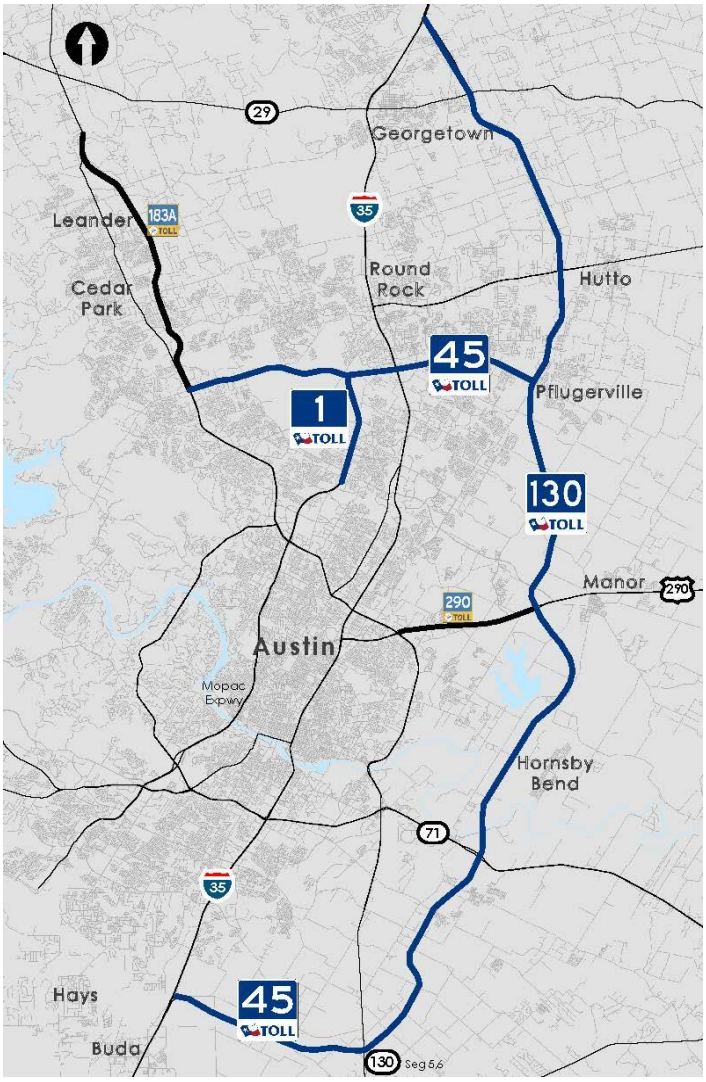
Central Texas Turnpike System
2014 Traffic & Revenue Study



Stantec

Prepared by:

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EXECUTIVE SUMMARY

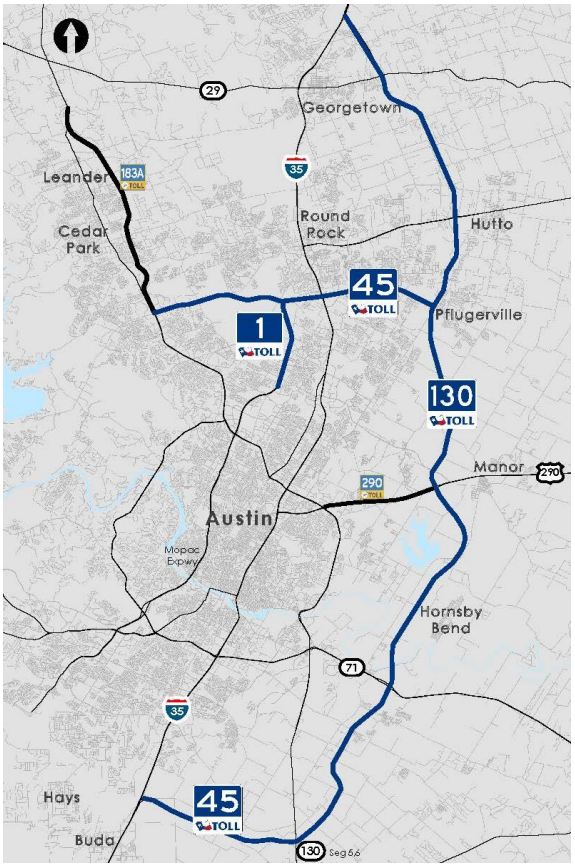
Stantec Consulting Services Inc. (Stantec) has conducted this Investment Grade Study to develop projections of traffic and toll revenues through 2042 for the Central Texas Turnpike System (CTTS) in the Austin area. The CTTS is owned by the Texas Transportation Commission, the governing body of the Texas Department of Transportation (TxDOT), and operated by TxDOT. This study will support the bond refinancing of the CTTS.

Introduction (Chapter 1)

The CTTS is a 72.8-mile turnpike system in the Austin area with four existing elements, as shown in Figure ES.1:

- SH 45 N extends from US 183 east to SH 130 (12.8 miles);
- Loop 1 (also called MoPac) extends from SH 45 N south to Parmer Lane (4 miles);
- SH 130 extends from IH-35 in Georgetown south to US 183/SH 45 SE south of the Austin-Bergstrom International Airport (49 miles); and
- SH 45 SE extends from US 183/SH 130 west to IH-35 (7 miles).

Figure ES.1 CTTS Toll Roads and Study Area



SH 45 N, Loop 1, and SH 130 opened in segments starting in 2006. SH 45 SE opened in May 2009 and became part of the CTTS in September 2012. The CTTS serves both commuter and through traffic in the Austin area.

On each of the CTTS elements, toll collection is by Electronic Toll Collection (ETC) and Pay by Mail (PBM), whereby the toll for the PBM transaction is billed after the trip, based on the identification of the vehicle owner via the vehicle's license plate.

Regional Transportation Network (Chapter 2)

Toll roads in the Austin area, in addition to the toll roads operated by CTTS, include 183A and the Manor Expressway owned and operated by Central Texas Regional Mobility Authority (CTRMA) and SH 130 Segments 5 & 6 financed, constructed, and operated by SH 130 Concession Company, LLC (the SH 130 Concession), a private concessionaire, pursuant to a 52-year concession agreement.

The major non-tolled routes in the Austin area which act as either feeder or competing routes with the CTTS elements include: IH-35, US 183 (Bell Boulevard/Research Boulevard), FM 734 (Parmer Lane/Ronald Reagan Boulevard), County Route 30 (Gattis School Road), US 79 (Palm Valley Boulevard), FM 1431 (Whitestone Boulevard) and FM 973. In some cases, one of these roads can be a feeder to one CTTS element and a competing route for a different CTTS element.

Key recent and proposed improvements to toll roads and toll-free routes in the region were applied to the networks used in regional transportation planning model used by Stantec in forecasting traffic for the CTTS elements. The latest available plans for proposed toll road projects in the Austin area were obtained from CTRMA and TxDOT. For other roadway projects, Stantec used the Capital Area Metropolitan Planning Organization (CAMPO) 2035 Regional Transportation Plan (adopted May 24, 2010) along with more recent amendments and also reviewed the draft version of the CAMPO 2040 Regional Transportation Plan to obtain the latest information about the implementation and configuration of individual projects. Based on the degree of commitment (feasibility studies, funding ROW status, and program inclusion), judgments were made as to whether or not to include projects in the future highway networks.

Existing Travel Patterns (Chapter 3)

For the 2014 Study traffic counts were recorded at over 200 locations along a series of screenlines and other key locations in the Austin region and on competing and feeder routes. Additional data sources included data collected during prior studies for the CTTS elements, approximately 370 counts from recent CTRMA studies, and data obtained through the TxDOT traffic database. Stantec also obtained transaction data for all toll roads that were in operation in 2013. While there was some overlap in the actual count locations, in total, traffic count data was available for 2,443 highway links for purposes of model calibration including 537 counts that were detailed vehicle classification counts used to quantify truck volumes.

A travel time data collection program was conducted in 2014 for the sections of the primary non-tolled routes that compete with the CTTS system, which include IH-35, the non-tolled section of Loop 1, US 183, FM 973, Gattis School Road and US 290. These travel time data were collected via GPS systems and were obtained for multiple trials in both directions for the peak and off-peak periods. Travel times collected in 2012 for earlier studies were also included for further model validations. These routes include SH 130, SH 45N, SH 21, SH 360, US 79, FM 685, RM 620, Parmer Lane, I-10 and SH 123.

Toll Collection (Chapter 4)

Since January 2013, TxDOT operates the CTTS elements as cashless facilities, using only two methods of toll collection: Electronic Toll Collection (ETC) and Pay by Mail (PBM). Drivers using ETC automatically pay the toll with their TxTag, while drivers without a TxTag have their license plate photographed at the pay points. TxDOT then mails a bill to the registered owner of the vehicle to collect payment.

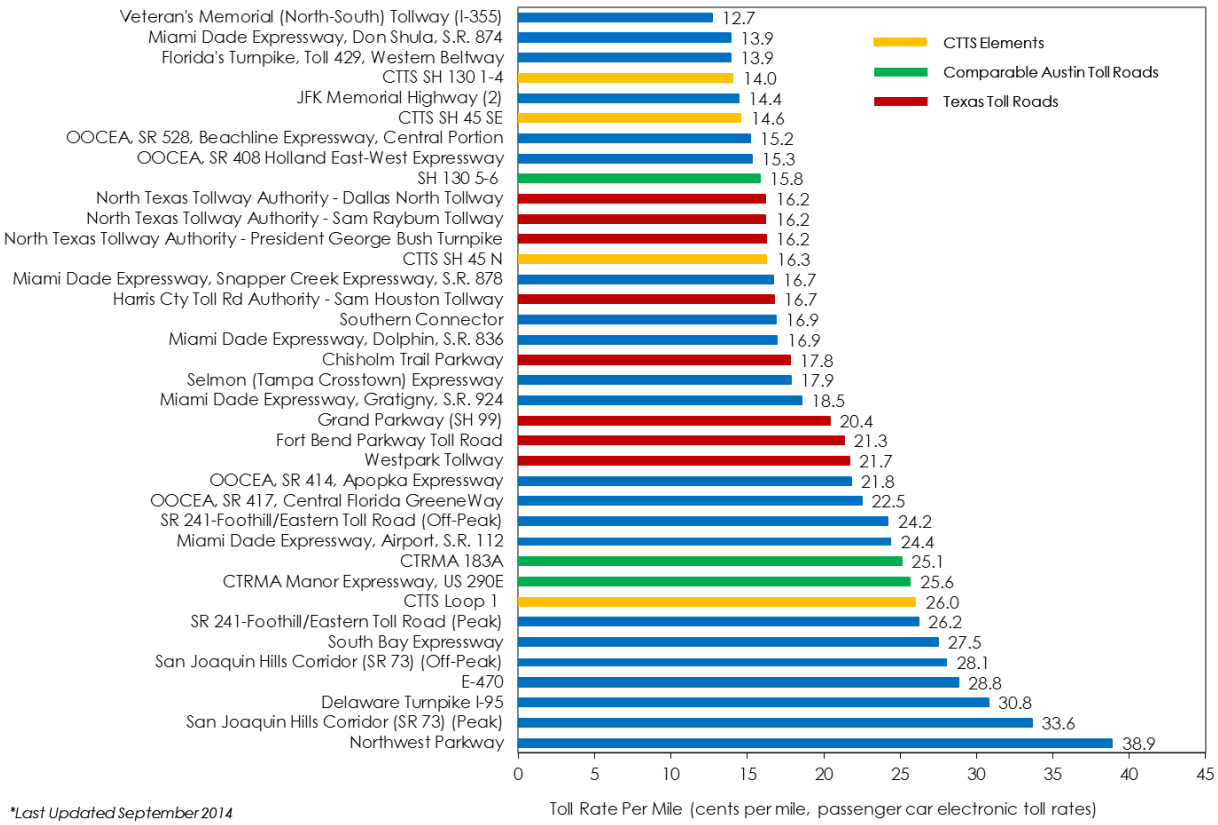
Current passenger ETC toll rates for a full-length trip on each of the CTTS elements is shown in Table ES.1. There is a 33 percent surcharge on PBM transactions. Vehicles with more than two axles pay a higher toll based on the (n - 1) formula whereby the toll is equal to the passenger car toll time the vehicle's number of axles less one. For the SH 130 and SH 45 SE, the maximum toll charge is limited to rate for a four-axle vehicle to encourage truck usage.

Table ES.1 2014 Passenger Car Toll Rates on CTTS Elements

CTTS Element	Full Length Distance (miles)	Full Length Toll	Per Mile Rate
SH 45 N	12.8	$ 2.08	$ 0.16
Loop 1	4	$ 1.04	$ 0.26
SH 130 Segments 1 - 4	49	$ 6.88	$ 0.14
SH 45 SE	7	$ 1.02	$ 0.15

Passenger car ETC toll rates for the CTTS elements are compared to rates for similar toll roads in Figure ES.2.

Figure ES.2 Toll Rates per Mile on CTTS Elements and Comparable Toll Roads



**Last Updated September 2014*

Future toll levels used for the 2014 Study are based on toll policy adopted by the Texas Transportation Commission, whereby tolls are escalated annually on January 1st based on Toll Rate Escalation Percentage, as calculated on each Toll Escalation Determination Date. The Toll Rate Escalation Percentage is the Consumer Price Index – Urban (CPI-U) on October 1st, the Toll Escalation Determination Date of each year, based on the twelve month period ending August 31st of the current year. The policy was first implemented in January 2014, when tolls were increased 1.5 percent. Figure ES.3 shows historical annual CPI-U growth trends and the forecasted trend used for the 2014 Study, while Table ES.2 shows, in detail, the recent and projected annual CPI-U growth rates used for developing future toll rates for the 2014 Study. For the 24-year period, from 1990 to the present, the average annual growth rate is calculated to be 2.5 percent. For the 34-year period from 1980 to the present, the average annual growth rate is greater, at 3.2 percent.

Figure ES.3 Annual Consumer Price Index - Historical and Projected

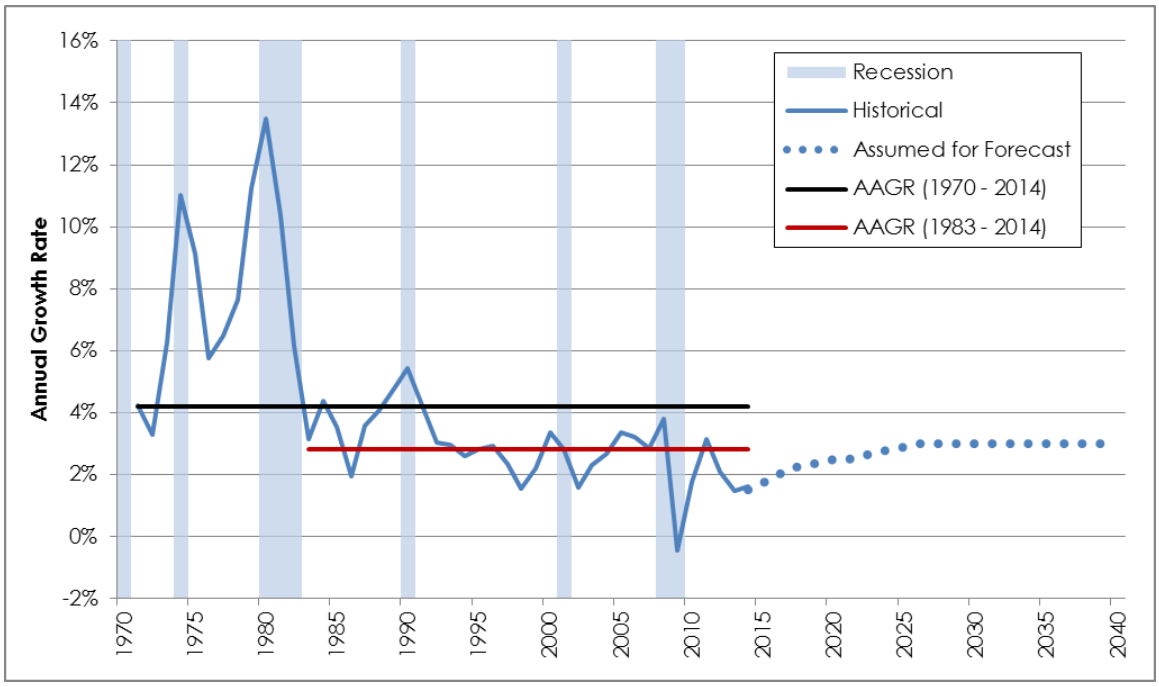


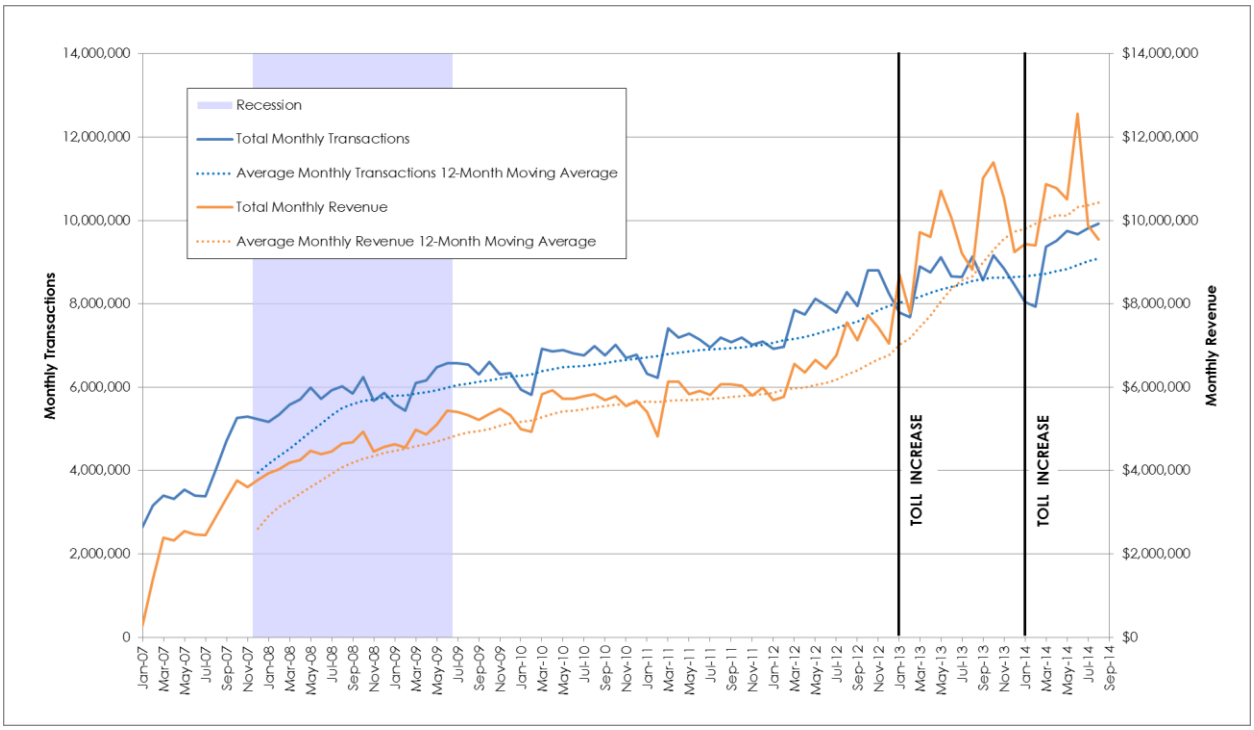
Table ES.2 Annual Toll Escalation – Recent and Projected

Year	Annual Escalation
2014 (Aug 2012 - Aug 2013)	1.5%
2015 (Aug 2013 - Aug 2014)	1.7%
2016	2.0%
2017	2.2%
2018	2.3%
2019	2.4%
2020	2.5%
2021	2.5%
2022	2.6%
2023	2.7%
2024	2.8%
2025	2.9%
2026 - 2040	3.0%
2014 - 2040	2.8%

Historical CTTS Toll Transactions and Revenue (Chapter 5)

Total transactions and revenue across the CTTS facilities have gradually increased since tolling began in 2007. Figure ES.4 shows total transactions and revenue for the CTTS elements, by month and the 12-month moving average, for the period January 2007 through August 2014.

Figure ES.4 CTTS Historical Transactions and Revenue



Total annual transactions and revenue for the CTTS elements, by fiscal year, are shown Table ES.3 and Table ES.4, respectively.

Table ES.3 Annual Fiscal Year Transactions by CTTS Element, FY 2008 – 2014

Fiscal Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE [1]	% Change	Total	% Change
2008	29,458,300		17,194,700		19,287,000		-	-	**65,940,000**	
2009	31,269,500	6.1%	17,381,000	1.1%	24,457,300	26.8%	-	-	**73,107,800**	**10.9%**
2010	32,166,700	2.9%	18,064,100	3.9%	28,298,300	15.7%	-	-	**78,529,100**	**7.4%**
2011	33,543,300	4.3%	18,883,100	4.5%	30,583,200	8.1%	-	-	**83,009,600**	**5.7%**
2012	35,790,100	6.7%	19,889,700	5.3%	34,352,100	12.3%	-	-	**90,031,900**	**8.5%**
2013	37,126,440	3.7%	19,715,300	-0.9%	41,365,500	20.4%	4,300,000	-	**102,507,240**	**13.9%**
2014	38,255,800	3.0%	19,839,100	0.6%	46,210,700	11.7%	4,743,000	10.3%	**109,048,600**	**6.4%**

Notes: [1] SH 45 SE opened to traffic in May 2009 but did not become part of the CTTS until September 2012 (FY 2013).

Table ES.4 Annual Toll Revenue by CTTS Element, FY 2008 – 2014

Fiscal Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE [1]	% Change	Total	% Change
2008 [2]	-	-	-	-	-	-	-	-	**$48,905,800**	
2009 [2]	-	-	-	-	-	-	-	-	**$58,913,900**	**20.5%**
2010	$19,798,600	-	$11,936,900	-	$34,408,300	-	-	-	**$66,143,800**	**12.3%**
2011	$20,268,200	2.4%	$12,316,600	3.2%	$36,237,000	5.3%	-	-	**$68,821,800**	**4.0%**
2012	$21,944,600	8.3%	$13,015,100	5.7%	$40,735,000	12.4%	-	-	**$75,694,700**	**10.0%**
2013	$29,075,300	32.5%	$16,142,700	24.0%	$54,492,200	33.8%	$4,274,300	-	**$103,984,500**	**37.4%**
2014	$34,830,800	19.8%	$18,559,800	15.0%	$67,092,300	23.1%	$4,679,700	9.5%	**$125,162,600**	**20.4%**

Notes: [1] SH 45 SE opened to traffic in May 2009 but did not become part of the CTTS until September 2012 (FY 2013).
[2] Revenue for PBM patrons was not allocated by each toll facility until September 2009 (FY 2010); therefore, only total CTTS revenue is shown for FY 2008 and FY 2009.

Socioeconomic Data (Chapter 6)

This chapter of the report discusses socioeconomic indicators that are used to identify growth in the region that encompasses the Austin area toll roads and are included in the regional transportation model. The study area included in the regional transportation model used for the CTRMA traffic forecast includes five counties in the CAMPO model area (Travis, Williamson, Hayes, Bastrop and Caldwell) and five counties in the Alamo Area Metropolitan Planning Organization (AAMPO) model area (Bexar, Guadalupe, Comal, Wilson and Kendall).

Starting with the estimated population for 2013, growth is anticipated to taper down from the annual average rate of 2.6 percent between 2010 and 2013 to 2.0 percent between 2013 and 2015. After that, it continues to slow down, reaching an annual growth rate of 1.5 percent between 2030 and 2040. The forecast of future population and average annual growth rate for the ten counties are presented in Table ES.5.

Table ES.5 Population Forecast for the Study Area, 2013 – 2040

Current & Projected Population						
REGION	**County**	**2013**	**2015**	**2020**	**2030**	**2040**
CAMPO	Travis	1,120,892	1,170,298	1,273,336	1,474,365	1,669,612
	Williamson	465,263	492,382	566,298	739,143	952,122
	Hays	175,837	188,375	220,507	288,990	364,369
	Bastrop	75,825	77,898	85,583	103,220	124,358
	Caldwell	39,226	39,969	42,471	48,235	55,111
	Total	1,877,043	1,968,922	2,188,195	2,653,953	3,165,572
AAMPO	Bexar	1,775,596	1,832,203	1,957,968	2,196,665	2,471,362
	Comal	117,419	123,502	138,646	168,731	197,279
	Guadalupe	141,300	147,921	169,057	214,674	265,018
	Kendall	37,246	39,827	45,117	55,789	66,740
	Wilson	44,869	46,215	50,898	60,663	71,049
	Total	2,116,430	2,189,668	2,361,686	2,696,522	3,071,448
Study Area Total		**3,993,473**	**4,158,590**	**4,549,881**	**5,350,475**	**6,237,020**
Average Annual Growth Rates						
REGION	**County**		**2013 - 2015**	**2015 - 2020**	**2020 - 2030**	**2030 - 2040**
CAMPO	Travis		2.2%	1.7%	1.5%	1.3%
	Williamson		2.9%	2.8%	2.7%	2.6%
	Hays		3.5%	3.2%	2.7%	2.3%
	Bastrop		1.4%	1.9%	1.9%	1.9%
	Caldwell		0.9%	1.2%	1.3%	1.3%
	Total		2.4%	2.1%	1.9%	1.8%
AAMPO	Bexar		1.6%	1.3%	1.2%	1.2%
	Comal		2.6%	2.3%	2.0%	1.6%
	Guadalupe		2.3%	2.7%	2.4%	2.1%
	Kendall		3.4%	2.5%	2.1%	1.8%
	Wilson		1.5%	1.9%	1.8%	1.6%
	Total		1.7%	1.5%	1.3%	1.3%
Study Area Total			**2.0%**	**1.8%**	**1.6%**	**1.5%**

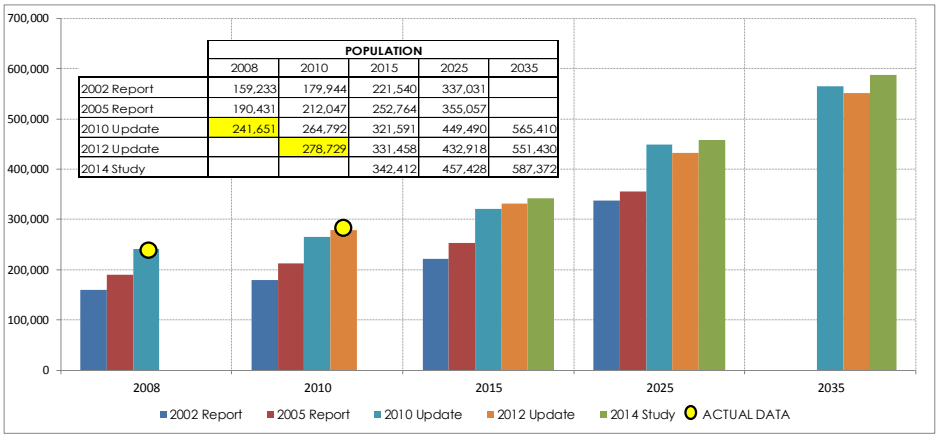
Employment growth is anticipated to taper down from the rate of 3.1 percent in 2012 and 3.7 percent in 2013 to 2.0 percent between 2013 and 2015. After that, it continues to slow down, reaching an annual growth rate of 1.5 percent between 2030 and 2040. The forecast of future employment for the ten counties is presented in Table ES.6.

Table ES.6 Employment Forecast for the Study Area, 2013 – 2040

Current & Projected Employment						
REGION	**County**	**2013**	**2015**	**2020**	**2030**	**2040**
CAMPO	Travis	635,250	660,559	717,497	839,247	962,917
	Williamson	139,191	147,884	168,721	211,554	254,472
	Hays	54,565	58,102	66,937	86,092	108,533
	Bastrop	15,058	15,797	18,221	24,358	33,126
	Caldwell	7,966	8,373	9,511	12,300	15,958
	Total	852,030	890,715	980,887	1,173,551	1,375,006
AAMPO	Bexar	771,162	796,244	856,370	982,096	1,116,034
	Comal	40,379	43,258	50,662	67,780	88,534
	Guadalupe	31,080	32,728	36,668	45,225	54,802
	Kendall	12,162	12,842	14,517	18,255	22,642
	Wilson	6,930	7,214	8,042	9,592	10,972
	Total	861,713	892,286	966,259	1,122,948	1,292,984
Study Area Total		**1,713,743**	**1,783,001**	**1,947,146**	**2,296,499**	**2,667,990**
Average Annual Growth Rates						
REGION	**County**		**2013 - 2015**	**2015 - 2020**	**2020 - 2030**	**2030 - 2040**
CAMPO	Travis		2.0%	1.7%	1.6%	1.4%
	Williamson		3.1%	2.7%	2.3%	1.9%
	Hays		3.2%	2.9%	2.5%	2.3%
	Bastrop		2.4%	2.9%	2.9%	3.1%
	Caldwell		2.5%	2.6%	2.6%	2.6%
	Total		2.2%	1.9%	1.8%	1.6%
AAMPO	Bexar		1.6%	1.5%	1.4%	1.3%
	Comal		3.5%	3.2%	3.0%	2.7%
	Guadalupe		2.6%	2.3%	2.1%	1.9%
	Kendall		2.8%	2.5%	2.3%	2.2%
	Wilson		2.0%	2.2%	1.8%	1.4%
	Total		1.8%	1.6%	1.5%	1.4%
Study Area Total			**2.0%**	**1.8%**	**1.7%**	**1.5%**

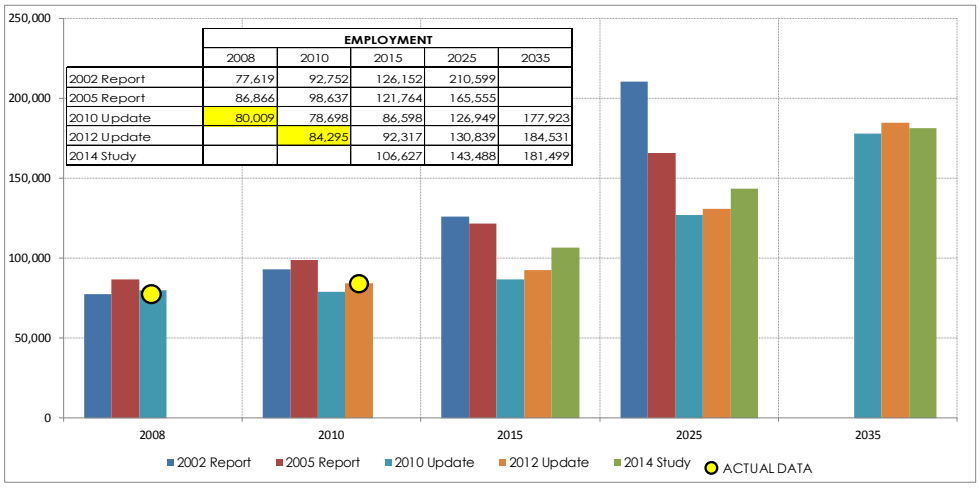
An analysis of the forecasting accuracy of estimates used for Previous Reports for selected areas was prepared by comparing the forecasts to actual results, when available. An example of this analysis is shown in Figure ES.5 for the population forecast prepared for the rapidly developing 'greenfield' corridor served by SH 130 Segments 1-4. The estimated population developed for each of the Previous Reports, by horizon year, along with the final observed values for 2008 (completion year of the CTTS) and 2010, are shown in the table in Figure ES.5. The forecasts for 2008 and 2010 were consistently lower than the actual growth within this corridor and the estimated population for 2008 and 2010 were increased in each subsequent study as the actual growth exceeded prior forecasts. Ultimately, the actual population values for 2008 and 2010 (241,651 and 278,729, shown as yellow-shaded cells in the table), exceeded the earlier forecasts. This demonstrates the reasonableness of these forecasts and the conservativeness of methodology used to generate the values. The results for employment are similar, as shown in Figure ES.6.

Figure ES.5 Comparison of SH 130 Corridor Population Forecasts



POPULATION	2008	2010	2015	2025	2035
2002 Report	159,233	179,944	221,540	337,031	
2005 Report	190,431	212,047	252,764	355,057	
2010 Update	241,651	264,792	321,591	449,490	565,410
2012 Update		278,729	331,458	432,918	551,430
2014 Study			342,412	457,428	587,372

Figure ES.6 Comparison of SH 130 Corridor Employment Forecasts



EMPLOYMENT	2008	2010	2015	2025	2035
2002 Report	77,619	92,752	126,152	210,599	
2005 Report	86,866	98,637	121,764	165,555	
2010 Update	80,009	78,698	86,598	126,949	177,923
2012 Update		84,295	92,317	130,839	184,531
2014 Study			106,627	143,488	181,499

Model Validation and Refinement (Chapter 7)

In preparing estimates of traffic and toll revenue for the CTTS elements, it was necessary to update the travel demand modeling process to reflect growth in the Austin region and the expansion of the toll road system. The model development effort included combining the CAMPO and AAMPO models to include the areas encompassed by both the Austin and San Antonio regions.

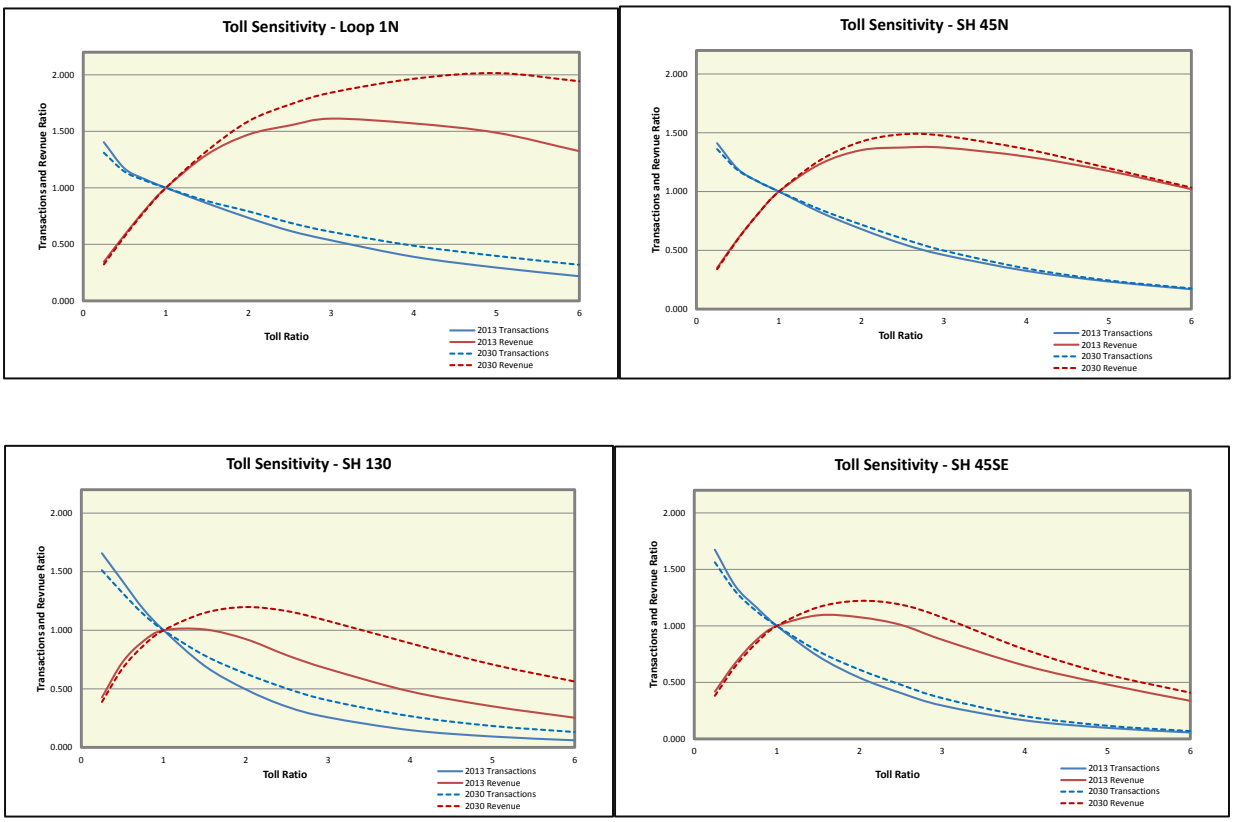
The new model utilized the existing toll diversion process as the basis for estimating tolled traffic. For the 2013 model calibration year, the temporary discounts for trucks using SH 130 and SH 45 SE were included since the discounts were applicable for 11 months of that year. Several refinements were incorporated into the toll diversion modeling to account for new tolling technologies, such as the PBM video tolling program, cashless payment, and dynamic pricing for the managed lane facilities that are planned for the Austin region. In addition to these refinements, the new toll diversion model provides for variation by household income and subregion in setting parameters, such as transponder usage. Similarly, parameters reflecting the

tolling policies of each agency (TxDOT, CTRMA, and the SH 130 Concession) and the tolling plans for trucks are now established at each tolling pay point. This enhancement permits variation in the tolling plans for each agency as well the transition to newer toll collection technologies. Finally, the introduction of a generalized cost function, instead of time-based function, for the path-building and highway assignment processes allows the model to react more realistically to the impact of toll changes.

Based on data collected from field studies and toll road records and model output, the model was calibrated to ensure that the modeling process adequately replicates both the observed traffic volumes and the observed speeds by time of day for each of the project corridors. The calibration was also structured to replicate the observed traffic and transactions by payment method to the extent feasible for each toll road by pay point.

In order to develop toll elasticity curves for the CTTS Project, the transportation model was run using a range of toll values above and below the existing toll rates for the 2013 calibration year as well with the future toll rates and networks for the year 2030. These elasticity estimates for each year are a function of both the overall travel demand and network conditions, in terms of competing roadways and congestion that exist for both years. For this analysis, a number of alternative toll rates were expressed as multiples of the base tolls. The multiples range from 0.25 to 6.0 and reveal how traffic and revenues change at different toll levels. The results were plotted for the four facilities as shown in Figure ES. 7. The transactions and revenues for 2013 are shown in solid lines while the dashed lines represent the same values in 2030 horizon year.

Figure ES. 7 Toll Sensitivity



For the future year 2030 conditions, the elasticity values decline indicating that the roadways become less elastic, primarily due to increasing congestion on the competing roadways as a result of on-going development and growth in traffic. The elasticity for SH 130 is reduced significantly as the adjacent arterial roadways become congested with traffic from development in what is currently a largely rural corridor. Elasticity for Loop 1, SH 45 North, and SH 45 SE will also decline. These reductions in elasticity indicate that under the future conditions, there will be more flexibility to increase tolls beyond the planned toll escalation assumed in the forecasts, particularly for SH 130. As shown in these figures, the optimum revenue points for each roadway increase most notably for SH 130 and Loop 1.

Traffic & Revenue Forecasts (Chapter 8)

Stantec developed traffic and toll revenue forecasts for each of the CTTS elements based on the travel demand model which incorporated future year network assumptions and revised socioeconomic forecasts. The travel demand modeling process, including the application of the individual MPO models and the toll diversion model, were applied to selected horizon years (2015, 2020, 2030, and 2040) to create annual traffic estimates from 2015 to 2042. Intermediate year estimates were developed via interpolation techniques and the years beyond 2040 were estimated via extrapolation.

Stantec reviewed the model-based forecasts, summarized the estimated traffic for each of the corridor screenlines and reviewed the detailed schematic diagrams for each horizon year. In order to prepare the final transactions and revenue streams by vehicle type and payment type, the model-based forecasts were reviewed and adjusted as necessary to account for any unacceptable model variation. Transaction and revenue streams prepared for each CTTS roadway include the key metrics related to payment type and vehicle type, along with both average weekday and annual estimates for total transactions and paying transactions using collection statistics provided by TxDOT.

The estimates of traffic and toll revenue presented in this report have been prepared by Stantec based on certain assumptions regarding tolling and traffic characteristics for each CTTS element based on observed traffic conditions and additional assumptions regarding future toll road and local and national conditions. Assumptions for future years are based on discussions with TxDOT and local government agencies and Stantec judgment. The Assumptions for the base case for 2015 are summarized in Table ES.7.

