedestrian enhancements are included as strategies to reduce the dependency on automobile travel. The plan identifies the widening of outside lanes on arterial streets to create a safer environment and recommends the development of a companion off-street system referred to as the Regional veloweb. A veloweb is composed of roads with limited stop signs and traffic signals to accommodate fast moving bicyclists. According to the Regional veloweb primary plan considerations, trails should go over or under major roadways (grade separated crossings). At intersecting roadways, pedestrians and bicyclists would be accommodated by sidewalks and designated bike lanes, as appropriate.

The Trinity Bicycle/Pedestrian Trail is included in the Regional veloweb off-street trail system and is located within the project area. The Trinity Bicycle trail is located on land under the administration (control) of the Tarrant Regional Water District (TRWD) and is located adjacent to the Clear Fork of the Trinity River, generally adjacent to maintenance roads controlled by the TRWD. These areas would be spanned by bridge structures and the ownership of this land would not change hands for this project. The bicycle trail as it exists today, should not be disturbed by this project because SH 121 would span the river and the bicycle trail.

Construction of SH 121 would require the temporary detour for this trail at two locations. One location of the trail proposed for temporary detour is found adjacent to the west bank of the Clear Fork of the Trinity River south of the existing IH 30 crossing of the river. The second location of the trail proposed for temporary detour is found upstream (to the southwest) of the first location and adjacent to the north bank of the Clear Fork of the Trinity River between Bryant Irvin Road and Hulen Street.

The proposed SH 121 would be constructed on structure at these locations and would span the bike trail and all property controlled by the TRWD. Construction activities at these locations would include hanging span structure support beams and construction of the span structure. This

construction would require moving construction material above the trail. No construction machinery would be allowed on the trail.

In order to ensure the safety of the public, trail users would be detoured during construction activities, i.e., moving support beams above the trail, at these locations. Detour of the trail at these locations would be temporary and of short duration. Users of the trail would be detoured only when the area is operating as a construction zone. When construction activities at each location pose no potential harm to trail users the trail would be re-opened for use at that location. No property ownership transfers for any portion of the bike trail or for any property controlled by TRWD would occur. No portion of the bike trail or property controlled by TRWD would be retained for long-term use by NTTA or TxDOT.

NTTA and TxDOT proposes to provide a reasonable and safe detour route for the trail users during the construction at the previous described locations, pursuant to 23 U.S.C. 109 (m). The proposed detour locations are depicted on Exhibit 4.6. The temporary trail detour would not result in temporary or permanent adverse changes to the activities, features, or attributes, which are essential to the purpose or functions of the trail. NTTA and TxDOT would coordinate the route and operation of the temporary detour with the TRWD. Prior to construction, NTTA and TxDOT would secure an agreement with the City and the TRWD concerning the temporary detour at the previous-described locations.

Connections to hike and bike trails would be considered in the amenities portion of the project detailed design at a later date. Park planning and other such activities outside of project ROW are, however, not within NTTA or TxDOT's authority or jurisdiction. The City would be responsible for Parks and Recreation planning and development of such facilities. Members of the Fort Worth Parks and Community Services Department have been present at several meetings during the extensive public involvement process for SH 121. This process has included numerous public meetings conducted by the SH 121 team, the CAC (City of Fort Worth), the Peer Review (City of Fort Worth), the PDT (City of Fort Worth) and other public meetings held by the City. Documentation of

participation in this extensive public involvement process is on file at the TxDOT Fort Worth District Office.

The project would cross the existing off-street hard surface trail along the Trinity River, which is part of the Fort Worth Trinity Trails, at two locations along the Clear Fork of the Trinity River. *Mobility 2025 - 2004 Update* maintains an inventory of existing and planned bicycle and pedestrian facilities. There are no planned or programmed trails along the proposed SH 121 or within project limits. The nearest planned bicycle or pedestrian facilities are the on-street system bicycle route and the City adopted off-street bicycle/pedestrian route located within the Forest Park area.

The project would be a multi-lane controlled access tollroad and, as such, would not incorporate design for pedestrian or bicyclist facilities longitudinally along the tollroad. At intersecting roadways, pedestrian and bicycle accommodations would be coordinated with the local jurisdictions.

5.8.1. Alternatives A, B, C, C/A and D

Impacts to existing bicycle or pedestrian facilities would be limited to the construction phase with no long-term impacts expected. Preliminary design of the project provides for the primary consideration of the Regional veloweb by providing grade-separated crossings at the existing trails. A map of the existing trails (Exhibit 4.6) depicts the proposed SH 121 location and bicycle and pedestrian facilities that would be affected by construction.

5.8.2. No-Build Alternative

The No-Build alternative would have no impact to bicycle or pedestrian facilities.

5.9. Section 4(f) Impacts

Section 4(f) is the national policy created to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges and historic sites. It is part of the *DOT Act of 1966*. Regulations issued by the FHWA implementing the *1966 DOT Act* and the *1966 Federal*

Highway Act, as amended by the *1968 Federal Highway Act*, require coordination with jurisdictional agencies when Federal projects use public parks, recreation lands, wildlife and waterfowl refuges or historic sites. The purpose of Section 4(f) is to protect such lands by requiring additional scrutiny and rigorous test requirements before their use in a transportation project can be approved. Section 4(f) states that land from a publicly owned park, recreation area, wildlife/waterfowl refuge or historic site can be used for a transportation project only if there is no feasible and prudent alternative to the use of the resource and all possible planning has been taken to minimize harm to the resource.

5.9.1. Publicly Owned Parks, Recreation, Wildlife and Waterfowl Refuge Lands

Other than the Trinity Bicycle/Pedestrian Trail, there are no publicly owned lands for parks, recreation areas, wildlife and waterfowl refuge that could be classified as Section 4(f) lands within the project area. With regard to the Trinity Bicycle/Pedestrian Trail, FHWA has determined that a Section 4(f) document would not be necessary because ROW would not be acquired and because the trail closure would be temporary with detours provided.

ROW for SH 121 would not be required from publicly owned parks, recreation areas, wildlife and waterfowl refuge of National, State, or local significance.

The Trinity Bicycle/Pedestrian Trail along the Clear Fork of the Trinity River, maintained by the City of Fort Worth Parks and Community Services Department, would not be permanently affected by this project. Measures to avoid impacts to the trail have been addressed within Exhibit 4.6 and further discussion is Section 4.6, Publicly Owned Facilities and Community Services and Section 5.8, Pedestrian and Bicycle Impacts. No permanent impacts to the trail would occur due to the project. The TPWD 1995 TORP shows no plans being developed for future public facilities and community services within the project area.

5.9.2. Cultural Impacts

Archeological Impacts

Archeological resources are discussed in detail in Chapter 4.4.2, Archeological Sites. With regard to potential Section 4(f) properties, a buried prehistoric site has been located on the south side of the Clear Fork of the Trinity River (March 1999 survey). This site is within the northern section of the PSC. Regulatory coordination regarding the possible significance of this site is ongoing. Due to its intact nature, good organic preservation and the presence of intact rock or hearth features, the site might be eligible for inclusion on the NRHP and/or as a SAL. The results of the survey suggest that no additional prehistoric sites exist within the PSC, much of which has been disturbed by historic fill.

Historic Impacts

Historic resources are discussed in detail in Chapter 4.4.3. With regard to Section 4(f) properties, historic resources could potentially be impacted under Alternatives B and D, but would not be impacted under Alternatives A, C and C/A.

Alternatives A

Alternative A does not require property from any historic properties.

Alternative B

Alternative B has been identified as having potential impacts at the Holly Water Plant and the Lancaster bridge that would require Section 4(f) evaluations.

