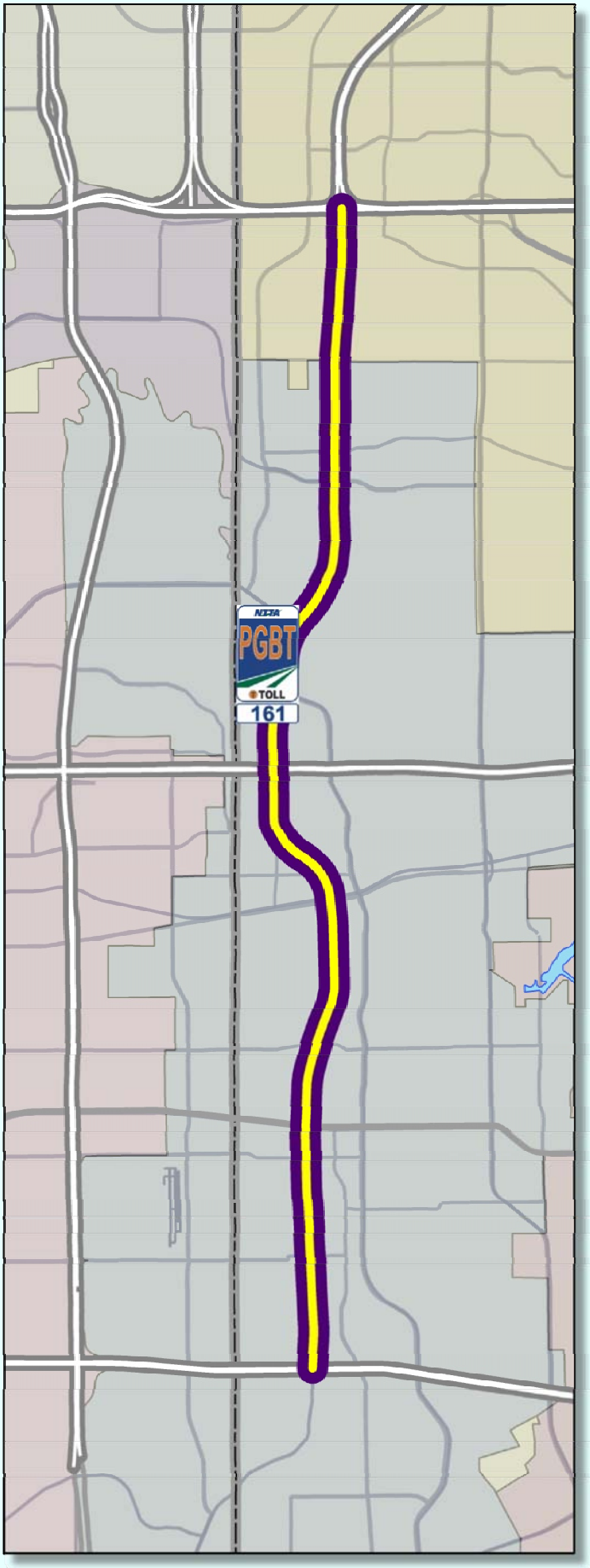

Investment Grade Traffic and Toll Revenue Study

President George Bush Turnpike

Western Extension

NTTA®

NORTH TEXAS TOLLWAY AUTHORITY

ENGINEERS
PLANNERS
ECONOMISTS

WilburSmith
ASSOCIATES

December 2010

Investment Grade Traffic and Toll Revenue Study

President George Bush Turnpike

Western Extension

Prepared For:

NTTA
NORTH TEXAS TOLLWAY AUTHORITY

Prepared By:

ENGINEERS
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December 2010

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December 31, 2010

Mr. Allen Clemson
Executive Director
North Texas Tollway Authority
5900 West Plano Parkway, Suite 100
Plano, TX 75093

Re: President George Bush Turnpike – Western Extension
Investment Grade Traffic and Toll Revenue Study

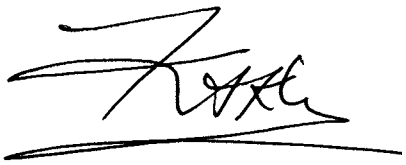
Dear Mr. Clemson:

Wilbur Smith Associates (WSA) is pleased to submit this report of our traffic and toll revenue study for the President George Bush Turnpike – Western Extension (PGBT-WE, formerly SH 161). The report summarizes the results of the study, which included development of traffic and toll revenue estimates for a fifty-one year period. The purpose of this study was to conduct an Investment Grade Traffic and Toll Revenue evaluation for the PGBT-WE.

Our project team, including Michael Copeland, Phani Jammalamadaka, Justin Winn, Worapong Hirunyanitiwattana, Yagnesh Jarmarwala, Naveen Mokkapati, Gustavo Baez (Baez Consulting) and other subconsultants, gratefully acknowledge the assistance and cooperation received from NTTA as well as others contacted during the course of the study. WSA sincerely appreciates the opportunity to have participated in this important project.

Respectfully submitted,

WILBUR SMITH ASSOCIATES



Kamran A. Khan
Senior Vice President

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DISCLAIMER

Results, findings, conclusions and recommendations found in this report are the direct result of the application of current state-of-the-practice processes and procedures in traffic and toll revenue forecasting. WSA believes that projections and other forward-looking statements contained within this report are based on reasonable assumptions as of the date of this report. However, there is considerable uncertainty inherent in forecasting traffic and revenue for any toll facility. There may sometimes be differences between forecasted and actual results caused by events and circumstances beyond the control of the forecasters. These differences could be material. Also, it should be recognized that traffic and revenue forecasts in this document reflect the overall estimated long-term trend. Actual experience in any given year may vary due to changing economic conditions or other factors.

In developing these forecasts, WSA has reasonably relied upon the accuracy and completeness of information provided (both written and oral) by North Texas Tollway Authority staff and consultants, North Central Texas Council of Governments (NCTCOG) staff and other local and state agencies. WSA has also relied upon the reasonable assurances of some independent parties and is not aware of any facts that would make such information misleading. Determination of several key variables impacting the traffic and revenue forecasts are the result of WSA's professional qualitative judgment based upon years of industry experience. These variables must be considered together as a whole rather than as discrete variables. Misleading or inaccurate conclusions could result without appropriate consideration of the intent or application of these variables or the underlying methodologies used to obtain the results.

WSA traffic and revenue forecasts rely heavily on the metropolitan transportation plan (MTP) and demographic forecasts produced by NCTCOG, which are updated periodically, and the most recent versions of each were used in this study. However, updates to either the MTP or the demographic forecasts (as they become available) could potentially have significant impacts to future traffic and revenue forecasts. If an updated MTP or demographic forecast is adopted, an update to this investment grade traffic and revenue study would be warranted to ensure the best possible traffic and revenue estimates.

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EXECUTIVE SUMMARY

This Investment Grade Traffic and Toll Revenue report reflects all current efforts requested of Wilbur Smith Associates (WSA) by the North Texas Tollway Authority (NTTA) to estimate traffic and toll revenue for the proposed President George Bush Turnpike – Western Extension (PGBT-WE, formerly SH 161) project in Dallas County. The study evaluated the traffic and revenue potential of the proposed PGBT-WE corridor between IH 20 and SH 183. The facility is assumed to open to traffic in phases, with the last phase opening in October 2012.

This study was conducted at an investment grade level and is considered suitable for use in project financing. The study utilized the latest North Central Texas Council of Governments (NCTCOG) 2030 Mobility Plan: 2009 Update, which includes the most recently approved future transportation improvement assumptions. The demographics datasets from the NCTCOG Mobility 2030 Plan: 2009 Update were updated based on the independent economic reviews that were performed along the existing NTTA system corridors, Southwest Parkway/Chisholm Trail Parkway corridor, Trinity Parkway corridor and along the PGBT-WE corridor by Insight Research Corporation (IRC), Research and Demographic Solutions (RDS) and Weinstein, Clower and Associates (WCA). The traffic and revenue estimates on the PGBT-WE were developed by using the trip tables that were generated using these updated demographics datasets.

The study effort involved the following key elements:

- **Data Collection Program** – This project relied heavily on data collected by the Texas Department of Transportation (TxDOT) and provided to NTTA. The data collected by TxDOT included traffic counts at specific locations around the PGBT-WE corridor, speed and delay runs on the potential competing routes, an origin/destination survey and a stated preference survey. Additional traffic counts and speed and delay data were also taken as part of this study. With this data, WSA evaluated the traffic trends and the travel time characteristics along the PGBT-WE corridor. Results from the stated preference survey were used to

estimate values of time for the PGBT-WE corridor and were subsequently used in the traffic and revenue estimation.

- **Corridor Growth Analysis** – Using the most recently approved demographics included by NCTCOG in their latest Mobility 2030 Plan: 2009 Update, WSA evaluated the socioeconomic conditions along the PGBT-WE corridor as described in Chapter 4. This included a review of the historical population and employment growth trends, as well as the future growth projections of these two major socioeconomic characteristics along the PGBT-WE corridor. A summary of the independent economic reviews performed by IRC and WCA along the PGBT-WE corridor is also presented in Chapter 4. Reports detailing the results of the IRC and WCA reviews are presented in Appendices A and B.
- **Traffic and Toll Revenue Forecasts** – WSA developed the traffic and revenue forecasts between 2011 and 2061 for PGBT-WE, as detailed in Chapter 6. The traffic and toll revenue forecasts were made based on the demographics trip tables, which were developed based on the latest independent economic reviews that were done along the PGBT-WE corridor and other DFW toll road corridors.

The toll sensitivity analyses for the PGBT-WE, as described in Chapter 6, show that the current and planned toll charges on the PGBT-WE are below the theoretical revenue maximization points. This demonstrates that, if needed, there is considerable potential for revenue enhancement through toll increases above those assumed for traffic and revenue forecasting purposes.

Table ES-1 presents the estimated annual transactions and annual toll revenue on the PGBT-WE. The annual transactions and annual revenue have been adjusted to reflect "ramp-up" during the first several years of operation. The annual transactions are expected to increase from 68.1 million in 2015 to 101.8 million in 2030 representing a 2.7 percent average annual growth between 2015 and 2030. Annual transactions are estimated to be 163.3 million in 2061, with an average annual growth rate of 1.5 percent between 2030 and 2061. Annual toll revenue is expected to be approximately $54.7 million in year 2015 and is expected to reach $127.5 million by 2030. This translates to an approximate 5.8 percent annual growth between 2015 and 2030. Annual revenue is anticipated to grow at an annual rate of 4.4 percent between 2030 and 2061, reaching $483.5 million in 2061.

Table ES-1
Estimated PGBT-WE Transactions and Revenue

Calendar Year	Annual Transactions	Annual Revenue
2011	13,277,000	$8,106,900
2012	23,390,200	$15,004,800
2013	52,451,900	$38,521,200
2014	62,477,500	$48,282,600
2015	68,052,500	$54,743,500
2016	70,781,900	$58,846,700
2017	73,641,600	$63,058,800
2018	76,637,100	$67,723,000
2019	80,081,500	$72,976,300
2020	85,759,900	$81,075,600
2021	87,783,600	$85,652,200
2022	89,858,700	$90,474,900
2023	91,986,900	$95,257,600
2024	94,169,200	$100,433,900
2025	89,847,900	$97,434,400
2026	92,091,300	$102,712,600
2027	94,400,900	$108,265,100
2028	96,779,700	$114,224,100
2029	99,229,000	$120,613,300
2030	101,751,700	$127,521,700
2031	112,213,300	$145,927,200
2032	115,075,500	$154,268,100
2033	118,022,900	$163,126,000
2034	121,058,600	$172,641,200
2035	124,185,600	$182,235,700
2036	125,800,000	$189,819,700
2037	127,435,500	$197,326,100
2038	129,092,100	$205,296,300
2039	130,770,400	$213,525,600
2040	132,470,000	$222,203,900
2041	133,794,900	$230,307,800
2042	135,133,000	$238,846,800
2043	136,484,500	$248,149,800
2044	137,849,300	$258,000,800
2045	139,227,700	$267,466,900
2046	140,620,000	$277,545,700
2047	142,026,100	$288,185,900
2048	143,446,500	$299,411,500
2049	144,880,900	$310,006,500
2050	146,329,800	$321,246,900
2051	147,792,800	$333,345,800
2052	149,270,800	$346,188,100
2053	150,763,500	$359,201,400
2054	152,271,400	$372,958,000
2055	153,793,900	$387,019,700
2056	155,331,600	$401,898,100
2057	156,885,000	$416,709,700
2058	158,454,000	$432,515,500
2059	160,038,600	$449,026,900
2060	161,638,800	$466,470,100
2061	163,255,300	$483,499,700

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CHAPTER 1 INTRODUCTION

This comprehensive traffic and revenue report reflects all current efforts requested of Wilbur Smith Associates (WSA) by the North Texas Tollway Authority (NTTA) to estimate the traffic and toll revenue potential for the President George Bush Turnpike – Western Extension (PGBT-WE, formerly SH 161) in Dallas County.

BACKGROUND AND AUTHORITY FOR STUDY

In 2007, WSA began work on a preliminary traffic and toll revenue (T&R) study for NTTA. Work on the project was halted during the market valuation negotiations between NTTA and the Texas Department of Transportation (TxDOT). After the completion of the initial market valuation negotiations in December 2007, WSA was tasked with upgrading the preliminary T&R study to an investment grade T&R study. An investment grade study report was completed in October 2008 by WSA. Due to the economic downturn, changes to the NTTA System toll rate schedules, update to the regional mobility plan, revenue recovery assumption changes and PGBT-WE phasing changes, NTTA authorized WSA to update the PGBT-WE investment grade T&R study again in 2009. A draft investment grade report summarizing that work was completed in August 2009. Since then, key project assumptions have changed again, and WSA has revisited the traffic and revenue forecasts for PGBT-WE. The results of the current investment grade study are summarized in this report. This study builds upon the previous work to generate updated investment grade traffic and toll revenue estimates that are suitable for financing purposes.

OBJECTIVE AND SCOPE OF STUDY

The purpose of this study was to develop investment grade traffic and toll revenue forecasts for the proposed PGBT-WE project extending from IH 20 in Dallas County to SH 183. The proposed tollway alignment is approximately 11.5 miles long and passes through the cities of Irving and Grand Prairie.

The following outlines the general structure of the report:

CHAPTER 2 – EXISTING TRAFFIC TRENDS AND CHARACTERISTICS

This chapter illustrates the historical traffic trends in the PGBT-WE study area. Traffic characteristics such as traffic counts, speed and delay, vehicle classification and others are detailed in this chapter. This section also summarizes the origin-destination and stated preference surveys that were used in the investment grade analysis.

CHAPTER 3 – DALLAS-FORT WORTH AREA TRANSPORTATION CHARACTERISTICS

This section contains a broad overview of the transportation system in the Dallas-Fort Worth region and outlines the region-wide characteristics that may impact the North Texas Tollway Authority System (NTTAS) and the PGBT-WE. The Mobility 2030 Plan: 2009 Update transportation commitments are described in this chapter.

CHAPTER 4 – DEMOGRAPHIC GROWTH

This chapter provides an overview of the methodology used to develop the official future socioeconomic datasets for the Dallas-Fort Worth Metropolitan Area (DFWMA) created by NCTCOG and approved by the NCTCOG Executive Board in 2003. NCTCOG's official demographic projections were evaluated throughout the area surrounding the PGBT-WE. This chapter also summarizes the independent economic reviews of NCTCOG's demographics that were performed.

CHAPTER 5 – TRAVEL DEMAND MODEL DEVELOPMENT

This chapter describes the databases utilized as part of this analysis and highlights the methodologies implemented to calibrate the travel demand model. The model is used to estimate future traffic on toll facilities, and it is calibrated and validated using current traffic to ensure that future projections are consistent with observed traffic characteristics along the corridor.

CHAPTER 6 – PGBT-WE ESTIMATED TRANSACTIONS AND TOLL REVENUE

The toll sensitivity analyses performed as part of the study are described in detail in this chapter. Also included is the analysis of the daily and annual transactions and toll revenues anticipated on the PGBT-WE, and sensitivity tests performed for the T&R estimates.

APPENDICES A & B – INDEPENDENT ECONOMIC REVIEWS

These appendices contain the documentation of the independent economic reviews as provided by Insight Research Corporation and Weinstein, Clower and Associates.

CHAPTER 2

EXISTING TRAFFIC TRENDS AND CHARACTERISTICS

This chapter provides background information regarding the existing traffic conditions for the highway infrastructure in and around the PGBT-WE corridor in Dallas County and Tarrant County. The corridor runs north/south between IH 20 in Grand Prairie and SH 183 in Irving. The information in this chapter provides a historical overview of traffic in the vicinity of the PGBT-WE corridor and was used as input to the traffic and toll revenue forecasting process.

DESCRIPTION OF EXISTING CORRIDOR FACILITIES

The PGBT-WE toll facility runs through the cities of Irving and Grand Prairie in a north/south direction and intersects several east/west arterial streets. There are also several potential north/south competing routes parallel to the PGBT-WE corridor. The study corridor is shown in Figure 2-1.

The PGBT-WE corridor is approximately 11.5 miles long and runs from IH 20 in Grand Prairie to SH 183 in Irving. The corridor crosses several major east/west highways and arterials including SH 183, IH 30, SH 180 and IH 20. Spur 303/Pioneer Parkway, which connects directly to the Mountain Creek Lake Toll Bridge, also crosses the PGBT-WE corridor. Additionally, SH 360, FM 157/Collins Road in Arlington, Carrier Parkway and Belt Line Road in Grand Prairie and Irving, and Loop 12/Spur 408 in Dallas are potential north/south competing routes.

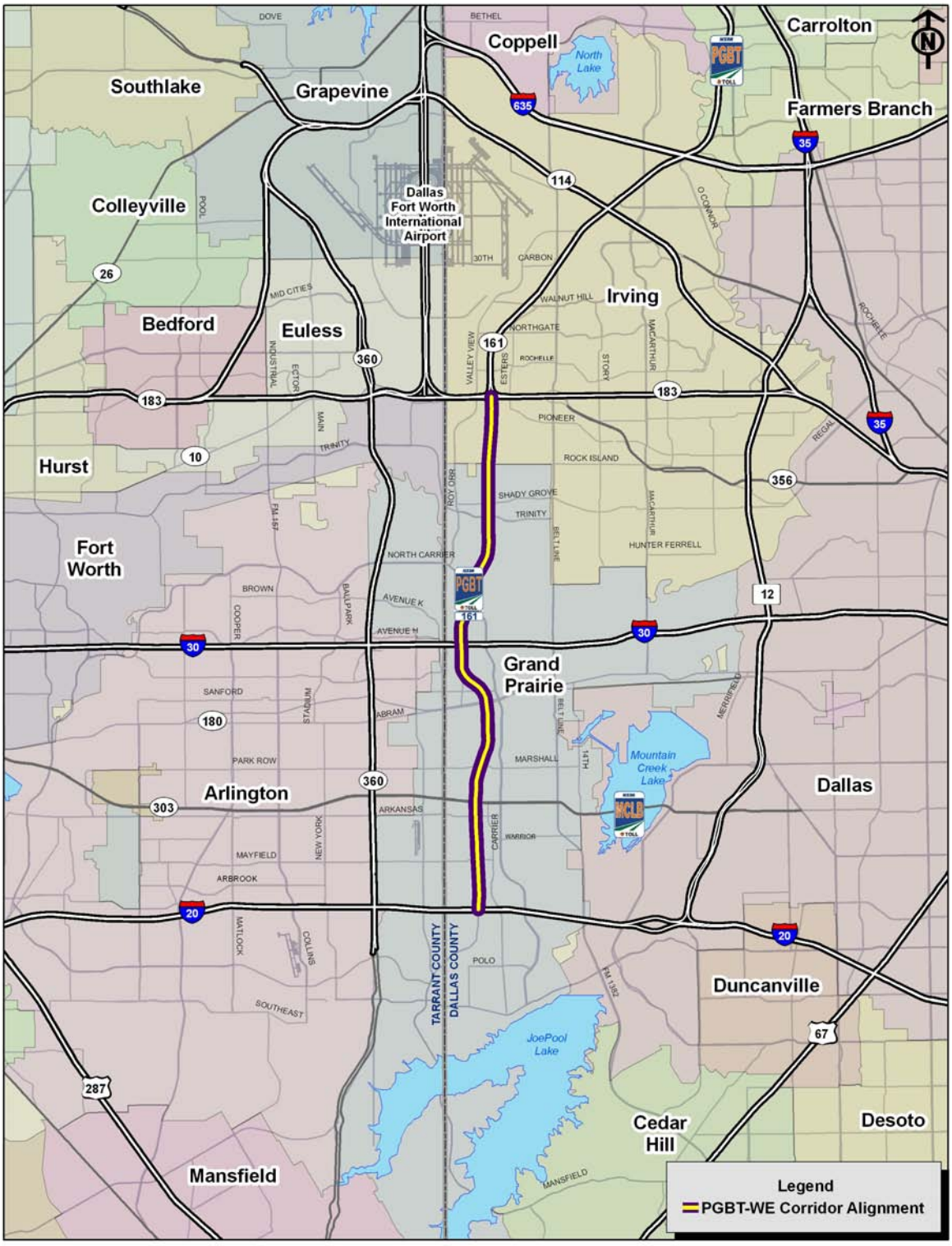


Figure 2-1. PGBT-WE Corridor Alignment

DATA COLLECTION EFFORT

The Texas Department of Transportation (TxDOT) hired WSA to conduct a comprehensive data collection effort in 2006. This effort consisted of traffic counts, speed-delay runs, an origin-destination survey and a stated preference survey. A detailed summary of the data collection can be found in the report *Data Collection: SH 161 Between IH 20 and SH 183*. This report as well as all collected data was provided to NTTA and its consultants by TxDOT via their FTP site in October 2007. This information provided the primary input data for this investment grade study. In addition to the data provided by TxDOT, WSA reviewed historic traffic counts and collected additional traffic counts and speed and delay data in the PGBT-WE corridor.