Table ES.7 Summary of Tolling and Traffic Characteristic Assumptions: Base Case – 2015

Assumptions Related to	Element			
	SH 45 N	Loop 1	SH 130	SH 45 SE
Vehicle Type Distribution				
Autos	96.2%	96.2%	91.4%	89.1%
Trucks	3.8%	3.8%	8.6%	10.9%
Payment Type Distribution - Passenger Cars				
PBM	21.3%	22.4%	33.5%	35.4%
ETC	78.7%	77.6%	66.5%	64.6%
Payment Type Distribution - Trucks				
PBM	21.2%	24.5%	35.5%	40.6%
ETC	78.8%	75.5%	64.5%	59.4%
Toll Ratios				
Truck/Auto Ratio	2.75	2.75	2.67	2.72
PBM/ETC Toll Rate	1.33	1.33	1.33	1.33
Collection Rates				
PBM	47.7%	47.7%	47.7%	47.7%
ETC	99.7%	99.7%	99.7%	99.7%
Full Length Trip				
Distance	12.8	4.0	49.0	7.0
Rate per Mile	$0.17	$0.27	$0.14	$0.15
Toll Cost (ETC)	$2.12	$1.06	$7.00	$1.04
Annualization Factor	320	320	330	330

The forecasts prepared for the 2012 Update and the 2014 Study are shown in Table ES.8. Average weekday transactions for FY 2013 and FY 2014 were 8 percent higher for both years, than forecasted in the 2012 Update. In the 2014 Study, the system-wide value of paying transactions is approximately 16 percent higher in the early years of the forecast due primarily to the higher level of recent growth in both SH 130 and SH 45 SE. The difference in paying transactions does decrease to about 12 percent by FY 2030 and generally is about 9 to 10 percent higher thereafter to 2042. In contrast, revenue is approximately 11 percent higher in FY 2015 and then gradually declines to equal the values from the 2012 Update by FY 2025. This gradual decline towards the prior forecast values is due to several changes in the forecasting assumptions from the conditions used in the prior forecasts.

These changes include:

- Lower toll escalation rates in the early forecast years;
- Lower share of ETC transactions;
- Lower level of collected PBM transactions; and
- Reduced share of SH 130 truck traffic.

Table ES.8 Comparison of 2012 and 2014 CTTS Transaction and Toll Revenue Forecasts

Fiscal Year	Average Weekday Paying Transactions			Annual Toll Revenue (in $000s)		
	2012 Update	2014 Study	% Difference	2012 Update	2014 Study	% Difference
2008	*186,366*	*186,366*	0%	***$48,906***	***$48,906***	0%
2009	*204,433*	*204,433*	0%	***$58,914***	***$58,914***	0%
2010	*217,953*	*217,953*	0%	***$66,144***	***$66,144***	0%
2011	*228,905*	*228,905*	0%	***$68,822***	***$68,822***	0%
2012	247,917	*246,593*	-1%	$74,229	***$75,695***	2%
2013	247,592	*266,619*	8%	$96,685	***$103,985***	8%
2014	258,034	*278,516*	8%	$115,359	***$125,163***	8%
2015	276,119	320,983	16%	$127,138	$140,665	11%
2016	290,229	339,503	17%	$138,980	$152,900	10%
2017	303,647	356,732	17%	$151,984	$165,020	9%
2018	317,267	373,638	18%	$165,261	$177,330	7%
2019	331,096	389,942	18%	$178,827	$189,621	6%
2020	345,142	405,435	17%	$192,703	$201,669	5%
2021	359,413	419,040	17%	$206,909	$213,939	3%
2022	373,917	431,900	16%	$221,468	$226,707	2%
2023	388,663	444,839	14%	$236,403	$240,119	2%
2024	403,659	457,859	13%	$251,740	$254,159	1%
2025	418,917	470,965	12%	$267,506	$268,800	0%
2026	431,392	484,160	12%	$285,323	$284,637	0%
2027	443,670	497,445	12%	$303,395	$301,477	-1%
2028	456,124	510,823	12%	$321,892	$319,104	-1%
2029	468,761	524,295	12%	$340,839	$337,549	-1%
2030	481,585	537,863	12%	$360,263	$356,850	-1%
2031	494,601	549,931	11%	$380,193	$376,822	-1%
2032	507,815	561,271	11%	$400,659	$397,611	-1%
2033	521,233	572,670	10%	$421,693	$419,370	-1%
2034	534,860	584,130	9%	$443,329	$442,139	0%
2035	548,701	595,651	9%	$465,605	$465,962	0%
2036	558,849	607,234	9%	$485,554	$490,885	1%
2037	567,769	618,881	9%	$504,918	$516,956	2%
2038	576,720	630,592	9%	$524,617	$544,224	4%
2039	585,702	642,369	10%	$544,666	$572,739	5%
2040	594,716	654,212	10%	$565,077	$602,557	7%
2041	603,761	665,668	10%	$585,867	$632,448	8%
2042	612,837	676,943	10%	$607,049	$662,988	9%

Notes: 1) SH 45 SE opened in May 2009 but did not become part of the CTTS until September 2012; therefore, it is not included in CTTS totals until FY 2013.
2) Revenue includes PBM surcharge (33 percent of ETC toll).
3) ***Actual Annual Revenue***

Table ES.9 shows the estimated toll plus Customer Service Center (CSC) revenue prepared for the 2014 Study and how they compare to the 2012 Update. The latest fee information for FY 2014 indicates that CSC revenue was approximately $0.065 per ETC transaction and $0.305 per PBM transaction. The CSC forecasts held these values constant during the forecast period, as TxDOT has not yet established a policy to escalate these fees over time.

Table ES.9 Estimated Toll plus Customer Service Center Revenue

Fiscal Year	Toll Revenue		CSC Revenue		Total Revenue			Annual Revenue Growth	
	2012 Update	2014 Study	2012 Update	2014 Study	2012 Update	2014 Study	% Diff.	2012 Update	2014 Study
2008	***$48,906***	***$48,906***			***$48,906***	***$48,906***	***0.0%***		
2009	***$58,914***	***$58,914***	***$5,320***	***$5,320***	***$64,234***	***$64,234***	***0.0%***	***31.3%***	***31.3%***
2010	***$66,144***	***$66,144***	***$7,172***	***$7,172***	***$73,316***	***$73,316***	***0.0%***	***14.1%***	***14.1%***
2011	***$68,822***	***$68,822***	***$6,562***	***$6,562***	***$75,384***	***$75,384***	***0.0%***	***2.8%***	***2.8%***
2012	$74,229	***$75,695***	$10,800	***$10,800***	$85,029	***$86,495***	1.7%	12.8%	***14.7%***
2013	$96,685	***$103,985***	$10,429	***$13,290***	$107,114	***$117,275***	9.5%	26.0%	***35.6%***
2014	$115,359	***$125,163***	$10,869	***$12,710***	$126,227	***$137,873***	9.2%	17.8%	***17.6%***
2015	$127,138	$140,665	$11,631	$15,961	$138,768	$156,626	12.9%	9.9%	13.6%
2016	$138,980	$152,900	$12,225	$16,707	$151,205	$169,607	12.2%	9.0%	8.3%
2017	$151,984	$165,020	$12,790	$17,386	$164,774	$182,406	10.7%	9.0%	7.5%
2018	$165,261	$177,330	$13,364	$18,028	$178,624	$195,358	9.4%	8.4%	7.1%
2019	$178,827	$189,621	$13,946	$18,619	$192,773	$208,240	8.0%	7.9%	6.6%
2020	$192,703	$201,669	$14,538	$19,132	$207,241	$220,801	6.5%	7.5%	6.0%
2021	$206,909	$213,939	$15,139	$19,734	$222,048	$233,673	5.2%	7.1%	5.8%
2022	$221,468	$226,707	$15,750	$20,397	$237,218	$247,104	4.2%	6.8%	5.7%
2023	$236,403	$240,119	$16,371	$21,063	$252,774	$261,182	3.3%	6.6%	5.7%
2024	$251,740	$254,159	$17,003	$21,733	$268,743	$275,892	2.7%	6.3%	5.6%
2025	$267,506	$268,800	$17,645	$22,406	$285,151	$291,206	2.1%	6.1%	5.6%
2026	$285,323	$284,637	$18,171	$23,083	$303,494	$307,720	1.4%	6.4%	5.7%
2027	$303,395	$301,477	$18,688	$23,763	$322,083	$325,240	1.0%	6.1%	5.7%
2028	$321,892	$319,104	$19,213	$24,446	$341,105	$343,550	0.7%	5.9%	5.6%
2029	$340,839	$337,549	$19,745	$25,134	$360,584	$362,683	0.6%	5.7%	5.6%
2030	$360,263	$356,850	$20,285	$25,825	$380,548	$382,675	0.6%	5.5%	5.5%
2031	$380,193	$376,822	$20,833	$26,418	$401,026	$403,240	0.6%	5.4%	5.4%
2032	$400,659	$397,611	$21,390	$26,962	$422,048	$424,573	0.6%	5.2%	5.3%
2033	$421,693	$419,370	$21,955	$27,508	$443,648	$446,878	0.7%	5.1%	5.3%
2034	$443,329	$442,139	$22,529	$28,056	$465,858	$470,195	0.9%	5.0%	5.2%
2035	$465,605	$465,962	$23,112	$28,606	$488,717	$494,568	1.2%	4.9%	5.2%
2036	$485,554	$490,885	$23,540	$29,159	$509,093	$520,044	2.2%	4.2%	5.2%
2037	$504,918	$516,956	$23,915	$29,714	$528,833	$546,670	3.4%	3.9%	5.1%
2038	$524,617	$544,224	$24,292	$30,271	$548,909	$574,495	4.7%	3.8%	5.1%
2039	$544,666	$572,739	$24,671	$30,830	$569,336	$603,569	6.0%	3.7%	5.1%
2040	$565,077	$602,557	$25,050	$31,391	$590,128	$633,948	7.4%	3.7%	5.0%
2041	$585,867	$632,448	$25,431	$31,946	$611,298	$664,394	8.7%	3.6%	4.8%
2042	$607,049	$662,988	$25,814	$32,497	$632,862	$695,485	9.9%	3.5%	4.7%

Notes: 1) SH 45 SE opened in May 2009 but did not become part of the CTTS until September 2012; therefore, it is not included in CTTS totals until FY 2013.
2) Historical Total Revenues differ from Audited Financial Reports due to accrued toll revenue receivables.
3) ***Actual Annual Revenue***

Sensitivities (Chapter 9)

In addition to the assumptions used for the base case, a broad range of alternative assumptions could be used in preparing the traffic and revenue for the CTTS elements. For the 2014 Study, sensitivity trials were run to assess the impacts to the forecasts based for three conditions:

- Reduced CPI growth: 0.25 percent lower than the base case;
- Reduced trip growth: 25 percent less than the base case; and
- Reduced Value of Time: 10 percent less than the base case.

Average weekday toll revenues for each sensitivity trial and the corresponding percent change in toll revenue when compared to the base case are provided in Table ES.10.

Table ES.10 Average Weekday Revenue Comparison for the Sensitivity Trials

Model Year	AVERAGE WEEKDAY TOLL REVENUE						
	Base Revenue	Sensitivity 1 (Reduced CPI)		Sensitivity 2 (Reduced Trip Growth)		Sensitivity 3 (Reduced VOT)	
		Revenue	% Difference	Revenue	% Difference	Revenue	% Difference
2020	$496,904	$487,786	-1.8%	$463,971	-6.6%	$476,566	-4.1%
2030	$872,656	$845,349	-3.1%	$775,700	-11.1%	$848,962	-2.7%
2040	$1,449,385	$1,393,799	-3.8%	$1,232,748	-14.9%	$1,419,541	-2.1%

1.0 INTRODUCTION

Acting as Traffic Consultant to the Texas Transportation Commission under the Master Indenture, Stantec Consulting Services Inc. (Stantec) has prepared this Investment Grade Study. The study includes projections of traffic and toll revenues through 2042 for the Central Texas Turnpike System (CTTS) in the Austin area. The CTTS is owned by the Texas Transportation Commission, the governing body of the Texas Department of Transportation (TxDOT), operated by TxDOT and is comprised of four tolled elements - SH 45 N, Loop 1, SH 130 Segments 1–4 (SH 130), and SH 45 SE. This study will support the bond refinancing of the CTTS.

1.1 CENTRAL TEXAS TURNPIKE SYSTEM

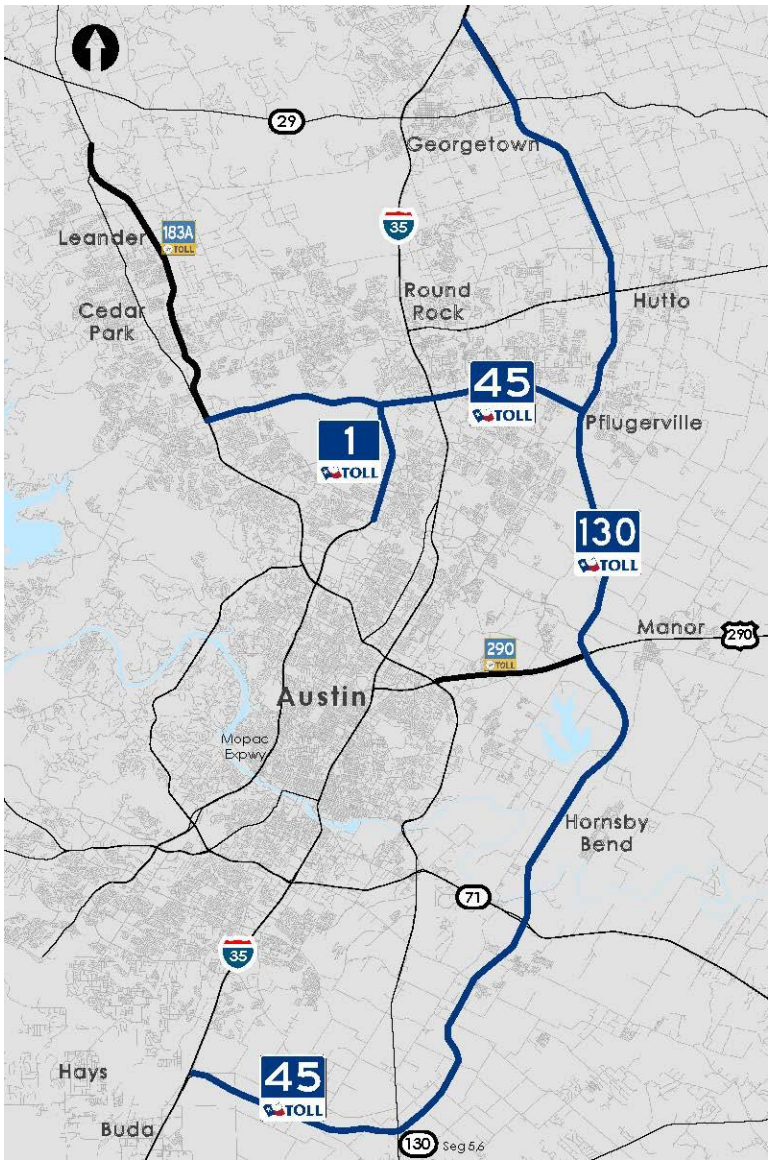
The CTTS is a 72.8-mile turnpike system in the Austin area with four existing elements:

- SH 45 N extends from US 183 east to SH 130 (12.8 miles);
- Loop 1 (also called Mopac) extends from SH 45 N south to Parmer Lane (4 miles);
- SH 130 extends from IH-35 in Georgetown south to US 183/SH 45 SE south of the Austin-Bergstrom International Airport (49 miles); and
- SH 45 SE extends from US 183/SH 130 west to IH-35 (7 miles).

SH 45 N, Loop 1, and SH 130 opened in segments starting in 2006. SH 45 SE opened in May 2009 and became part of the CTTS in September 2012. The CTTS serves both commuter and through traffic in the Austin area. The CTTS elements in the Austin area are shown in Figure 1.1.

On each of the CTTS elements, toll collection is by Electronic Toll Collection (ETC) and Pay by Mail (PBM), whereby the patron is billed after the trip, based on the identification of the vehicle's license plate. Cash collection was an option on SH 45 N, Loop 1 and SH 130 until being discontinued on January 1, 2013 as discussed in Chapter 2 of this report.

Figure 1.1 CTTS Toll Roads and Study Area



1.2 STUDY PURPOSE, METHODOLOGY, AND HISTORY

The purpose of this study is to provide an update to the 35-year traffic and revenue forecasts prepared in 2012 in connection with bond financing of the CTTS. The projections presented in this report have taken into account: historical traffic and toll revenue performance; toll structure; economic, population, employment and other demographic forecasts in the Austin/San Antonio metropolitan areas; traffic capacities of the roadway network in the region; and current and programmed construction activities on the regional toll roads CTTS, Central Texas Regional Mobility Authority (CTRMA) and SH 130 Concession Company LLC (the SH 130 Concession), and the non-toll highway network in the region

The transportation model used for the forecasting process was developed by Stantec for the CTTS based on the model developed by the Capital Area Metropolitan Planning Organization (CAMPO) and supplemented by an extension to the south to include the San Antonio region. The modeled area within the San Antonio region was obtained from the regional model prepared by the San Antonio – Bexar County Metropolitan Planning Organization, now the Alamo Area Metropolitan Planning Organization (AAMPO).

Previous studies for the CTTS prepared by Stantec staff date back to 2002 for the original financing of the system. At that time there were no toll roads in Austin. After CTTS opened to traffic and was expanded, updated studies were prepared in 2005, 2008, 2010 and, most recently, in 2012. These studies, including the current study, and the terms used to reference them in this report are shown in Table 1.1.

Table 1.1 CTTS Traffic & Revenue Studies

Date	Report Title	Reference Used Herein *
July 22, 2002	Central Texas Turnpike System 2002 Project Traffic and Revenue	2002 Report
December 8, 2005	Central Texas Turnpike System 2002 Project Traffic and Revenue Forecast, 2005 Update	2005 Report
February 11, 2009	Central Turnpike System 2008 Project Review	2008 Review
December 20, 2010	Central Texas Turnpike System 2010 Project Traffic and Revenue	2010 Update
September 20, 2012	Central Texas Turnpike System 2012 Project Traffic and Revenue	2012 Update
November 1, 2014	Central Texas Turnpike System 2014 Traffic and Revenue Study	2014 Study

Note: * The 2002 Report, 2005 Report, 2008 Review, 2010 Update and 2012 Update are collectively refferred to as " the Previous Reports".

1.3 ORGANIZATION OF THE REPORT

The remainder of this report is organized in the following chapters:

Chapter 2 – Regional Transportation Network. This chapter describes the CTTS, other toll roads and the non-toll highway system in the Austin area and proposed key network improvements.

Chapter 3 – Existing Travel Patterns. This chapter presents a summary of traffic counts, travel time data and other information used in developing the forecasts and discusses travel patterns in the area.

Chapter 4 – Toll Collection. This chapter presents the methods of toll collection and toll rates on the CTTS system and future toll policy.

Chapter 5 – Historical CTTS Toll Transactions and Revenue. This chapter presents the history of toll road traffic performance in terms of number and type of transactions, payment type and daily and seasonal traffic activity. This chapter also presents historical toll revenues for the CTTS elements.

Chapter 6 – Socioeconomic Review. This chapter describes historical trends as well as existing and forecasted socioeconomic conditions, and the assumptions used to assess future development in the CTTS study area.

Chapter 7 – Model Validation and Refinement. This chapter explains the methodology used to produce travel demand forecasts for the CTTS study area, based upon Stantec's integrated model developed from the CAMPO and AAMPO models. The toll diversion model developed by Stantec staff and the results of the model validation are also described.

Chapter 8 – Traffic and Revenue Forecasts. This chapter presents updates to the original 35-year forecasts of traffic and revenue for each of the CTTS elements; presents estimates of customer service center revenue; and summarizes the Assumptions and Conditions used in preparing the forecasts. Also included is an allocation process for preparing monthly forecasts of transactions and toll revenue.

Chapter 9 – Sensitivities. This chapter shows the changes in the traffic and revenue forecast using different underlying parameters, such as value of time or roadway development timing.

1.4 CONSULTANT TEAM

Stantec, founded in 1954, provides professional consulting services in planning, engineering, architecture, interior design, landscape architecture, surveying, environmental sciences, project management, and project economics for infrastructure and facilities projects, including studies within the Austin area over the past 15 years. Stantec supports public and private sector clients in a diverse range of markets, at every stage, from initial concept and financial feasibility to project completion and beyond. Stantec services are offered through approximately 15,000 employees operating out of more than 230 locations in North America. Stantec trades on the New York Stock Exchange and on the Toronto Stock Exchange under the symbol STN.

Stantec has prepared traffic and revenue financing studies that have been the basis for the sale of more than $38 billion in revenue bonds. Drawing upon a depth in transportation planning and over 30 years of experience in the toll facility industry, Stantec staff advises clients on establishing screening criteria for potential toll facility corridors, completing traffic and revenue analyses at the investment-grade level, developing financial plans and appropriate toll structures, determining the extent to which a proposed toll facility could provide financing for itself and/or other highway projects, maximizing revenue potential, planning and designing for the future, and solving operational problems.

Stantec led the team for the Traffic and Revenue Study and was responsible for project management, coordination, model development and forecasting traffic and revenues for the CTTS. Stantec staff prepared the current report as well as all prior studies and updates.

Three firms assisted in the preparation of this study. These firms were involved in previous traffic and revenue studies for CTTS. They are:

- Michael S. Bomba., Ph.D., (Dr. Bomba) provided the socioeconomic review and employment and population projections used in the traffic model. Income projections for the future year were also provided.

- GRAM Traffic Counting, Inc. (GRAM) provided traffic counts for non-toll locations within the study area.

- Alliance Transportation Group (ATG) conducted travel time surveys in the study area and provided local engineering support in identifying regional highway network improvements.

2.0 REGIONAL TRANSPORTATION NETWORK

The regional transportation network in the Austin area consists of tolled and non-tolled roads. Toll roads, in addition to the toll roads operated by CTTS, include 183A and Manor Expressway owned and operated by CTRMA and SH 130 Segments 5 & 6 financed, constructed, and operated by SH 130 Concession Company, LLC (the SH 130 Concession), a private concessionaire, pursuant to a 52 year concession agreement. The network is shown in Figure 1.1. This chapter includes a description of the existing network and the proposed key network improvements.

2.1 CTTS

The CTTS is a 72.8-mile toll road system in the Austin metropolitan area comprised of four elements: SH 45N, Loop 1, SH 130 (Segments 1 – 4) and SH 45SE. SH 130 opened in phases between 2006 and 2008; Loop 1 and SH 45N East, the portion east of Loop 1, opened in 2006 and SH 45N West, the portion west of Loop 1, opened in 2007. SH 45SE opened in May 2009 and became part of the CTTS in September 2012. Since the CTTS elements were the first toll roads in the Austin area, the roads opened with reduced rate tolls or toll-free. Tolls were gradually introduced as the public became more familiar with the advantages of using the toll facilities. Toll payment on all CTTS elements is by ETC or PBM; there are no operational toll booths. A chronology of major events for the CTTS elements is shown in Table 2.1.

SH 45N is an east-west route located in southern Williamson and northern Travis counties, northeast of Austin. The 12.8-mile toll road extends from US 183 eastward to SH 130. SH 45N connects the north/south routes SH 130, IH-35, Loop 1 and US 183N/183A. The western section serves commuter traffic from central Austin to the northern and western suburbs as well as several shopping areas and through traffic. The eastern section serves the northeast suburbs of Austin and through traffic.

The eastern portion of SH 45N was opened to traffic in November 2006 and the remaining western portion was completed and opened in spring 2007. The O'Connor Drive interchange opened to traffic on August 21, 2014. The road has three main lanes plus three frontage road lanes in each direction, except for one section which has two main lanes in each direction. Frontage roads are parallel to the mainline both east and west of the Loop 1 Interchange; however, they are not continuous through the Loop 1 Interchange and at the east end of SH 45N. Direct access and egress is provided for certain moves while others require frontage road connections. There are two mainline paypoints and gantries on ramps serving seven interchanges on SH 45N.

Table 2.1 Chronology of CTTS Events

Date	Event
October 2006	Loop 1, SH 45 N East and SH 130 Segment 2 open toll free
December 2006	SH 130 Segment 1 opens toll free
January 2007	Begin tolling - cash tolls full rate and ETC toll free for all open toll facilities
January 2007	PBM pilot program established
February 2007	Cash tolls full rate and ETC half rate for all open facilities
March 2007	Full rate tolls for all open facilities
August 2007	SH 45 N West opens with full rate tolls
September 2007	SH 130 Segment 3 opens with full rate tolls
April 2008	SH 130 Segment 4 opens with full rate tolls
September 2008	SH 45 N Heatherwilde Ramps open with full rate tolls
May 2009	SH 45 SE opens as TxDOT toll road; ETC toll free, PBM full rate, no cash tolls (shape-based rates)
June 2009	SH 45 SE ETC half rate and PBM full rate
July 2009	SH 45 SE full rate tolls
March 2011	Truck tolls discounted (Capped at 4-Axle Rate) on SH 130 & SH 45 SE
2011	Signalization improvements on SH 45 N frontage road at AW Grimes
Sept/Oct 2011	Speed limits changed from 70 mph to 75 mph on SH 45 N; from 65/70 to 75 mph on IH-35 north of Georgetown
December 2011	Truck tolls discounted (pay auto rate) on SH 130 & SH 45 SE - 1 Month Pilot Program
January 2012	SH 130 Cameron Road Ramps open with full rate tolls (shape based-rates)
March 2012	Speed limits changed from 75 mph to 80 mph on SH 130 Seg 1-4 and SH 45 SE
August 2012	New toll escalation policy adopted
August 2012	System-wide cashless operations adopted
August 2012	January 2013 toll increases adopted
September 2012	SH 45 SE becomes part of CTTS
September 2012	PBM adopted as a permanent payment method
December 2012	Introduction of toll free program for Disabled Veterans and Medal of Honor and Purple Heart recipients paid by SHF
January 2013	System-wide toll increases are implemented along with cashless operations
February 2013	Truck tolls discounted (pay auto rate) on SH 130 & SH 45 SE - 1 Month Pilot Program
April - December 2013	Truck tolls discounted (pay auto rate) on SH 130 & SH 45 SE - Extended Pilot Program
April 2013	Shape-based toll rate replaced by axle-based toll rates on SH 45 SE and SH 130 Cameron Road Ramps
January 2014	First toll increase based on the CPI-U following adoption of annual toll escalation policy
April 2014	Xerox assumes responsibility for toll operations and collection transition period
August 2014	Opening of SH 45 N / O'Connor Drive Ramps

Loop 1 is a north-south route located in southern Williamson and northern Travis counties and is also known as the MoPac Expressway. The route provides a by-pass around western Austin for commuter and other traffic between the northern and western suburbs and downtown Austin. Loop 1 opened to traffic in November 2006. The 4-mile toll road extends southward from a connection with SH 45N to the intersection with Parmer Lane and serves as a connector between SH 45N and non-tolled Loop 1 to the south. The road has three lanes in each direction on the southern end and four lanes in each direction on the northern end. Access and egress is via parallel frontage roads south of Shoreline Drive. There are paypoints at one mainline location and on ramps serving two interchanges.

SH 130 Segments 1 – 4 extends from IH-35 in Georgetown in Williamson County on the north side of Austin to US 183S/SH 45SE south of Austin-Bergstrom International Airport in Travis County. On its southern end, the 49-mile toll road connects with SH 45SE, which provides access to IH-35. SH 130 also connects with SH 130 Segments 5 & 6, a toll road operated by the SH 130 Concession. The full 90-mile SH 130 toll route provides an alternate route to IH-35 and a by-pass of the city of Austin for through trips. The route also serves local trips in the corridor east of Austin. There are paypoints at four mainline locations and on ramps at 16 interchanges on SH 130 Segments 1-4.

SH 130 opened in phases between November 2006 and May 2008. The Cameron Road interchange opened to traffic in January 2012. Discontinuous frontage roads parallel the four-lane toll road.

SH 45SE serves as a 7-mile connector for traffic between the southern end of SH 130 Segment 4 and IH-35 in Travis County south of Austin. The four-lane toll road has one mainline paypoint near its western terminus and two sets of ramps with paypoints at the N. Turnersville Road and FM 1625 interchanges. SH 45SE was opened in May 2009 and operated by TxDOT until September 2012 when it became part of CTTS.

2.2 OTHER TOLL ROADS IN AUSTIN AREA

Other toll roads in the Austin area include the 183A and the Manor Expressway owned and operated by CTRMA and SH 130 Segments 5 & 6 financed, constructed, and operated by a concessionaire pursuant to a 52 year concession agreement.

183A is a six-lane controlled access highway approximately 11.6 miles long and functions as a central arterial through Leander and Cedar Park in Williamson County. 183A interacts with CTTS through its interchange at the western terminus of SH 45N. The road is primarily a commuter route but it also provides access to and egress from the northwest Austin shopping areas.

Phase I of 183A opened to traffic in March 2007 providing mainline and frontage road service from SH 45N to just north of FM 1431. The toll road was opened with reduced rate tolls and full tolling began in July 2007. Phase II opened in April 2012 and extended the mainline toll lanes from FM 1431 to CR 276, approximately 5.1 miles. In December 2008, cash tolls were eliminated; required payment of tolls is either by ETC or PBM at all paypoints.

The **Manor Expressway** (US 290E), is a six-lane controlled access highway approximately 6.2 miles in length with associated ramps, frontage roads and toll collection facilities located in the City of Austin, Travis County. Tolling is at two mainline locations and at four interchanges.

- *Manor Expressway Phase I Project:* The Manor Phase I project is four tolled direct connectors and associated pavement at the US 183 interchange that provides direct access to and from the Manor Expressway Project mainlines. This phase was opened January 2013.

- *Manor Expressway Phase II Project:* The Manor Expressway Phase II Project is an approximately 6.2 mile toll road project located along the existing US 290 corridor between US Highway 183 and just east of SH 130. This phase of the project opened May 2014.

- *Manor Expressway Phase III Project:* As traffic conditions warrant and funding is identified, the Manor Expressway Phase III Project is anticipated to involve the construction of additional direct connectors at the SH 130 interchange and the associated ramps.

The Manor Expressway interacts with the CTTS through its interchange with the SH 130 element of the CTTS.

SH 130 Segments 5 & 6, operated by the SH130 Concession, extends 41 miles from the southern terminus of the CTTS SH 130 element to a connection with I-10 northeast of Seguin. SH 130 Segments 5 & 6 opened to traffic in October 2012 and consists of four toll lanes. US 183S serves as a parallel frontage road system from the segment 4 terminus of SH 130 to Lockhart, primarily within the limits of Segment 5. There are two mainline paypoints and paypoints on ramps serving seven interchanges on the road. As this facility was recently completed, its toll collection system was structured to collect tolls by either ETC or PBM. In contrast to all of the other Austin area toll roads, toll rates for SH 130 segments 5 & 6 are based on the shape of the vehicle (passenger car, single unit or tractor trailer) rather than the number of axles.

The full SH 130 route (the CTTS SH 130 elements 1-4 and Segments 5 & 6 of the SH 130 Concession) and a segment of I-10 provide a long-distance eastern by-pass around the City of Austin. The SH 130 Concession Segments 5 & 6 interacts with the CTTS SH 130 element since together the roads provide the major portion of an alternative to IH-35 for long distance traffic between Austin and San Antonio. SH 130 Segments 5 & 6 also interact with SH 45 SE, providing a continuous limited access facility from Lockhart into Austin via IH-35.

2.3 NON-TOLL ROADWAY NETWORK IN AUSTIN

The major routes in the Austin area which act as either feeder or competing routes with the CTTS elements include: IH-35, US 183 (Bell Boulevard/Research Boulevard), FM 734 (Parmer Lane), County Route 30 (Gattis School Road), US 79 (Palm Valley Boulevard), FM 1431 (Whitestone Boulevard) and FM 973. In some cases, one of these roads can be a feeder to one CTTS element and a competing route for a different CTTS element.

Stantec has developed two broad categories to provide an indication of how various highway elements relate to each other as "feeders" (F) or "competitors" (C) for specific trip patterns. Generally speaking, if a roadway intersects with another roadway they are considered feeders to each other for selected travel movements, while if two roadways are parallel and in some close proximity to each other, they are considered to be competitors for some portion of trip patterns. Due to the increasingly complex system of roadways in the Austin region, each new or expanded roadway serves multiple trip patterns and the interrelationship seldom fits neatly into one or the other category (i.e., the new or expanded roadway may carry both feeder and competitor traffic). A quantitative method of determining the interrelationships would be to

remove individual roadway elements from the travel demand model and compare the traffic forecasts without the element in place. The multitude of projects planned for this region would make this approach impractical. For purposes of this study, Stantec has applied a more qualitative method of using engineering judgment to establish the effect of roadway improvements on individual CTTS elements or segments within CTTS elements, noting that a new or expanded roadway may function as a feeder to one CTTS element/segment and a competitor to another. The limitation is that the scale of the impact cannot be easily forecast and, in the case of competitive elements, the impact applies differently to drivers depending on the specific trip pattern for which the elements are truly competitive. The relationships between these routes and the CTTS elements are summarized in Table 2.2.

Table 2.2 Relationships between Non-Toll Routes and CTTS Elements

Route		Effect on CTTS Element	
		F/C*	Element
IH-35		C	SH 130
		C	Loop 1
US 183		F	SH 45N
		C	SH 130
		C	Loop 1
FM 734	Parmer Lane	F	SH 45N
		F	SH 130
County Rt. 30	Gattis School Road	F	SH 130
		C	SH 45N
US 79	Palm Valley Blvd.	F	SH 130
		C	SH 45N
FM 1431	Whitestone Blvd.	C	SH 45N
FM 973		C	SH 130

*F = Feeder
C = Competitor

IH-35, a major north-south US route from Canada to Mexico, carries local traffic in the Austin area in addition to long distance traffic. The route has two to six lanes in each direction, plus frontage roads. In addition to the surface route, there is an elevated four-lane express route through the Austin Central Business District (CBD). IH-35 is a competing route to SH 130 for long distance through trips. According to TxDOT, in 2014, IH-35 in Travis County was the second most congested road in Texas for all traffic and the most congested road in Texas for trucks.

US 183 begins at US 90 in Luling, continues north parallel to SH 130 Segments 5 & 6 acting as a frontage road to SH 130 Segments 5 & 6. At the southern terminus of Segment 4 of SH 130, US 183 continues along the east side of downtown Austin and then turns northwest of the City. The route is a 4-lane divided highway with frontage roads between US 290 and SH 45N.

US 183 interacts with three elements of the CTTS. As the western terminus of SH 45N, US 183N is a feeder route for that facility. It is parallel to Loop 1 and, therefore, a competitor to that CTTS element. US 183 is also a competitor to the southern sections of SH 130.

Parmer Lane (FM 734) extends from US 290 southeast of Austin in a northeasterly direction to the suburbs northwest of Austin. The road intersects with SH 130; Loop 1, south of the tolled portion; and SH 45N. The road is an arterial with four lanes on its eastern and western ends and six lanes in the more populated central portion. Parmer Lane is a feeder route for SH 45N and SH 130.

Gattis School Road (County Route 30) and **US 79 (Palm Valley Boulevard)** are competing routes to the eastern section of SH 45N. Gattis School Road is an east/west 4-lane arterial route north of Austin, between IH-35 and SH 130. It is approximately three miles north of SH 45N and the nearest competing route to the eastern section of SH 45N. US 79 also extends from IH-35 easterly to SH 130, parallel to the eastern section of SH 45N. The road is a 4-lane arterial approximately one mile north of SH 45N. Both Gattis School Road and US 79 have interchanges with SH 130 and therefore act as feeder routes to that CTTS element.

FM 1431 (Whitestone Boulevard) competes with the western section of SH 45N: Whitestone Boulevard is a four-lane arterial approximate five miles north of SH 45N, extending from US 183 easterly to IH-35.

FM 973 competes with SH 130 between US 290 and US 183. FM 973 is a north/south 2-lane arterial extending over 20 miles from its southern terminus with US 183 to US 290E. The roadway parallels the alignment of SH 130 through mostly rural farmland. Capital Metro, operator of Austin's regional public transportation system, provides limited bus and light rail service in the area. MetroRail, the 32-mile light rail line, operates between Leander and downtown Austin Monday through Friday and between Lakeland and downtown Austin on Saturday. The system has nine stations and three Park & Ride facilities. The route is parallel to SH 183A, SH 45N and Loop1; however it provides limited competition with the CTTS elements due to the limited schedule.

2.4 RECENT AND PROPOSED KEY NETWORK IMPROVEMENTS

Stantec used a regional transportation planning model originally developed by CAMPO, and expanded to include the region in the AAMPO model encompassing San Antonio. Key recent and proposed improvements to toll roads and toll-free routes in the region were applied to the networks used for the base model year 2013 and for future model years 2015, 2020, 2030 and 2040. (All model years discussed in this section represent calendar years.)

The latest available plans for proposed toll road projects were obtained from CTRMA, TxDOT and the counties in the Austin area. For other roadway projects, Stantec used the CAMPO 2035 Regional Transportation Plan (adopted May 24, 2010) along with more recent amendments. In addition, the project team also reviewed the draft version of the CAMPO 2040 Regional Transportation Plan to obtain the latest information about the implementation and configuration of individual projects. Based on the degree of commitment (feasibility studies, funding ROW status, and program inclusion), judgments were made as to whether or not to include projects in the future highway networks.

Several toll road projects in the Austin area, including managed lanes with dynamic pricing, as well as expressways, are currently in the planning or development stages. These facilities will be

owned and operated by CTRMA. The description and anticipated schedule for these projects, as currently envisioned, are shown in Table 2.3.

Table 2.3 Proposed Toll Facilities in Austin Area

Roadway	Managed Lane (dynamic pricing) vs. Toll Road (fixed toll rate)	Assumed Opening Year	Length	Full Length Toll	Toll Rate per mile	Number of Tolled Mainline Segments	Lane Configuration
Bergstrom Expressway	Toll Road	2018 Interim Build, 2020 Full Build	8.0	$2.29 (in 2020$)	$0.29 (in 2020$)	2	3 lanes per direction from 290E to 71E. Direct connectors on 183S to 290E (NB to EB and WB to SB) and 183S to 71E (SB to WB and EB to NB)
MoPAC North Express Lanes	Managed Lane (3+ axle vehicles not allowed)	2016	11.5	$0.50 (in 2016$) (minimum rate is 5 cents per mile in 2016$)	$0.05 (in 2016$)	2	1 express lane per direction from Parmer Lane (FM 734) to Cesar Chavez Street
71 E Express Lanes	Toll Road	2016	3.0	$0.78 (in 2016$)	$0.26 (in 2016$)	1	1 lane per direction from Presidential to Terry Lane; 2 lanes per direction from Terry Lane to Falwell Lane; and 1 lane per direction from Falwell to east of SH 130
45 SW Phase 1	Toll Road	2017	3.4	$0.90 (in 2017$)	$0.26 (in 2017$)	1	2 lanes per direction from Loop 1 to FM 1626
MoPAC South Express Lanes	Managed Lane (3+ axle vehicles not allowed)	2020	7.9	$0.55 (in 2020$) (minimum rate is 5 cents per mile in 2016$)	$0.07 (in 2020$)	2	2 express lanes per direction from Caesar Chavez to Loop 360 and 1 express per direction from Loop 360 to Slaughter Lane
183N Express Lanes	Managed Lane (3+ axle vehicles not allowed)	2020	7.2	$0.55 (in 2020$) (minimum rate is 5 cents per mile in 2016$)	$0.08 (in 2020$)	2	1 express lane per direction from Northern Terminus to Lake Creek Parkway, 2 express per direction from Lake Creek Parkway to Loop 1. Direct connectors on 183N to MoPac North Express Lanes (SB to SB and NB to NB). Direct connectors at the Northern Terminus (4 DCs, NB egress to 45N EB&WB and SB ingress from 45N EB&WB)
45 SW Phase 2	Toll Road	2025	3.8	$1.24 (in 2025$)	$0.33 (in 2025$)	1	2 lanes per direction from FM 1626 to I-35

Note: Subject to change.

2.4.1 2012 – 2013 Key Network Improvements

A number of major network changes have been completed and opened to traffic between 2012 and 2013. These improvements were incorporated into the model to update it to the base year 2013:

- The most significant improvement to the highway network, on a regional level, is the addition of SH 130 Segments 5 and 6, which opened with toll-free operations in October 2012. Tolls were introduced in November 2012. These new segments extend the SH 130 toll road southward to I-10 northeast of San Antonio. Two direct connectors were constructed between SH 130 Segment 5 and SH 45 SE, facilitating the movements between SH 130 to/from the south and SH 45 SE to/from the west; and

- Phase I of the Manor Expressway (US 290 E), a limited-access toll road, was opened to traffic in January 2013. The project is constructed within the expanded median of US 290 and connects US 183 and SH 130. (See section 2.2 for a further information for this road.)

2.4.2 2014-2015 Key Network Improvements

Two toll projects completed in 2014 are the Phase II Full Build Manor Expressway extending from the end of Phase II Interim Milestone to 0.5 miles east of FM 734 (Parmer Lane), and the O'Connor Interchange providing an improved connection between SH 45N/Loop 1 Toll Roads and RM 620.