Alternative C and C/A

Alternative C and Alternative C/A do not require property from any historic properties.

Alternative D

Alternative D has been identified as having potential impacts at the Holly Water Plant and the Lancaster bridge that would require Section 4(f) evaluations.

No-Build Alternative

The No-Build alternative would have no impact on Section 4(f) properties.

5.10. Air Quality Impacts

In order to protect the public health, safety and welfare from the hazardous affects of air pollution, the CAA of 1970 mandated the establishment of the NAAQS. Table 5-10 lists both primary and secondary standard pollutant concentrations for sulfur dioxide (SO_2), particulate matter (PM), CO, O_3, Nitrogen Oxides (NO_x) and lead (Pb). When the pollutant levels within an area cause a violation of the standard, the area is classified as non-attainment for the pollutant.

Under the CAAA of 1990, the EPA was authorized to designate areas failing to meet O_3 standards. Where these areas are located, the State is then required to submit a SIP to the EPA. This legal document (SIP) is a collection of regulations that explain how the State would reduce emissions and help meet O_3 standards. The CAAA also required the MPOs and the U.S. DOT to determine the conformity to State or Federal Implementation Plans of Transportation Plans, Programs and Projects Funded under Title 23 USC or the *Federal Transit Act*.

The air quality impacts of any transportation project are addressed by applying a mesoscale and a microscale analysis. The first one is performed on those pollutants that cannot be analyzed on a project-by-project basis but by region, such as O_3. A microscale analysis is performed on CO, which is a project-related concern.

Table 5-10 – National Ambient Air Quality Standards

Pollutant	Averaging Period	Standard	Primary NAAQS	Secondary NAAQS
O_3	1-hour	Not to be at or above this level on more than three days over three years	125 ppb	125 ppb
	8-hour	The average of the annual fourth highest daily eight-hour maximum over a three-year period is not to be at or above this level	85 ppb	85 ppb
CO	1-hour	Not to be at or above this level more than once per calendar year	35.5 ppm	35.5 ppm
	8-hour	Not to be at or above this level more than once per calendar year	9.5 ppm	9.5 ppm
SO_2	3-hour	Not to be at or above this level more than once per calendar year	-	550 ppb
	24-hour	Not to be at or above this level more than once per calendar year	145 ppb	-
	Annual	Not to be at or above this level	35 ppb	-
Nitrogen Dioxide (NO_2)	Annual	Not to be at or above this level	54 ppb	54 ppb
Respirable PM (10 microns or less)	24-hour	The three-year average of the annual 99th percentile for each monitor within an area is not to be at or above this level	155 $\mu g/m^3$	155 $\mu g/m^3$
	Annual	The three-year average of annual arithmetic mean concentrations at each monitor within an area is not to be at or above this level	51 $\mu g/m^3$	51 $\mu g/m^3$
Respirable PM (2.5 microns or less)	24-hour	The three-year average of the annual 98th percentile for each population- oriented monitor within an area is not to be at or above this level	66 $\mu g/m^3$	66 $\mu g/m^3$
	Annual	The three-year average of annual arithmetic mean concentrations from single or multiple community-oriented monitors is not to be at or above this level	15.1 $\mu g/m^3$	15.1 $\mu g/m^3$
Pb	Quarter	Not to be at or above this level	1.55 $\mu g/m^3$	1.55 $\mu g/m^3$

Source: EPA's National Ambient Air Quality Standard.

5.10.1. Mesoscale Analysis

Four areas in Texas: Houston/Galveston, Beaumont-Port Arthur, DFW and El Paso are in non-attainment for O_3 under the 1-hour standard. Under this standard, O_3 concentrations of 125 ppb

should not be met or exceeded more than three times in three consecutive years at the same monitoring site. Tarrant County has recently been classified as non-attainment under the 8-hour ozone standards. A demonstration of transportation conformity for added capacity projects to the 8-hour O3 standard is not required until the end of the EPA one-year grace period. The EPA one-year grace period will end June 15, 2005. Under 8-hour standard, ozone concentrations for the average of the annual fourth highest daily eight-hour maximum over a three year period cannot be at or above 85ppb.

NCTCOG conducted the air quality conformity determinations for *Mobility 2025 - 2004 Update* and for the *2004-2006 TIP* for the Metroplex. The NCTCOG used the EPA's Mobile Source Emission Factor Model (MOBILE) for the 2007, 2015 and 2025 analysis years for the conformity analysis. The Volatile Organic Compounds (VOC) and NO_x emissions from each of the previous mentioned action scenario years are all under the emission budget. Using the same model the NO_x emissions for the same years were also below the emission limit budget. Both precursors of O_3 meet conformity criteria. Results of the conformity determination show that *Mobility 2025 – 2004 Update* and the *2004-2006 TIP* meet the transportation requirements of the CAAA (42 USC. 7504, 750(c) and (d)) and the transportation conformity rule (40 CFR Parts 51 and 93).

In addition to the NAAQS set forth by EPA for the six criteria pollutants, EPA has also established a list of 33 urban air toxics. Urban air toxics, also know as hazardous air pollutants, are pollutants that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects. Most air toxics originate from human-made sources, including on-road mobile sources (i.e., cars, trucks, buses), non-road mobile sources (i.e., construction equipment, aircraft, lawnmowers) and stationary sources (i.e., refineries, power plants, factories), as well as indoor sources (i.e., building materials). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires.

These pollutants are in our atmosphere as a result of our industrialized society, but science has been providing more evidence about the risks they pose to human health. The health risks for people exposed to urban air toxics at sufficiently high concentrations or lengthy durations include an

increased risk for getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive, developmental, respiratory and other health problems.

To better understand the harmful effects road sources of urban air toxics have on human health, in 1996 EPA developed a list of 22 mobile source air toxics (MSAT), such as acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein and 1,3-butadiene and assessed the risks of various kinds of exposures to these pollutants on human health. In July 1999, the EPA published a strategy to reduce urban air toxics. In March 2001, the EPA issued regulations for the producers of urban air toxics to decrease the amounts of these pollutants by target dates in 2007 and 2020. Under these regulations, between 1999 and 2020, on-road emissions of benzene, formaldehyde, 1,3-butadiene and acetaldehyde will be reduced by 67 to 76 percent and on-road highway PM emissions will be reduced by 90 percent. These reductions are due to the impacts of national mobile source control programs, including the reformulated gasoline program, a new cap on the toxics content of gasoline, the national low emissions vehicle standards, the Tier 2 motor vehicle emissions standards and on-road diesel fuel sulfur control requirements. These are net emission reductions, that is, the reductions that will be experienced even after growth in VMT is taken into account.

The EPA has not yet determined how best to evaluate the impact of future roads and intersections on the ambient concentrations of urban air toxics. There are no standards for MSAT and there are no tools to determine the significance of localized concentrations or of increases or decreases in emissions. Without the necessary standards and tools, we cannot analyze the specific impacts of certain transportation related projects in any meaningful way. With the information currently available, all we can conclude is that 1) there are likely to be localized concentrations of air toxics along the new highway that are similar to those experienced by existing residences at similar distances from other similar arterial corridors and 2) regardless of the alternative chosen, emissions in the project area will decrease over time due to EPA's national control programs.

EPA has determined the health effects of fine PM and has set the PM2.5 standard to ensure that the public health is protected. Many areas of the country, including Texas, are in the process of

monitoring levels of PM2.5 and this monitoring will serve as the basis for whether this pollutant needs to be addressed at the regional scale, local scale, or both. All Texas counties are currently monitoring attainment. FHWA believes that PM2.5 at a project level cannot be determined at this time. It may turn out that PM2.5 is very similar to ozone in that it is a regional effect, not a localized effect. Therefore, a regional analysis of PM2.5 may ultimately be required.