TRAFFIC COUNTS

The traffic counts commissioned by TxDOT were collected in November 2006 throughout the PGBT-WE corridor along eight screenlines. The screenlines and traffic count locations are shown in Figures 2-2 and 2-3, respectively. Most of the counts were 48-hour counts conducted on interior weekdays (Tuesday, Wednesday and Thursday). Several week-long (168-hour) counts were also included, as well as vehicle classification counts. The results of the traffic counts are shown in Figure 2-4 and reported as average weekday traffic. As shown in the figure, SH 360 carries a large portion of the screenline traffic throughout the corridor. Collins Road and Belt Line Road are also major north/south routes. Screenline traffic directionality profiles for each of the eight screenlines are shown in Figures 2-5 through 2-12. The profiles indicate that in the PGBT-WE corridor, traffic is heavier in the northbound direction during the morning peak period and in the southbound direction during the evening peak period. This strong directionality of traffic in the corridor is expected on the PGBT-WE toll facility.

SUPPLEMENTAL TRAFFIC COUNTS

As a supplement to the traffic data provided by TxDOT, NTTA conducted additional traffic counts in November 2007 on Screenlines 2, 5 and 8. In June and July 2009, counts were collected on Screenlines 2 and 5 and at several locations on the PGBT-WE frontage roads. The locations of the additional counts collected in 2007 and July 2009 are shown in Figure 2-13. In November 2009, counts were collected on Screenlines 2, 5, 7, and on the direct connections between SH 183 and the PGBT-WE which were opened in August 2009. In January 2010, counts were made along three screenlines (2, 3 and 5) and at some locations on Screenline 7. Three of the screenlines were extended to the east to include Loop 12 and Spur 408. A new screenline, Screenline 9, along the county line between IH 20 and SH 183 was added to count the traffic traveling east and west across the corridor. The locations of these additional counts and the average weekday volumes recorded in 2010 are shown in Figure 2-14. Each count was taken for a consecutive 48-hour period on interior weekdays. Figure 2-15 shows a schematic of the portion of the PGBT-WE mainlanes that is currently open to traffic, the average daily transactions on the facility since opening in August 2009, and the average weekday transactions in March 2010 (before the opening of Phase 3), May 2010 (after the opening of Phase 3), and October 2010.

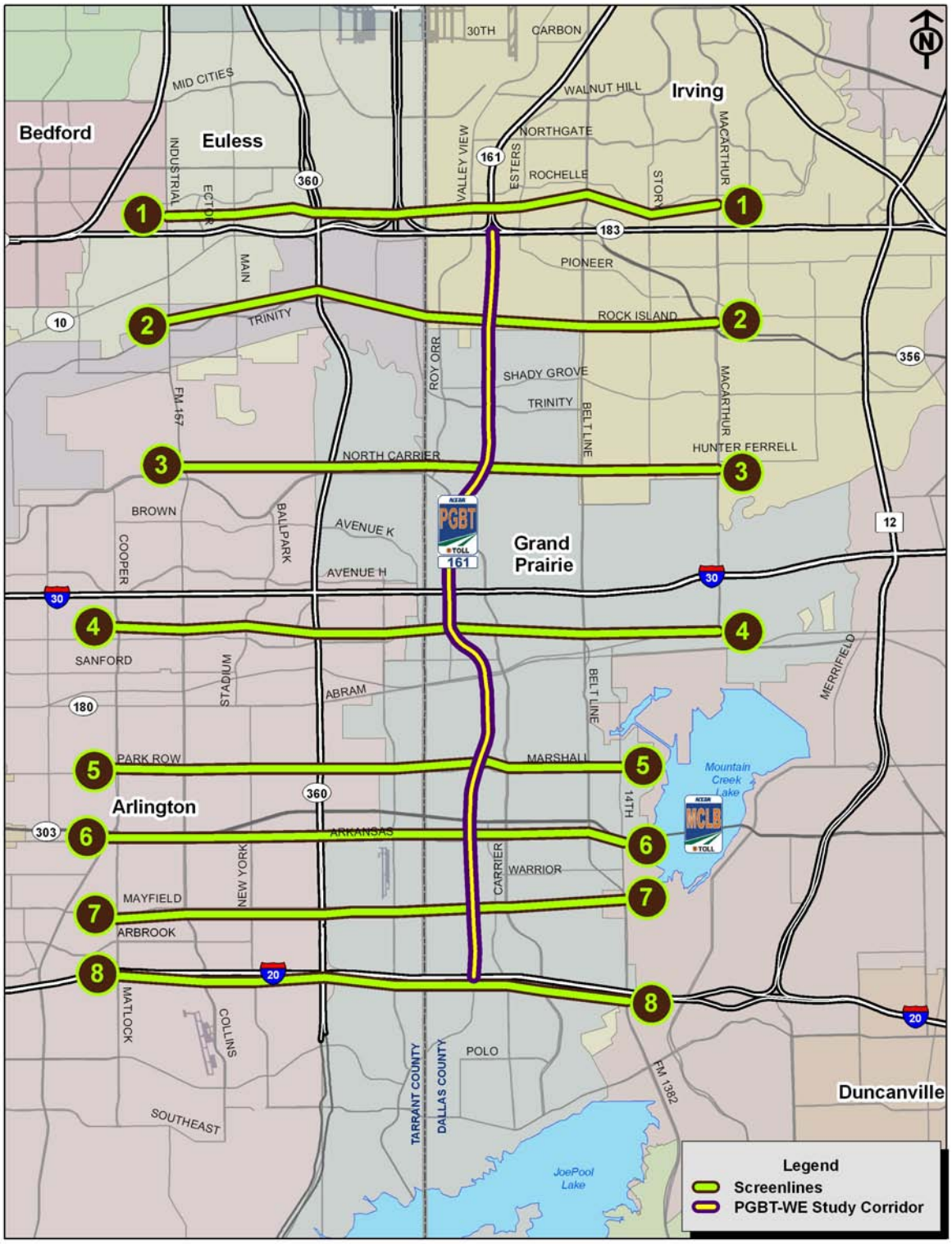


Figure 2-2. PGBT-WE Screenlines (TxDOT Data Collection Effort)

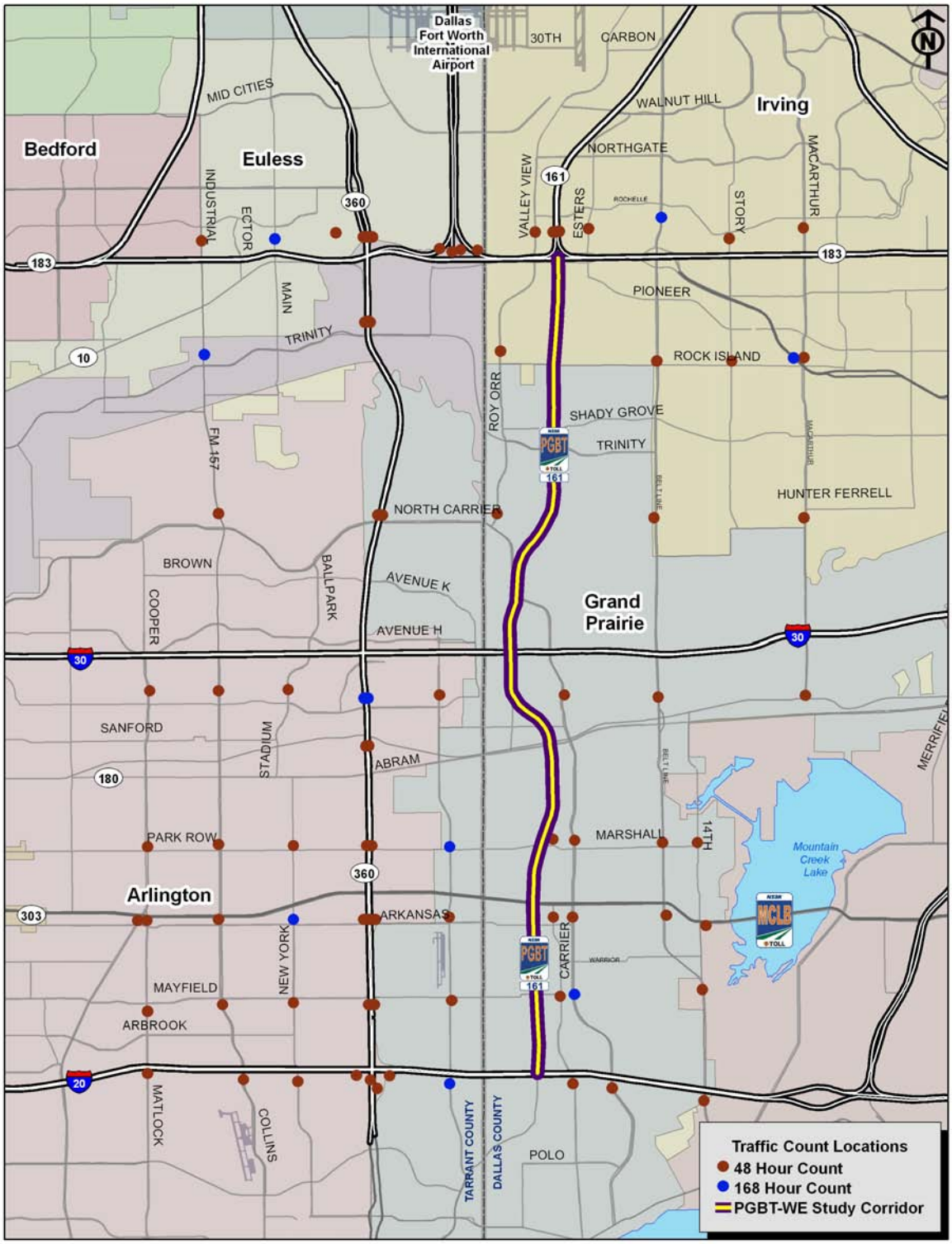


Figure 2-3. PGBT-WE Traffic Count Locations
(TxDOT Data Collection, November 2006)

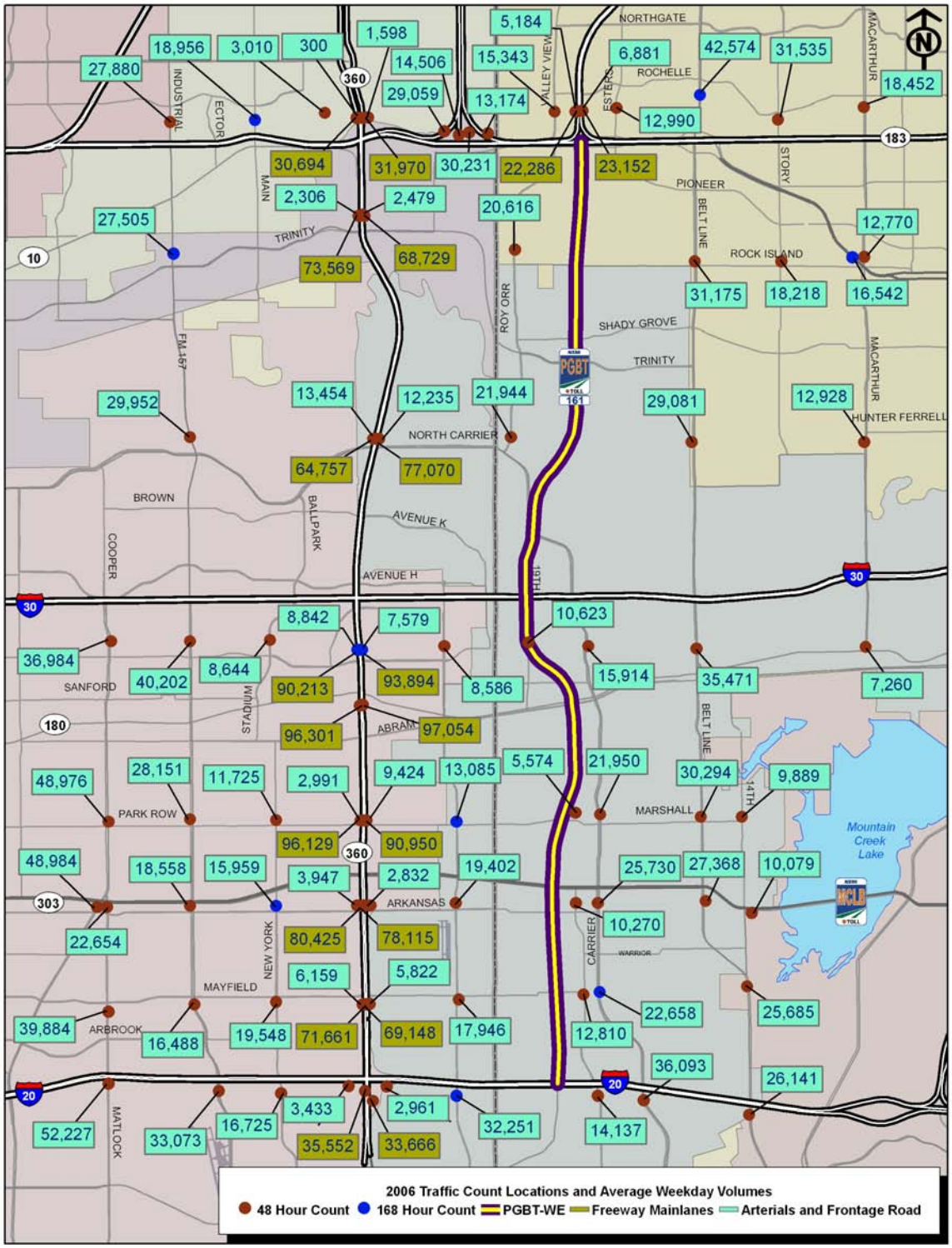


Figure 2-4. PGBT-WE Traffic Count Results
(TxDOT Data Collection, November 2006)