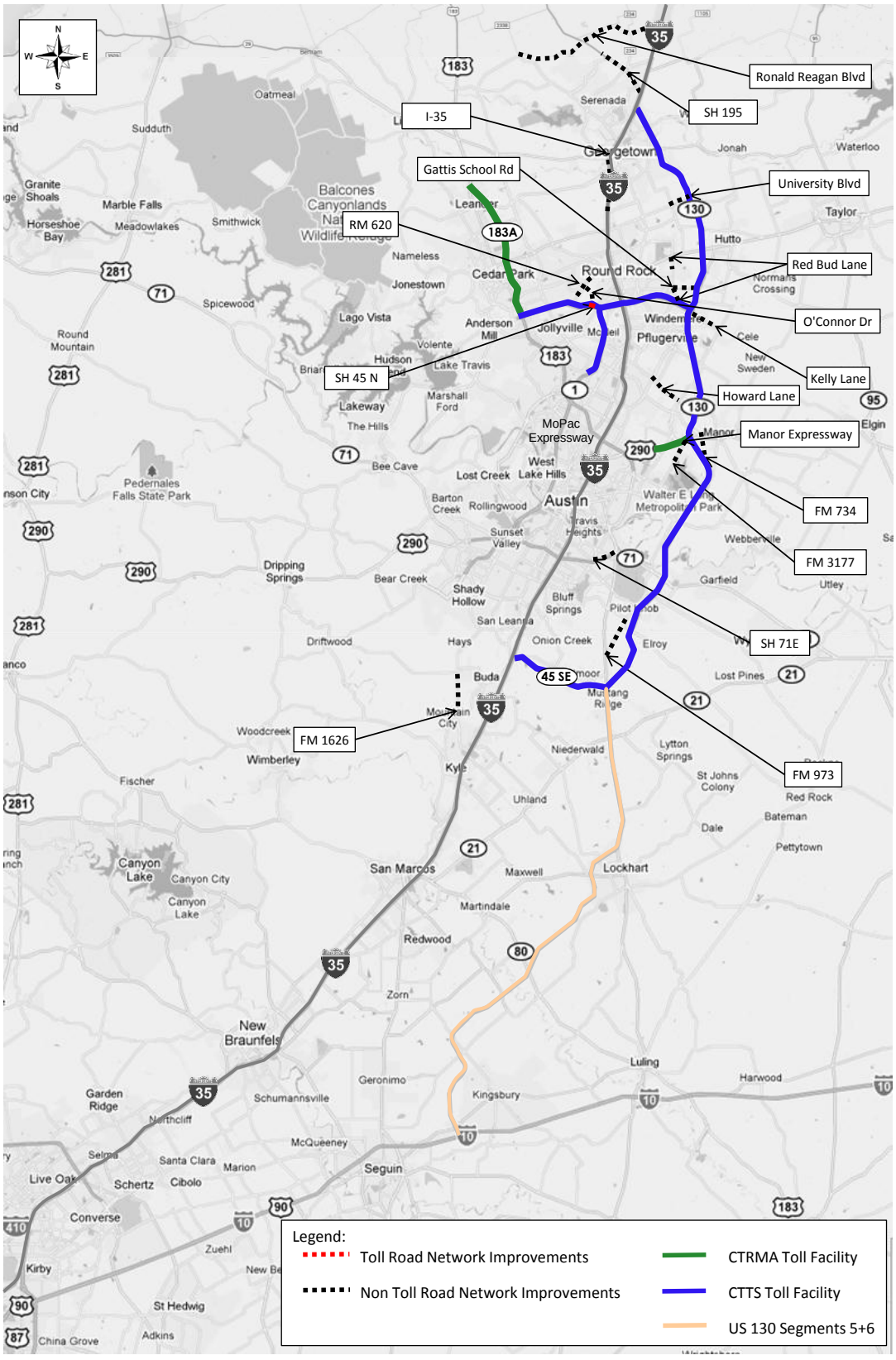
A number of other changes have been completed or are expected to be completed during this period. A new northbound frontage road from Westinghouse Road to SH 29 along IH-35 is scheduled to be completed in 2015. Other major improvements include upgrading existing roadways (SH71E, FM 1626, RM 620, Gattis School Road) and building new sections of existing roadways (FM 734, O'Connor Drive). Major improvements to the regional highway network for the period 2014 and 2015 were incorporated into the model for the year 2015. These improvements are listed in Table 2.4, along with whether they are feeder or competing routes with the CTTS elements, based on judgment, and shown in Figure 2.1.

Table 2.4 Key Network Improvements 2014 – 2015

Route Name/Number	Planned Improvement	Limits	Opening Year	Effect on CTTS Element	
				F/C*	Element
Toll Roads					
Manor Expressway, Phase II Full Build	New Toll Road	East of Springdale to east of FM 734	2014	F	SH 130
SH 45 N	O'Connor Interchange	SH 45 N/Loop 1/O'Connor Drive	2014	F	SH 45 N, Loop 1
Non Toll Roads					
US Highways					
IH-35	New NB frontage road	Westinghouse Rd to SH 29	2015	C	SH 130, Loop 1
State Highways					
SH 71E	New frontage road & interchange upgrade	West of Montopolis Rd to US 183 S	2014	F	SH 130
SH 195	Widening project	SH 138 to IH-35	2015	F	SH 130
FM 1626	Widening project	FM 967 to RM 2770	2015	NA	-
RM 620	Upgrade project	Cornerwood Dr to Wyoming Springs	2015	F	SH 45 N
FM 734	Roadway extension	Old Hwy 20 to Blue Bluff Rd	2015	F	SH 130
FM 973	Widening project	FM 812 to US 183	2015	C	SH 130
FM 3177	Roadway realignment	US 290 E to Lindell Lane	2015	F	SH 130
Other					
O'Connor Drive	Roadway extension	RM 620 to SH 45N	2014	F	SH 45 N, Loop 1
Gattis School Rd	Upgrade project	CR 122 to SH 130	2015	F	SH 130
				C	SH 45 N
Kelly Lane	Roadway extension	Murchison Ridge Lane to Moorlynch Ave	2015	F	SH 45 N, SH 130
Red Bud Lane	Upgrade and widening project	CR 123 to Woodland Loop	2015	NA	-
Red Bud Lane	Widening project	Gattis School Rd to Heatherwilde Blvd	2015	NA	-
University Blvd	Upgrade project	CR 110/Southwestern Blvd to SH 130	2015	F	SH 130
Howard Lane	Upgrade project	Dessau Rd to Cameron Rd	2015	F	SH 130
Ronald Reagan Blvd	Roadway extension & widening	FM 2338 to IH-35	2015	C	SH 130

* F = feeder; C = competitor

Figure 2.1 Key Network Improvements Map 2014-2015



2.4.3 2016 – 2020 Key Network Improvements

Several toll road projects are scheduled to be completed between 2016 and 2020. These include Managed Lanes on MoPac North in 2016, on MoPac South in 2020 and on 183 North in 2020. The Bergstrom Expressway, scheduled to be completed in phases between 2018 and 2020, will provide toll lanes in the center of US 183 South between the Manor Expressway and SH 71 E. Express lanes on SH 71E between Presidential Boulevard and SH 130 are scheduled for 2016. The 45 SW Phase 1 Toll Road is planned to open in 2017 between Loop 1 S and FM 1626.

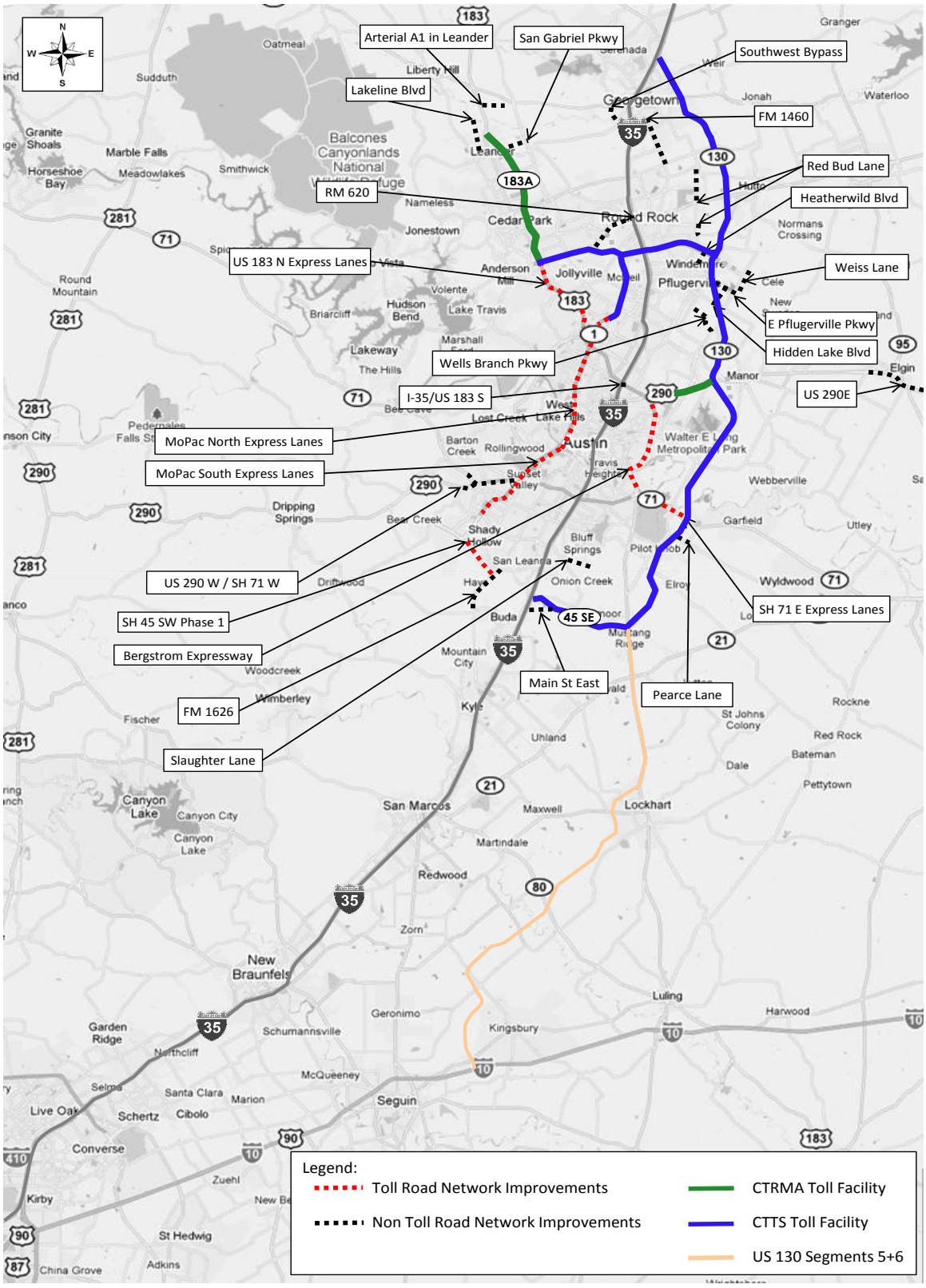
Non-toll road projects include the construction of direct connectors between IH-35 and US 183 South and the upgrade and widening of US 290E between FM 696 and the Lee County line, and US 290W/SH71W from Loop 1 to FM 1826 and US 290W to Silvermine Drive. Upgrading is also scheduled for RM 620, FM 1460 and FM 1626. The improvements listed in Table 2.5, along with their relationship to the CTTS elements, based on judgment, and shown in Figure 2.2 were included in the 2020 regional transportation model.

Table 2.5 Key Network Improvements, 2016 – 2020

Route Name/Number	Planned Improvement	Limits	Opening Year	Effect on CTTS Element	
				F/C*	Element
Toll Roads					
MoPac North Express Lanes	Managed Lanes	Between Parmer Lane and Cesar Chavez St	2016	F	Loop 1
SH 71 E Express Lanes	New Toll Road	Between Presidential Blvd and SH 130	2016	F	SH 130
SH 45 SW Phase 1	New Toll Road	Between S MoPac Expwy and FM 1626	2017	NA	-
Bergstrom Expressway	New Toll Road	Between Manor Expressway and Patton Ave; Direct Connectors to/from SH 71E	Phased 2018 to 2020	C	SH 130
US 183 N Express Lanes	Managed Lanes	SH 45 N - MoPac North	2020	F	SH 45 N
MoPac South Express Lanes	Managed Lanes	Between Cesar Chavez St and Slaughter Lane	2020	F	Loop 1
Non Toll Roads					
US Highways					
IH-35/US 183 S	Construct Direct Connectors	IH-35/US 183 to/from the south and US 183 S/IH-35 to/from the north	2017	C	SH 130
US 290 E	Upgrade and widening project	FM 696 to Lee County Line	2018	F	SH 130
US 290 W/SH 71W (Oak Hill Pkwy)	Upgrade and widening project	S MoPac Expressway to FM 1826/US 290W to Silvermine Dr	2018	NA	-
State Highways					
RM 620	Widening project	Cornerwood Dr to IH-35	2020	C	SH 45 N
FM 1460	Upgrade and widening project	FM 2243 to University Blvd	2020	C	SH 130
FM 1626	Widening project	Brodie Lane to FM 967	2020	NA	-
Other					
Main St East	New segment	IH-35 to Turnersville Rd	2016	F	SH 45 SE
Weiss Lane	Widening and upgrade project	Pecan St to Kelly/Cele Lane	2017	NA	-
Hidden Lake Blvd	New segment	E Pflugerville Pkwy to Pecan St	2016	F	SH 130
Arterial A1 in Leander	New segment	US 183 N to Kauffman Loop	2020	NA	-
CR 122/Red Bud Lane	Widening and upgrade project	CR 112 to US 79	2020	C	SH 130
CR 122/Red Bud Lane	Widening and upgrade project	Forest Creek Blvd to Gattis School Rd	2020	C	SH 130
Heatherwilde Blvd	Widening and upgrade project	SH 45N to Wilke Ridge Lane	2020	C	SH 130
				F	SH 45 N
Lakeline Blvd	New segment	San Gabriel Pkwy W to CR 271/281	2020	NA	-
Pearce Lane	Widening and upgrade project	SH 130 to Ross Rd	2020	F	SH 130
San Gabriel Pkwy	New segment	CR 270 to Ronald Reagan Blvd	2020	NA	-
Wells Branch Pkwy	Widening and upgrade project	Immanuel Rd to Cameron Rd	2020	F	SH 130
E Pflugerville Pkwy	Upgrade project	SH 130 to Weiss Lane	2020	F	SH 130
Southwest Bypass	New segment	SH 29 to IH-35	2020	NA	-
Slaughter Lane	New segment	Pleasant Valley Rd to Thaxton Rd	2020	NA	-

* F = feeder; C = competitor

Figure 2.2 Key Network Improvements Map 2016-2020



2.4.4 2021 – 2030 Key Network Improvements

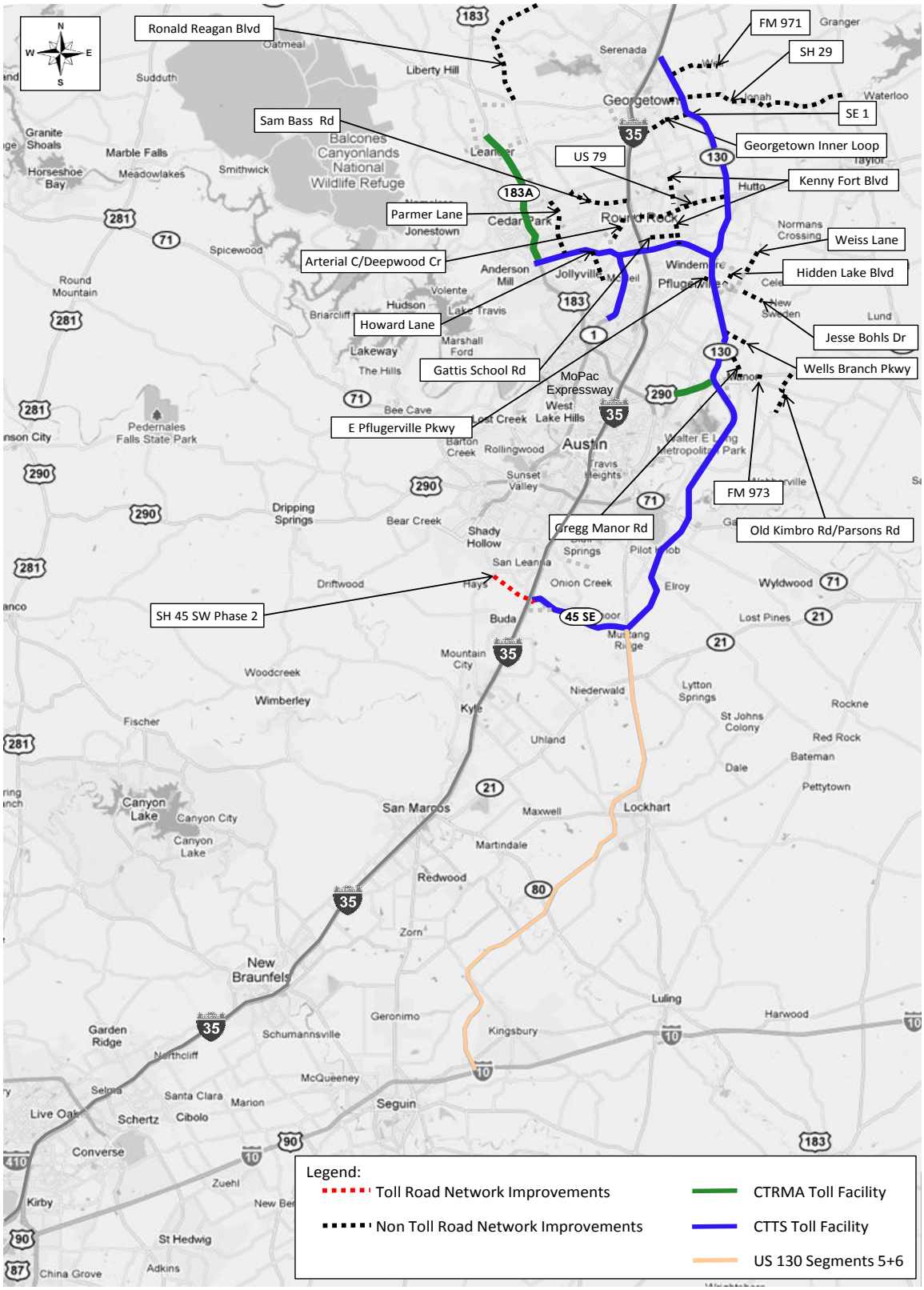
The only toll road planned to be opened in the 2021 - 2030 period is the SH 45 SW Phase 2 Project between FM 1626 and IH-35, scheduled for completion in 2025. Major non-toll road projects include completing a new segment of Howard Lane between SH 45N and McNeil Road, the widening of US 79 between IH-35 and FM 635, and the upgrade and widening of SH 29, FM 973 and FM 971. Other roadways scheduled for improvements are Ronald Reagan Boulevard, Parmer Lane and Gattis School Road. These projects and the others noted in Table 2.6 and shown in Figure 2.3 were included in the regional highway network for 2030. Also shown in Table 2.6 is the relationship to the CTTS elements, based on judgment.

Table 2.6 Key Network Improvements, 2021 – 2030

Route Name/Number	Planned Improvement	Limits	Opening Year	Effect on CTTS Element	
				F/C*	Element
Toll Roads					
SH 45 SW Phase 2	New Toll Road	FM 1626 - IH-35	2025	F	SH 45 SE
Non Toll Roads					
US Highways					
US 79	Widening project	Business Route IH-35 to FM 685	2030	F	SH 130
				C	SH 45 N
State Highways					
SH 29	Upgrade and widening project	Georgetown Inner Loop to SH 95	2030	F	SH 130
FM 973	Upgrade and widening project	US 290 to Old Hwy 20	2030	NA	-
FM 971	Upgrade project	SH 130 to FM 1105	2030	F	SH 130
Other					
Jesse Bohls Dr	Upgrade and widening project	Weiss Lane to Cameron Rd	2023	F	SH 130
Hidden Lake Dr	New segment	Dry Brook Blvd to E Pflugerville Pkwy	2025	NA	-
Howard Lane	New roadway	SH 45N to McNeil Rd	2030	F	SH 45 N
				C	Loop 1
Wells Branch Pkwy	New segment	SH 130 to Fuchs Grove Rd	2030	F	SH 130
Ronald Reagan Blvd	Widening project	FM 2338 to SH 29	2030	NA	-
Parmer Lane	Widening project	FM 1431 to Spectrum Dr	2030	F	SH 45 N
Arterial C/Deepwood Cr	New segment	Sam Bass Rd - O'Connor Dr	2030	F	SH 45 N
Weiss Lane	Upgrade and widening project	Kelly Lane to Rowe Lane	2030	C	SH 130
Kenny Fort Blvd	New segment	CR 112/117 to Chandler Creek Blvd	2030	F	SH 45 N
				C	SH 130
Kenny Fort Blvd	New segment	Forest Creek Dr to SH 45 N	2030	F	SH 45 N
				C	SH 130
E Pflugerville Pkwy	Upgrade	FM 685 to SH 130	2020	F	SH 130
Gregg Manor Rd	Upgrade and widening project	Howard Lane to US 290E	2030	F	SH 130
Gattis School Rd	Upgrade and widening project	Greenlawn Blvd to Arterial A in Round Rock	2030	C	SH 45 N
Old Kimbro Rd/Parsons Rd	Upgrade and widening project	US 290E to Blake Manor Rd	2030	NA	-
Sam Bass Rd	Upgrade and widening project	FM 1431 to IH-35	2030	NA	-
SE 1	New segment and widening of existing	Georgetown Inner Loop to SH 130	2030	F	SH 130
Georgetown Inner Loop	Upgrade project	SE 1 (CR 110) to IH-35	2030	F	SH 130

* F = feeder; C = competitor

Figure 2.3 Key Network Improvements Map 2021-2030



One significant project still in the early development stages is a capacity improvement to a 65-mile segment of IH-35 from Georgetown to San Marcos. The project (named Mobility35) generally adds one lane in each direction for the full distance. Current study results indicate the best use of this lane would be some form of express lane. The overall project has many separate elements which include some isolated spot improvements such as auxiliary lanes and collector-distributor lanes at critical locations, some of which will be ready for construction bidding next year. Preliminary cost estimates for the entire set of project improvements exceed $4.0 billion, with funding yet to be identified. Due to the congested traffic conditions on IH-35, the project would likely be built in phases, with the most critical segment in central Austin contingent on the construction of other improvements that would provide additional capacity as bypasses during the construction phase. Those contingent facilities are the planned Bergstrom Expressway and the MoPac improvements (both assumed to be completed by 2020 for the 2014 Study).

In terms of the construction schedule, the complete project could be constructed in seven to ten years, with the segment in central Austin being initiated in 2021 and completed by 2025; however, funding sources have not yet been identified. Given that project construction will require significant detours of existing traffic for extensive periods of time, it is anticipated that, should this project actually be constructed, it would have a potential positive impact on CTTS revenue during the construction period. After construction is completed, some of the diverted traffic will likely continue to use CTTS elements producing a long-term revenue increase. Given the uncertainty of the project and significant construction costs, which lack committed funding at this time, a decision was made not to include this project in the background network for the forecast of future traffic.

2.4.5 2031 – 2040 Key Network Improvements

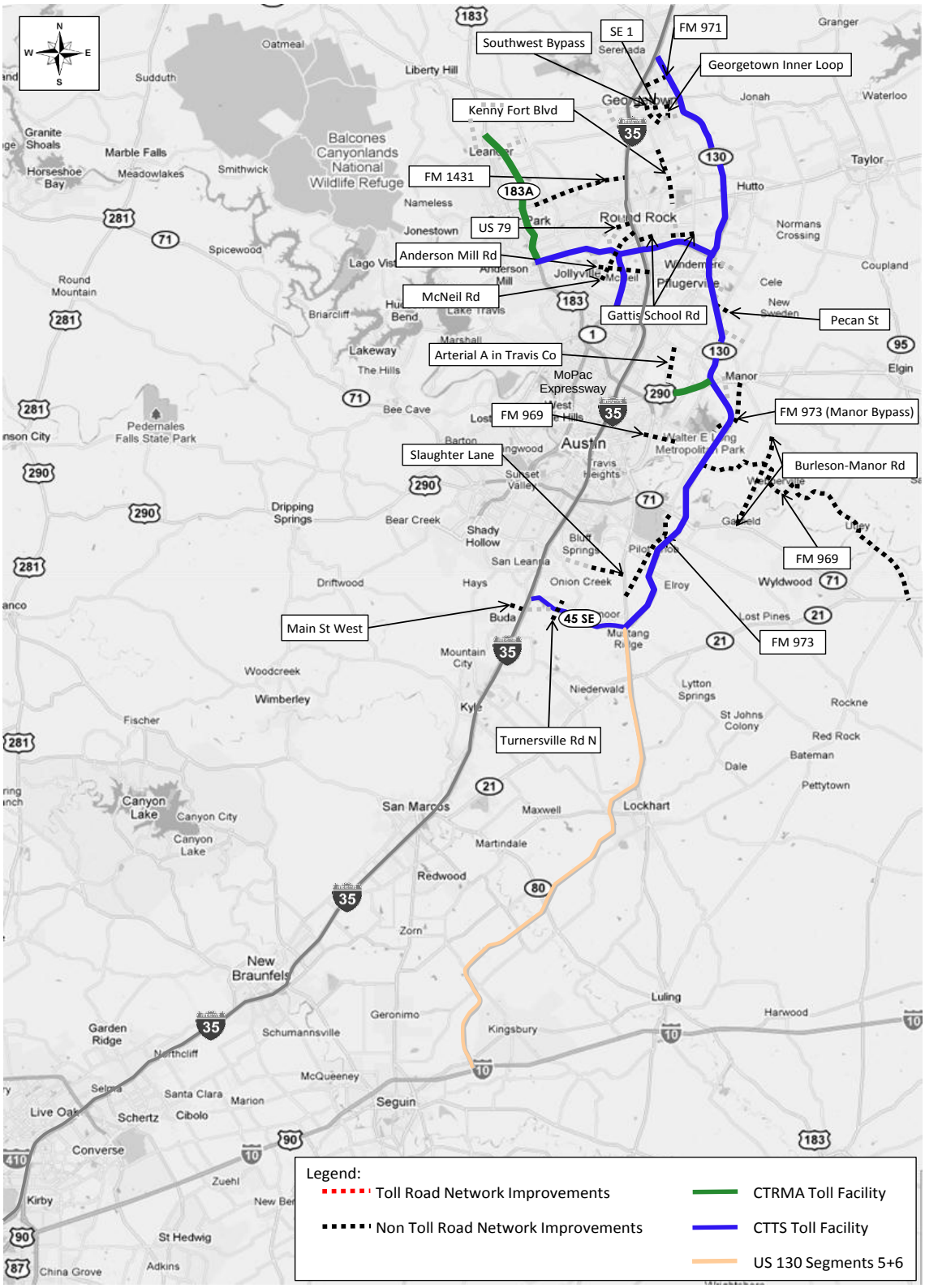
There are no toll roads scheduled for completion during the period 2031 through 2040; however major non-toll road projects include widening FM 969, FM 971 and FM 1431 and upgrading and widening FM 973, McNeil Road and Gattis School Road. New segments are planned for FM 973 (Manor Bypass) between Old Highway 20 and Decker Creek and for US 79 between Deepwood Creek Drive and IH - 35N. These projects and the others listed in Table 2.7 and shown in Figure 2.4 have been included in the highway network for the 2040 model year. The relationship of these projects to the CTTS element is also shown in Table 2.7.

Table 2.7 Key Network Improvements, 2031 – 2040

Route Name/Number	Planned Improvement	Limits	Opening Year	Effect on CTTS Element	
				F/C*	Element
Non Toll Roads					
State Highways					
FM 969	Upgrade project	Webberville Rd to Decker Lane	2035	F	SH 130
FM 969	Upgrade and widening project	East of SH 130 to SH 71	2035	F	SH 130
FM 971	Widening project	Business Route IH-35 to IH-35	2040	F	SH 130
FM 973	Widening and upgrade	SH 71 to US 183	2040	C	SH 130
FM 973 (Manor Bypass)	New segments	Old Hwy 20 to Decker Creek	2040	C	SH 130
FM 1431	Widening project	Cottonwood Creek Trail to IH-35	2040	C	SH 45 N
US 79	New segment	Deepwood Creek Dr to IH-35 N	2040	NA	-
Other					
Turnersville Rd N	Upgrade and widening project	CR 105 to FM 1327	2035	F	SH 45 SE
Anderson Mill Rd	New segment	East of Parmer Lane to Grand Ave Pkwy	2040	F	Loop 1
				C	SH 45 N
Arterial A in Travis Co	New segment	US 290 to FM 734	2040	C	SH 130
Kenny Fort Blvd	New segment	Westinghouse Rd to CR 112	2040	C	SH 130
Burleson Manor Rd	Upgrade and widening project	Blake Manor Rd to FM 969	2040	C	SH 130
Burleson Manor Rd	New segment	FM 969 to SH 71	2040	C	SH 130
McNeil Rd	Upgrade and widening project	Howard Lane to IH-35	2040	C	Loop 1
				F	SH 45 N
Main St West	Upgrade and widening project	Garrisonville Rd to IH-35	2040	NA	-
Gattis School Rd	Upgrade and widening project	Business Route IH-35 to Greenlawn Blvd	2040	C	SH 45 N
Gattis School Rd	Upgrade and widening project	Arterial A in Round Rock to CR 122	2040	C	SH 45 N
Pecan St	Widening project	SH 130 to Cameron Rd	2040	F	SH 130
Slaughter Lane	New segment	Thaxton Rd to US 183	2040	C	SH 45 SE
Southwest Bypass	Upgrade and widening project	SH 29 to CR 110/Southwestern Blvd	2040	C	SH 130
SE 1	Upgrade and widening project	Georgetown Inner Loop to SH 29	2040	C	SH 130
Georgetown Inner Loop	Upgrade and widening project	SE 1 (CR 110) to SH 29	2040	C	SH 130

* F = feeder; C = competitor

Figure 2.4 Key Network Improvements Map 2031-2040



3.0 EXISTING TRAVEL PATTERNS

An extensive traffic data collection program was undertaken to obtain information for validating the output of the regional transportation model. Surveys conducted in the Austin region included traffic counts using Automatic Traffic Recorders (ATRs) and Wavetronics electronic vehicle counting equipment, vehicle classification counts and travel time runs.

3.1 TRAFFIC VOLUMES

The data collection program for the 2014 Study was conducted by GRAM Traffic Counting, Inc. (GRAM). The data were gathered in the April – June 2014 period. Traffic counts were recorded at over 200 locations, including ten locations that included both the mainline and frontage roads. Traffic counts were collected along a series of screenlines and other key locations along the traffic corridors of the toll roads in the Austin region and on competing and feeder routes.

The locations of these screenlines are shown in Figure 3.1 and Figure 3.2. Figure 3.1 displays the screenlines used as part of the overall regional model calibration, which covers the long distance travel between Austin and San Antonio southward into the areas where IH-35 competes with segments 5 & 6 of SH 130. Figure 3.2 displays the screenlines and counts in the focused area served by the CTTS roadways.

Additional data sources were available for use in this study. These sources included approximately 370 counts from recent CTRMA studies, data collected during prior studies for the CTTS projects, as well as data obtained through the TxDOT traffic database. The TxDOT database contributed 1,638 Annual Average Daily Traffic (AADT) counts from the TxDOT 2012 count maps, 106 classification counts from TxDOT's truck count program, and 182 counts from the TxDOT (Statewide Traffic Analysis and Reporting System (STARS), database. Stantec also obtained transaction data for all toll roads that were in operation in 2013. While there was some overlap in the actual count locations, in total, traffic count data was available for 2,443 highway links for purposes of model calibration including 537 counts that were detailed vehicle classification counts used to quantify truck volumes.

Figure 3.1 Overall Screenline Map

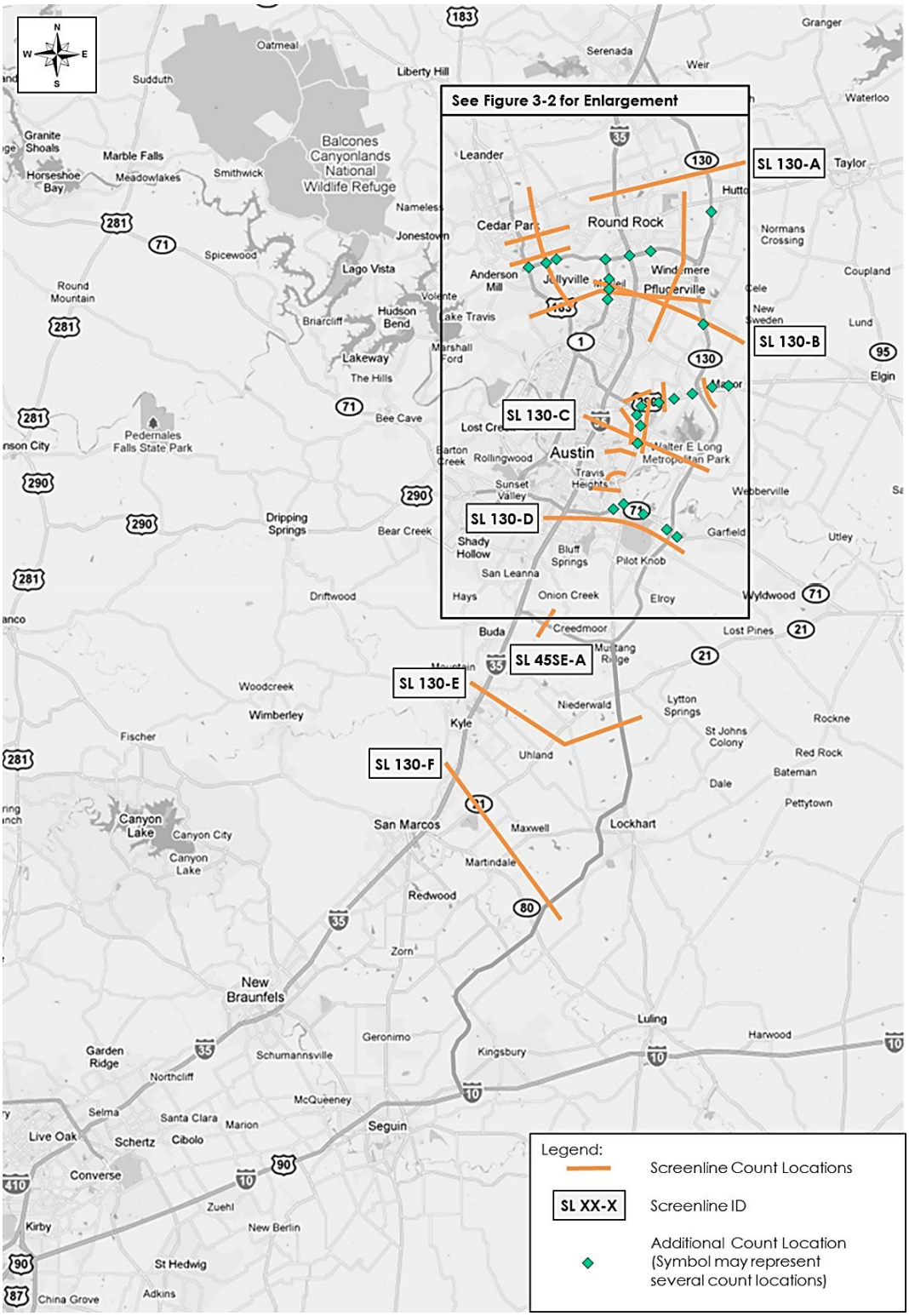
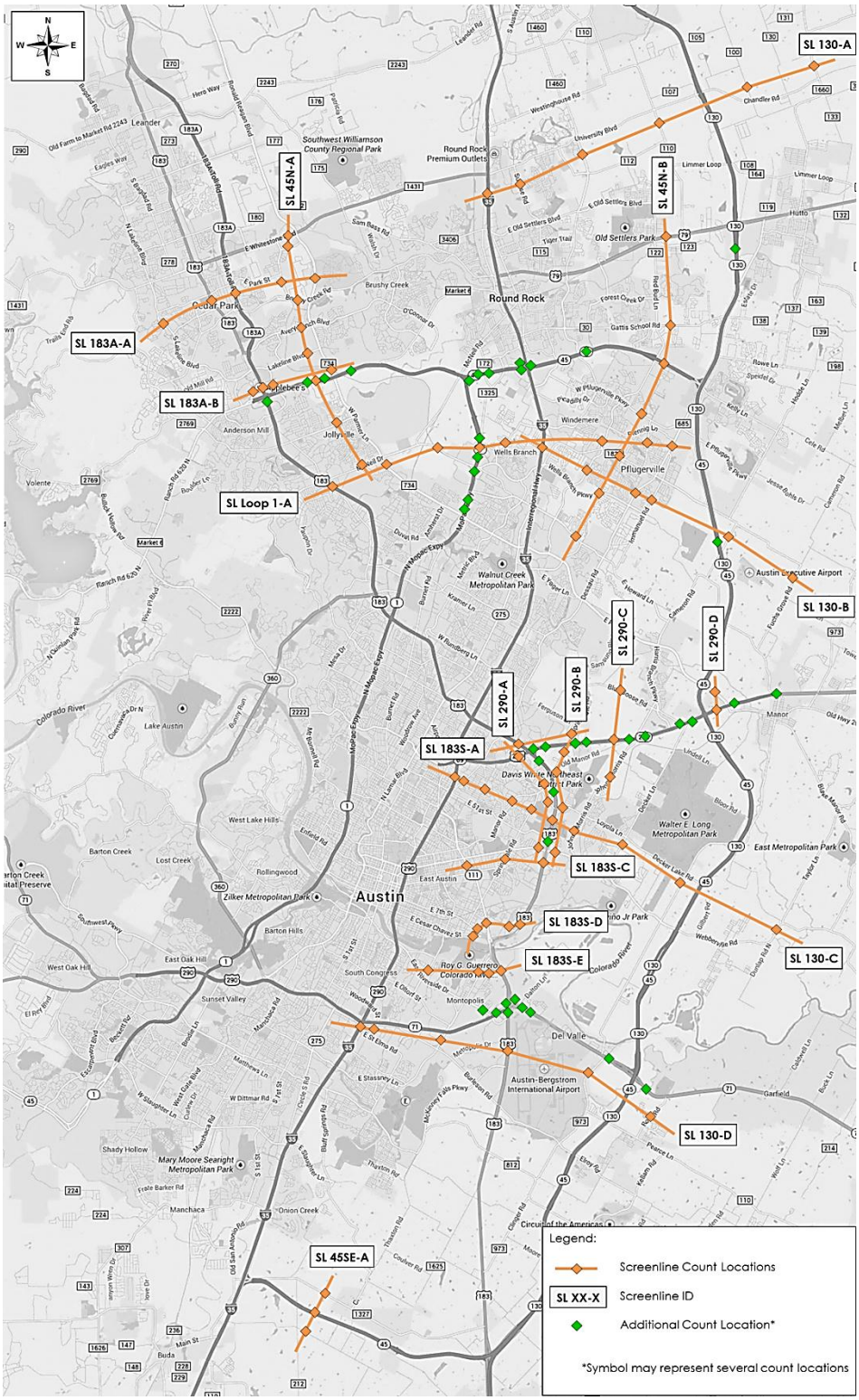


Figure 3.2 Project Area Screenline Map



The screenline locations are intended to capture the toll road traffic at the respective mainline toll paypoints and the non-toll road traffic on adjacent roadways. The observed traffic volumes, broken down by vehicle type, for each screenline count location are shown in Table 3.1 through Table 3.3.

Table 3.1 lists the screenline volumes for the CTTS SH 130 element (Segments 1-4) as well as the two screenlines for the southern section that is operated separately as a concession (Segments 5 & 6), and which is not part of the CTTS. Trucks, which are defined to include 2-axle, 6-tire vehicles for consistency with the regional models, are generally between 10 to 15 percent of all traffic. For the CTTS SH 130 element, the toll road captures approximately 6 to 13 percent of the total traffic along the screenlines. For Segments 5 & 6, the toll road share of screenline traffic is slightly lower at approximately 3 to 5 percent.

Table 3.2 shows the screenline volumes for the SH 45 North, Loop 1, SH 45 SE and 183A, the latter of which is not part of the CTTS. For these screenlines, the toll roads tend to have a larger share of the overall traffic ranging between 17 percent and 53 percent, except for the Loop 1 screenline that includes IH-35. The share of trucks on these toll roads tends be much lower, ranging from approximately 2 to 4 percent, except for SH 45 SE which is a feeder route of long-distance traffic to SH 130.

Table 3.3 lists the screenlines collected as part of the recent CTRMA traffic and revenue study for the planned Bergstrom Expressway (US 183S) in June 2014, shortly after the opening of Phase II of the Manor Expressway. Since the surveys were conducted in fairly narrow corridors centered around the recently completed Manor Expressway (290E) and US 183S, the current non-tolled alignment for the planned Bergstrom Expressway, these roadways tend to have a dominant share of traffic ranging from 26 to 60 percent of the screenline totals. Truck shares for these screenlines are approximately 10 percent.

