

Master Development Plan for the TxDOT North Tarrant Express Project Segments 2-4

Chapter 1: Key Parameters and Assumptions



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Chapter 1: Key Parameters and Assumptions

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1. Key Parameters and Assumptions

1.1. Introduction

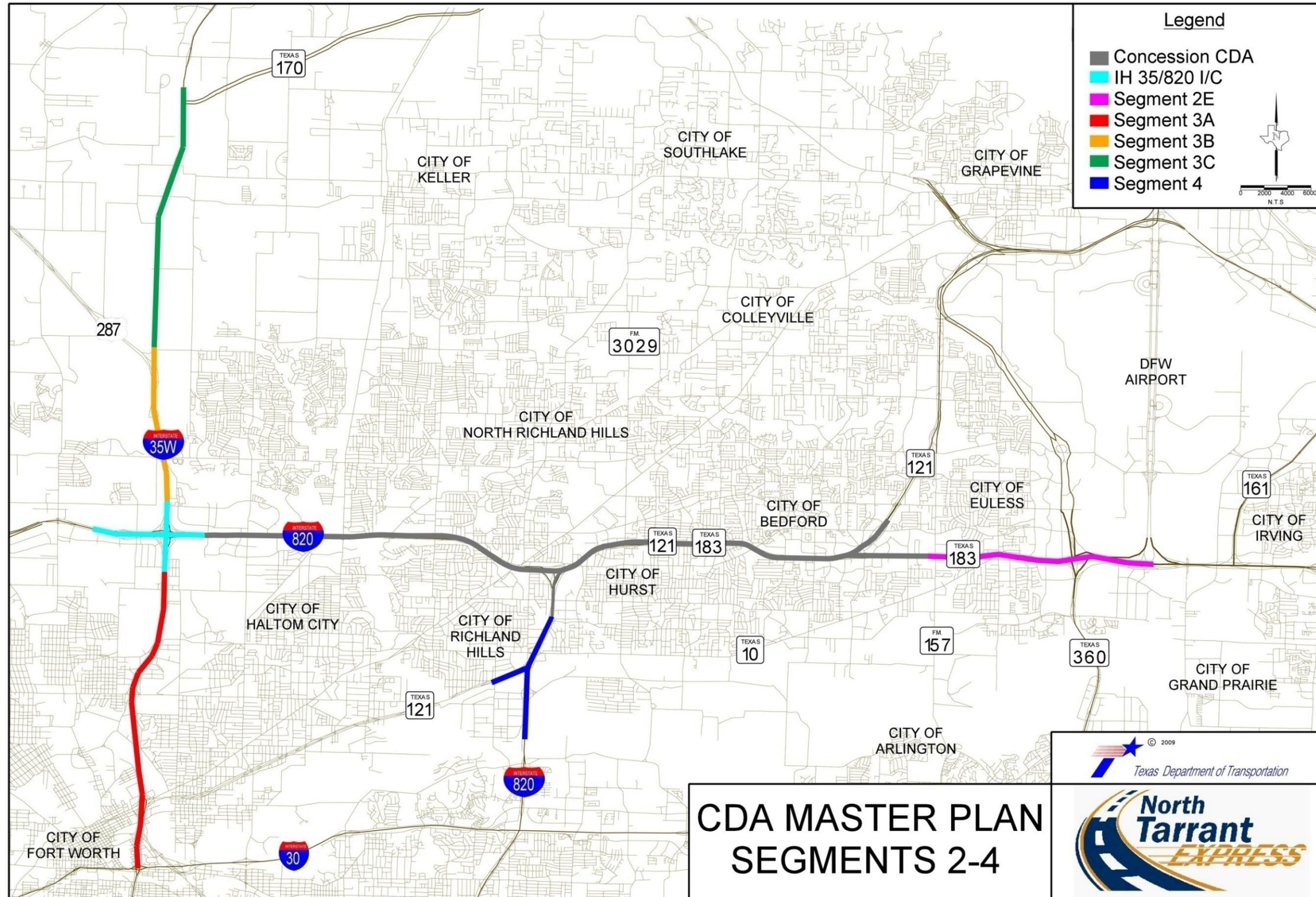
1.1.1. Description of Project and Locality

The North Tarrant Express (NTE) Project is dedicated to improving mobility and connectivity along a 35-mile corridor encompassing portions of IH 35W, IH 820 and SH 121/183 Airport Freeway in northern Tarrant County through a regionally supported Managed Lane system.

The first phase of NTE, Segments 1 and 2W, will rebuild and expand 13 miles along IH 820 and SH 121/183, adding four tolled Managed Lanes, plus frontage roads and auxiliary lanes to approximately double the existing capacity. The ultimate configuration of Segments 1 and 2W, developed when a certain level of demand is recorded, also includes two additional non-tolled General Purpose Lanes. Segments 1 and 2W are expected to be operational by 2015.

This Master Development Plan discusses NTE Segments 2-4 (hereinafter referred to as the Project), which are the additional Segments proposed for construction following the Segments 1 and 2W. These Segments, as may be combined and/or modified into NTE Facilities, will expand and rebuild SH 183 east of the Concession Facility to past DFW Airport, extend the Project on IH 820 and SH 121 south of the Concession Facility, and improve mobility on IH 35W north and south of IH 820. The Segments making up the Project are mapped in Figure 1-1. Segments 2-4 total approximately 24 miles. The ultimate configuration of each Segment will include three to four General Purpose Lanes and two to three Managed Lanes. The Project includes 10 major interchanges and numerous connections to local roads.

Figure 1-1: North Tarrant Express Segment Map





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The Project is located in Tarrant County, within TxDOT's Fort Worth District. This area is experiencing population growth and economic activity, resulting in high levels of traffic. The Project will serve traffic between Dallas and Fort Worth, as well as radial traffic from Fort Worth to and from developing residential and economic centers. The NTE Corridor is also part of the major route providing access to Dallas-Fort Worth International Airport. Approximately 18 percent of workers living in the Fort Worth area commute to the Dallas area daily, further necessitating efficient and reliable travel between the two cities.

This report examines the socio-economic and demographic drivers for traffic growth in this area, and considers the publicly available forecasts for these drivers, and how these will impact growth in the NTE Corridor. While this report presents an analysis of factors affecting future traffic, not all data presented here were used as inputs into the NTE Mobility Partners Segments 2-4 (NTEMP24) traffic and revenue forecast.

Both the Dallas-Fort Worth-Arlington Metropolitan Statistical Area (MSA), as defined by the U.S. Census Bureau, and the DFW Urban Area, as defined by the North Central Texas Council of Governments (NCTCOG)¹, are relevant to the Project. These areas contribute to traffic in the Corridor and are therefore included in the local traffic and socio-economic data presented in this report.

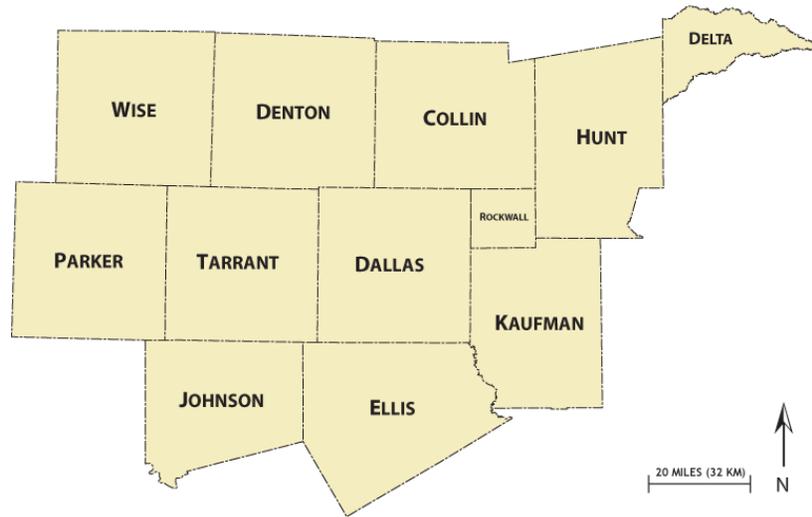
The Dallas-Fort Worth-Arlington MSA consists of the following 12 counties, shown in Figure 1-2.

- Collin
- Dallas
- Delta
- Denton
- Ellis
- Hunt
- Johnson
- Kaufman
- Parker
- Rockwall
- Tarrant
- Wise

¹North Central Texas Council of Governments, *Census 2000 and American Community Survey*, <http://www.nctcog.org/ris/census/>, Accessed October 30, 2009.

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Figure 1-2: Dallas-Fort Worth-Arlington Metropolitan Statistical Area

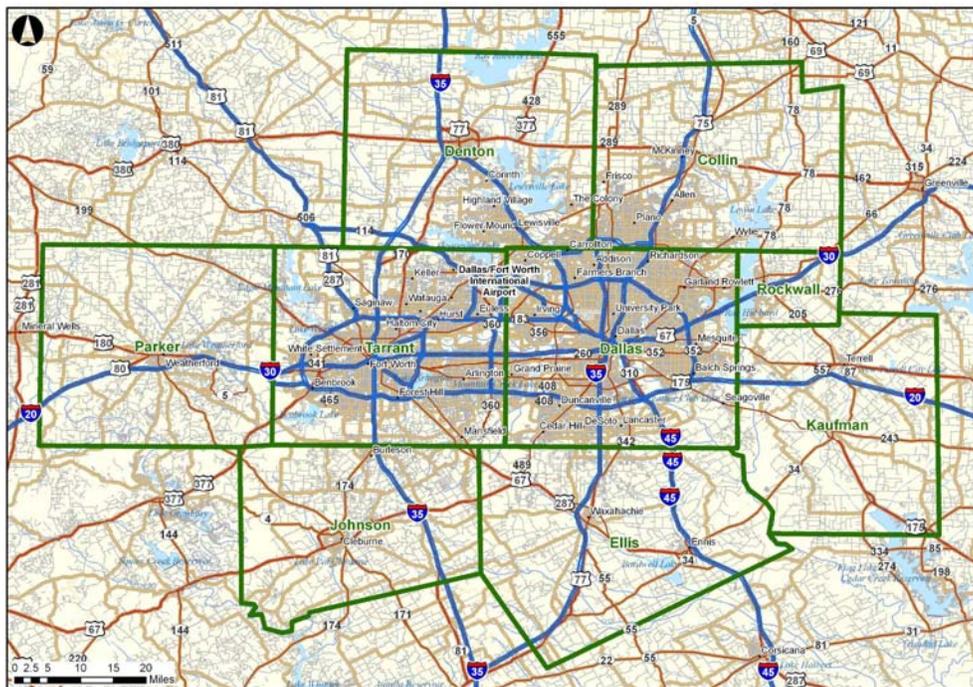


The DFW Urban Area consists of the following nine counties*, also shown in :

- Collin
- Dallas
- Denton
- Ellis
- Johnson
- Kaufman
- Parker
- Rockwall
- Tarrant

*Certain NCTCOG statistics also include Wise County.

Figure 1-3: DFW Urban Area



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In addition to presenting area-wide NCTCOG and Census Bureau Data, NTEMP24 has carried out a limited analysis of a more focused area surrounding the project, hereinafter referred to as the NTE Study Area. Study Area data presented in this report includes information on forecast growth in population, employment and truck traffic growth.

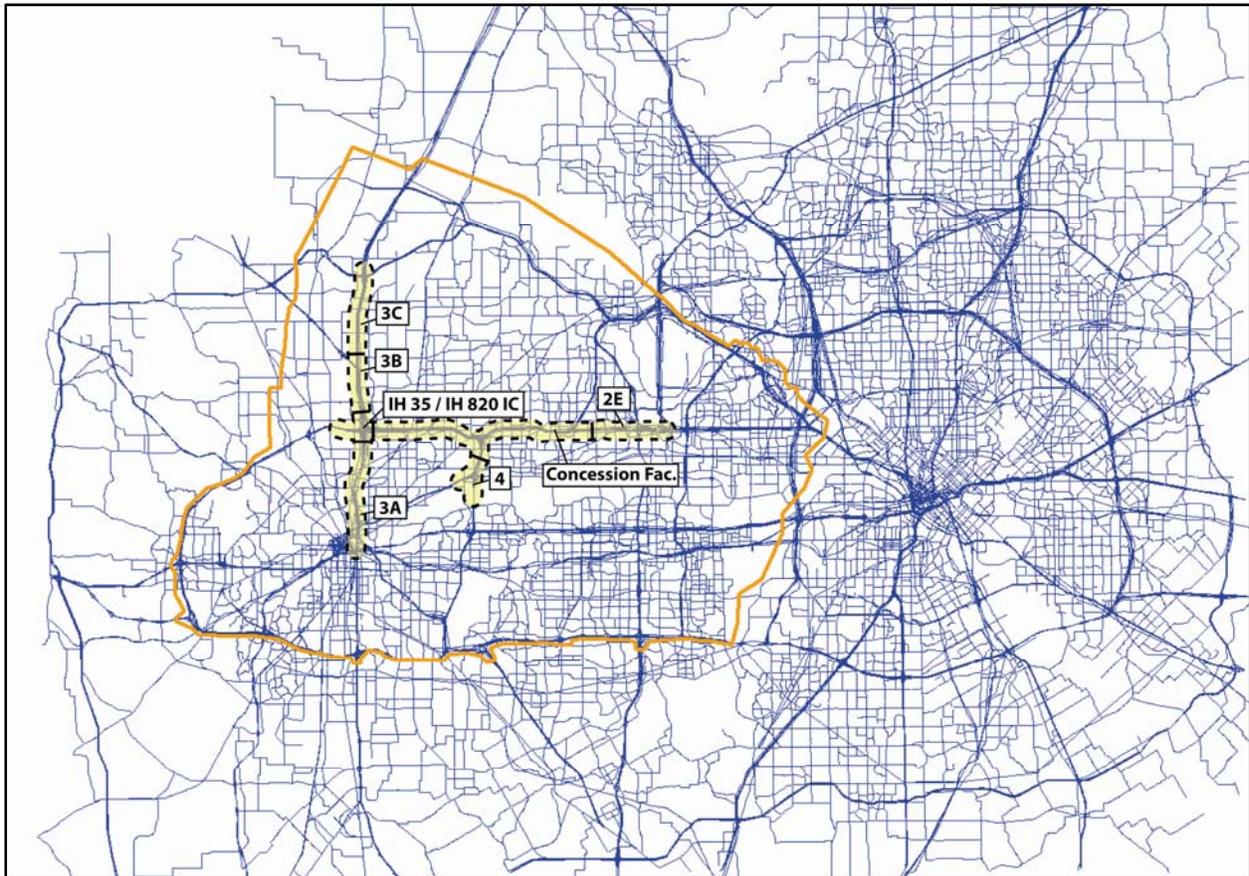
The NCTCOG Dallas-Fort Worth Regional Travel Model (DFWRTM) was used as the starting point for the analysis of the NTE Study Area during the MDP. The DFWRTM is a TransCAD model that covers the DFW Metroplex, which includes the whole of Collin, Dallas, Denton, Rockwall, and Tarrant counties, as well as portions of Kaufman, Ellis, Johnson and Parker counties. These counties are divided into 4,800 Traffic Analysis Zones (TAZs). The DFWRTM is a four-step model that utilizes the regional demographic estimates and forecasts to forecast future travel demand levels and levels of congestion of the transportation system. The four steps are: Trip Generation, Roadway Skim and Trip Distribution, Mode Choice, and Roadway Traffic and Transit Assignment. The results of this model help the Metroplex to plan for future expansion, effectively distribute transportation funding, and regulate air quality control issues.

Because the DFWRTM covers the entire DFW Metroplex, it is highly complex. In general, transportation improvements most impact the area directly adjacent to the improvement, with the impact lessening as the distance from the improvement increases. Thus, for the traffic demand forecasting purposes of the NTE MDP, a sub-area model was extracted from the DFWRTM relevant to the NTE Study Area. This sub-area model includes approximately 1,500 of the total 4,800 TAZs. The sub-area model contains the major competing facilities to NTE and the major generators and attractors of trips related to the Project. The sub-area model's cordon area (NTE Study Area) is shown in Figure 1-4.

Traffic and Revenue modeling has been carried out in accordance with Exhibit D, Item E of the CDA.

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Figure 1-4: NTE Study Area



This sub-area model will be used during later milestones that require a modeling effort. The impacts of the transportation improvements on the network will be demonstrated by this modeling work.

1.1.2. Purpose of Report

The purpose of this report is to identify the key assumptions aiding in the development of the Master Development Plan (MDP). Some of the assumptions are technical in nature and specifically impact the sequencing of Segments, while others are broader concepts that help guide the entire MDP.

The MDP is part of an overall planning effort being performed by the Texas Department of Transportation (TxDOT) and NTEMP24 for the NTE Project. Another part of TxDOT's overall planning effort includes a National Environmental Policy Act (NEPA) environmental review process. TxDOT is in the process of preparing NEPA Environmental Assessments (EAs) for certain Segments. The MDP is being developed at the same time as the EAs, and will take their findings into account during the planning process.

NTE Segments 1 and 2 were approved by the Federal Highway Administration (FHWA) on December 5, 2008 and October 26, 2009, respectively. NEPA approvals for the other Segments are currently pending. The anticipated EA Finding of No Significant Impact (FONSI) for Segment 3A and Segments 3B and 3C is June 2011 and March 2011, respectively. The anticipated EA re-evaluation approval for Segment 4 is January 2012.

Segment alignments will be identified, evaluated and independently approved through the NEPA process. Following satisfactory completion of the NEPA process, Facility development will be elaborated using the guidelines established in the Comprehensive Development Agreement (CDA) signed by TxDOT and NTEMP24 on June 23, 2009.

The basis for developing the MDP is to expand and update the Conceptual Development Plan (CDP) presented by NTEMP24 to TxDOT in its December 1, 2008 Proposal. As such, the MDP will attempt to follow the same general process by which Segments were analyzed, quantified, sequenced and presented that was outlined in the CDP. That said, the MDP is being developed collaboratively with TxDOT and therefore the details may be adjusted through incorporation of feedback from TxDOT and other stakeholders.

The historic socio-economic and demographic data presented here will be used in conjunction with forecast data provided by the North Central Texas Council of Governments (NCTCOG) along the NTE Corridor as the basic assumptions underpinning the analysis of the Segments included in this MDP. NCTCOG has decades of experience in projecting the future of the DFW Metroplex. NTEMP24 will draw upon this expertise to the maximum extent possible. NTEMP24 is using the compiled data to elaborate upon the demand projections as part of this Master Development Plan. This entire process will help to assure both TxDOT and NTEMP24 that when Segments are determined Ready for Development they can easily make it through all tasks required to achieve financial close and delivery. This analysis will help

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to maximize Project delivery, optimize the schedule for the delivery of the system and minimize public fund contributions.

1.1.3. The Cost of Congestion

Over the next 25 years, road use in Texas is projected to grow by 214 percent, much of it concentrated in its most congested metropolitan areas².

The Texas Transportation Institute's 2009 *Urban Mobility Report* ranks the Dallas-Fort Worth-Arlington area as the sixth most congested among very large urban areas in the U.S.³ In 2007, the average traveler in the area spent 53 hours per year in congestion delays, up more than 50 percent since 1997, when the average delay was 34 hours. Area commuters spend 66 percent of their peak-hour travel in congested conditions.

The cost of annual travel delay and extra fuel consumed in stop-and-go traffic by Texans was \$6.7 billion in 2007, \$2.8 billion of which is attributed to the Dallas-Fort Worth-Arlington Area. Translated into terms all Texans can understand, \$6.7 billion per year in travel delay and fuel expense is equal to a "congestion tax" averaging \$570 per commuter per year.

Increasing traffic congestion is also severely impacting the area's freight transportation network and thereby reducing economic productivity. Trucking is the backbone of the nation's freight transportation system, with nearly 80 percent of exports moved by trucks on the roads. The DFW region is considered the primary truck, rail, and air cargo center in the southwestern U.S., with \$38.4 billion in annual imports, \$21.3 billion in annual exports and more than 100,000 jobs in intermodal freight depending on the reliability of the regional roadway and freight rail systems⁴.

An FHWA report found that freight highway bottlenecks are causing 243 million hours of freight delays annually, resulting in annual delay costs of \$7.8 billion per year.⁵ The freight tonnage moved in the U.S. is forecast to nearly double between 2005 and 2035, with trucks making up 84 percent of the growth.⁶

USDOT Chief Economist Jack Wells estimates that the nationwide cost of traffic congestion is about double the commonly cited figure of \$63B per year from the Texas Transportation Institute.

² *Texas Transportation Challenge* (page 1, heading: "Texans Have a Problem"), Texas Department of Transportation.

³ *Urban Mobility Report 2009*, Texas Transportation Institute, The Texas A&M University System, July 2009.

⁴ *Trucking Environment and Changes in the Future*, NCTCOG, October 1, 2009.

⁵ *An Initial Assessment of Freight Bottlenecks on Highways*, Federal Highway Administration, Office of Transportation Policy Studies, October 2005

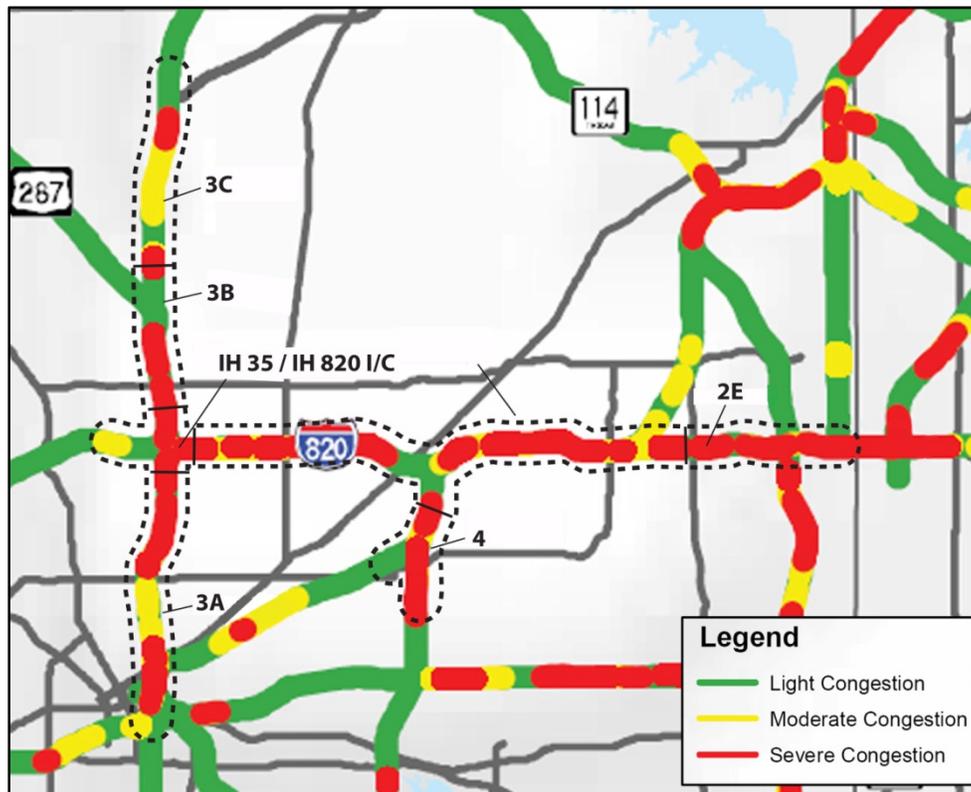
⁶ *America's Top Five Transportation Headaches -- and Their Remedies*. The American Association of State Highway and Transportation Officials (AASHTO), January 2009

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According to Figure 1-5, a map produced by the Texas 2030 Committee, NTE Segments 1, 2 and portions of Segments 3A and 3B constitute some of the most severely congested Metroplex roadways during peak periods of travel.

The Preliminary Project Traffic and Revenue analysis to be provided during Milestone 4 will include analysis of the extent to which the addition of Managed Lanes and other improvements associated with the Project will relieve congestion on all Segments.

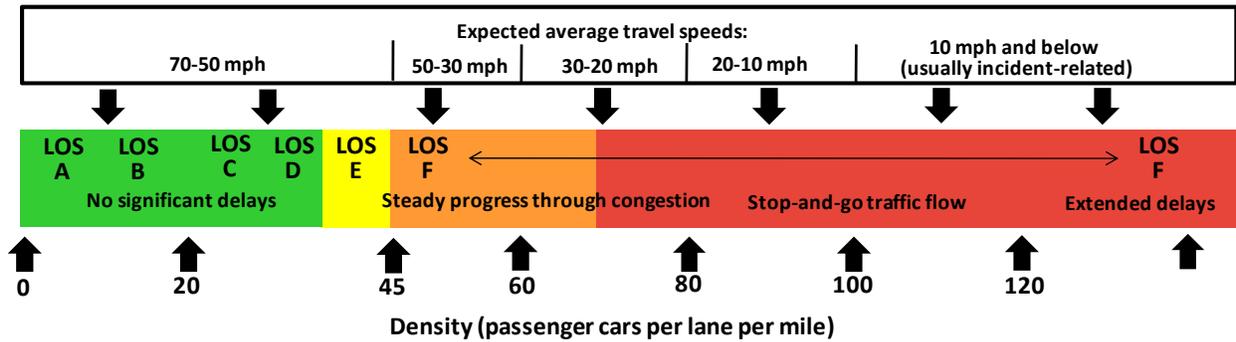
Figure 1-5: 2007 Congestion Intensity during Peak Travel Periods



Level-of-service (LOS) is a measure of effectiveness that is used to estimate the efficiency of highway flow. It is presented as a letter grade from A to F. LOS A is optimal, with traffic flows at or above the posted speed limit. As quality of traffic flow goes down, the grade can deteriorate as far as LOS F - constant traffic jams or gridlock. This interaction is shown graphically in Figure 1-6.