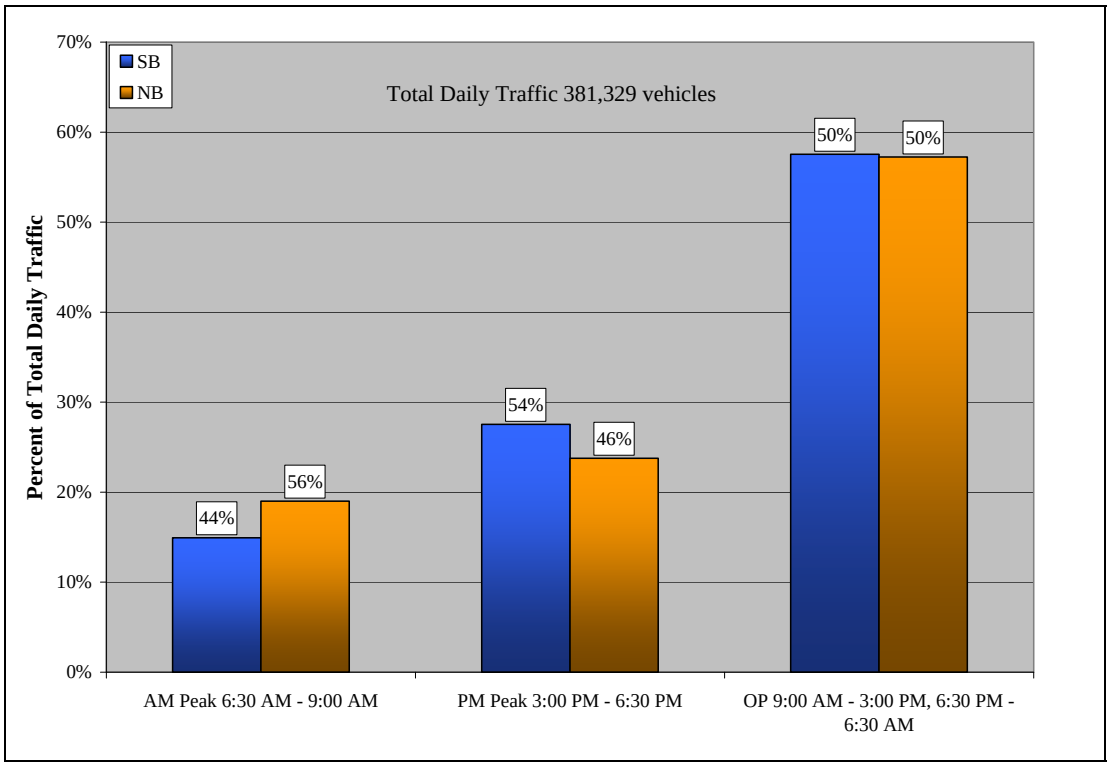


Figure 2-5. Screenline 1 Traffic Profile

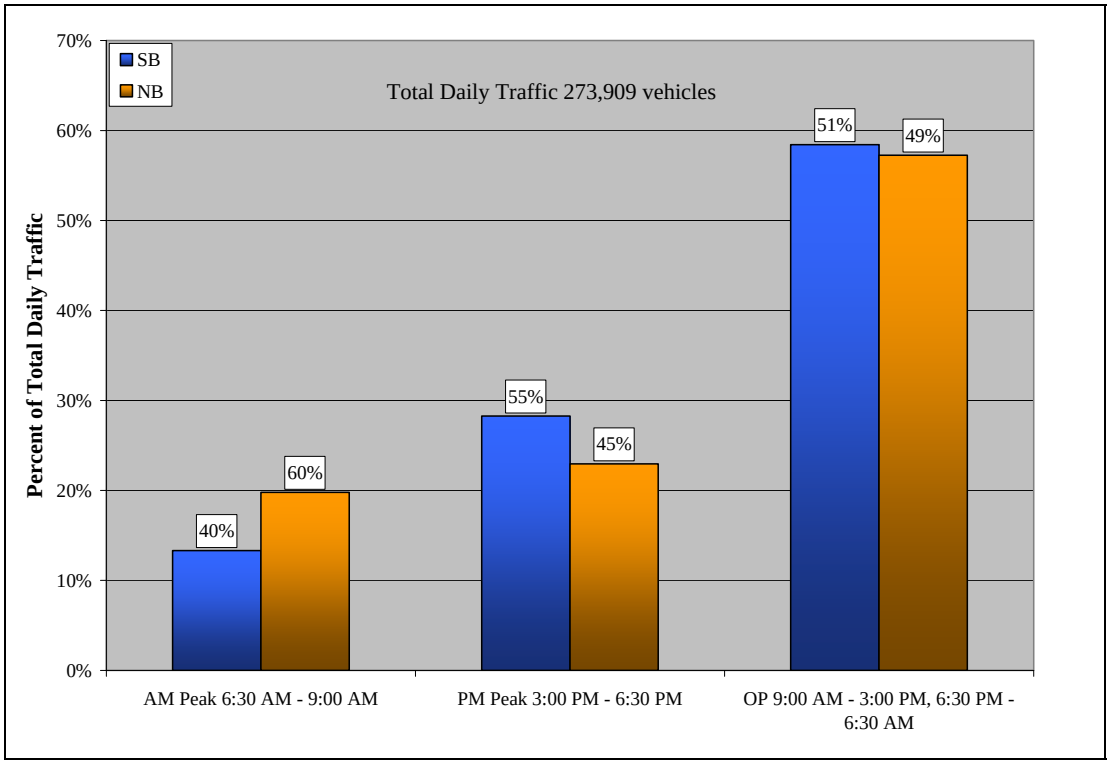


Figure 2-6. Screenline 2 Traffic Profile

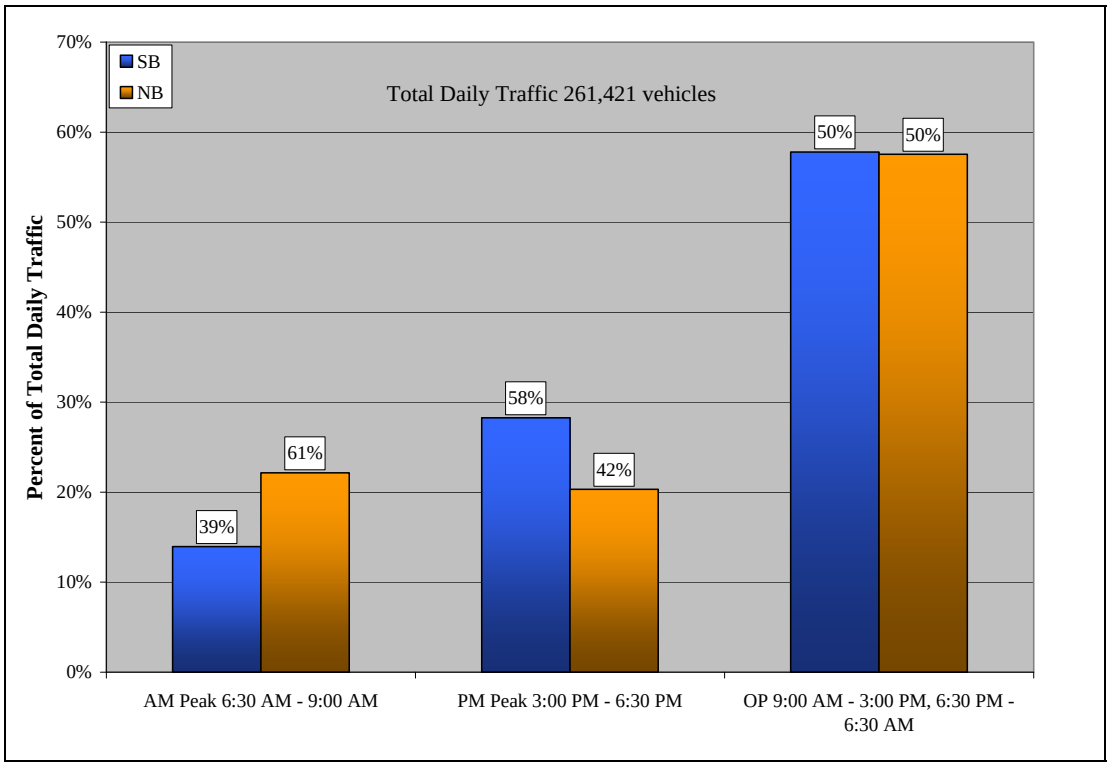


Figure 2-7. Screenline 3 Traffic Profile

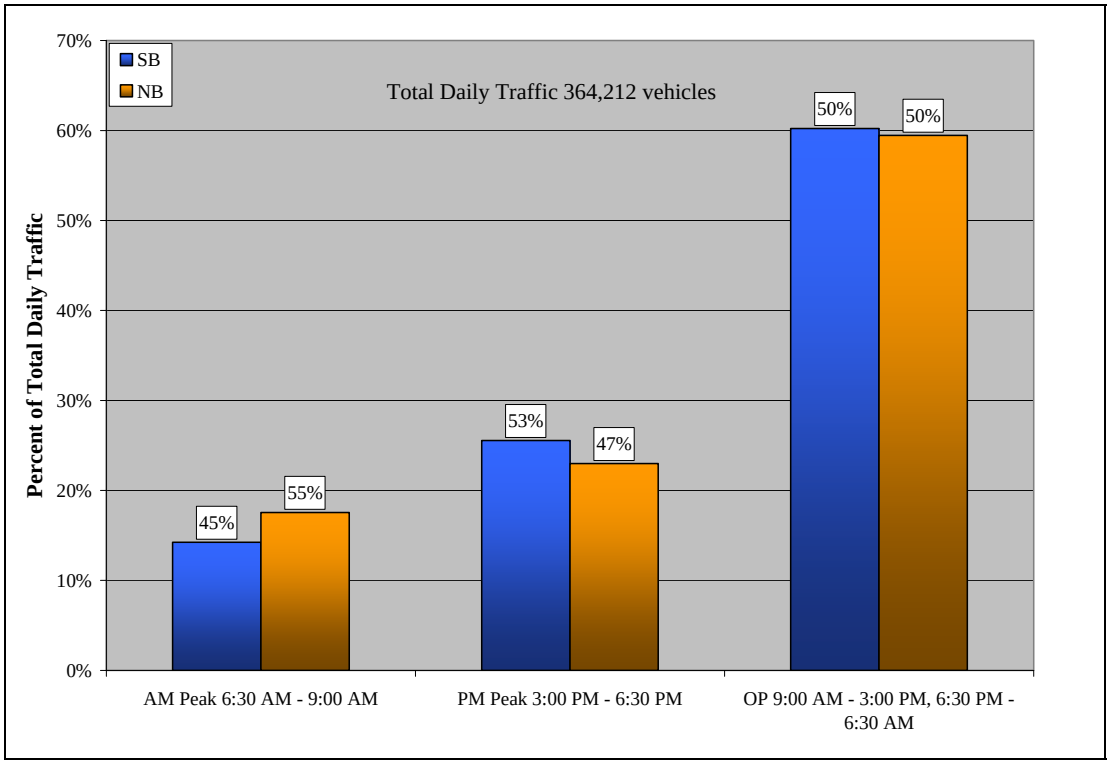


Figure 2-8. Screenline 4 Traffic Profile

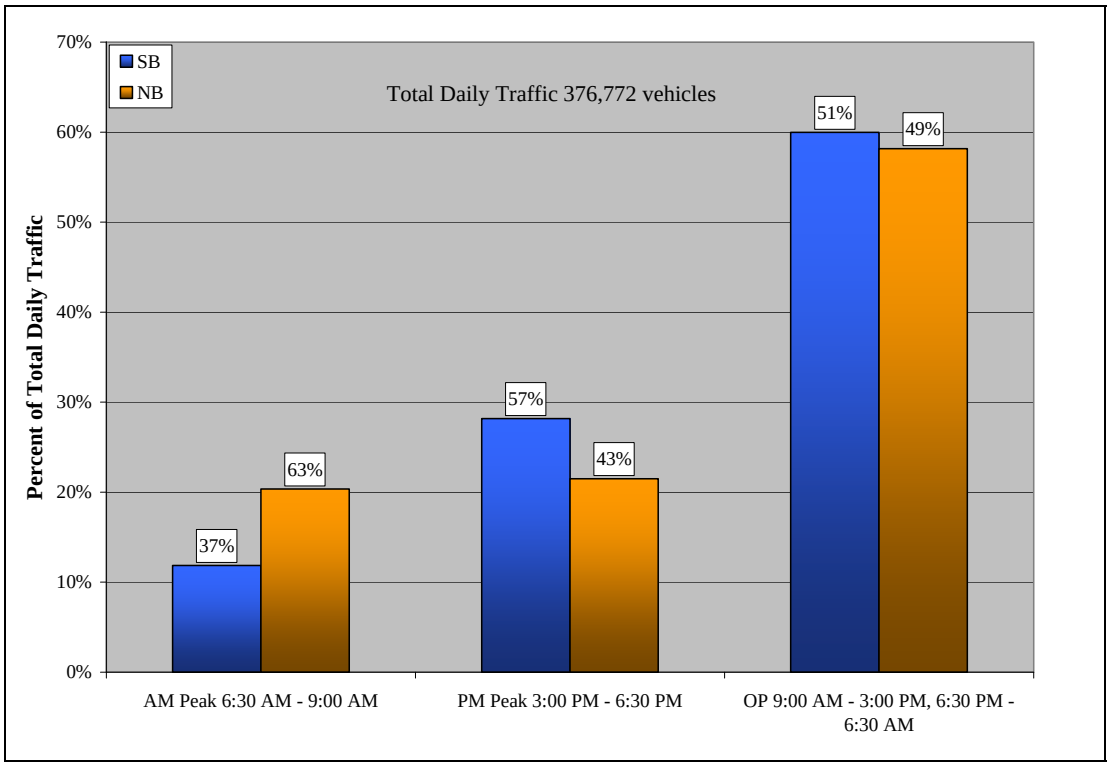


Figure 2-9. Screenline 5 Traffic Profile

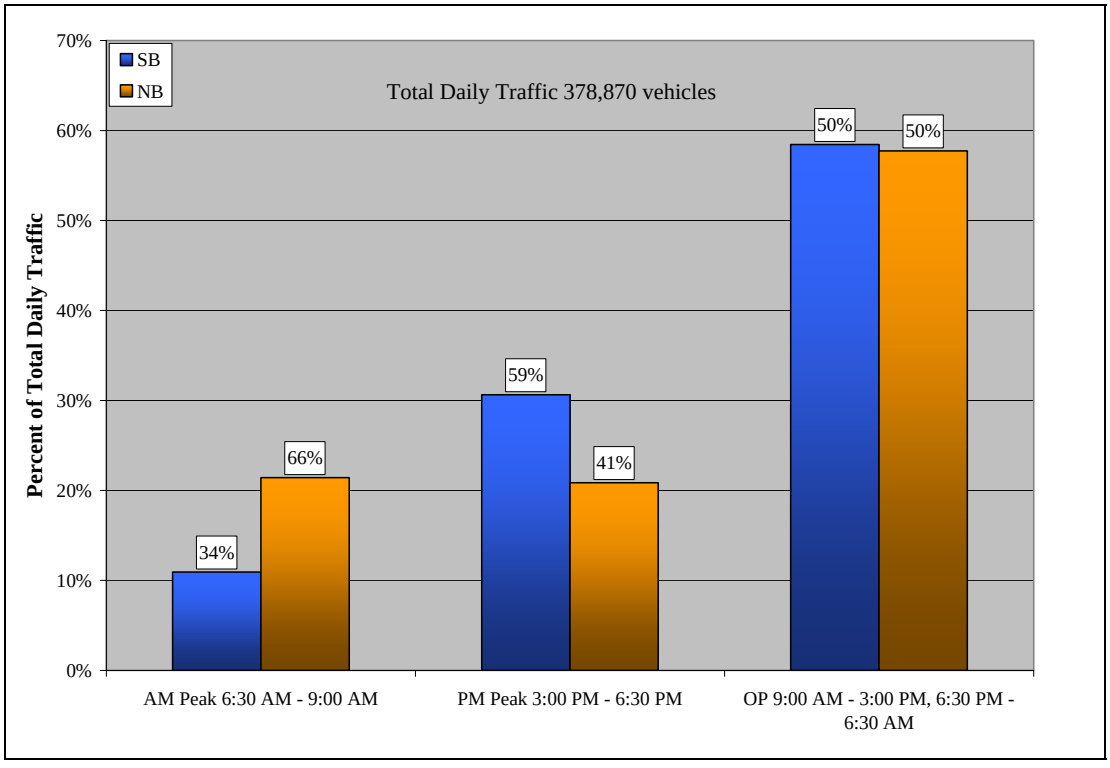


Figure 2-10. Screenline 6 Traffic Profile

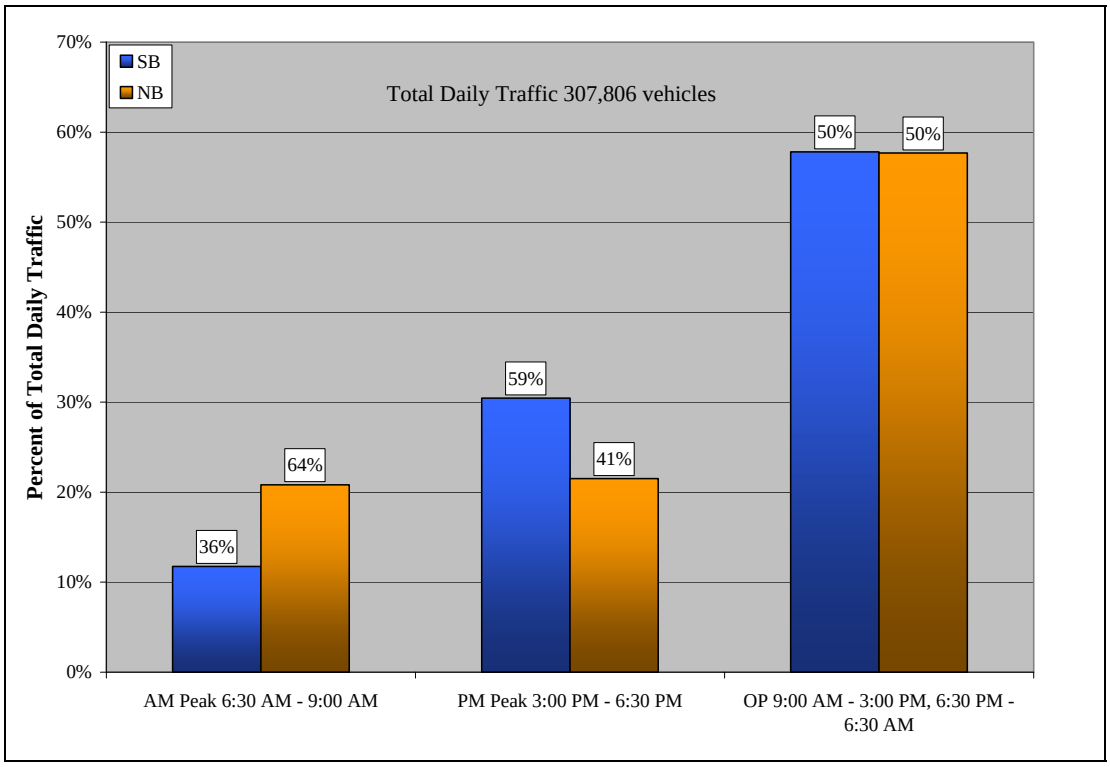


Figure 2-11. Screenline 7 Traffic Profile

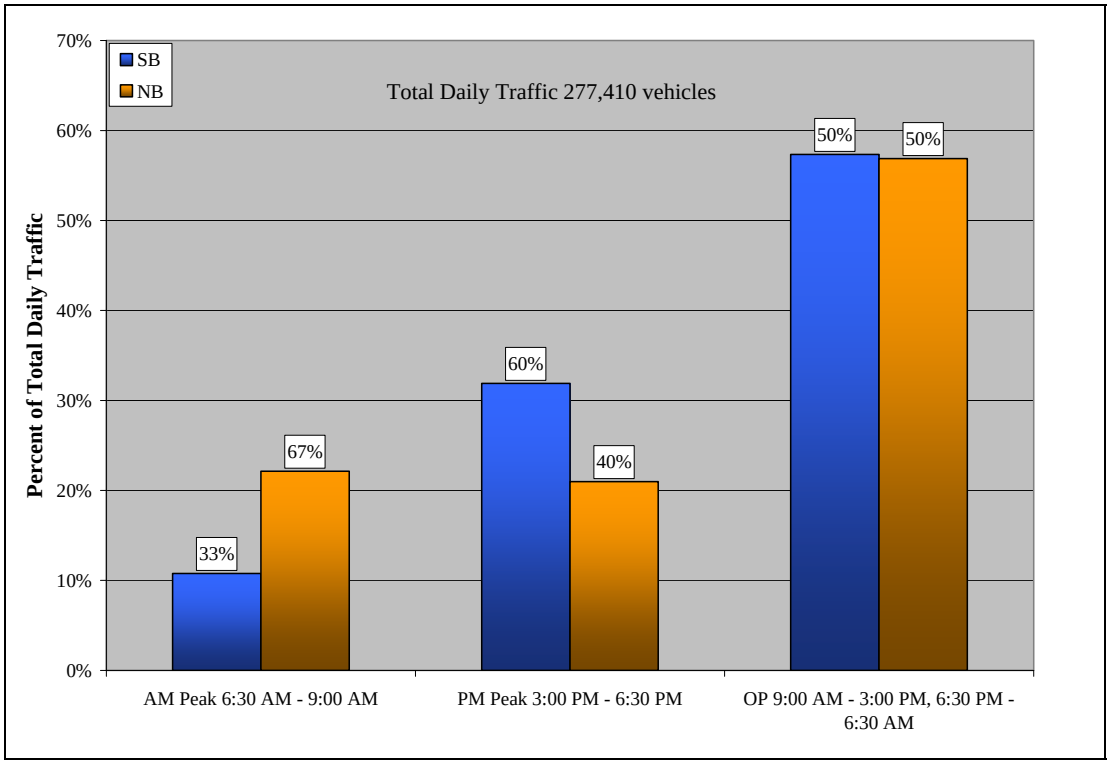


Figure 2-12. Screenline 8 Traffic Profile

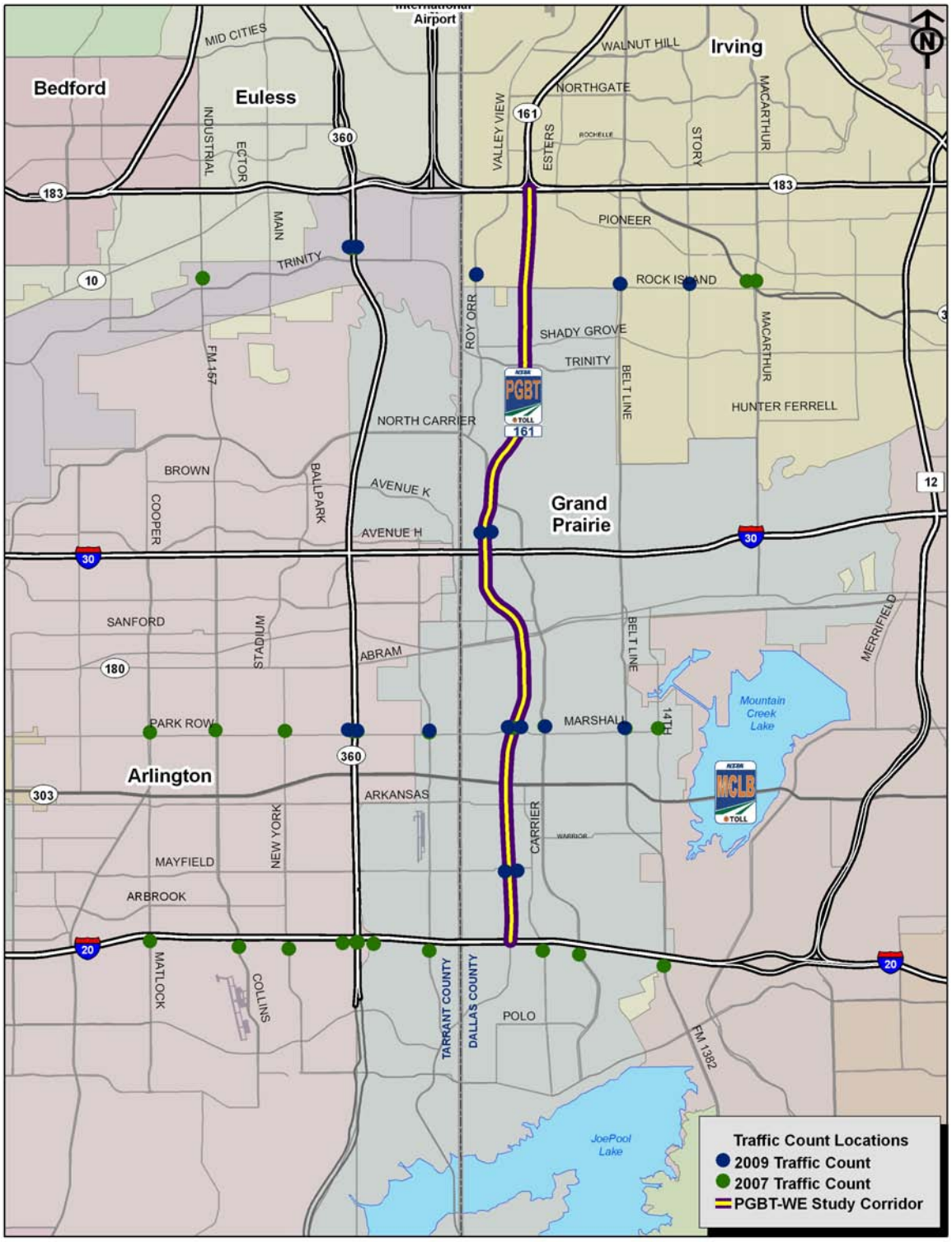


Figure 2-13. PGBT-WE Traffic Count Locations
(WSA Data Collection 2007 & 2009)

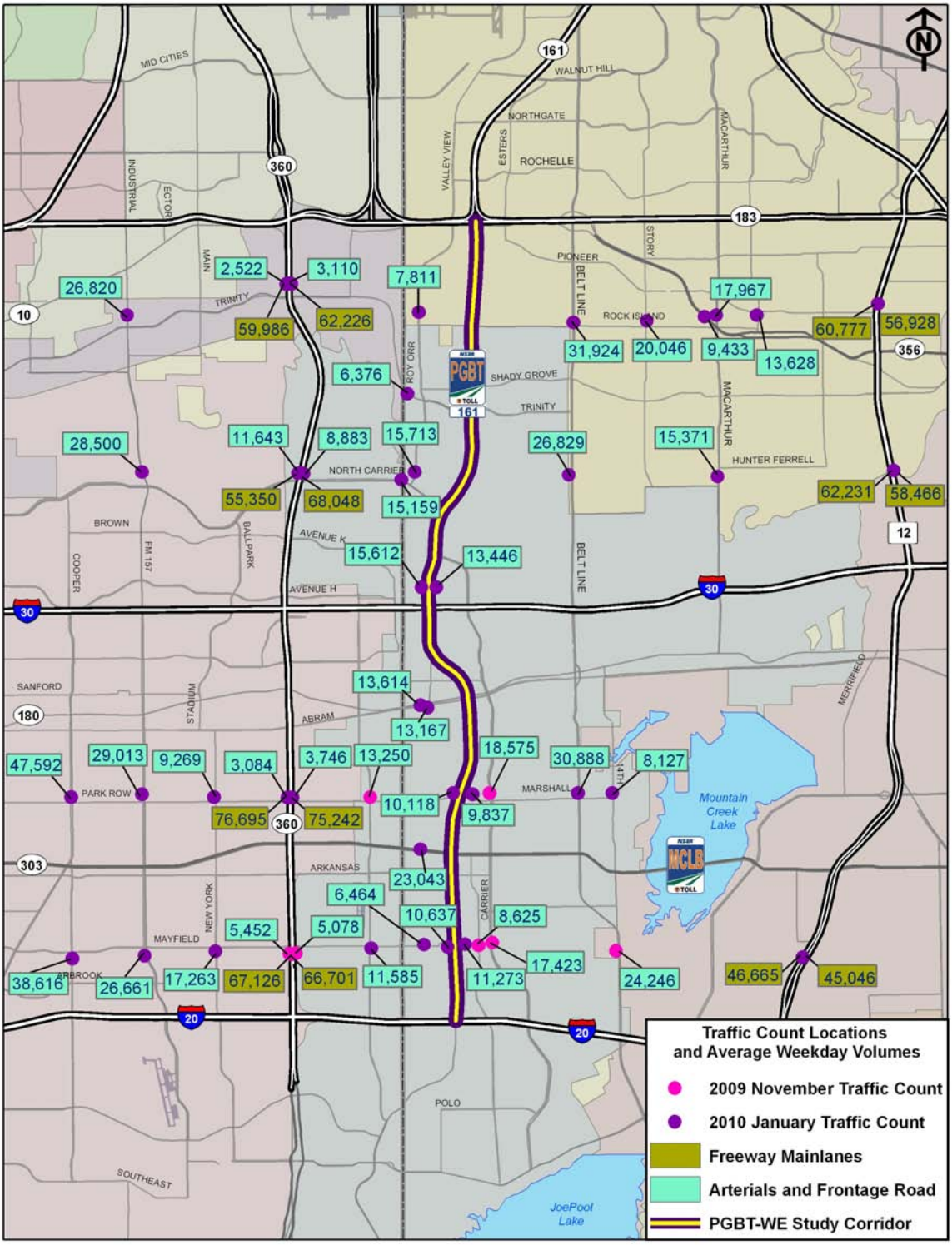
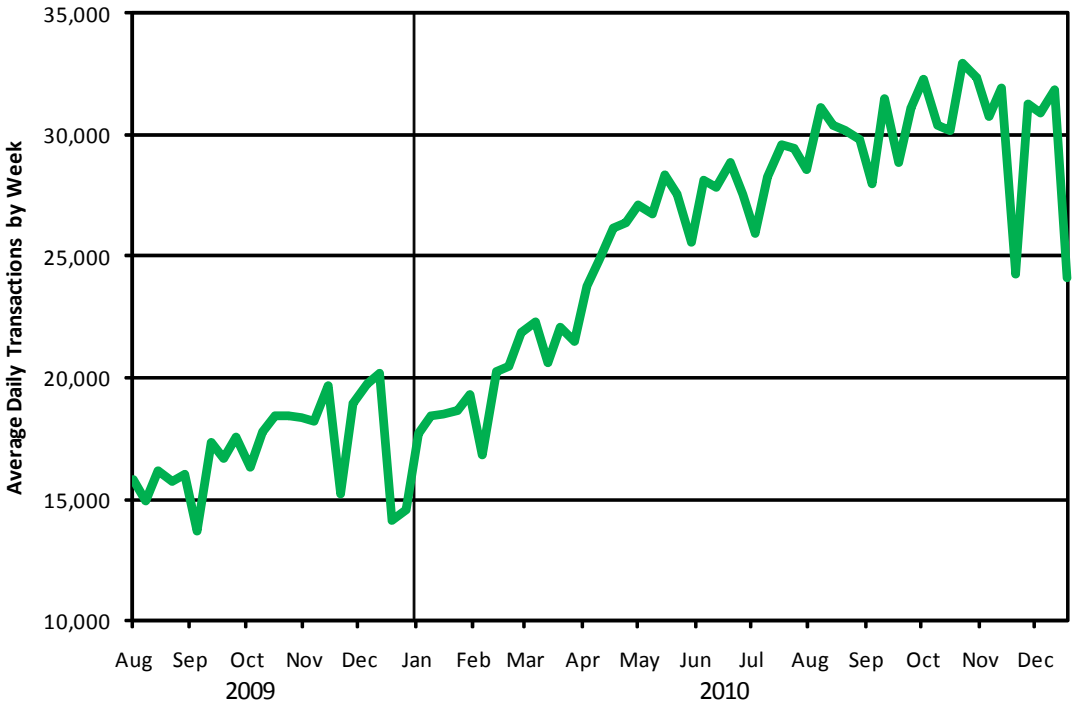
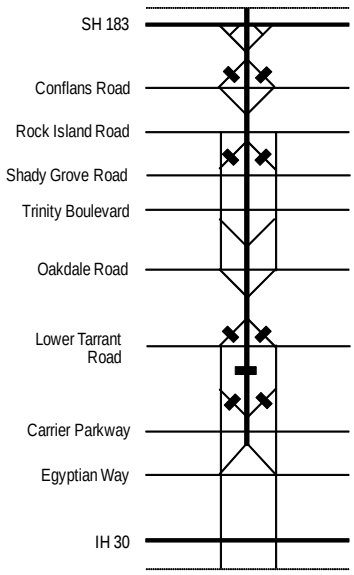