According to *Mobility 2025 - 2004 Update*, the recommended project is planned as a six-lane tollroad from IH 30 to Altamesa/Dirks Road by 2015 and a four-lane tollroad from Altamesa/Dirks Road to FM 1187 for the same year. Opening year of the facility is currently expected to be after 2007 with construction occurring in stages. All projects in the MPO TIP that are proposed for Federal or State funds were initiated in a manner consistent with Federal guidelines in section 450, of Title 23 CFR and Section 613.200, Subpart B, of Title 49 CFR. Energy, environment, air quality, cost and mobility considerations are addressed in the programming of the TIP. The proposed action is consistent with the area's financially constrained *Mobility 2025 - 2004 Update* and the *2004-2006 TIP* found to conform to the CAAA of 1990, by the U.S. DOT on April 8, 2004.

The proposed SH 121 is part of the *Mobility 2025 - 2004 Update* as one of the facilities to improve the regional transportation system by the construction of a new roadway facility and a rural highway southwest of Tarrant County. Therefore, the project is included in a plan that meets conformity.

5.10.2. Microscale Analysis

Tarrant County is in attainment with CO standards. CO concentrations have not exceeded the 1-hour standard of 35.5 ppm as of May 24, 2004. A monitoring site located on Ross Avenue near downtown Fort Worth records 1-hour CO concentrations in ppm for the area. Monthly reports provided by the TCEQ Data Management and Analysis Department show daily maximum 1-hour readings at the station for 2001, 2002, 2003 and 2004 (up to May 24, 2004). The maximum 1-hour concentrations for each year are shown on Table 5-11 as well as the month of occurrence. The reports show no values exceeding the 35.5 ppm standard. The highest concentration was 4.0 ppm recorded in February and November of 2002. This concentration is 14 percent of NAAQS.

Table 5-11 – Yearly Maximum 1-Hour Carbon Monoxide Concentrations, 2001-2004

Year	Max 1-Hour CO Concentration in ppm	Month
2001	3.4	November and December
2002	4.0	February and November
2003	3.9	January
2004	2.3	February

Source: TCEQ Data Management and Analysis Department as of 4/24/2004.

For this project, MOBILE6 composite emission factors and the California Line Source Model (CALINE3) were used to predict the hourly CO concentrations for the estimated time of construction completion (ETC), 2008 and the ETC+20, 2028. MOBILE6 takes into account the benefits gained from the inspection/maintenance (I/M) and anti-tampering programs that have been in place since the mid 80's and early 90's, the existence of newer more efficient vehicles and the elimination of old and inefficient vehicles from the roadway. Modeling speeds used were 65 mi per hour (mph) on the north and south main lanes of the facility, 40 mph on frontage roads and 50 mph on ramps.

The emission factors in grams per mile (gm/mile) (Table 5-12) were then used in CALINE3 to predict the 1-hour CO concentration generated by motor vehicles within the PSC. The worst-case meteorological conditions were used. Results were modeled every 30 degrees of wind direction, with a CO background concentration of 1.8 ppm and the 2008 and 2028 design hourly traffic volume. The CO total concentrations at sensitive receivers and along the ROW were determined for each case.

Table 5-12 – MOBILE6 CO Emission Factors Used (gm/mile)

Speed in mph	2008	2028
65*	22	12
50	20	11
40	19	11

Source: EPA's "look up tables" for the DFW area.
* *Maximum speed (worse case scenario) that can be modeled with MOBILE6.*

The highest 1-hour CO concentrations at each receiver and along the project ROW are depicted in

Table 5-13 for year 2008 and Table 5-14 for year 2028. Exhibit 5.2 through Exhibit 5.5 depict the locations of air modeling sites.

Modeling results show that for the ETC year (2008), north of Bellaire Drive, the average percent of NAAQS (35.5 ppm) along the ROW is 15 percent and the average CO concentration is 5.5 ppm. South of Bellaire Drive, the average NAAQS is 11 percent with an average CO concentration of 3.8 ppm. In ETC + 20 year (2028), north of Bellaire Drive, the average percent of NAAQS along the ROW is 16 percent and the average CO concentration is 6.2 ppm. South of Bellaire Drive, the average NAAQS is 15 percent with an average CO concentration of 5.1 ppm. None of the CO levels at the sensitive receivers (San Mateo Church, Fort Worth Country Day School, Hunters Green Apartments, Hunters Ridge Apartments, Marina Club Apartments, All Saints Hospital, Harris Methodist Hospital, Hulen Bend Addition and other residential areas) exceeded the 1-hour NAAQS standards. The Toll Plaza was analyzed using the appropriate emission factors to best describe the traffic activity at the approaching lanes and the tollbooths. The CO concentrations north and south of this area were modeled to be 12 and 16 percent of the NAAQS standard (35.5 ppm) in the year 2008 and 14 and 22 percent of the NAAQS standard in the year 2028.

Alternatives A, B, C, C/A and D

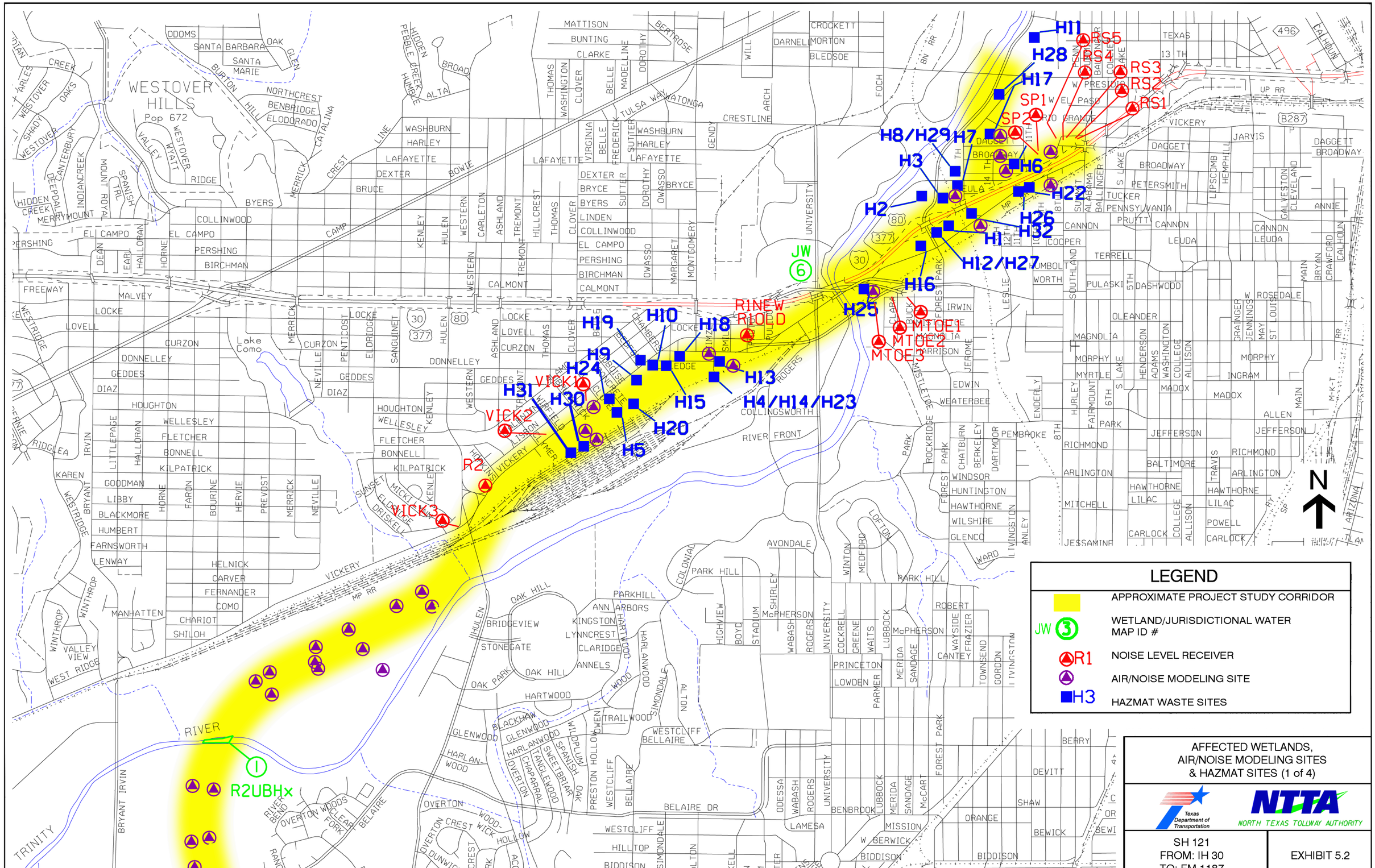
Based on MOBILE6 and CALINE3 air quality models, the Build alternatives would not degrade the air quality in the PSC. CO concentrations are not expected to exceed current NAAQS standards. MOBILE6 emissions are predicted to decrease due to program improvements and the existence of more efficient vehicles, decreasing the CO concentrations. The *Mobility 2025 – 2004 Update* includes the Build alternative of this project, its implementation would help improve air quality and meet the transportation needs of the future.