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Figure 1-6: Summary of Freeway Traffic Condition Ratings (Density-Based Level of Service)

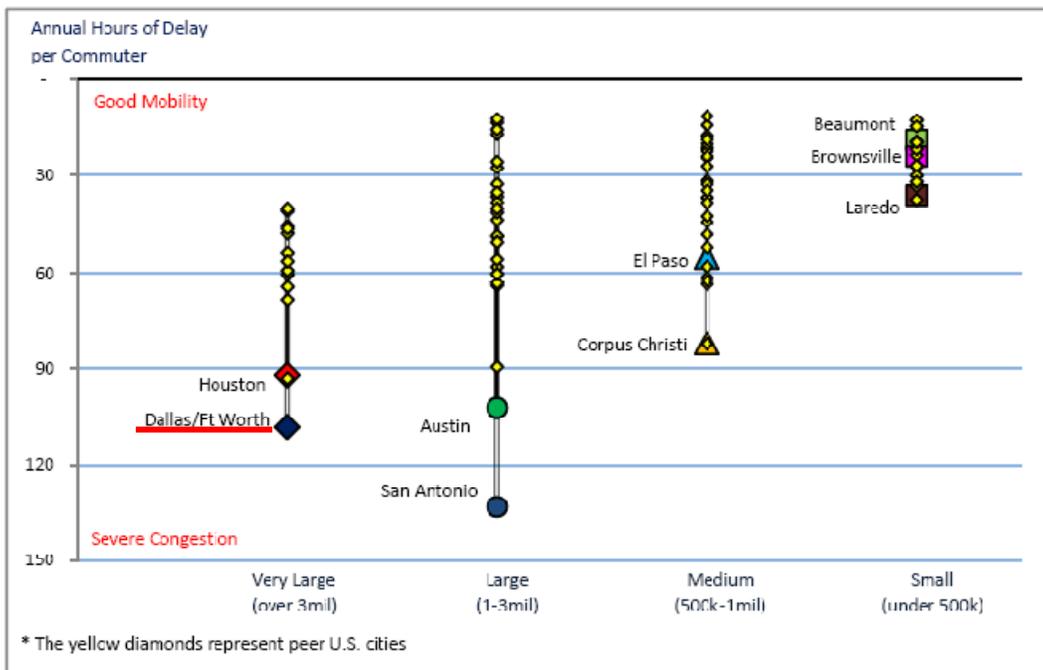


These service level definitions are based on the 2000 Highway Capacity Manual.

Source: NCTCOG⁷

The Texas 2030 Committee predicts that, with current funding trends, many Texas regions will be among the most congested in the country by 2030, the average trip taking almost twice as much time as in light traffic conditions. Furthermore, the DFW Metroplex would fare far worse than every other comparably sized city that was studied in terms of mobility (see Figure 1-7).

Figure 1-7: Projected Hours of Delay per Commuter (2030) - Current Funding Trend



Source: Texas Transportation Needs Report⁸

⁷ Congestion Management Process Document, Section 2, Controlled Access Facilities. North Central Texas Council of Governments, 2007.

⁸ Texas Transportation Needs Report, February 2009, Texas 2030 Committee.

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By redistributing traffic to provide more efficient traffic operations through the use of Managed Lanes, the Project is expected to ease congestion on the corridor's freeway network and surrounding arterials. Demand-based dynamic toll pricing will allow roadway users on the Managed Lanes to travel at speeds of 50 mph or faster, as mandated in the CDA documents, thereby reducing travel times and making commute times more predictable. Improving mobility in the corridor is expected to attract more economic activity in the corridor and improve air quality.

The Project Traffic and Revenue forecasts provided in Chapter 4 quantifies the extent to which each Segment of the Project is expected to relieve congestion on the mainlanes and surrounding network. These forecasts have been coordinated with ongoing TxDOT forecasting and modeling efforts.

1.1.4. Economic Benefits of Investment in Infrastructure

Beyond reducing the direct costs of congestion, investment in infrastructure benefits the economy in several ways.

When congestion is reduced, businesses can serve more customers with the same equipment and personnel, lowering their costs and increasing profits. Increased business profitability generates economic growth and creates jobs. The creation of jobs, in turn, spurs population growth, added economic activity, and therefore greater tax revenues for state and local governments.

Construction activity also carries economic benefits. Every \$1 billion invested in highways supports 27,823 jobs, according to the FHWA, including 9,537 on-site construction jobs, 4,324 jobs in supplier industries and 13,962 jobs throughout the rest of the economy⁹. The local economy benefits from the income paid to these workers, the purchase of materials and supplies used to build the project, and workers' local purchases of food, clothing, housing, entertainment and other activities.

The American Association of State Highway and Transportation Officials (AASHTO) estimates that every dollar invested in the nation's highway system yields \$5.69 in economic benefits through reduced delays, improved safety, reduced emissions, lower vehicle operating costs and reduced maintenance costs.¹⁰

⁹ *Economics and Research Fact Sheet*, American Road & Transportation Builders Association, http://www.keepwvwmoving.org/shared/content//ARTBA_jobs_fact_sheet.pdf, accessed January 6, 2010.

¹⁰ *America's Top Five Transportation Headaches -- and Their Remedies*. The American Association of State Highway and Transportation Officials (AASHTO), January 2009

1.2. Demographics

Texas' economy, government and infrastructure will be impacted in coming decades by a population that is larger, older and increasingly diverse. The size and complexity of the population are likely to increasingly challenge the State's infrastructure and resources while also providing expansion in markets for a wide variety of goods and services.

1.2.1. Population Growth

DFW Urban Area and Tarrant County

The U.S. Census Bureau recently reported that the Dallas-Fort Worth-Arlington MSA experienced the nation's largest numeric increase in population among large urban areas between 2008 and 2009 (see Figure 1-8), with growth in Tarrant County accounting for 27 percent of this increase. Texas was the nation's third fastest-growing state during the same year.

Figure 1-8: Ten U.S. Urban Areas with Largest Numeric Population Increase (2008-2009)

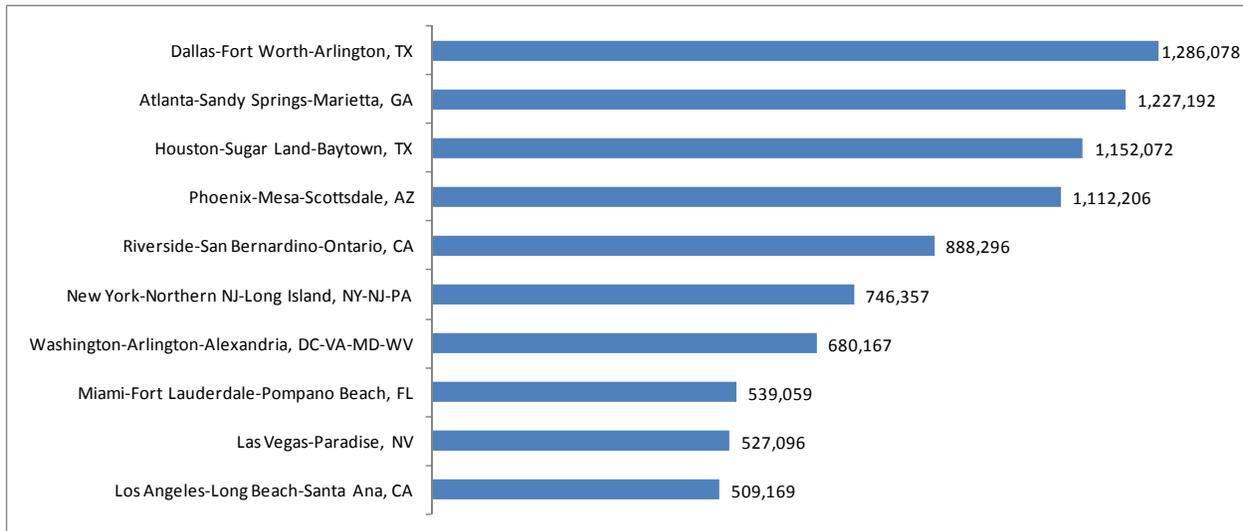


Source: U.S. Census Bureau

An examination of population data since 2000 shows that the DFW MSA has been within the top four U.S. urban areas for largest numeric population growth every year since 2000, and tops the list when the data is examined cumulatively for 2000-2009, with an addition of nearly 1.3 million people (see Figure 1-9).

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Figure 1-9: Ten U.S. Urban Areas with Largest Numeric Population Increase (2000-2009)



Source: U.S. Census Bureau

The DFW Metroplex is growing more rapidly than Texas as a whole. The most relevant population cores of Dallas and Tarrant County have had very strong and consistent historical population growth. Also, Denton County, located north of Fort Worth, has shown strong growth from a relatively small base. This county is expected to contribute significantly to north-south travel demand in the NTE corridor between Denton and Fort Worth.

Between 1970 and 2009, population in the nine counties within the DFW Urban Area region grew at an average of 2.36 percent per year according to U.S. Census Bureau data. The overall population is expected to top nine million by 2030.

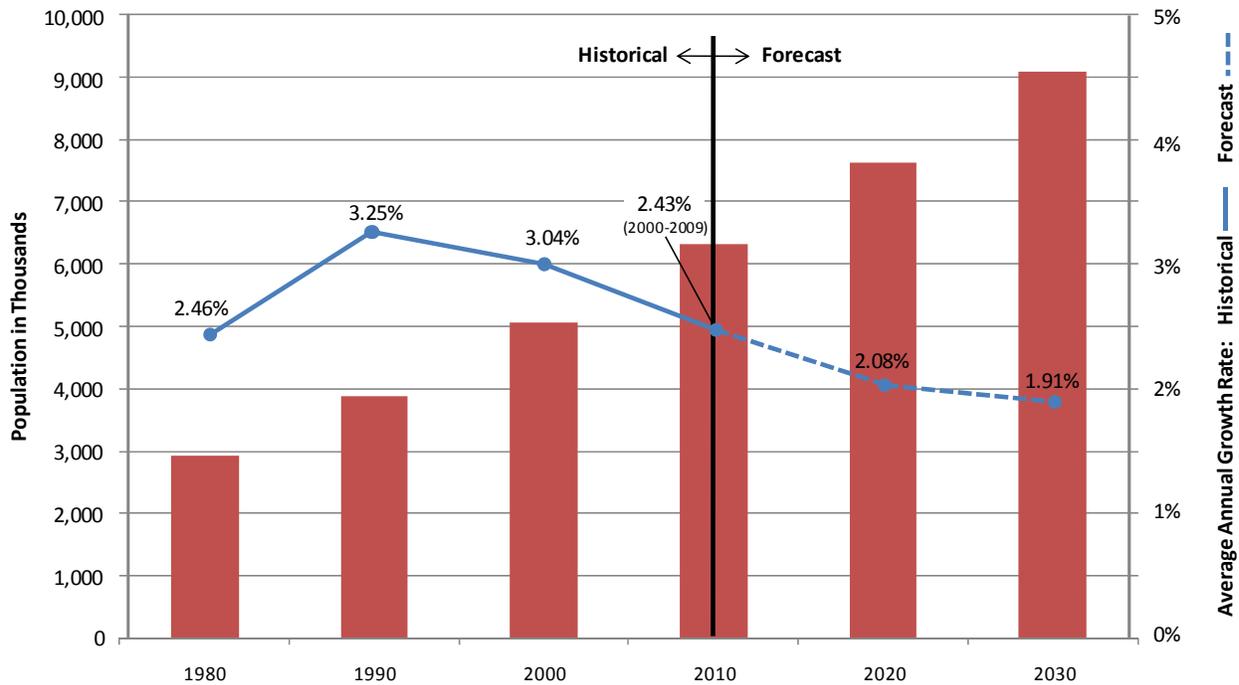
The 2009 population of Tarrant County was 1.79 million people. Dallas County boasted a population approaching 2.45 million people; and Denton County had an estimated population of around 658,000. The remaining counties comprising the DFW Urban Area had a combined population of just below 1.4 million. As such, the NTE Project provides a critical connection to roughly 78 percent of the population of the rapidly expanding population base.

Several institutions and organizations within Texas publish population forecasts. The NCTCOG produces the most relevant set of forecasts for the Study Area in relation to developing traffic forecast projections. NCTCOG utilizes the Texas State Data Center (TSDC) county-level forecasts, in conjunction with other information sources and forecasts, including local decision-makers such as city and county authorities, transportation and transit providers, to develop forecasts to the MPO (Metropolitan Planning Organization) level.

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The NCTCOG population trends and forecasts for population growth in the relevant DFW Urban Area are shown in Figure 1-10. Despite the large increases in population, the rate of population growth is projected to decrease, predominantly due to the aging of the population and, consequently, an increase in the number of deaths.

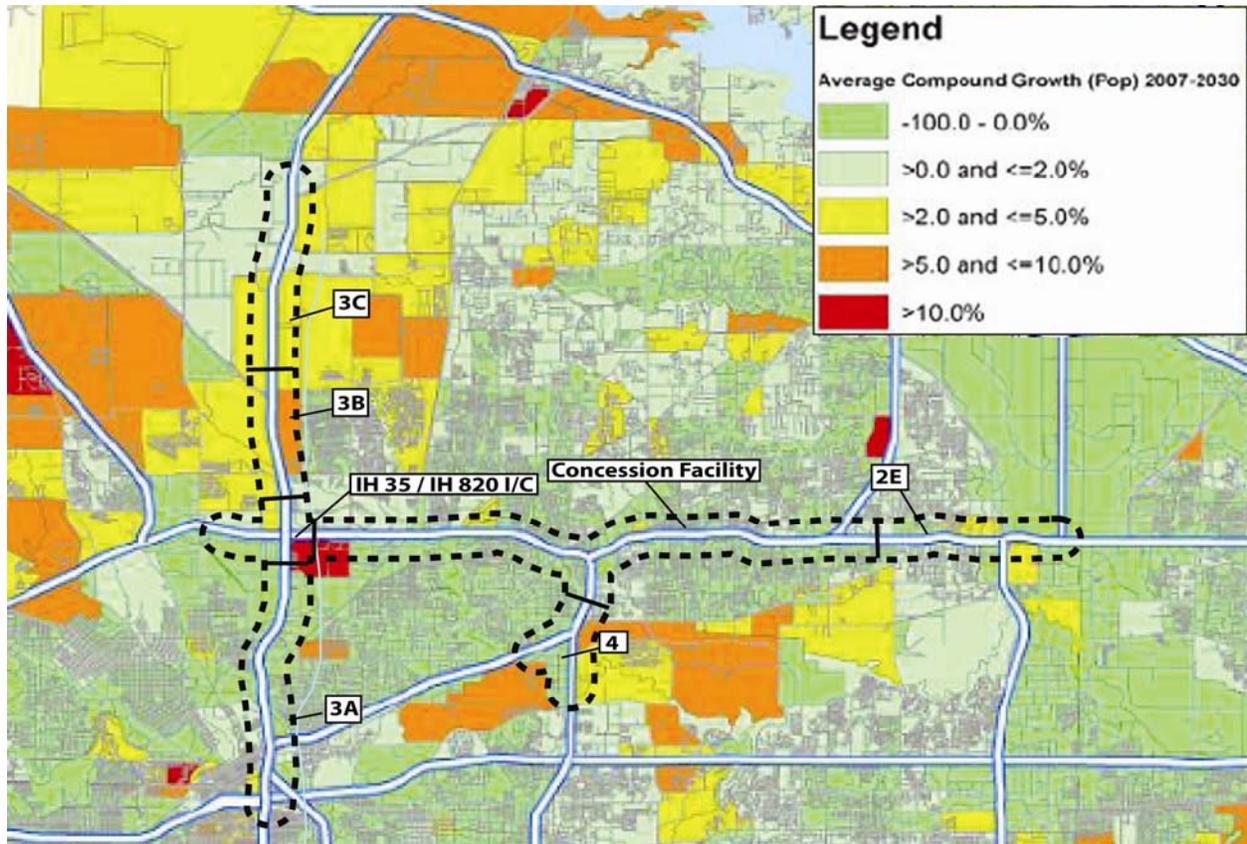
Figure 1-10: Historical and Forecast DFW Population Growth



Sources: U.S. Census Bureau (Historical Data), NCTCOG (Forecast Data)

The NCTCOG forecasts for population growth are shown by Traffic Analysis Zone (TAZ) in Figure 1-11. This figure highlights the relevant growth pockets that are anticipated to grow significantly over the next 25 years. As can be easily seen from the yellow and orange shading in the northern portion of Tarrant and southern portion of Denton Counties, growth of 2-10 percent per year is expected to the west of Fort Worth and adjacent to the Project corridor, particularly Segments 3B, 3C, 4 and southeast of the IH 35 / IH 820 Interchange.

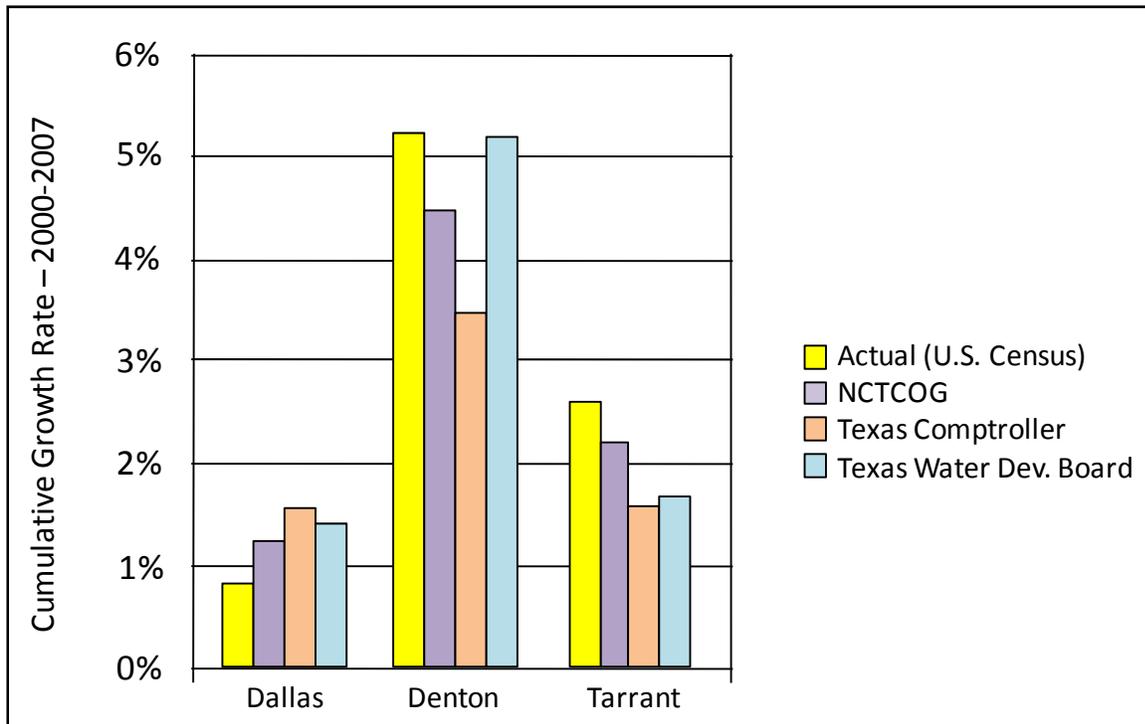
Figure 1-11: Population Growth Forecasts Surrounding NTE Project 2007 - 2030



U.S. Census population estimates have been compared to an interpolated value between the 2005 and 2010 NCTCOG forecasts to determine whether the forecasts are in line with the observed data available. This comparison is summarized as Figure 1-12. The comparison highlights that the NCTCOG forecasts represent the best estimate between 2000 and 2007 of the observed population growth rates for Dallas, Denton and Tarrant Counties. The comparison also demonstrates that the observed (actual, as recorded by the Census) population growth has generally exceeded all forecasts (including NCTCOG) and that the population forecasts produced by NCTCOG may already be conservative compared to observed growth for most counties.

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Figure 1-12: DFW Growth Rate Comparisons (Cumulative, 2000-2007)



These sources, along with the Texas State Data Center and the Texas Water Development Board, will be utilized as sources of crucial information to track and project Texas' population demographics for the NTE Corridor over the duration of the CDA.

NTE Study Area

Total population in the Study Area (as defined in Figure 1-4) is forecast to grow by 21 percent between 2007 and 2030, from 1.54 million residents in 2007 to 1.86 million in 2030, an average growth rate of 0.8 percent per year. Table 1-1 details the projected population growth in the NTE Study Area, broken down by county and city.

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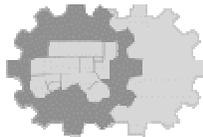
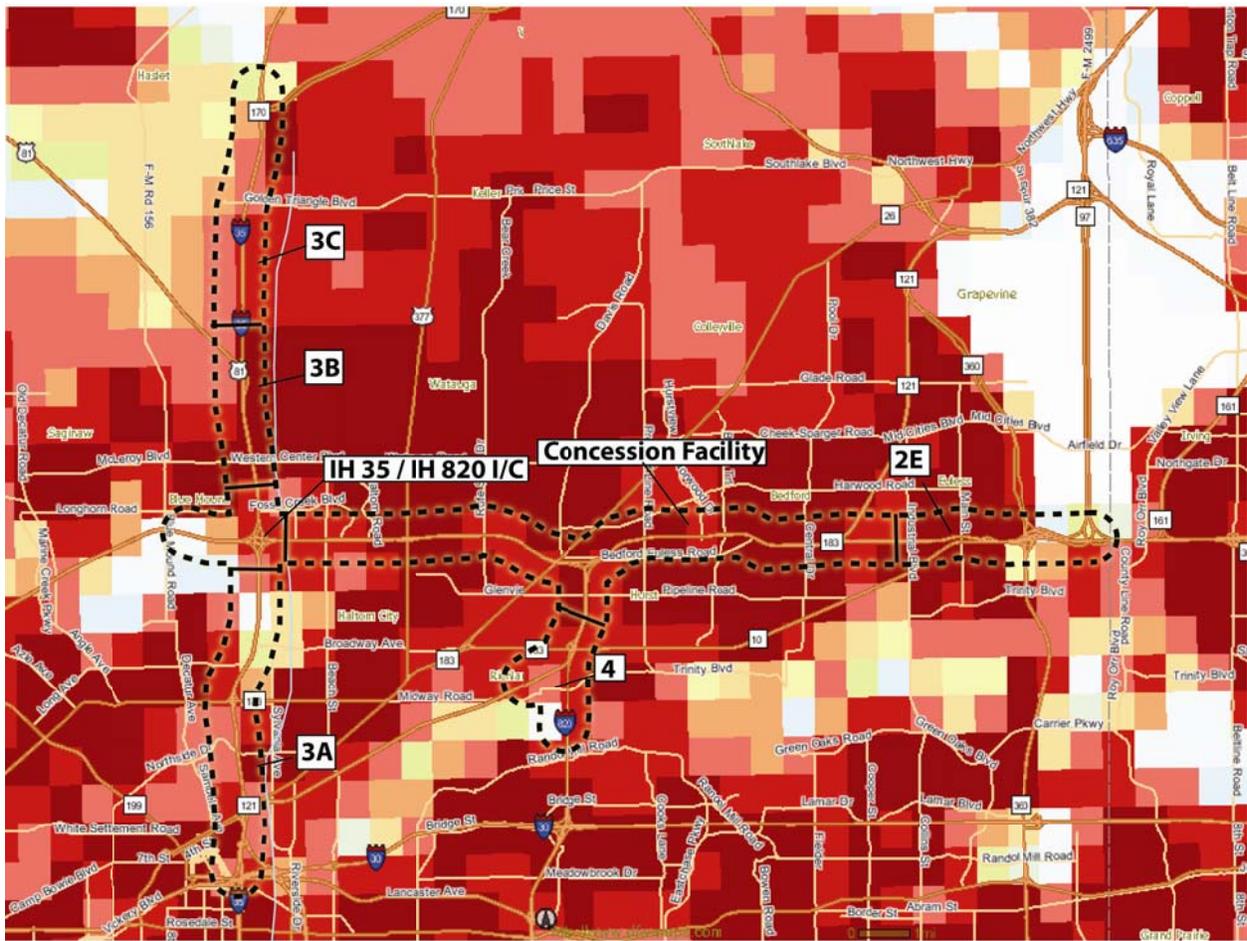
Table 1-1: NTE Study Area Population Projections

City	# of Zones	2007 Pop	2009 Pop	2015 Pop	2025 Pop	2030 Pop
Denton	22	20,128	21,673	32,048	42,087	42,025
Dallas	250	273,822	275,332	278,410	295,736	299,513
Tarrant	1,088	1,242,590	1,265,220	1,329,602	1,461,342	1,517,270
<i>Total</i>	1,360	1,536,540	1,562,225	1,640,060	1,799,165	1,858,808

City	# of Zones	2007 Pop	2009 Pop	2015 Pop	2025 Pop	2030 Pop
Irving	156	177,075	178,214	179,751	184,008	184,037
Dallas	6	433	481	706	844	844
Southlake	20	27,481	27,976	28,952	30,330	31,605
Keller	21	35,342	36,582	38,924	43,737	47,174
Grapevine	42	39,415	39,948	40,434	43,740	44,125
N. Richland Hills	46	67,328	68,021	71,722	75,932	75,952
Euless	38	52,080	52,536	55,510	61,657	63,300
Arlington	172	250,862	252,587	259,089	279,474	287,886
Other Incorporated	858	885,650	904,891	963,816	1,077,891	1,122,080
Other Unincorporated	1	874	989	1,156	1,552	1,805
<i>Total</i>	1,360	1,536,540	1,562,225	1,640,060	1,799,165	1,858,808

The area surrounding the Project is forecast to be an area of relatively high population density by 2030, as shown in Figure 1-13. The highest densities shown on the map (greater than 5.5 persons per acre), are equivalent to at least 3,520 persons per square mile. By contrast, the average population density in Tarrant County is 1,990 persons per square mile.