Figure 2-14. PGBT-WE Traffic Count Locations
(WSA Data Collection: 2009 & 2010)



Average Weekday Transactions



Plaza	March 2010 (Before Phase 3)	May 2010 (After Phase 3)	October 2010
Conflans Ramps	3,011	2,659	2,765
Shady Grove Ramps	---	2,681	3,561
Lower Tarrant Ramps (North)	---	1,902	3,852
Lower Tarrant MLG	21,916	24,392	25,320
Lower Tarrant Ramps (South)	---	189	97
Total	**24,927**	**31,824**	**35,595**

Figure 2-15. PGBT-WE Transaction Trends

HISTORIC TRAFFIC COUNTS

The Texas Department of Transportation (TxDOT) records the annual average daily traffic (AADT) at several locations on all state roadways and the volumes are shown on district and county maps. WSA obtained AADT values for several locations along and adjacent to the PGBT-WE corridor for the eighteen year period between 1991 and 2008. The compounded annual traffic growth between 1991 and 2008 at the historic traffic count locations is shown in Table 2-1. Over this period, most of the locations in the PGBT-WE corridor had a positive traffic growth in AADT. The locations of the AADT counts are shown in Figure 2-16. Figures 2-17 through 2-20 show the historic traffic count profiles.

Table 2-1
Historic Traffic Counts

Location Number	Location	1991 Volume	2008 Volume	Annual Growth
1	SH 360 South of 183	98,000	161,000	3.0%
2	SH 183 East of Tarrant County Line	109,000	178,000	2.9%
3	SH 161 North of SH 183	19,500	72,000	8.0%
4	SH 360 North of IH 30	108,000	172,000	2.8%
5	IH 30 East of Tarrant County Line	86,000	121,000	2.0%
6	SH 360 South of SH 180	123,000	188,000	2.5%
7	SH 180 West of Belt Line	18,000	13,200	-1.8%
8	Beltline South of SH 180	17,100	25,000	2.3%
9	Spur 303 West of Tarrant County Line	25,000	22,000	-0.7%
10	SH 360 South of Spur 303	90,000	171,000	3.8%
11	Spur 303 West of Belt Line	24,000	24,000	0.0%
12	SH 360 South of IH 20	19,400	86,000	9.2%
13	IH 20 East of Tarrant County Line	86,000	161,000	3.8%
14	Belt Line North of IH 20	14,400	21,000	2.2%

Note: Volumes are average annual daily traffic (AADT). The AADT includes freeway and frontage road volumes for both directions at that location.

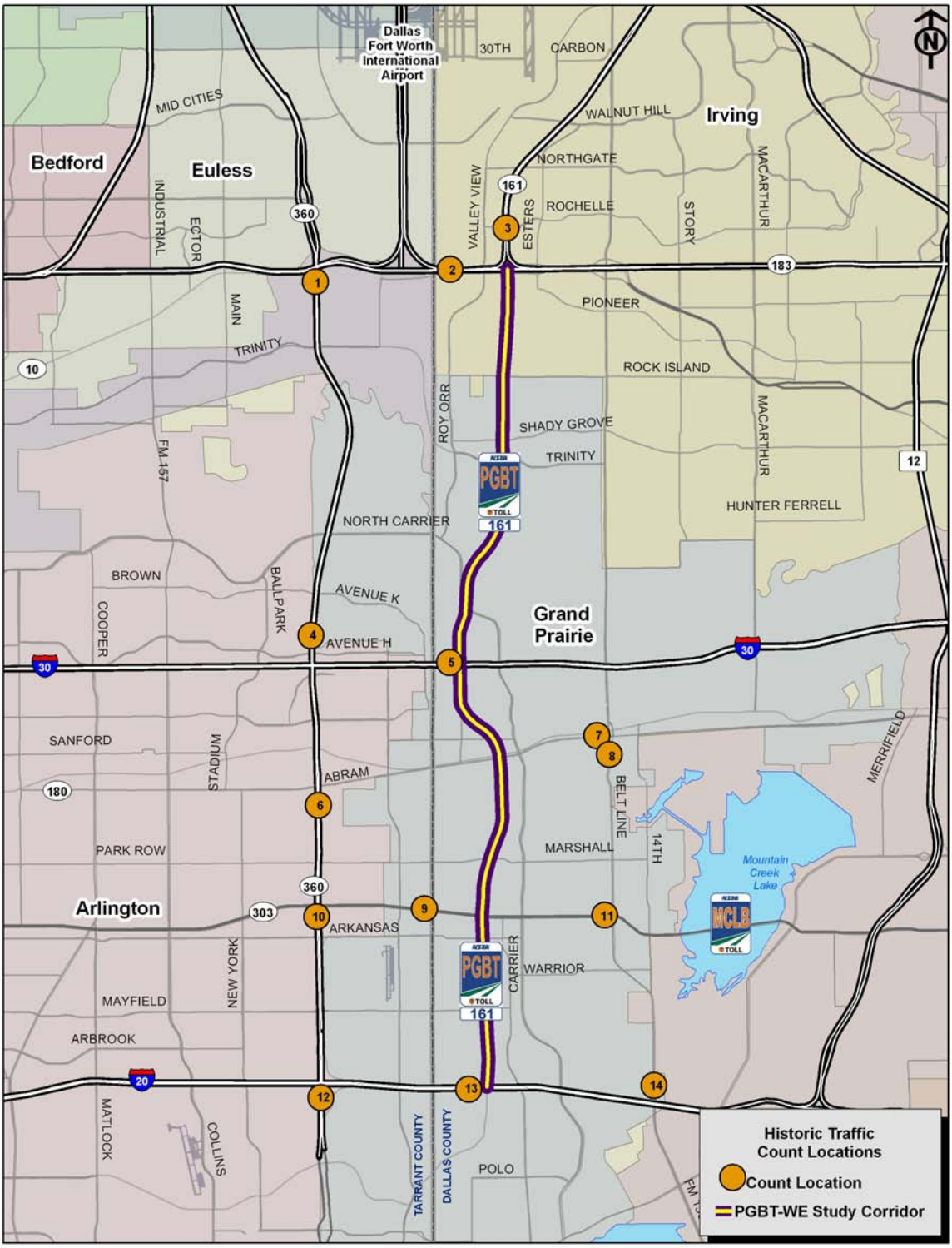


Figure 2-16. PGBT-WE Corridor Historic Traffic Counts

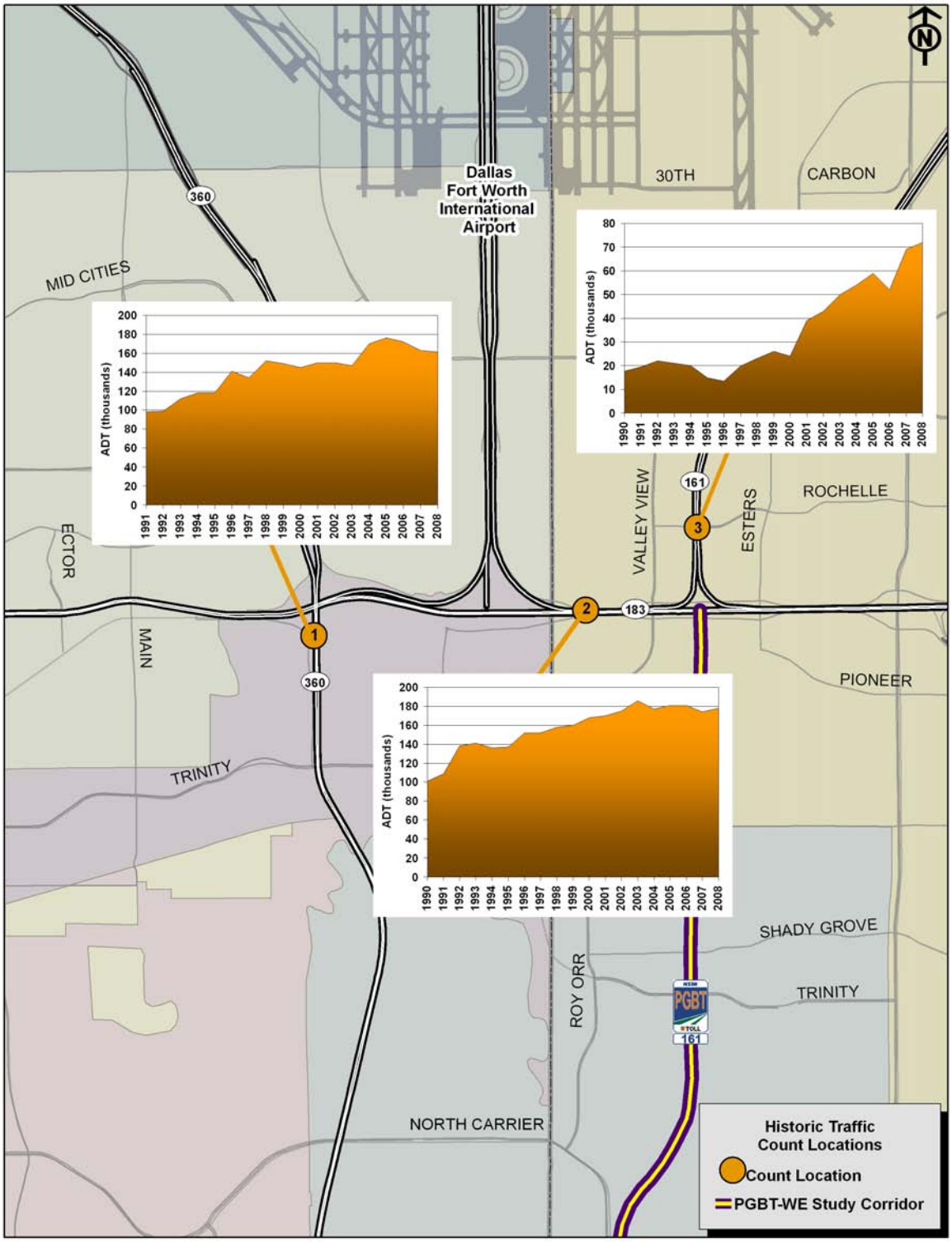


Figure 2-17. PGBT-WE Corridor Historic Traffic Count Profiles

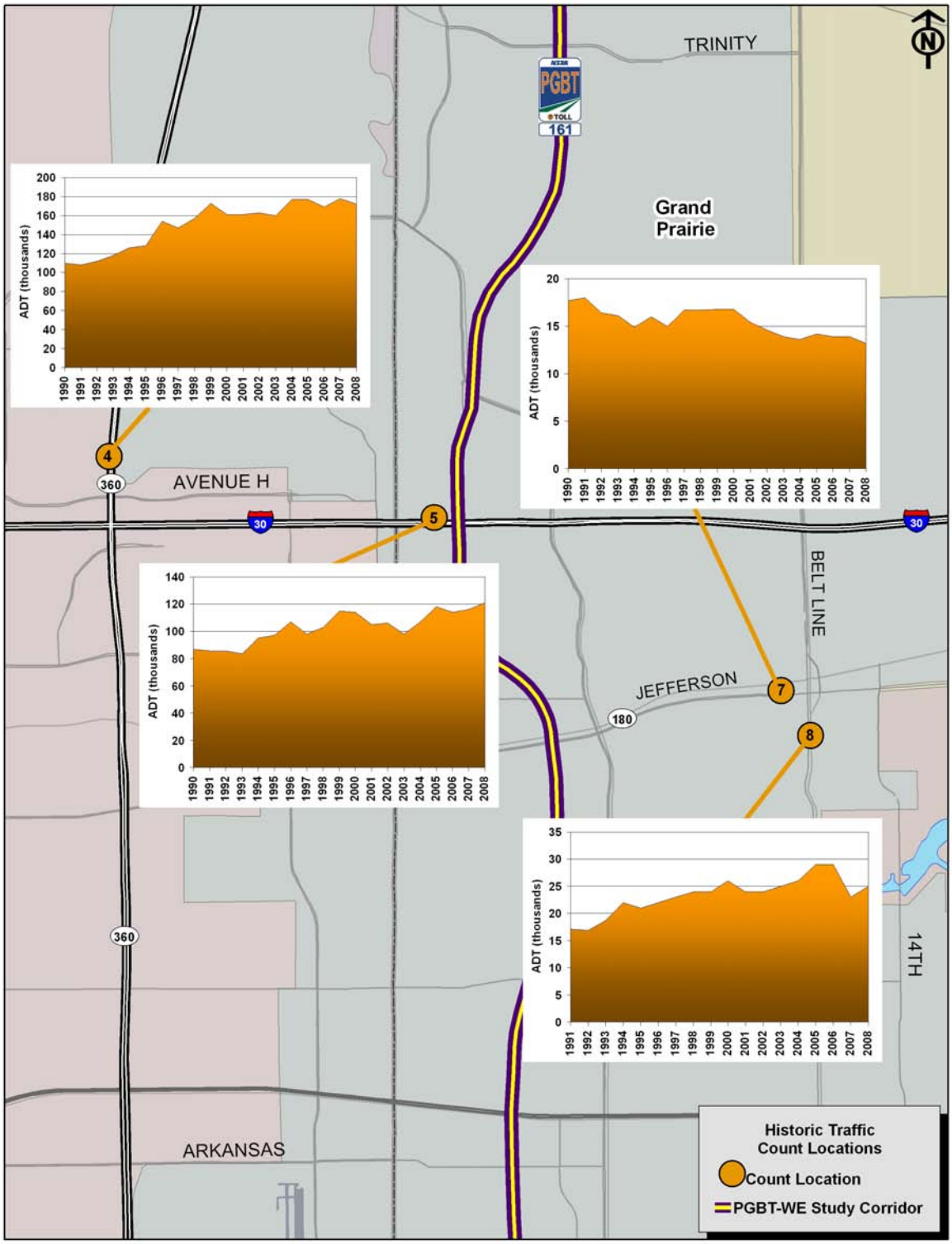


Figure 2-18. PGBT-WE Corridor Historic Traffic Count Profiles

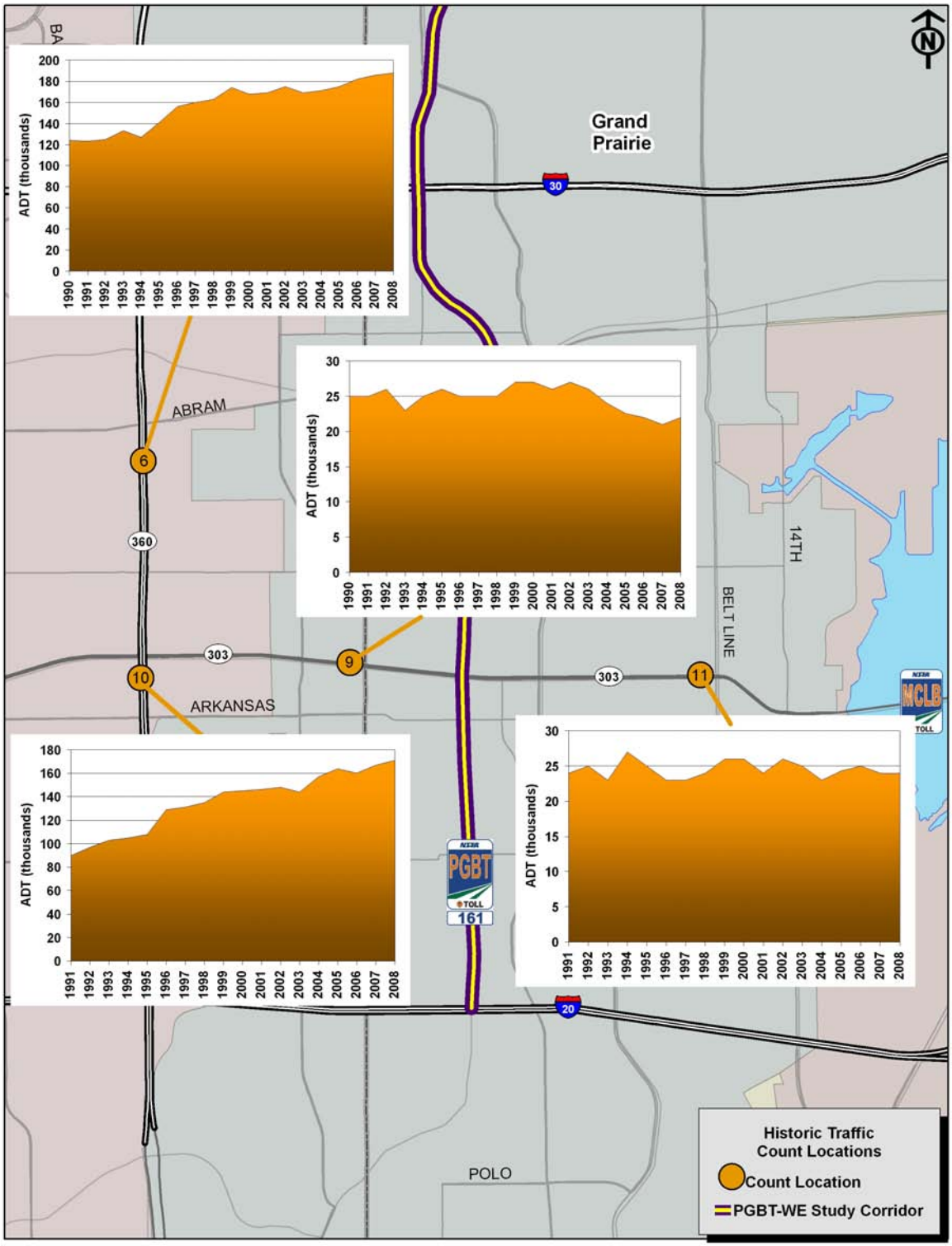


Figure 2-19. PGBT-WE Corridor Historic Traffic Count Profiles

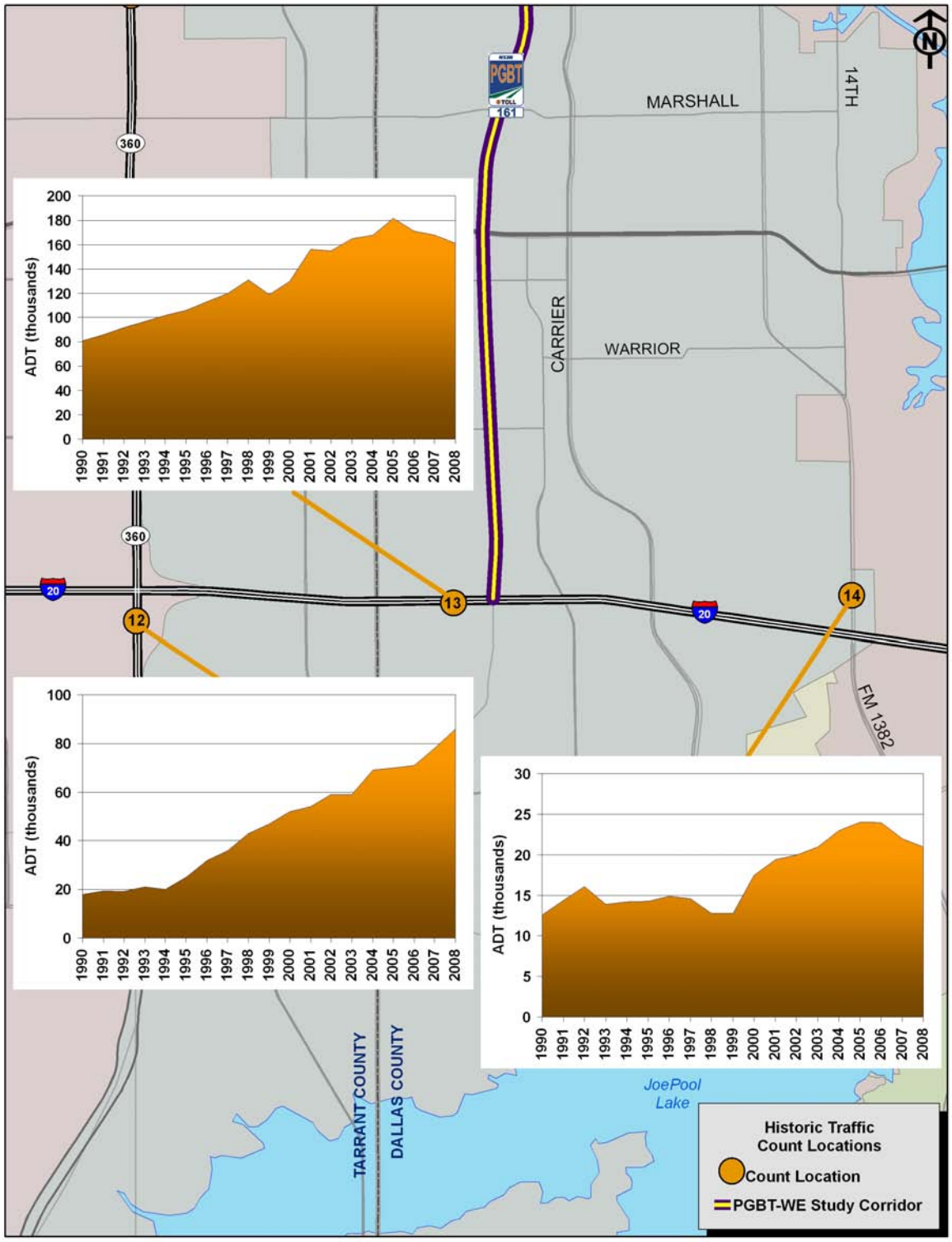


Figure 2-20. PGBT-WE Corridor Historic Traffic Count Profiles

SPEED AND DELAY CHARACTERISTICS

TxDOT's data collection efforts in 2006 also included the collection of speed and delay information. These data were collected by driving on select routes in the PGBT-WE corridor during the morning and evening peak periods. Figure 2-21 illustrates the routes driven for the speed and delay studies. Global Positioning System (GPS) units recorded the vehicle's location and current time every tenth of a mile. These data were then used to generate speed profiles along several routes in the PGBT-WE corridor for both the AM and PM peak periods.