Table 3.1 2013 Average Weekday Screenline Volumes for SH 130 Screenlines

Route		Auto	Truck	% Truck	Total	% of Total
SH 130						
Screenline 130-A	IH 35	133,510	15,255	10.3%	148,765	75.0%
	CR 115	11,098	755	6.4%	11,852	6.0%
	FM 1460	11,622	990	7.8%	12,611	6.4%
	CR 110	3,193	284	8.2%	3,476	1.8%
	SH 130	**16,617**	**1,837**	**10.0%**	**18,453**	**9.3%**
	CR 100	655	85	11.5%	740	0.4%
	FM 1660	1,760	663	27.4%	2,423	1.2%
	Total	178,453	19,869	10.0%	198,322	100.0%
Screenline 130-B	IH 35	146,092	24,105	14.2%	170,197	69.6%
	Heatherwilde Blvd	10,370	1,405	11.9%	11,775	4.8%
	Dessau / FM 685	19,137	2,779	12.7%	21,917	9.0%
	Immanuel	3,963	347	8.1%	4,310	1.8%
	SH 130	**29,035**	**2,649**	**8.4%**	**31,684**	**13.0%**
	Cameron Rd	2,904	144	4.7%	3,048	1.2%
	Fuchs Grove	1,268	424	25.1%	1,692	0.7%
	Total	212,770	31,853	13.0%	244,623	100.0%
Screenline 130-C	IH 35	197,488	42,255	17.6%	239,743	59.5%
	Cameron Rd.	15,877	1,183	6.9%	17,060	4.2%
	Berkman Dr.	9,939	1,260	11.3%	11,200	2.8%
	Manor Rd.	9,746	277	2.8%	10,024	2.5%
	Springdale Rd.	8,500	287	3.3%	8,787	2.2%
	US 183	50,847	9,026	15.1%	59,873	14.9%
	Johnny Morris Rd.	4,887	295	5.7%	5,182	1.3%
	FM 3177	8,874	863	8.9%	9,737	2.4%
	FM 973	5,682	1,097	16.2%	6,779	1.7%
	SH 130	**26,011**	**2,444**	**8.6%**	**28,454**	**7.1%**
	FM 969	5,379	546	9.2%	5,925	1.5%
	Total	343,230	59,533	14.8%	402,763	100.0%
Screenline 130-D	IH 35	166,144	20,863	11.2%	187,007	64.6%
	Todd Ln.	10,102	1,048	9.4%	11,150	3.9%
	Stassney Ln.	18,836	2,123	10.1%	20,959	7.2%
	US 183	26,725	4,789	15.2%	31,513	10.9%
	FM 973	6,525	1,374	17.4%	7,900	2.7%
	SH 130	**16,420**	**2,209**	**11.9%**	**18,630**	**6.4%**
	Ross Rd.	11,738	667	5.4%	12,405	4.3%
	Total	256,491	33,073	11.4%	289,563	100.0%
Screenline 130-E	IH 35	122,551	7,664	5.9%	130,215	77.4%
	Goforth Rd (FM 157)	2,200	162	6.8%	2,362	1.4%
	SH 21	10,546	2,794	20.9%	13,340	7.9%
	FM 2001	1,878	534	22.1%	2,412	1.4%
	US 183 - SH130 Frontage	8,403	509	5.7%	8,913	5.3%
	SH 130 Seg 5 ML	**7,451**	**1,283**	**14.7%**	**8,733**	**5.2%**
	FM 1854	2,017	254	11.2%	2,271	1.3%
	Total	155,046	13,200	7.8%	168,246	100.0%
Screenline 130-F	IH 35	117,654	11,320	8.8%	128,974	84.1%
	SH 21	10,047	2,328	18.8%	12,375	8.1%
	FM 1984	1,217	169	12.2%	1,385	0.9%
	SH 1342	4,590	469	9.3%	5,059	3.3%
	SH 130 Seg 6 ML	**3,481**	**919**	**20.9%**	**4,400**	**2.9%**
	State Park Rd (FM 20)	1,024	129	11.2%	1,152	0.8%
	Total	138,012	15,334	10.0%	153,346	100.0%

Note: Truck volumes shown include 2-axle, 6-tire trucks and 3+ axle trucks.

Table 3.2 2013 Average Weekday Screenline Volumes for SH 45 N, Loop 1, SH 45 SE, and 183A

Route		Auto	Truck	% Truck	Total	% of Total
SH 45 N						
Screenline 45N-A	FM 1431	35,239	6,589	15.8%	41,828	21.0%
	Colonial Parkway	5,550	693	11.1%	6,243	3.1%
	Brushy Creek Rd.	10,066	2,091	17.2%	12,156	6.1%
	Avery Ranch Blvd.	11,310	1,658	12.8%	12,968	6.5%
	Lakeline Blvd.	8,809	899	9.3%	9,707	4.9%
	SH 45 NW ML	**36,934**	**1,082**	**2.8%**	**38,017**	**19.1%**
	SH 45 NW Frontage	28,893	1,621	5.3%	30,514	15.3%
	Anderson Mill Rd.	15,531	3,016	16.3%	18,547	9.3%
	McNeil Dr.	25,896	3,357	11.5%	29,253	14.7%
	Total	178,229	21,005	10.5%	199,234	100.0%
Screenline 45N-B	US 79	24,120	2,651	9.9%	26,771	17.6%
	CR 168/Gattis School Rd.	14,472	1,228	7.8%	15,700	10.3%
	SH 45 NE ML	**30,696**	**1,226**	**3.8%**	**31,922**	**20.9%**
	SH 45 NE Frontage	7,872	967	10.9%	8,839	5.8%
	Pflugerville Loop Rd.	10,265	1,597	13.5%	11,862	7.8%
	FM 1825/Pecan St.	18,400	3,527	16.1%	21,928	14.4%
	Wells Branch Pkwy	13,974	1,111	7.4%	15,085	9.9%
	Howard Lane	17,788	2,599	12.7%	20,387	13.4%
	Total	137,588	14,906	9.8%	152,494	100.0%
Loop 1						
Screenline Loop 1-A	US 183	144,620	10,915	7.0%	155,535	28.6%
	Parmer Lane	35,782	4,748	11.7%	40,529	7.4%
	Howard Lane	12,720	1,929	13.2%	14,650	2.7%
	FM 1325/Loop 1 SR	21,092	867	3.9%	21,958	4.0%
	Loop 1 Mainline Plaza	**55,775**	**796**	**1.4%**	**56,571**	**10.4%**
	Bratton Lane	6,766	562	7.7%	7,328	1.3%
	IH 35	146,092	24,105	14.2%	170,197	31.2%
	Heatherwilde	15,211	551	3.5%	15,762	2.9%
	N Railroad Rd	6,134	137	2.2%	6,272	1.2%
	FM 685	21,750	2,437	10.1%	24,186	4.4%
	SH 130	29,035	2,649	8.4%	31,684	5.8%
	Total	494,977	49,696	9.1%	544,673	100.0%
SH 45 SE						
Screenline 45SE-A	FM 1327	8,993	1,488	14.2%	10,481	43.6%
	SH 45 SE ML	**11,548**	**1,296**	**10.1%**	**12,844**	**53.4%**
	Turnersville Rd.	648	79	10.9%	726	3.0%
	Total	21,189	2,863	11.9%	24,051	100.0%
183A						
Screenline 183A-A	Lakeline Blvd	22,231	2,165	8.9%	24,396	16.1%
	US 183	32,810	9,372	22.2%	42,182	27.8%
	183A ML	**38,545**	**1,471**	**3.7%**	**40,016**	**26.4%**
	Vista Ridge Blvd	6,851	481	6.6%	7,332	4.8%
	Parmer Ln	32,815	4,796	12.8%	37,610	24.8%
	Total	133,252	18,284	12.1%	151,536	100.0%
Screenline 183A-B	Pecan Park Blvd	6,792	738	9.8%	7,530	3.7%
	US 183	67,467	5,649	7.7%	73,115	35.5%
	183A ML	**35,799**	**970**	**2.6%**	**36,769**	**17.8%**
	US 183 SB On-Ramp	25,188	2,109	7.7%	27,297	13.2%
	US 183/SH 45 DC	10,798	2,225	17.1%	13,024	6.3%
	Lake Creek Pkwy	11,656	1,186	9.2%	12,843	6.2%
	Parmer Ln	30,613	5,011	14.1%	35,624	17.3%
	Total	188,313	17,888	8.7%	206,201	100.0%

Note: Truck volumes shown include 2-axle, 6-tire trucks and 3+ axle trucks.

Table 3.3 2013 Average Weekday Screenline Volumes for US 183S and US 290E

Route		Auto	Truck	% Truck	Total	% of Total
183S						
Screenline 183S-A	**US 183**	**32,559**	**5,344**	**14.1%**	**37,903**	**48.1%**
	US 183 Frontage Rd.	31,687	3,175	9.1%	34,862	44.2%
	Springdale Rd.	5,378	656	10.9%	6,035	7.7%
	Total	69,624	9,176	11.6%	78,800	100.0%
Screenline 183S-C	Airport Blvd.	30,238	3,816	11.2%	34,054	36.0%
	Springdale Rd.	7,553	472	5.9%	8,025	8.5%
	US 183	**46,050**	**6,593**	**12.5%**	**52,643**	**55.6%**
	Total	83,842	10,880	11.5%	94,722	100.0%
Screenline 183S-D	E. Cesar Chavez St.	10,051	1,069	9.6%	11,121	9.8%
	E. 5th St.	1,639	151	8.5%	1,790	1.6%
	E. 7th St.	12,047	1,096	8.3%	13,143	11.6%
	Airport Blvd.	23,107	3,371	12.7%	26,477	23.4%
	Bolm Rd.	4,058	745	15.5%	4,803	4.2%
	US 183	**51,767**	**4,109**	**7.4%**	**55,876**	**49.4%**
	Total	102,670	10,541	9.3%	113,210	100.0%
Screenline 183S-E	S. Pleasant Valley Rd.	15,027	1,418	8.6%	16,445	17.6%
	Montopolis Dr.	17,110	599	3.4%	17,709	19.0%
	Vargas Rd.	3,300	404	10.9%	3,704	4.0%
	US 183	**47,890**	**7,559**	**13.6%**	**55,449**	**59.4%**
	Total	83,327	9,980	10.7%	93,307	100.0%

US 290						
Screenline 290-A	**US 290**	**24,076**	**3,510**	**12.7%**	**27,586**	**27.9%**
	US 290 Frontage Rd.	27,302	1,275	4.5%	28,576	28.9%
	Springdale Rd.	14,415	793	5.2%	15,208	15.4%
	Loyola Ln.	8,687	965	10.0%	9,652	9.8%
	MLK Blvd.	16,851	947	5.3%	17,798	18.0%
	Total	91,331	7,489	7.6%	98,820	100.0%
Screenline 290-B	Springdale Rd. (South of US 290)	8,357	923	9.9%	9,279	14.7%
	Springdale Rd. (East of US 183)	10,422	1,259	10.8%	11,681	18.5%
	Loyola Ln.	15,561	1,836	10.6%	17,397	27.5%
	MLK Blvd.	22,923	2,032	8.1%	24,955	39.4%
	Total	57,263	6,050	9.6%	63,313	100.0%
Screenline 290-C	Blue Goose Rd.	1,388	115	7.7%	1,503	3.0%
	US 290 Frontage Rd.	20,649	3,737	15.3%	24,386	49.2%
	US 290 - Giles ML Plaza	**18,380**	**750**	**3.9%**	**19,130**	**38.6%**
	Johnny Morris Rd.	4,099	472	10.3%	4,571	9.2%
	Total	44,516	5,074	10.2%	49,590	100.0%
Screenline 290-D	FM 734	14,414	3,565	19.8%	17,979	36.0%
	US 290 Frontage Rd.	15,396	3,093	16.7%	18,489	37.0%
	US 290 - Parmer ML Plaza	**12,742**	**698**	**5.2%**	**13,440**	**26.9%**
	Total	42,552	7,356	14.7%	49,908	100.0%

Note: Truck volumes shown include 2-axle, 6-tire trucks and 3+ axle trucks.

3.2 TRAVEL SPEEDS

A travel time data collection program was conducted by Alliance Transportation Group (ATG) in 2014 for the sections of the primary non-tolled routes that compete with the CTTS system, which include IH-35, the non-tolled section of Loop 1, US 183, FM 973, Gattis School Road and US 290. These travel time data were collected via GPS systems and were obtained for multiple trials in both directions for the peak and off-peak periods. Travel times collected in 2012 for earlier studies were also included for further model validations. These routes include SH 130, SH 45N, SH 21, SH 360, US 79, FM 685, RM 620, Parmer Lane, I-10 and SH 123. The travel time data collection program is shown in Figure 3.3.

Table 3.4 summarizes the average speeds across segments of each roadway for both peak periods and the off-peak period. As expected, speeds for SH 130, SH 45 North, and SH 45 SE are well above 65 MPH throughout the day. Loop 1 has slightly slower speeds because the data includes both the tolled and non-tolled sections of Loop 1. In the table, IH-35 is summarized by three segments, each of which includes shorter, more congested portions during particular time periods. While off-peak speeds for IH-35 generally range between 60 to 70mph, the peak period congested speeds in the peak travel direction are reduced to between 47– 50 MPH.

Speeds by smaller, individual sections of these roadways in the primary project area are shown for the AM peak period, PM peak period, and Off-peak period in Figure 3.4, Figure 3.5, and Figure 3.6, respectively. From the figures, is it clear that IH-35 has congestion through central Austin for all periods of the day and that Loop 1 and US 183 within Austin also have significant congestion during the peak periods.

Figure 3.3 Travel Time Run Map

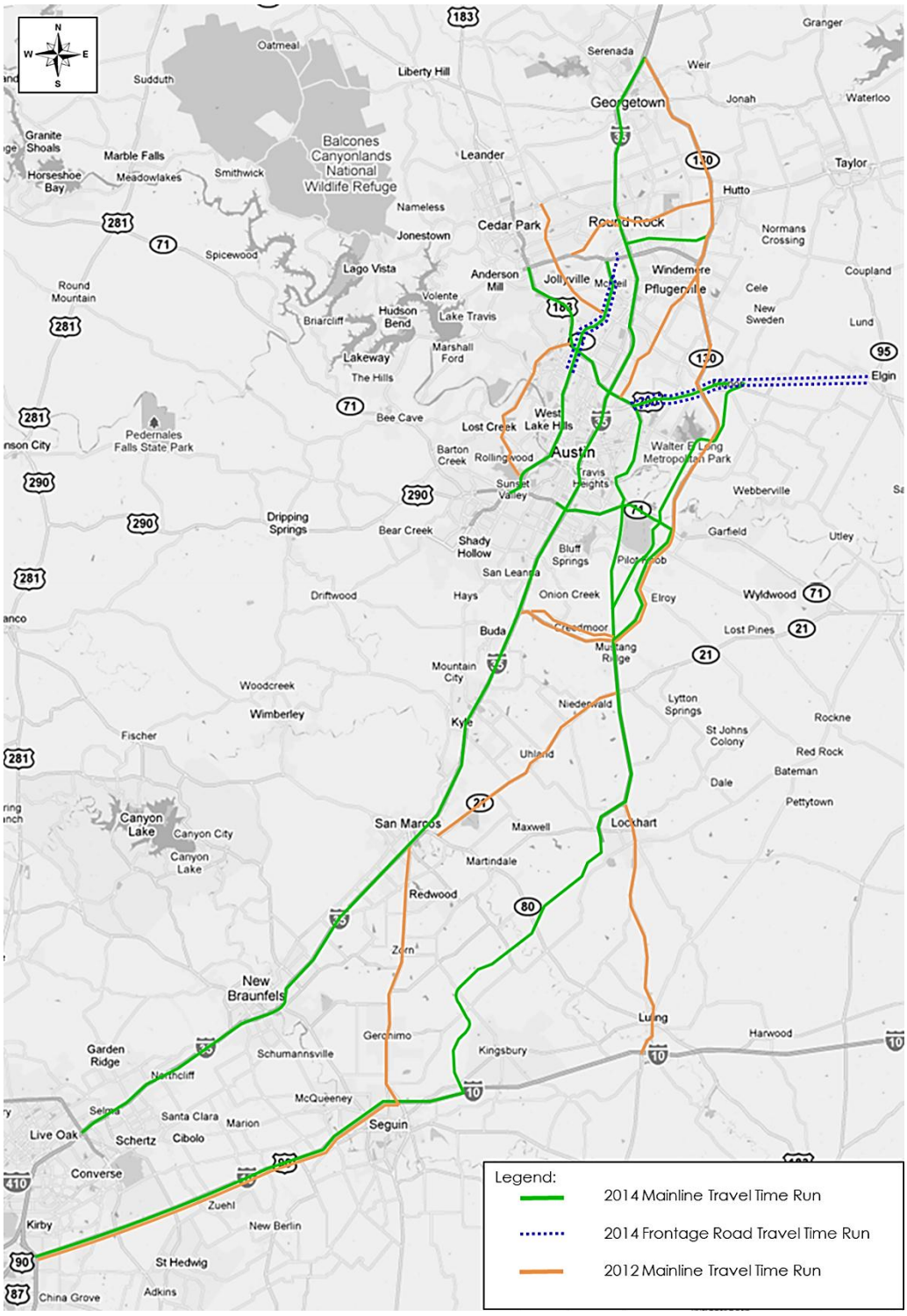


Table 3.4 Observed Speeds – Averages by Segments

Route	Section Limits		Direction	AM	PM	Off-peak
IH 35	SH 130	MLK Blvd.	NB	66	53	65
			SB	50	54	60
	MLK Blvd.	SH 80	NB	53	59	64
			SB	69	47	65
	SH 80 [1]	Loop 1604 [1]	NB	70	67	71
			SB	64	64	70
Loop 1	SH 45 N	US 290 W	NB	53	43	66
			SB	52	43	68
SH 130 [1]	IH 35	US 183	NB	73	72	71
			SB	72	72	71
SH 45 N [1]	US 183	SH 130	EB	66	68	71
			WB	68	66	74
US 183	SH 45 N	Manor Rd.	NB	67	47	67
			SB	56	68	66
	Manor Rd.	SH 130	NB	31	36	45
			SB	42	32	47
	SH 130	IH 10	NB	53	55	54
			SB	52	52	54
SH 21 [1]	US 183	US 80	NB	57	58	60
			SB	60	58	61
SH 360 [1]	US 183	Loop 1	NB	36	24	46
			SB	30	34	45
US 79 [1]	IH 35	SH 130	EB	40	37	40
			WB	31	33	35
FM 973	US 290	US 183	NB	36	38	39
			SB	36	39	42
IH 10 [1]	Loop 410	SH 123	EB	71	72	70
			WB	67	71	72
SH 123 [1]	IH 35	IH 10	NB	54	53	51
			SB	53	52	52
FM 685 [1]	SH 45 N/Kelly Ln.	US 290E	NB	35	27	34
			SB	24	32	37
RM 620 [1]	SH 45 N	IH 35	EB	33	30	36
			WB	30	30	39
Gattis School Rd.	IH 35	SH 130	EB	29	25	30
			WB	29	26	34
Parmer Ln. [1]	FM 1431	Loop 1	NB	38	37	47
			SB	34	35	38
Loop 1 Frontage	SH 45 EB Frontage	US 183	NB	28	25	27
			SB	27	32	30
SH 45 SE [1]	IH 35	SH 130	EB	77	78	76
			WB	78	78	78
FM 1327 [1]	IH 35	US 183	EB	56	52	55
			WB	54	52	55

Note: 1) Travel time runs conducted in 2012. All other runs were conducted in 2014.

Figure 3.4 AM Observed Speeds

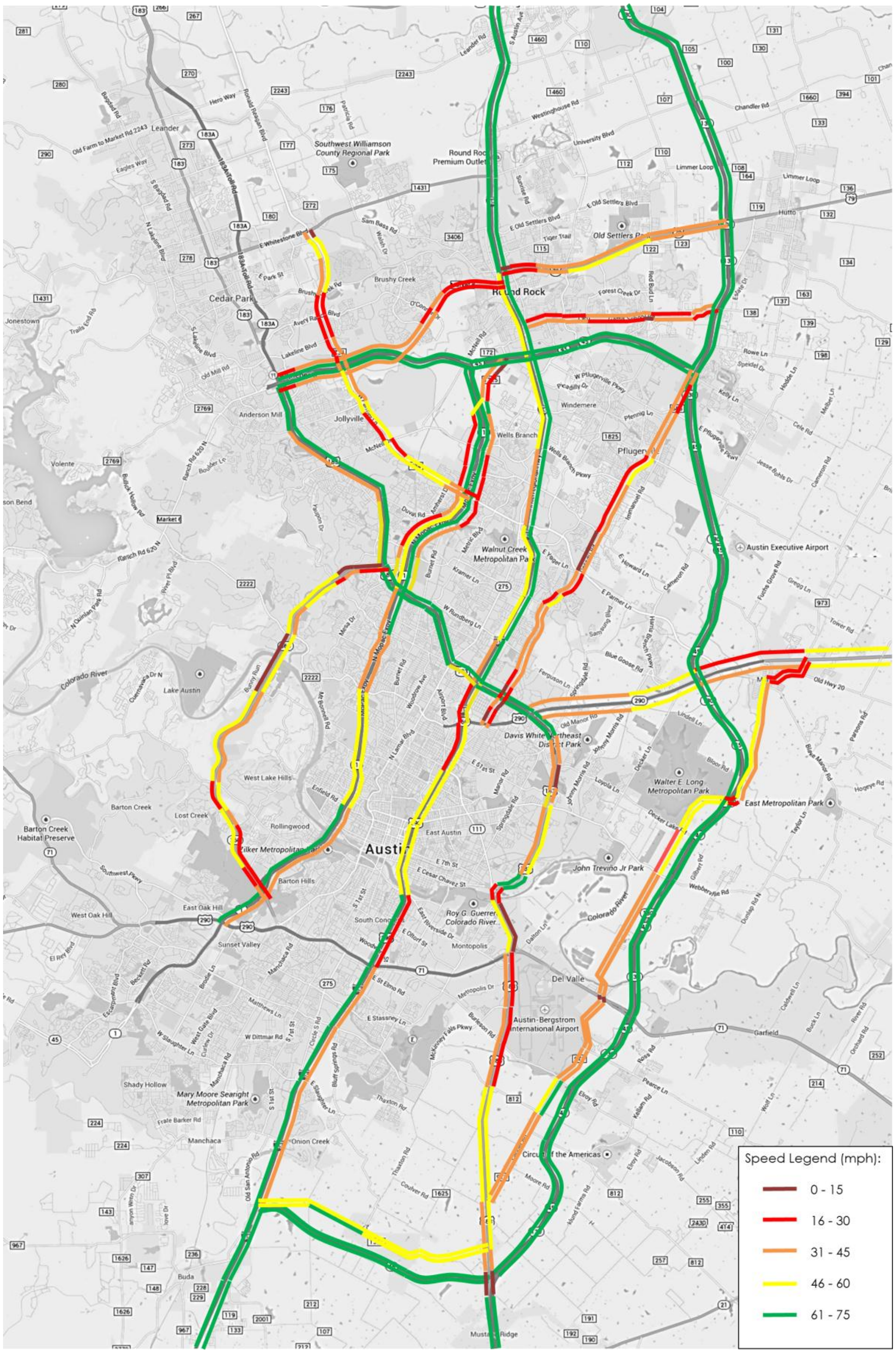


Figure 3.5 PM Observed Speeds

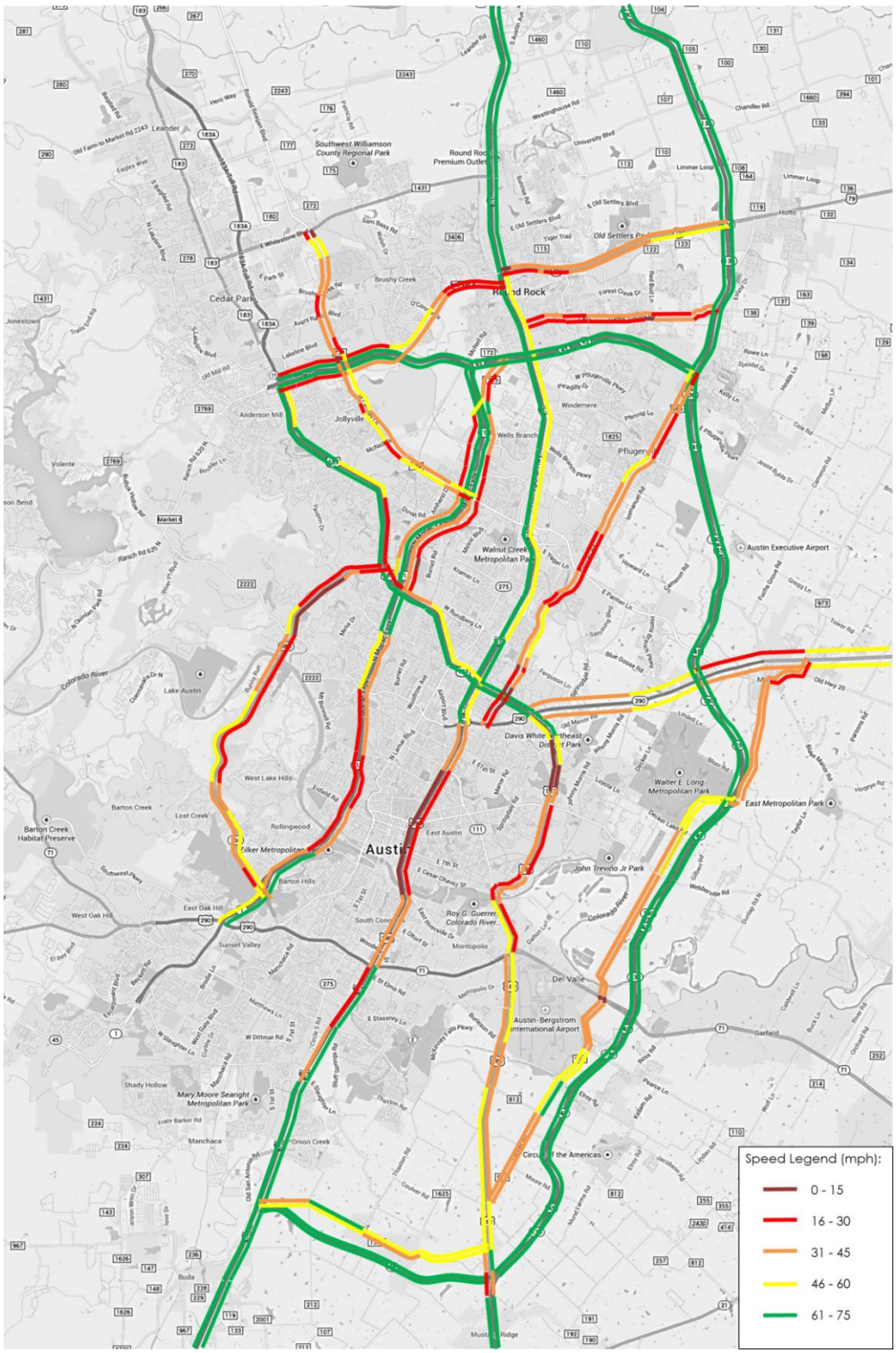
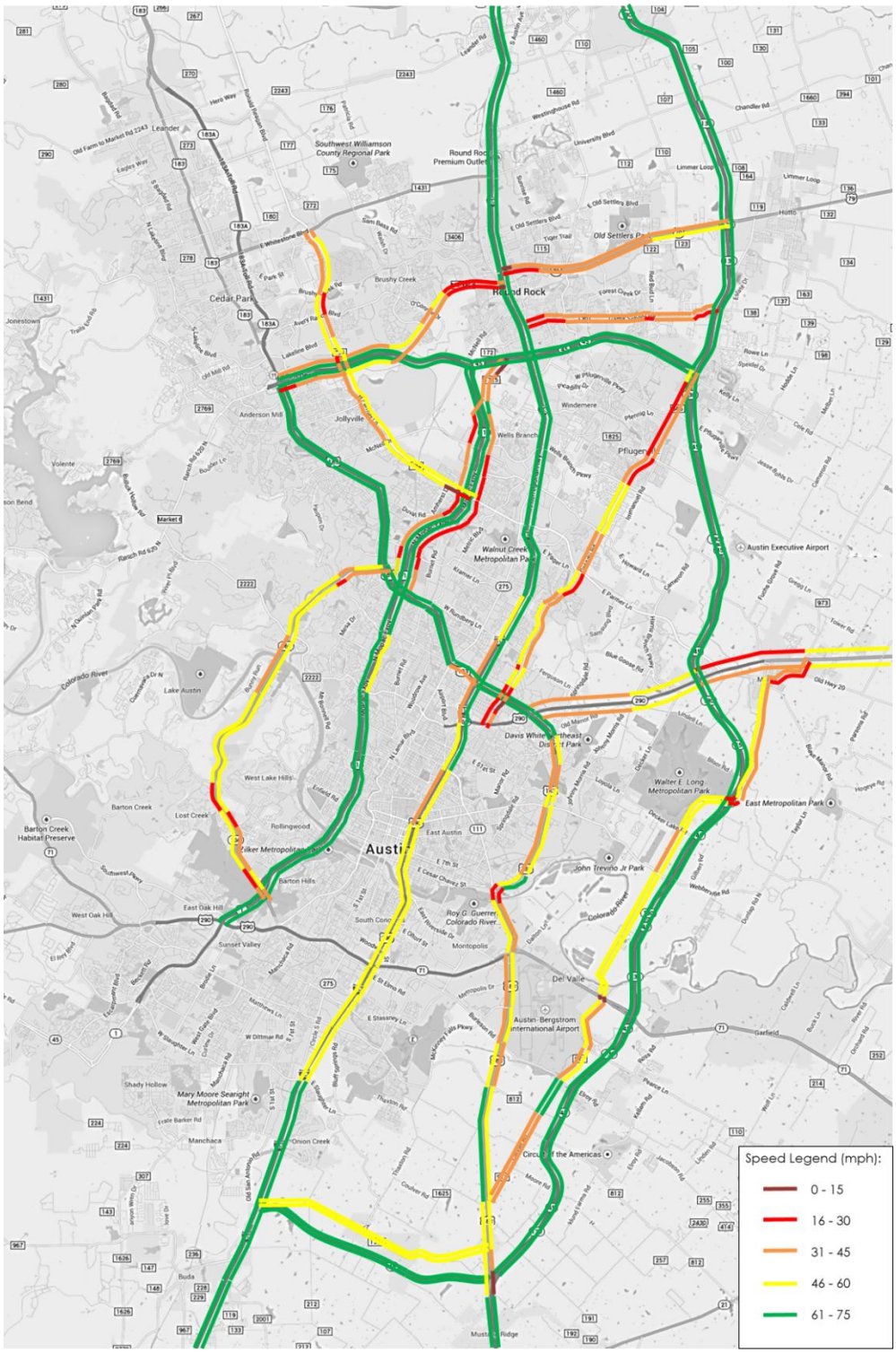


Figure 3.6 Off-Peak Observed Speeds



4.0 TOLL COLLECTION

This chapter presents TxDOT's toll collection policy for the CTTS, including methods of toll collection, toll rates, and violation procedures, as well as the policy regarding future rates. Future toll rates and tolling assumptions used to develop the forecasts for this study are also presented in this chapter.

4.1 METHODS OF TOLL COLLECTION

Since January 2013, TxDOT operates the CTTS as cashless facilities, using only two methods of toll collection: Electronic Toll Collection (ETC) and Pay by Mail (PBM). Drivers using ETC automatically pay the toll with their TxTag, while drivers without a TxTag have their license plate photographed at the pay points. TxDOT then mails a bill to the registered owner of the vehicle to collect payment.

4.2 HISTORICAL AND CURRENT TOLL RATES

The historical toll rates for 2-axle vehicles using SH 45N and Loop 1, SH 130, and SH 45 SE are shown in Table 4.1, Table 4.2, and Table 4.3, respectively. Each facility opened with a phased toll schedule: toll free to half rate to full rate. SH 45 SE was originally constructed as a cashless facility which opened after the other elements of the CTTS were opened; therefore, cash rates are not shown for this roadway.

The toll rates remained the same since each road's opening until the system-wide toll increases were implemented in January 2013 for SH 45 N, Loop 1, and SH 130. In January 2014, another toll increase was implemented across all facilities, including SH 45 SE, as part of the annual toll escalation process adopted in 2013, under which tolls will increase annually based on the prior 12-month Consumer Price Index - Urban (CPI-U Index).

Table 4.1 SH 45 N and Loop 1 Historical Toll Rates, 2-axle vehicles

Dates	SH 45 N and Loop 1					
	Mainline Plazas			Ramps		
	ETC	Pay by Mail	Cash	ETC	Pay by Mail	Cash
Nov-06 to Dec-06	Open Toll Free					
Jan-07	-	-	$0.75	-	-	$0.50
Feb-07	$0.34	-	$0.75	$0.23	-	$0.50
Mar-07 to Dec-12	$0.68	$0.90	$0.75	$0.45	$0.60	$0.50
2013	$1.02	$1.36	-	Varies by Location		
2014	$1.04	$1.38	-	Varies by Location		

Table 4.2 SH 130 Historical Toll Rates, 2-axle vehicles

Dates	SH 130					
	Mainline Plazas			Ramps		
	ETC	Pay by Mail	Cash	ETC	Pay by Mail	Cash
Nov-06 to Dec-06	Open Toll Free					
Jan-07	-	-	$1.50	-	-	$0.50
Feb-07	$0.68	-	$1.50	$0.23	-	$0.50
Mar-07 to Dec-12	$1.35	$1.80	$1.50	$0.45	$0.60	$0.50
2013	$1.69	$2.24	-	Varies by Location		
2014	$1.72	$2.29	-	Varies by Location		

Table 4.3 SH 45 SE Historical Toll Rates, 2-axle vehicles

Dates	SH 45 SE			
	Mainline Plazas		Ramps	
	ETC	Pay by Mail	ETC	Pay by Mail
May-09	Open Toll Free			
Jun-09	$0.50	-	$0.33	-
Jul-09 to Dec-13	$1.00	$1.33	$0.66	$0.88
2014	$1.02	$1.36	$0.67	$0.89

As shown in the tables above, there is a 33 percent surcharge on PBM transactions. Vehicles having more than two axles pay a proportionately higher toll using the (n-1) formula whereby the toll is equal to the passenger car toll times the vehicle's number of axles less one. For instance, a three axle vehicle pays two times the passenger car rate. The maximum truck toll rate for SH 130 and SH 45 SE is capped at the 4-axle rate, which is three times the auto rate. This limitation was implemented to encourage long-distance truck traffic to utilize the CTTS as an alternative to I-35 through Austin. Current 2014 toll rates for 5-axle vehicles are shown for each CTTS element in Table 4.4.

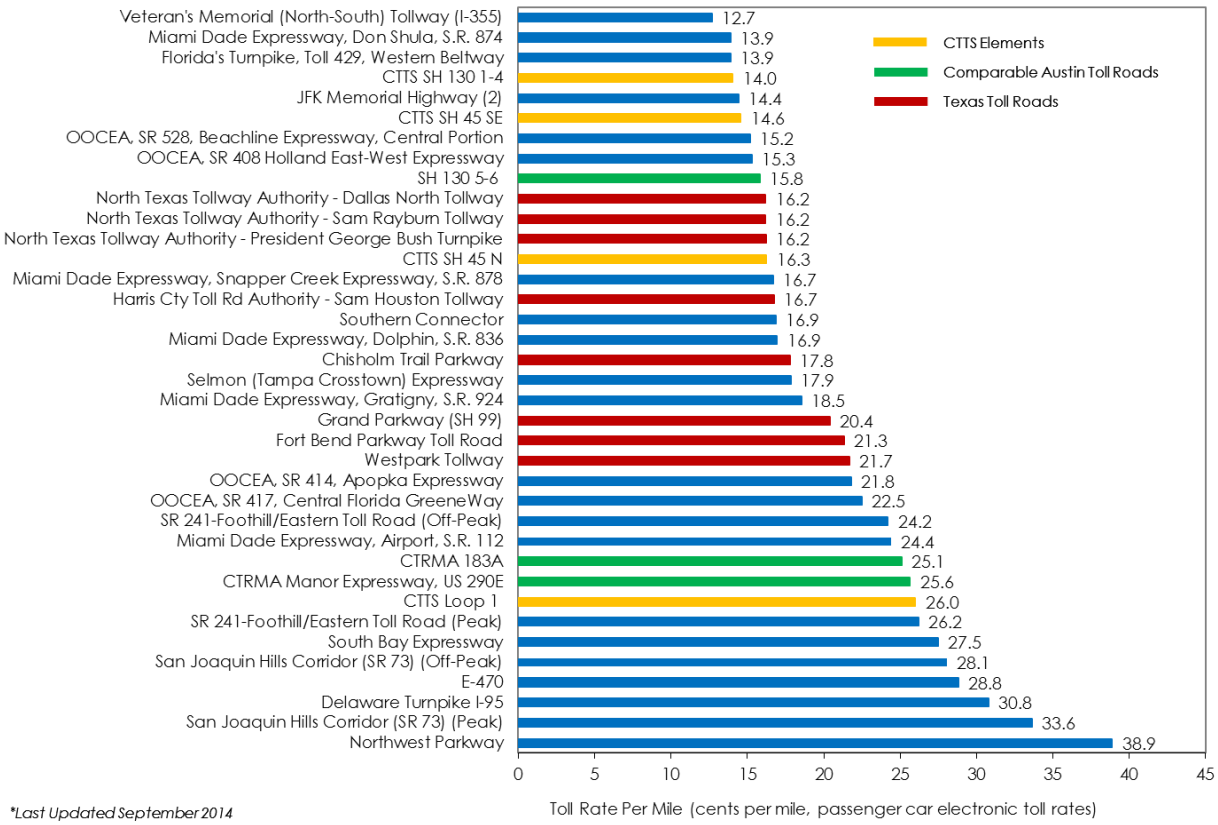
Table 4.4 CTTS 2014 Toll Rates, 5-axle vehicles

CTTS Element	Mainline Plazas	
	ETC	Pay by Mail
SH 45 N	$4.16	$5.53
Loop 1	$4.16	$5.53
SH 130 [1]	$5.16	$6.68
SH 45 SE [1]	$3.06	$4.07

Note: 1) Effective March 2011, truck tolls capped at 4-axle rate on SH 130 and SH 45 SE.

As shown in Figure 4.1, the per-mile ETC toll rates for passenger cars on CTTS facilities are comparable to, or lower than, the rates at various facilities across the United States. The reasonable rate of inflation used for the toll escalation rate will ensure that CTTS toll rates stay within a comparable range assuming similar CPI rate escalation on such other toll facilities.

Figure 4.1 Comparable Passenger Car ETC Toll Rates per Mile



**Last Updated September 2014*

4.3 POLICY REGARDING FUTURE RATES

The future toll rates for the CTTS facilities are based on the current toll rates in 2014, escalated annually at the annual inflation rate. This escalation policy was adopted by the Texas Transportation Commission in 2013 whereby tolls are escalated annually on January 1st based on Toll Rate Escalation Percentage, as calculated on each Toll Escalation Determination Date. The Toll Rate Escalation Percentage is the Consumer Price Index – Urban (CPI-U) on October 1st, the Toll Escalation Determination Date of each year, based on the twelve month period ending August 31st of the current year. The first inflation-based annual escalation was implemented in January 2014 when tolls were increased 1.5 percent.

Per the adopted escalation policy, the actual level of tolls for any future year will be determined based on the actual CPI-U; the resulting toll revenues will be changed by a combination of the change in transactions and the change in the toll level. Table 4.5 shows historical CPI-U annual averages as well as several average annual growth rates depicting long term trends, while Table 4.6 shows more recent CPI-U data and the projected annual escalation rates used for developing future toll rates in the 2014 study. For the 24-year period from 1990 to the present, the average annual growth rate is calculated to be 2.5 percent. For the 34-year period from 1980 to the present, the average annual growth rate is greater, at 3.2 percent.

Table 4.5 Annual Consumer Price Index – Historical since 1970

Year	Annual CPI-U [1] (1982-84=100)	Average Annual Rate of Change
1970	39	
1980	82	7.8%
1990	131	4.7%
2000	172	2.8%
2010	218	2.4%
2014 [2]	237	2.1%
Average Annual Growth Rate		
1970 - 2014		4.2%
1980 - 2014		3.2%
1990 - 2014		2.5%
2000 - 2014		2.3%
2010 - 2014		2.1%

Notes: 1) CPI-U values shown are nominal U.S. city average, all items, seasonally adjusted annual averages.
2) Annual 2014 value shown is average of monthly data through November 2014.