Figure 1-13: Population Density Surrounding NTE Project - 2030



NCTCOG Maps
www.dfwmaps.com
2030 Population (persons per acre)

DISCLAIMER
This data has been compiled for NCTCOG. Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.

0.01 - 0.04
0.04 - 0.07
0.07 - 0.1
0.1 - 0.14
0.14 - 0.25
0.25 - 0.5
0.5 - 1
1 - 2.7
2.7 - 5.5
> 5.5

1.2.2. Employment

The Texas labor force is growing and diverse. Texas experienced the largest net growth of any state between 2000 and 2006. The state is attracting many college-educated workers who relocate within the U.S. In 2006, more than 42,000 college-educated workers moved from other states to join the Texas labor force. Texas ranked second only to California by this measure and well ahead of California when the new arrivals are considered as a share of the total work force.

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As one of the fastest-growing areas of the state, the DFW Urban Area will also see significant job growth in coming years. The NCTCOG forecasts growth of just over two million jobs in the DFW area between 2000 and 2030. By 2030, the area is expected to reach 5.4 million jobs, as shown in Table 1-2.

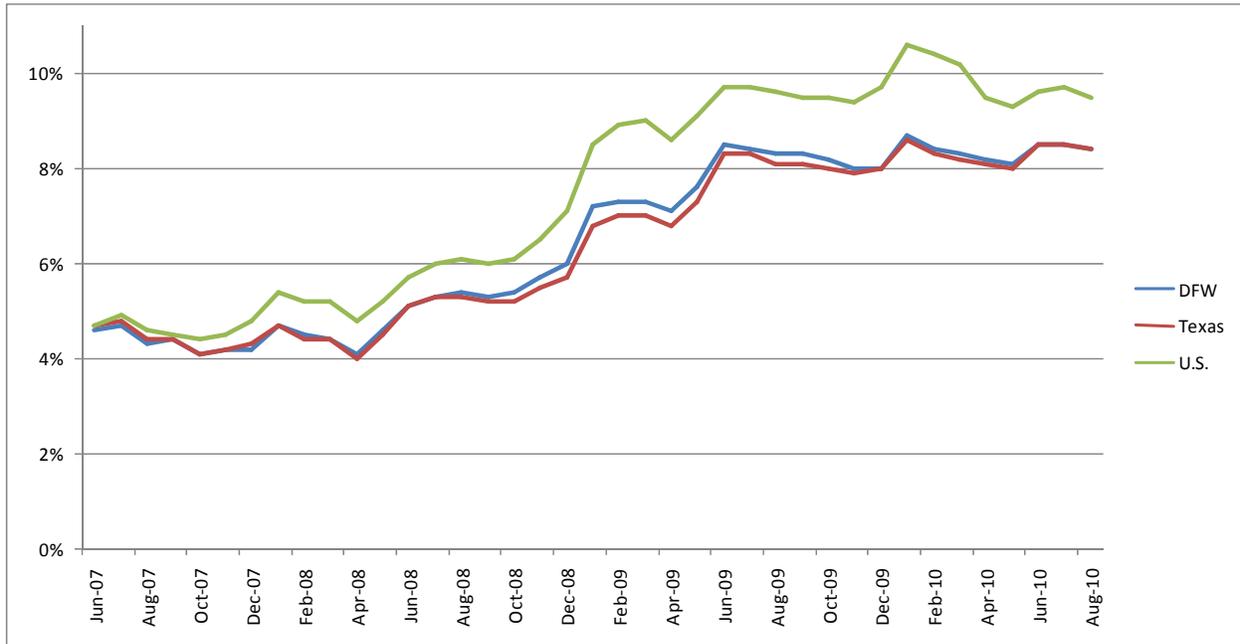
Table 1-2: Forecast Job Growth - 2000-2030

	2000	2010	2020	2030
Number of Jobs	3,158,200	3,897,000	4,658,700	5,416,700

Source: NCTCOG

The current economic recession has impacted employment nationwide, and the DFW Area is no exception. The statewide unemployment rate surpassed eight percent in June 2009, for the first time in 22 years. DFW Area unemployment rates have closely reflected those of Texas as a whole and have been significantly lower than the nationwide unemployment rate since the official beginning of the recession in December 2007, as shown in Figure 1-14.

Figure 1-14: DFW, Texas and U.S. Unemployment Rates: 2007-2010



Source: Texas Workforce Commission

Texas Comptroller Susan Combs attributes this favorable variance to a diversified economy, with Texas' gross state product declining more slowly than the U.S. economy (-1.4 percent versus -2.4 percent) during calendar year 2009.¹¹

¹¹ Comptroller's Economic Outlook, <http://www.texasahead.org/economy/outlook.html>, updated October 29, 2009.

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According to the *Fort Worth Star-Telegram*, the Fort Worth Central Business District is projected to add 20,965 new jobs by 2030, compared to 22,509 for the Dallas Central Business District, an area nearly twice its size and with a population 60 percent higher. In the shorter term, the \$787 billion American Recovery and Reinvestment Act (ARRA) is expected to create as many as 28,000 jobs in Tarrant County¹². Though the jobs created by the ARRA are intended to be short-term, they will impact the employment base value from which all growth is projected, which will ultimately impact regional employment forecasts.

DFW-area financial institutions have accepted \$4.7 billion in funds under the Federal Government's Troubled Asset Relief Program (TARP), which expired in October 2010.¹³ The U.S. Treasury Department recently revised its forecast for the cost of TARP from \$700 billion down to around \$50 billion.

In March 2010, the Hiring Incentives to Restore Employment (HIRE) Act was signed into law. This \$17.5 billion job creation package provides payroll tax breaks and incentives for businesses to hire unemployed workers. The HIRE Act also extended the federal transportation bill and provided new funding for the Highway Trust Fund (see Section 1.3 for more details).

As shown in Table 1-3, *Forbes* magazine ranked the Fort Worth-Arlington area at #11 for projected job growth in 2010 among major metropolitan areas. The Dallas metropolitan area is ranked at #19. Fort Worth was also named among the magazine's top 35 Best Cities for Business and Careers in 2010.

¹² "Texas, Tarrant stand to gain thousands of jobs from stimulus bill", *Fort Worth Star-Telegram*, February 18, 2009.

¹³ Eye on the Bailout, <http://bailout.propublica.org/main/list/index>, accessed October 18, 2010.

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Table 1-3: Forbes' Top Cities for Projected Job Growth - 2010

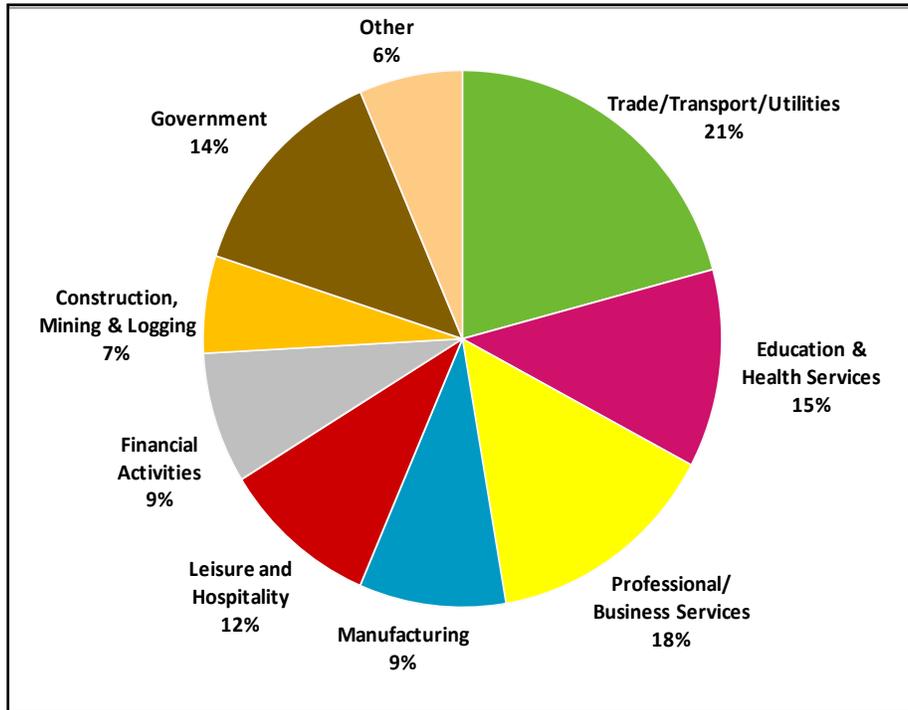
Rank	Metro Area	Metro Area Population (thousands)
1	Cedar Rapids IA	256
2	Huntsville AL	406
3	McAllen TX	741
4	Brownsville TX	396
5	Mobile AL	412
6	Columbus GA	293
7	Albuquerque NM	858
8	Montgomery AL	366
9	San Antonio TX	2,072
10	Des Moines IA	563
11	Fort Worth-Arlington TX	2,121
12	Austin TX	1,705
13	Port St. Lucie FL	406
14	Raleigh NC	1,126
15	El Paso TX	751
16	Houston TX	5,867
17	Boulder CO	303
18	Pensacola FL	455
19	Dallas TX	4,326
20	Amarillo TX	246

Employment by Sector

Figure 1-15 shows the Bureau of Labor Statistics' estimates of employment by sector in the DFW Urban Area. The sectors employing the most workers are Trade/Transport/Utilities, followed by Professional/Business Services, Education Health Services and Government. Comparing 2000 data to 2009 data, the most marked changes were a 36 percent increase in Education and Health Services jobs, a 28 percent decrease in manufacturing jobs and a 19 percent increase in Government jobs. The decline in manufacturing jobs mirrors the nationwide shift to a service and technology-oriented economy.

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Figure 1-15: 2009 Employment by Sector - DFW Urban Area



Source: Bureau of Labor Statistics

Employment and Housing Density

According to the U.S. Department of Housing and Urban Development, approximately 18 percent of workers living in the Fort Worth Housing Market Area (consisting of Tarrant, Johnson, Parker and Wise Counties) commute to the Dallas area, further necessitating reliable transportation and predictable commute times.

The largest Fort Worth-area employers from 2008 through 2009 are shown in Table 1-4.

Table 1-4: Largest Fort Worth-Area Employers - 2008-2009

2009 Ranking	2008 Ranking	Employer	Sector	# of Employees
1	1	American Airlines, Inc.	Transportation & Utilities	24,540
2	3	Texas Health Resources	Education & Health Services	18,448
3	2	Lockheed Martin Aeronautics Company	Manufacturing	13,500
4	4	Fort Worth ISD	Education & Health Services	10,316

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2009 Ranking	2008 Ranking	Employer	Sector	# of Employees
5	5	Arlington ISD	Education & Health Services	8,126
6	6	City of Fort Worth	Government	6,558
7	7	Bell Helicopter Textron, Inc.	Manufacturing	5,718
8	8	University of Texas at Arlington	Education & Health Services	5,422
9	13	JPS Health Network	Education & Health Services	4,633
10	9	Texas Health Harris Methodist Fort Worth Hospital	Education & Health Services	4,500
11	12	Cook Children's Health Care System	Education & Health Services	4,326
12	10	Chase Bank	Financial Activities	4,200
13	11	Tarrant County Govt.	Government	4,173
14	N/A	Keller ISD	Education & Health Services	3,492
15	16	Alcon Laboratories, Inc.	Education & Health Services	3,299
16	17	Fidelity	Financial Activities	3,200
17	18	City of Arlington	Government	3,111
18	21	BNSF Railway	Trade/Transport/Utilities	3,100
19	N/A	Sabre Inc. (Travelocity)	Leisure & Hospitality	3,000
20	N/A	Bank of America Home Loans	Financial Activities	2,881
N/A (closed)	14	Albertson's Distribution Ctr.	Trade/Transport/Utilities	3,800
N/A (acquired by Bank of America)	15	Countrywide Financial	Financial Activities	3,700
N/A	19	Tarrant Co. College District	Education & Health Services	3,182
N/A	20	AT&T	Trade/Transport/Utilities	3,000

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2009 Ranking (layoffs)	2008 Ranking	Employer	Sector	# of Employees

Source: Fort Worth Chamber of Commerce

NTE Study Area

Employment in the Study Area (as defined in Figure 1-4) is forecast to grow by 29 percent between 2007 and 2030, from 1.15 million jobs in 2007 to 1.48 million in 2030, an average growth rate of 1.2 percent per year.

Table 1-5 details the forecast employment growth in the NTE Study Area, broken down by county and city.

Table 1-5: NTE Study Area Employment Forecast

County	# of Zones	2007 Emp	2009 Emp	2015 Emp	2025 Emp	2030 Emp
Denton	22	18,222	20,505	36,246	44,743	46,891
Dallas	250	228,805	237,827	264,122	293,359	293,859
Tarrant	1,088	899,320	926,715	1,003,797	1,115,445	1,140,038
<i>Total</i>	1,360	1,146,347	1,185,047	1,304,165	1,453,547	1,480,788

City	# of Zones	2007 Emp	2009 Emp	2015 Emp	2025 Emp	2030 Emp
Irving	156	171,057	177,970	198,502	221,866	222,113
Dallas	6	6,982	7,138	7,705	8,778	8,784
Southlake	20	12,113	13,482	23,254	25,226	26,040
Keller	21	5,638	6,308	8,992	11,920	14,379
Grapevine	42	61,528	65,411	67,515	70,295	70,570
North Richland Hills	46	25,827	27,298	29,837	32,808	32,966
Euless	38	22,253	23,603	28,562	30,795	30,814
Arlington	172	136,274	138,639	143,986	152,551	152,760
Other Incorporated	858	704,580	725,081	795,612	899,108	922,161
Other Unincorporated	1	95	117	200	200	201
<i>Total</i>	1,360	1,146,347	1,185,047	1,304,165	1,453,547	1,480,788

An analysis of 2007 Census Bureau data for the ZIP codes surrounding the Project shows the highest concentration of jobs near the IH 35/820 Interchange, DFW Airport (Segment 2E) and approaching the Fort Worth Central Business District (Segment 3A).

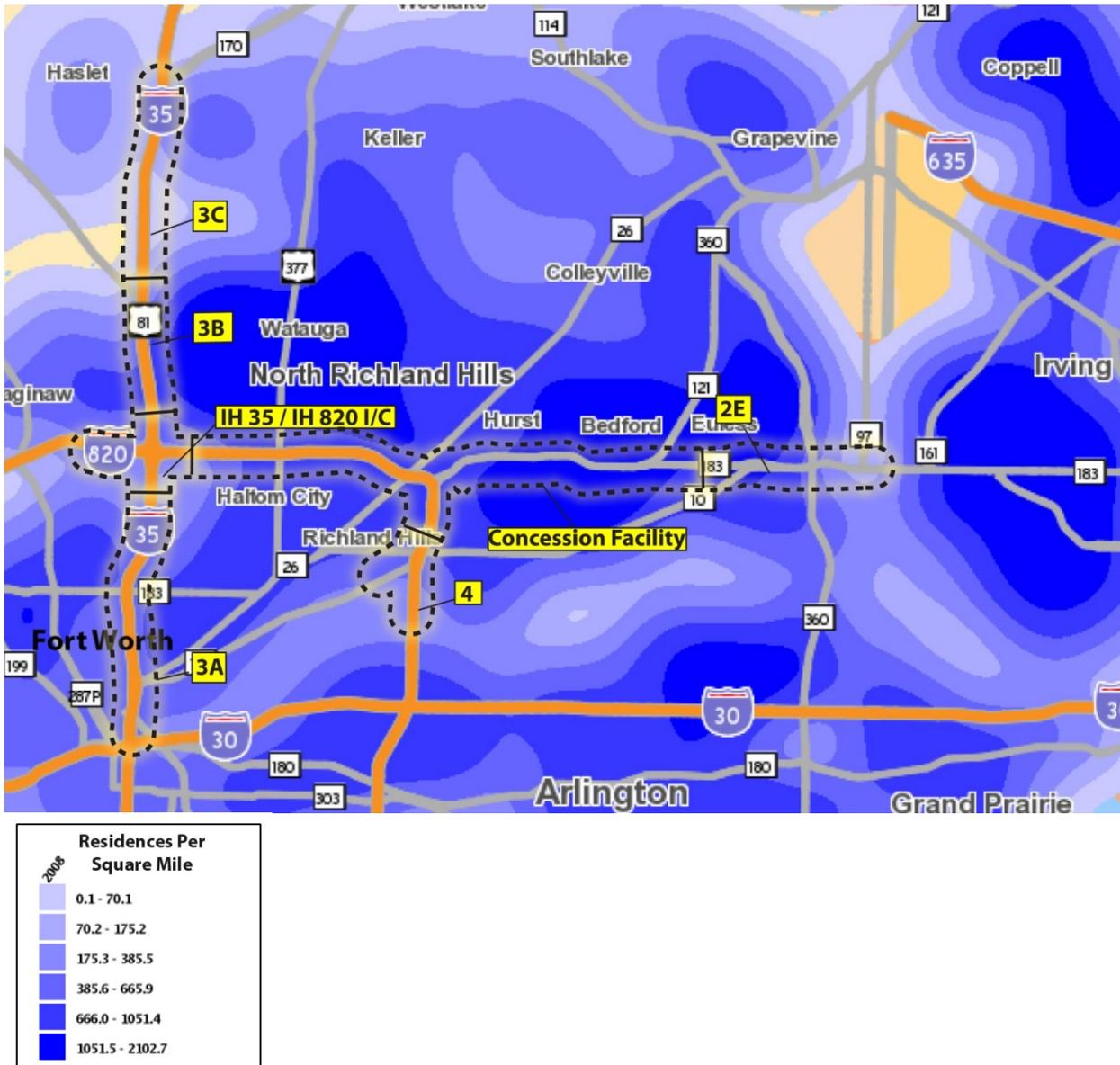
The ZIP codes containing the cities of Keller (76248), to the east of Segment 3C, and Grapevine (76051), to the north of Segment 2E, have added the most businesses between 1998 and 2007. The number of businesses in 76248-Keller has increased by

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155 percent since 1998 (from 382 to 973) and 76051-Grapevine has seen a 57 percent increase (from 1,151 to 1,748).

While jobs are relatively concentrated in the urban centers, living spaces are more widespread. The maps show a particular concentration of workers both living and working along the NTE Corridor, along with concentrations of jobs in the Central Business Districts of Fort Worth, Arlington and Dallas. Figures 1-16 and 1-17 show the concentration of workers' residences and jobs, respectively, in the DFW Urban Area.

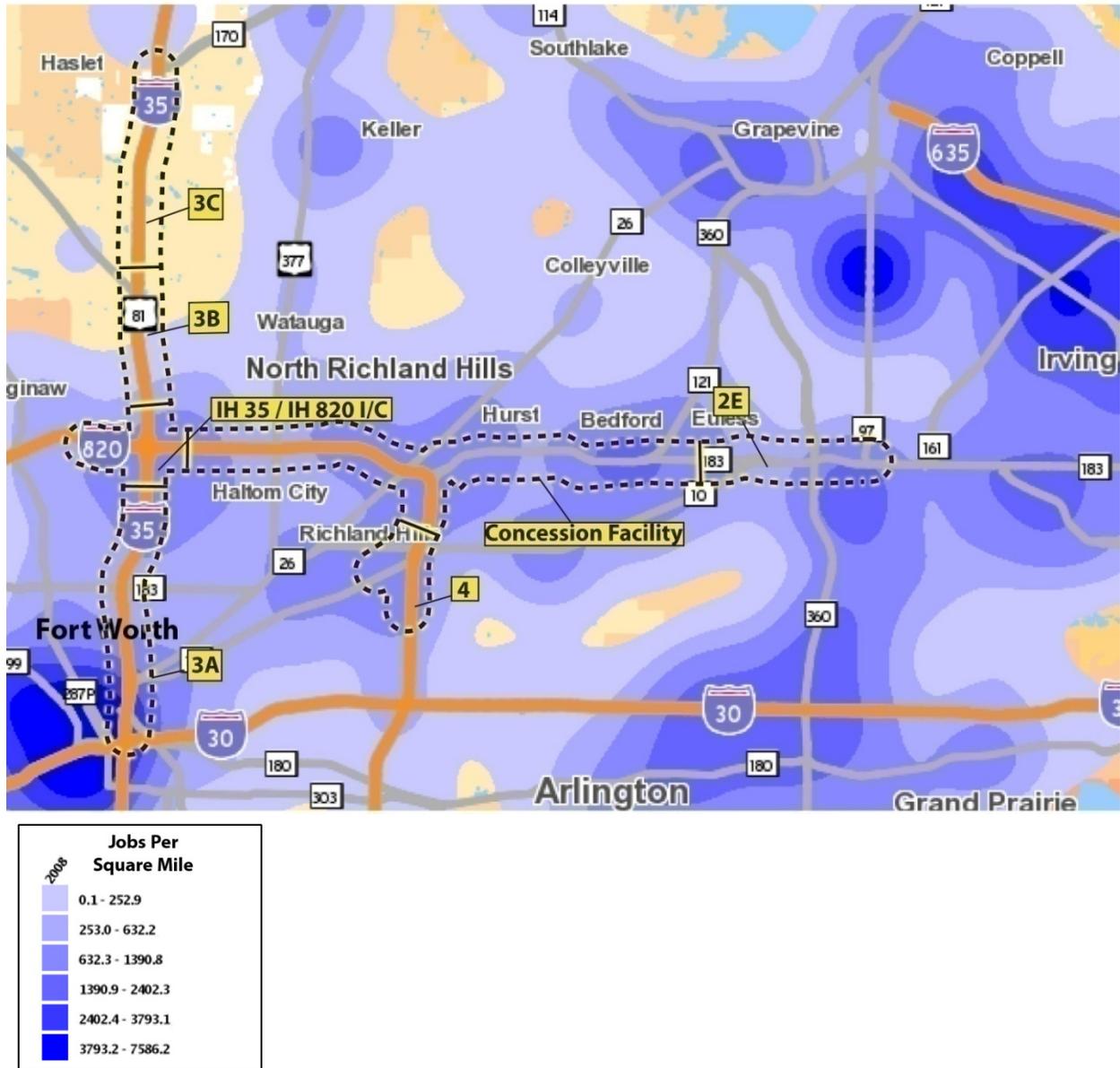
Figure 1-16: Distribution of Workers' Residences Surrounding NTE Project



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Source: U.S. Census Bureau,¹⁴

Figure 1-17: Distribution of Jobs Surrounding NTE Project



Source: U.S. Census Bureau¹⁵

¹⁴ U.S. Census Bureau, *Longitudinal Employer-Household Dynamics*, <http://lehdmap3.did.census.gov/themap3/>, accessed January 25, 2010

¹⁵ U.S. Census Bureau, *Longitudinal Employer-Household Dynamics*, <http://lehdmap3.did.census.gov/themap3/>, accessed January 25, 2010



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Table 1-6 shows the number of establishments surrounding the Project by ZIP code (actual 2007 Census Bureau figures)¹⁶, as well as the growth or decline in this number since 1998, the number of jobs by ZIP code and the average annual wages of employees working (but not necessarily residing) in each ZIP code. The number of jobs per ZIP code is presented graphically in Figure 1-18.

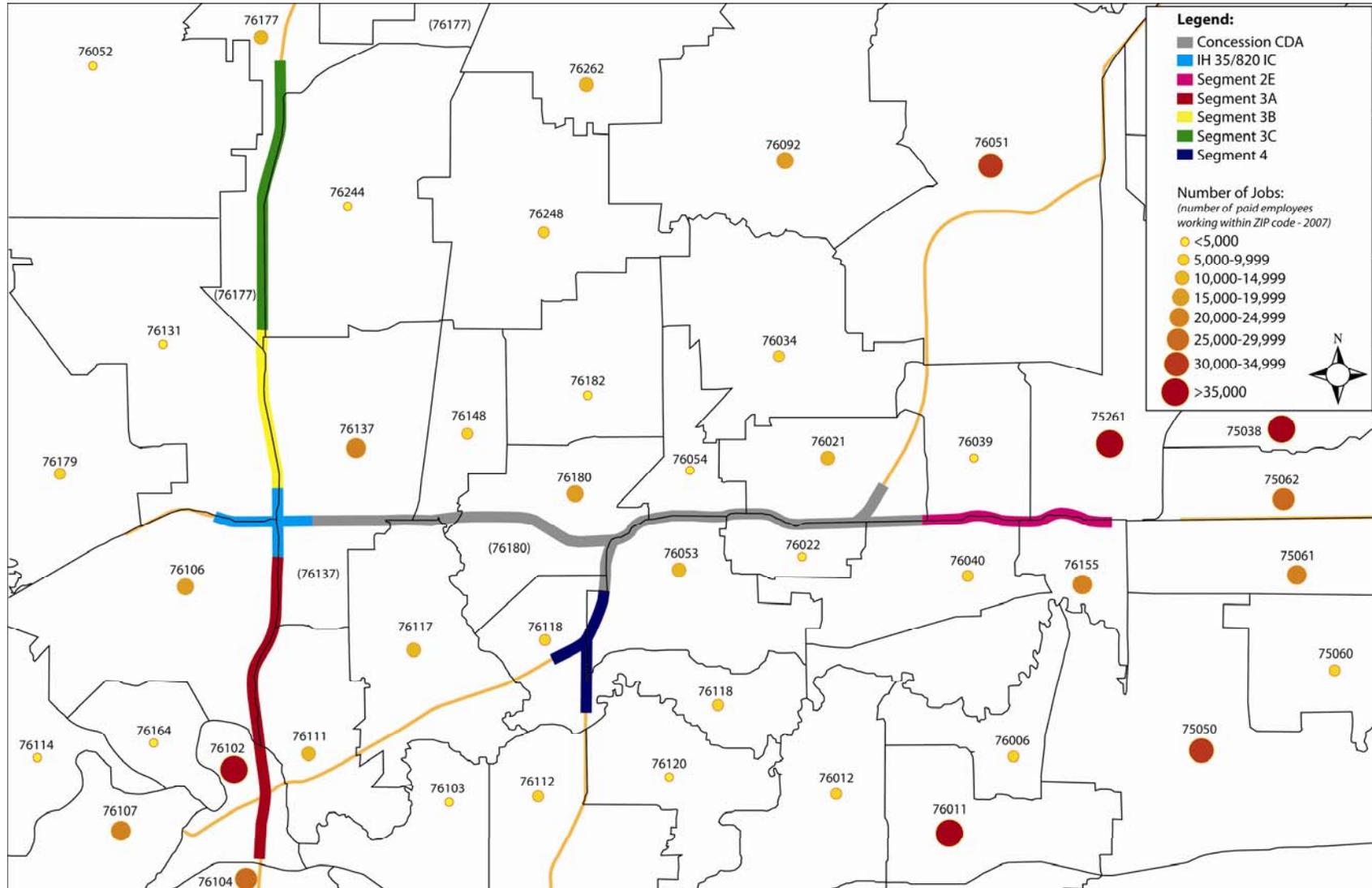
¹⁶ U.S. Census Bureau, ZIP Code Business Patterns, <http://censtats.census.gov/cbpnaic/cbpnaic.shtml>, accessed January 25, 2010.