The results of the speed and delay runs for the AM and PM peak periods are shown in Figures 2-22 through 2-25. Figures 2-22 and 2-23 show the speed and delay results for the arterial routes, and Figures 2-24 and 2-25 show the results for the runs on SH 360. During the AM peak period, most of the arterial routes had average speeds around 30 mph, with significant delay at some locations in the northbound direction. SH 360 operated above 50 mph in the southbound direction but showed significant delay in the northbound direction. During the PM peak period, much of the delay was in the southbound direction, particularly on SH 360, New York Avenue, and Macarthur Boulevard. In both peak periods, the greatest delay on SH 360 was seen as traffic approached IH 30. One probable factor contributing to this delay is the lack of a fully directional interchange at SH 360 and IH 30.

SUPPLEMENTAL SPEED AND DELAY DATA

To ensure that the most accurate traffic information is being used for the WSA travel demand model, supplemental speed and delay data was obtained in the PGBT-WE tollway corridor. Data was collected on three of the routes from the TxDOT data collection effort: SH 360, Valley View / Roy Orr / Carrier Parkway, and Belt Line Road, and along the now opened PGBT-WE corridor. The supplemental speed and delay data was collected in February 2010. Each route was traveled between SH 183 and IH 20. Figure 2-26 illustrates the routes driven for the supplemental speed and delay studies.

The results of the supplemental speed and delay runs are shown in Figures 2-27 through 2-30. The observed speed profiles on SH 360, Valley View / Roy Orr / Carrier Parkway, and Belt Line Road were similar to the speeds observed in 2006. In the northbound direction of SH 360 in the AM peak period it appeared that congestion had decreased, likely due to the diversion of some of the traffic to the newly opened PGBT-WE mainlanes north of IH 30. However, the PM peak period congestion on Southbound SH 360 appeared worse, probably due to construction at the SH 180 interchange and the Union Pacific Railroad (UPRR) crossing. In the off peak directions (southbound in the AM and northbound in the PM), traffic continued to travel at free flowing speeds on SH 360. Congestion observed previously on Belt Line Road had been relieved by the opening of the grade separation over Jefferson, the UPRR, and Main Street. The route along the PGBT-WE corridor required a detour at the UPRR in both directions due to the fact that the frontage roads did not cross the railroad. Despite this, the observed speeds in the PM peak period in the southbound direction of the PGBT-WE were higher than the observed speeds on southbound SH 360.

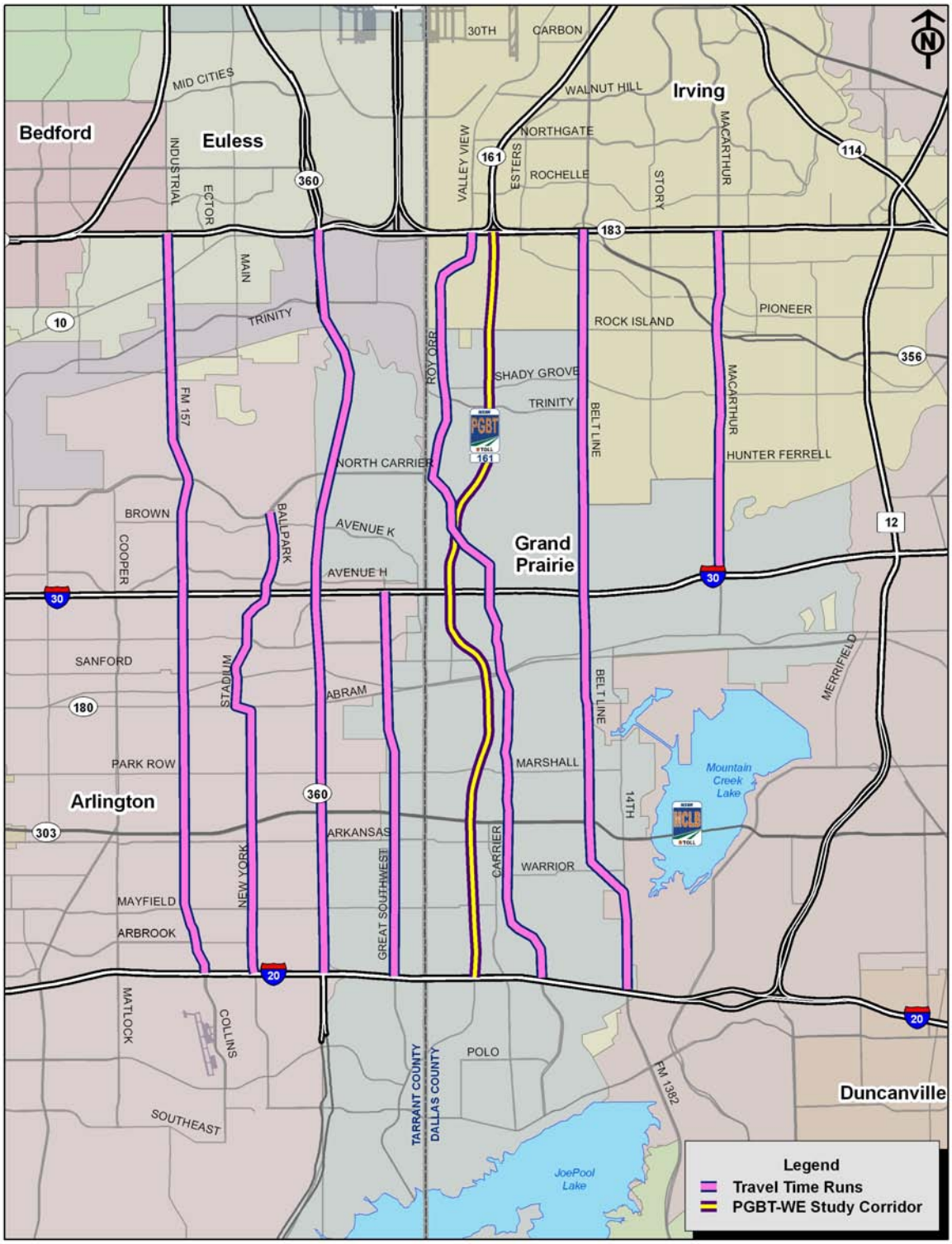


Figure 2-21. PGBT-WE Speed-Delay Run Locations (2006)

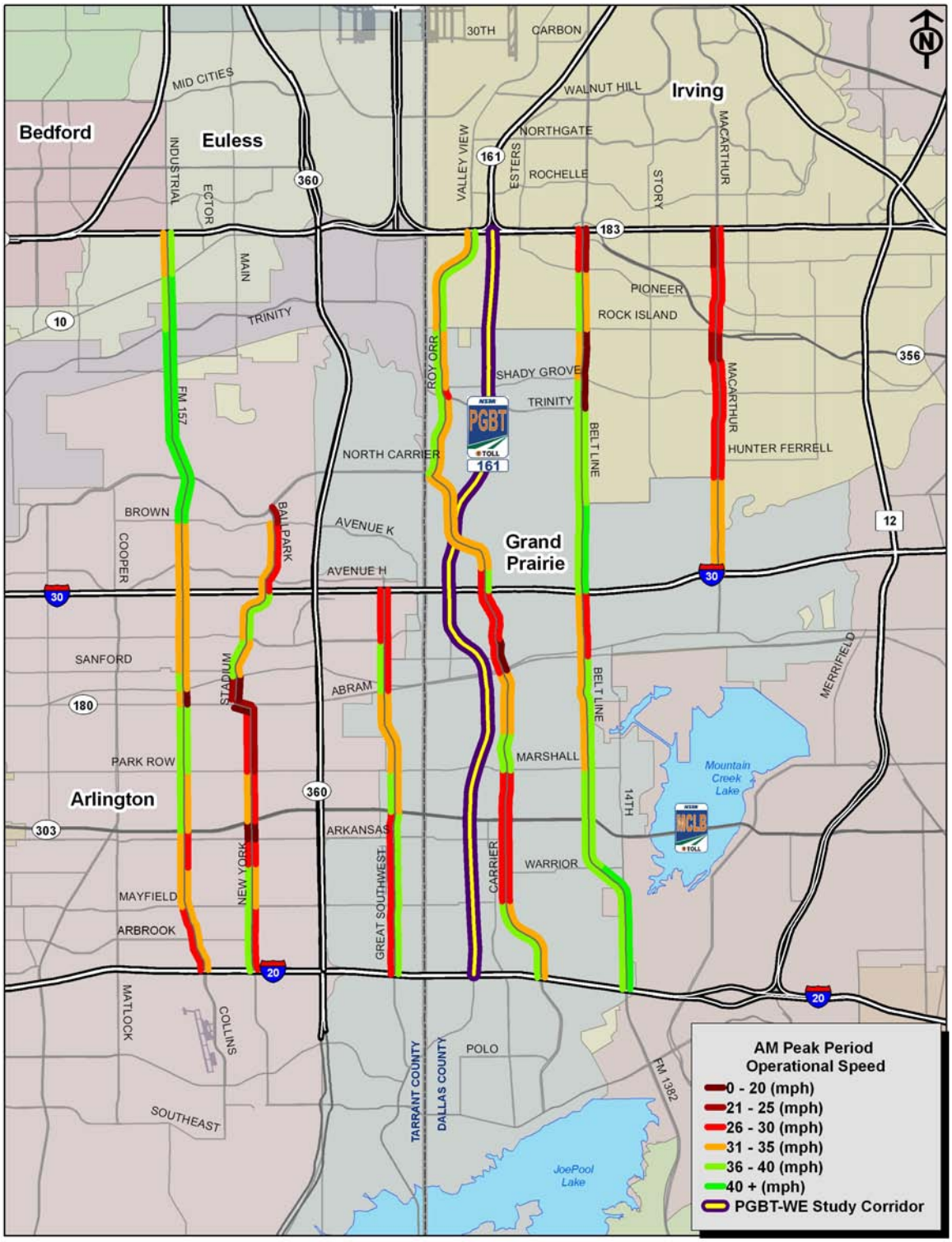


Figure 2-22. 2006 Speed-Delay Results: AM Peak Period (Arterials)

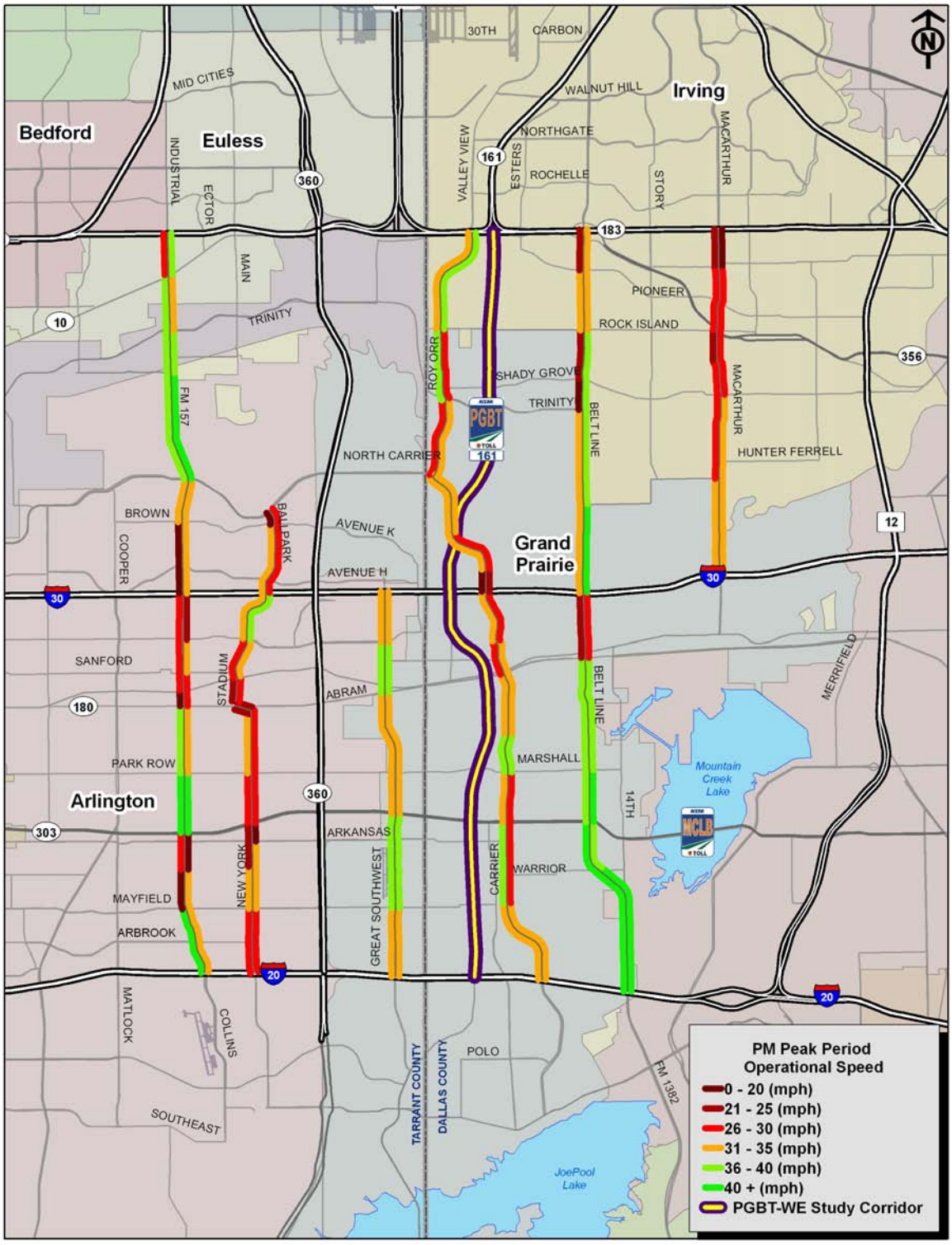


Figure 2-23. 2006 Speed-Delay Results: PM Peak Period (Arterials)

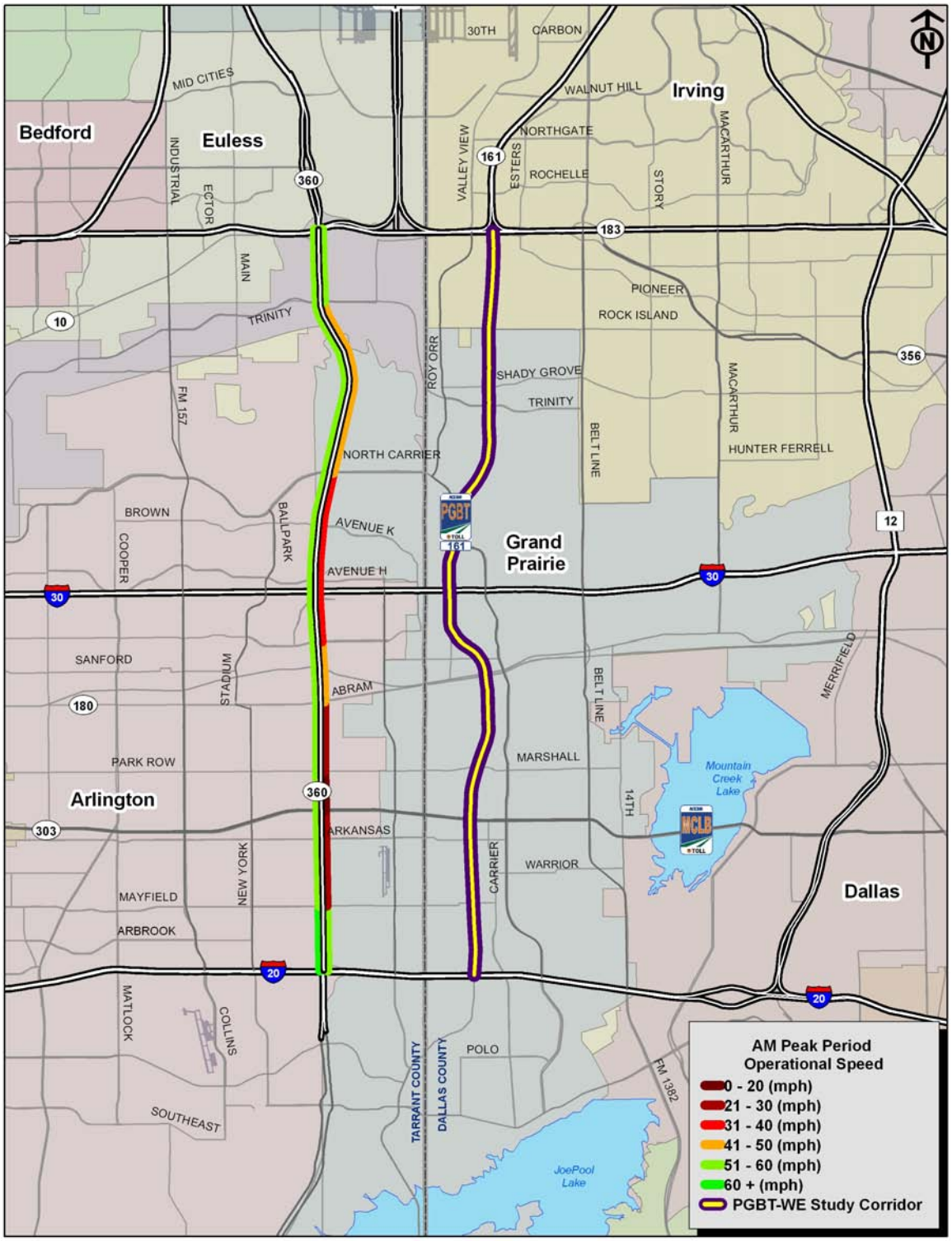


Figure 2-24. 2006 Speed-Delay Results: AM Peak Period (SH 360)

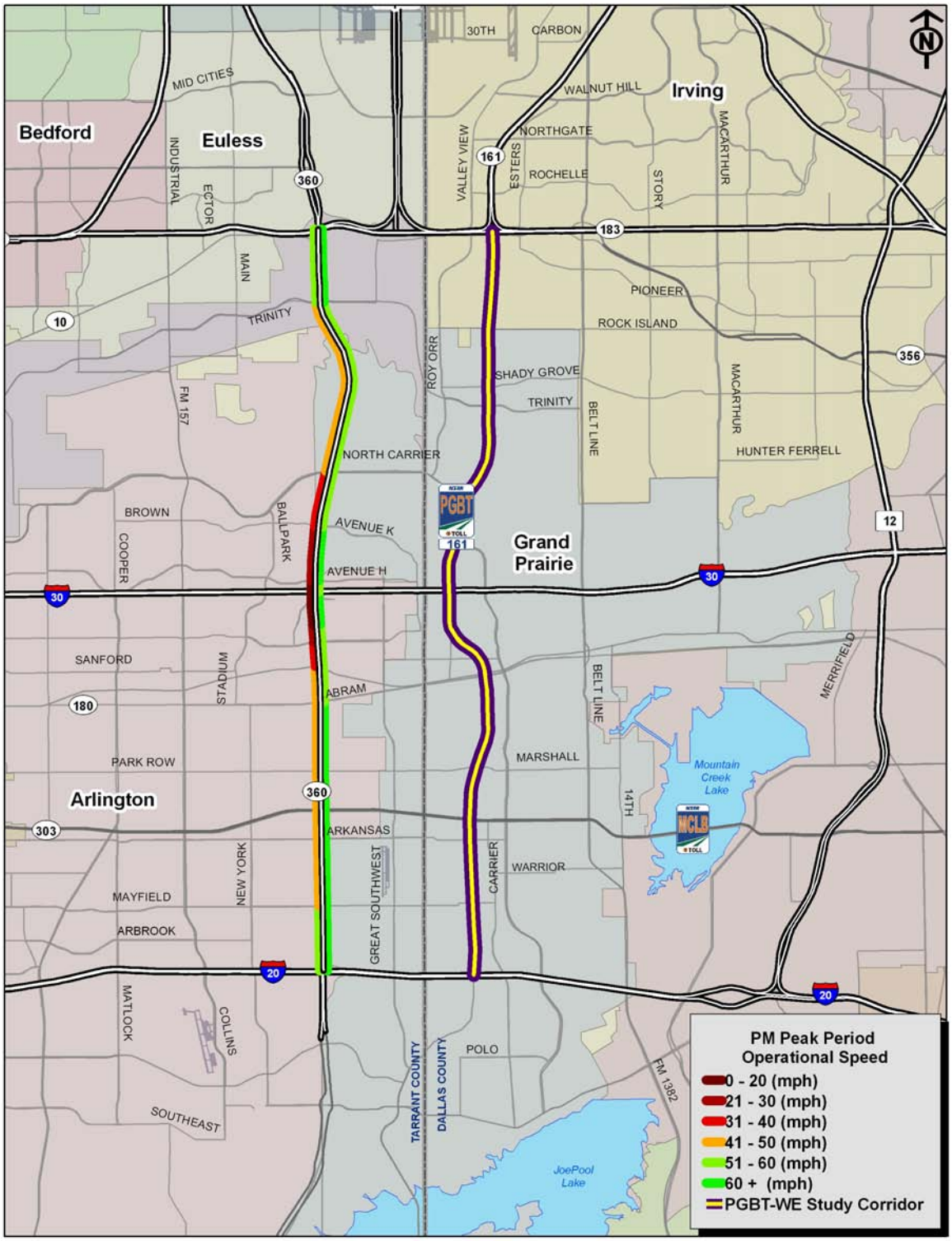


Figure 2-25. 2006 Speed-Delay Results: PM Peak Period (SH 360)