Table 5-13 – Predicted 1-Hour Carbon Monoxide Concentrations in parts per million, 2008

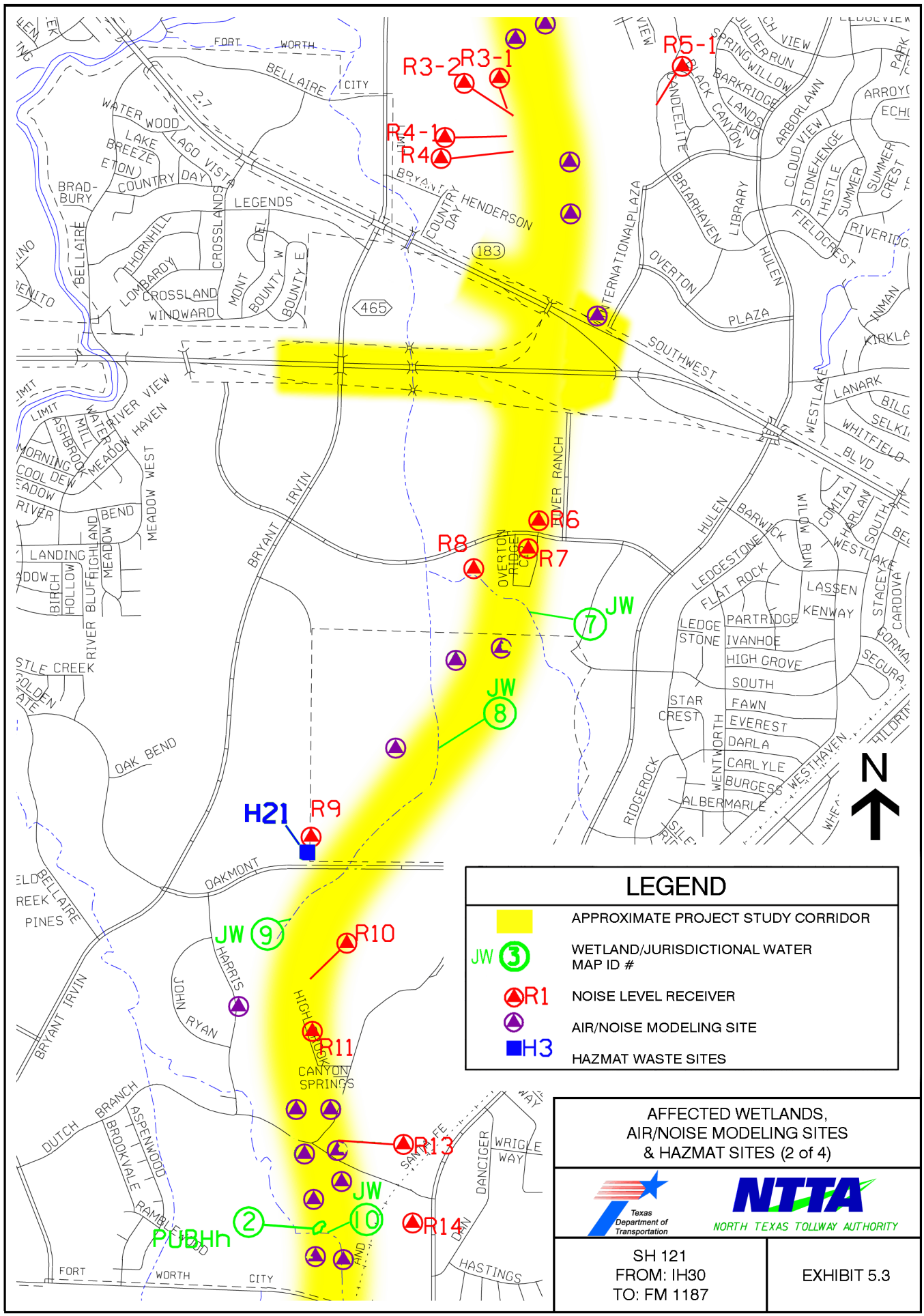
Modeling Years	2008						
Highway Area/Segment	**Traffic Volume in veh/hr**	**1 hr CO at Receiver**	**1 hr CO at ROW**	**Percent of NAAQS (35.5 ppm) at ROW**	**8 hr CO at Receiver**	**8 hr CO at ROW**	**Percent of NAAQS (9 ppm) at ROW**
East of Forest Park, north of IH 30	20,534	NA	10.7	30%	NA	6.5	73%
East of Forest Park, South of IH 30	21,478	NA	8.9	25%	NA	5.5	61%
East of Forest Park Boulevard, along Southwest Parkway, south of IH 30	18,526	NA	4.6	13%	NA	2.9	32%
West of Forest Park to Rosedale	22,186	NA	3.8	11%	NA	2.4	27%
North of Toll Plaza along Vickery Boulevard	5,428	NA	4.1	12%	NA	2.6	29%
South of Toll Plaza	5,428	NA	6	17%	NA	3.7	41%
Hulen Street bridge	9,205	NA	3.9	11%	NA	2.5	27%
San Mateo Church	5,665	4.4	3.3	9%	2.8	2.1	23%
South of Hulen Street bridge to proposed Stonegate	4,350	NA	4.1	12%	NA	2.6	29%
Proposed Stonegate to the Trinity River	9,205	NA	5.1	14%	NA	3.2	35%
South of the Trinity River to Bellaire Drive	10,858	NA	5.6	16%	NA	3.5	39%
Bellaire Drive to SH 183 at Country Day School:	6,389		3.2	9%		2.0	23%
Kindergarten area		3.5			2.2		
Middle school area		3.4			2.16		
Library area		3.0			1.92		
South of Overton Ridge Boulevard to proposed Oakmont Boulevard:	8,025		4	11%		2.5	28%
Hunters Green Apartments		4.5			2.82		
Hunters Ridge Apartments		4.4			2.76		
Marina Club		4.6			2.88		
South of Overton Ridge Boulevard to proposed Oakmont Boulevard:	7,081		4.1	12%		2.6	29%
All Saints Hospital		2.7			1.74		
South of Oakmont Boulevard to Dutch Branch Road:	4,248			10%			24%
Hulen Bend Addition (under construction)		2.6	3.5		1.68	2.2	
Harris Methodist Hospital		2.5	2.7		1.62	1.7	
Dutch Branch Road to Dirks Road	6,844		3.8	11%		2.4	27%
New Residence 1		4.1			2.58		
New Residence 2		4.6			2.88		
Sycamore School Road To proposed McPherson	5,310	NA	3	8%	NA	1.9	21%
Proposed McPherson to Cleburne-Crowley Road	2,360	NA	4.2	12%	NA	2.6	29%
Cleburne-Crowley Road to FM 1187	4,484	NA	4.4	12%	NA	2.8	31%