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Table 1-6: Establishments, Jobs and Average Wages in ZIP Codes Surrounding Project

ZIP Code	Number of Establishments (2007)	Change in # of Establishments Since 1998	Number of Paid Employees (2007)	Average Wages (2007)
IH 35 / IH 820 Interchange				
76106 (Fort Worth)	710	-59	15,451	\$37,696
76131 (Fort Worth)	178	97	2,781	\$33,930
76137 (Fort Worth)	567	290	20,833	\$38,526
Segment Totals:	1,455	328	39,065	\$36,717 (avg.)
Segment 2E				
75050 (Grand Prairie)	1,263	20	33,993	\$36,770
76052 (Haslet)	183	136	2,776	\$33,428
76039 (Eules)	336	49	3,562	\$28,262
76040 (Eules)	561	59	8,008	\$37,371
76051 (Grapevine)	1,748	597	31,016	\$35,681
76155 (Fort Worth)	240	63	24,573	\$50,386
Segment Totals:	4,331	924	103,928	\$36,983 (avg.)
Segment 3A				
76102 (Fort Worth)	1,462	-79	36,042	\$67,347
76103 (Fort Worth)	244	-35	3,738	\$36,458
76106 (Fort Worth)	710	-59	15,451	\$37,696
76111 (Fort Worth)	565	-54	10,679	\$31,347
76134 (Fort Worth)	176	-32	not avail.	not avail.
Segment Totals:	3,157	-259	65,910	\$43,212 (avg.)
Segment 3B				
76131 (Fort Worth)	178	97	2,781	\$33,930
76137 (Fort Worth)	567	290	20,833	\$38,526
Segment Totals:	745	387	23,614	\$36,228 (avg.)
Segment 3C				
76052 (Haslet)	183	136	2,776	\$33,428
76117 (Haltom City)	795	-50	11,013	\$35,053
76248 (Keller)	973	591	9,389	\$30,218
76262 (Roanoke)	501	210	10,357	\$57,536
Segment Totals:	2,452	887	33,535	\$39,059 (avg.)
Segment 4				
76053 (Hurst)	877	-10	14,345	\$37,032
76118 (Fort Worth)	448	-58	7,355	\$40,495
Segment Totals:	1,325	-68	21,700	\$38,764 (avg.)

Figure 1-18: Jobs Surrounding NTE Project, by ZIP Code (2007)

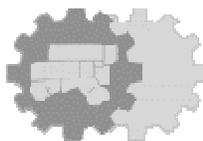
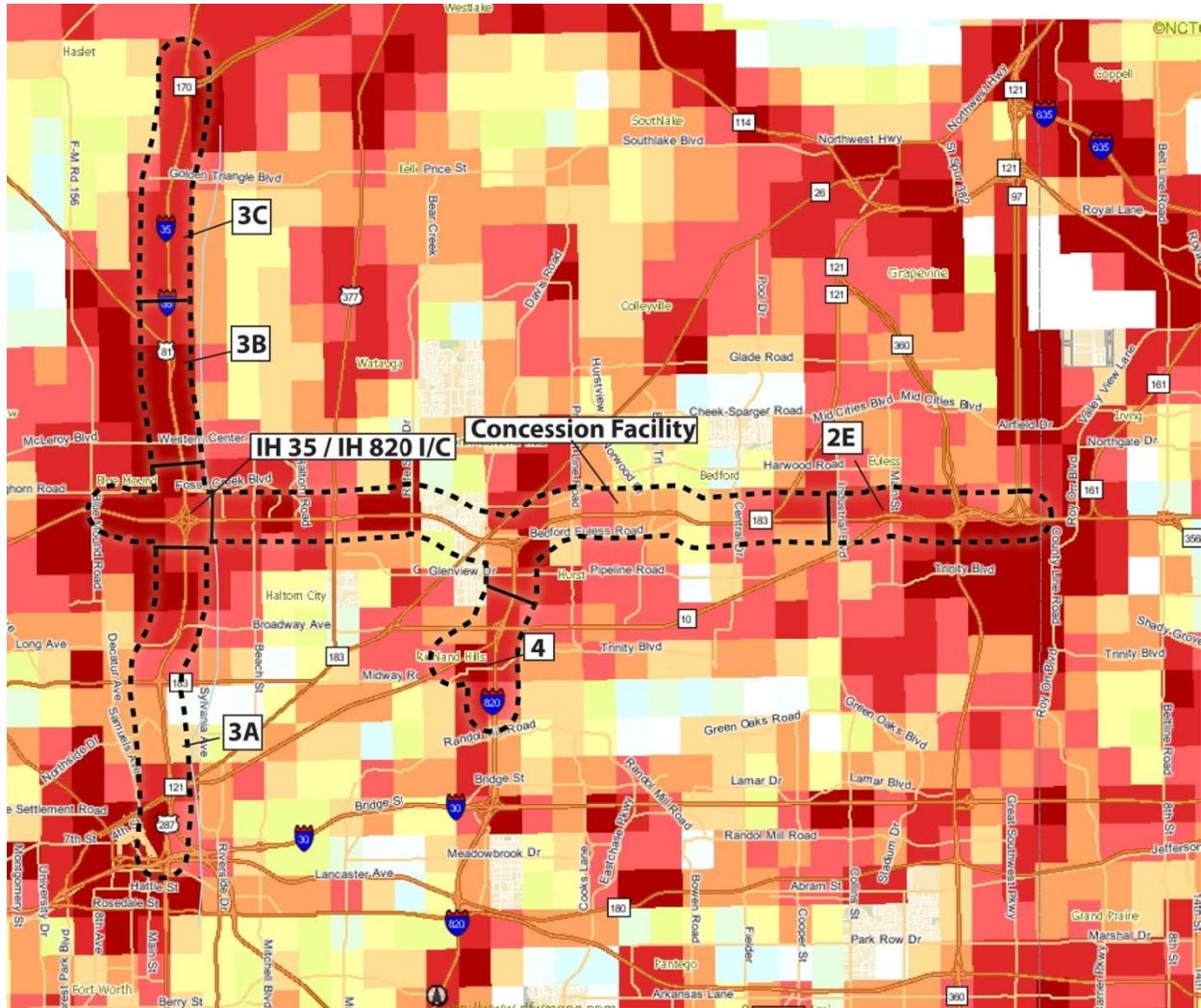


Source: U.S. Census Bureau

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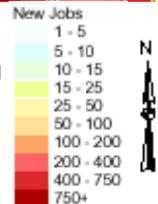
Figure 1-16 illustrates the projected distribution of employment growth surrounding the Project between 2000 and 2030. The highest employment growth is forecast in Segment 2E adjacent to DFW Airport; along the entirety of Segments 3B and 3C as well as north of Segment 3C; and all along Segment 4. More modest employment growth is forecast along most of Segment 3A and along the western portion of Segment 2E.

Figure 1-19: Forecast Employment Growth Surrounding NTE Project



NCTCOG Maps
www.dfwmaps.com
2000-2030 Employment Growth

DISCLAIMER
This data has been compiled for NCTCOG. Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.



1.2.3. Housing

In 2008, Fort Worth had the second highest number of new home starts in the country and the number of households in Tarrant County is projected to grow nearly 63 percent by 2030.

The U.S. Department of Housing and Urban Development (HUD) conducted a comprehensive housing market analysis of the Fort Worth Housing Market Area (HMA) in June 2008. The HMA comprises Tarrant, Johnson, Parker and Wise Counties.

The study found that since 2000, the housing market has been balanced as a result of economic growth and affordable home sales prices. Home sales decreased by 11 percent during the 12-month period ending May 2008, but the average home sales price in the HMA increased by 4 percent to \$145,100, compared with the average price recorded during the previous 12-month period.

A 2009 report by the Real Estate Center at Texas A&M University found that home prices in the Dallas-Fort Worth-Arlington area were, on average, significantly higher than the statewide average, but relatively low compared to other parts of the United States. When indexed for affordability relative to median family income, the disparities were reduced and Fort Worth was shown to offer the most affordable housing in the region, closer to the statewide average, as shown in Table 1-7.

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Table 1-7: 2008 Housing Affordability Index

Market Segment	2008 Median-Priced Home	Required Income to Qualify	Median Family Income	HAI*	HAI for First-Time Homebuyers**
Arlington	\$130,100	\$30,614	\$64,600	2.11	1.42
Collin County	\$203,300	\$47,839	\$99,600	2.08	1.31
Dallas	\$156,000	\$36,709	\$64,800	1.77	1.29
Denton County	\$160,100	\$37,674	\$74,480	1.98	1.21
Fort Worth	\$117,000	\$27,532	\$64,600	2.35	1.70
Irving	\$146,660	\$34,497	\$64,800	1.88	1.40
Texas	\$97,600	\$22,985	\$55,000	2.39	1.55
United States	\$196,600	\$46,152	\$61,500	1.33	0.66

* The HAI is the ratio of the median family income to the income required to buy the median-priced house using standard mortgage financing at the current interest rate. Standard financing is a fixed-rate, 30-year loan covering 80 percent of the cost of the home. A HAI of 1.00 indicates that the median family income is exactly equal to the required income to qualify for the standard loan to purchase the median-priced house.

**First-time home buyer is assumed to purchase a home equal to the first quartile home price using a 90 percent home loan at an interest rate 0.5 percent greater than the standard current rate.

Source: Real Estate Center at Texas A&M University

With its relatively low home prices compared to Dallas, the Fort Worth HMA attracts a large number of residents who commute to work in the Dallas area. The average sales price of a single-family home in Dallas (\$218,300) is more than 50 percent higher than the average price in the Fort Worth HMA (\$145,100). As stated earlier, approximately 18 percent of workers living in the Fort Worth HMA commute to the Dallas area for work. Combined with the strong employment projections for Fort Worth itself, the demand for housing in Tarrant County is expected to grow.

HUD estimates that 69.1 percent of residents in the Fort Worth HMA own their homes and 30.9 percent are renters. The rental housing market in the HMA has been soft since 2002, with a 2008 vacancy rate of 13 percent, because of oversupply of units. The average rent increased five percent to \$705 during the 12 months ended May 2008 compared with the previous year. The current supply of excess vacant units and the 4,850 units currently under construction will satisfy rental demand through HUD's three-year forecast period.

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The NCTCOG forecasts that Tarrant County will be the fastest-growing county in terms of households in the DFW Area between 2000 and 2030, with the number of households expected to grow by 60 percent. However, Tarrant County will decline slightly (three percent) in its share of households as Ellis, Johnson, Kaufman, Parker and Rockwall Counties more than triple their number of households during the forecast period, further necessitating regional connectivity.

Nationwide, average household sizes are declining while the number of vehicles per household is rising. The average household in Tarrant County contained 2.67 people and 1.9 vehicles in 2008, according to the U.S. Census Bureau. The NCTCOG predicts that decline in household sizes in North Central Texas between 2000 and 2030 will be very gradual, if one occurs at all, due to increasing immigration populations with historically higher household sizes offsetting declines that would be attributed to an aging population.

Future projections for number of vehicles per household are not available, but assuming that the figure of 1.9 stays fairly constant, the forecast addition of 321,000 households in Tarrant County by 2030 may translate to as many as 611,000 new vehicles on area roadways.

Cities Surrounding NTE Project

The forecast percentage of household growth in the major cities surrounding the Project is shown in Table 1-8. In several cases, the areas with the lowest forecast household growth are the areas that are already built out, or are approaching build-out within the next 10 years.

Table 1-8: Forecast Household Growth in Cities Along NTE Project

City	% Household Growth (2000-3030)	Projected Build-Out Year	Adjacent NTE Segment(s)
Grand Prairie	79.52	not avail.	2
Keller	76.54	2025	3C
Fort Worth	58.75	not avail.	CF*, 3A, 3B, 3C, IH 35 / IH 820 Interchange
Euless	31.06	not avail.	CF, 2
Colleyville	30.05	not avail.	CF
Arlington	29.51	2030	CF, 2
N. Richland Hills	29.21	2025	CF
Irving	17.22	2030	2
Haltom City	12.62	2010	3A, IH 35 / IH 820 Interchange, CF
Hurst	10.20	2030	CF, 4



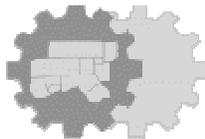
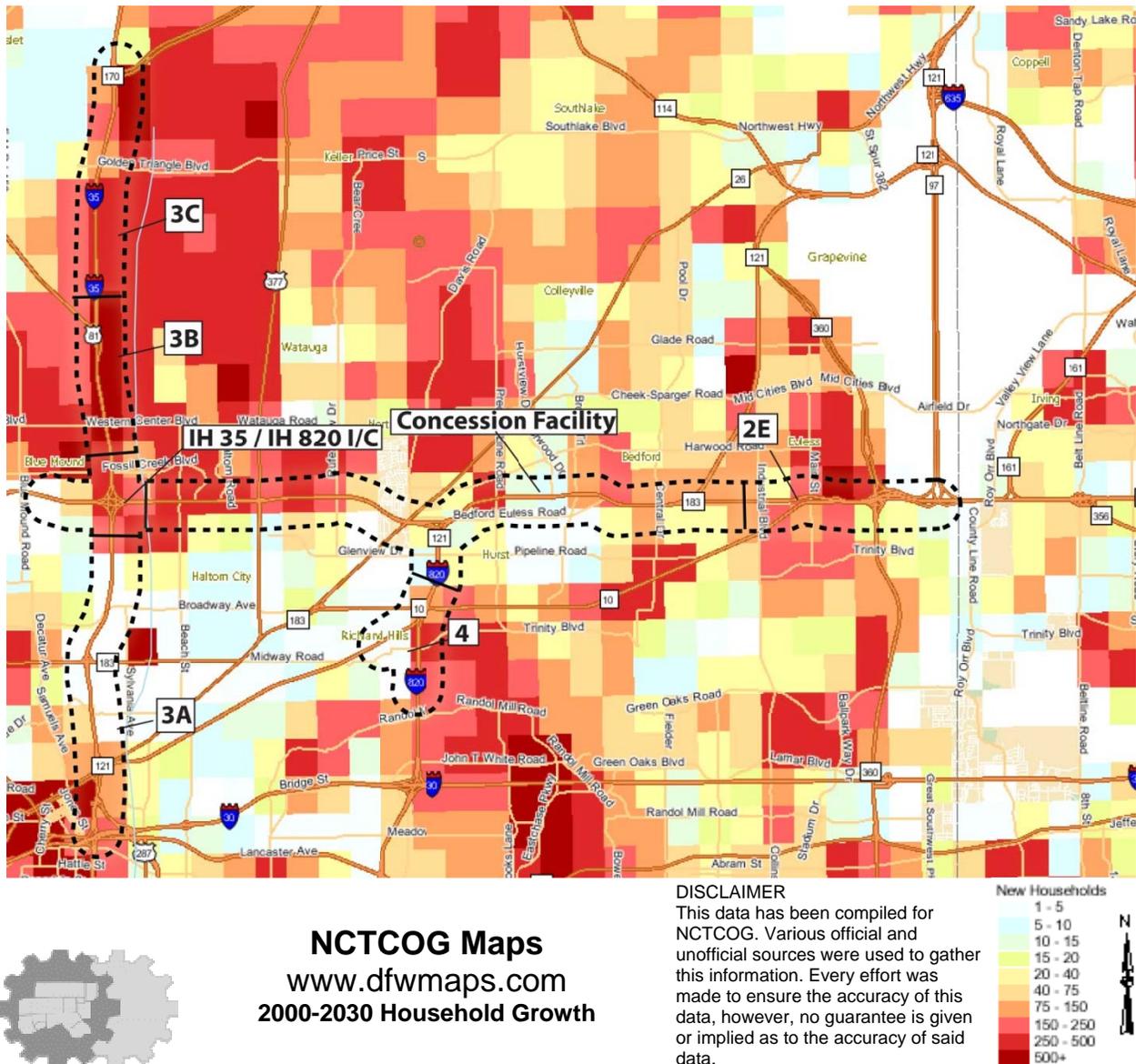
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City	% Household Growth (2000-3030)	Projected Build-Out Year	Adjacent NTE Segment(s)
Bedford	7.71	2020	CF, 2
Richland Hills	0.41	2005	CF, 4

* Concession Facility

Figure 1-20 illustrates the forecast distribution of growth in households surrounding the Project between 2000 and 2030. The highest growth in households is forecast in Segments 3B, 3C, south of Segment 4 and along the IH 35 / IH 820 Interchange with more modest household growth along most of Segment 2E.

Figure 1-20: Forecast Household Growth Surrounding NTE Project



NCTCOG Maps
www.dfwmaps.com
2000-2030 Household Growth

Figure 1-21 shows existing housing developments near the Project. There are large concentrations of multi-family homes south of Segment 3A in the Fort Worth CBD, north of the IH 35 / IH 820 Interchange, and both east and west of DFW Airport, near Segment 2E. Single-family homes are spread out more evenly across the area, generally at a slightly greater distance from the Project than the multi-family developments.

Figure 1-22 shows new housing developments that are either announced or under construction near the Project. Notable single-family developments include Sendera Ranch, a 9,500-home community under construction off FM 718 to the west of Segment



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3C, and Viridian, a planned 3,400-home development off FM 157, south of Segment 2E. More than 4,700 multi-family units are in development (nine developments) directly to the east of DFW Airport, east of Segment 2E.

Figure 1-21: Existing Housing Developments Surrounding Project

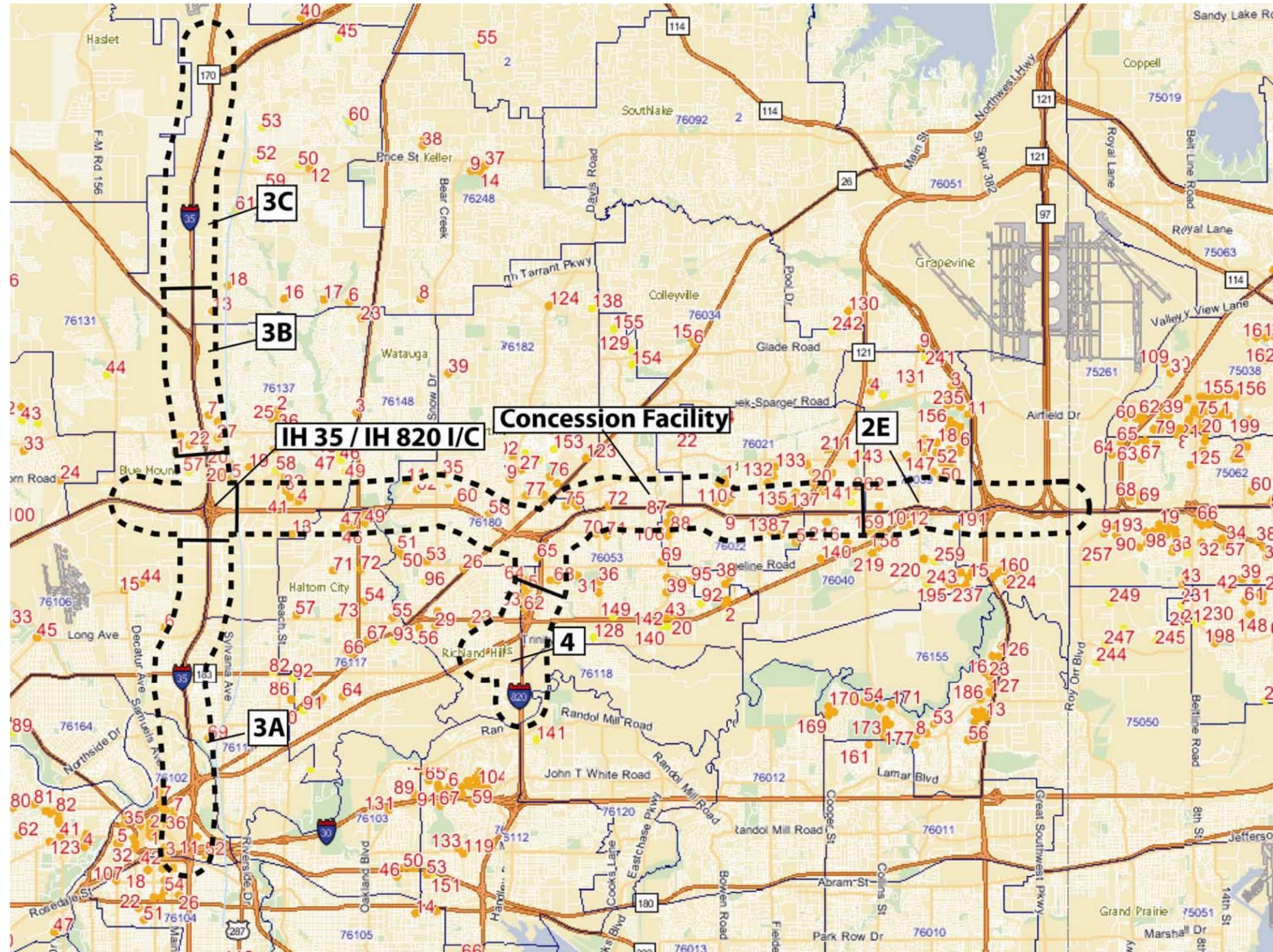
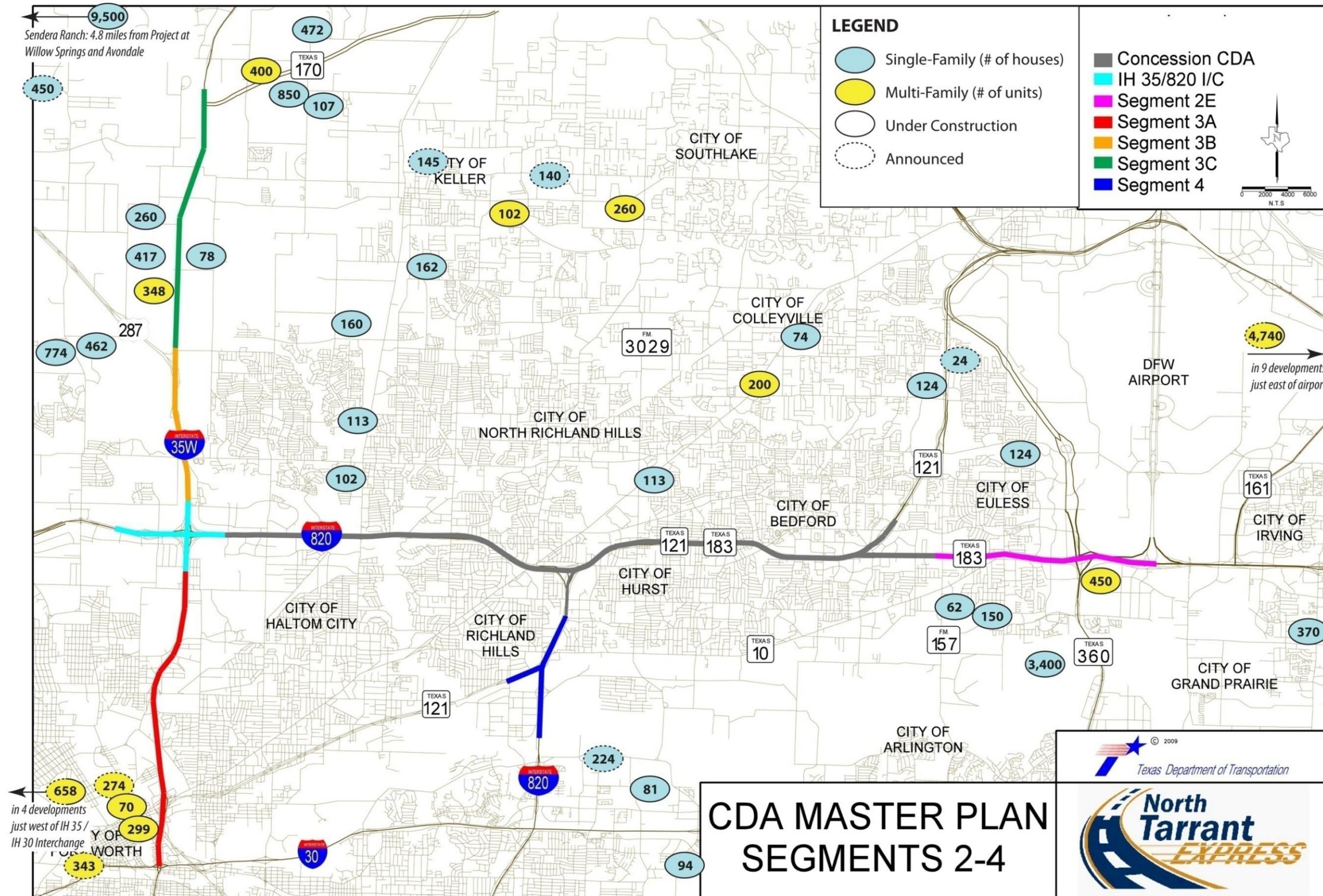


Figure 1-22: New Housing Developments (Announced and Under Construction) Surrounding Project



1.2.4. Build-Out Projections

Several cities surrounding the NTE Corridor are approaching build-out within the next 10 to 20 years. When cities reach build-out, redevelopment is a typical tactic for renewing the city and retaining and growing the tax base. The NCTCOG predicts that although cities may indicate that they have reached their ultimate build-out, there may continue to be growth at and around rail stations, through commercial conversions, and by low-density residential developments being replaced by higher-density structures. The projected build-out dates of cities surrounding the NTE Corridor are shown in Table 1-9. Fort Worth is not included in this table because although the city limits may build out before 2030, it has a very large Extra-Territorial Jurisdiction (ETJ), which is projected to show continued new growth.