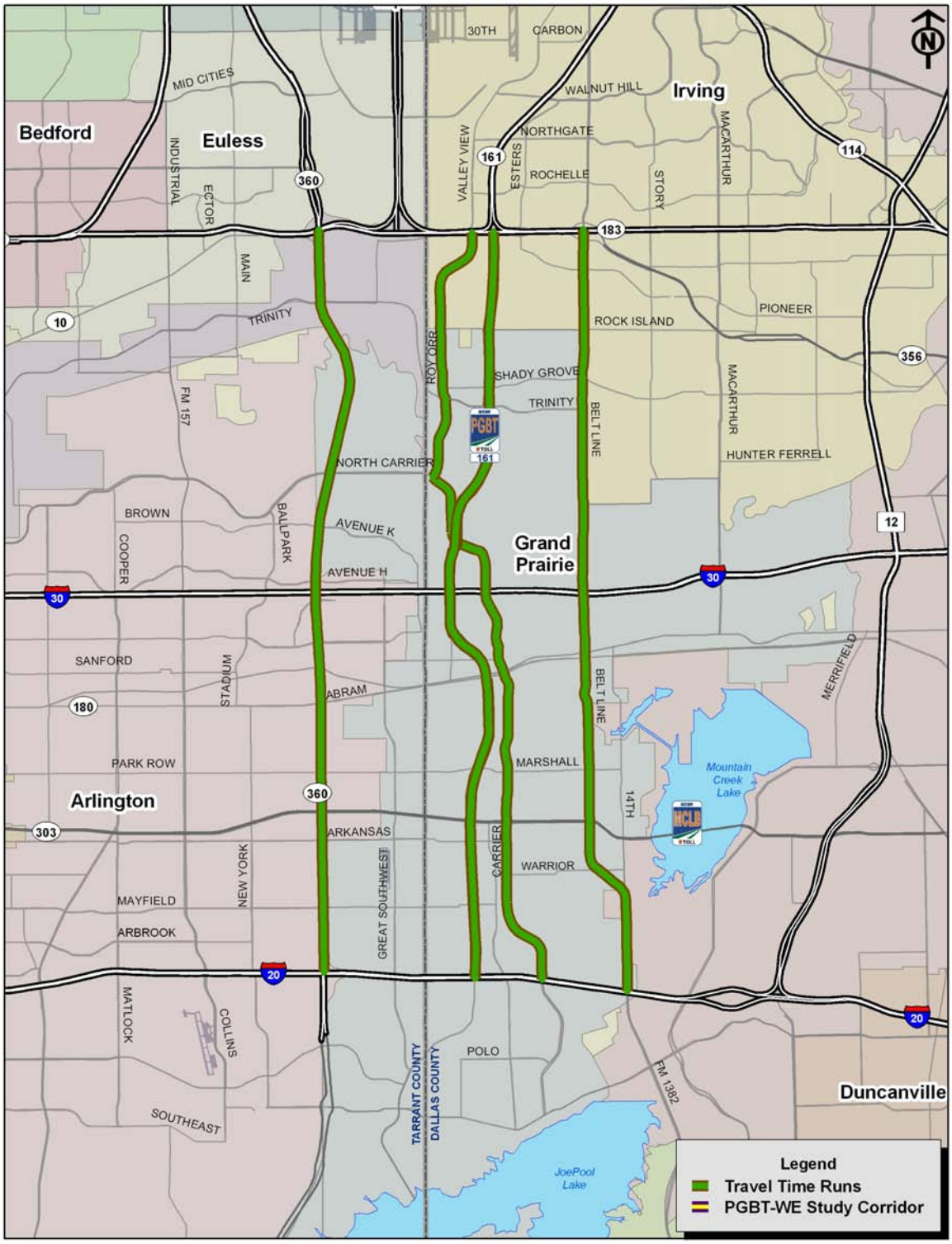


Figure 2-26. PGBT-WE Speed-Delay Run Locations (2010)

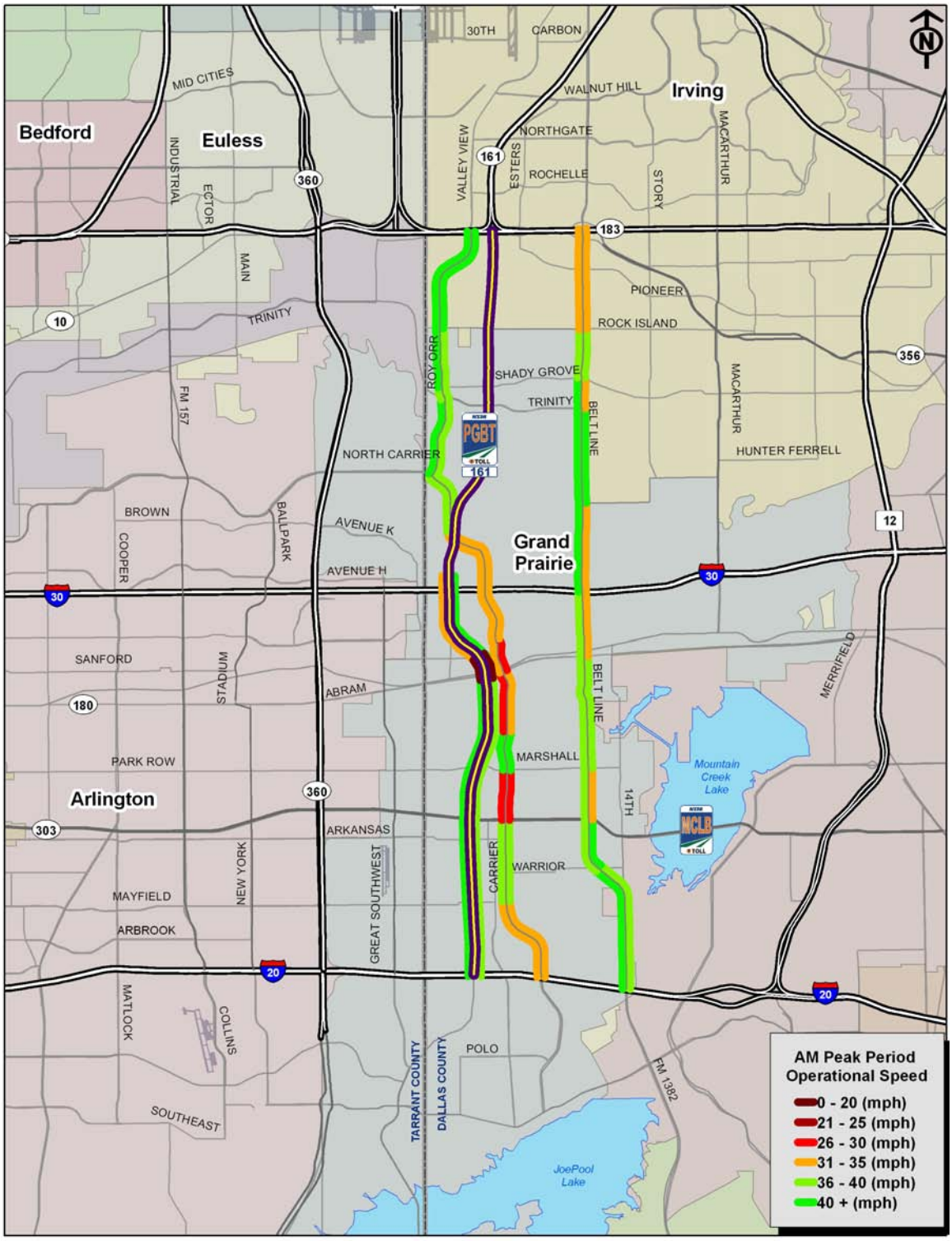


Figure 2-27. 2010 Speed-Delay Results: AM Peak Period (Arterials)

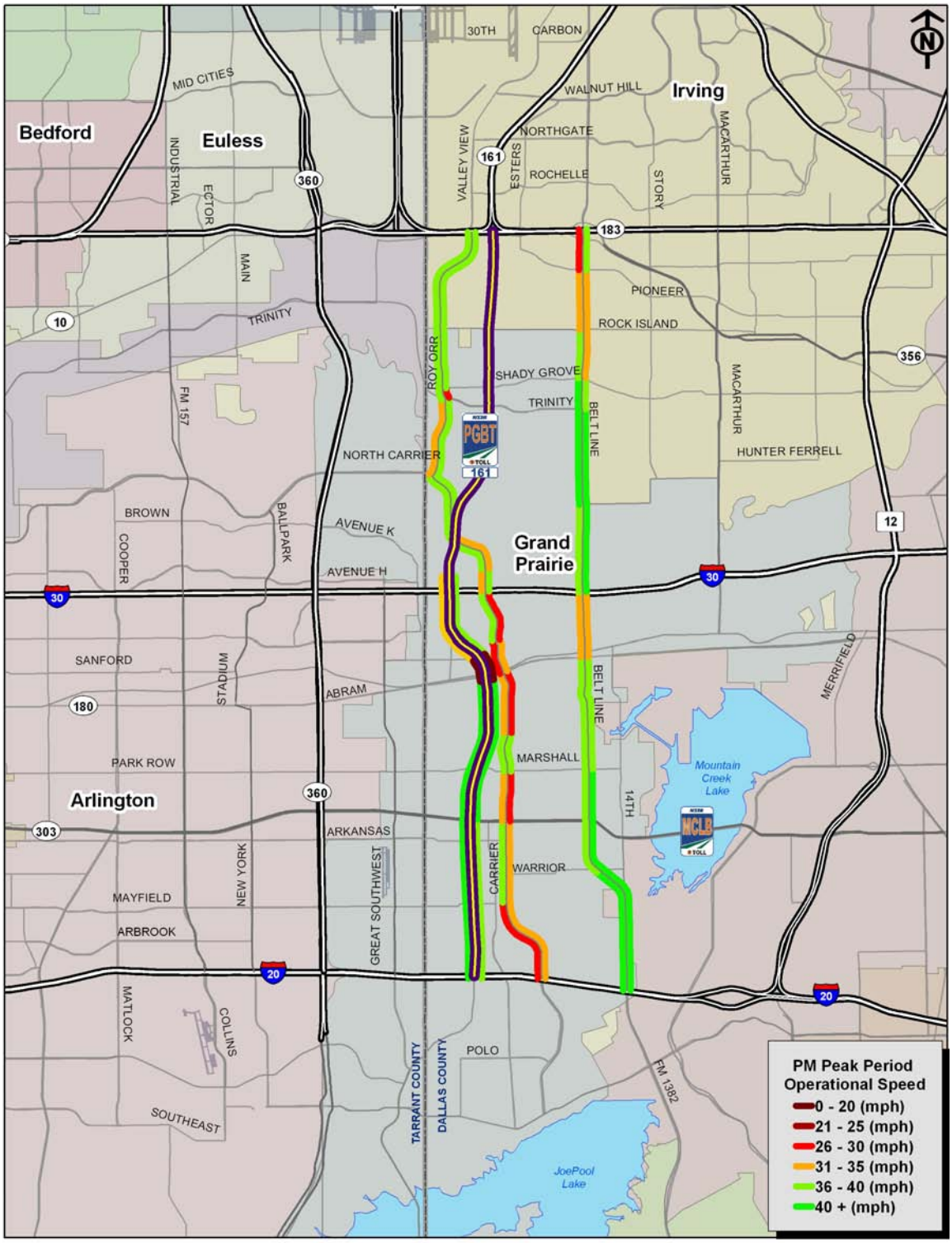


Figure 2-28. 2010 Speed-Delay Results: PM Peak Period (Arterials)

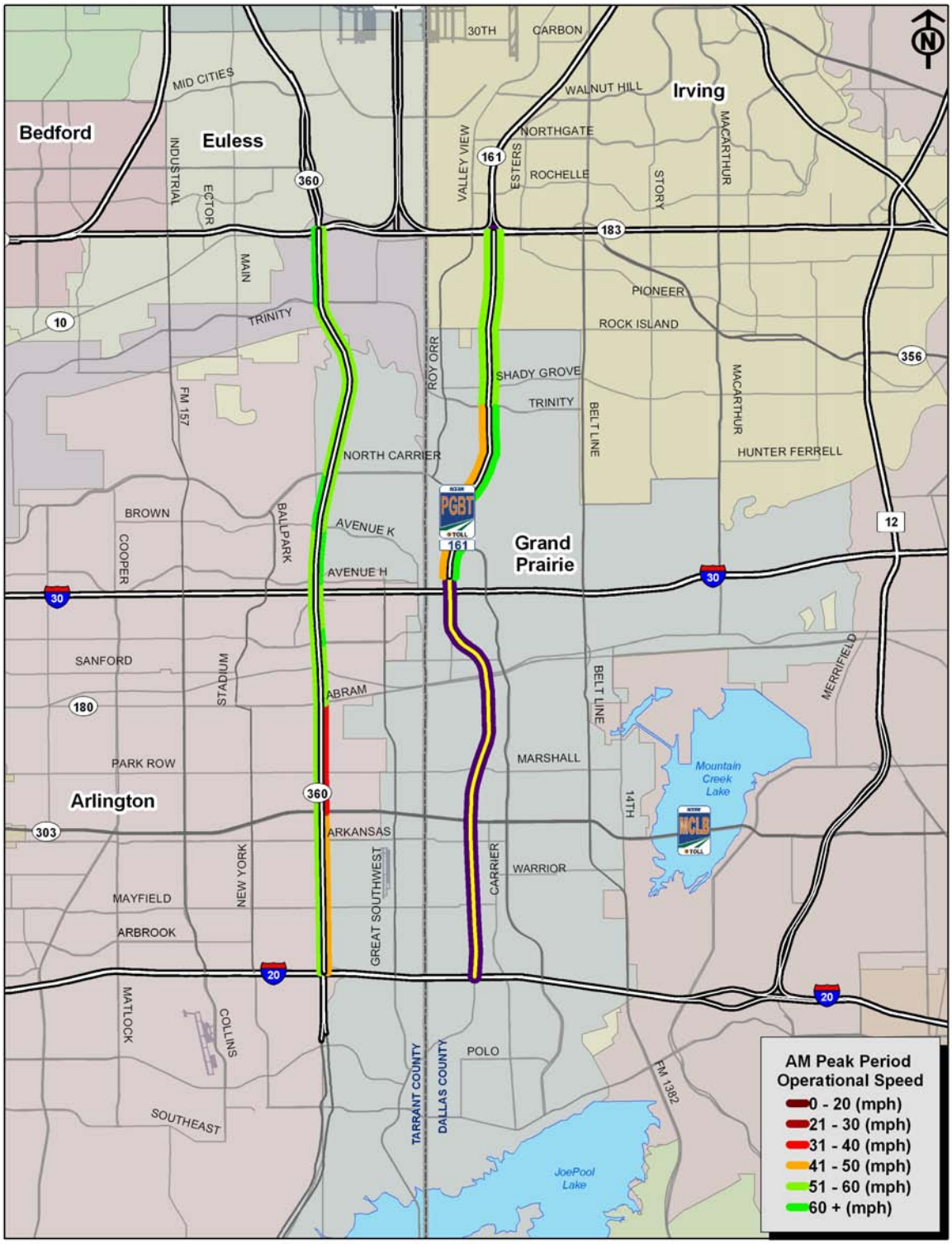


Figure 2-29. 2010 Speed-Delay Results: AM Peak Period
(SH 360 & PGBT-WE Mainlanes)

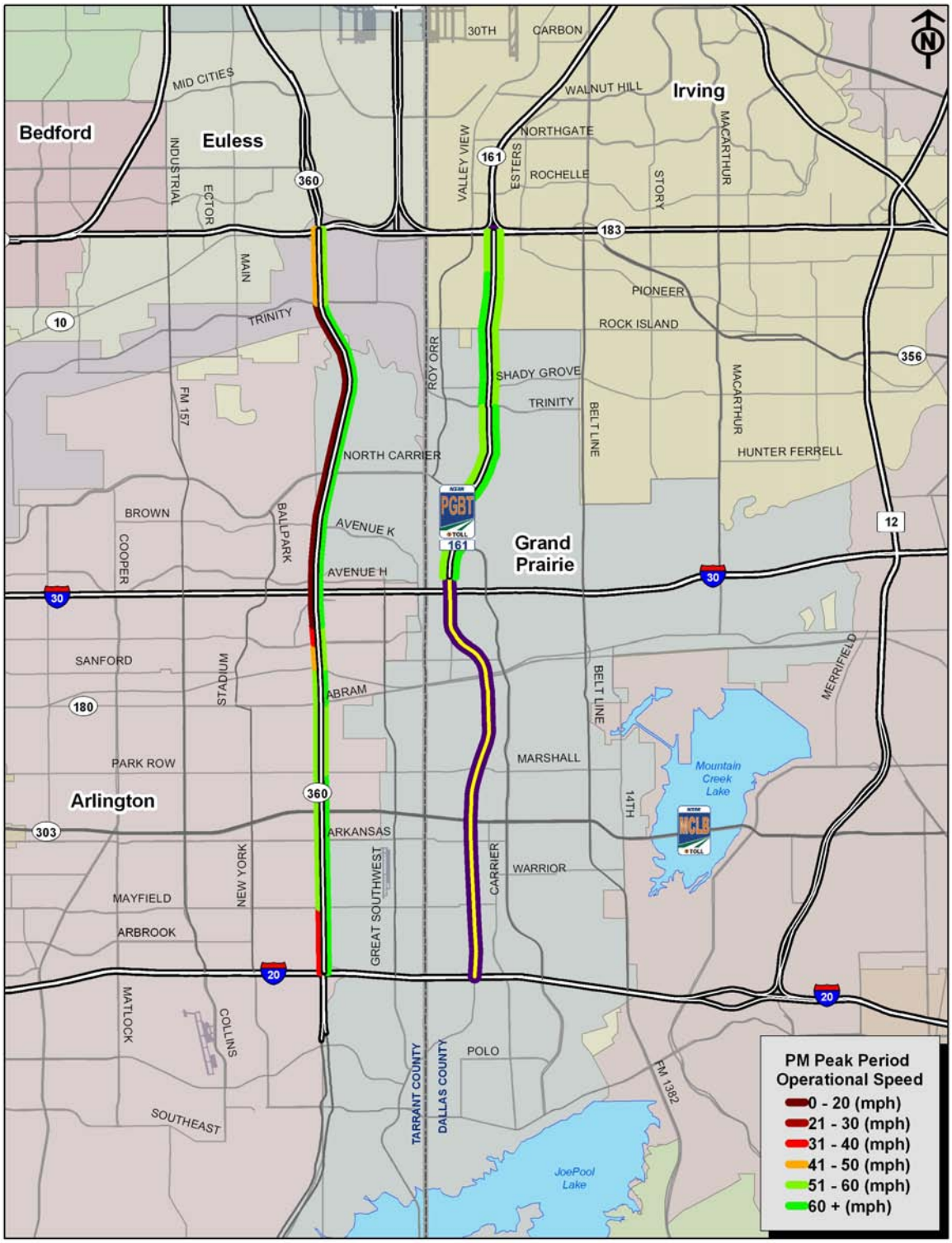


Figure 2-30. 2010 Speed-Delay Results: PM Peak Period (SH 360 & PGBT-WE Mainlanes)

STATED PREFERENCE SURVEY

In order to estimate the average value of time (VOT) in the PGBT-WE corridor, TxDOT contracted Resource Systems Group, Inc. (RSG) to conduct a stated preference survey. In November 2006, RSG conducted field intercept surveys at several public locations in the PGBT-WE corridor. They also conducted an internet-based version of the survey that was offered to drivers who had provided e-mail addresses during the origin-destination survey. The stated preference survey asked drivers to describe a recent trip in the PGBT-WE corridor. The dynamic computer-based survey then gave the respondents several potential travel scenarios and asked them to choose a travel route. In each scenario, the respondent was asked to choose between a tolled route on the PGBT-WE, and an alternate toll-free route. By using the results of the survey, RSG was able to estimate the average VOTs of drivers in the PGBT-WE corridor. These VOTs were used in WSA's travel demand model as described in Chapter 5.

ORIGIN-DESTINATION SURVEY

A detailed motorist travel pattern and trip characteristic survey is essential in the development and calibration of the model databases that assist the calculation of traffic and toll revenue. As part of the data collection effort for TxDOT, WSA conducted an origin-destination (O-D) survey in the PGBT-WE corridor in November 2006. The O-D data was collected using two survey distribution methods: a mailout survey using video-captured license plate numbers and an intercept survey handed out to travelers at signalized intersections. The locations used in the survey are shown in Figure 2-31.