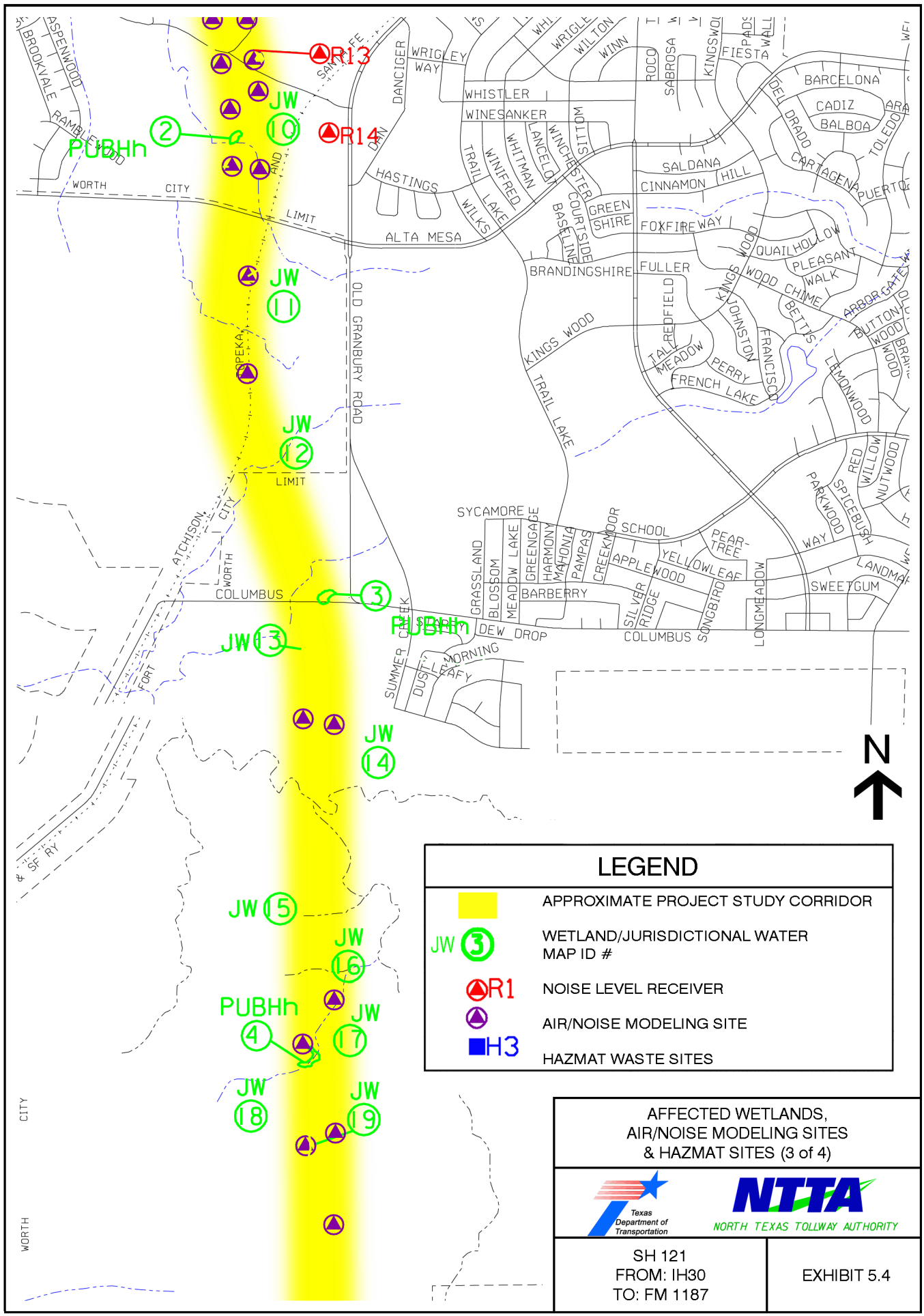
Table 5-14 – Predicted 1-Hour Carbon Monoxide Concentrations in parts per million, 2028

Modeling Years	2028						
Highway Area/Segment	**Traffic Volume in veh/hr**	**1 hr CO at Receptor**	**1 hr CO at ROW**	**Percent of NAAQS (35.5 ppm) at ROW**	**8 hr CO at Receptor**	**8 hr CO at ROW**	**Percent of NAAQS (9 ppm) at ROW**
East of Forest Park, north of IH 30	37,088	NA	10.7	30%	NA	6.5	73%
East of Forest Park, South of IH 30	38,793	NA	9	25%	NA	5.5	61%
East of Forest Park Boulevard, along Southwest Parkway, south of IH 30	33,466	NA	4.7	13%	NA	2.9	33%
West of Forest Park to Rosedale	23,891	NA	3.7	10%	NA	2.3	26%
North of Toll Plaza along Vickery Boulevard	9,804	NA	5.1	14%	NA	3.2	35%
South of Toll Plaza	9,804	NA	7.7	22%	NA	4.7	53%
Hulen Street bridge	16,626	NA	6.1	17%	NA	3.8	42%
San Mateo Church	11,801	4.6	3.4	10%	2.1	2.2	24%
South of Hulen Street bridge to proposed Stonegate	13,615	NA	5.6	16%	NA	3.5	39%
Proposed Stonegate to the Trinity River	16,626	NA	6.4	18%	NA	4.0	44%
South of the Trinity River to Bellaire Drive	28,913	NA	5.5	15%	NA	3.4	38%
Bellaire Drive to SH 183 at Fort Worth Country Day School:	11,540		3.9	11%		2.5	28%
Kindergarten area		3.5			2.2		
Middle school area		3.4			2.2		
Library area		3.0			1.9		
South of Overton Ridge Boulevard to proposed Oakmont Boulevard:	14,494		5.2	15%		3.2	36%
Hunters Green Apartments		4.7			2.9		
Hunters Ridge Apartments		4.7			2.9		
Marina Club		4.6			2.9		
South of Overton Ridge Boulevard to proposed Oakmont Boulevard:	20,128		5.6	16%		3.5	39%
All Saints Hospital		3.2			2.0		
South of Oakmont Boulevard to Dutch Branch Road:	13,309			13%			
Hulen Bend Addition (under construction)		3.2	4.6		2.0	2.9	32%
Harris Methodist Hospital		2.9	4.4		1.9	2.8	31%
Dutch Branch Road to Dirks Road	12,363		4.5	13%		2.8	31%
New Residence 1		4.8			3.0		
New Residence 2		5.4			3.4		
Sycamore School Road to proposed McPherson	9,591	NA	3.9	11%	NA	2.5	27%
Proposed McPherson to Cleburne-Crowley Road	8,785	NA	6.6	19%	NA	4.1	45%
Cleburne-Crowley Road to FM 1187	9,091	NA	7	20%	NA	4.3	48%