Table 1-9: Build-Out Projections for Cities Adjacent to NTE Project

City	Build-Out Date	Adjacent to NTE Segment(s)
Arlington	2030	CF* & 2
Bedford	2020	CF
Haltom City	2010	CF, 3A, 4
Hurst	2030	CF, 4
Irving	2030	2
North Richland Hills	2025	CF
Richland Hills	2005	CF, 4

*Concession Facility

1.2.5. Per Capita Income

Throughout the state, personal income levels increased 40 percent from 1990 to 2007, representing an annual growth rate of two percent per year. Forecasted purchasing power and disposable income are expected to grow.

According to the Texas Workforce Commission’s 2007 data, workers in the Dallas-Fort Worth-Arlington area earn the highest average hourly wages in the state – averaging \$19.98/hour compared to the statewide average of \$18.21/hour. As of 1999, the Metroplex had the lowest poverty rates across all ethnic groups compared to all other regions in the state, as shown in Table 1-10.

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Table 1-10: Texas Poverty Rates by Region (1999)

	Metroplex	East Texas	Gulf Coast	Rio Grande	Central	West	Panhandle
Anglo	5.8	11.5	6.7	10.8	8.4	9.6	11.3
Black	20	33.1	23.5	28.9	22.4	24.7	33.3
Hispanic	20.1	29.5	22.8	37.6	21.2	27.3	26
Total	10.9	16.4	14.5	34.4	14.2	20.9	15.9

Source: U.S. Census Bureau data

Given that Texas' population will have nearly doubled between 1990 and 2035¹⁷, it can be seen that population and personal wealth will be the strong drivers for Gross State Product (GSP) growth. Historical and forecast growth in GSP and Gross Domestic Product (GDP) are shown in Figure 1-23.

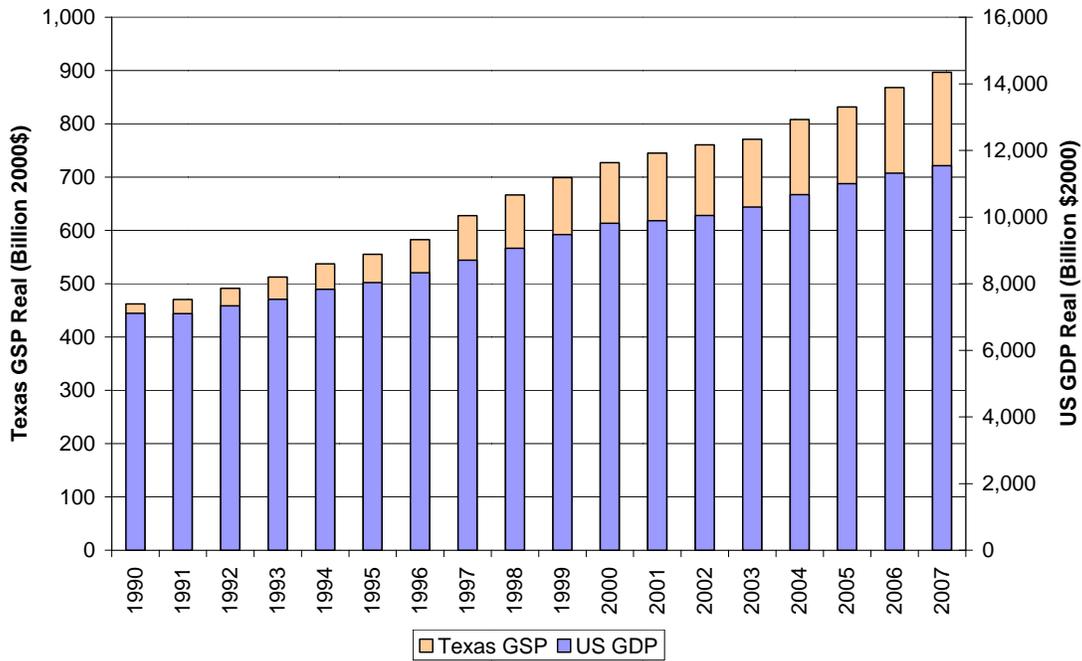
As of the fourth quarter of 2008, the per capita personal income in the state of Texas was \$39,071, up from \$29,128 in 2001, and consistent with the U.S. per capita income for the same year, which was \$39,751¹⁸. Real personal income growth per capita is forecast to continue to grow at 3.6 percent per year (on average) until 2038, as shown in Figure 1-24. The graph shows the effects of the 2001 to 2003 decline in employment, driven by downturns in oil and high-tech and the aftermath of 9/11. During this time, the Texas job situation was made significantly worse by continued strong population growth across the state despite the ongoing recession. The economy declined 2.8 percent before growth resumed in July 2003. Despite this, per capita income levels increased 113 percent from 1990 to 2007.

¹⁷ *Texas in Focus: A Statewide View of Opportunities*. Texas Comptroller of Public Accounts, January 2008.

¹⁸ Washington Office of Financial Management, <http://www.ofm.wa.gov/trends/tables/fig101.asp>, accessed January 29, 2010.

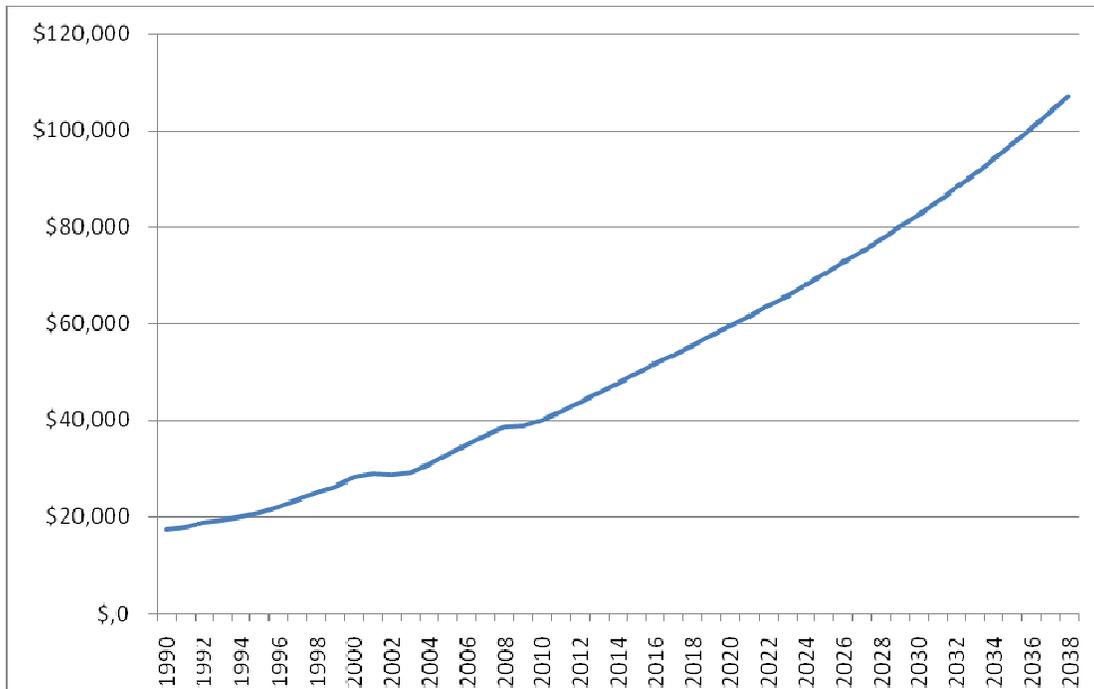
Chapter 1: Key Parameters and Assumptions

Figure 1-23: Texas GSP and U.S. GDP - 1990-2007



Source: Texas Comptroller

Figure 1-24: Texas Historical and Forecast Per Capita Income: 1990-2038



Source: Texas Comptroller¹⁹

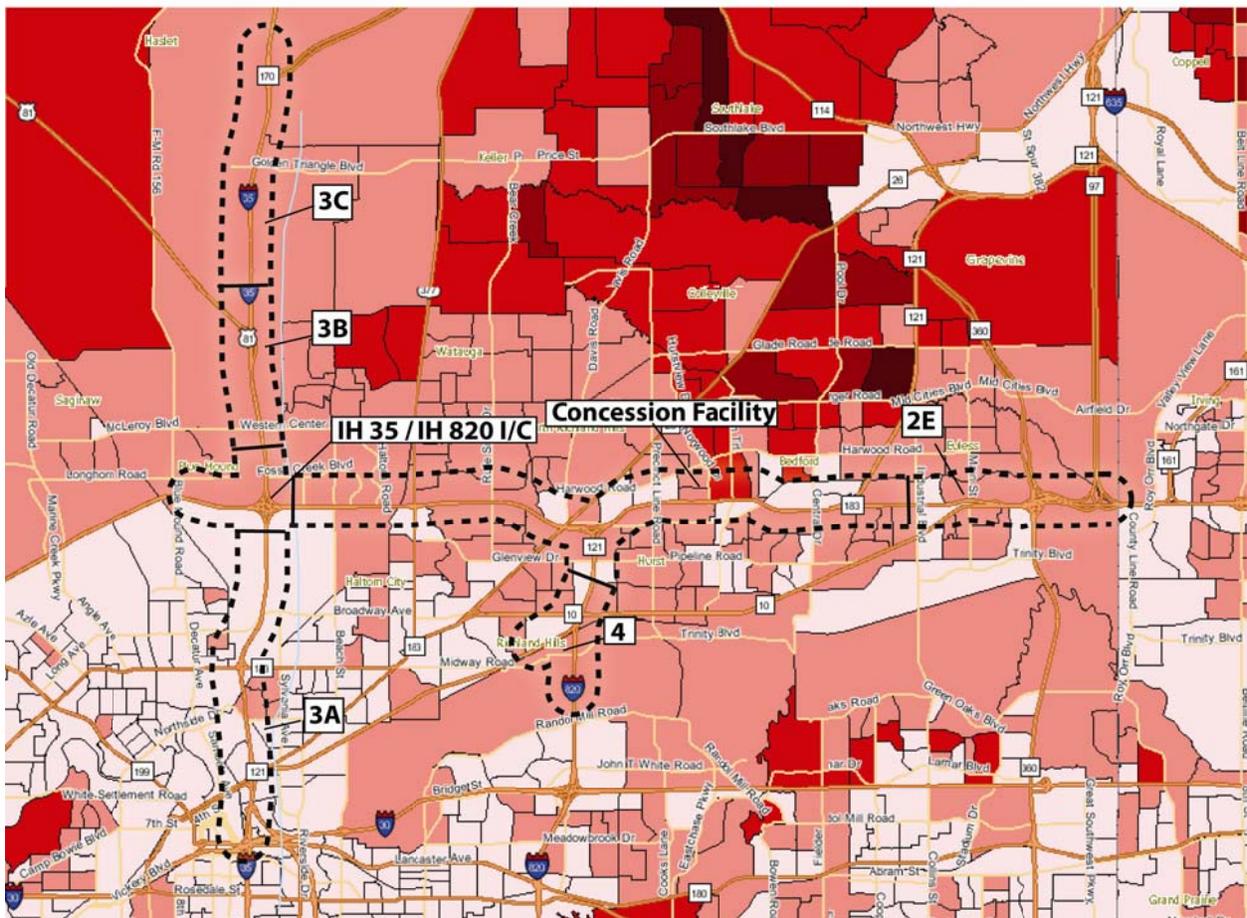
¹⁹ Texas Ahead, Winter 2008-2009 Economic Forecast, Texas Comptroller's Office, <http://www.texasahead.org/economy/fcst0809/>, accessed November 1, 2009.

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According to the U.S. Department of Housing and Urban Development, the median family income in the Fort Worth-Arlington Metro area increased from \$43,000 to \$64,000 between 1993 and 2008, an average annual increase of 3.3 percent.

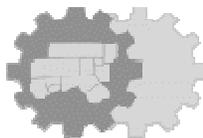
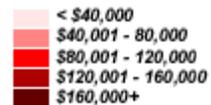
Figure 1-25 illustrates the distribution of household income in the area surrounding the Project, based on U.S. Census data. Generally, lower-income areas are found to the south of the Project, especially adjacent to Segment 3A, with higher-income areas a slight distance away to the north of the Concession Facility and Segment 2E, as well as to the west of Segments 3B and 3C.

Figure 1-25: Median Household Income Surrounding NTE Project - 2000



DISCLAIMER

This data has been compiled for NCTCOG. Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.



NCTCOG Maps
www.dfwmaps.com
Median Household Income

1.2.6. Age and Ethnic Distribution

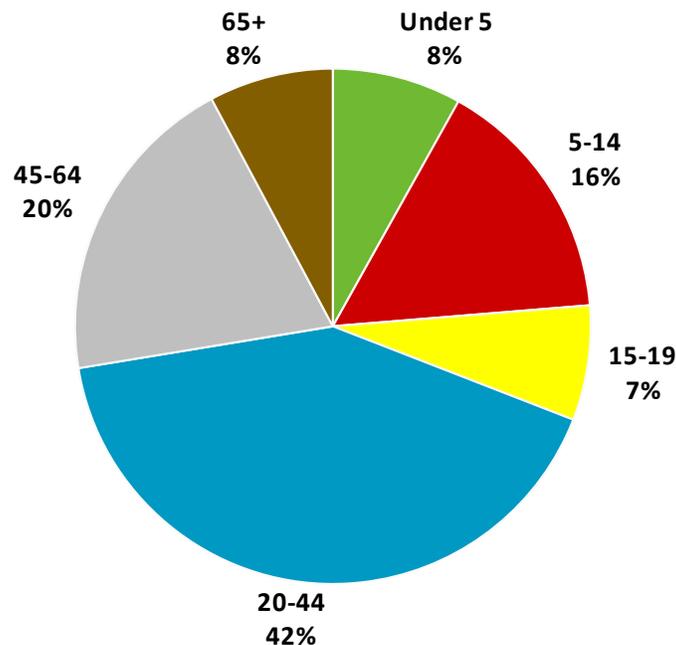
Age Distribution

According to 2007 Census data, the median age of the Texas population is 33.1 years, versus 36.6 years for the nation as a whole. Texas has the youngest median population by far among the 10 most populous states. Texas also has the fifth-youngest work force in the nation, with a median age of 39.4 years, according to the University of Texas at San Antonio’s Institute for Demographic and Socioeconomic Research.

Over the next 30 years, the population will age, and the current one in ten Texans over the age of 64 will climb to over 16 percent. The aging of the population will increase demand for health care, long-term care, and other services. However, the aging of Texas’ population will be offset somewhat by relatively rapid growth in younger cohorts, and therefore Texas is expected to remain younger than the nation as a whole.

Figure 1-26 shows the age distribution of the population of the DFW Urban Area, according to data from the 2000 Census.

Figure 1-26: Age Distribution in the DFW Urban Area (2000)



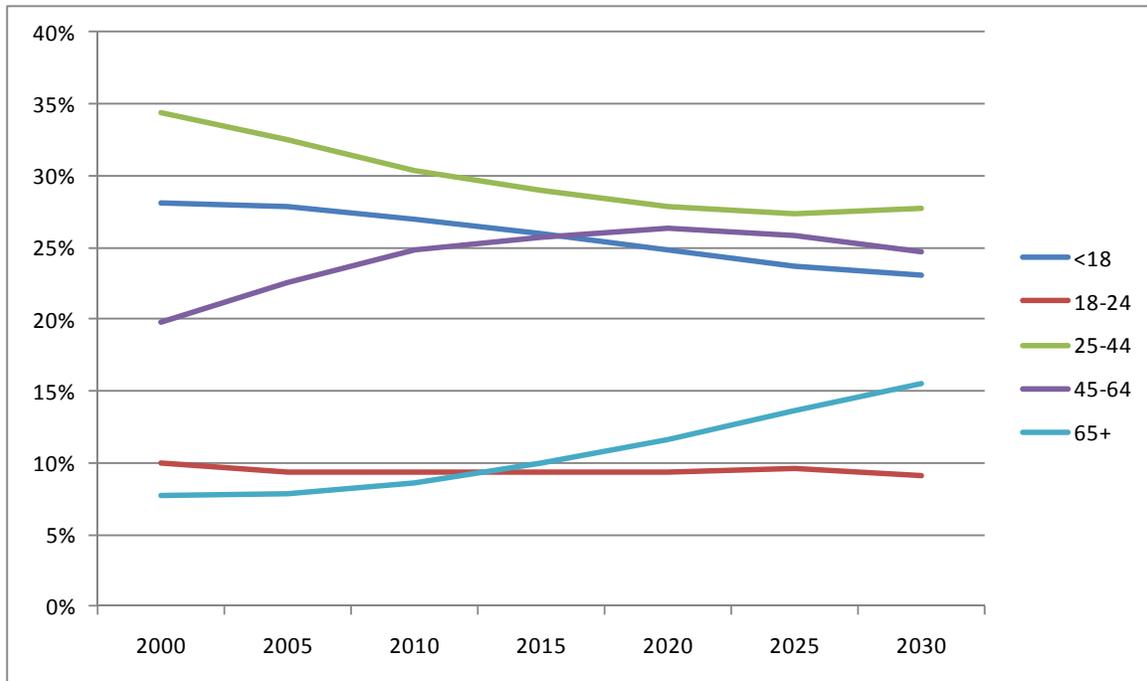
Source: U.S. Census Bureau

The age distribution is similar to that of the state as a whole, with the exception of two cohorts – the age 20-44 cohort is three percent higher and the age 65+ cohort is two percent lower than the statewide total. This slightly younger population is associated with a healthy economic situation, since the 25-44 age group contains the greatest share of the labor force.

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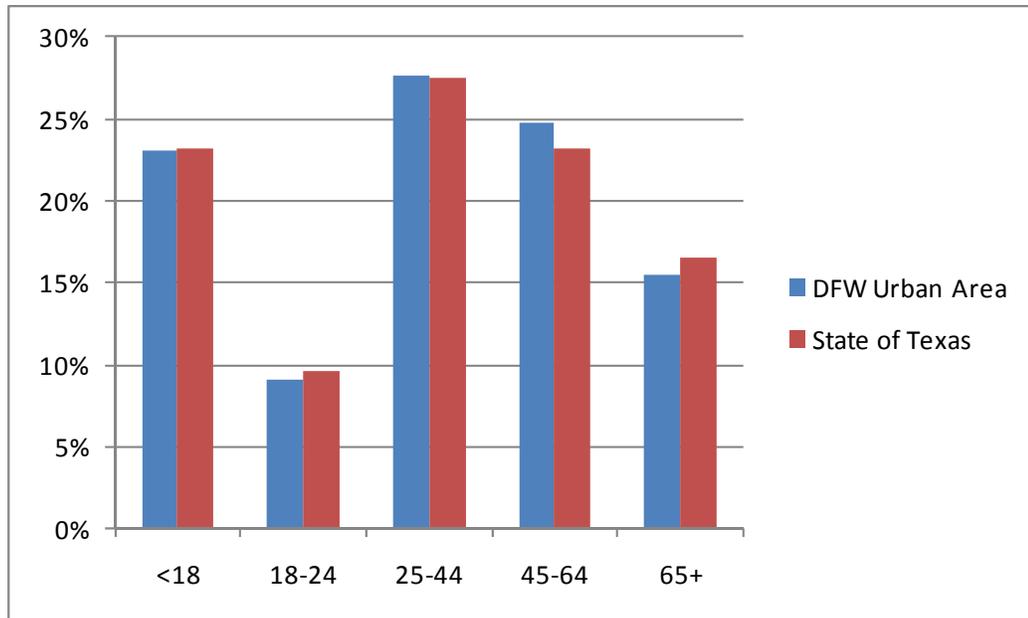
Figure 1-27 illustrates the projected age distribution of the nine-county DFW Urban Area through 2030. It shows a marked increase in the age 65+ cohort, with declines in every other age group. Yet compared to the state as a whole, the DFW urban area is projected to have fewer residents over 65 and higher numbers of working-age residents ages 25-44 and 45-64, as shown in Figure 1-28.

Figure 1-27: Projected Age Distribution of DFW Urban Area - 2000-2030



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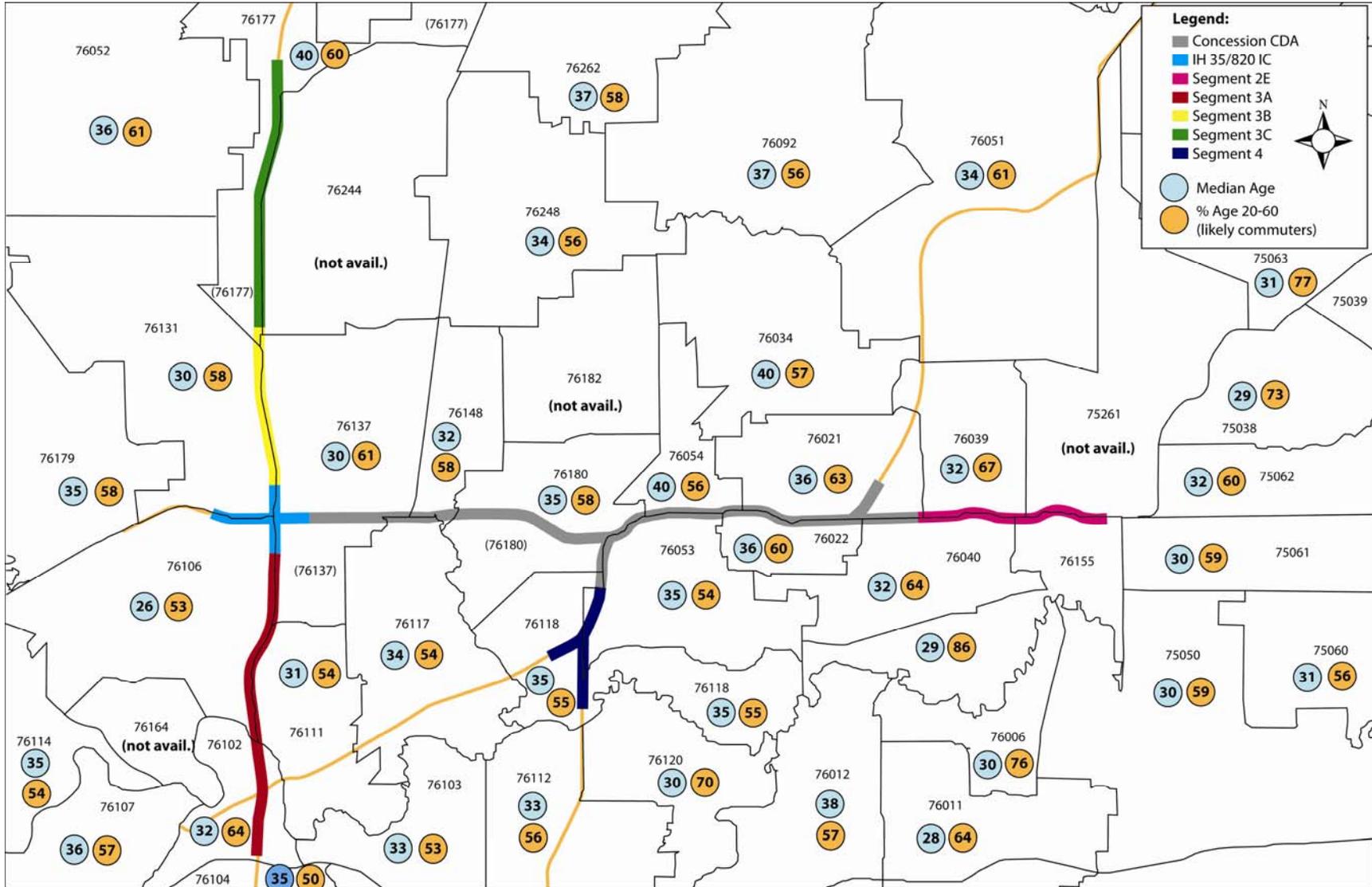
Figure 1-28: Projected 2030 Age Distribution in DFW Urban Area vs. State of Texas



Source for Figures 1-27 and 1-28: Data from the Texas State Data Center (TSDC), also known as the Office of the State Demographer. The TSDC developed three forecasts for population growth, which present differing estimated rates of net migration into Texas. The zero scenario, provided primarily for comparison purposes, assumes no net migration into the state and demonstrates the population change that would occur as a result of only births and deaths. The 0.5 scenario assumes half the net migration into the state that was recorded in the 1990s and the 1.0 scenario assumes that net migration stays the same as the rate recorded in the 1990s. For most areas of the state, the TSDC suggests the 0.5 scenario is the most appropriate for long-term planning. Therefore, the graphs above use data from the 0.5 scenario.

Figure 1-29 shows the median age and percent of the population aged 20-60 (likely commuters) in the ZIP codes surrounding the Project. People age 20-60 make up an average of 60 percent of the population in the ZIP codes shown. The highest percentage of likely commuters is shown in the areas surrounding DFW Airport and to the southeast of Segment 4. However, this information should be viewed in conjunction with total population/population density in each ZIP code to determine actual numbers of people aged 20-60.