Mailout Survey

At three locations on SH 360, video cameras were used to capture license plate numbers of passing cars. Surveys were then mailed to the registration addresses for each captured number. Each survey questionnaire asked respondents to report the origin and destination of a recent trip on SH 360 along with several trip characteristics. In total, 63,214 surveys were mailed out, and 6,012 were returned, representing a response rate of 9.5 percent. The results of this survey made up the majority of the O-D data.

Intercept Survey

To supplement the mailout survey conducted for SH 360, TxDOT also performed intercept surveys along several arterials in the PGBT-WE corridor. At signalized intersections, drivers who were stopped while the signal was red were handed postage-paid surveys. The questionnaires used in the intercept survey were virtually identical to those used in the mailout survey. In total, 12,878 surveys were handed out, and 1,766 were returned, representing a response rate of 13.7 percent.

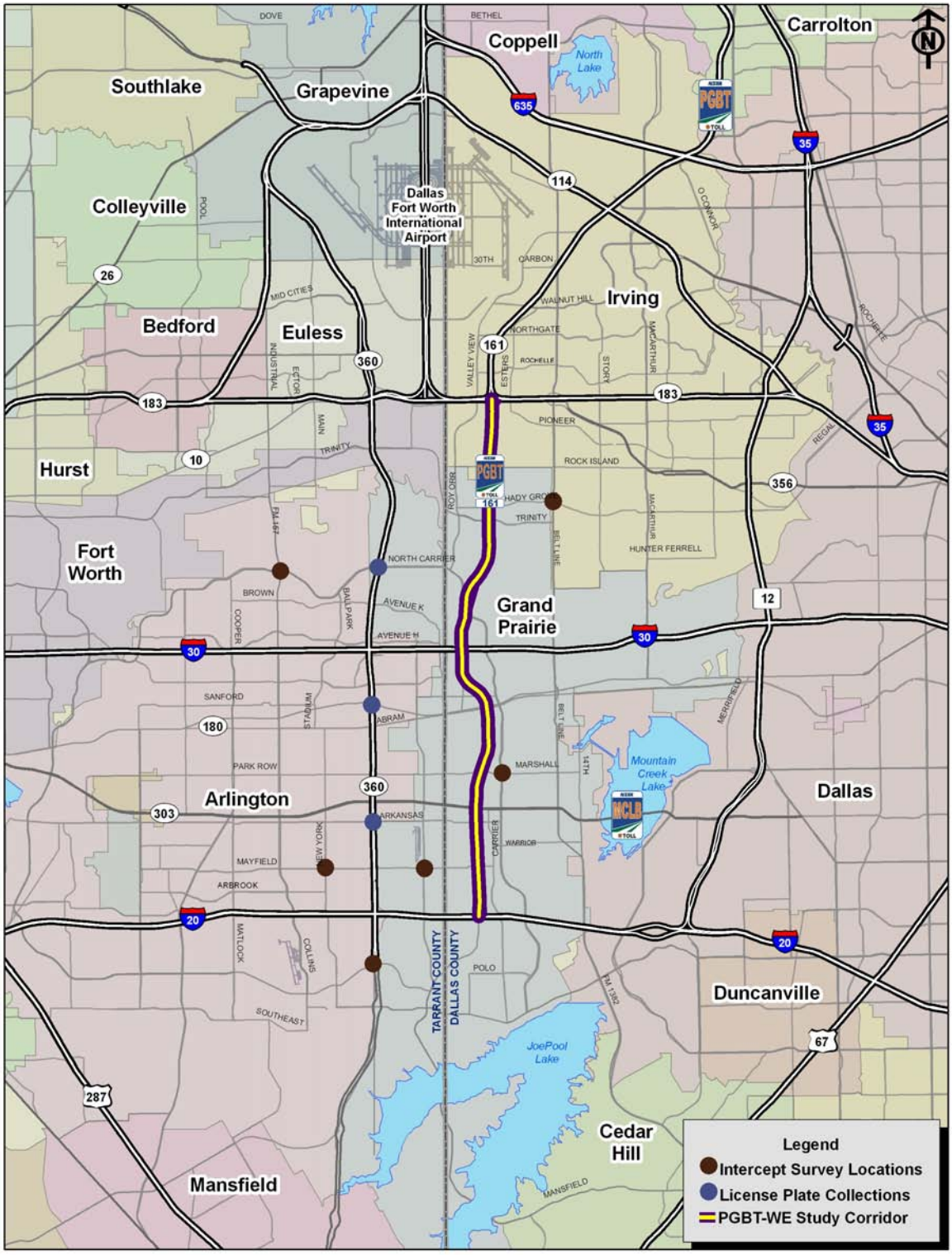


Figure 2-31. Origin-Destination Survey Locations

Summary of Results

A significant number of statistical facts concerning the customer base of motorists in the PGBT-WE corridor were obtained as a direct result of the survey effort. In addition to questions about trip origins and destinations, the surveys also included questions regarding several other trip characteristics such as trip purpose, trip frequency, vehicle occupancy, and TollTag participation.

Figure 2-32 shows the trip purpose distribution of the O-D respondents. As shown in the figure, 74.9 percent of survey respondents reported that they were on a trip to or from work or on company business. Figure 2-33 shows the weekly trip frequency for the trips reported in the O-D survey. Over half of the respondents indicated that they made their reported trip at least five times per week. The vehicle occupancy distribution of survey respondents is shown in Figure 2-34. Almost 80 percent of respondents reported occupancies of one, and the average occupancy reported was around 1.3. Figure 2-35 shows the responses to the survey question about TollTag enrollment. As shown, 28.8 percent of respondents reported having a TollTag, while 71.2 percent did not. However, it is important to note that at the time of the survey, respondents in this corridor would probably not use an NTTA facility on their daily trips. In October 2010, TollTag usage on the PGBT-WE mainlanes had reached approximately 68 percent after about fifteen months of operation.

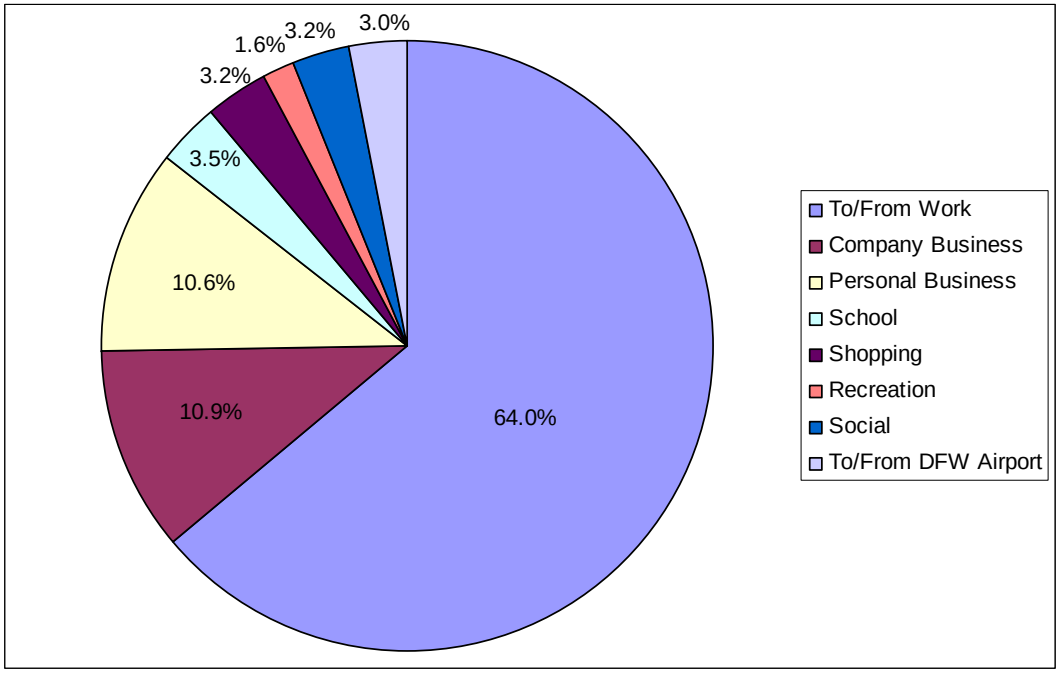


Figure 2-32. Trip Purpose Distribution
(TxDOT Data Collection, November 2006)

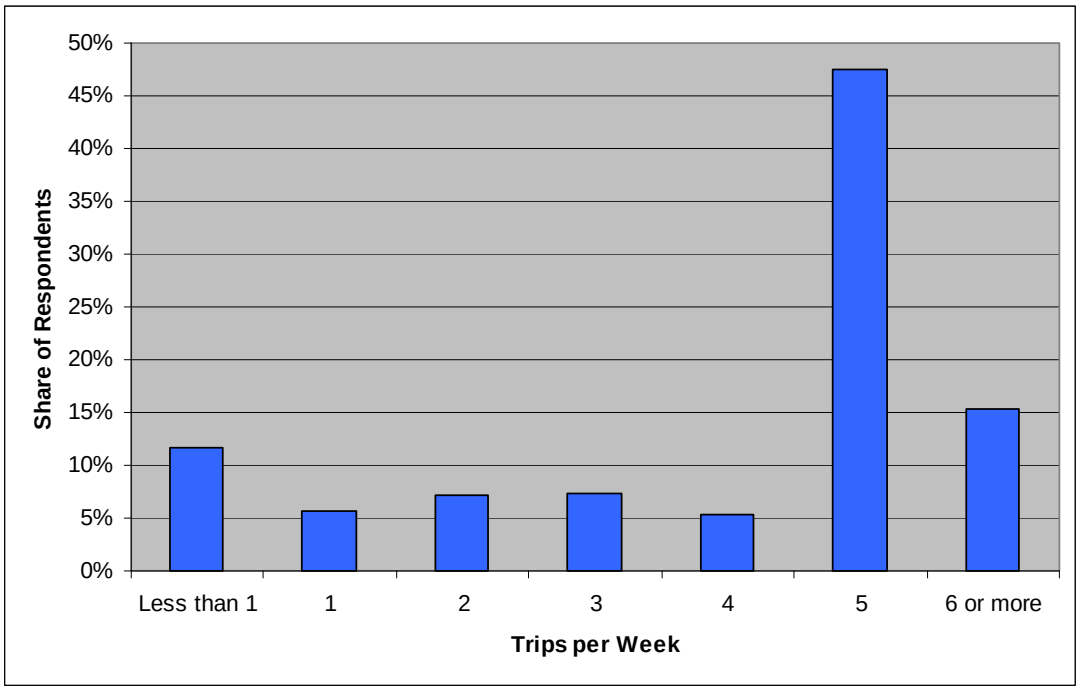


Figure 2-33. Trip Frequency Distribution
(TxDOT Data Collection, November 2006)

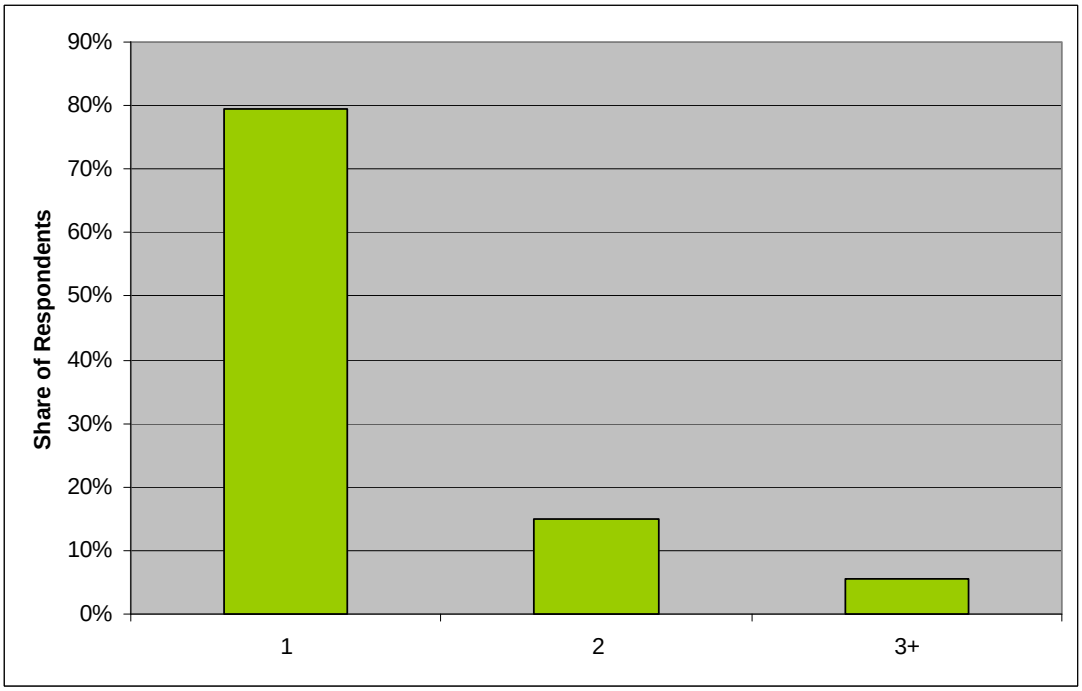


Figure 2-34. Vehicle Occupancy Distribution
(TxDOT Data Collection, November 2006)

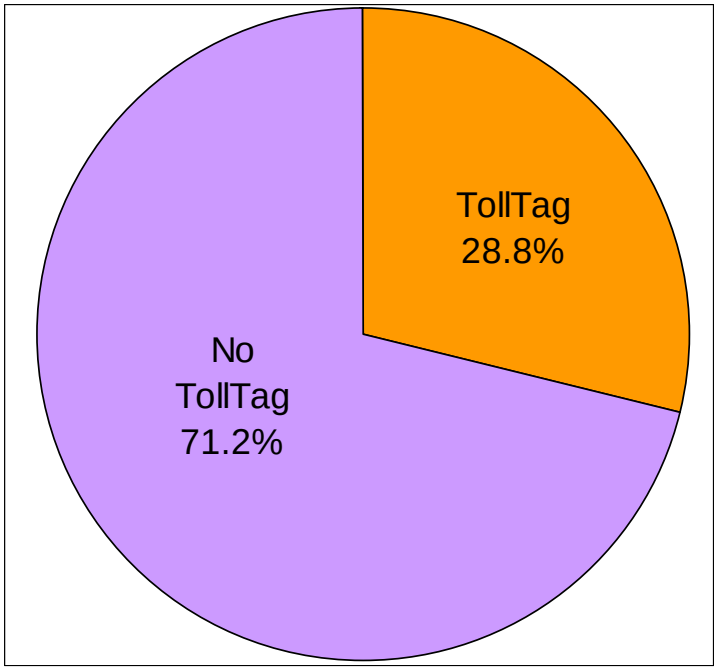


Figure 2-35. TollTag Participation
(TxDOT Data Collection, November 2006)

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CHAPTER 3

DALLAS - FORT WORTH AREA TRANSPORTATION CHARACTERISTICS

The purpose of this chapter is to provide a background of the existing and future transportation characteristics surrounding the PGBT-WE corridor in the Dallas-Fort Worth Metropolitan Area (DFWMA). The information described in this section draws from the Metropolitan Transportation Plan (MTP) Mobility 2030 – 2009 Update developed by the North Central Texas Council of Governments (NCTCOG), the metropolitan planning organization (MPO) for the DFWMA. As the MPO, NCTCOG is primarily responsible for conducting the multimodal long-range regional planning process for transportation infrastructure in the region.

The MTP for the DFWMA serves as a guideline for the region's planned investment in transportation infrastructure and services over the next twenty years. The MTP developed by NCTCOG is required to be financially constrained and balanced to the region's anticipated revenue streams over a minimum time horizon of twenty years. The MTP 2030 – 2009 Update was approved by Regional Transportation Council (RTC, the MPO policy body for DFWMA) in April 2009. The financial plan illustrates that the region could anticipate investing $71 billion for the transportation infrastructure improvements including freeway, tollway, transit, bicycle and pedestrian facilities, congestion mitigation strategies, HOV lanes, and many others. An updated MTP is currently under development and is expected to be approved in early 2011.

As the fourth largest metropolitan area in the country, the DFWMA had a population of five million in 2000 and is expected to have an estimated population of nine million by 2030. On average, the DFWMA population increases by one million every seven to eight years. Total employment is also expected to increase from 3.1 million in 2000 to 5.4 million by 2030. Chapter 4 provides detailed information regarding the demographic growth characteristics of the region.

TRAFFIC CONGESTION TRENDS

Figure 3-1 provides an illustration of the areas that experienced congested traffic conditions during the peak periods in 2007 according to the MTP report. Figure 3-1 also provides an estimate of the 2030 congestion levels with currently planned transportation infrastructure. Figure 3-1 illustrates that the PGBT-WE corridor area will be subject to light to moderate congestion through 2030.

The MTP 2030 – 2009 Update estimated that the region-wide annual cost of congestion during 2007 was close to $4.2 billion and would possibly reach $6.5 billion by 2030. This increase of 55 percent from the 2007 levels is in spite of approximately $71 billion in infrastructure investment through the year 2030, including $29.7 billion for additional highway capacity.

FREEWAY AND TOLLWAY SYSTEM

Figure 3-2 provides an illustration of the freeway and tollway corridor improvements that were adopted as part of the MTP 2030 – 2009 Update. The identification of these facilities is very important to this study because additional freeway and arterial improvements could materially impact the traffic and toll revenue on the PGBT-WE. Facilities providing improved accessibility to the corridor could provide positive impacts to the PGBT-WE while competing/alternative routes could dampen its traffic and revenue potential. Improvements to the existing highway system and the addition of new roadways that could potentially have an effect on the traffic and revenue for the PGBT-WE are shown in Figure 3-2. Among them are the following:

- SH 183 improvements, from IH 820 to Loop 12
- IH 30 improvements, from IH 820 to IH 35E
- SH 360 improvements, from IH 20 to IH 30
- IH 20 improvements, from SH 360 to IH 635
- SH 114 improvements, from IH 35E to Business 114
- Loop 12 improvements, from SH 183 to Spur 408, and
- PGBT/SH 161 improvements, from SH 183 to SH 78.

Additional toll roads programmed for the region during the next 20 years are marked in green in Figure 3-2. Among them are the following:

- PGBT Eastern Extension, from SH 78 to IH 30 (currently under construction)
- Trinity Parkway, from IH 35E to US 175
- Sam Rayburn Tollway, from Denton Creek to US 75 (partially open and under construction)
- Loop 9, in Collin, Rockwall, Kaufman, Dallas, Ellis, Johnson, Parker, Wise, and Denton Counties
- SH 360, from Green Oaks to south of US 67
- SH 170, from Loop 9 to SH 114, and
- Southwest Parkway/Chisholm Trail Parkway, from IH 30 to US 67.