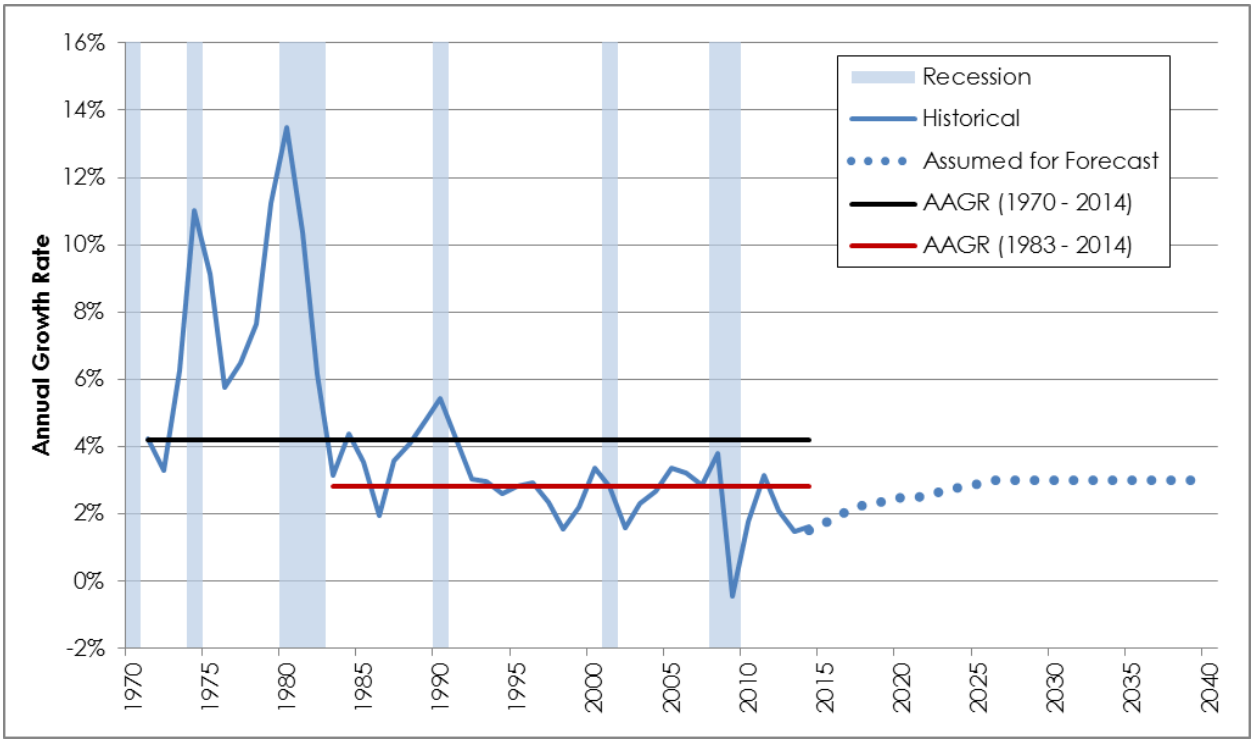
Table 4.6 Annual Consumer Price Index – Recent and Projected

Year	Annual CPI-U [1] (1982-84=100)	Annual Rate of Change
2005	195	
2006	202	3.2%
2007	207	2.9%
2008	215	3.8%
2009	214	-0.4%
2010	218	1.8%
2011	225	3.1%
2012	230	2.1%
2013	233	1.5%
2014 [2]	237	1.6%
Annual Escalation		
2014 (Aug 2012 - Aug 2013)		1.5%
2015 (Aug 2013 - Aug 2014)		1.7%
2016		2.0%
2017		2.2%
2018		2.3%
2019		2.4%
2020		2.5%
2021		2.5%
2022		2.6%
2023		2.7%
2024		2.8%
2025		2.9%
2026 - 2040		3.0%
2014 - 2040		2.8%

Notes: 1) CPI-U values shown are nominal U.S. city average, all items, seasonally adjusted annual averages.
2) Annual 2014 value shown is average of monthly data through November 2014.

Considering these trends, Stantec found it reasonable to escalate inflation as listed in Table 4.6. The assumed annual escalation rates begin close to the more recent data at 1.7 percent in 2015, then gradually increase to 3.0 percent by 2026 and continue at that level through 2040. The historical and projected average annual growth rates are also shown in Figure 4.2 below.

Figure 4.2 Annual Consumer Price Index – Historical and Projected



4.4 FUTURE TOLL RATES

The assumed toll rates on each CTTS facility for each model year, as well as the existing 2014 toll rates, are shown in Table 4.7, Table 4.8, Table 4.9, and Table 4.10 below. The surcharge of 33 percent for PBM transactions is assumed to continue throughout all model years. Vehicles having more than two axles will continue to pay a proportionately higher toll using the (n-1) formula in the same way these vehicle currently do. Consistent with TxDOT's current policy described previously, truck tolls for SH 130 and SH 45 SE are capped at the rate of a 4-axle vehicle.

A full length trip using ETC on SH 45 N currently costs $2.08 in 2014, and by 2040, the toll for the same trip increases to $4.22. The per mile rate for the 12.8 mile full length trip on SH 45 N is $0.16 in 2014, increasing to $0.33 in 2040. On Loop 1, a full length trip costs $1.04 today for ETC transactions, but will increase to $2.11 in 2040. The per mile toll rate on Loop 1 for a full length trip of four miles is currently $0.26 and will increase to $0.53 in 2040.

Table 4.7 SH 45 N Toll Schedule (Autos)

Toll Location	Payment Type	2013*	2014	2015*	2020*	2030*	2040*
Lake Creek ML Plaza	Pay by Mail	$1.36	$1.38	$1.41	$1.57	$2.09	$2.80
	ETC	$1.02	$1.04	$1.06	$1.18	$1.57	$2.11
Parmer Ln (FM 734) Ramps	Pay by Mail	$1.17	$1.18	$1.21	$1.35	$1.78	$2.40
	ETC	$0.88	$0.89	$0.91	$1.01	$1.34	$1.80
RM 620 (Howard Ln) Ramps	Pay by Mail	$1.17	$1.18	$1.21	$1.35	$1.78	$2.40
	ETC	$0.88	$0.89	$0.91	$1.01	$1.34	$1.80
O'Connor Dr (Arterial C) Ramps	Pay by Mail		$1.21	$1.24	$1.38	$1.82	$2.45
	ETC		$0.91	$0.93	$1.04	$1.37	$1.84
Greenlawn Ramps	Pay by Mail	$0.90	$0.92	$0.93	$1.04	$1.38	$1.86
	ETC	$0.68	$0.69	$0.70	$0.79	$1.04	$1.40
AW Grimes Ramps	Pay by Mail	$0.90	$0.92	$0.93	$1.04	$1.38	$1.86
	ETC	$0.68	$0.69	$0.70	$0.79	$1.04	$1.40
Schultz Ln (Arterial A) Ramps	Pay by Mail	$1.36	$1.38	$1.41	$1.57	$2.09	$2.80
	ETC	$1.02	$1.04	$1.06	$1.18	$1.57	$2.11
Wilke Ln (Heatherwilde) Ramps	Pay by Mail	$1.36	$1.38	$1.41	$1.57	$2.09	$2.80
	ETC	$1.02	$1.04	$1.06	$1.18	$1.57	$2.11
Heatherwide ML Plaza	Pay by Mail	$1.36	$1.38	$1.41	$1.57	$2.09	$2.80
	ETC	$1.02	$1.04	$1.06	$1.18	$1.57	$2.11
Full Length Trip	Distance	12.8	12.8	12.8	12.8	12.8	12.8
	Rate per Mile	$0.16	$0.16	$0.17	$0.18	$0.25	$0.33
	Toll Cost (ETC)	$2.04	$2.08	$2.12	$2.36	$3.14	$4.22

Notes: 1) Rate per mile shown for a full length trip is equal to the total toll cost divided by the distance.
2) Toll cost for a full length trip is equal to the sum of the mainline plaza tolls.
3) The assumed annual escalation rates are as shown in Table 4.6.
4) Toll rates shown for 2013 through 2015 are actual; toll rates shown for 2020, 2030 and 2040 are assumed based on the escalation rates shown in Table 4.6.
5) Years shown with an asterisk (*) are model years.

Table 4.8 Loop 1 Toll Schedule (Autos)

Toll Location	Payment Type	2013*	2014	2015*	2020*	2030*	2040*
Howard Ln / Wells Branch Ramps	Pay by Mail	$0.90	$0.92	$0.93	$1.04	$1.38	$1.86
	ETC	$0.68	$0.69	$0.70	$0.79	$1.04	$1.40
Merrilltown ML Plaza	Pay by Mail	$1.36	$1.38	$1.41	$1.57	$2.09	$2.80
	ETC	$1.02	$1.04	$1.06	$1.18	$1.57	$2.11
Shoreline Dr Ramps	Pay by Mail	$0.90	$0.92	$0.93	$1.04	$1.38	$1.86
	ETC	$0.68	$0.69	$0.70	$0.79	$1.04	$1.40
O'Connor Dr Ramps	Pay by Mail		$1.21	$1.24	$1.38	$1.82	$2.45
	ETC		$0.91	$0.93	$1.04	$1.37	$1.84
Full Length Trip	Distance	4	4	4	4	4	4
	Rate per Mile	$0.26	$0.26	$0.27	$0.30	$0.39	$0.53
	Toll Cost (ETC)	$1.02	$1.04	$1.06	$1.18	$1.57	$2.11

Notes: 1) Rate per mile shown for a full length trip is equal to the total toll cost divided by the distance.
2) Toll cost for a full length trip is equal to the sum of the mainline plaza tolls.
3) The assumed annual escalation rates are as shown in Table 4.6.
4) Toll rates shown for 2013 through 2015 are actual; toll rates shown for 2020, 2030 and 2040 are assumed based on the escalation rates shown in Table 4.6.
5) Years shown with an asterisk (*) are model years.

To travel the full length of 49 miles on SH 130 Segments 1-4 today, the toll cost is $6.88 using ETC or $0.14 per mile. By 2040, the same full length trip on this road increases to $13.96 for a per mile rate of $0.28. On SH 45 SE, the current ETC cost for a full length trip is $1.02, and increases to $2.07 by 2040. The per-mile rate for a full length seven mile trip will increase from $0.15 in 2014 to $0.30 in 2040.

Table 4.9 SH 130 Toll Schedule (Autos)

Toll Location	Payment Type	2013*	2014	2015*	2020*	2030*	2040*
Segment 1 ML Plaza	Pay by Mail	$2.24	$2.29	$2.33	$2.60	$3.45	$4.64
	ETC	$1.69	$1.72	$1.75	$1.96	$2.59	$3.49
Segment 2 ML Plaza	Pay by Mail	$2.24	$2.29	$2.33	$2.60	$3.45	$4.64
	ETC	$1.69	$1.72	$1.75	$1.96	$2.59	$3.49
Segment 3 ML Plaza	Pay by Mail	$2.24	$2.29	$2.33	$2.60	$3.45	$4.64
	ETC	$1.69	$1.72	$1.75	$1.96	$2.59	$3.49
Segment 4 ML Plaza	Pay by Mail	$2.24	$2.29	$2.33	$2.60	$3.45	$4.64
	ETC	$1.69	$1.72	$1.75	$1.96	$2.59	$3.49
Cameron Rd Ramps	Pay by Mail	$2.24	$2.29	$2.33	$2.60	$3.45	$4.64
	ETC	$1.69	$1.72	$1.75	$1.96	$2.59	$3.49
FM 104, Pecan St, Gregg Manor, FM 973, FM 969, Pearce Ln, and FM 812 Ramps	Pay by Mail	$0.75	$0.76	$0.77	$0.86	$1.14	$1.54
	ETC	$0.56	$0.57	$0.58	$0.65	$0.86	$1.15
US 79, CR 138, Chandler Rd and Elroy Rd Ramps	Pay by Mail	$0.97	$0.98	$1.00	$1.12	$1.48	$1.99
	ETC	$0.73	$0.74	$0.75	$0.84	$1.12	$1.50
SH 29, Blue Bluff, Harold Green, and Moore Rd Ramps	Pay by Mail	$0.60	$0.61	$0.63	$0.70	$0.92	$1.24
	ETC	$0.45	$0.46	$0.47	$0.52	$0.69	$0.93
Full Length Trip	Distance	49	49	49	49	49	49
	Rate per Mile	$0.14	$0.14	$0.14	$0.16	$0.21	$0.28
	Toll Cost (ETC)	$6.76	$6.88	$7.00	$7.84	$10.36	$13.96

Notes: 1) Rate per mile shown for a full length trip is equal to the total toll cost divided by the distance.
2) Toll cost for a full length trip is equal to the sum of the mainline plaza tolls.
3) The assumed annual escalation rates are as shown in Table 4.6.
4) Toll rates shown for 2013 through 2015 are actual; toll rates shown for 2020, 2030 and 2040 are assumed based on the escalation rates shown in Table 4.6.
5) Years shown with an asterisk (*) are model years.

Table 4.10 SH 45 SE Toll Schedule (Autos)

Toll Location	Payment Type	2013*	2014	2015*	2020*	2030*	2040*
Mainline Plaza	Pay by Mail	$1.33	$1.36	$1.38	$1.54	$2.05	$2.75
	ETC	$1.00	$1.02	$1.04	$1.16	$1.54	$2.07
Ramp to/from west	Pay by Mail	$0.88	$0.89	$0.90	$1.01	$1.34	$1.81
	ETC	$0.66	$0.67	$0.68	$0.76	$1.01	$1.36
Ramp to/from east	Pay by Mail	$0.88	$0.89	$0.90	$1.01	$1.34	$1.81
	ETC	$0.66	$0.67	$0.68	$0.76	$1.01	$1.36
Full Length Trip	Distance	7	7	7	7	7	7
	Rate per Mile	$0.14	$0.15	$0.15	$0.17	$0.22	$0.30
	Toll Cost (ETC)	$1.00	$1.02	$1.04	$1.16	$1.54	$2.07

Notes: 1) Rate per mile shown for a full length trip is equal to the total toll cost divided by the distance.
2) Toll cost for a full length trip is equal to the sum of the mainline plaza tolls.
3) The assumed annual escalation rates are as shown in Table 4.6.
4) Toll rates shown for 2013 through 2015 are actual; toll rates shown for 2020, 2030 and 2040 are assumed based on the escalation rates shown in Table 4.6.
5) Years shown with an asterisk (*) are model years.

4.5 PBM AND VIOLATION PROCEDURES

For drivers without a TxTag and therefore cannot pay the toll using ETC, a PBM option is available. TxDOT's Customer Service Center (CSC) collects these tolls by sending a bill to the registered owner of the vehicle (identified from the photographed license plate). This invoice includes a 33 percent surcharge over the ETC rate plus a nominal statement fee of $1.15 regardless of the number of transactions. All toll payments are required to be paid within 30

days. If payment is not made within 30 days, another invoice is sent including an additional $1.15 statement fee, for a total of $2.30 in statement fees.

4.5.1 Standard Violators

If the payment of the second invoice is not made within 30 days from Statement date, the toll transaction becomes a toll violation in which the two statement fees are retracted, and replaced by an administration fee of $5.00 per transaction. Toll violation payments are required to be paid within 30 days to avoid being forwarded to TxDOT's collection contractor. Once the violation is passed to TxDOT's collection contractor, the $5.00 administration fee is replaced by a collections administration fee of $25.00 per transaction. After a minimum of 30 days in collections, the account is then eligible for court action, where the $25.00 fee is replaced with a $100.00 court administration fee. A summary of these fees in presented in Table 4.11.

Table 4.11 Summary of Violation Fees

No. of 30-day Periods since Transaction	Description	Amount
1	Mailed or Faxed Statement	$1.15 per statement
2	Mailed or Faxed Statement	$1.15 per statement
3	Admin Fee - Violation Notice	$5.00
4	Admin Fee - Violation in Collections	$25.00
5	Admin Fee - Violation Sworn Complaint Issued	$100.00

Source: Minute Order 110816

Although each case varies, TxDOT typically only files one violation transaction per case due to constraints on the number of total cases that a court can handle. The court almost always requires full payment of fees and tolls for the transaction filed, then a negotiated discount on any remaining fees that is contingent on the defendant entering into a payment plan with TxDOT.

According to the latest FY 2014 statistics (September 2013 through February 2014), approximately 50 percent of the image based transactions were collected. Of these, 86 percent were collected during the PBM resolution or invoice stage and the remainder (14 percent) were collected during the violation resolution stage.

4.5.2 Habitual Violators

In June 2013, additional toll enforcement legislation authorized new toll enforcement tools for Habitual Violators (HVs) throughout Texas. Habitual Violators are customers that have accumulated 100 or more unpaid tolls in less than one year and have already been issued two notices of non-payment. In these instances, a Notice of Determination is mailed to the customer, allowing the customer 35 days to request a court hearing.

If no hearing is requested, or the customer is confirmed to be a HV during the court hearing, the HV is prohibited from using the toll roads until payment is made. This Notice of Prohibition is

mailed to the HV, county tax assessor or collector, and law enforcement. HVs affirmed by the court have 30 days to appeal. If the court issues a negative finding for the customer, the HV process is terminated, otherwise the HV status is confirmed. A Notice of Prohibition is mailed to the HV, the county tax assessor or collector and law enforcement. The County Tax Collector or Assessor (TAC) has the option to deny registration renewal for the vehicle registered. If an HV is pulled over by law enforcement using the prohibited toll road, the HV may be subject to having their vehicle impounded.

4.6 CUSTOMER SERVICE CENTER REVENUES

In addition to the toll revenues generated by CTTS, TxDOT also generates revenue from various fees charged to patrons by the Customer Service Center (CSC). These fees consist of charges for TxTags (used for ETC transactions) and for the processing of PBM transactions, as discussed above. A summary of the TxTag fees are listed in Table 4.12.

Table 4.12 Summary of TxTag Fees

Description	Amount
Initial and Replacement Tags (refunded if enrolled in AutoPay)	$13.85 per tag
Bumper and Motorcycle Tags (includes $35 refundable deposit)	$45.00 per tag
Mailed or Faxed Statement	$1.15 per 5 pages of statement
Returned Check (insufficient funds)	$30.00

SOURCE: Minute Orders 112971 and 114073

For FY 2014, the CSC fees equal approximately 11.4 percent of total toll revenue for the corresponding period. On a transaction basis, the average CSC revenue for an ETC transaction is approximately $0.065 and the average CSC revenue for a PBM transaction is $0.306.

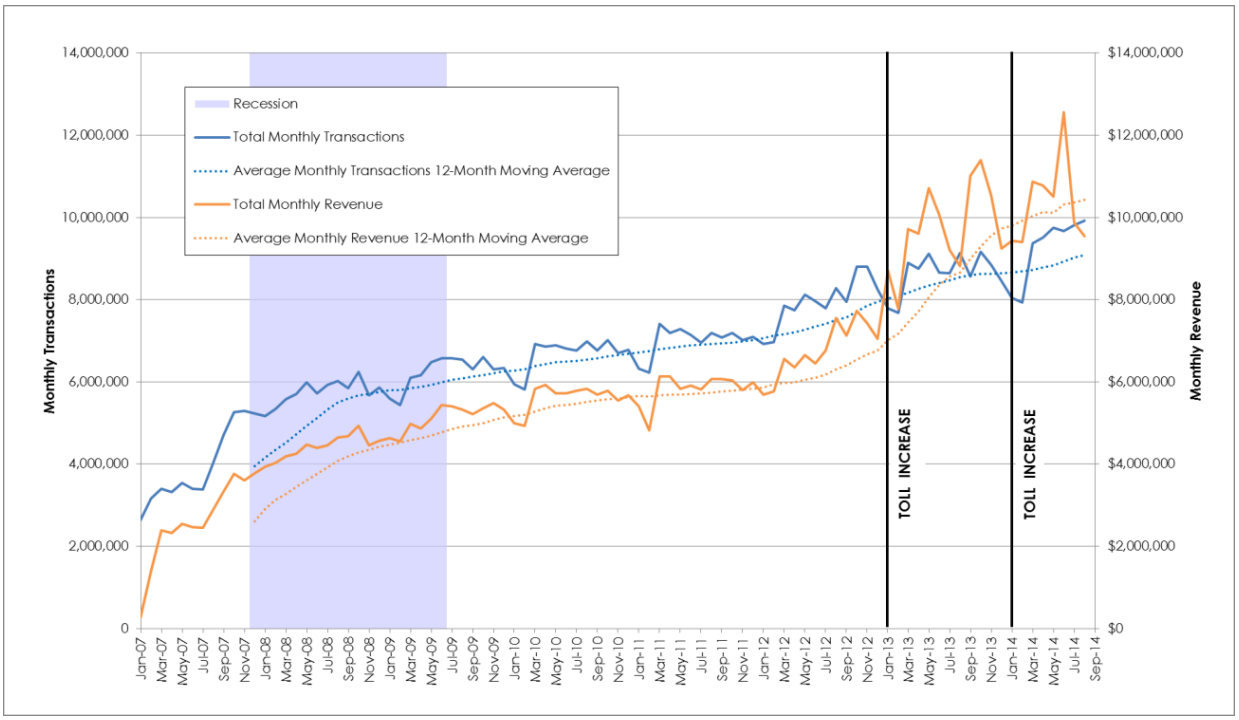
5.0 HISTORICAL CTTS TOLL TRANSACTIONS AND REVENUE

Transactions for CTTS toll facilities have been reviewed since November 2006 when the first phases of SH 45 N, Loop 1, and SH 130 opened to traffic. Historical transaction and revenue data, as presented within this chapter, provide a comprehensive record of the transaction and revenue growth, vehicle distribution, weekday and seasonal patterns, payment methods and transaction payment status. It should also be noted that the recognition of revenue by payment method varies, where ETC and Cash revenue (during the period when available) were recognized at the time of the transaction, whereas PBM revenue was recognized at the time the toll invoices were paid. These historical characteristics are the foundation for the assumptions in this study about future conditions and trends of the facilities.

5.1 MONTHLY AND ANNUAL TRANSACTIONS AND REVENUE

Total transactions and revenue across the CTTS facilities have gradually increased since tolling began in January 2007. Figure 5.1 below shows the historical performance of the CTTS facilities by month and 12-month moving averages for total transactions and revenue.

Figure 5.1 CTTS Historical Transactions and Revenue



As shown in the figure, the facilities opened with strong growth in traffic due to ramp up. An additional factor affecting revenue growth was the toll phasing that occurred during 2007 as part of the introductory marketing period where the facilities opened in a toll free condition and transitioned to half rates and subsequently to full rates over several months. Growth then flattened out somewhat at the start of the recession at the end of 2007. Transaction and

revenue growths have been fairly parallel, progressing at a similar growth rate until January 2013 when revenues increased as a result of a toll increase. In September 2012, SH 45 SE became a part of the CTTS, and the toll road's transactions and revenue were added to the CTTS total. In looking the annual patterns of transactions and revenue across the historical data, there is a clear reduction in traffic and revenue during the winter months. This is due to multiple factors, most notably the inclement weather conditions that tend to suppress travel and construction activity.

The total annual transactions and revenue by calendar year are shown in Table 5.1 and Table 5.2. Annual transactions and revenue by fiscal year are shown in Table 5.3 and Table 5.4, respectively. CTTS's fiscal year runs from September 1 through August 31 of the succeeding calendar year.

The transaction growth of 63.4 percent for SH 45 N in CY 2008 reflects the opening of SH 45 N West in August 2007 and Heatherwilde Ramps in September 2008. Since then, SH 45 N has maintained fairly steady transaction growth until 2013 which showed much lower growth due to the CTTS system-wide toll rate increase implemented in January 2013. Despite the flattened growth in transactions of 0.7 percent in CY 2013, revenue increased 49.1 percent, showing the impact of the toll rate increase. With the subsequent 1.5% toll increase in January 2014, SH 45 N maintains growth for both transactions and revenue of 4.6 percent and 6.0 percent, respectively, when comparing January through August 2013 and 2014 data.

Loop 1 has also sustained its transaction and revenue growth from CY 2007 through CY 2013 with fairly parallel growth rates. In CY 2013, the toll rate increase had an impact on performance, and although there was a 2.2 percent loss of transactions, there was an increase in revenue of 39.3 percent. When comparing the first eight months of data since the toll increase in January 2014 to the same months in 2013, transactions and revenue increased by 1.5 percent and 2.6 percent, respectively.

SH 130 experienced very high transaction growth in the early years due to the phased opening of Segment 3 in November 2007 and Segment 4 in July 2008. In CY 2012, transactions and revenue both increased notably by approximately 19 percent due to the opening of Cameron Road Ramps in January and Segments 5 & 6 in October along with on-going development in this largely rural corridor. Although Segments 5 & 6 are not operated by TxDOT, they interact with the CTTS portion of SH 130 (Segments 1 - 4), as they add continuity as a competing roadway to IH-35 for long distance traffic. Since the January 2014 toll increase, transactions increased by 13.0 percent driven primarily by increased development within the corridor, and revenue increased by 15.7 percent (as compared to the same months in 2013). Note that due to the length of SH 130, the growth rates by segment have varied. From 2009 to 2014, Segment 2 has the highest amount of transactions and has a compounded growth rate of approximately 10 percent. Segments 1 and 3 have compounded growth rates of approximately 14 percent over that period and Segment 4, with the lowest amount of transactions, has a compounded growth rate of approximately 22 percent. The variations in the growth rates are a function of the existing level of development adjacent to each segment and the rate of new development being added each year. Segment 2 is primarily serving the more developed Round Rock and Pflugerville areas, while the areas near Segment 4 are largely undeveloped.

As of September 2012, SH 45 SE is now operated by CTTS and, therefore, contributes to the CTTS total transactions and revenue. Since then, the facility has experienced strong growth similar to SH 130, also driven by increased development nearby. In FY 2014, transactions increased 10.3 percent while revenue increased 9.5 percent. For the first eight months of CY 2014, transactions increased 12.0 percent and revenue increased 25.2 percent.

Table 5.1 Total Annual Calendar Year Transactions by CTTS Element

Calendar Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE [1]	% Change	Total	% Change
2007	18,495,000		16,506,800		12,378,900		-	-	**47,380,700**	
2008	30,213,200	63.4%	17,315,600	4.9%	21,562,200	74.2%	-	-	**69,091,000**	**45.8%**
2009	31,632,100	4.7%	17,511,400	1.1%	25,879,300	20.0%	-	-	**75,022,800**	**8.6%**
2010	32,602,600	3.1%	18,372,700	4.9%	29,272,300	13.1%	-	-	**80,247,600**	**7.0%**
2011	33,917,100	4.0%	19,100,800	4.0%	31,101,100	6.2%	-	-	**84,119,000**	**4.8%**
2012	36,867,000	8.7%	20,086,700	5.2%	37,094,700	19.3%	1,410,600	-	**95,459,000**	**13.5%**
2013	37,132,540	0.7%	19,636,600	-2.2%	42,574,500	14.8%	4,395,200	211.6%	**103,738,840**	**8.7%**
First 8 Months of Calendar Year (January - August)										
2013	24,666,340		13,122,400		28,022,700		2,889,400		**68,700,840**	
2014 [2]	25,789,600	4.6%	13,324,900	1.5%	31,658,900	13.0%	3,237,200	12.0%	**74,010,600**	**7.7%**

Notes: [1] SH 45 SE opened to traffic in May 2009 but did not become part of the CTTS until September 2012. As a result, the large Increase in 2013 is due to results for 2012 representing only part of year.
[2] Total transaction data was only available up to August 2014 at the time this report; therefore, CY 2014 transactions shown are from only eight months of the calendar year.

Table 5.2 Total Annual Calendar Year Toll Revenue by CTTS Element

Calendar Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE [1]	% Change	Total	% Change
2007 [2]	-	-	-	-	-	-	-	-	**$31,241,900**	
2008 [2]	-	-	-	-	-	-	-	-	**$53,038,800**	**69.8%**
2009 [2]	-	-	-	-	-	-	-	-	**$61,674,400**	**16.3%**
2010	$19,894,000	-	$12,060,000	-	$35,498,600	-	-	-	**$67,452,600**	**9.4%**
2011	$20,667,900	3.9%	$12,513,700	3.8%	$36,839,900	3.8%	-	-	**$70,021,500**	**3.8%**
2012	$22,503,400	8.9%	$13,101,800	4.7%	$43,902,000	19.2%	$1,643,200	-	**$81,150,400**	**15.9%**
2013	$33,543,600	49.1%	$18,247,200	39.3%	$61,005,700	39.0%	$4,015,900	144.4%	**$116,812,400**	**43.9%**
First 8 Months of Calendar Year (January - August)										
2013	$21,498,500		$11,847,200		$38,652,000		$2,631,100		**$74,628,800**	
2014 [3]	$22,785,700	6.0%	$12,159,800	2.6%	$44,738,600	15.7%	$3,294,900	25.2%	**$82,979,000**	**11.2%**

Notes: [1] SH 45 SE opened to traffic in May 2009 but did not become part of the CTTS until September 2012.
[2] Revenue for PBM patrons was not allocated by each toll facility until September 2009; therefore, only total CTTS revenue is shown for CY 2007 through CY 2009.
[3] Total revenue data was only available up to August 2014 at the time this report; therefore, CY 2014 revenues shown are from only eight months of the calendar year.

Table 5.3 Total Annual Fiscal Year Transactions by CTTS Element

Fiscal Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE [1]	% Change	Total	% Change
2008	29,458,300		17,194,700		19,287,000		-	-	**65,940,000**	
2009	31,269,500	6.1%	17,381,000	1.1%	24,457,300	26.8%	-	-	**73,107,800**	**10.9%**
2010	32,166,700	2.9%	18,064,100	3.9%	28,298,300	15.7%	-	-	**78,529,100**	**7.4%**
2011	33,543,300	4.3%	18,883,100	4.5%	30,583,200	8.1%	-	-	**83,009,600**	**5.7%**
2012	35,790,100	6.7%	19,889,700	5.3%	34,352,100	12.3%	-	-	**90,031,900**	**8.5%**
2013	37,126,440	3.7%	19,715,300	-0.9%	41,365,500	20.4%	4,300,000	-	**102,507,240**	**13.9%**
2014	38,255,800	3.0%	19,839,100	0.6%	46,210,700	11.7%	4,743,000	10.3%	**109,048,600**	**6.4%**

Notes: [1] SH 45 SE opened to traffic in May 2009 but did not become part of the CTTS until September 2012 (FY 2013).

Table 5.4 Total Annual Fiscal Year Toll Revenue by CTTS Element

Fiscal Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE [1]	% Change	Total	% Change
2008 [2]	-	-	-	-	-	-	-	-	**$48,905,800**	
2009 [2]	-	-	-	-	-	-	-	-	**$58,913,900**	**20.5%**
2010	$19,798,600	-	$11,936,900	-	$34,408,300	-	-	-	**$66,143,800**	**12.3%**
2011	$20,268,200	2.4%	$12,316,600	3.2%	$36,237,000	5.3%	-	-	**$68,821,800**	**4.0%**
2012	$21,944,600	8.3%	$13,015,100	5.7%	$40,735,000	12.4%	-	-	**$75,694,700**	**10.0%**
2013	$29,075,300	32.5%	$16,142,700	24.0%	$54,492,200	33.8%	$4,274,300	-	**$103,984,500**	**37.4%**
2014	$34,830,800	19.8%	$18,559,800	15.0%	$67,092,300	23.1%	$4,679,700	9.5%	**$125,162,600**	**20.4%**

Notes: (1) SH 45 SE opened to traffic in May 2009 but did not become part of the CTTS until September 2012 (FY 2013).
(2) Revenue for PBM patrons was not allocated by each toll facility until September 2009 (FY 2010); therefore, only total CTTS revenue is shown for FY 2008 and FY 2009.

Table 5.5 shows the average toll per transaction for the CTTS elements by fiscal year. Note that the tolls per transaction for fiscal years 2010 through 2012 are nearly identical since tolls were held constant during this period. The minor variation is likely due to variation in the recognition of the PBM revenue between fiscal years. There is a significant increase in the toll value per transaction for FY 2013 and FY 2014, reflecting the large increase in tolls that was implemented in January 2013.

Table 5.5 Average Toll Per Transaction by CTTS Element

Fiscal Year	SH 45 N	% Change	Loop 1	% Change	SH 130	% Change	SH 45 SE	% Change	Total	% Change
2008	-	-	-	-	-	-	-	-	**$0.74**	
2009	-	-	-	-	-	-	-	-	**$0.81**	**8.7%**
2010	$0.62	-	$0.66	-	$1.22	-	-	-	**$0.84**	**4.5%**
2011	$0.60	-1.8%	$0.65	-1.3%	$1.18	-2.6%	-	-	**$0.83**	**-1.6%**
2012	$0.61	1.5%	$0.65	0.3%	$1.19	0.1%	-	-	**$0.84**	**1.4%**
2013	$0.78	27.7%	$0.82	25.1%	$1.32	11.1%	$0.99	-	**$1.01**	**20.7%**
2014	$0.91	16.3%	$0.94	14.3%	$1.45	10.2%	$0.99	-0.7%	**$1.15**	**13.1%**

Table 5.6 and Table 5.7 set forth the unaudited total System transactions and toll revenue by month for FY 2010 through FY 2014. For ease of comparison, these values include SH 45 SE for all months and years, although it was not actually part of the CTTS until FY 2013.

Table 5.6 Historical System Total Transactions

Month	FY 2010		FY 2011		FY 2012		FY 2013		FY 2014	
	Total Transactions (in 000s)	% Change Over Prior Year	Total Transactions (in 000s)	% Change Over Prior Year	Total Transactions (in 000s)	% Change Over Prior Year	Total Transactions (in 000s)	% Change Over Prior Year	Total Transactions (in 000s)	% Change Over Prior Year
September	6,529	12%	7,016	7%	7,352	5%	7,951	8%	8,573	8%
October	6,834	9%	7,282	7%	7,478	3%	8,797	18%	9,160	4%
November	6,539	15%	6,979	7%	7,310	5%	8,805	20%	8,854	1%
December	6,554	12%	7,040	7%	7,392	5%	8,253	12%	8,452	2%
January	6,135	10%	6,546	7%	7,177	10%	7,798	9%	8,041	3%
February	6,015	11%	6,431	7%	7,248	13%	7,684	6%	7,928	3%
March	7,189	18%	7,730	8%	8,210	6%	8,899	8%	9,376	5%
April	7,104	15%	7,470	5%	8,078	8%	8,759	8%	9,511	9%
May	7,153	6%	7,563	6%	8,467	12%	9,124	8%	9,754	7%
June	7,063	3%	7,426	5%	8,334	12%	8,655	4%	9,664	12%
July	7,028	3%	7,238	3%	8,154	13%	8,648	6%	9,814	13%
August	7,251	7%	7,467	3%	8,674	16%	9,135	5%	9,922	9%
Total	**81,393**	**10%**	**86,188**	**6%**	**93,874**	**9%**	**102,507**	**9%**	**109,049**	**6%**

Notes: [1] System transactions are shown in the month in which they occur. As used herein, System transactions occur when each vehicle crosses a tolling station within the System, including all ETC, PBM and non-invoiced transactions.
[2] Transactions shown include SH 45 N, Loop 1, SH 130 and SH 45 SE, including SH 45 SE transactions while not part of the System. SH 45 SE became part of the System effective FY 2013.

Table 5.7 Historical System Toll Revenue

Month	FY 2010		FY 2011		FY 2012		FY 2013		FY 2014	
	Revenue (in $000s)	% Change Over Prior Year	Revenue (in $000s)	% Change Over Prior Year	Revenue (in $000s)	% Change Over Prior Year	Revenue (in $000s)	% Change Over Prior Year	Revenue (in $000s)	% Change Over Prior Year
September	$5,459	17%	$5,989	10%	$6,408	7%	$7,131	11%	$11,007	54%
October	$5,606	13%	$6,082	9%	$6,361	5%	$7,734	22%	$11,397	47%
November	$5,737	29%	$5,838	2%	$6,106	5%	$7,435	22%	$10,543	42%
December	$5,562	22%	$5,976	7%	$6,319	6%	$7,056	12%	$9,237	31%
January	$5,232	13%	$5,702	9%	$5,978	5%	$8,708	46%	$9,440	8%
February	$5,167	14%	$5,066	-2%	$6,073	20%	$7,773	28%	$9,399	21%
March	$6,115	23%	$6,447	5%	$6,924	7%	$9,722	40%	$10,878	12%
April	$6,220	28%	$6,439	4%	$6,684	4%	$9,615	44%	$10,776	12%
May	$6,006	18%	$6,133	2%	$7,054	15%	$10,711	52%	$10,502	-2%
June	$6,022	11%	$6,228	3%	$6,819	9%	$10,064	48%	$12,559	25%
July	$6,082	8%	$6,117	1%	$7,184	17%	$9,209	28%	$9,877	7%
August	$6,147	10%	$6,401	4%	$8,031	25%	$8,826	10%	$9,549	8%
Total	**$69,354**	**17%**	**$72,418**	**4%**	**$79,941**	**10%**	**$103,985**	**30%**	**$125,163**	**20%**

Notes: [1] Toll revenues from ETC payment method are shown on an accrual basis. Toll revenues from PBM payment method are shown on a cash basis. Total annual revenue differs from results shown in the audited financials of the System due to adjustments to reflect PBM revenues earned but not collected, less allowance for doubtful accounts.
[2] Toll revenues shown include SH 45 N, Loop 1, SH 130 and SH 45 SE, including SH 45 SE toll revenues while not part of the System. SH 45 SE became part of the System effective FY 2013.

5.2 VEHICLE CLASS DISTRIBUTION

The distribution of traffic by vehicle class has also been historically monitored for each CTTS facility. These values are derived from the toll transaction data, which does not identify 2-axle 6-tire trucks as a separate category. Therefore, the auto statistics include all autos as well as 2-axle, 6-tire trucks and the truck statistics include all trucks with 3+ axles. As shown by the tables below, the distribution of trucks and autos for each facility has remained fairly consistent throughout the

years, but the percent of trucks and autos varies between facilities. Table 5.8 displays the historical vehicle distributions for each CTTS facility.

Table 5.8 Historical Fiscal Year Average Vehicle Distributions by CTTS Facility

Fiscal Year	SH 45 N and Loop 1		SH 130		SH 45 SE	
	% Autos	% Trucks	% Autos	% Trucks	% Autos	% Trucks
2007	98.0%	2.0%	94.5%	5.5%	-	-
2008	97.9%	2.1%	93.2%	6.8%	-	-
2009	98.2%	1.8%	93.2%	6.8%	91.1%	8.9%
2010	98.4%	1.6%	93.2%	6.8%	90.9%	9.1%
2011	98.3%	1.7%	93.1%	6.9%	90.2%	9.8%
2012	98.2%	1.8%	92.7%	7.3%	88.2%	11.8%
2013	97.9%	2.1%	92.2%	7.8%	88.8%	11.2%
2014	97.2%	2.8%	91.1%	8.9%	89.4%	10.6%

Note: "Autos" includes 2-axle, 6-tire trucks and "Trucks" incudes all 3+ axle vehicles.

Table 5.9 displays the most recent fiscal year's vehicle distributions for each CTTS facility, by month.

Table 5.9 Fiscal Year 2014 Vehicle Distribution by CTTS Facility

Month-Year	SH 45 N and Loop 1		SH 130		SH 45 SE	
	% Autos	% Trucks	% Autos	% Trucks	% Autos	% Trucks
Sep-13	97.3%	2.7%	90.9%	9.1%	89.2%	10.8%
Oct-13	97.5%	2.5%	91.3%	8.7%	89.7%	10.3%
Nov-13	97.4%	2.6%	91.0%	9.0%	89.6%	10.4%
Dec-13	97.3%	2.7%	90.6%	9.4%	88.8%	11.2%
Jan-14	97.4%	2.6%	91.0%	9.0%	89.1%	10.9%
Feb-14	97.4%	2.6%	91.3%	8.7%	89.3%	10.7%
Mar-14	97.0%	3.0%	91.0%	9.0%	89.3%	10.7%
Apr-14	97.0%	3.0%	91.2%	8.8%	89.6%	10.4%
May-14	97.0%	3.0%	91.4%	8.6%	89.7%	10.3%
Jun-14	96.9%	3.1%	90.9%	9.1%	89.2%	10.8%
Jul-14	96.8%	3.2%	90.8%	9.2%	89.5%	10.5%
Aug-14	97.0%	3.0%	91.4%	8.6%	89.5%	10.5%
FY 2014 Average	**97.2%**	**2.8%**	**91.1%**	**8.9%**	**89.4%**	**10.6%**

SH 45 N and Loop 1 are integrated toll roads since they intersect and many vehicles use both roads for the same trip. As such, their vehicle distribution data is summarized together. The percent of trucks is low, hovering around 2 percent since the roads have opened, and trucks average 2.8 percent of total traffic for FY 2014 to date.