Figure 1-29: Age Distribution in ZIP Codes Surrounding the Project



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Ethnic Distribution

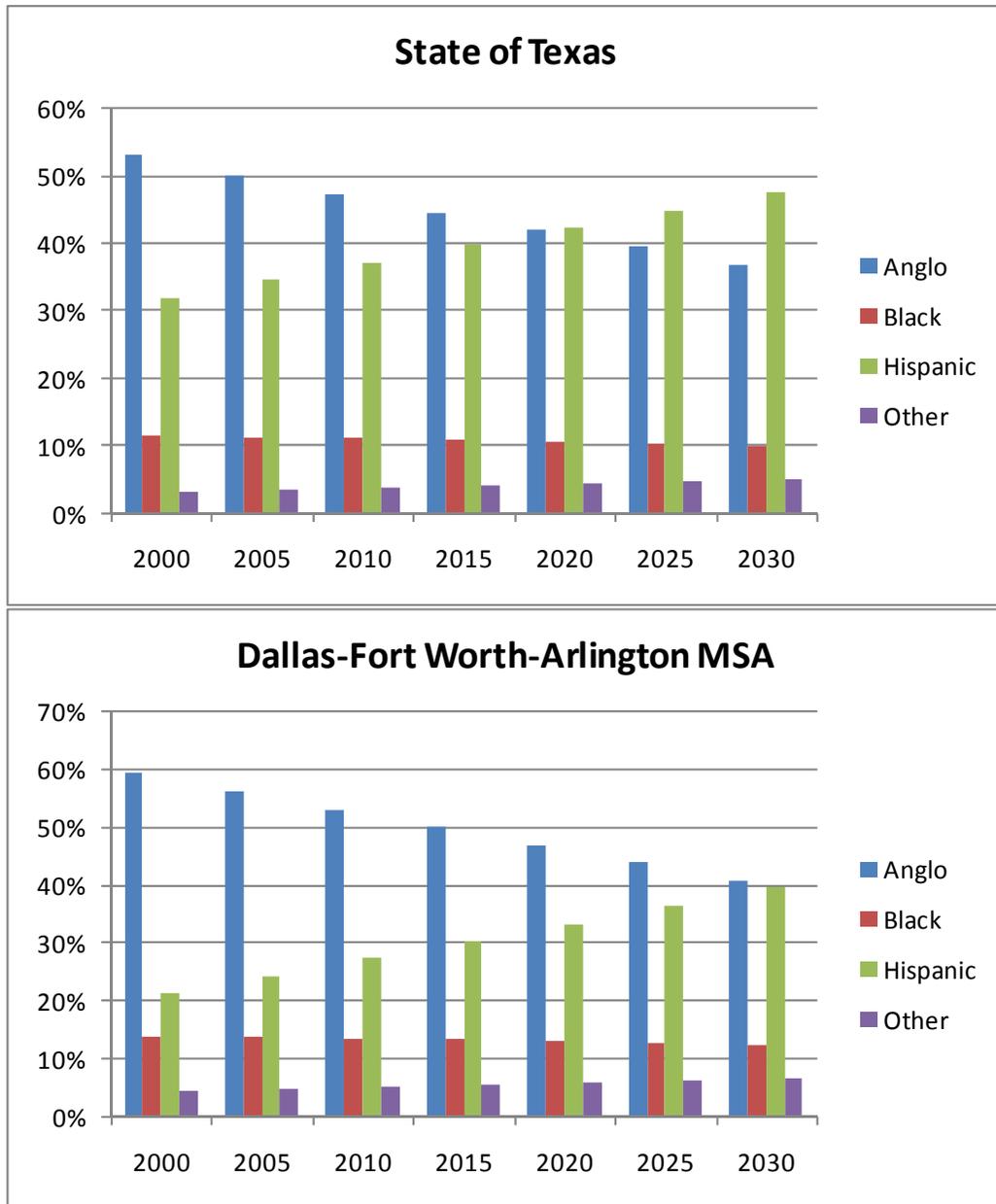
The racial and ethnic diversity of the population of Texas has increased substantially in recent decades. In the 1980s and 1990s, non-Anglo population groups showed substantially larger percentage increases than the Anglo population. Texas recently became less than one-half Anglo and is likely to have a majority Hispanic population by 2040. Figure 1-30 illustrates the projected ethnic distribution of Texas and the Dallas-Fort Worth-Arlington MSA through 2030.

If socioeconomic differentials between demographic groups are reduced in coming years through increased education and other means, the state's diversity, population growth and relative youth may become a source of increased private- and public-sector resource growth and increased competitiveness that would give Texas a competitive advantage relative to other states.

Figure 1-31 shows the current ethnic distribution in the ZIP codes surrounding the project. Ethnic distribution varies widely between these ZIP codes, but, in general, the areas to the north of the east-west portions of the Project and to the south of the Concession Facility are primarily Anglo, with a much higher percentage of Anglos than the statewide and DFW Area averages. The areas to the south of Segments 2 and 4 and to the west of Segment 3A are more diverse, with larger Hispanic/Latino and Black populations.

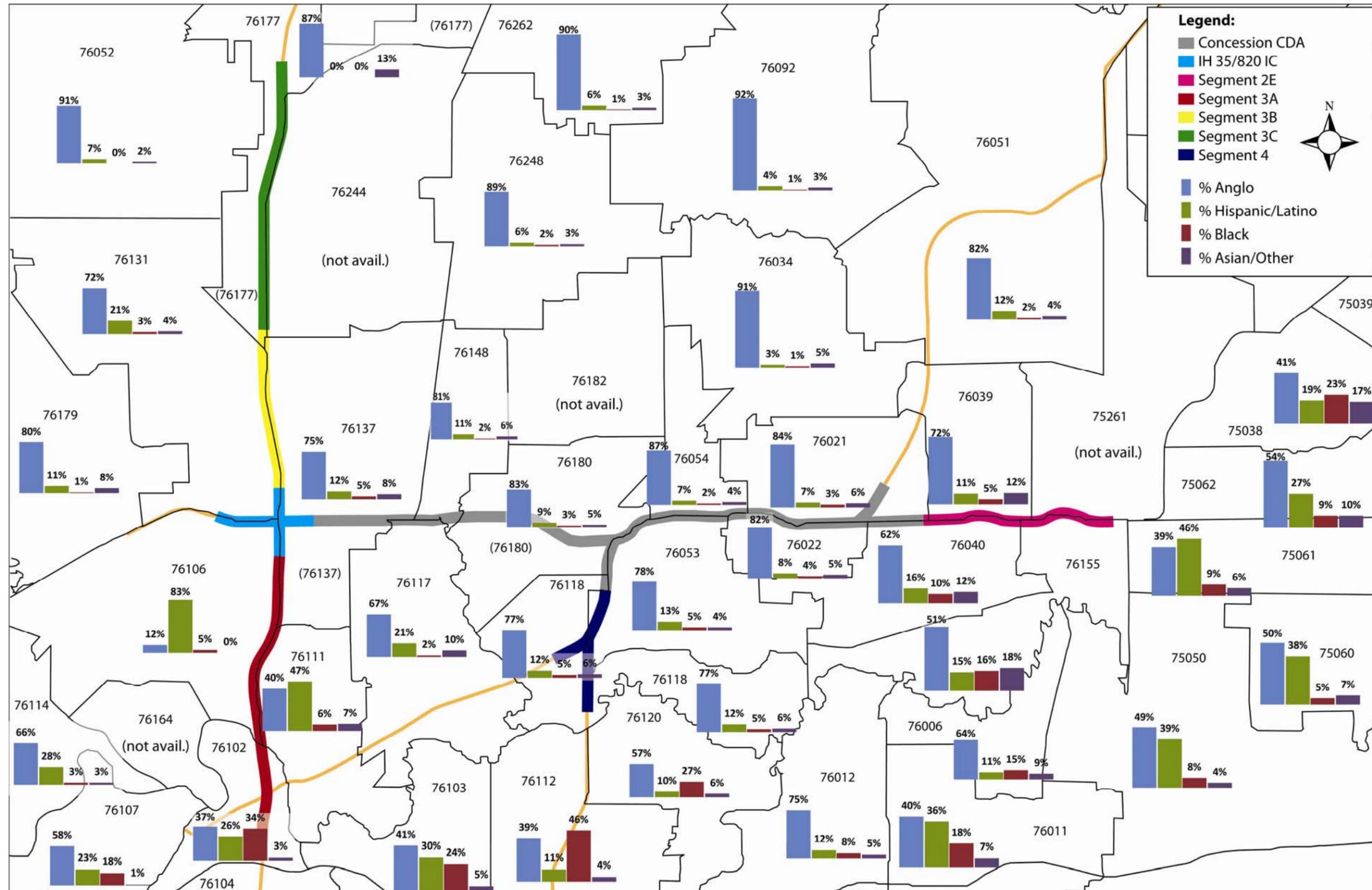
Chapter 1: Key Parameters and Assumptions

Figure 1-30: Projected Ethnic Distribution of Texas and DFW-Arlington MSA - 2000-2030



Source: Data from the Texas State Data Center (TSDC), using its 0.5 net migration scenario.

Figure 1-31: Ethnic Distribution in ZIP Codes Surrounding the Project



1.3. Federal and State Fiscal Status and Budget Trends

The role of the public sector in funding basic infrastructure is changing, with a greater emphasis on user fees, public-private partnerships and alternative financing mechanisms. Public sector funding of basic infrastructure, including the transportation network, has been declining for some time, as the State of Texas spends proportionately less today on highways than it did 20 years ago. For example, the Comptroller's Office reports that highway, maintenance and construction as a single line item accounted for 11.2 percent of State expenditures during fiscal 1983. By fiscal 2003, highway maintenance and construction had fallen to 8.2 percent. In the 2010-2011 budget, nearly another percentage point was lost with such expenditures totaling only 7.3 percent. This decrease is occurring while the actual maintenance demand increases due to aging infrastructure.

For the first time since 1991, Texas gas tax revenues fell in the first eight months of Texas' 2009 fiscal year (September 2008-April 2009), coming in at 3.2 percent below the same eight months from the previous year. The FHWA estimates that cumulative travel fell 3.6 percent nationwide in 2008. This decline is attributed to higher fuel prices. Another factor in falling gas tax revenues is increasing use of hybrid automobiles and other fuel-efficient vehicles.

Over the past 10 years, state gas tax revenues have generally increased two to three percent per year. However, these increases have not been nearly enough to keep up with the growth in highway costs and the decline in the real value of money. The gas tax has been frozen at 20 cents per gallon for 18 years. TxDOT receives about 72 percent of gas tax revenue collected, and it is estimated that a three-percent drop in revenue would cost TxDOT more than \$70 million.²⁰

These trends are indicative of what is happening throughout the country. "You have a trend line that is very disturbing," said Ned Holmes of the Texas Transportation Commission. "There is no way we can fund the needs we have with this formula."

Because it is not adjusted for inflation, the federal gas tax, 18.4 cents per gallon, has experienced a cumulative loss in purchasing power of 33 percent since it was last increased in 1993.

The recession has caused the steepest decline in state tax receipts on record. Declining fuel tax revenues have severely affected the solvency of the federal Highway Trust Fund. The Fund, primarily sourced through federal gas tax receipts, collected \$31 billion in revenue between October 2007 and September 2008. This is \$3 billion less than it

²⁰ *Slide in gas tax revenue hits roads.* Ben Wear, Austin American-Statesman, April 9, 2009

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collected the previous year. Meanwhile, federal transportation spending increased by \$2 billion.

In October 2009, the federal government is pulled the plug on \$8.7 billion in existing contract authority from state transportation budgets to go towards the Highway Trust Fund. As part of this rescission, TxDOT lost \$742 million in federal funding. The HIRE Act restored the \$8.7 billion in contract authority and also restored \$19.5 billion in interest to the Highway Trust Fund to keep it from going bankrupt before the end of 2010. The HIRE Act is only a short-term solution, however. States cannot depend on the future solvency of the Highway Trust Fund for funding needed infrastructure projects.

More funding sources and more efficient project development must be components of the next federal surface transportation policy reauthorization to maintain an adequate level of transportation development in this country. The National Surface Transportation Infrastructure Financing Commission has recommended a shift to a user charge system based more directly on miles driven (versus the current gas tax per-mile system which does not account for the fuel efficiency of vehicles) as well as facilitation of expanded private-sector financial participation in mobility improvements.

The current shortage of State funding for transportation projects may impact planned improvements to roads that feed into the Project, affecting potential traffic and revenue. These potential impacts have not been analyzed at this stage, but will be addressed in the Milestone 4 Draft Facilities Report, as specified in Exhibit D, Item I of the CDA.

The American Recovery and Reinvestment Act

Texas was appropriated approximately \$2.6 billion for transportation projects as part of the American Recovery and Reinvestment Act (ARRA). While this funding will help build many worthwhile projects, including the DFW Connector and others in the Metroplex, the amount allocated is far from addressing transportation needs across the state, further necessitating innovative financing measures such as public-private partnerships.

The ARRA includes provisions for making as much as \$200 million of discretionary Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) funding available to transportation projects. TIFIA funding has become an even more attractive option due to the disruption in credit markets. Given past experience with the program's multiplier effect, \$200 million of contract authority allocated to the program could generate as much as \$6 billion in project expenditures.²¹

The ARRA also includes tax code changes that create incentives for private capital investment. The US DOT Secretary may allocate up to \$15 billion worth of Private Activity Bonds (PABs), provided the projects meet a number of tax code restrictions.

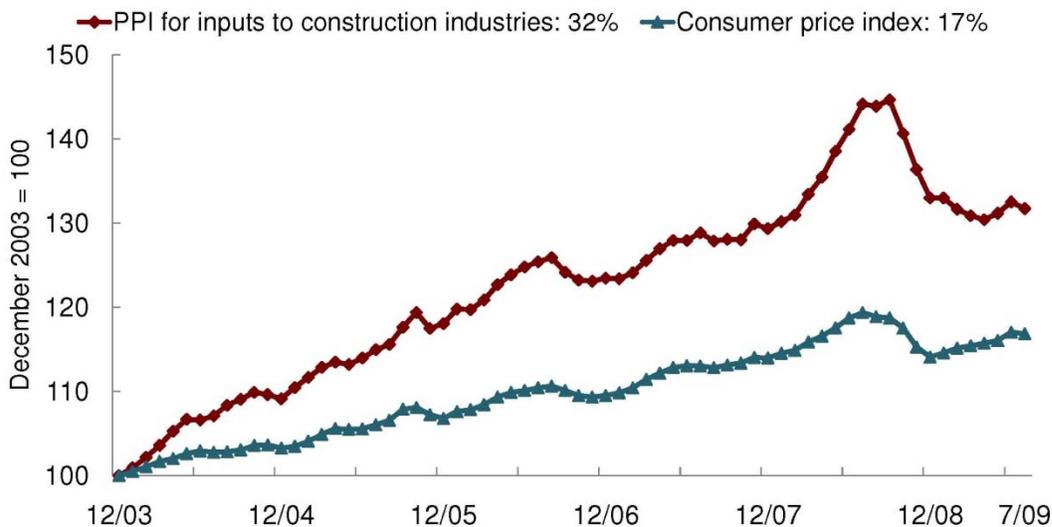
²¹ ARRA, PPP or Both? Barney A. Allison, Project Finance Magazine, May 2009.

This increased availability of PABs and TIFIA funding is advantageous to funding the planned Project Segments.

Rising Construction Prices

Between 2003 and 2008, the price of highway and street construction materials rose a total of 35 percent, with the Producer Price Index (PPI) for construction rising at a much higher rate than the Consumer Price Index (CPI). This trend has abated somewhat in 2009 due to the deflation in commodity and gas prices associated with the economic recession, as shown in Figure 1-32. As compared to August 2008, the cost of construction was down 7.4 percent. The chief economist for the Associated General Contractors of America referred to this development as a “limited-time sale”, stating that once the domestic and global economy recover further, prices are likely to rise again. Between October and November 2009, the PPI rose 0.06 percent, indicating that construction prices are going up again.

Figure 1-32: PPI for Construction vs. CPI, 2003-2009



Source: Associated General Contractors of America

As costs have risen and public funds have become more and more scarce for highway maintenance and construction, the focus has shifted toward alternatives to the traditional general obligation debt financing of basic infrastructure, with a greater emphasis on tolls, tax-increment financing, development fees and other alternative financing structures.

The PPI will be a key indicator for NTEMP24 in estimating construction costs and securing financing for the Project. A variety of financing mechanisms and sources can be employed, such as senior debt, bank loans, PAB/TIFIA funding and private equity. With the recent funding and budgetary challenges at both the State and Federal levels, utilizing every type of project delivery that the private sector offers becomes an

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extremely important component of building and maintaining transportation infrastructure in Texas.

1.4. Social and Urbanization Trends

The physical character of Texas communities continues to evolve. Urban areas in Texas have long been characterized by relatively low density, as abundant land fostered spread-out cities that relied almost exclusively on the automobile. In recent years, the rate of population and traffic growth has exceeded that of the road system in many areas, leading to increased congestion. This has consequences. The *2009 Urban Mobility Report* by the Texas Transportation Institute (TTI) showed that Texans in major metropolitan areas wasted \$6.7B during 2007 because of traffic congestion²². Therefore, congestion relief must remain an integral component as urban areas expand and density continues to grow.

In the past decade, many communities have been revitalizing Central Business Districts (CBDs) with more dense dwelling units, new high-rise condominiums, warehouse loft developments and townhomes. Both Dallas and Tarrant Counties have made significant effort toward increasing population density with urban revitalization projects. From Sundance Square to the proposed developments along the Trinity River in both counties, considerable strides are being made. Even with these changes in urbanization to help combat commute times, jobs and homes remain dispersed throughout the Metroplex, with multiple job concentrations outside the CBDs of Fort Worth and Dallas, and the sheer volume of population and employment growth continues to increase urban congestion. With the urbanized areas further expanding geographically, the limits of congestion expand as well.

With this increased congestion, acceptance of user charges increases. This includes individuals in their daily commutes, as well as commercial and freight users, who consider timely delivery a key component of their business model. As trade with Mexico and Canada resulting from the North American Free Trade Agreement (NAFTA) and trade within inland multimodal hubs in the Metroplex increases, the amount of freight traffic in the NTE Study Area (as defined in Figure 1-4) is expected to increase by an average of 2.2 to 2.9 percent per year through 2030, likely increasing the use of managed lanes as a viable means of avoiding delay and loss of efficiency.

Freight rail operations in the region will benefit from reduced congestion in the Corridor, which will allow trucks carrying shipments to and from intermodal freight transport hubs to reach their destinations more quickly and reliably. At the same time, improvements to the local rail system may decrease truck volumes on the Project, particularly the IH 35W segments, since rail may become a more attractive option for shipping freight through

²² *Urban Mobility Report 2009*, Texas Transportation Institute, The Texas A&M University System, July 2009.

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the area. Proposed improvements to Tower 55, the congested rail yard at the corner of IH 35W and IH 30, involve construction of trenches to reroute three rail lines so that they would no longer stop at Tower 55. Currently, stopping at Tower 55 causes 15-90-minute delays for 100-120 freight trains per day. Should the proposed improvements go forward, construction is expected to begin around 2020.

One factor in user acceptance of tolled facilities is past experience and familiarity with such facilities. Toll roads have been a way of life in the Metroplex for over 40 years, since the first segment of the Dallas North Tollway (DNT) opened to traffic in 1968. The DNT served an average daily traffic of 40,000 vehicles in 1969²³. Combined average annual daily transactions (AADT) on the DNT and President George Bush Turnpike (PGBT) now exceeds one million vehicles. Between 2005 and 2008, AADT has increased at an average of 3.1 percent per year on the DNT and 7.5 percent per year on the PGBT.²⁴

Gasoline prices do not appear to be a factor in use of tolled facilities. A study by the NCTCOG measured average weekday transactions at all NTTA toll booths and average weekday traffic counts on non-tolled facilities against the average price of gas in the DFW Area between January 2004 and December 2009.

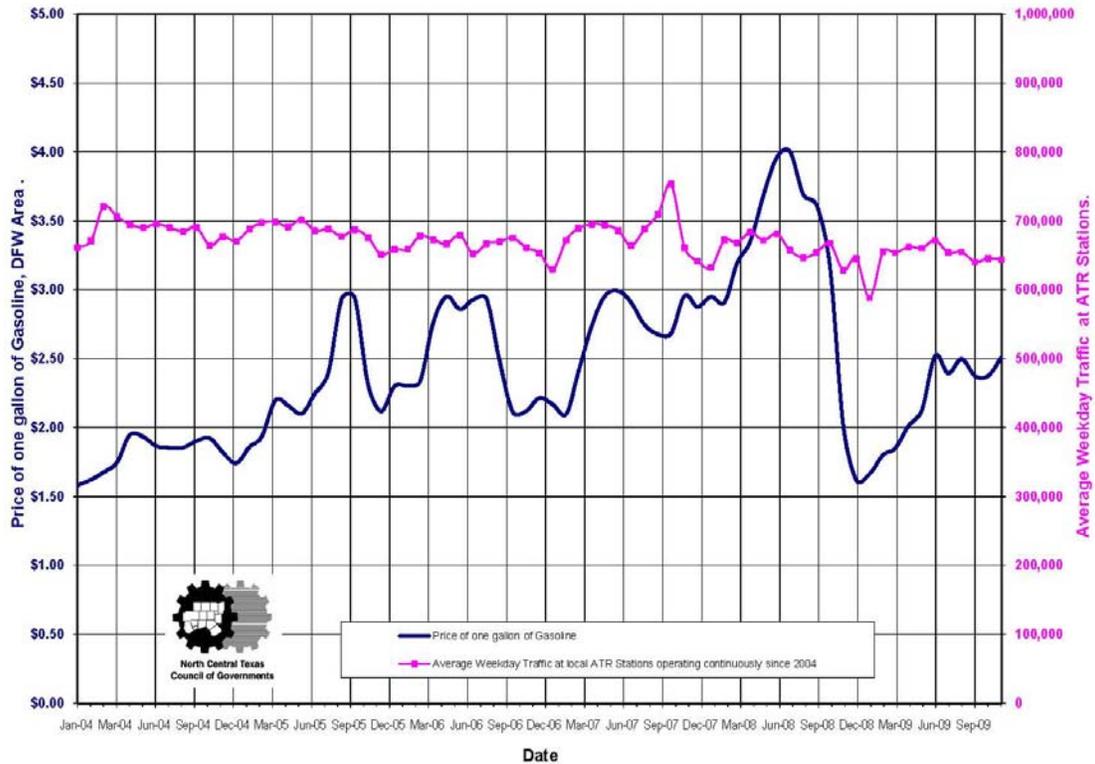
The study found that travel on non-tolled facilities stayed fairly constant even when gas prices peaked at about \$4.00 in the summer of 2008. Travel volumes fell sharply in late 2008 and early 2009, coinciding with the lowest gas prices since 2004 and the lowest Dow Jones Industrial Average in over 10 years, but have since recovered. Figure 1-33 shows the study results for non-tolled facilities.

²³ *The Economic, Fiscal and Developmental Impacts Of The North Texas Tollway Authority: A 40-Year Perspective.* North Texas Tollway Authority, August 2006.

²⁴ *North Texas Tollway System Investment Grade Traffic and Revenue Study,* NTTA and Wilbur Smith Associates, July 2009.

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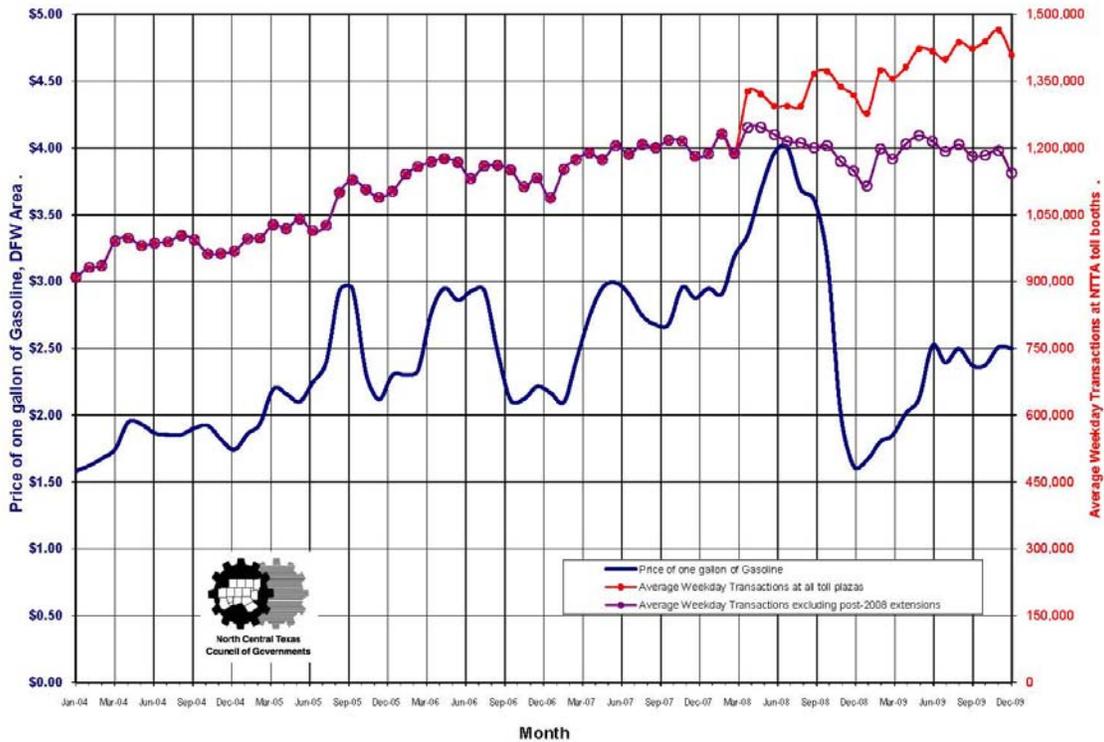
Figure 1-33: Price of Gasoline vs. Average Weekday Counts at Automatic Traffic Recorder (ATR) Stations (Non-Tolled Facilities)



On the NTTA toll roads, Average Weekday Transactions (AWTs) have risen steadily since 2004, experiencing only a slight decline when gasoline prices reached their peak, followed by a sharper decline in late 2008, coinciding with the low point of the economic recession, as described above, prior to leveling off. Figure 1-37 shows the results of the study for NTTA toll roads. The split in the line illustrating AWDTs accounts for the opening of new NTTA facilities in 2008.