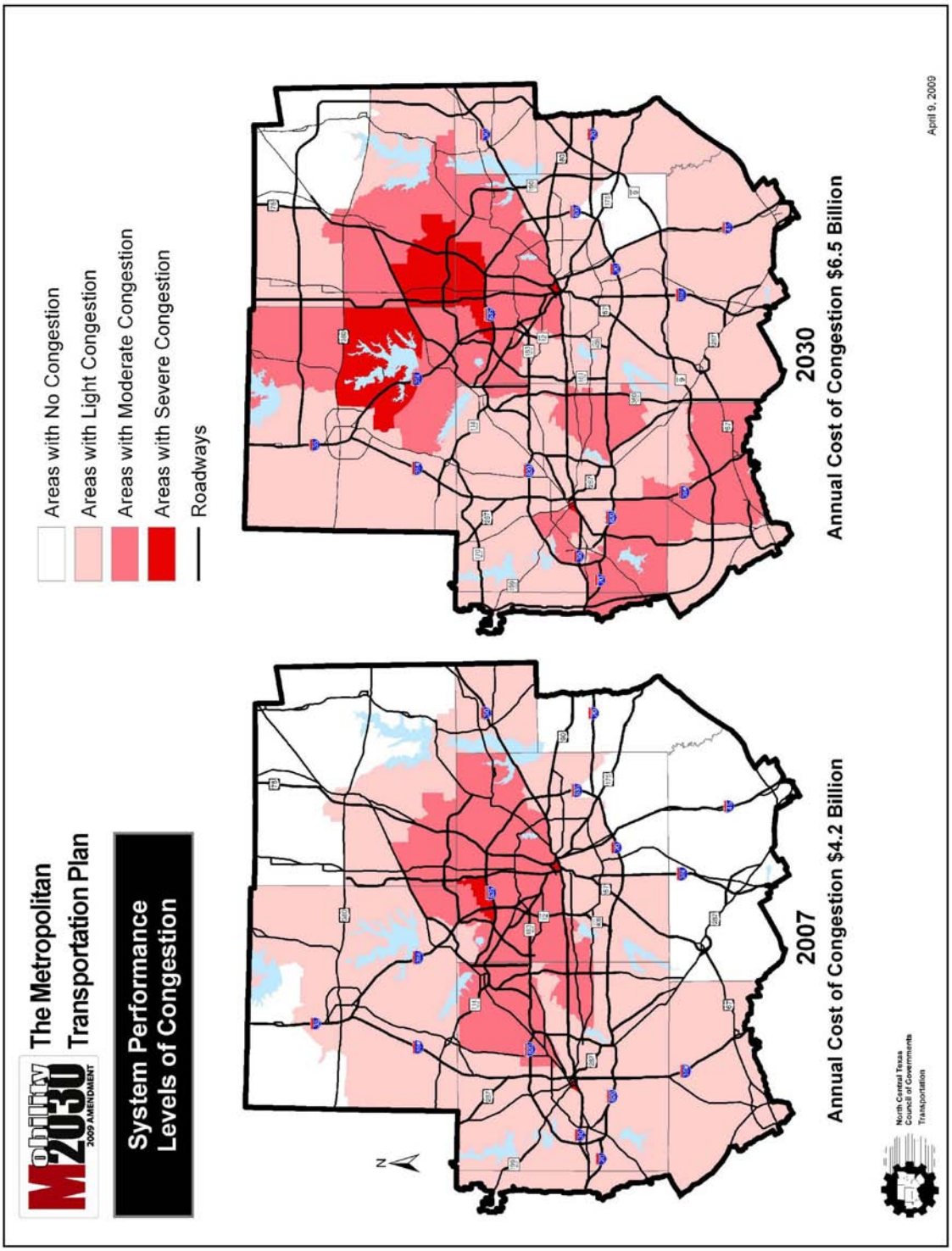

Figure 3-1. 2007 and 2030 Congestion Levels
Source: North Central Texas Council of Governments

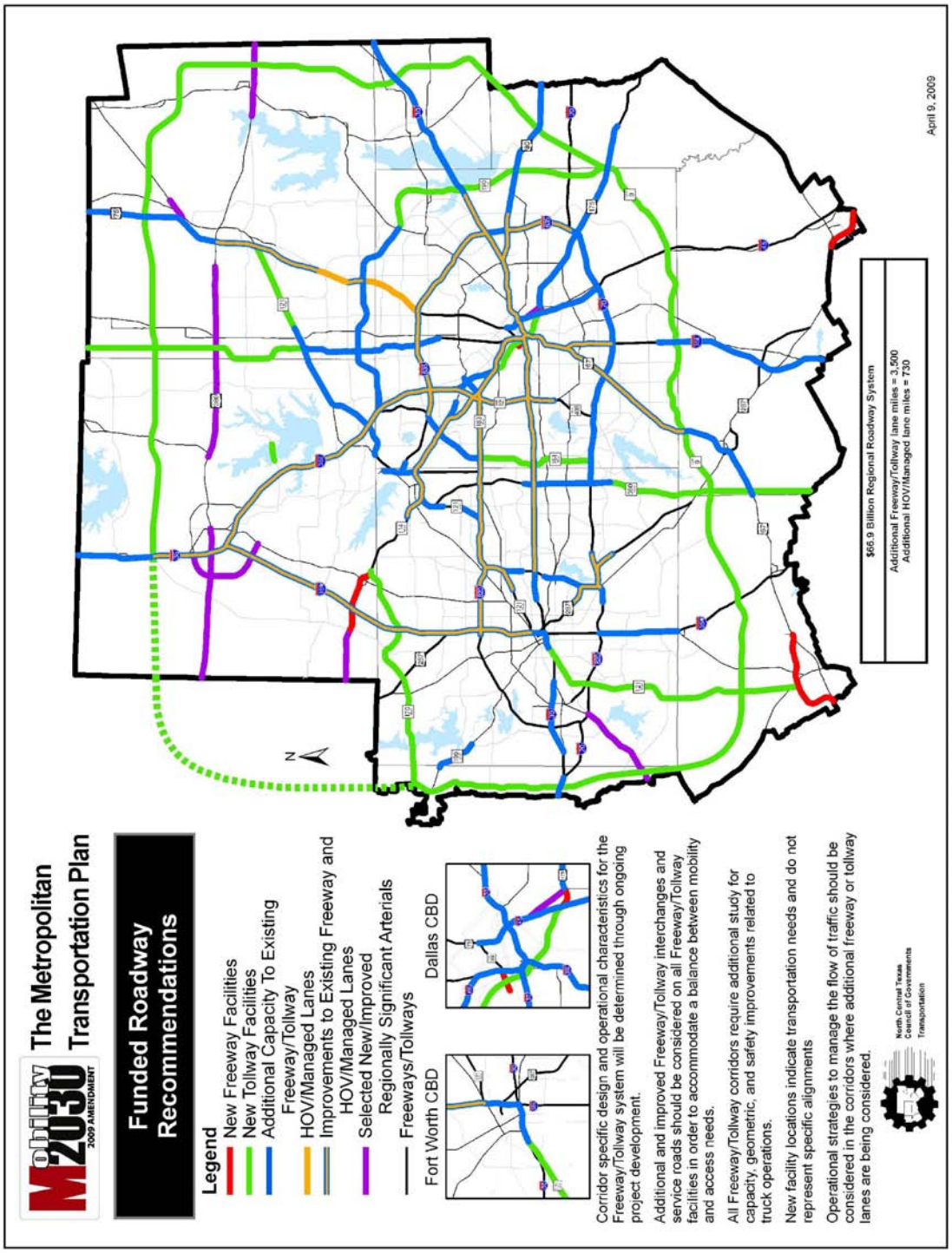

Figure 3-2. 2030 Freeway and Tollway System
Source: North Central Texas Council of Governments

Future roadway improvements in the PGBT-WE corridor are highlighted in Figure 3-3. These improvements consist of several of the previously mentioned highway improvements plus some arterial improvements on Cooper Street, Collins Street, Belt Line Road, Trinity Boulevard, and MacArthur Boulevard. Another significant improvement in the area is a fully directional interchange at SH 360 and IH 30 which is scheduled to open in 2025.

RAIL TRANSIT SYSTEM

Transit service in the DFWMA is provided primarily by the Dallas Area Rapid Transit (DART), the Fort Worth Transportation Authority (The T) and the Denton County Transportation Authority (DCTA). The existing DART light-rail system consists of three lines operational and one line under construction. The Red Line begins in South Dallas in Westmoreland Avenue and ends at the Parker Road station in Plano; the Blue Line extends from Ledbetter Drive in South Dallas to Downtown Garland; the Green Line opened in December 2010 and runs from Frankford Road in Carrollton southeast through downtown Dallas to Buckner Boulevard in Dallas. The Trinity Railway Express (TRE), which is jointly owned by DART and The T, connects the Dallas and Fort Worth central business districts. The planned Orange Line will run parallel with the Green Line through Downtown Dallas to Bachman Station in Northwest Dallas. From Bachman Station, the Orange Line will run northwest to the Las Colinas Urban Center in 2011 and Dallas/Fort Worth International Airport in 2013. A map of the current DART rail system is shown in Figure 3-4.

The Fort Worth Transportation Authority, popularly known as The T, is the operator of the bus system in the city of Fort Worth. The T also partners with DART through the Trinity Railway Express (TRE), which offers commuter rail service from downtown Fort Worth to DFW Airport and downtown Dallas.

The Denton County Transportation Authority (DCTA) is the transit authority that operates in Denton County, which is located northwest of Dallas County. Along with operating bus service in three cities within Denton County, the agency is also developing the A-Train commuter rail, a regional rail line which will parallel IH 35E and connect with DART's light rail system at Trinity Mills Station in Carrollton.

Figure 3-5 illustrates the proposed rail system as developed by NCTCOG in cooperation with the transit agencies. The transportation system defined in the MTP 2030 – 2009 Update and described above is reflected in the trip tables used to estimate the traffic and toll revenue for the PGBT-WE project. The trip tables and networks were obtained from NCTCOG to reflect all the planned transportation infrastructure development included in the MTP 2030 – 2009 Update.

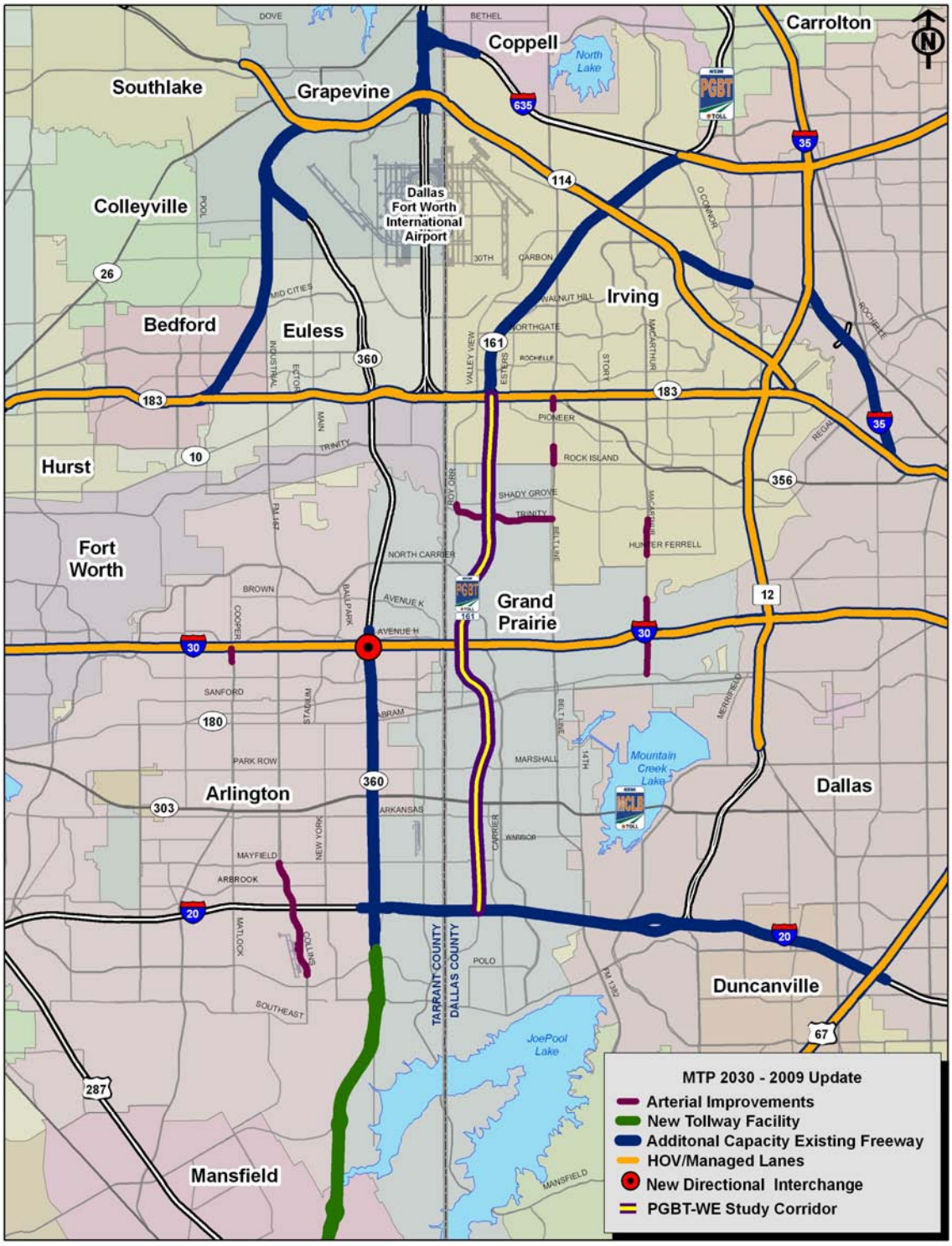

Figure 3-3. Future Roadway Improvements in the PGBT-WE Corridor

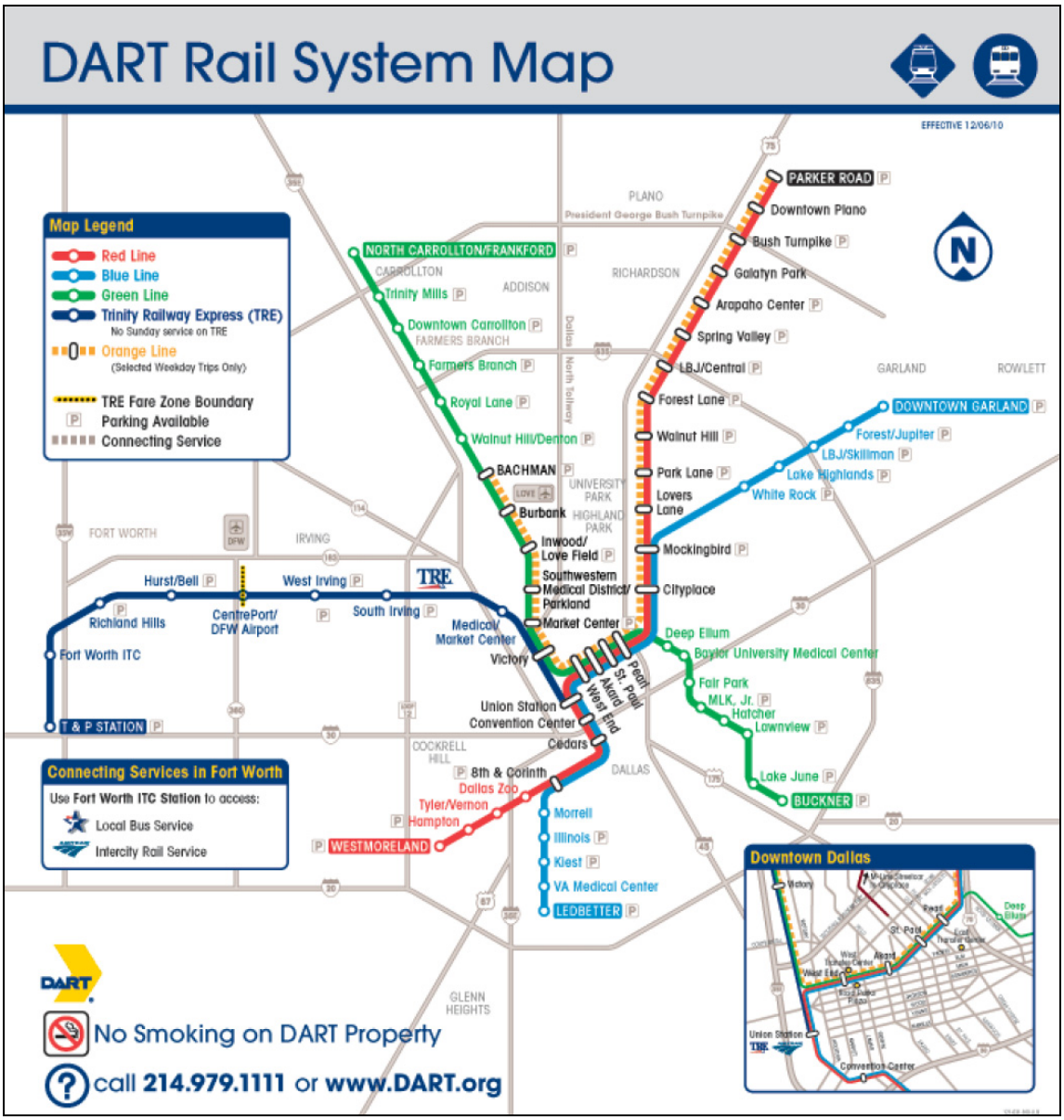

Figure 3-4. Current DART Rail System
Source: Dallas Area Rapid Transit (http://www.dart.org)

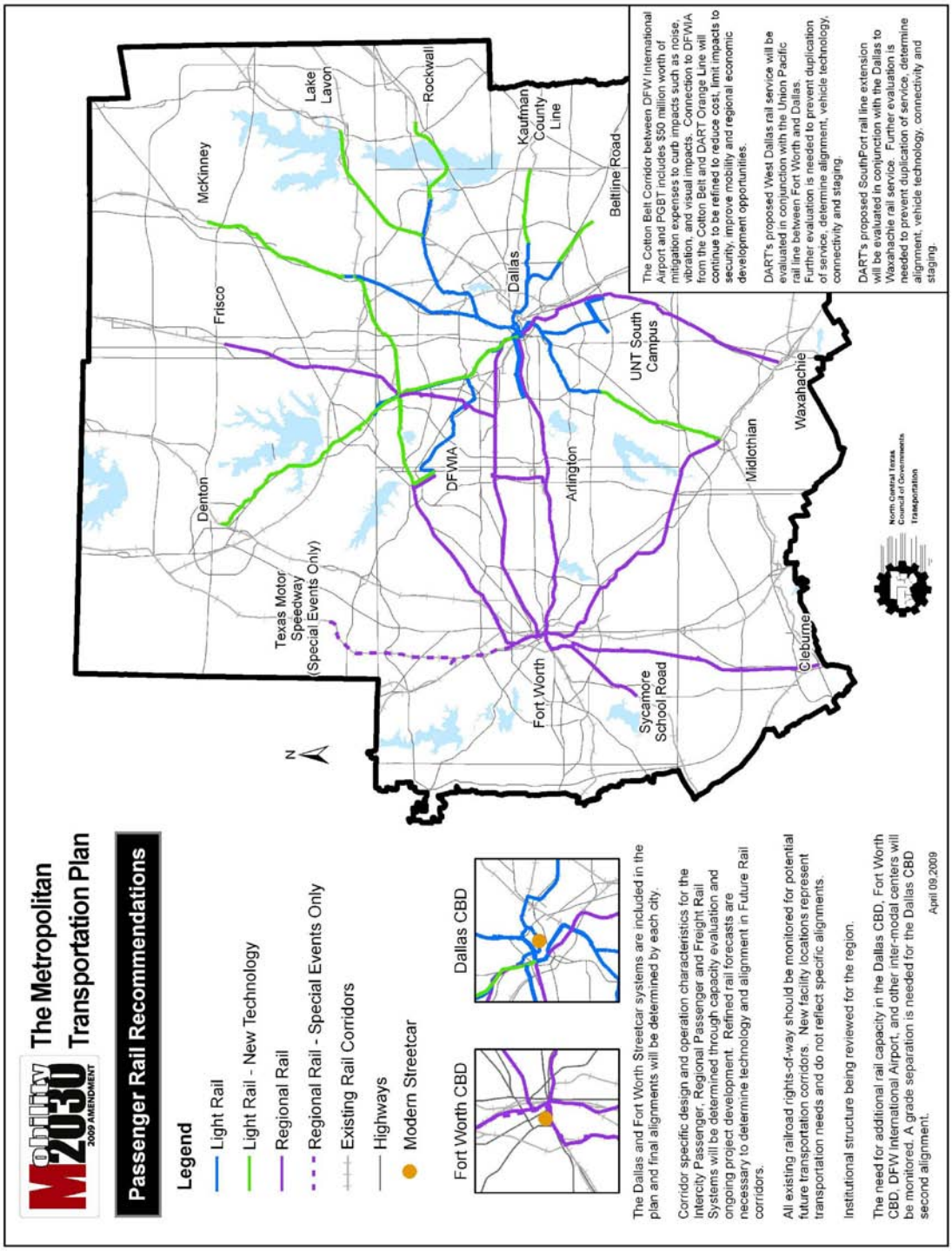

Figure 3-5. 2030 Future Rail System
Source: North Central Texas Council of Governments

CHAPTER 4

DEMOGRAPHIC GROWTH

As part of the PGBT-WE investment grade study, a review was made of the historic and projected demographic characteristics used by the North Central Texas Council of Governments (NCTCOG) to develop its traffic modeling trip tables. This chapter describes the major socioeconomic characteristics of the Dallas-Fort Worth Metropolitan Area (DFWMA) including both regional and specific trends within the PGBT-WE corridor.

The NCTCOG Executive Board approved the current regional demographic forecast in April 2003. That forecast includes the ten counties that comprise the DFWMA: Collin, Dallas, Denton, Tarrant, Johnson, Ellis, Kaufman, Rockwall, Parker and Wise. The resulting database was used as the baseline to generate future trip patterns in the DFWMA. An updated demographic forecast is currently under development and is expected to be approved in early 2011.

The first section of this chapter provides a description of the NCTCOG forecasting process used to generate the base demographics. The second section details the regional historical and future growth in the NCTCOG forecast area. The historical and future growth of the individual municipalities within the study corridor is considered in the third section of the chapter, and the fourth section describes the demographic characteristics of the PGBT-WE corridor. The final sections of the chapter discuss various socioeconomic indicators and summarize the independent economic review conducted as part of this investment grade study. The demographic descriptions included in this chapter range from the macro level (the region) to the corridor level which covers an area within five miles around the PGBT-WE. This information is the foundation to develop the potential demand for the proposed PGBT-WE toll facility. The demographic information is used in the trip generation model to estimate total trips produced in the area.

NCTCOG DEMOGRAPHIC FORECAST PROCESS

As required by federal legislation, NCTCOG periodically develops future demographics based on county and region control totals created by the Texas State Data Center (TSDC) and other independent consultants. The TSDC is part of the State Data Center System, a national network of 52 centers (all 50 states, Puerto Rico and the Virgin Islands) in charge of disseminating demographic information. The demographics adopted by NCTCOG are considered official demographics to support the metropolitan planning process and travel demand modeling within the DFW region.

The demographic forecast process and development of trip tables implemented by NCTCOG is divided into six steps as illustrated in Figure 4-1. In the first step, regional control totals of population and employment were developed in five-year increments from a base year (2000) through the forecast year (2030). These regional totals were obtained from the TSDC and were combined with forecasts developed by independent economists at the Perryman Group. A task force of local officials from city, county, and transportation entities acted as a governing body for the process and endorsed the forecast for approval by NCTCOG's Executive Board.

The TSDC population forecast process is a cohort-component forecast method for which the key element is the rate of migration. Three scenarios with different rates of migration are usually developed. The 0.0 scenario assumes that there is zero net migration (in-migration equals out-migration) and population change is only the result of births and deaths. The 0.5 scenario assumes a migration rate that is fifty percent of the migration seen from 1990-2000. Finally, the 1.0 scenario assumes migration equal to that experienced from 1990-2000.

Table 4-1 shows the control totals that were considered during the forecasting process. The 2030 population forecast ranges from 6.2 million for the zero percent migration scenario to 12.1 million under the 1.0 percent migration scenario. The population control totals adopted by NCTCOG for the ten-county area are shown in bold in Table 4-1. They reflect similar trends to those developed by the Perryman Group, and fall between the 0.5 and 1.0 migration scenarios from the TDSC.

Table 4-1
Population Control Totals

	2000	2010	2020	2030
TSDC Scenario 0.0	5,079,600	5,576,147	5,924,157	6,150,687
TSDC Scenario 0.5	5,079,600	6,075,653	7,172,447	8,403,478
TSDC Scenario 1.0	5,079,600	6,670,036	8,937,884	12,132,893
The Perryman Group	5,079,600	6,336,947	7,728,399	9,216,601
NCTCOG Adopted Forecast	**5,067,400**	**6,328,200**	**7,646,600**	**9,107,900**

Source: North Central Texas Council of Governments, Research and Information Services.