LEGEND
APPROXIMATE PROJECT STUDY CORRIDOR
JW 3 WETLAND/JURISDICTIONAL WATER MAP ID #
R1 NOISE LEVEL RECEIVER
AIR/NOISE MODELING SITE
H3 HAZMAT WASTE SITES
AFFECTED WETLANDS, AIR/NOISE MODELING SITES & HAZMAT SITES (1 of 4)
Texas Department of Transportation
NTTA NORTH TEXAS TOLLWAY AUTHORITY
SH 121
FROM: IH 30
TO: FM 1187
EXHIBIT 5.2
N
WESTOVER HILLS
Pop 672
H11
H28
H17
RS5
RS4
RS3
RS2
RS1
SP1
SP2
H8/H29
H7
H3
H6
H2
H22
H26
H32
H1
H12/H27
H16
H25
MTOE1
MTOE2
MTOE3
R1NEW
R1OLD
H19
H10
H18
H9
H24
H13
H15
H4/H14/H23
H31
H30
H20
H5
VICK1
VICK2
VICK3
R2
JW 6
R2UBHx
1
RIVER
TRINITY


R3-2
R3-1
R5-1
R4-1
R4
R6
R7
R8
R9
R10
R11
R13
R14
H21
JW 7
JW 8
JW 9
JW 10
JW 2
PUBHh
N
LEGEND
APPROXIMATE PROJECT STUDY CORRIDOR
JW 3 WETLAND/JURISDICTIONAL WATER MAP ID #
R1 NOISE LEVEL RECEIVER
AIR/NOISE MODELING SITE
H3 HAZMAT WASTE SITES
AFFECTED WETLANDS, AIR/NOISE MODELING SITES & HAZMAT SITES (2 of 4)
Texas Department of Transportation
NTTA NORTH TEXAS TOLLWAY AUTHORITY
SH 121
FROM: IH30
TO: FM 1187
EXHIBIT 5.3



LEGEND

	APPROXIMATE PROJECT STUDY CORRIDOR
JW 3	WETLAND/JURISDICTIONAL WATER MAP ID #
R1	NOISE LEVEL RECEIVER
	AIR/NOISE MODELING SITE
H3	HAZMAT WASTE SITES

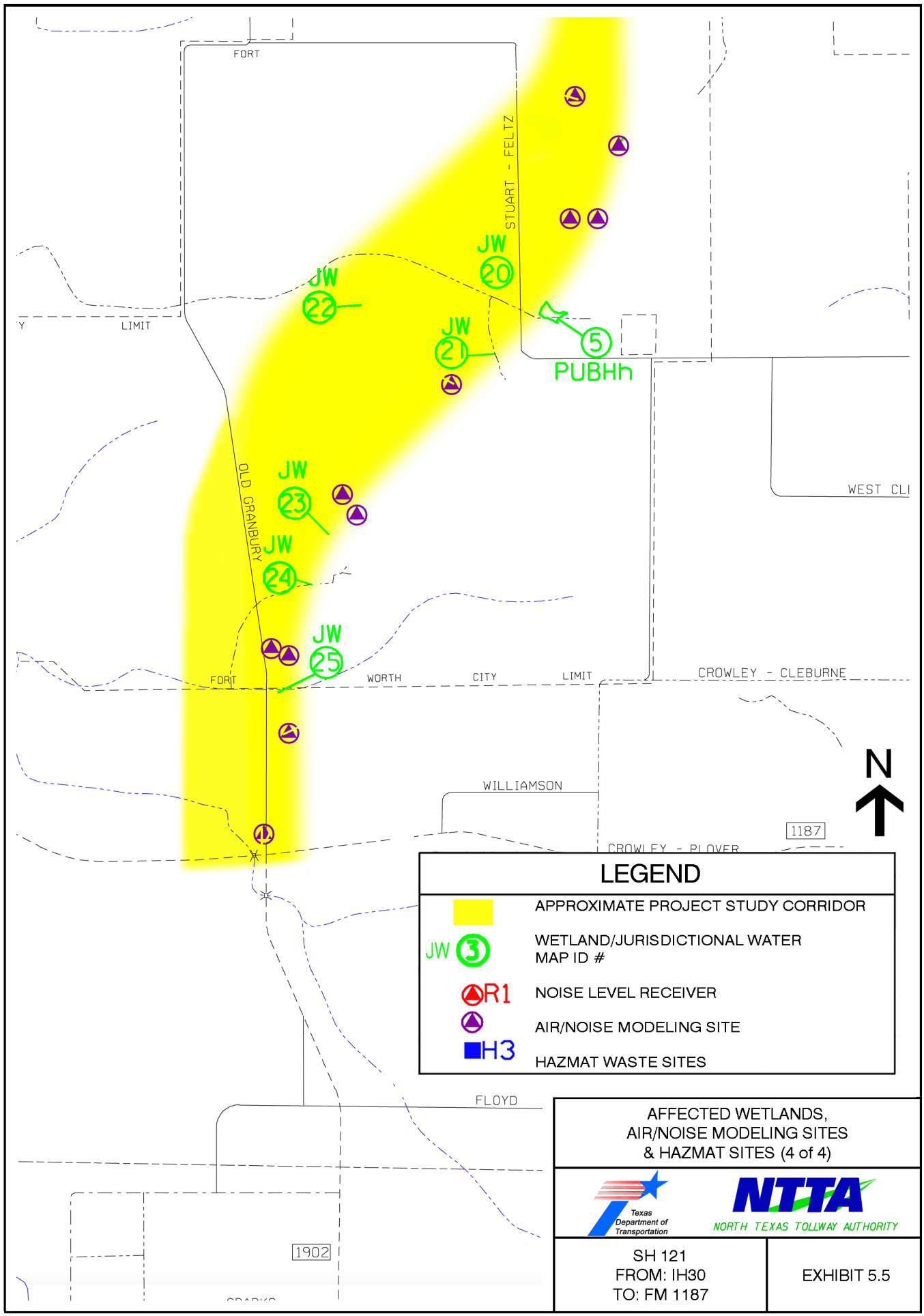
AFFECTED WETLANDS, AIR/NOISE MODELING SITES & HAZMAT SITES (3 of 4)

Texas Department of Transportation

NTTA NORTH TEXAS TOLLWAY AUTHORITY

SH 121
FROM: IH30
TO: FM 1187

EXHIBIT 5.4


FORT
STUART - FELTZ
JW 20
JW 22
JW 21
5
PUBHh
LIMIT
OLD GRANBURY
JW 23
JW 24
JW 25
WEST CLI
FORT
WORTH
CITY
LIMIT
CROWLEY - CLEBURNE
WILLIAMSON
1187
CROWLEY - PLOVER
N
LEGEND
APPROXIMATE PROJECT STUDY CORRIDOR
JW 3
WETLAND/JURISDICTIONAL WATER
MAP ID #
R1
NOISE LEVEL RECEIVER
AIR/NOISE MODELING SITE
H3
HAZMAT WASTE SITES
FLOYD
1902
AFFECTED WETLANDS,
AIR/NOISE MODELING SITES
& HAZMAT SITES (4 of 4)
Texas Department of Transportation
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
SH 121
FROM: IH30
TO: FM 1187
EXHIBIT 5.5

5.10.3. No Build Alternative

The No Build alternative would not be consistent with local transportation plans and programs. Based on the predicted 2025 population and employment growth and the traffic congestion, the No Build alternative of this project might contribute to air quality degradation.