SH 130 has a greater proportion of trucks with an average of 8.9 percent for FY 2014. As shown in Table 5.8, SH 130 opened with approximately 5.5 percent trucks, and has slowly increased to its current level. These statistics have been influenced by a series of temporary truck rate discounts that have been implemented for selected periods during 2012 and 2013. These temporary

discounts encouraged commercial traffic to try SH 130 and improved traffic flow through Austin thus increasing safety for travelers. These discounts were represented in the modeling process for the purposes of replicating traffic for the 2013 calibration year, but the forecasts developed for the 2014 Update use do not use the discounts since they were terminated in January 2104. SH 45 SE has the highest portion of trucks of the CTTS facilities with an average of 10.6 percent for FY 2014. The historical vehicle distribution ranges between 9 and 12 percent, but has been consistently between 10 and 11 percent recently.

5.3 WEEKDAY AND SEASONAL PATTERNS

Seasonal transaction patterns for FY 2014 are summarized in Table 5.10 by showing the monthly and quarterly distributions for each facility. The CTTS fiscal year begins on September 1, making each quarter correlate to typical seasonal months. Across all facilities, the winter months in Quarter 2 have the fewest number of transactions, while the summer (Quarter 4) has the highest number of transactions.

Table 5.10 Monthly and Quarterly Transaction Distribution for FY 2014

Month-Year	SH 45 N and Loop 1	SH 130	SH 45 SE	Total
Sep-13	8.1%	7.6%	7.6%	**7.9%**
Oct-13	8.6%	8.1%	8.1%	**8.4%**
Nov-13	8.0%	8.2%	8.5%	**8.1%**
Dec-13	7.9%	7.6%	7.5%	**7.8%**
Jan-14	7.7%	6.9%	6.8%	**7.4%**
Feb-14	7.5%	7.0%	7.1%	**7.3%**
Mar-14	8.4%	8.8%	8.9%	**8.6%**
Apr-14	8.7%	8.8%	8.8%	**8.7%**
May-14	9.0%	9.0%	9.0%	**8.9%**
Jun-14	8.6%	9.2%	9.1%	**8.9%**
Jul-14	8.7%	9.4%	9.3%	**9.0%**
Aug-14	9.0%	9.3%	9.2%	**9.1%**
Sept - Nov (Q1)	**24.8%**	**23.9%**	**24.2%**	**24.4%**
Dec - Feb (Q2)	**23.2%**	**21.5%**	**21.4%**	**22.4%**
Mar - May (Q3)	**26.0%**	**26.6%**	**26.7%**	**26.3%**
Jun - Aug (Q4)	**26.1%**	**28.0%**	**27.6%**	**27.0%**

The average number of transactions for a weekday, and how it compares to the average number for any day of the year, is summarized for FY 2014 in Table 5.11. For FY 2014, the average weekday traffic was approximately 11 percent greater than the average daily traffic.

Table 5.11 FY 2014 Average Daily and Average Weekday CTTS Traffic Comparison

Month-Year	Average Daily Traffic (ADT)	Average Weekday Daily Traffic (AWDT)	Percent Difference (AWDT/ADT - 1)
Sep-13	285,753	322,226	13%
Oct-13	295,468	322,106	9%
Nov-13	295,130	330,872	12%
Dec-13	272,645	306,871	13%
Jan-14	259,394	290,703	12%
Feb-14	283,139	311,716	10%
Mar-14	302,455	334,545	11%
Apr-14	317,023	344,103	9%
May-14	314,652	348,291	11%
Jun-14	322,127	352,514	9%
Jul-14	316,590	349,556	10%
Aug-14	320,077	353,649	10%
FY 2014	**298,763**	**330,988**	**11%**
		FY 2014 Annualization Factor	***329***

This data was also used to develop annualization factors to be used in the traffic and revenue forecasts by converting weekday traffic volumes into annual volumes for each CTTS facility. The annualization factors vary for each facility depending on the characteristics of the road. For Loop 1 and SH 45 N, the annualization factor is approximately 320, while for SH 130, it is slightly higher at 330, due to higher levels of weekend traffic. SH 45 SE also has an annualization factor of approximately 330, generally consistent with the trends from SH 130.

5.4 PAYMENT METHOD DISTRIBUTION

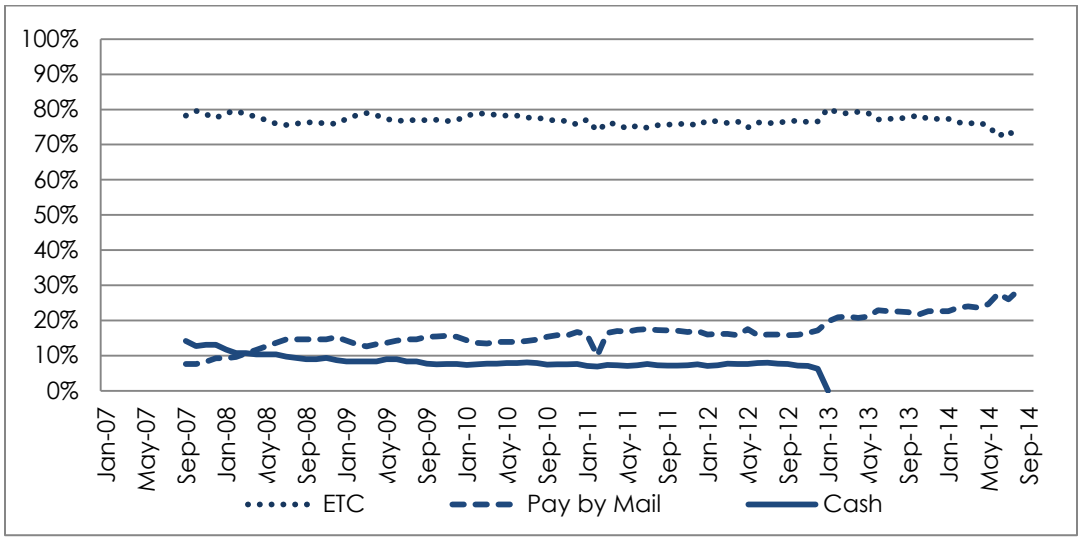
As previously discussed in Chapter 4 of this report, prior to January 2013, CTTS had three methods of toll collection: cash, ETC, and PBM. Since January 2013, all facilities are operated cashless, therefore, the payment method distribution for FY 2014 of the different CTTS facilities shown in Table 5.12 includes only the ETC and PBM methods.

Table 5.12 Fiscal Year 2014 Payment Method Distribution by CTTS Facility

Month-Year	SH 45 N and Loop 1		SH 130		SH 45 SE		Total	
	% ETC	% Pay by Mail	% ETC	% Pay by Mail	% ETC	% Pay by Mail	% ETC	% Pay by Mail
Sep-13	77.7%	22.3%	65.0%	35.0%	63.0%	37.0%	71.7%	28.3%
Oct-13	78.3%	21.7%	66.0%	34.0%	64.0%	36.0%	72.4%	27.6%
Nov-13	77.3%	22.7%	65.0%	35.0%	62.0%	38.0%	71.2%	28.8%
Dec-13	77.3%	22.7%	65.0%	35.0%	63.0%	37.0%	71.4%	28.6%
Jan-14	77.3%	22.7%	66.0%	34.0%	64.0%	36.0%	72.4%	27.6%
Feb-14	76.3%	23.7%	65.0%	35.0%	63.0%	37.0%	71.1%	28.9%
Mar-14	76.0%	24.0%	63.0%	37.0%	61.0%	39.0%	69.7%	30.3%
Apr-14	76.3%	23.7%	64.0%	36.0%	62.0%	38.0%	70.6%	29.4%
May-14	75.3%	24.7%	63.0%	37.0%	61.0%	39.0%	69.2%	30.8%
Jun-14	72.4%	27.6%	61.0%	39.0%	59.0%	41.0%	67.8%	32.2%
Jul-14	74.0%	26.0%	61.0%	39.0%	60.0%	40.0%	67.7%	32.3%
Aug-14	71.3%	28.7%	60.0%	40.0%	59.0%	41.0%	66.0%	34.0%
FY 2014 Average	**75.9%**	**24.1%**	**63.5%**	**36.5%**	**61.4%**	**38.6%**	**70.0%**	**30.0%**

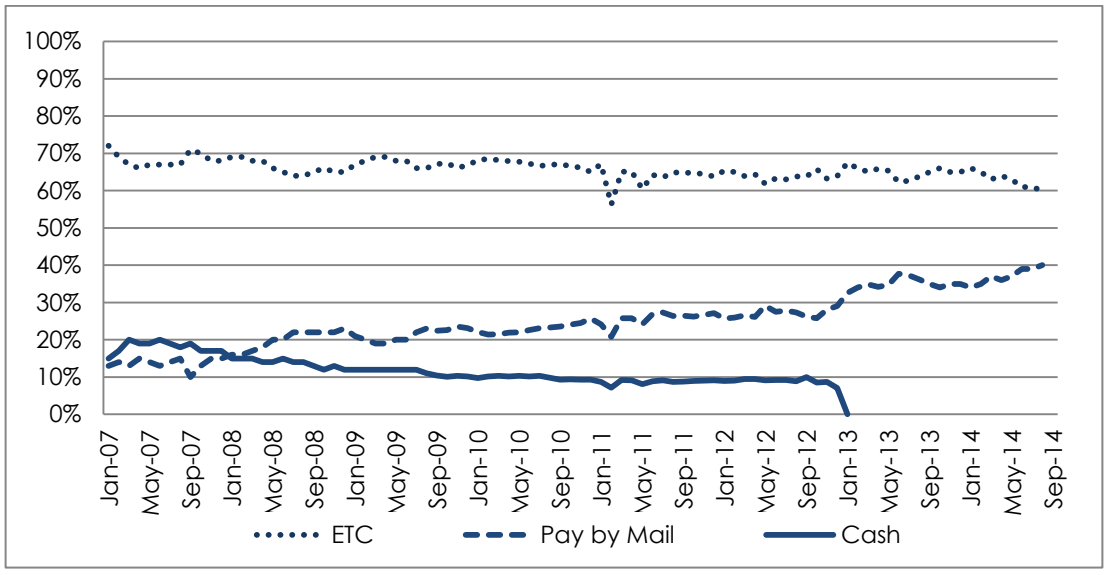
Again, SH 45 N and Loop 1 are summarized together because of their similarities in traffic behavior and relationship to each other. In FY 2014, 75.8 percent of the traffic paid by ETC, the highest rate of ETC usage on the CTTS facilities. The historical distribution is shown in Figure 5.2.

Figure 5.2 SH 45 N and Loop 1 Historical Payment Method Distribution



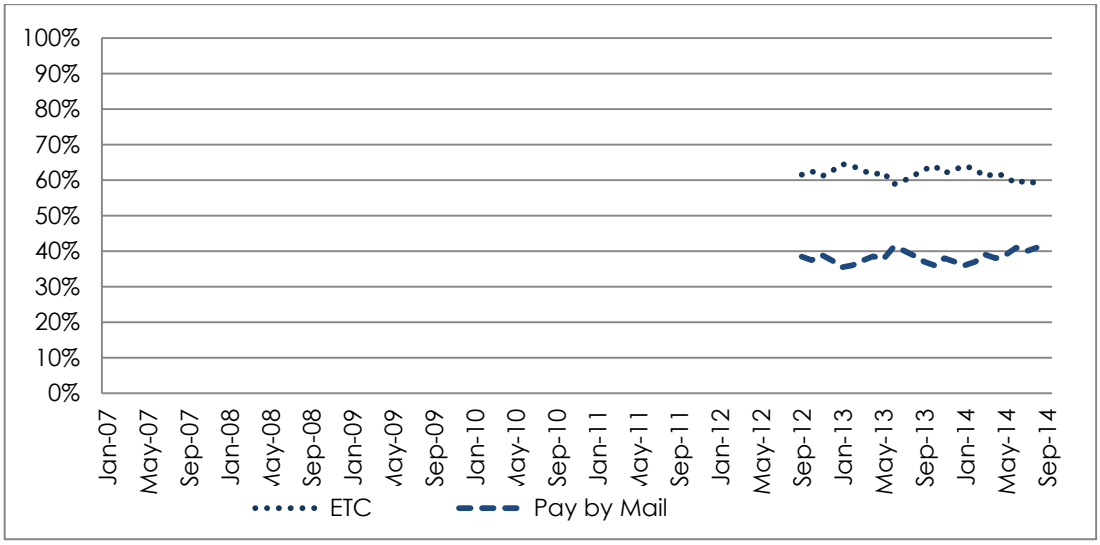
SH 130 currently has ETC and PBM transactions with FY 2014 averages of 63.7 percent and 36.3 percent, respectively. Looking at the historical distribution for this toll road in Figure 5.3, the percent of ETC transactions began at approximately 70 percent, and has slowly decreased since. This is due to the formal adoption of the PBM payment method and the removal of the cash payment option. More recently, the transition to the Xerox system and business rules for delinquent accounts has also caused a temporary increase in transactions identified as PBM.

Figure 5.3 SH 130 Historical Payment Method Distribution



SH 45 SE has always operated as cashless since it began operations as a TxDOT toll road in May 2009. When SH 45 SE became part of CTTS is September 2012, approximately 60 percent of transactions were ETC transactions and has sustained that percentage since. Currently, it has an FY 2014 average payment method distribution of 61.8 percent for ETC and 38.3 percent for PBM. The historical distribution since joining the CTTS is shown in Figure 5.4.

Figure 5.4 SH 45 SE Historical Payment Method Distribution



5.5 TRANSACTION PAYMENT STATUS

With the introduction of cashless toll collection, Stantec has been monitoring the effective collection rates for ETC and PBM transactions. For this report, the collection statistics for FY 2014 through February, which is the latest available data, were obtained from TxDOT.

The FY 2014 data through February are summarized in Table 5.13. These data provide the distribution of FY 2014 transactions for the CTTS by payment type and by payment status (paid/unpaid transactions). The data show that there were 50.6 million transactions through February with approximately 36.1 million ETC-based transactions including interoperable transactions from transponders from other agencies and 14.5 million image-based transactions. As shown in the table, the image-based transactions were approximately 28.7 percent of the total amount.

Paid transactions include both regular payment of the tolls from patrons as well as payments reimbursed from TxDOT for the free passage allowed for selected veteran categories. These veterans' waivers were 1.9 percent of the total transactions. For the non-paying transaction category, the table summarizes both *unbilled* PBM transactions where it was not possible to invoice patrons due to bad images or lack of acceptable vehicle registration information. The *unpaid* category includes both PBM transactions for which payment was not received and non-revenue ETC transactions or invalid ETC tags. For the combined ETC category approximately 99.7 percent of all transactions were paid while the PBM category had only 47.7 percent of transactions paid.

Table 5.13 FY 2014 CTTS Transaction Payment Status

Payment Type	Paid Transactions		Non-Paying Transactions			Total Transactions	Percent Paid
	Regular [1]	Vet. Waiver [2]	Unpaid [3]	Unbilled	Total		
ETC	32,176,432	520,110	83,204		83,204	32,779,746	99.7%
ETC - InterOP	3,327,821	19,989	15,189		15,189	3,362,999	
Image Based (PBM)	6,479,402	448,332	3,711,478	3,872,038	7,583,516	14,511,250	47.7%
Total	41,983,655	988,431	3,809,871	3,872,038	7,681,909	50,653,995	84.8%
Percent of Total Transactions							
ETC	63.5%	1.0%	0.2%	0.0%	0.2%	64.7%	
ETC - InterOP	6.6%	0.0%	0.0%	0.0%	0.0%	6.6%	
Image Based (PBM)	12.8%	0.9%	7.3%	7.6%	15.0%	28.7%	
Total	82.9%	1.9%	7.5%	7.6%	15.2%	100.0%	

Notes:

1) - includes ETC transactions that were Paid by Plate (images that were subsequently linked to transponder accounts)

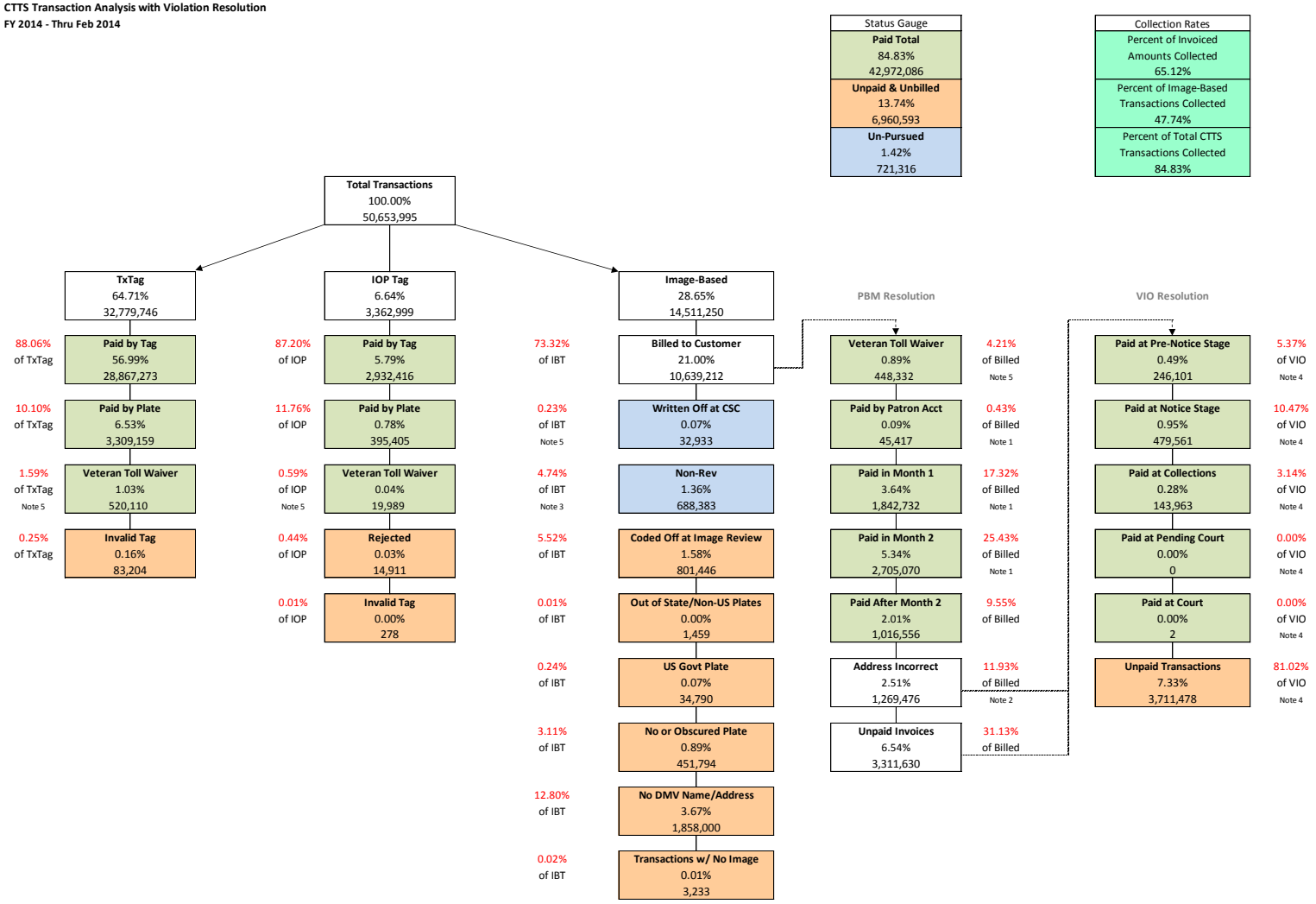
2) - CTTS Revenue Fund reimbursed by TxDOT

3) - Includes ETC & InterOP rejects/Invalid Tag

Figure 5.5 displays a flow chart with a further break down of transactions by payment type for FY 2014 through February. The collection data reflect the collection status based on conditions that have occurred since the adoption of new laws that allow TxDOT to pursue habitual violators, including vehicle registration hold and a dedicated administrative hearing process. Based on the initial results of the Habitual Violator enforcement program, which was focused on the individuals with the largest amounts of unpaid tolls, TxDOT is now expanding the ranges of targeted individuals to include individuals with lower amounts of unpaid tolls to broaden the program's impact and deter more infrequent violators. The data also include the changes in collection procedures that are being implemented by the new toll system operator (Xerox) and other issues associated with that transition.

Improvements are currently ongoing for the CTTS collections program that include recently contracted collection efforts on a performance based payment scale, more robust monthly reporting, performance measures and a collections manual. A change will also be implemented related to the account selection methodology for courts.

Figure 5.5 CTTS Transactions Processing Flow Chart



Note 1: Pay By Mail distribution is based on the Pay By Mail Resolution Report for transactions that occurred thru February 2014.
Note 2: Address Incorrect information represents the percent of invoices mailed compared to the Address Incorrect information provided for the subsequent month.
Note 3: Non-Revenue transactions post as zero-dollar transactions and are authorized free passage per CTTS Bond Indenture.
Note 4: Violation resolution data is as of July 3, 2014.
Note 5: Veteran Toll Waiver Program transactions post as zero-dollar, are authorized free passage per TTC Minute Order 113247 (initiated in December, 2012), and are paid to the CTTS Revenue Fund by TxDOT.

6.0 SOCIOECONOMIC DATA

This chapter discusses socioeconomic indicators that are used to identify growth in the region that encompasses the Austin area toll roads and are included in the regional transportation model. The socioeconomic baseline (2013) and future forecasts were prepared by Dr. Bomba and Stantec for use in the disaggregated traffic analysis zone (TAZ) system used in the individual travel demand models. In this process, the historical data are analyzed, base year data are established, and forecasts are prepared for the entire TAZ system.

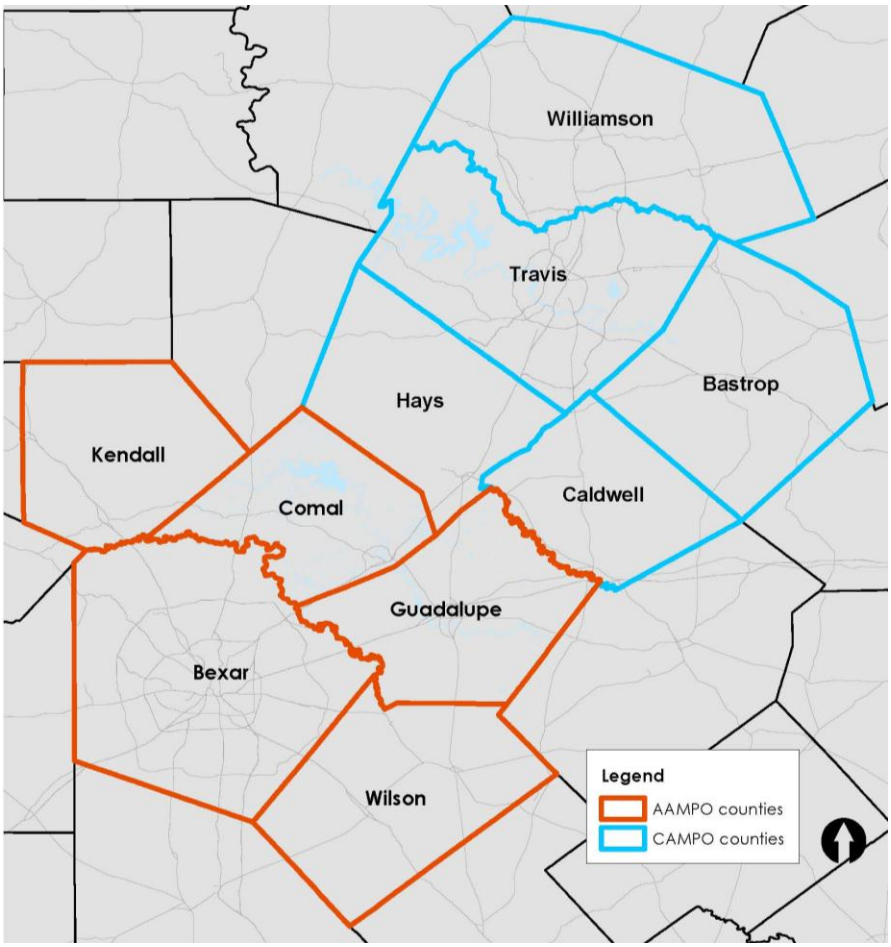
This discussion presents recent demographic and economic trends and projections of future levels of activity in the area, a comparison of revised county control figures for population and employment with previous forecasts, a description of the methodology used to update information on the Transportation Analysis Zone (TAZ) level and a summary of interviews of local government representatives regarding proposed development in the Austin region.

Additional detailed information may be found in Dr. Bomba's Technical Memorandum included as Appendix A.

6.1 REGIONAL TRENDS

The study area included in the regional transportation model used for the CTRMA traffic forecast includes five counties in the CAMPO model area (Travis, Williamson, Hayes, Bastrop and Caldwell) and five counties in the AAMPO model area (Bexar, Guadalupe, Comal, Wilson and Kendall) as shown in Figure 6.1.

Figure 6.1 Counties in Transportation Model



6.1.1 Regional Population

The population of the State of Texas has grown rapidly since 1980, increasing from 14.2 million in 1980 to more than 25.1 million residents in 2010. Between 2000 and 2010, Texas added 4.3 million residents, making it the fastest growing state in terms of total population. Most of this population increase was in the urban areas of the state.

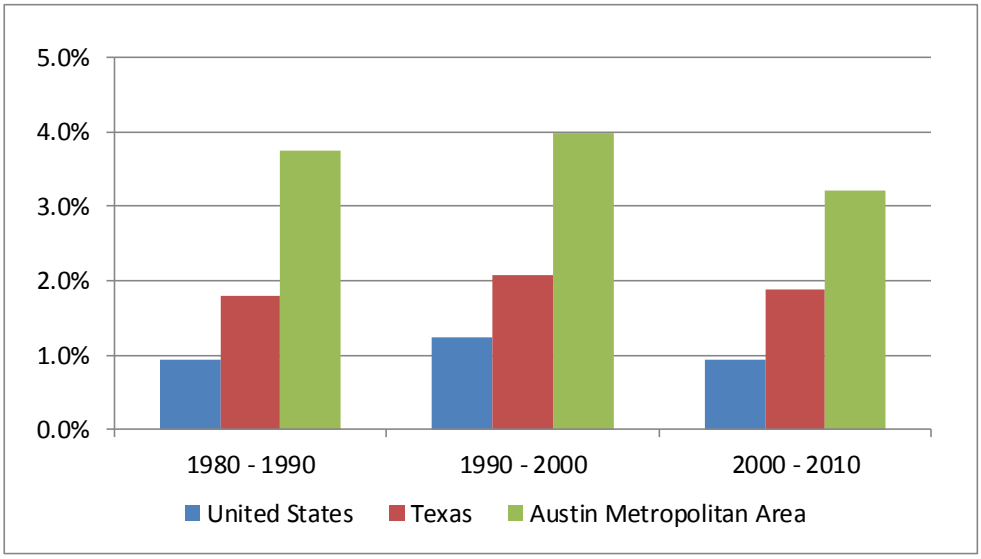
Table 6.1 U.S., Texas and Austin Metropolitan Area Population, 1980 – 2010

Census Year	United States		Texas		Austin Metropolitan Area	
	Population	Average Annual Rate of Growth	Population	Average Annual Rate of Growth	Population	Average Annual Rate of Growth
1980	226,546,000		14,229,000		585,000	
1990	248,710,000	0.9%	16,987,000	1.8%	846,000	3.8%
2000	281,422,000	1.2%	20,852,000	2.1%	1,250,000	4.0%
2010	308,748,000	0.9%	25,146,000	1.9%	1,716,289	3.2%

Sources: United States and Texas, U.S. Bureau of the Census; Austin Metropolitan Area, Department of Planning, City of Austin.

Population growth in the Austin Metropolitan Area since 1980 is compared to growth in the United States and in Texas in Table 6.1. The historical growth rates are shown in Figure 6.2.

Figure 6.2 Average Annual Population Growth - United States, Texas and Austin Metropolitan Area 1980 – 2010



Sources: United States and Texas, U.S. Bureau of the Census; Austin Metropolitan Area, Department of Planning, City of Austin.

Population in the Austin area continues to grow at a rapid rate. The Department of Planning of the City of Austin reports that the Austin Metropolitan Area (which includes the same five counties as included in the CAMPO model) increased 2.3 percent in 2013, making it the fastest growing large (1.0+ million) metropolitan area in the country by percent change. Travis County was the fastest growing large (250,000+) county in the United States between 2010 and 2013 with an increase of more than 90,000 persons.

Population in the five counties included in the CAMPO model increased from 1.7 million in the 2010 Census to an estimated 1.9 million in 2013, an average annual growth rate of 2.6 percent. The population of Travis County, which includes the City of Austin, increased at an average annual rate of 3.1 percent during the same 3-year period.

Total population in the AAMPO region (Bexar, Comal, Guadalupe, Kendall, and Wilson counties) increased at an average annual rate of 2.1 percent between 2010 and 2013. The City of San Antonio is located in Bexar, the largest county in the AAMPO region.

Total population in the ten-county study area increased at an average annual rate of 2.6 percent between 2010 and 2013, increasing from 3.7 million to 4.0 million. The regional growth rate for the region has been relatively steady over the last 33 years and continues to be strong. Population for each county for census years 1980 through 2010 and the latest estimate for 2013 from the U.S. Bureau of the Census are shown in Table 6.2.

Table 6.2 Historical Population in Study Area, 1980-2013

Population							
Region	**County**	**1970**	**1980**	**1990**	**2000**	**2010**	**2013**
CAMPO	Travis	295,516	419,573	576,407	812,280	1,024,266	1,120,954
	Williamson	37,305	76,521	139,551	249,967	422,679	471,014
	Hays	27,642	40,594	65,614	97,589	157,107	176,026
	Bastrop	17,297	24,726	38,263	57,733	74,171	75,825
	Caldwell	21,178	23,637	26,392	32,194	38,066	39,232
	Total	398,938	585,051	846,227	1,249,763	1,716,289	1,883,051
AAMPO	Bexar	830,460	988,800	1,185,394	1,392,931	1,714,773	1,817,610
	Comal	24,165	36,446	51,832	78,021	108,472	118,480
	Guadalupe	33,554	46,708	64,873	89,023	131,533	143,183
	Kendall	6,964	10,635	14,589	23,743	33,410	37,766
	Wilson	13,041	16,756	22,650	32,408	42,918	45,418
	Total	908,184	1,099,345	1,339,338	1,616,126	2,031,106	2,162,457
Study Area Total		**1,307,122**	**1,684,396**	**2,185,565**	**2,865,889**	**3,747,395**	**4,045,508**
Average Annual Growth Rates							
Region	**County**		**1970 - 1980**	**1980 - 1990**	**1990 - 2000**	**2000 - 2010**	**2010 - 2013**
CAMPO	Travis		3.6%	3.2%	3.5%	2.3%	3.1%
	Williamson		7.4%	6.2%	6.0%	5.4%	3.7%
	Hays		3.9%	4.9%	4.0%	4.9%	3.9%
	Bastrop		3.6%	4.5%	4.2%	2.5%	0.7%
	Caldwell		1.1%	1.1%	2.0%	1.7%	1.0%
	Total		3.9%	3.8%	4.0%	3.2%	3.1%
AAMPO	Bexar		1.8%	1.8%	1.6%	2.1%	2.0%
	Comal		4.2%	3.6%	4.2%	3.4%	3.0%
	Guadalupe		3.4%	3.3%	3.2%	4.0%	2.9%
	Kendall		4.3%	3.2%	5.0%	3.5%	4.2%
	Wilson		2.5%	3.1%	3.6%	2.8%	1.9%
	Total		1.9%	2.0%	1.9%	2.3%	2.1%
Study Area Total			**2.6%**	**2.6%**	**2.7%**	**2.7%**	**2.6%**

Source: U.S. Bureau of the Census.

For the 2014 Study, Dr. Bomba prepared an update of the estimates of population included in the CAMPO and AAMPO models to better reflect recent development in the areas served by the toll roads in the Austin region. Population in the counties in the CAMPO area is basically unchanged, while AAMPO regional population is reduced 2.1 percent. Population for the total region is estimated at 1.3 percent less than the Census estimate. As can be seen in Table 6.3, the adjustments were minor. The decline in the baseline population mainly relates to how each MPO addressed group quarters populations. The AAMPO population was adjusted downward to remove the population in group quarters to conform to the estimate for the CAMPO counties. In the CAMPO study area, the Williamson County 2013 population was adjusted downward modestly due to the differing opinions between the U.S. Census Bureau's 2013 population estimate and the Texas State Data Center's (TxSDC) population estimates, which are strongly influenced by net migration.

Table 6.3 Comparison of Census and Adjusted 2013 Population for Study Area

Region	County	2013 Population		Difference	
		Census	Adjusted	Number	Percent
CAMPO	Travis	1,120,954	1,120,892	(62)	0.0%
	Williamson	471,014	465,263	(5,751)	-1.2%
	Hays	176,026	175,837	(189)	-0.1%
	Bastrop	75,825	75,825	-	0.0%
	Caldwell	39,232	39,226	(6)	0.0%
	Total	1,883,051	1,877,043	(6,008)	-0.3%
AAMPO	Bexar	1,817,610	1,775,596	(42,014)	-2.3%
	Comal	118,480	117,419	(1,061)	-0.9%
	Guadalupe	143,183	141,300	(1,883)	-1.3%
	Kendall	37,766	37,246	(520)	-1.4%
	Wilson	45,418	44,869	(549)	-1.2%
	Total	2,162,457	2,116,430	(46,027)	-2.1%
Study Area Total		**4,045,508**	**3,993,473**	**(52,035)**	**-1.3%**

Sources: U.S. Bureau of the Census and Michael Bomba, PhD.

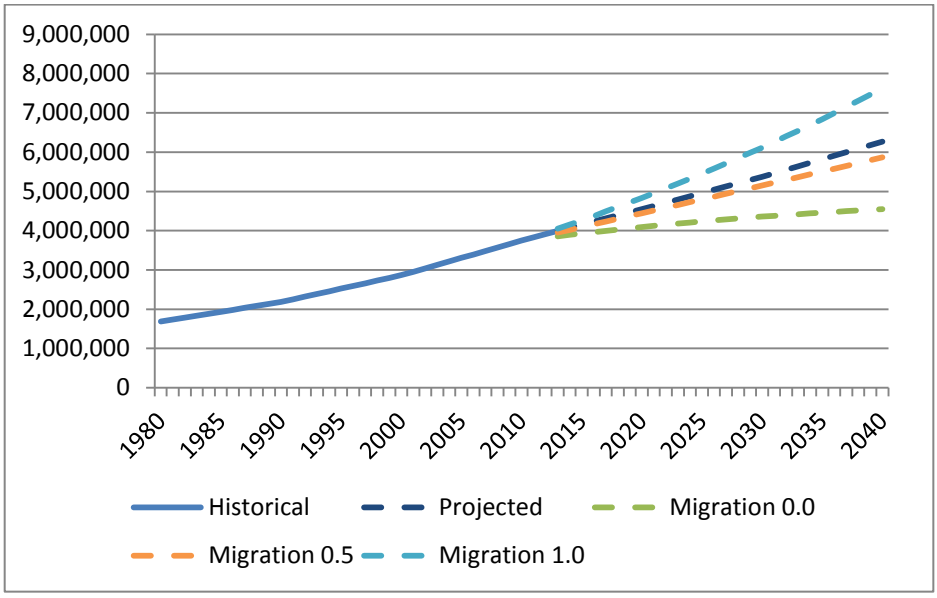
Starting with the adjusted population for 2013 presented above, growth is anticipated to taper down from the annual average rate of 2.6 percent between 2010 and 2013 to 2.0 percent between 2013 and 2015. After that, it continues to slow down, reaching an annual growth rate of 1.5 percent between 2030 and 2040. The forecast of future population and average annual growth rate for the ten counties are presented in Table 6.4. Historical and projected population used for the 2014 Study and average annual growth rate are shown in Figure 6.3.

The projections of population prepared by the TxSDC for three alternative migration scenarios are also shown in Figure 6.3. The high migration scenario, 1.0, is based on future migration at the same rate as 2000 to 2010. The 0.5 scenario reflects half of that rate, and the low migration scenario, 0.0, is based on no migration.

Table 6.4 Population Forecast for the Study Area, 2013 – 2040

Current & Projected Population						
REGION	**County**	**2013**	**2015**	**2020**	**2030**	**2040**
CAMPO	Travis	1,120,892	1,170,298	1,273,336	1,474,365	1,669,612
	Williamson	465,263	492,382	566,298	739,143	952,122
	Hays	175,837	188,375	220,507	288,990	364,369
	Bastrop	75,825	77,898	85,583	103,220	124,358
	Caldwell	39,226	39,969	42,471	48,235	55,111
	Total	1,877,043	1,968,922	2,188,195	2,653,953	3,165,572
AAMPO	Bexar	1,775,596	1,832,203	1,957,968	2,196,665	2,471,362
	Comal	117,419	123,502	138,646	168,731	197,279
	Guadalupe	141,300	147,921	169,057	214,674	265,018
	Kendall	37,246	39,827	45,117	55,789	66,740
	Wilson	44,869	46,215	50,898	60,663	71,049
	Total	2,116,430	2,189,668	2,361,686	2,696,522	3,071,448
Study Area Total		**3,993,473**	**4,158,590**	**4,549,881**	**5,350,475**	**6,237,020**
Average Annual Growth Rates						
REGION	**County**		**2013 - 2015**	**2015 - 2020**	**2020 - 2030**	**2030 - 2040**
CAMPO	Travis		2.2%	1.7%	1.5%	1.3%
	Williamson		2.9%	2.8%	2.7%	2.6%
	Hays		3.5%	3.2%	2.7%	2.3%
	Bastrop		1.4%	1.9%	1.9%	1.9%
	Caldwell		0.9%	1.2%	1.3%	1.3%
	Total		2.4%	2.1%	1.9%	1.8%
AAMPO	Bexar		1.6%	1.3%	1.2%	1.2%
	Comal		2.6%	2.3%	2.0%	1.6%
	Guadalupe		2.3%	2.7%	2.4%	2.1%
	Kendall		3.4%	2.5%	2.1%	1.8%
	Wilson		1.5%	1.9%	1.8%	1.6%
	Total		1.7%	1.5%	1.3%	1.3%
Study Area Total			**2.0%**	**1.8%**	**1.6%**	**1.5%**

Figure 6.3 Historical and Projected Population in Study Region, 1980 – 2040



Sources: U.S. Bureau of the Census; Michael Bomba, PhD; Texas State Data Center

A comparison of the population projections prepared for the 2012 Update and the forecasts used for the 2014 Study indicates that the difference in the CAMPO area is due to actual growth in 2013. As shown in Table 6.5, the 2013 population in the counties in the CAMPO model area is 2.1 percent greater than in the 2012 Update; however, the difference between the two series diminishes over the period included in the forecasts. Regarding growth in the AAMPO counties, higher population projections reflect higher baseline population for Bexar County and a higher forecast due to updated migration data used by TxSDC in preparing their most recent population projections.

Table 6.5 Comparison of 2012 and 2014 Projections of Population

Year	Estimated Population		Difference	
	2012 Update	2014 Study	Number	Percent
CAMPO Counties				
2013	1,838,320	1,877,043	38,723	2.1%
2015	1,926,488	1,968,922	42,434	2.2%
2020	2,149,074	2,188,195	39,121	1.8%
2030	2,650,675	2,653,953	3,278	0.1%
2040	3,208,706	3,165,572	(43,134)	-1.3%
AAMPO Counties				
2013	2,113,121	2,116,430	3,309	0.2%
2015	2,190,936	2,189,668	(1,268)	-0.1%
2020	2,328,180	2,361,686	33,506	1.4%
2030	2,569,577	2,696,522	126,945	4.9%
2040	2,777,887	3,071,448	293,561	10.6%
Total Region				
2013	3,951,441	3,993,473	42,032	1.1%
2015	4,117,424	4,158,590	41,166	1.0%
2020	4,477,254	4,549,881	72,627	1.6%
2030	5,220,252	5,350,475	130,223	2.5%
2040	5,986,593	6,237,020	250,427	4.2%

6.1.2 Regional Employment

In 2013, employment in Texas grew at an annual rate of 2.7 percent, but has since reached the level of 3.7 percent in September 2014. The Austin region's economy is generally recognized as one of the most resilient in the nation, particularly during and following the 2008 - 2009 Recession. As the state capital and home to the University of Texas, Austin adds a degree of stability to the local economy. Employment in the Austin Metropolitan Area has increased from 243,800 in 1980 to 864,000 in 2013, as reported by the U.S. Bureau of Labor Statistics. This is an average annual rate of increase of 3.9 percent.

According to CAMPO, the largest employers in the greater Austin area are in the government, universities, technology, warehouse and distribution and health care sectors. Major employers (over 6,000 employees) include:

- Austin School District;
- City of Austin;
- Federal Government;
- IBM;
- Dell;
- State of Texas;
- University of Texas at Austin; and
- Seton Healthcare Family.