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Figure 1-34: Price of Gasoline vs. Average Weekday Transactions at All NTTA Toll Booths

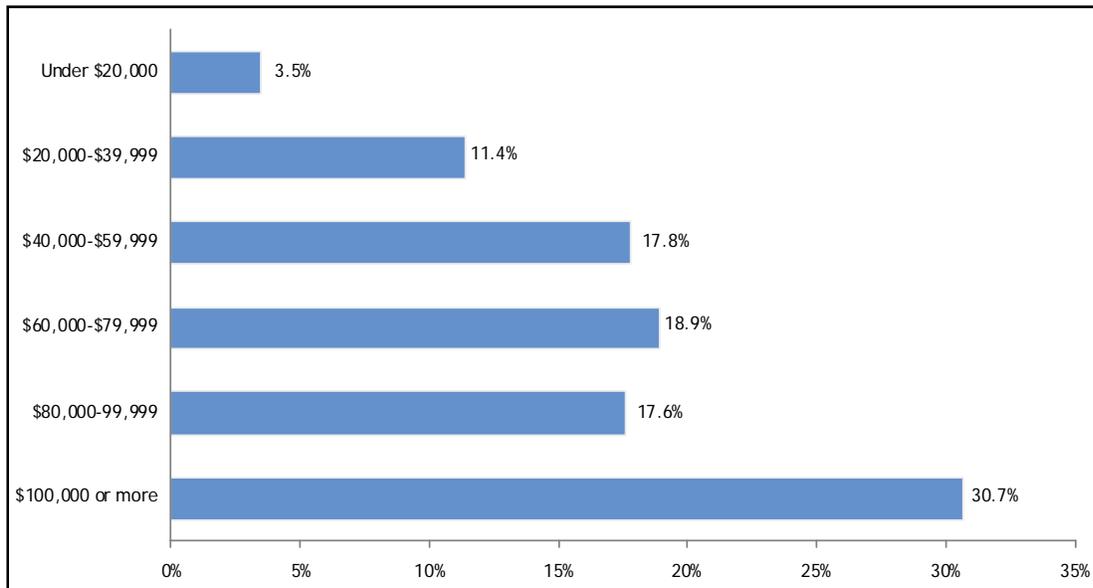


Median family income is another important factor in determining potential traffic and revenue. Though the calculation of toll rates will not directly take household income into account, this information will factor into the traffic and revenue forecast for each Segment, which will ultimately determine the demand on which toll pricing is based. Once the Project is open to traffic, it will be necessary to monitor response by users in various income groups and other demographic cohorts to gauge the extent to which the Project is serving varied segments of the population.

In a 2006 survey of IH 820/SH 183 users (likely NTE customers), over 30 percent of users surveyed reported an annual family income of \$100,000 or more, outpacing all other income groups, as shown in Figure 1-35.

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Figure 1-35: Income Composition of Likely NTE Users

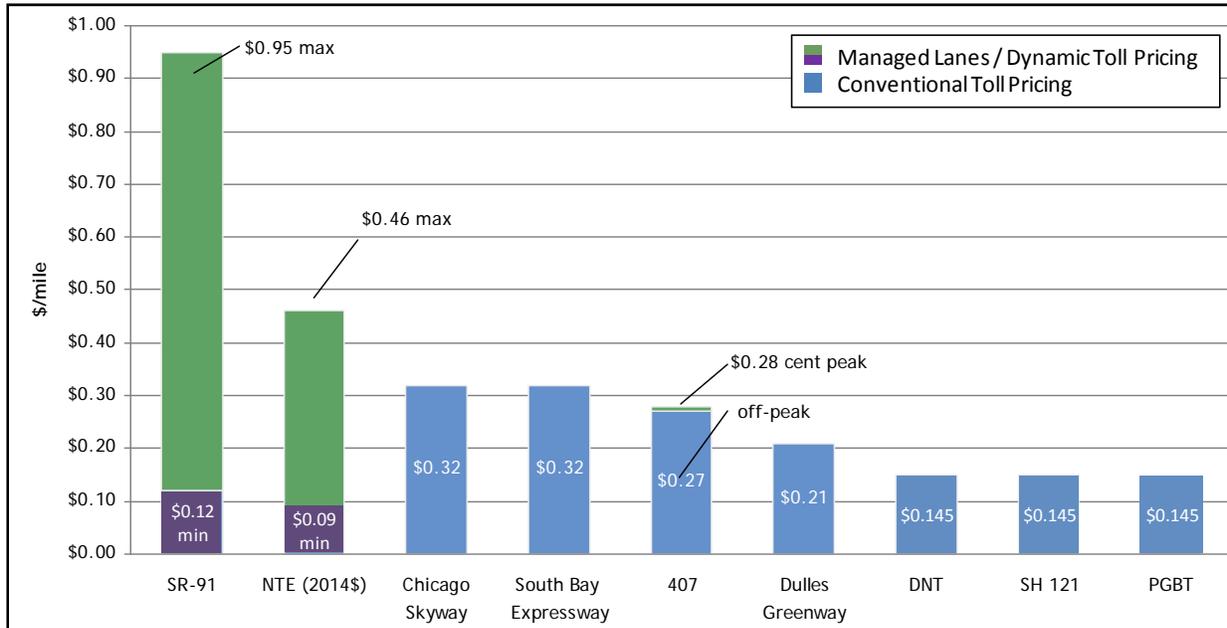


Source: IH 820/SH 183 Stated Preferences Survey Tabulations, Resource Systems Group, Inc. February 2006

In comparison with DFW-area and nationwide toll roads, the proposed toll rates on NTE are relatively low. At the lowest off-peak rate of nine cents per mile, user charges on NTE are lower than on the Dallas North Tollway or President George Bush Turnpike, at 14.5 cents per mile. During peak usage, user charges on NTE will increase as high as 46 cents per mile. This is less than half of the maximum rate on the SR-91 managed lanes in California, which peaks at 95 cents per mile. During periods of moderate traffic, NTE user charges will fall somewhere between the low and high per-mile rates, a range comparable to other major tolled facilities in North America. Figure 1-36 compares user charges on NTE to those on other major North American toll roads.

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Figure 1-36: Toll Rate Comparisons to Other Major Toll Roads



During periods of peak travel demand, the managed-lane facilities depicted above are more expensive than conventionally priced toll roads. However, the NTE Managed Lanes offer two advantages over these conventionally tolled facilities – guaranteed reliable travel times ensured through demand-based dynamic pricing and lower tolls during periods of lower travel demand.

The NTTA increased its toll rates from an average of 11 cents per mile to a system-wide rate of 14.5 cents per mile in September 2009, a 32 percent increase (excludes the NTTA-owned bridges). The NTTA had forecasted that traffic would decrease by 7.5 percent. Though in the initial weeks traffic did fall 10 percent, it has now recovered to pre-increase levels. The NTTA board tolling policy is to increase toll rates every two years by 5.6 percent for the majority of the system. This will result in a toll of 18 cents per mile in 2017. The Sam Rayburn Tollway will have differing rates than the rest of the NTTA system due to the contract between the NTTA and TxDOT. The reaction to the recent NTTA toll rate increases are evidence that the elasticity to toll rate increases in the DFW area is low, and that users are willing to pay for a less congested trip.

The Project Traffic and Revenue forecasts to be provided for Milestone 4 will include the methodology and assumptions used to determine user charges on each Segment as specified in Exhibit D, Item E of the CDA. Milestone 4 will also include a comprehensive, integrated financial model and pro-forma analysis, as specified in Exhibit E, Item B of the CDA.

1.5. Economic Development in the DFW Metroplex

Texas and DFW Economic Performance

Overall, Texas generally outperforms the U.S. economy and the DFW region is at the core of this economy. Population growth is supported by strong domestic and foreign migration. The economy has a diverse employment base, with strong concentrations in trade, transportation, energy, healthcare, education and professional/business services.

Texas is the leading state for production of oil and natural gas; and is also a major producer of other natural resources. Texas also manufactures an enormous variety of products including chemicals and chemical products, food, transportation equipment, and machinery and fabricated metals. In addition, manufacturing of electronic equipment is one of the state's leading industries.

Texas agriculture is also very important to the U.S., as it leads production in cattle, sheep, cotton and cottonseed. It also farms grains, vegetables, fruits, rice, dairy products, wool and other products. Further, Texas has an important commercial fishing industry.

The historical growth in Texas GSP and the U.S. Gross Domestic Product (GDP) are shown in Figure 1-23 on page 41. Texas GSP grew by about four percent per year between 1990 and 2007 and has exceeded growth in the GDP of 2.9 percent per year.

Texas and DFW Role in Global Markets

Texas' role in the global marketplace will only grow over time, as the economy continues to move toward higher value-added production and services. The transformation of Texas from a center of commodity production to a place that emphasizes adding value through the application of knowledge and technology is virtually complete. Until recently, basic products such as food and energy were the primary goods produced in Texas, and purchases tended to be the more sophisticated manufactured goods. That trend has been turned upside-down in recent years, as Texas has become a center of research and advanced technology manufacturing. With this shift in the State's economy, Texas has been able to grow faster than most states and outperform the national economy, as discussed above.

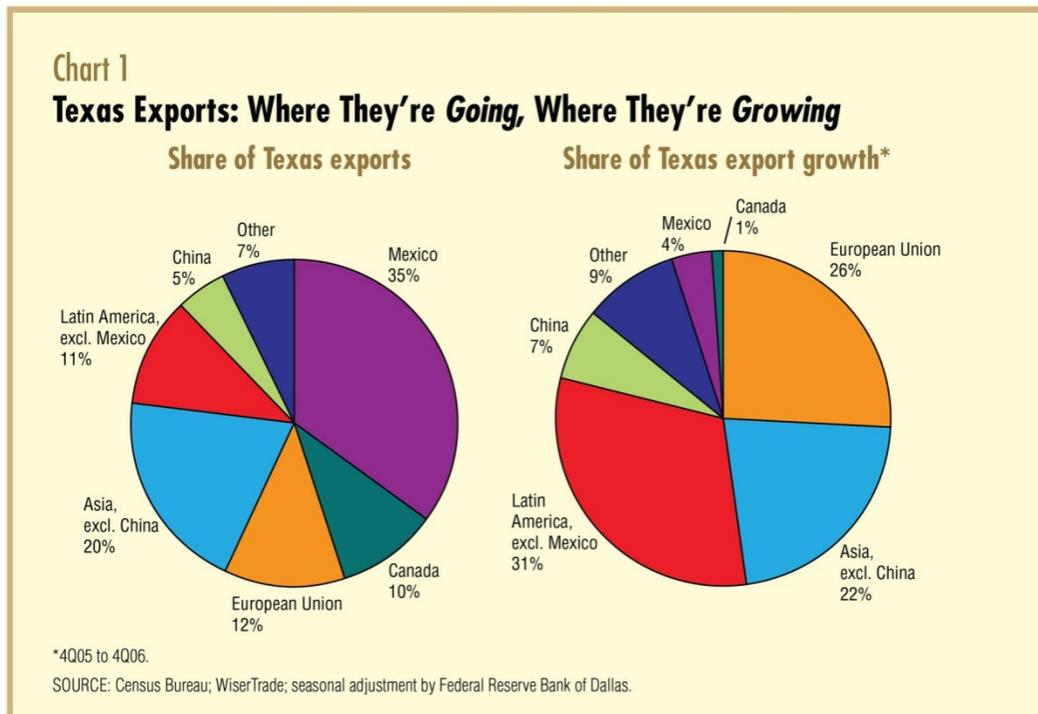
In the process, Texas' economic linkages with the rest of the world have grown stronger, both in terms of integrated production on the Texas-Mexico border and through international trade. For example, most estimates suggest that about 80 percent of NAFTA-related traffic flows through the state and Texas exports of goods overseas during 2008 totaled 192.2B, the highest level in the U.S. for the seventh year in a row²⁵. Figure 1-37 shows the distribution of Texas exports and key areas of growth.

²⁵ Texas: Exports, Jobs, and Foreign Investment, U.S. Department of Commerce, International Trade Administration, http://www.trade.gov/td/industry/otea/state_reports/texas.html, accessed January 29, 2010

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Texas' NAFTA trading partners, Mexico and Canada, account for approximately 45 percent of the total. However, as shown in Figure 1-37, roughly 60 percent of Texas' expected export growth is to Latin America and Asia.

Figure 1-37: Texas Exports



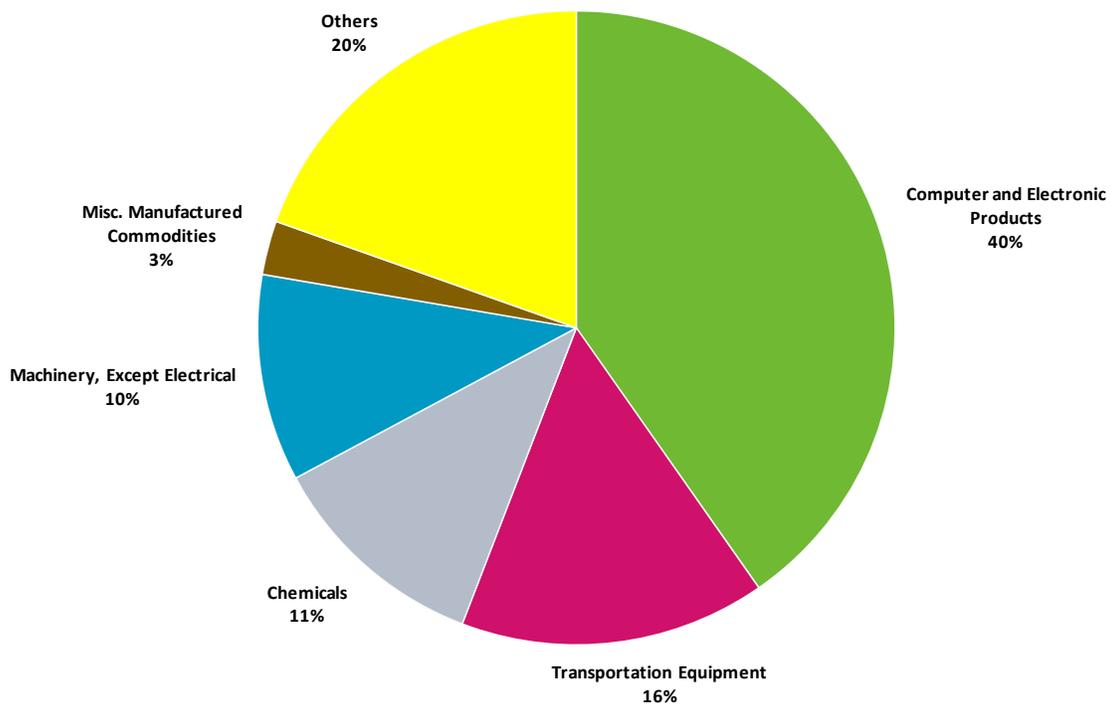
The DFW region is the primary economic engine in the State of Texas, generating 33 percent of gross sales in the state and accounting for 29 percent of the state's employment. From the region, nearly the entire U.S. population can be reached by truck within 48 hours. On the whole, the region is considered by most economic and logistics experts as the primary truck, rail, and air cargo center in the Southwestern United States, as well as the primary urban gateway between the United States and Mexico.

In the first half of 2008, the DFW Metropolitan Area was the 11th largest export market in the U.S., with merchandise sales to other countries totaling \$11.5 billion. The area benefitted from existing free trade agreements in the first half of 2008, exporting \$3.5 billion to the NAFTA region.²⁶ Computers and electronic products were the area's top exports in 2007, followed by transportation equipment, chemicals and machinery, as shown in Figure 1-38.

²⁶ Dallas-Fort Worth Arlington Fact Sheet, U.S. Department of Commerce, International Trade Administration, http://ita.doc.gov/td/industry/otea/metro/FS/2008/mid_year/Dallas.pdf, accessed October 27, 2009.

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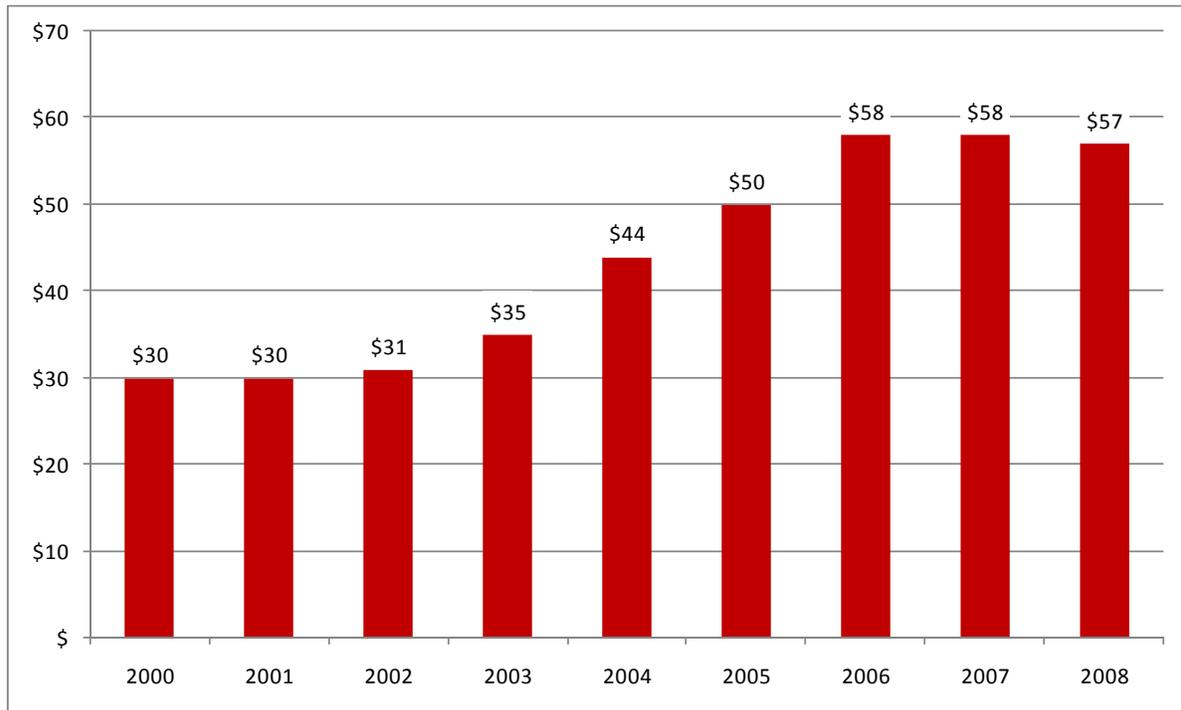
Figure 1-38: DFW Exports by Type of Product - 2007



Source: U.S. Department of Commerce, International Trade Administration

International trade in the DFW Metropolitan Area has grown considerably during this decade, from \$30 billion in overall trade in 2000 to \$57 in billion in 2008, as shown in Figure 1-39.

Figure 1-39: DFW International Trade - 2000-2008 (\$ Billions)



Source: Dallas Chamber of Commerce

Development at AllianceTexas' Global Logistics Hub and planned expansions to the DFW International Airport's cargo facilities will facilitate expanded international trade.

Despite the national economic downturn, the DFW Metroplex led employment growth among the top 310 metropolitan areas surveyed across the nation by the U.S. Bureau of Labor Statistics. DFW's resilient economy and favorable business cost environment led to several corporate relocations in 2008, including the announcement of the relocation of AT&T's global corporate headquarters from San Antonio to Dallas, underscoring the importance of the DFW Airport and the area's concentration of tech firms and telecommunication workers. Daimler Financial also relocated its trucking finance office, which employs more than 600 people, from Illinois to AllianceTexas.

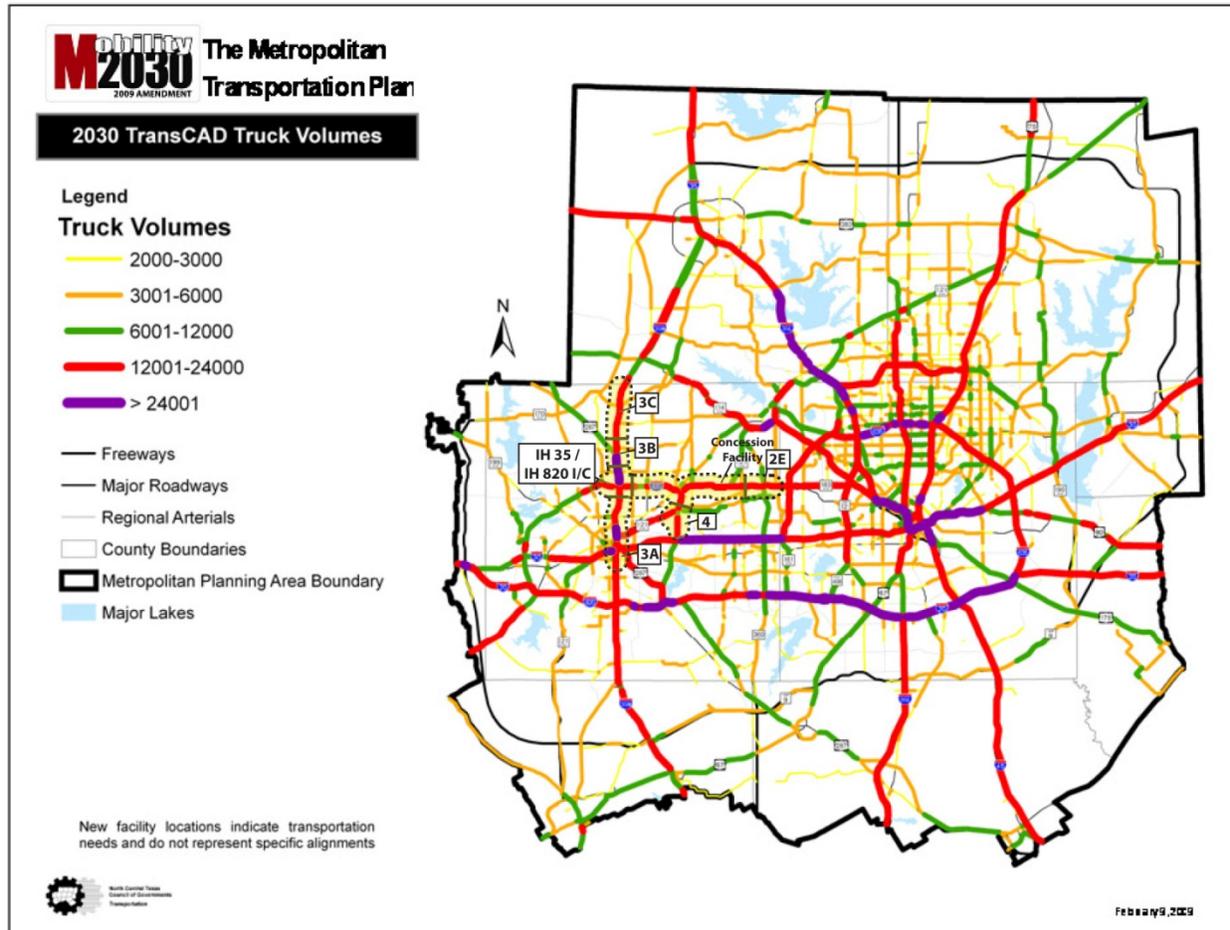
Fort Worth Mayor Mike Moncrief recently declared Fort Worth's economy "stronger than a habañero", but warned that, "without swift and major upgrades to our transportation network, Fort Worth's economic engine will sputter and die."

Industrial and Economic Factors Related to Traffic

Without improvement to the existing IH 820 / SH 183 network, the trucking industry would be subject to the severe levels of congestion discussed above. The delay caused by this congestion translates to dollars—unreliable travel times, higher fuel, maintenance and insurance costs.

Congestion could greatly increase the costs of the freight movements that are today managed to exacting schedules. NCTCOG's forecasted 2030 truck volumes in the region are shown in Figure 1-40.