5.11. Noise Impacts

A preliminary noise analysis in accordance with FHWA Regulation 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise and TxDOT's 1996 Guidelines for Analysis and Abatement of Highway Traffic Noise was conducted for the proposed tollroad and presented in the DEIS. The purpose of the analysis was to determine potential traffic noise impacts on developed land adjacent to the alternatives under consideration. A more detailed, in depth analysis in accordance with FHWA Regulation 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise and TxDOT's 1996 Guidelines for Analysis and Abatement of Highway Traffic Noise has been performed for the recommended alternative and is included herein.

5.11.1. Sound Measurement Units

Sound from highway traffic is generated primarily from vehicle tires, engine and exhaust. It is commonly measured in dB.

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sound. This adjustment is called A-weighting and is expressed as dB(A).

Also, because traffic sounds are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as L_{eq}. L_{eq} is defined as the equivalent steady state sound levels, which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same period. $L_{eq}Hr$

means the L_{eq} established over a one-hour period. Common outdoor and indoor sound levels are listed on Table 5-15.

Table 5-15 – Common Sound/Noise Levels

Outdoor	dB(A)	Indoor
Pneumatic hammer	100	Subway Train
Gas lawn mower at 3 ft		
	90	Food blender at 3 ft
Downtown (large city)	80	Garbage disposal at 3 ft
Lawn mower at 100 ft	70	Vacuum cleaner at 10 ft
		Normal speech at 3 ft
Air conditioning unit	60	Clothes dryer at 3 ft
Babbling brook		Large business office
Quiet urban (daytime)	50	Dishwasher (next room)
Quiet urban (nighttime)	40	Library

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established NAC shown in Table 5-16, for various land use activity areas that are used to determine if a traffic noise impact has occurred.

A noise impact occurs when either the absolute or relative criterion is met:

Absolute Criterion: The predicted noise level at a receiver approaches, equals or exceeds the NAC. Approach is defined as one dB(A) below the NAC. For example: a noise impact would occur at a category B residence if the noise level is predicted to be 66 dB(A) or above.

Table 5-16 – Federal Highway Administration Noise Abatement Criteria

Activity Category	dB(A) L_{eq}	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 (exterior)	Developed lands, properties or activities not included in categories A or B above.
D	—	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Note: Primary consideration is given to exterior areas (Category A, B or C) frequently used by humans. However, interior areas (Category E) are used if exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

Relative Criterion: The predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. Substantially exceeds is defined as more than 10 dB(A). For example: a noise impact would occur at a category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A), i.e., an 11 dB(A) increase.

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact on an activity area.

5.11.2. Methodology

Presently the predominant noise generators north of Bellaire Drive in the proposed tollroad project area are vehicular traffic and the UPRR Yard. Noise from the railroad yard is attributed to the existing train hump station. This station is where railcars are released from the train they are on and

sent over a hump to self propel to a new train by a computer operated switch network. The noise from the impact as the railcar connects with a new train can be heard from quite a distance.

Land use from Vickery Boulevard to FM 1187, is predominantly undeveloped with a few exceptions such as a school, a church, two hospitals and residential areas. The church, the hospital and the multi-family residential areas have no frequent human outdoor activity areas between highway and receiver; therefore, they were analyzed as activity category E (interior), with FHWA NAC of 52 dB(A). Because the school and the single-family areas south of Oakmont Boulevard, Sunset Terrace and Mistletoe Heights have frequent human outdoor activity areas facing the proposed SH 121, they were analyzed as activity NAC category B (exterior), with FHWA NAC of 67 dB(A).

The receivers identified in Table 5-17 were modeled along the tollroad. The noise levels for the interior categories were modeled and estimated using a noise reduction factor based on the type of building structure. Existing and predicted noise levels at each site, as well as receiver location are shown on Table 5-17. Noise modeling sites were also located along the undeveloped land based on future land use or zoning designations. Exhibit 5.6 shows the location of the noise monitoring/modeling sites.

The FHWA Traffic Noise Model software was used to calculate predicted traffic noise levels. The model considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the location of activity areas likely to be impacted by the associated traffic noise. Predicted traffic noise levels for the year 2025 were modeled at locations that represent activity areas B, C, D and E adjacent to the roadway that might be impacted by traffic noise and that may potentially benefit from reduced noise levels.

5.11.3. Results

As indicated in Table 5-15, predicted noise levels exceed existing levels by a maximum of 18 dB(A), the NAC was approached, equaled or exceeded (absolute criterion) and substantially exceeded the existing levels at 16 receivers. Therefore, the project would result in a traffic noise impact and the

Table 5-17 – Traffic Noise Levels L_{eq}

Receiver	Site	Location	NAC Category	NAC Level	Existing Noise Level	Predicted Noise Level	Change (+/-)	Impact
RS1	Sunset Terrace House 1	Sunset Terrace	B	67	57	61	4	N
RS2	Sunset Terrace Apartment	Sunset Terrace	E	52	41	46	5	N
RS3	Sunset Terrace House 3	Sunset Terrace	E	52	40	45	5	N
RS4	Sunset Terrace House 4	Sunset Terrace	B	67	63	71	8	Y
RS5	Sunset Terrace House 5	Sunset Terrace	E	52	40	44	4	N
SP1	St. Paul School	West Freeway	E	52	40	41	1	N
SP2	St. Paul Church	West Freeway	E	52	40	43	3	N
MTOE1	Mistletoe House 1	West Rosedale Street	B	67	65	67	2	Y
MTOE2	Mistletoe House 2	West Rosedale Street	B	67	68	70	2	Y
MTOE3	Mistletoe House 3	Mistletoe Drive	B	67	68	71	3	Y
R1-NEW	San Mateo church (new building)	Lovell Avenue	E	52	40	48	8	N
R1-OLD	San Mateo church (old building)	Lovell Avenue	E	52	40	48	8	N
VICK1	AlamoHeights House 1	Vickery Boulevard	B	67	65	69	4	Y
VICK2	AlamoHeights House 2	Vickery Boulevard	B	67	66	70	4	Y
VICK3	AlamoHeights House 3	Vickery Boulevard and South Hulen Street	B	67	67	73	6	Y
R4	Fort Worth Country Day Middle School	Country Day Middle School building	B	67	50	63	13	Y
R4-1	Fort Worth Country Day Middle School	Country Day Middle School outdoor activity area	B	67	50	63	13	Y
R5-1	Overton Woods residences	Across Country Day Lane	B	67	50	50	0	N
R6	Hunters Ridge Apartments 1st floor	Briarhaven Road	E	52	40	44	4	N
R7	Hunters Green Apartments 1st floor	Overton Ridge Boulevard	E	52	40	40	0	N
R8	Marina Club Apartments 1st floor	Overton Ridge Boulevard	E	52	40	40	0	N
R9	All Saints Episcopal Hospital	Oakmont Boulevard	E	52	40	40	0	N
R10	Hulen Bend Addition House 1	East of Harris Parkway	B	67	56	74	18	Y
R11	Hulen Bend Addition House 2	East of Harris Parkway	B	67	56	73	17	Y
R13	Park Palisades House 1	North of Dutch Branch Road	B	67	56	70	14	Y
R14	Park Palisades House 2	South of Dutch Branch Road	B	67	56	71	15	Y

following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers.

5.11.4. Noise Abatement

Before any abatement measure can be incorporated into the project, it must be both feasible and reasonable. In order to be feasible, the measure should reduce noise levels by at least five dB(A) per benefited receiver; and to be reasonable the construction cost should not exceed $25,000 per benefited receiver.

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per five mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on SHs.

Alteration of horizontal and/or vertical alignments: any alteration of the existing alignment would displace existing businesses and residences, require additional ROW and not be cost effective/reasonable.