Data for the San Antonio – New Braunfels Metropolitan Area are only available since 1990 and show that employment in that area has increased from 543,300 in 1990 to 906,300 in 2013. Historical employment in the two metropolitan areas is summarized in Table 6.6.

Table 6.6 Historical Employment in Study Area

Employment					
REGION	**1980**	**1990**	**2000**	**2010**	**2013**
CAMPO: Austin-Round Rock-San Marcos Metro Area	243,800	389,000	672,700	770,300	864,200
AAMPO: San Antonio-New Braunfels Metro Area[(1)]		543,300	745,200	844,200	906,300
Study Area Total		**932,300**	**1,417,900**	**1,614,500**	**1,770,500**
Average Annual Growth Rate					
REGION	**1970 - 1980**	**1980 - 1990**	**1990 - 2000**	**2000 - 2010**	**2010 - 2013**
CAMPO		4.8%	5.6%	1.4%	3.9%
AAMPO			3.2%	1.3%	2.4%
Study Area Total			4.3%	1.3%	3.1%

Note:
[(1)] San Antonio-New Braunfels Metro Area, as definied by the U.S. Census, includes Bexar, Comal, Guadalupe, Kendall, Wilson, Medina, Atacosta and Bandera counties.

Detailed annual data by county is shown in Table 6.7 for the period 2007 through 2013. With the exception of 2009, when the number of jobs decreased due to the recession, employment has been increasing on a steady basis. According to CAMPO, Austin has had significant increases in health care, professional and management positions, and arts, entertainment and food industries while manufacturing jobs are decreasing. There is a demand for high-tech workers due to the presence of computer and internet firms serving the increasing demand for their products. Growth has been both in suburban areas and in the Austin Central Business District.

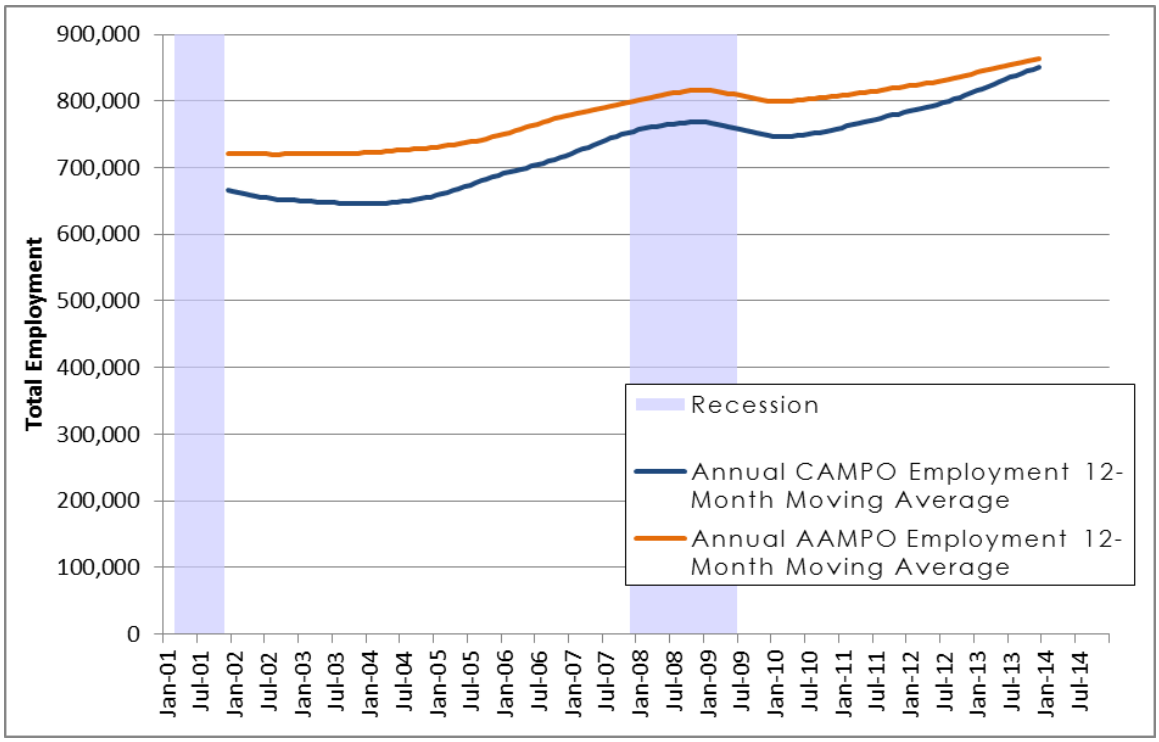
Table 6.7 Employment by County, 2007 - 2013

Employment								
Region	**County**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
CAMPO	Travis	569,200	578,961	559,751	567,693	581,510	604,648	633,471
	Williamson	117,842	121,725	119,984	120,860	128,863	133,518	139,123
	Hays	47,714	46,748	47,510	48,616	50,577	52,585	55,305
	Bastrop	13,335	13,883	14,143	14,283	14,032	14,120	15,081
	Caldwell	6,583	6,871	6,712	6,929	7,441	7,729	8,029
	Total	754,675	768,189	748,101	758,381	782,423	812,600	851,009
AAMPO	Bexar	716,666	730,302	715,292	722,147	732,527	749,534	770,591
	Comal	36,955	39,034	39,173	39,332	41,073	42,249	42,804
	Guadalupe	28,787	29,887	28,825	28,932	29,983	30,602	31,477
	Kendall	10,176	10,674	10,755	10,654	11,243	11,675	12,074
	Wilson	6,400	6,546	6,419	6,490	6,645	6,683	7,064
	Total	798,983	816,442	800,464	807,555	821,471	840,742	864,010
Study Area Total		**1,553,657**	**1,584,631**	**1,548,565**	**1,565,935**	**1,603,894**	**1,653,342**	**1,715,019**
Average Annual Growth Rates								
Region	**County**	**2006 - 2007**	**2007 - 2008**	**2008 - 2009**	**2009 - 2010**	**2010 - 2011**	**2011 - 2012**	**2012 - 2013**
CAMPO	Travis	4.0%	1.7%	-3.3%	1.4%	2.4%	4.0%	4.8%
	Williamson	10.0%	3.3%	-1.4%	0.7%	6.6%	3.6%	4.2%
	Hays	6.4%	-2.0%	1.6%	2.3%	4.0%	4.0%	5.2%
	Bastrop	5.7%	4.1%	1.9%	1.0%	-1.8%	0.6%	6.8%
	Caldwell	2.0%	4.4%	-2.3%	3.2%	7.4%	3.9%	3.9%
	Total	5.1%	1.8%	-2.6%	1.4%	3.2%	3.9%	4.7%
AAMPO	Bexar	2.5%	1.9%	-2.1%	1.0%	1.4%	2.3%	2.8%
	Comal	5.0%	5.6%	0.4%	0.4%	4.4%	2.9%	1.3%
	Guadalupe	4.1%	3.8%	-3.6%	0.4%	3.6%	2.1%	2.9%
	Kendall	3.3%	4.9%	0.8%	-0.9%	5.5%	3.8%	3.4%
	Wilson	2.4%	2.3%	-1.9%	1.1%	2.4%	0.6%	5.7%
	Total	2.7%	2.2%	-2.0%	0.9%	1.7%	2.3%	2.8%
Study Area Total		**3.8%**	**2.0%**	**-2.3%**	**1.1%**	**2.4%**	**3.1%**	**3.7%**

Sources: U.S. Bureau of Labor Statistics; Michael Bomba, PhD.

Employment in the CAMPO and AAMPO areas is shown graphically in Figure 6.4 for the period 2001 through 2014. The effects of the recession can be seen in the downturn in 2009 and the rebound since then. Employment levels are now higher than before the recession and total employment levels for both the CAMPO and AAMPO areas exceed 850,000 in 2013.

Figure 6.4 Employment in Study Area, 2001 - 2014



Starting with the adjusted employment for 2013 presented above, growth is anticipated to taper down from the rate of 3.1 percent in 2012 and 3.7 percent in 2013 to 2.0 percent between 2013 and 2015. After that, it continues to slow down, reaching an annual growth rate of 1.5 percent between 2030 and 2040. The forecast of future employment for the ten counties is presented in Table 6.8.

Table 6.8 Employment Forecast for Study Area, 2013 – 2040

Employment Control Totals						
REGION	**County**	**2013**	**2015**	**2020**	**2030**	**2040**
CAMPO	Travis	635,250	660,559	717,497	839,247	962,917
	Williamson	139,191	147,884	168,721	211,554	254,472
	Hays	54,565	58,102	66,937	86,092	108,533
	Bastrop	15,058	15,797	18,221	24,358	33,126
	Caldwell	7,966	8,373	9,511	12,300	15,958
	Total	852,030	890,715	980,887	1,173,551	1,375,006
AAMPO	Bexar	771,162	796,244	856,370	982,096	1,116,034
	Comal	40,379	43,258	50,662	67,780	88,534
	Guadalupe	31,080	32,728	36,668	45,225	54,802
	Kendall	12,162	12,842	14,517	18,255	22,642
	Wilson	6,930	7,214	8,042	9,592	10,972
	Total	861,713	892,286	966,259	1,122,948	1,292,984
Study Area Total		**1,713,743**	**1,783,001**	**1,947,146**	**2,296,499**	**2,667,990**
Average Annual Growth Rates						
REGION	**County**		**2013 - 2015**	**2015 - 2020**	**2020 - 2030**	**2030 - 2040**
CAMPO	Travis		2.0%	1.7%	1.6%	1.4%
	Williamson		3.1%	2.7%	2.3%	1.9%
	Hays		3.2%	2.9%	2.5%	2.3%
	Bastrop		2.4%	2.9%	2.9%	3.1%
	Caldwell		2.5%	2.6%	2.6%	2.6%
	Total		2.2%	1.9%	1.8%	1.6%
AAMPO	Bexar		1.6%	1.5%	1.4%	1.3%
	Comal		3.5%	3.2%	3.0%	2.7%
	Guadalupe		2.6%	2.3%	2.1%	1.9%
	Kendall		2.8%	2.5%	2.3%	2.2%
	Wilson		2.0%	2.2%	1.8%	1.4%
	Total		1.8%	1.6%	1.5%	1.4%
Study Area Total			**2.0%**	**1.8%**	**1.7%**	**1.5%**

A comparison of the population projections prepared for the 2012 Update and the forecasts used in the 2014 Study, as shown in Table 6.9, indicates that the current projections are higher due to strong employment growth during the last few years. Travis and Bexar counties are the major sources of the additional jobs but most of the other counties contributed positively as well.

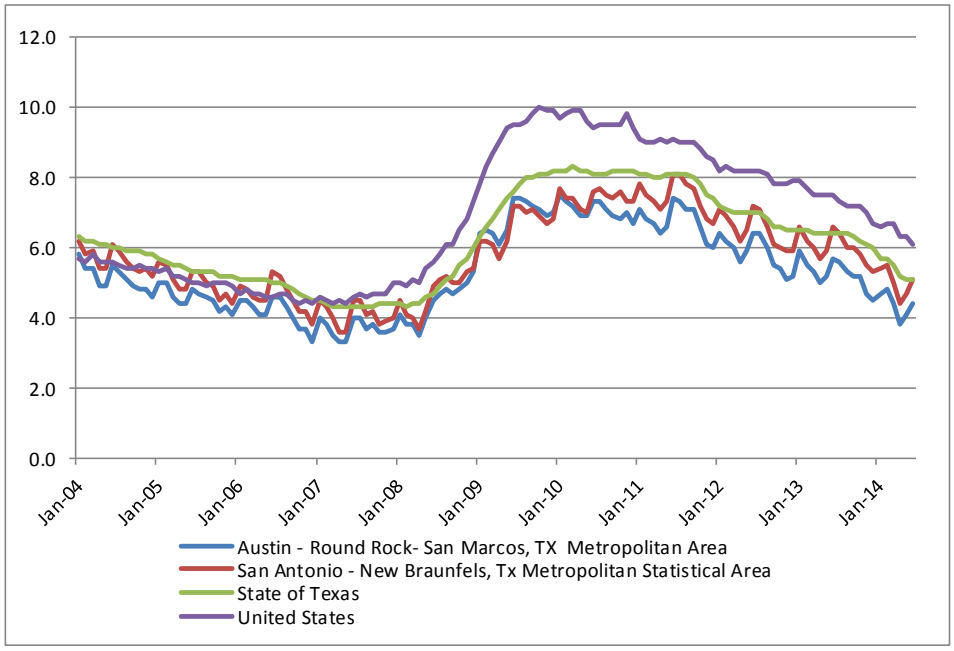
The model's 2015 employment control is in alignment with historical growth trends over the past decade and the period since the recession. The employment would be higher if it was based only on the most recent period, but that assumes that present conditions stay constant, which is not a conservative assumption. There are still some unknowns about oil prices and the effects on domestic production, which could definitely affect the Austin economy.

Table 6.9 Comparison of 2012 and 2014 Projections of Employment

Year	Estimated Employment		Difference	
	2012 Update	2014 Study	Number	Percent
CAMPO Counties				
2013	772,653	852,030	79,377	10.3%
2015	793,232	890,715	97,483	12.3%
2020	891,785	980,887	89,102	10.0%
2030	1,102,293	1,173,551	71,258	6.5%
2040	1,326,205	1,375,006	48,801	3.7%
AAMPO Counties				
2013	839,769	861,713	21,944	2.6%
2015	862,742	892,286	29,544	3.4%
2020	928,900	966,259	37,359	4.0%
2030	1,070,475	1,122,948	52,473	4.9%
2040	1,221,313	1,292,984	71,671	5.9%
Total Region				
2013	1,612,422	1,713,743	101,321	6.3%
2015	1,655,974	1,783,001	127,027	7.7%
2020	1,820,685	1,947,146	126,461	6.9%
2030	2,172,768	2,296,499	123,731	5.7%
2040	2,547,518	2,667,990	120,472	4.7%

Austin has the second lowest unemployment rate among large metropolitan areas (population greater than 1.0 million) in the United States. In July 2014, the unemployment rate in Texas was 5.1 percent and in Austin, 4.1 percent, substantially lower than the national rate of 8.2 percent. The unemployment rates in the Austin and in San Antonio metropolitan areas were lower than the national rate at the start of the recession and were consistently below the national level during the recession. The monthly unemployment rates for the U.S., the State of Texas and the Austin and San Antonio areas are shown for 2004 to date in Figure 6.5.

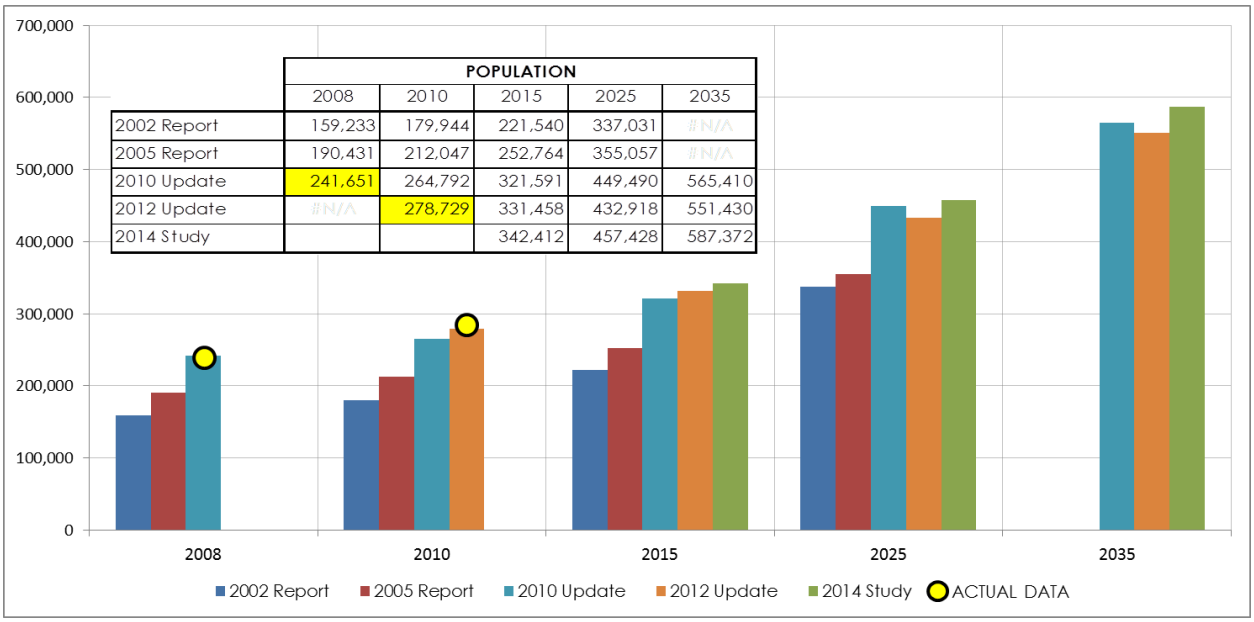
Figure 6.5 Comparison of Unemployment Rates, 2004-2014



An analysis of the forecasting accuracy of estimates used for Previous Reports for selected areas was prepared by comparing the forecasts to actual results, when available. An example of this analysis is shown in Figure 6.6 for the population forecast prepared for the rapidly developing 'greenfield' corridor served by SH 130 Segments 1-4. The estimated population developed for each of the Previous Reports, by horizon year, along with the final observed values for 2008 (completion year of the CTTS) and 2010, are shown in the table in Figure 6.6. Note that the forecasts for 2008 and 2010 were consistently lower than the actual growth within this corridor and the estimated population for 2008 and 2010 were increased in each subsequent study as the actual growth exceeded prior forecasts. Ultimately, the actual population values for 2008 and 2010 (241,651 and 278,729, shown as yellow-shaded cells in the table), exceeded the earlier forecasts. This demonstrates the reasonableness of these forecasts and the conservativeness of methodology used to generate the values.

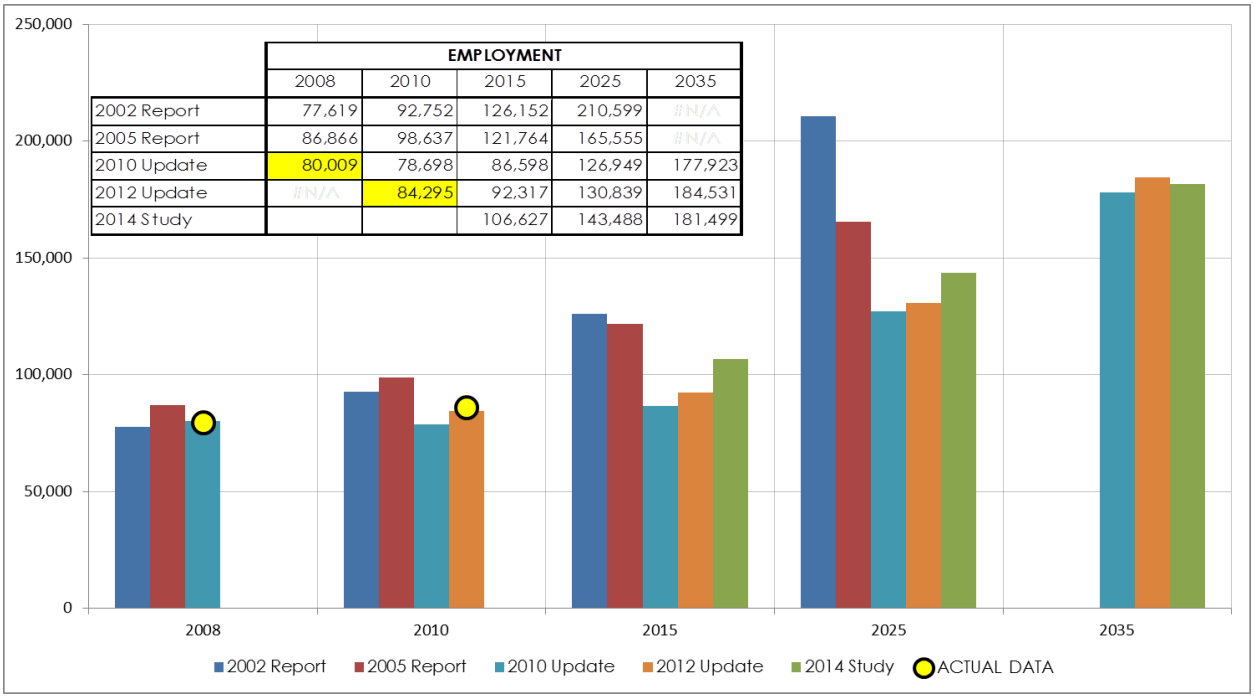
Similarly, the employment forecasts in Figure 6.7 were reviewed for the same corridor. The severe recession condition that occurred in 2008 caused the observed employment of 80,009 for 2008 to be less than the forecast of 86,866. In the subsequent 2010 Update, the employment forecasts were reduced for all horizon years. As the economy recovered, the actual 2010 employment (84,295) exceeded the prior forecast prepared for the 2010 Update.

Figure 6.6 Comparison of SH 130 Corridor Population Forecasts



POPULATION	2008	2010	2015	2025	2035
2002 Report	159,233	179,944	221,540	337,031	#N/A
2005 Report	190,431	212,047	252,764	355,057	#N/A
2010 Update	241,651	264,792	321,591	449,490	565,410
2012 Update	#N/A	278,729	331,458	432,918	551,430
2014 Study			342,412	457,428	587,372

Figure 6.7 Comparison of SH 130 Corridor Employment Forecasts



EMPLOYMENT	2008	2010	2015	2025	2035
2002 Report	77,619	92,752	126,152	210,599	#N/A
2005 Report	86,866	98,637	121,764	165,555	#N/A
2010 Update	80,009	78,698	86,598	126,949	177,923
2012 Update	#N/A	84,295	92,317	130,839	184,531
2014 Study			106,627	143,488	181,499

6.2 UPDATE OF TAZ LEVEL ESTIMATES

The socioeconomic review and employment and population projections used in the traffic model were developed by Michael S. Bomba, Ph.D. Dr. Bomba has extensive experience in the Austin area and has been retained by Stantec to provide socioeconomic data forecast assessment for the Austin area toll roads since the early 2000s. For this project, Stantec staff conducted field reviews and interviews with local government agencies responsible for preparing the current socioeconomic forecasts used as a baseline condition for Dr. Bomba's analysis.

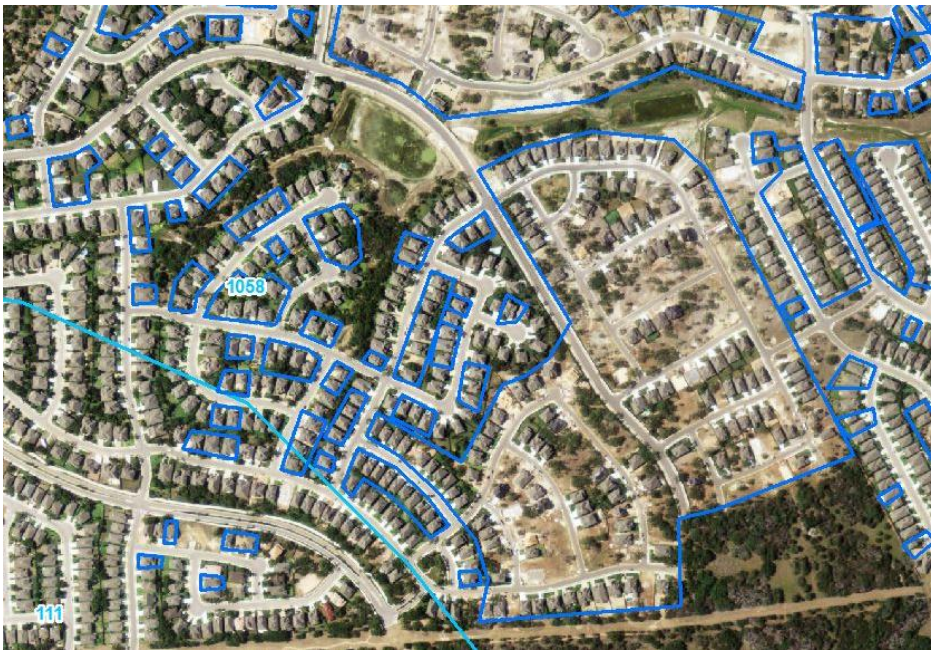
As part of this analysis, Dr. Bomba has reviewed the development trends in the individual markets for residential and commercial development. The review effort also considers the existing utility capacity and plans for expansion in order to confirm the reasonableness of the local development plans. The revised forecasts prepared from this analysis are structured to provide a reasonable estimate of future activity that would be considered as conservative for the purposes of estimating future demand for the region's toll facilities. The report prepared by Dr. Bomba for the 2014 Study is presented in Appendix A of this report and summarized here.

6.2.1 Methodology

Base Year Methodology

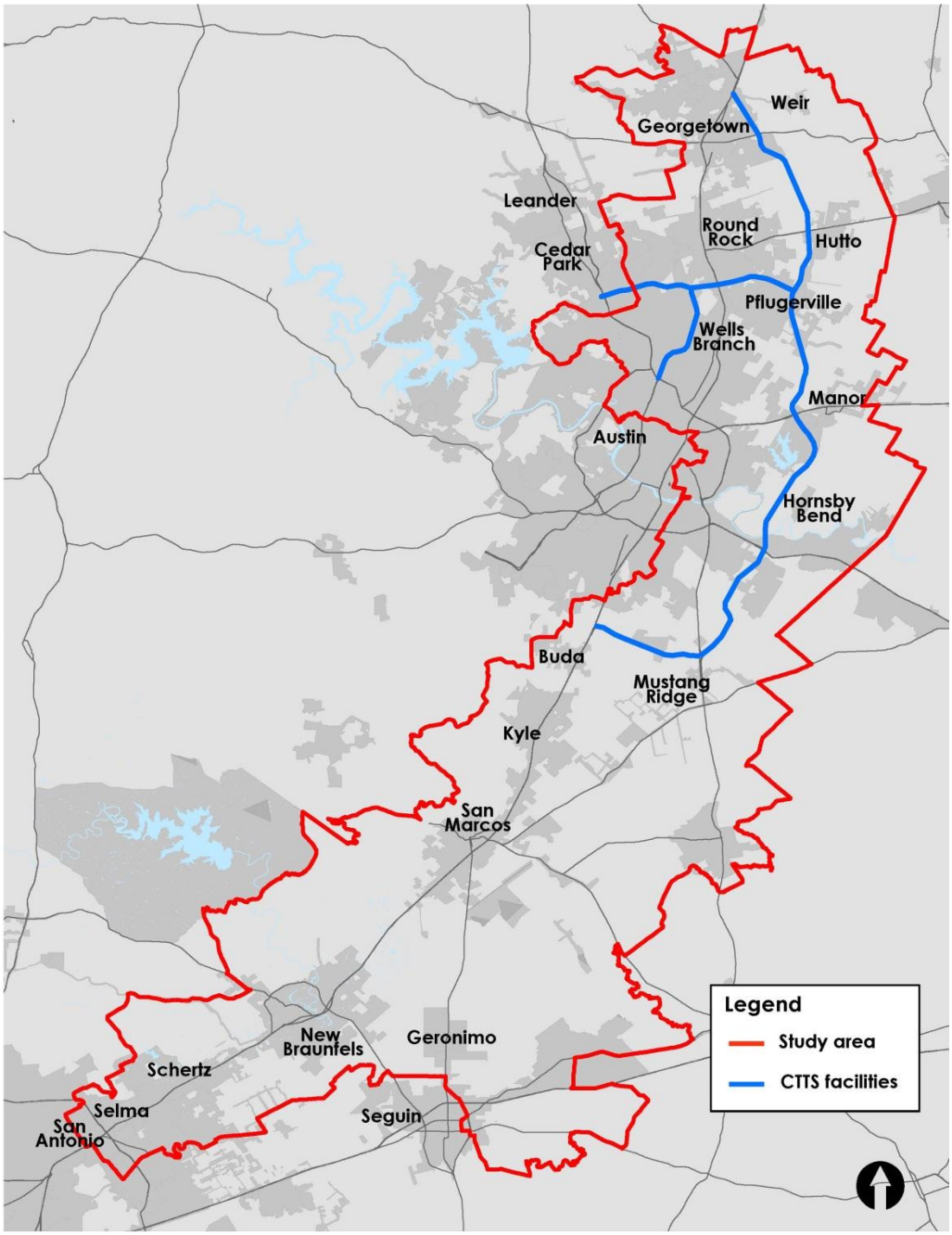
In order to establish base year socioeconomic data, a review of recent development was conducted by comparing orthographic photos from the United States Geologic Survey of the area from 2010 and 2012 using ArcGIS. The previous baseline had been established in 2010, and this review helped to identify changes to the land use between the baseline year for the 2010 Update and the baseline year for the 2014 Study. Development that appeared in the 2012 photos was highlighted, and determined to be either residential (including multi-family) or commercial based on visual inspection of rooftop layout. An example is shown in Figure 6.8. Changes in residential units were quantified, and commercial development activity was researched to approximate the number of jobs generated by each development.

Figure 6.8 Example of Orthographic Review



The rooftop comparison was completed for all of the Austin and San Antonio study areas shown in Figure 6.9. This information was used to generate baseline demographic data for each TAZ in the study area. These data were then reviewed by Stantec staff to ensure internal consistency (e.g., ratio of population to households, check of employment totals against different employment categories, etc.).

Figure 6.9 CTTS Study Area



Future Conditions Methodology

Socioeconomic forecasts were developed using a combination of the MPO's forecasts and a series of interviews with individual municipalities. Socioeconomic interviews were conducted with communities and counties in the study area (see Figure 6.9) to provide an updated assessment of potential future near-term and long-term growth parcels. Municipality representatives were asked to identify parcels that would experience new residential or commercial development; to

quantify the type of development (number of dwelling units for single or multi-family residential, and square footage or employee counts for commercial development); and to specify a development timeframe, if possible. In addition to these quantitative statements about specific development parcels, they were also asked to describe other factors that may influence development in their jurisdiction. These included factors such as the development of new parks, schools, municipal buildings, and other parameters, such as the water and wastewater capacity, the extent of the utility network, and potential environmental constraints. A list of the municipalities that were interviewed is shown in Table 6.10. These comments were recorded directly on a large-scale aerial map during the meeting by municipality representatives and/or Stantec interviewers. The projections were then compared against the MPO baseline forecasts, and an updated socioeconomic forecast for each TAZ in the study area was developed.

Table 6.10 Socioeconomic Interviews Conducted

Cities				Counties
Austin	Hutto	Manor	San Marcos	Caldwell
Buda	Kyle	Mustang Ridge	Schertz	Guadalupe
Cedar Park	Leander	New Braunfels	Seguin	Hays
Cibolo	Liberty Hill	Pflugerville	Selma	Travis
Garden Ridge	Live Oak	Round Rock	Universal City	Williamson
Georgetown	Lockhart	San Antonio		

6.2.2 TAZ Population & Employment

The results of the analysis are shown in Figure 6.10 and Figure 6.11 as the absolute change between 2013 and 2030. For analysis purposes, the data were summarized by sector, which provided a method for analyzing data at a level between individual TAZs and counties. The sectors indicate areas with high growth rates for both population and employment.

The annual average growth rates of the fastest growing sectors for 2013-2015 and 2015-2040 are shown in Table 6.11. High population growth is expected outside of the City of Austin. Fast population growth is expected north and east of Austin, along the SH 130 and SH 45N corridors in Round Rock, Pflugerville, and Leander (Williamson-6, -15, and Travis-8 sectors). High population growth is also expected southwest of Austin, along the I-35 corridor to San Marcos (Hays-10 and -11). This area includes Buda, Kyle, and San Marcos.

The areas with significant increase in population are also expected to see large employment growth rates. The fastest employment growth is expected in Williamson-15, northeast of Austin, but the other sectors are also expected to see a large growth in employment.

Figure 6.10 Population Growth, 2013-2030

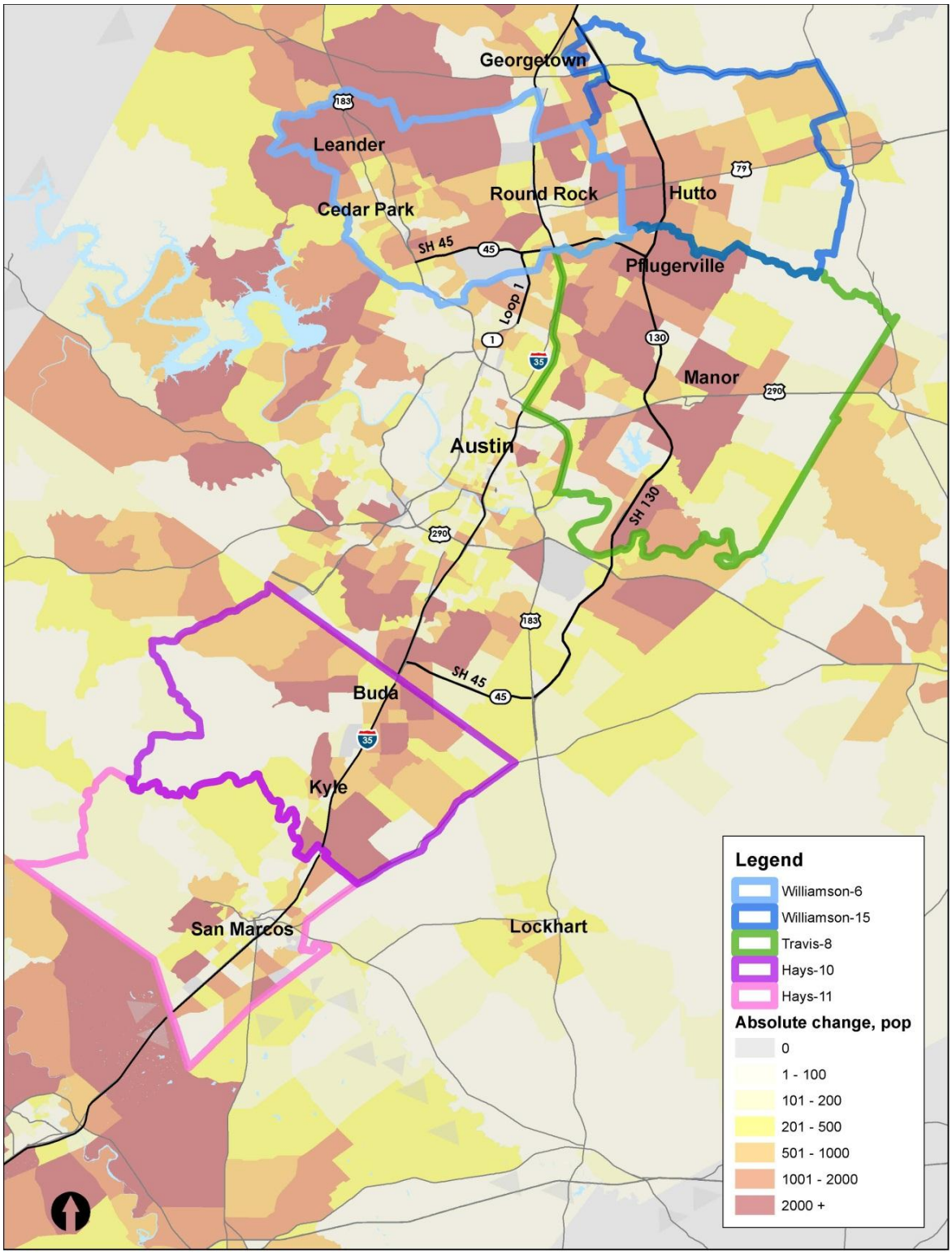


Figure 6.11 Employment Growth, 2013-2030

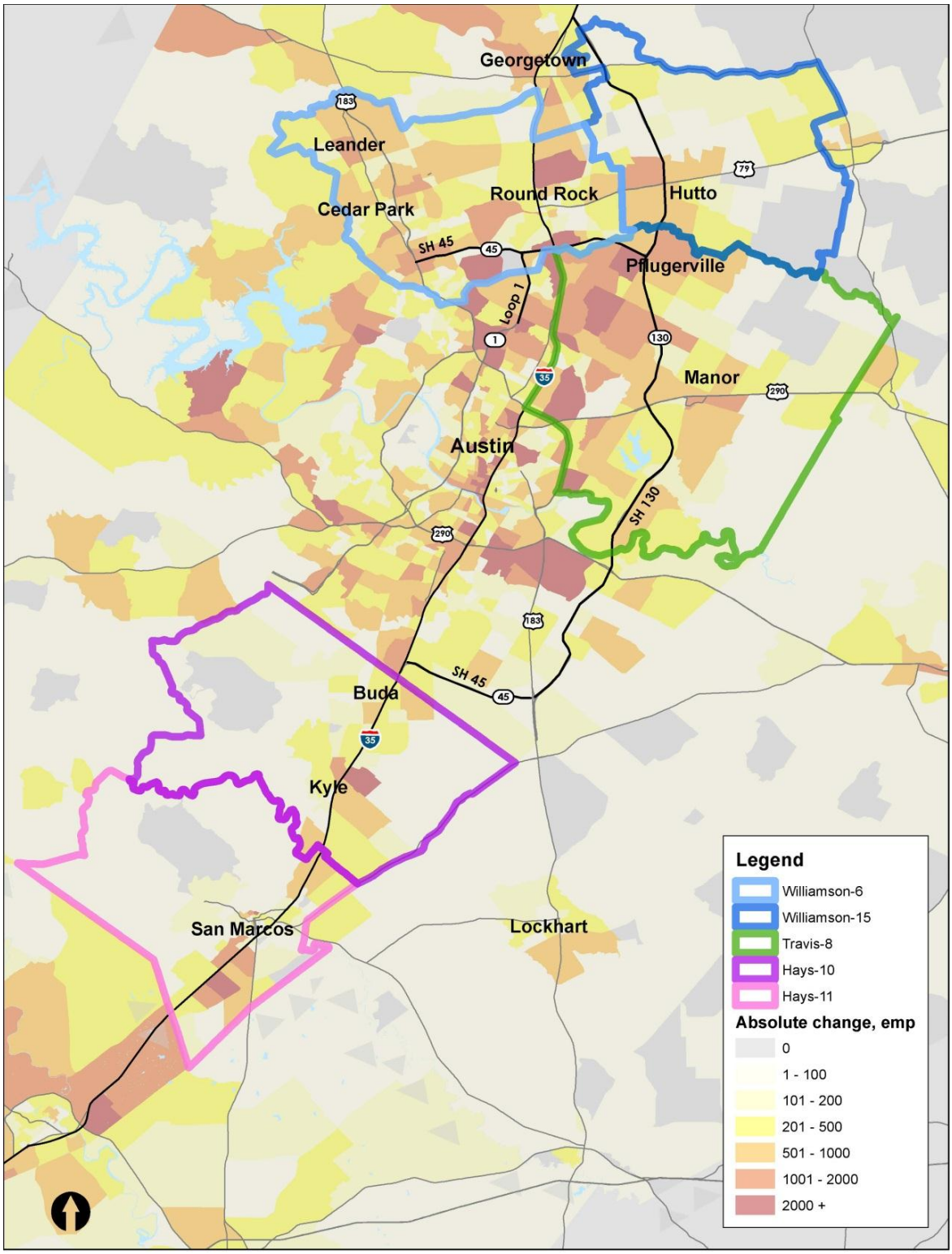


Table 6.11 Forecasted Population & Employment Growth Rates

Sector	2013-2015 Population AAGR	2015-2040 Population AAGR	2013-2015 Employment AAGR	2015-2040 Employment AAGR
Williamson-6	2.5%	1.9%	3.3%	1.8%
Williamson-15	4.9%	3.4%	5.0%	4.3%
Travis-8	3.5%	2.4%	3.3%	2.3%
Hays-10	3.8%	3.0%	4.4%	3.1%
Hays-11	3.9%	2.6%	2.9%	2.2%

6.3 REGIONAL DEVELOPMENT TRENDS

As mentioned above, interviews were conducted with community and county representatives to provide an assessment of near-term and long-term growth. While the interview process identified hundreds of developments in all parts of the map, the following section provides a review of recent permitting trends and a broad overview of the larger-scale developments near the toll roads in the Austin region and along the competitor roads. The Austin and San Antonio regional economies have experienced consistent growth over the past decade, and that economic strength was reflected in the information gathered from the interviews. All of the communities have new developments that are either ongoing or planned; many of them have developed or plan to develop catalysts to growth -- among them, their location along a major arterial, a favorable development environment, a well-managed water supply, and/or a strong utility network. Many communities have zoned certain parcels to encourage new development.