Figure 1-40: Forecasted 2030 TransCAD Truck Volumes



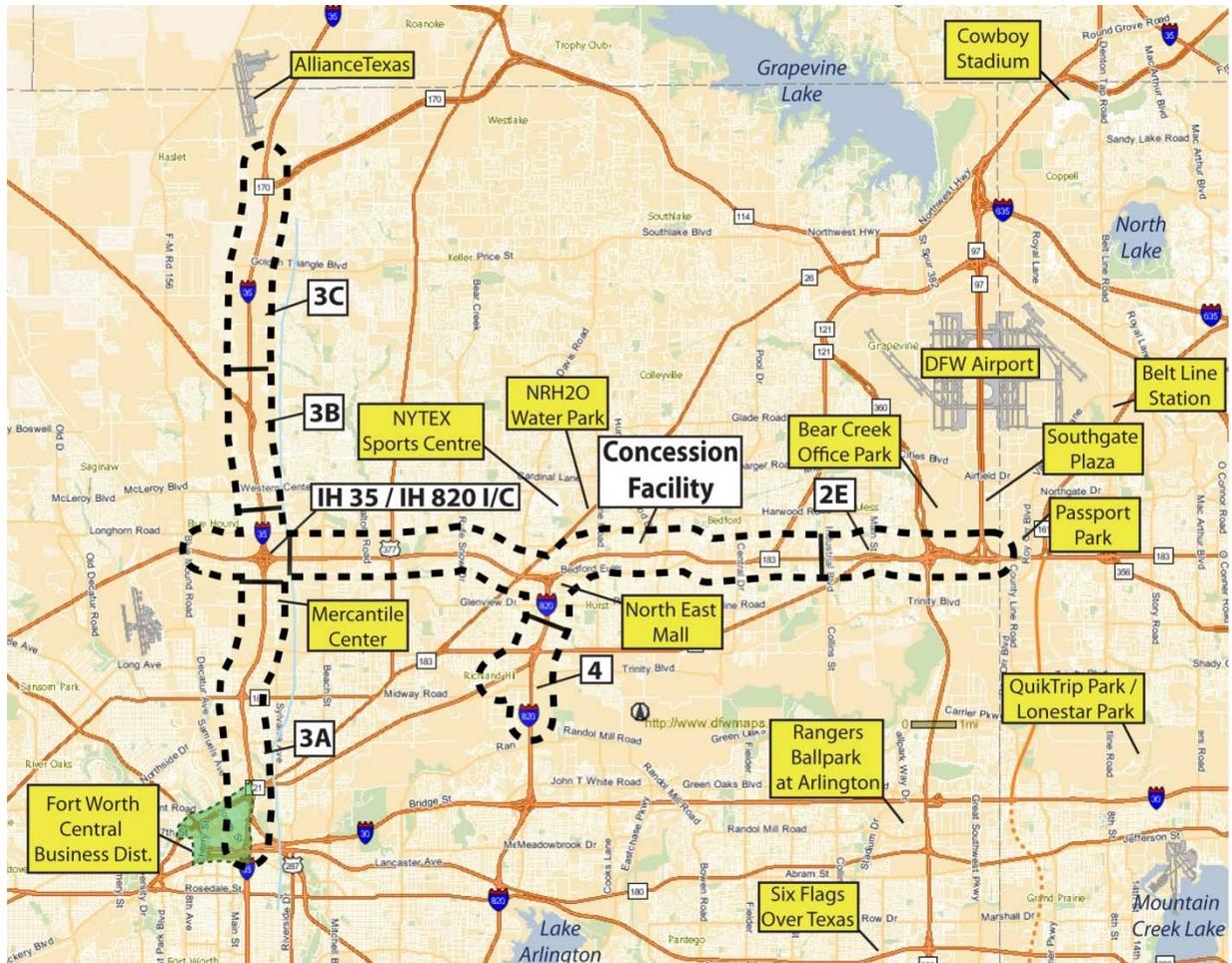
Within the NTE Study Area (as defined in Figure 1-4), daily truck traffic is forecast to nearly double by 2030, growing at an average rate of 2.9 percent per year through 2015 and 2.2 percent per year between 2015 and 2030.

1.5.1. Special Trip Generators

Roadway users utilize the NTE Corridor to reach a variety of business and recreational destinations. The Project provides regional connectivity to serve a number of entertainment destinations in the in the Mid-Cities area (mostly along IH 30), including Cowboys Stadium, Rangers Ballpark, QuikTrip Park at Grand Prairie (professional baseball), NYTEX Sports Centre (hockey, arena soccer) Lone Star Park (horse racing), Six Flags Over Texas / Hurricane Harbor Water Park and NRH2O Water Park.

In 2008, the value of commercial construction was the highest in Fort Worth's history²⁷. Some key commercial developments leading to the forecasted growth in population and employment in the immediate vicinity of NTE are discussed below. These developments are mapped in Figure 1-41, and discussed following the map.

Figure 1-41: NTE Special Trip Generators



Dallas Fort Worth (DFW) International Airport – DFW International Airport is a major traffic generator within the corridor. It is third busiest airport in the nation in terms of aircraft movements (656,000 in 2008) and fourth in the number of passengers served (57.1 million). Approximately 60,000 people are employed within the airport and it contributed approximately \$16.6 billion to the area economy in 2008²⁸. The airport owns

²⁷ Mike Moncrief, Mayor of Fort Worth. (Feb. 2009). *2009 State of the City Address*, Fort Worth, Texas.

²⁸ *DFW Airport Facts*, DFW Airport website (<http://www.dfwairport.com/visitor/index.php?ctnid=24254>), accessed October 27, 2009.

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a significant amount of land that it has slated for commercial development. Developments associated with DFW Airport include:

- **Bear Creek Office Park:** 1,800 acres located on the southwest side of SH 183 and SH 360. There are large corporate campus sites available for development, incorporating recreational facilities including two 18-hole championship golf courses. Current development within this office park includes a six-building complex of one-story professional office suites.
- **Passport Park:** a 600-acre hybrid development located at the corner of the SH 183 frontage road and Valley View Lane near the airport's south entrance. Currently in the planning and design phase, the development is planned to accommodate 400,000 square feet of retail, including "big box" retail anchors, junior anchors, specialty retail and restaurants. Industrial/warehouse and garden office development opportunities are also envisioned.
- **Southgate Plaza:** a 32-acre mixed-use zone on the southeast side of the airport located in front of the Consolidated Rental Car Center. Currently in the planning and design stage, the development envisions 30,000 square feet of restaurant space with three dine-in restaurants and four fast-food establishments with Flight Information Delay Systems in place to provide patrons with updated flight information. Additional proposed development includes a four-story office complex and limited-service hotel.
- **Belt Line Station:** A future DART light rail line stop (est. completion in December 2012), this 23-acre mixed-use commercial development will be located on the southeast corner of Belt Line Road and Valley View Lane. This will be a transit-oriented development with retail and office use located near the high-density, pedestrian-oriented intermodal station.

AllianceTexas Development – AllianceTexas is a 17,000-acre master-planned, mixed-use community located north of Fort Worth. The AllianceTexas development is one of the major economic drivers in North Texas. The development is multi-jurisdictional with boundaries that fall within four cities (Fort Worth, Haslet, Roanoke and Westlake), two counties (Denton and Tarrant) and two school districts (Northwest Independent School District and Keller Independent School District).

AllianceTexas developers report that the community now houses more than 170 companies. These firms have invested more than \$5B in the development. The anchor of the AllianceTexas community is the Fort Worth Alliance Airport, the world's first purely industrial airport. Since its establishment in 1989, AllianceTexas has grown into one of the nation's preeminent logistics and transportation hubs. According to an economic impact study done by Hillwood Company, businesses located in AllianceTexas had an estimated positive annual impact of \$2.8 billion on the local economy.

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With the industrial and commercial base now well established, future growth in the community is focused on destination retail and entertainment development, combined with strong residential growth. The overall scale of the AllianceTexas community and the anticipated build-out of this new residential / retail / entertainment initiative represent important factors in considering both the level and distribution of future demand along NTE. Since 1990, the development has added 27,000 jobs in 25 million square feet of commercial space. By contrast, residential construction in AllianceTexas is reported at just 6,700 homes. With commercial / industrial development disproportionately greater than residential development, and a roster of well-paid jobs, AllianceTexas has been drawing labor from the surrounding area and supporting residential growth in the neighboring communities with good proximity to Alliance.

With greater residential development now slated for AllianceTexas, there will be a growing residential base north of Fort Worth with a possible interest in traveling to downtown for shopping and entertainment. Dual-income households with one worker in Fort Worth and one in AllianceTexas may select a household location along NTE to minimize the joint commuting time.

Mercantile Center – Located south of the of IH 820/IH 35W interchange, Mercantile Center is a 1,500-acre master-planned business park developed for industrial, office and service facilities. More than 40 companies currently occupy space in Mercantile Center and approximately half of the development's land is available for development. Approximately 4,400 employees work within Mercantile Center on a daily basis and the businesses within the center generated over \$3.1 billion in sales in 2007.²⁹

North East Mall: North East Mall is a traffic generator for portions of the Project near the IH 820/SH 183 interchange. North East Mall is a 1,644,000 square foot indoor shopping mall located southeast of the IH 820/SH 183 interchange in Hurst, adjacent to portions of Segments 2 and 4. Established in 1971, the mall was renovated and expanded in 2000 and currently includes nearly 150 stores. In addition, the mall is affiliated with the Shops at North East Mall, an adjacent open-area shopping center called with 10 large anchor stores covering 376,000 square feet.

Commuter Rail: Cotton Belt Line – The Cotton Belt Line is a planned 67-mile commuter rail corridor from northern Fort Worth to downtown Wylie currently proposed as a public-private partnership between DART, The T and a private developer. This project connects passengers with the TRE service in downtown Fort Worth, and the DART Light Rail System via the Orange Line at DFW Airport, the Green Line in downtown Carrollton, and the Red Line in the Richardson/Plano area. It also connects with the Addison Transit Center which provides extensive bus connectivity in the north central part of the DART Service Area.

²⁹ *Economic .Impact of Mercantile Center*, City of Fort Worth, Economic and Community Development Department, February 2008.

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In 2006, The T selected a locally preferred alternative that would provide passenger rail service from southwest Fort Worth to the northern entrance of DFW Airport. This part of the corridor will likely cross NTE Segment 3A north of SH 183 near E. Long Avenue. Daily ridership in year 2030 for the section of the Cotton Belt Rail Line from southwest Fort Worth to DFW Airport is estimated to be 15,500. However, as a private developer has not yet been selected, timing and funding for this project is unclear at this time.

In addition to these special trip generators, Fort Worth's downtown revitalization projects such as Sundance Square and Bass Performance hall have culturally transformed the downtown. As this revitalization continues, downtown Fort Worth is expected to draw more traffic for its cultural and recreational activities.

1.5.2. Localized Impacts to Facility Implementation

The economic development impacts are implicit in the trends discussed in the previous sections. The opportunity and need to leverage the continued upgrade of its network infrastructure is crucial to the future success of the state and local economies. In general, these effects fall into two broad categories:

More efficient movement of people and products, which have positive effects on costs and,

An improved "asset base", helping to attract more companies and people, further enhancing economic development.

In addition, road users would receive long-term economic benefits resulting from lower vehicle operating costs and improved safety.

Direct benefits of construction and operation of the Project will include the economic activities of the Developer and contractors – hiring employees, paying wages and purchasing materials. In turn, the companies engaged in the construction, operation and maintenance of the Project will purchase supplies, and initiate subcontracts for on-site services and professional services such as legal and accounting.

Indirect benefits include the economic activities of the companies providing goods and services to the Developer and contractors. These suppliers and professional service firms will purchase supplies and equipment, hire personnel and services and lease office space to support the Project. Finally, the employees of all the businesses supporting the project will spend a portion of their income within the local economy. This is referred to as "induced effects".

Based on previous experience in the region, improved mobility in the NTE corridor will generate direct, indirect and induced effects, drive adjacent growth in businesses and residences and improve surrounding property values.

The existing NTTA toll roads offer indicators of how new tolled facilities can stimulate economic growth in the Metroplex, though the comparison with NTTA facilities is not

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intended to present a precise analogy to specific NTE Segments. NTTA analyzed the economic effects of the Dallas North Tollway (DNT) and President George Bush Turnpike (PGBT) using the IMPLAN economic input-output model developed by the Minnesota IMPLAN Group. This analysis found that based on more than \$1.5 billion in spending, in adjusted dollars, construction of the DNT and PGBT have added almost \$2.6 billion to the regional economy, supporting over 25,000 person-years of employment paying in excess of \$1.1 billion in salaries, wages, and benefits. Property income has been boosted by nearly \$250 million. Local and state taxing jurisdictions have received an estimated \$75.6 million in indirect tax revenues including sales taxes, property taxes and permit and licensing fees.

Within one mile of the PGBT, there has been a marked increase in population and job growth, accompanied by an explosion of private residential and commercial development since construction began in 1990. Additions to property tax rolls between 1990 and 2005 have totaled about \$7.5 billion, resulting in approximately \$149 million in annual tax receipts to adjacent cities, counties and school districts.

It is expected that NTE Segments 2-4 will similarly benefit economic development along the corridor. Like the NTTA toll roads, NTE will contribute to the attractiveness of the corridor for businesses by providing access and connectivity in the region – improving links between IH 35W, IH 820 and SH 183 and providing improved access to DFW Airport and throughout northern Tarrant County.

The Project will benefit mobility in the entire region, but will provide particular economic benefit to the 10 cities and nine school districts through which the Project passes. The ZIP codes immediately surrounding the Project contained nearly 9,000 businesses and 183,000 jobs as of 2007, with a combined annual payroll of \$2.9 billion. Accommodating the predicted growth in the Corridor and attracting additional residential and business activity is conducive to increasing tax revenues and economic opportunity.

1.5.3. Existing Urbanized Areas in the NTE Corridor

When NTE Segments are developed in urbanized areas, the additional capacity will help reduce congestion and improve trip reliability, especially through the use of congestion pricing. Improved, more reliable sub-parts of a trip result in an overall benefit to long trips in the Metroplex. Dynamic pricing ensures reliable travel time on the portion of a trip taken on NTE, making longer trips more attractive.

Additional capacity and improved reliability are two key issues to the business community. Improved mobility helps shift wasted private resources due to congestion to productive uses and will increase the attractiveness of development of manufacturing and distribution centers adjacent to NTE.

1.5.4. Potential for Increased Demand in the NTE Corridor

As more users are attracted to NTE, the demand for ancillary facilities will also increase. Businesses such as service stations, restaurants and shopping centers will see increased demand, thus improving the economy of the cities surrounding the Segments.

1.5.5. Potential for Revenue Sharing Partnerships

As all of the above aspects lead to an improved economy, there is more opportunity for revenue sharing between the private sector and the State. “All boats rise” as the State’s goals for NTE are realized. Specifically, the additional business identified from corridor development will deliver increased tax revenue to the State.

1.6. Alignment of Project Plans with Policies on Global Climate Change and Air Quality

Improving mobility along the NTE Corridor is important not only for efficient travel and economic development, but also for its potential to reduce greenhouse gases and improve air quality. The NTE Project will aim to reduce polluting emissions by reducing the amount of energy expended by users. Specific measures include:

- implementing demand-based dynamic toll pricing (congestion pricing) in the Managed Lanes to reduce stop-and-go traffic and fuel consumption and vehicle miles traveled (VMT) along the corridor;
- adding capacity and strengthening connectivity to adjacent highways and arterials, which also reduces idling, fuel consumption and VMT
- encouraging carpooling through discounted tolls for high-occupancy vehicles (and motorcycles);
- promoting the use of public transportation by allowing free access to the Managed Lanes for transit vehicles;
- implementing Intelligent Transportation System (ITS) technology to further reduce congestion by monitoring traffic flows and notifying users of traffic conditions, emergencies and special events, thereby reducing the amount of fuel consumed; and
- charging a higher toll rate to trucks with three or more axles, which, when powered by diesel, produce disproportionately high emissions of nitrogen oxide compared to passenger vehicles.

This section discusses how the Project will align with state and federal policy on air quality and global climate change.

Motor Vehicle-Related Pollution in the Region

The primary pollutants produced by motor vehicles are volatile organic compounds (VOCs), carbon monoxide (CO) and nitrogen oxides (NOx). Ozone is a greenhouse gas that forms when NOx gases and VOCs combine through a chemical reaction stimulated by heat and sunlight.

In 2008, the American Lung Association ranked the Dallas-Fort Worth area seventh among the most ozone-polluted cities in the U.S.³⁰ Ozone pollution is associated with bronchitis, asthma and heart attacks, among other health risks.³¹ Children, elderly people and those who work or exercise outdoors are especially vulnerable to these risks.

On-road vehicles are estimated to cause half of the ozone-forming emissions³². The chemical reactions that produce ozone take place over several hours, and therefore maximum concentrations of ozone often appear far downwind of their original sources, making ozone a regional problem rather than a localized condition.

The U.S. Environmental Protection Agency (EPA) establishes National Ambient Air Quality Standards (NAAQS) for six principal air pollutants under the authority of the federal Clean Air Act (CAA). These six pollutants are carbon monoxide, lead, nitrogen oxides, ozone, particulates and sulfur oxides. In 2004, the EPA designated nine counties in North Central Texas, including Tarrant County, as nonattainment areas for ground-level ozone.

The CAA restricts federal transportation funds to nonattainment areas. Proposed highway projects must conform to certain requirements, known as “transportation conformity” aimed at achieving air quality goals or Federal funding may be withheld.

Compliance with State and Regional Initiatives

States containing ozone nonattainment areas are required to develop air quality plans, known as State Implementation Plans (SIPs) to demonstrate how ozone will be reduced to comply with the NAAQS. The SIP, developed by the Texas Commission on Environmental Quality (TCEQ), describes how the state will reduce and maintain air pollution emissions in order to comply with the federal standards.

In the DFW nonattainment area, the NCTCOG is responsible for conducting transportation conformity within its Metropolitan Planning Area and has produced a Transportation Improvement Program (TIP) containing measures for complying with the

³⁰ American Lung Association, Press Release: *First City outside California (Pittsburgh) Tops One of the Most-Polluted Lists – National Trends Show that Declines in Ozone and Particle Pollution Have Stalled*, May 1, 2008, <http://www.lungusa.org/site/c.dvLUK9O0E/b.34894/apps/s/content.asp?ct=5318243> (accessed September 10, 2009)

³¹ U.S. Environmental Protection Agency, *Fact Sheet, Final Revisions to the National Ambient Air Quality Standards for Ozone*, March 2008, http://www.epa.gov/groundlevelozone/pdfs/2008_03_factsheet.pdf

³² North Central Texas Council of Governments, *Air Facts*, <http://www.airnorthtexas.org/facts.asp> (accessed September 16, 2009)

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SIP. In addition, the Regional Transportation Council (RTC) has developed a Metropolitan Transportation Plan (MTP), entitled *Mobility 2030*, which contains an aggressive mobile emission reduction program to achieve on-road mobile source emission reductions. The U.S. Department of Transportation found both the MTP and TIP to conform to the SIP in 2007.

All projects in the NCTCOG's TIP that are proposed for federal or state funds were initiated in a manner consistent with requirements of amended 23 USC 134, 23 USC 135, 176(c) of the CAA [42 USC 7506(c)] and 49 USC 5303. Energy, environment, air quality, cost and mobility considerations are addressed in the programming of the TIP.

The improvements making up NTE Segments 2-4 are included in the TIP. The portions still undergoing the NEPA process are listed in the TIP as “environmental approval projects” to allow feasibility and environmental clearance efforts to continue. The NCTCOG will re-examine these improvements’ consistency with the Mobility Plan as alternatives are explored in these studies and environmental clearance efforts are advanced. All forthcoming environmental documents will address climate change and greenhouse gas emissions impacts (positive and/or negative) as a result of the Project.

Because modeling procedures for ozone require long-term meteorological data and detailed area-wide emission rates for industry, business and transportation, ozone modeling is beyond the scope of a NEPA environmental analysis for a highway project; therefore ozone modeling will not take place as part of the NEPA process for Segments 2-4. This type of modeling is conducted by the NCTCOG for the TIP. As stated above, projects recommended under the TIP must be found to conform with the CAA prior to acceptance, approval and funding. To remain in compliance with the TIP, the design concept and scope of the Project that was in place at the time of the conformity finding must be maintained throughout implementation.

The NEPA process for Segments 2-4 will include carbon monoxide modeling, per federal regulations. The Environmental Assessment for IH 820 from IH 35W to SH 121/183/26 (NTE Segment 1)³³ included “worst-case” carbon monoxide modeling to 2030 and concluded that the local concentrations of carbon monoxide are not expected to exceed national standards at any time. Results for Segments 2-4 are likely to be consistent with these results.

The NEPA process for Segments 2-4 will also include an assessment of the potential for releases of Mobile Source Air Toxics (MSATs), in accordance with the current MTP, *Mobility 2030 – 2009 Amendment*. The MSAT analysis for Segment 3A is scheduled to be completed prior to release of the updated MTP in Spring 2011 and prior to receiving a FONSI for this Segment of the Project.

³³ *Environmental Assessment: Interstate Highway 820 from Interstate Highway 35W to State Highway 121/183/26*. United States Department Of Transportation, Federal Highway Administration and Texas Department Of Transportation, October 2008.

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MSATs are pollutants known or suspected to cause cancer, such as benzene, diesel exhaust and formaldehyde. The Environmental Assessment for Segment 1 found that MSAT emissions were expected to decrease by 57 percent between 2007 and 2030 under the 2030 Build Scenario and by 59 percent under the No-Build Scenario. The Build Scenario is expected to generate a five percent increase in Vehicle Miles Traveled (VMT) as compared to the No-Build, with a corresponding slightly higher rate of MSATs. The overall decrease in MSATs under both scenarios is attributed to new EPA standards that are expected to lower overall MSAT emissions, even when increased VMT is taken into account. These regulations include the EPA's reformulated gasoline program, national low emission vehicle standards, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements.

Reducing Congestion to Improve Air Quality

The RTC's air quality program consists of a number of locally implemented projects, programs, and policies designed to focus on the major contributing factors to mobile source emissions. These factors include:

- High-emitting vehicles
- Cold starts
- Hard accelerations
- High speeds
- Low speeds
- Excessive idling
- Diesel engines
- Vehicle miles traveled

The NTE Project responds primarily to the RTC's initiatives of optimizing vehicle speeds and reducing idling by eliminating sites of extreme congestion on the corridor's freeway system and surrounding arterials. The Project will also encourage a reduction in vehicle miles traveled per person by offering discounted tolls to vehicles containing two or more people and free passage for transit vehicles.

Congestion prolongs the operating time of a vehicle per trip, resulting in more fuel combustion and therefore more pollutant emissions. In addition, vehicles operate less efficiently when idling or traveling at low speeds, resulting in higher emissions in slow or stop-and-go traffic. Idling cars stuck in traffic can pollute up to three times as much as moving cars³⁴. Highway capacity additions that increase average vehicle operating speeds will therefore have a direct effect on emission levels.

³⁴ Environmental Defense Fund, *New York City Faces a Traffic Crisis*, <http://www.edf.org/page.cfm?tagID=19899>, accessed October 11, 2009.

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Emissions of most pollutants are lowest in intermediate-speed, free-flowing traffic conditions and higher in low-speed, congested conditions. At very high speeds, emissions increase again, but do not reach a level as high as at the lowest speeds. Oxides of nitrogen are the exception, with emission levels rising most dramatically at the highest speeds.

Dynamic toll pricing in the Managed Lanes optimizes vehicle speeds by adjusting the toll rate up or down based on detected speeds and/or volumes on the Managed Lanes. The contractually mandated minimum speed of 50 mph is consistent with relatively low emissions compared to those produced by stop-and-go traffic.

The addition of frontage roads will also improve speeds by relieving congestion on the mainlanes and surrounding arterial network. The Electronic Toll Collection System (ETCS) will facilitate free movement of vehicles entering and exiting the Managed Lanes.

In addition to the traffic management features provided by the ETCS, the Project's ITS elements will aid in reducing congestion due to accidents and emergencies by helping transportation operators and emergency response personnel to monitor traffic, detect, and respond to incidents, and by informing the public of traffic conditions via multiple sources such as the Internet, Dynamic Message Signs, and the media.

1.7. Effects of Key Parameters and Assumptions on the Master Development Plan

Population and economic growth, increasing traffic congestion and air quality goals all require innovative strategies to update and enhance North Texas' infrastructure network. These innovative strategies include effective implementation of a public-private partnership to introduce efficiencies in design and optimize construction, thereby reducing cost and environmental impacts; as well as leveraging private funds to expedite Project completion;

A thorough understanding of these issues will enable TxDOT and NTEMP24 to develop a plan for the Project that promotes sustainable growth.

Much of the modern economy's development can be traced to the implementation of networks – highways, rail, telecommunications, and energy. The ability to efficiently move goods, people, capital, energy, and ideas continues to transform the way the world lives, works, and plays. The NTE project holds the promise of significantly enhancing the network system of the DFW area, and would, in the process, make a measurable contribution to local economic growth and development.

At the opening of the 21st century, the United States began a new wave of industrialization that is transforming the global market and changing traditional notions of development. According to the FHWA, this wave is based on innovations in logistics and manufacturing. Increasingly, components are manufactured offshore, and then they are assembled into finished products near the point of their final consumption or use. This business model depends strongly on a fast and reliable transportation network that minimizes the cost of production. A recent report by a leading logistics company notes that nearly 80 percent of executives consider product delivery as important as product quality. Just as highway infrastructure made the previous wave of industrialization possible in the United States, the country's success during this wave will depend on provide options to users of the system based on their immediate transportation needs.

In 2005, FHWA released a report that showed how highway improvements significantly lower production costs in 35 sectors of the economy. They found that a \$1 increase in highway capital historically generates about 30 cents of total savings per year over the lifetime of the road improvement. The transportation and manufacturing sectors were among the sectors with the largest cost savings.

In the near term, the infrastructure associated with the NTE project could serve to more efficiently connect the population in the project area with the employment demands of the Dallas market, in the process relieving the levels of congestion, delay, and associated cost of the current system. Over time, increased development will likely occur in close proximity to the Corridor.

Conclusions and Summary

It is believed that the following concepts have been effectively presented in this report and summarize the motivating factors justifying a need for the North Tarrant Express project:

- Significant growth in population, employment and housing is expected in the region surrounding the Project.
- The current transportation system is showing signs of decay and there is already considerable existing congestion. This is only expected to worsen over time with the anticipated growth trends.
- It is clear that innovative solutions are necessary to solve future problems brought about by growth trends.
- Public-private partnerships are an innovative strategy that, when implemented effectively, offer efficiencies in design, construction and financing.
- A well planned transportation system for people and goods enhances mobility and access to land.
- Improved mobility and access to land leads to a more efficient economy, which enhances the quality of life.
- NTE is expected to help fulfill many of the transportation needs of the future.
- NTE is being planned in coordination with local enhancement plans, including citywide and MPO plans. The NCTCOG is an active member in the development of these key corridors for the region, particularly with regard to demographic and traffic forecasting and providing input and opinions on design concepts and elements.
- Because of existing trends in motor fuel tax revenues, innovative means of finance are necessary to develop projects such as NTE. Public-private partnerships leverage private funds to expedite completion of these projects.