Buffer zone: the acquisition of sufficient undeveloped land adjacent to the highway project to preclude future development that could be impacted by highway traffic noise would not be cost effective/reasonable.

Noise barriers: this is the most commonly used noise abatement measure. For this project, a noise barrier would restrict access to a majority of the adjacent activity areas. Numerous gaps in the noise barrier would satisfy access requirements but would render the barrier ineffective (unfeasible). Also, noise barriers could have a detrimental impact on nearby businesses by restricting views and access by potential customers. Finally, a noise barrier would not be cost effective for an individual receiver. For these reasons, a noise barrier would not be feasible and reasonable for the receivers at Sunset

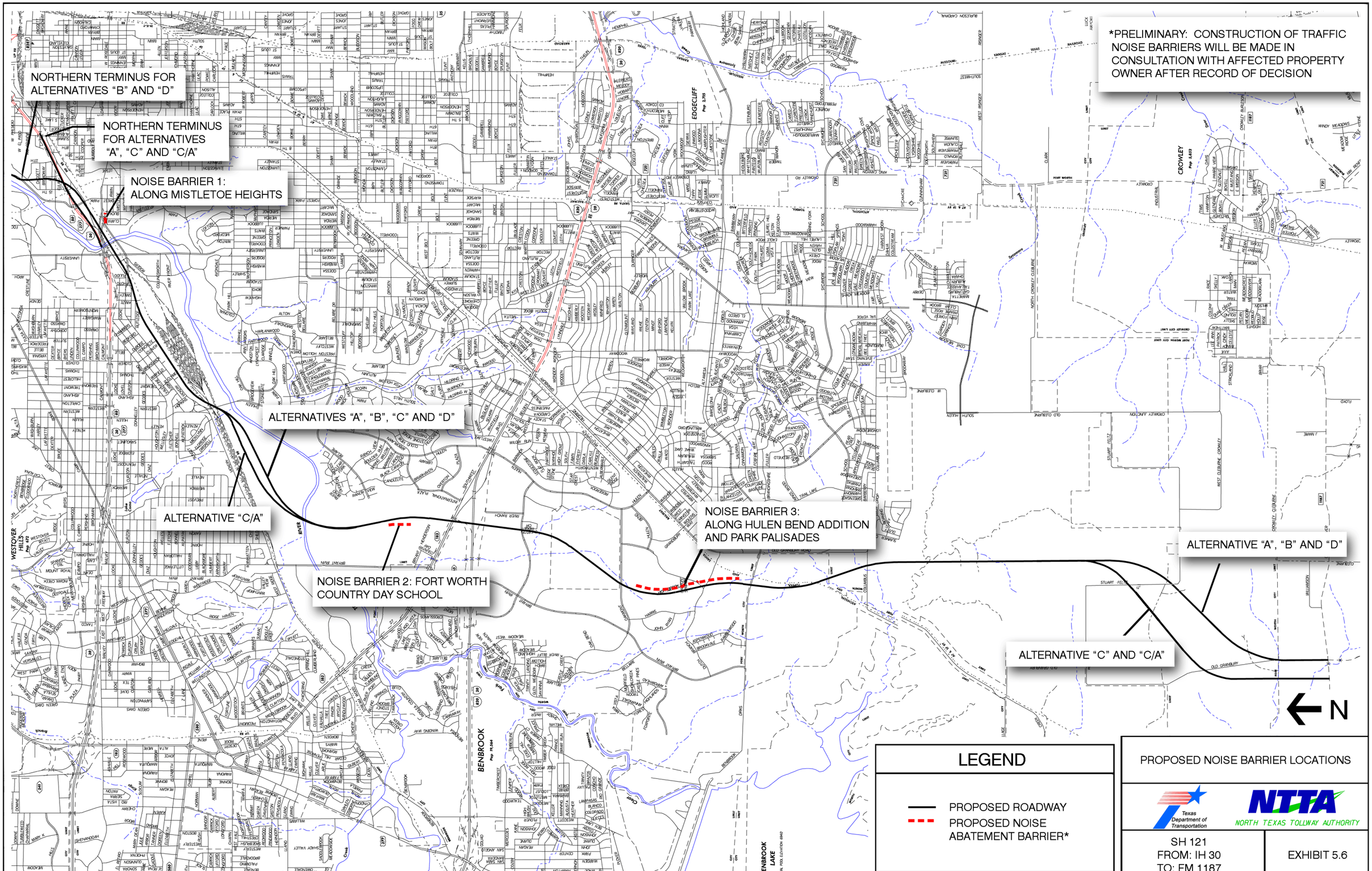
Terrace, Marcus Cable, Alamo Heights and one receiver at Mistletoe Heights (MTOE3). However, a noise barrier was determined to be both feasible and reasonable for Mistletoe Heights (Receivers MTOE1 and MTOE2), Fort Worth Country Day School (Receivers R3-1, R3-2, R4 and R4-1) and Hulen Bend Addition/Park Palisades (Receivers R10, R11, R13 and R14); therefore, these noise barriers are proposed for incorporation into the project. Details of these proposed noise barriers are shown in Table 5-18 and the general location shown on Exhibit 5.6. The final decision to construct the proposed noise barrier would be made after the ROD and following consultation with the affected property owners.

Table 5-18 – Noise Barrier Proposal

Barrier	Area	#Benefited Receivers	Length (ft)	Height (ft)	Total Cost	$/Benefited Receivers
1	Mistletoe Heights	4	524	5*	$43,720	$10,930
2	Fort Worth Country Day School	11	1,000	12 to 16	$244,800	$22,255
3	Hulen Bend Addition/Park Palisades	84	5,200	8 to 12	$813,800	$9,688

* *The five ft high wall would be added on top of an existing berm producing a total barrier height ranging between nine and 12 ft high.*

Because the City zoning maps were developed taking into consideration the proposed SH 121, the project area continues to be predominately undeveloped. In particular, the areas between Hulen Street and IH 20, including the areas north and south of the proposed Arborlawn Road interchange. South of IH 20, the area is also mainly undeveloped with the exception of multi-family residential areas north and south of Overton Ridge Boulevard and the single-family residential area (Hulen Bend Addition and Park Palisades). The undeveloped areas along the alignment are currently zoned commercial and residential, falling under NAC activity category D, which has no established FHWA NAC. Exhibit 5.2 through Exhibit 5.5 depict the existing and undeveloped/zoned land uses along the PSC.


NORTHERN TERMINUS FOR ALTERNATIVES "B" AND "D"
NORTHERN TERMINUS FOR ALTERNATIVES "A", "C" AND "C/A"
NOISE BARRIER 1: ALONG MISTLETOE HEIGHTS
ALTERNATIVES "A", "B", "C" AND "D"
ALTERNATIVE "C/A"
NOISE BARRIER 2: FORT WORTH COUNTRY DAY SCHOOL
NOISE BARRIER 3: ALONG HULEN BEND ADDITION AND PARK PALISADES
ALTERNATIVE "A", "B" AND "D"
ALTERNATIVE "C" AND "C/A"
*PRELIMINARY: CONSTRUCTION OF TRAFFIC NOISE BARRIERS WILL BE MADE IN CONSULTATION WITH AFFECTED PROPERTY OWNER AFTER RECORD OF DECISION
EDGECLIFF
CROWLEY
WESTOVER HILLS
BENBROOK
ENBROOK LAKE
N
LEGEND
PROPOSED ROADWAY
PROPOSED NOISE ABATEMENT BARRIER*
PROPOSED NOISE BARRIER LOCATIONS
Texas Department of Transportation
NTTA
NORTH TEXAS TOLLWAY AUTHORITY
SH 121
FROM: IH 30
TO: FM 1187
EXHIBIT 5.6