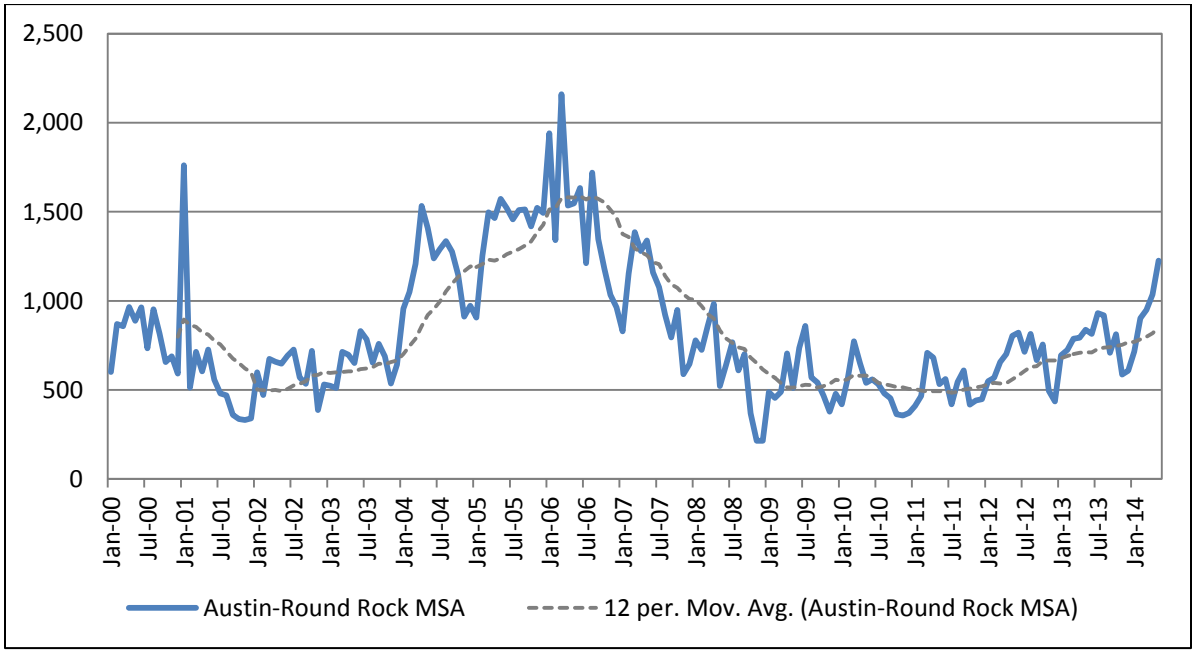
6.3.1 Housing Trends

The 2008-2009 Recession had a profound impact on Austin regional housing real estate due to the curtailment of demand. While the commercial real estate market was affected by the recession, due to tight credit markets or financially stressed tenants, it did not experience the same collapse as the residential market and has been showing a consistently positive movement during the recent past.

The U.S. Census Bureau's single-family building permit data from Real Estate Center at Texas A&M University are shown in Figure 6.12, which shows the number of monthly single-family building permits issued in the Austin-Round Rock MSA. While an issued building permit does not guarantee that a structure was constructed (a certificate of occupancy would provide that proof), it provide a means of gauging builder interest and to compare activity in a region over time. The data generally show that the monthly issuance of building permits in the Austin-Round Rock MSA grew during the "Housing Bubble", reaching a peak in mid-2006 of more than 2,000 permits. Then the number of permits issued began to decline quickly and reached its lowest level during early-2009. Since then, the local housing markets has moved towards recovery with approximately 1,200 building permits issues during mid-2014, it is nowhere near previous levels of

activity. While this recovery could be interpreted as construction industry that is still under pressure from the last recession, the period leading up to 2006 is not a desirable comparison. In general, the 14-year period offers few extended periods of a normally functioning housing construction market.

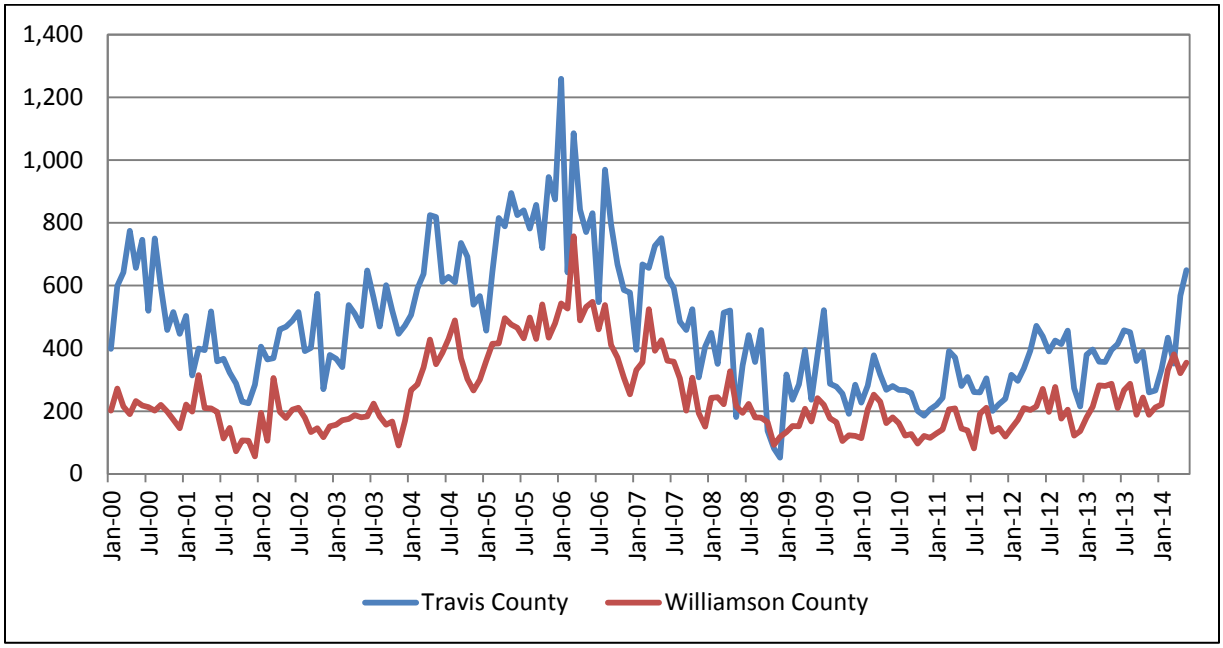
Figure 6.12 Single-Family Building Permits Issued in Austin-Round Rock MSA, January 2000 to May 2014



Note: MSA data based on 2013 core-based statistical area definitions.
Source: Texas A&M Real Estate Center, 2014.

Figure 6.13 provides more detailed showing the number of single-family building permits issued in Travis and Williamson Counties. The data show a pattern similar to the Austin-Round Rock MSA.

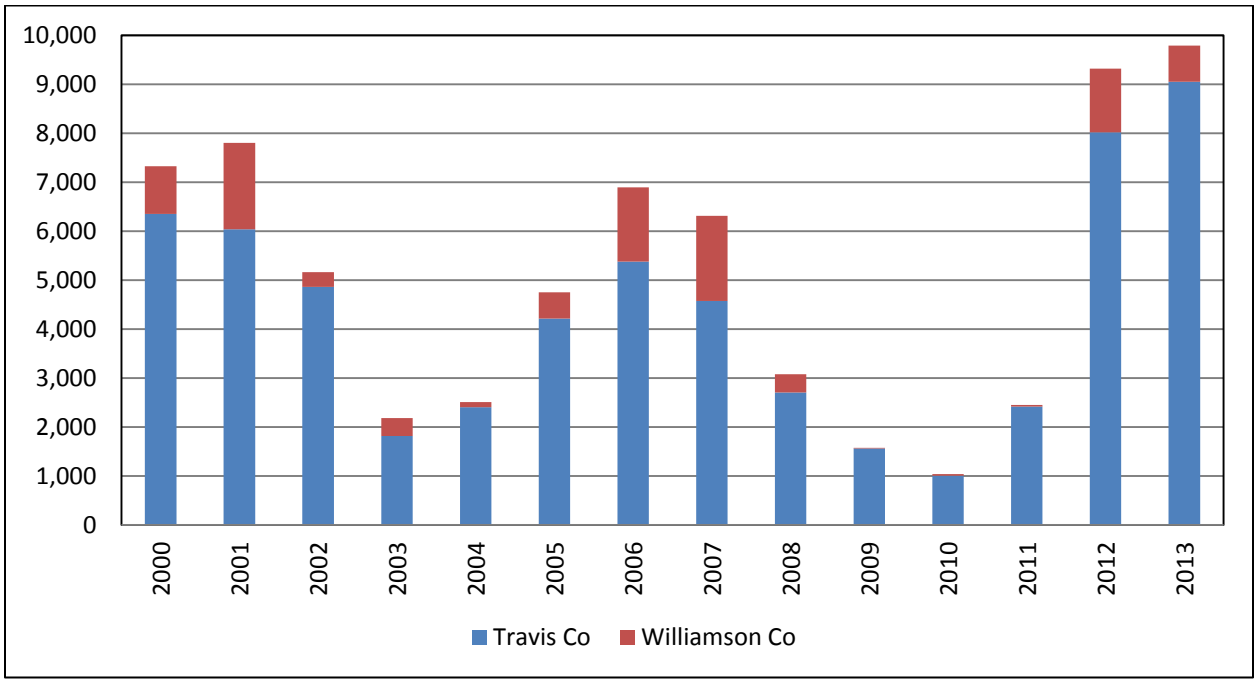
Figure 6.13 Single-Family Building Permits Issued in Travis and Williamson Counties, January 2000 to May 2014



Note: Monthly data for Hays, Bastrop, and Caldwell Counties were not available.
Source: Texas A&M Real Estate Center, 2014.

Figure 6.14 shows the total number of multifamily units permitted in Travis and Williamson Counties. The number of multifamily permits increased sharply during the early-2000s with the technology-fueled expansion; and again during the mid-2000s as a component of the Housing Bubble (at a slightly lower volume). There was a significant increase in the number of multifamily units permitted during 2012 and 2013, likely due to the constrained supply of single-family homes for lower-income households and households with poor credit, as well as decisions by more affluent households to rent their dwelling rather than buy one.

Figure 6.14 Multifamily Units Permitted in Travis and Williamson Counties, 2000-2013



Source: Texas A&M Real Estate Center, 2013.

6.3.2 Austin

During 2013, the city of Austin was the fastest growing city in the nation with a population under one million residents. As a result of its rapid growth (and the relatively modest impact of the 2008-2009 Recession), land development in the region has been generally widespread. The SH 130/Manor Expressway/Bergstrom Expressway corridors, in particular, are benefitting from this growth. Historically, the city's eastern side has not attracted significant development, but attitudes appear to be changing and middle-income households' growing need for affordable housing (as well as gentrification that has attracted young professionals and higher-income households) have encouraged new development projects. Additionally, the linear form of the Austin metropolitan area means that many locations in eastern Travis County currently provide quick commutes to central Austin, which are unavailable from any other direction without paying significantly more for housing. As a result, various residential development projects are planned or underway within the SH 130/Manor Expressway/Bergstrom Expressway corridors.

Most of the new residential growth has occurred within the traditional context of the large single-family subdivision. This type of activity has been especially prolific in Northeast Austin along Parmer Lane, Howard Lane, and Dessau Road, where large vacant tracts are available. However, some of these new developments have been small infill projects of 20 or 30 lots or multifamily projects, while others have been redevelopments, like those currently underway in downtown Austin, at the former Mueller Airport, along Riverside Drive, and The Domain in North Austin, or (at a smaller scale) along Manor Road east of I-35.

South of the Manor Expressway and east of US 183, developments have been slower to come to market. However, there are a number of very large residential projects that, when built, will bring many thousands of new households to the area. Some of the projects in this area include Rio De Vida (6,700 dwelling units; currently pursuing permits), Whisper Valley (6,200 dwelling units; currently under construction), Whitehorse (5,800 dwelling units; permitted but construction has not started), and Eastwood (2,300 dwelling units; permitted). Further south and west of US 183, the proposed Carma development will bring more than 14,000 dwelling units, if it is fully built out.

In the Loop 1/SH 45 study area, much of the recent growth has been infill subdivisions and multifamily projects. However, there are still large tracts of land that will bring new housing units to market, particularly at Robinson Ranch (6,000, mostly undeveloped, acres sandwiched between Austin and Round Rock) and along RM 620, from the Travis County line to RM 2222.

General assumptions about current and planned commercial developments in Austin, some of which are listed in Table 6.12 and highlighted in an example of a proposed toll road corridor shown in Figure 6.15, are that employers will increasingly maximize their utilization of downtown commercial space and that the long-term occupancy rates of downtown commercial space will increase. Additional employment growth is expected as several large hotels are built and mixed use projects come online, such as the Seaholm redevelopment (8 in Figure 6.15 and Table 6.12). There are large parcels of developable land bordering neighborhoods that are transitioning to higher-income households.

Figure 6.15 Selected Commercial Developments in Austin

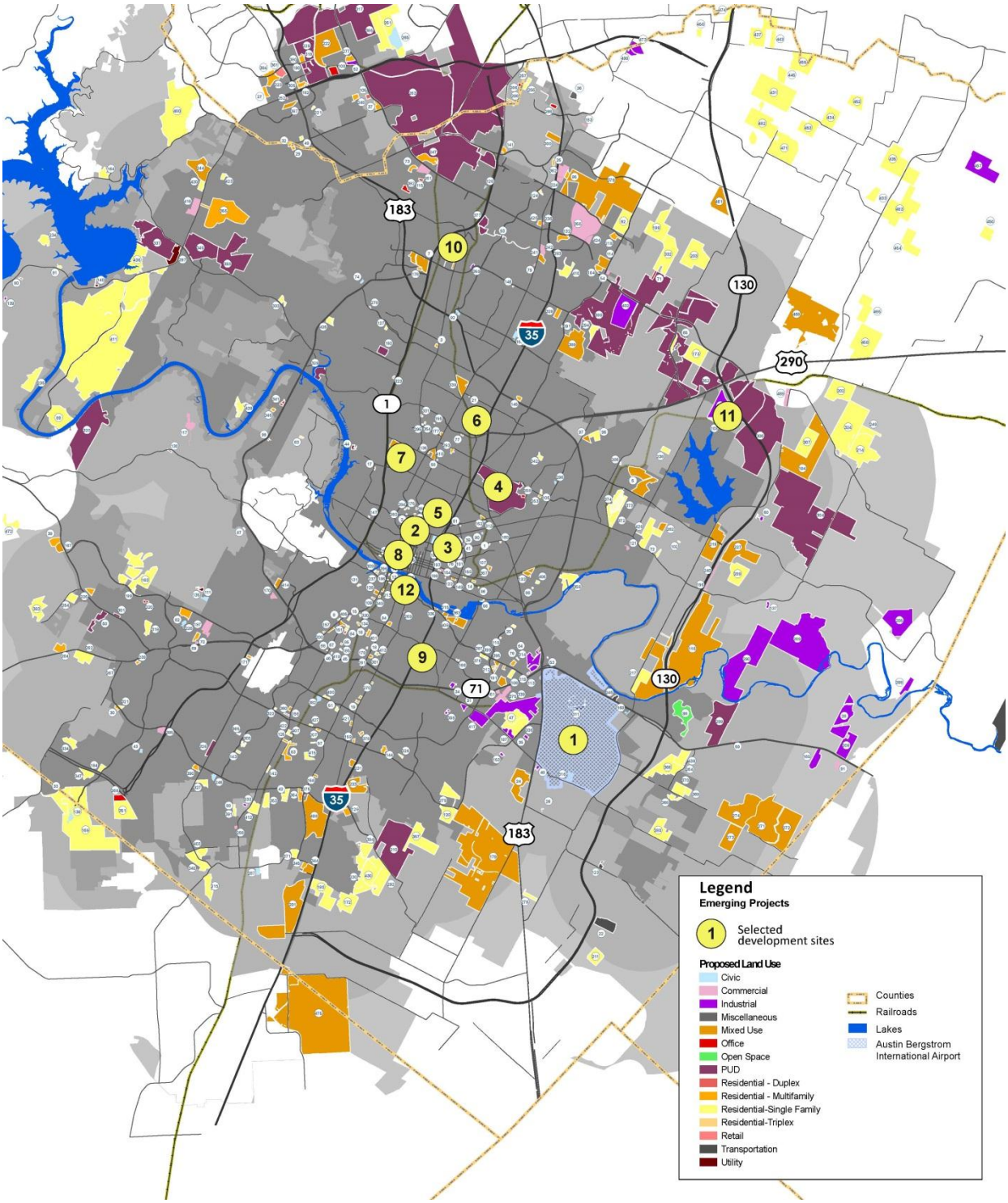


Table 6.12 Selected Commercial Developments in Austin

Number on Figure 6.9	Project
1	Austin-Bergstrom International Airport
2	University of Texas at Austin
3	Dell Medical School at University of Texas at Austin
4	Mueller redevelopment
5	Concordia University development
6	Highland Mall
7	Large parcel in central West Austin
8	Seaholm redevelopment
9	St. Edwards University
10	Domain development
11	Wildhorse planned unit development
12	Rainey Street neighborhood

Much employment growth is anticipated at Austin-Bergstrom International Airport ("ABIA") (1). In addition to growth at the commercial airport facility, this TAZ also contains all of ABIA's freight and general aviation facilities, a large Armed Forces Reserve Complex, and a youth correctional facility. With the exception of the air freight operations, most of these other uses are likely to increase their employment over time.

As mentioned above, the Rainey Street neighborhood (12) is going to eventually be redeveloped, and it will include a 21-story office tower and a 38-story mixed-use tower. Nearby, there are some vacant parcels near St. Edwards University (9) along or in proximity to I-35. This area has ample opportunities for redevelopment as household incomes continue to rise in the surrounding neighborhoods.

The Dell Medical School at University of Texas at Austin (2 & 3) is expected to open in the fall of 2016. The project is expected to be 515,000 square feet consisting of an academic building, a research building, a medical office building and a parking garage. The teaching hospital is about 480,000 square feet. The complex could also include a psychiatric hospital, a cancer center, a second medical office building, additional parking garages and more academic and research buildings in the future. Additional employment growth, aside from that which will result from the medical school, is expected at the university, including daily workers at the Frank Erwin Center.

Stratus Properties has proposed to build a mixed project with residences, offices and shops on a large parcel of high-value property in central West Austin (7). In the same area, the former Concordia University site (5) has plans for development, and the Highland Mall and its surrounding area (6) are being redeveloped. The Mueller neighborhood (4) is also being redeveloped and will include more than 3 million square feet of commercial space and 790,000 square feet of retail at build out.

In the northern part of Austin, the third phase of The Domain development (13) is being completed, and will include more than 3,500,000 square feet of office space and more than 1,100,000 square feet of retail space. The development will also include some 340 hotel rooms.

6.3.3 Cedar Park

The City of Cedar Park has experienced a high rate of population growth over the past two decades and, as a result, expects to reach build-out within the next 20 years. Within the project study area and on the north side of Cedar Park, the Caballo Ranch subdivision is platted for 419 lots and across the road is an 80-unit condominium. Further to the east and west of US 183, a 150-lot development called Cedar Grove is currently in the planning stages and, adjacent to it, a 300-unit multifamily project is also being planned. Moving south, there are several proposed infill projects: the West Park subdivision (55 lots); Thousand Oaks (56 lots); and the Park West Estates (77 lots and currently under construction).

Further south and west of US 183, two condominium projects are being proposed. On the east side of US 183, the Abrantes subdivision will have 88 lots and the Ranch at Brushy Creek has approximately 1,300 single-family completed homes and will contain over 1,700 units when finished.

Recent retail developments include a new Costco that opened in November 2013 at US 183-A and Whitestone Boulevard and a Walmart that opened in May 2014 near Whitestone Boulevard and Ronald Reagan Boulevard. A grocery chain has purchased land north of a quarry along RM 1431 in anticipation of a future store, and a restaurant and retail development will be developed in the vicinity.

Cedar Park's city council is also open to new mixed-use type developments, but they do not necessarily want multifamily projects, which they feel are adequately represented in the city. Their preferred development option would be "executive-style" (i.e. large homes on large lots) housing developments, for which there is currently a demand.

6.3.4 Leander

The City of Leander currently has more than 13,000 lots in various stages of the development process, ranging from proposed to fully-built. There is a large concentration of new residential development along the Ronald Reagan Boulevard corridor, which until recently was fairly undeveloped. The largest of the subdivisions along this corridor are located just south of its intersection with SH 29, which are the Wedemeyer subdivision (2,970 lots) and the Rancho Sienna subdivision (1,242 lots).

Further south along the corridor are the Red Oak Valley subdivision (132 lots), Palmera Ridge subdivision (500 lots), Reagan's Overlook (98 lots), Steward Crossing (225 lots), Marbella (216 lots), Sarita Valley (96 lots), Springwood (100 lots), Crystal Springs (283 lots), a new section of Cold Springs (31 lots), the Hazlewood subdivision (227 lots), Catalina Ranch (110 lots), the Pecan Creek subdivision (189 lots), and the Borho subdivision (268 lots).

Around the Bagdad Road corridor, west of US 183, are the Greatwood subdivision (124 lots); the Savana Ranch subdivision (281 lots); the Oak Creek and Northside Meadow subdivisions (689 and 193 lots, respectively); Hawkes Landing (313 lots); Carnero's Ranch (400 lots); Magnolia Creek subdivision (114 lots); Connelly's Crossing (150 lots); and the Mason Ranch subdivision (803 lots). Outside of the study area and in Travis County, there are several other subdivisions, which include Travisso (3,140 lots), the Bluffs at Crystal Falls (739 lots), a new section of the Grand Mesa subdivision (111 lots), and a new section of the Fairways at Crystal Falls subdivision (739 lots).

The City of Leander is attempting to add more commercial development and has commissioned a study to determine which types of commercial development are lacking in Leander. One issue may be that there are not many commercial lots available in the city. There is a concept plan for a large commercial lot in the southeast quadrant of the city. The construction of schools, on the other hand, has not suffered. There are several new schools proposed for Leander's east and north sides.

Looking toward the future, Leander's planning officials believe the city's strengths are its good ordinances and a receptive council. They also believe that the US 183A project has accelerated new development in the city, particularly along the Ronald Reagan corridor. The city continues to push a proposed transit-oriented development (TOD) area near the proposed Austin Community College (ACC) campus. Both the TOD project and the ACC campus have been favorite projects of the City of Leander for many years but struggled due to the 2008-2009 Recession and need for higher population densities. There will be a bond measure during the next election to expand ACC and build new campuses and, if successful, may allow that project to move forward.

6.3.5 Georgetown

The City of Georgetown's general development trends are currently concentrated in its west and northwest, as well as to the east and southeast of the city towards SH 130. Among Georgetown's largest residential developments, the Sun City retirement community continues to expand, with more than 1,000 dwelling units being built on a 400-acre parcel. There are also a number of other parcels on the northwest side of Georgetown that are expected to be developed during the next 5 to 10 years. Further south, adjacent to the Wolf Ranch retail development, townhome and apartment projects are being planned.

Along SH 29, there are two large projects that are starting construction or expected to start in the near term. The Brownstone development will consists of 2,400 multifamily units with an anticipated 12-year build-out. The Water Oak subdivision has 1,500 acres available for development and up to 3,000 single-family units. On the east side of I-35 and towards the SH 130 corridor, two subdivisions are being proposed that would have 250 lots each. Further south along Sam Houston Boulevard, an 800-900 lot subdivision is being proposed, along with a 200-lot addition to the Pinnacle subdivision. Due east of the Pinnacle subdivision, on the west side of Maple Street, a 300-lot subdivision is also being planned.

Additionally, a 220-unit multifamily project has been proposed at the southwest corner of the Inner Loop and FM 1460. South of Georgetown, in an unincorporated area that is also due north of the city of Round Rock, the Teravista development continues to add a large number of single-family homes.

Georgetown city planners did not identify any recent, ongoing, or planned commercial developments. They also reported that the Georgetown City Council is trying to attract commercial development of any type. The current trend in the city is clearly towards the construction of single-family homes.

While new development in Georgetown is starting to move towards the SH 130 corridor, at present, areas along SH 130 have limited utility infrastructure and there are few pressures to develop in that area. Some of these areas were annexed by the city prior to the 2008-2009 Recession, but have remained vacant. There are also competing development opportunities on the south side of Georgetown, where there is little existing development and easy access to I-35 and SH 130.

6.3.6 Round Rock

Round Rock continues to be one of the primary recipients of suburban growth in the Austin region, although its growth has slowed somewhat over the last decade as other cities compete and as its supply of developable land diminishes. At present, there are a number of residential subdivision projects planned or underway, including: the Freeman Tract, Avery North, Warner Ranch, and Kenney Fort. There will also be expansions of the Paloma and Sienna subdivisions, which fall within the jurisdiction of municipal utility districts (MUDs) and are outside the City of Round Rock's boundaries. All of these projects are located east of I-35 and collectively they will add thousands of new housing units to this portion of the CTRMA study area.

New multifamily development projects are expected at the La Frontera development at the northeast corner of I-35 and SH 45 and along University Boulevard. There are several upcoming commercial projects, which include: a Bass Pro Shop scheduled to open in November 2014 along I-35 north of University Boulevard; a large grocery store that will anchor a large retail development along University Boulevard; and a new hospital near the La Frontera development on the south side of SH 45.

Looking out over the medium to long term, there are various issues or trends that will influence the city's growth patterns. Although city planners reported that there has not been significant demand for development in the SH 130 corridor, they did point out that development patterns in the city are moving to the northeast, which is in the direction of SH 130. Given the distance between the SH 130 corridor and existing development and the amount of vacant land in between, new development adjacent to the corridor is not expected to increase significantly until the periphery of the city shifts closer. The City of Round Rock also sees opportunities for redevelopment and new growth in its downtown, around the I-35/SH 45 interchange, Avery Center (northeast Round Rock), and near Chisholm Trail (which was recently reconfigured).

6.3.7 Hutto

Located east of the SH 130 corridor in Williamson County, the pace of population growth in the City of Hutto has rapidly outpaced the surrounding area. Since the 2000 U.S. Census, when its population was 1,451 residents, Hutto has grown approximately 1,300 percent to its 2013 population of more than 20,000 residents. City officials estimate that 89 percent of Hutto's residents do not work in the city, but instead commute to work locations in Round Rock, Pflugerville, and Austin. Some of the active residential projects in Hutto include: the Hutto Highlands subdivision; a new section of the Hutto Park subdivision (104 lots); the Park at Brush Creek subdivision (98 lots), Phase 6 of the Glenwood subdivision (75 lots); and Phase 3 of the Riverwalk subdivision (389 lots). A 66-unit multifamily project for seniors is also being planned near the SH 130 corridor.

Although Hutto has grown to a sizeable population in a short period of time, commercial development has lagged. However, as the city grows, Hutto planners anticipate that developer demand for commercial plots will increase. Like many of its neighbors, the City of Hutto considers itself very pro-growth and city officials would like to see more commercial projects to increase the sales tax base. Elected officials are in favor of adding multifamily housing, but want it in a desirable context (e.g., as part of a mixed-use development).

6.3.8 Pflugerville

The City of Pflugerville is viewed by many as an attractive location due its affordable housing and its relative proximity to Austin. This interest has extended to developers, who have been attracted to projects along the SH 130 corridor. There is currently strong construction in the Highland Park subdivision (which is expected to be built-out in the next 5 years), the Falcon Pointe subdivision, and the Villages of Hidden Lake subdivision. The Sorrento subdivision is another project that has just started construction and it will eventually consist of 996 lots. In addition to single-family housing, there are also a number of multifamily projects that are currently being planned for Pflugerville.

Two of these projects are being proposed south of SH 45 and east of Schultz Lane. Combined, these projects will bring 650 apartments to market. There are other multifamily projects being proposed near the southwest and southeast corners of SH 130 and SH 45 intersection and along Dessau Road north of Wells Branch Parkway. The Sorrento subdivision will also include approximately 400 condominiums/townhomes.

Along with its robust residential market, Pflugerville is also experiencing considerable commercial development. The City of Pflugerville recently signed an incentives agreement for a new one million square foot data center on the southwest corner of SH 130 and SH 45. The developer has until next summer to advance this project or decline the development rights. Other projects in this area include an assisted living facility, office buildings, retail, and a restaurant. A mixed-use development will be located near Heatherwilde Boulevard and Wells Branch Parkway. This development will include single-family construction in Austin and commercial development in Pflugerville. Other anticipated commercial developments under consideration or construction

include: a cluster of large, light industrial developments at SH 130 and E. Pecan Street; a mix of office, retail, and multi-family near SH 130 and Pflugerville Parkway; and a variety of retail development along the Kelly Lane corridor.

City officials are optimistic about Pflugerville's growth prospects, especially considering its location along the SH 130 corridor.

6.3.9 Manor

Manor is located along the US 290/Manor Expressway corridor, due east of the City of Austin. During the mid-2000s, Manor was a growing rapidly suburb, however, growth was negatively affected by the 2008-2009 Recession. Until recently, its recovery was slow but activity is beginning to accelerate. A number of residential projects are being planned, many as additional phases of existing subdivisions. Among the anticipated residential projects are: Presidential Glen (500 lots); Presidential Heights (599 lots), Stonewater (360 lots); Shadow Glen (1,500 lots); and Bell Farms (125 lots). Manor is surrounded by more than 11,000 lots to the south in the proposed Indian Hill subdivision, Whisper Valley subdivision, and other projects that are anticipated in the future. Wildhorse (14 in Figure 6.15) is another large planned development with a significant amount of retail and commercial development that is being proposed adjacent to Manor's western boundary.

As with Hutto, commercial development has been slow to follow residential growth in Manor. Its relatively close proximity to retail and service facilities in Austin, coupled with lower population densities, has historically resulted in little commercial development. The situation has begun to change when Walmart opened a Manor location in 2014. There are currently several new commercial projects planned for Manor, which include medical offices, strip retail, and a new city hall. Most of the larger residential developments (existing or proposed) have also set aside land for commercial development, where it remains available for development.

6.3.10 Buda

Located due south of Austin in Hays County, Buda is the fastest growing city in Texas with population under 10,000. Buda is expected have a significant number of single-family residential developments over the coming decades. Although Buda's historic center is located west of I-35, recent residential development has been on both sides of the highway. On the west side of I-35, development is currently underway in the Garlic Creek subdivision (200 lots), the Whispering Hollow subdivision (450 lots), and the Meadows at Buda subdivision (125 lots). There are two multifamily projects planned west of I-35, as well.

To the east, the largest project underway is the Sunfield development, which will be a mix of residential, industrial, and commercial land uses. The proposed 2030 build-out for Sunfield is 6,632 lots, with 339 lots currently platted. The project is also planning for 300 multifamily units planned for construction in 2015 or 2016 and a retail development called the Shops at Sunfield. Historically, Sunfield's development has been a slow process, although current market conditions might give the project the boost needed to make its growth more sustainable. Other residential

developments in eastern Buda are the Stonefield subdivision (583 lots at build-out) and the Stone Ridge subdivision (125 lots), which is a proposed greenfield project.

There are a number of commercial projects being proposed around the city. Some of these projects are single-building retail establishments, such as a convenience store or a drugstore. Other projects are multi-tenant strip retail centers. On the north side of Buda, for example, a 150,000 square foot retail redevelopment project is being planned at the intersection of I-35 and Main Street. However, most of the proposed retail projects in Buda are smaller (50,000 square feet or less). Two hotels are being planned, one west of I-35 with 80 rooms and another on the east side of I-35 with 70 rooms. There are also a number of industrial buildings being proposed with activities ranging from warehousing to a brewery.

6.3.11 Kyle

Kyle is a rapidly growing Hays County suburb located between Austin and San Marcos. Bisected by I-35, the city is expecting new residential development on both sides of the roadway. On the west side of I-35 the Plum Creek development continues to add single-family housing, with another 2,000 housing units planned over the next two decades. There are an additional 400 single-family dwelling units planned for a subdivision adjacent to Plum Creek, as well as an expansion of the Hometown Kyle subdivision across CR 150. On the east side of the roadway, new residential projects include additional phases at the Brookside subdivision (150 lots), the Post Oak subdivision (300 lots), Bunton Creek (600 lots), Kensington Trails (400 lots), Woodlands Park (250 lots); Amberwood (200 lots); and a new subdivision called the Meadows at Kyle (400 lots). There are two multifamily developments being proposed in Kyle: development will be at the southwest corner of CR 171 and CR 1626 with 220 units and another along the I-35 frontage in front of the Amberwood subdivision.

New commercial construction underway included a Walmart, a bowling alley, and a medical clinic. Austin Community College recently built a campus in Kyle at the northeast corner of CR 171 and CR 1626. Over the long term, this campus is expected to grow and attract multifamily and retail development. The Village at Kyle retail center is also expected to be a future location of employment growth.

7.0 MODEL VALIDATION AND REFINEMENT

In preparing the estimates of traffic and toll revenue for the 2014 Study, it was necessary to update the existing travel demand modeling process to reflect growth in the Austin region and the expansion of the toll road system. Additional data on the toll road performance after the 2013 toll increase and the initiation of annual toll escalation is also now available. The objective of this model update and refinements is to provide a more robust tool for modeling the CTTS toll roads as well as other local toll roads that influence traffic on the CTTS.

Consistent with the CTTS 2012 Update, the modeled area includes an expanded area south of Austin that covers San Antonio. This expanded area encompasses areas and facilities that could influence traffic volumes on the various CTTS roadways, primarily SH 130 and SH 45 SE. The expanded region includes all of the area in the San Antonio-Bexar County Metropolitan Planning Organization (SABC) regional transportation model which is now being updated by the Alamo Area Metropolitan Planning Organization (AAMPO). The expanded area south of Austin was included primarily to reflect the anticipated growth in the I-35 corridor southward towards San Antonio and the impacts of growing congestion that could influence diversion as a result of the SH 130 Segments 5 & 6 that extend southward towards Seguin.

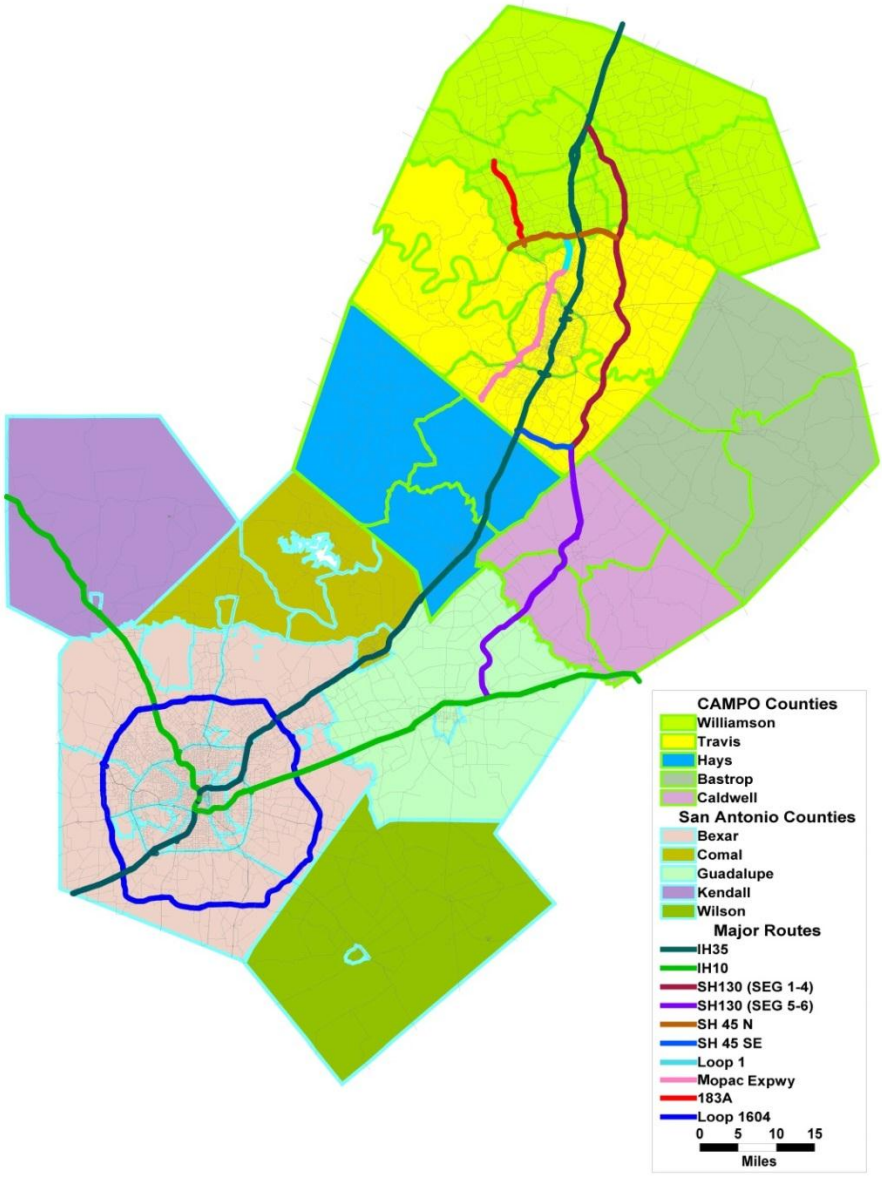
In addition to the expansion of the modeled region, the toll diversion modeling techniques were also updated to reflect new aspects of the tolling policy including PBM video tolling and cashless payment. The toll diversion model was updated to provide for greater flexibility in representing the variations in toll policy utilized by TxDOT and CTRMA, Including several managed lane facilities now under construction or in the planning process. The modeling process was also refined to provide variation in the methods of payments by individual subregions based on assumptions of transponder ownership by household income. Lastly, the toll diversion models were further refined to improve the representation of several planned toll facilities that will be operated as managed lanes with variable pricing.

The effect of all of these enhancements is the creation of an improved modeling process that is capable of supporting forecasts for the growing region surrounding Austin. These enhancements will enable the modeling process to be responsive to a wide range of potential changes in toll policies as well as specific conditions that will influence traffic diversion for the next generation of toll facilities.

7.1 TRAVEL DEMAND MODEL DEVELOPMENT

The model development effort was designed specifically to take advantage of the existing CAMPO and AAMPO regional models that encompass the expanded study area and to refine the toll diversion process originally developed for the 2002 Report. The expanded study area encompassing both the CAMPO and AAMPO regional models is shown in Figure 7.1. The common boundary of these regional models is along the Hays-Comal and Caldwell-Guadalupe county lines.

Figure 7.1 Austin – San-Antonio Integrated Model Region



In order to integrate the individual regional models into a single unified modeling process, it was necessary to merge the network and vehicle trip tables. The regional models are utilized to estimate total vehicle trips in the study area. Each of the regional models is executed from trip generation through trip distribution and mode choice using the revised socioeconomic data described in Chapter 6 to create vehicle trips by trip purpose and vehicle type (SOV, HOV, and Truck). The networks from each regional model were compared and a decision was made to adopt the network facility type–area type definitions as well the speeds and capacities from the CAMPO Model. Similarly, the resulting vehicle trip tables from the execution of both regional models were integrated using the trip purpose designations from the CAMPO Model. The use of

the CAMPO Model network parameters and trip purposes for the final integrated model reflect the fact the CTTS and the CTRMA toll facilities are entirely within the Austin modeled region and the Austin model represents a more advanced modeling process.

As part of the model development, it was recognized that several specific issues would influence the approach to model calibration. In contrast to the model development for the original 2002 Report, the current model calibration would need to replicate volumes across the entire study area and traffic on the recently completed toll facilities. The latest available socioeconomic data available for both regions (2013) was set as the calibration year. As a result, the study utilized a network that reflects the 2013 conditions, and that network is consistent with the speed and travel time data collected for this study as well as for the prior 2012 CTTS Update.

The new model utilized the existing toll diversion process as the basis for estimating tolled traffic. For the 2013 model calibration year, the temporary discounts for trucks using SH 130 and SH 45 SE were included since the discounts were applicable for 11 months of that year. Several refinements were incorporated into the toll diversion modeling to account for new tolling technologies, such as the PBM video tolling program, cashless payment, and dynamic pricing for the managed lane facilities that are planned for the Austin region. In addition to these refinements, the new toll diversion model provides for variation by household income and sub region in setting parameters, such as transponder usage. Similarly, parameters reflecting the tolling policies of each agency (TxDOT, CTRMA, and the SH 130 Concession) and the tolling plans for trucks are now established at each tolling pay point. This enhancement permits variation in the tolling plans for each agency as well the transition to newer toll collection technologies. Finally, the introduction of a generalized cost function, instead of time-based function, for the path-building and highway assignment processes allows the model to react more realistically to the impact of toll changes.

Toll diversion equations were established for each of six trip purposes, including:

- Home Based Work (HBW)
- Home Based Shopping (HBS)
- Home Based School (HBSch)
- Home Based Other (HBO)
- Work Based Other (WBO)
- Other Based Other (OBO)

The current toll diversion process utilizes the existing toll diversion equations as the basis for the forecasts. The formula is a basic binary logit equation and is defined as follows:

$$\text{Toll Share} = 1 / (1 + e^{U})$$

where:

Toll Share	= Probability of selecting a toll road
e	= Base of natural logarithm (ln)
U (work)	= $a * (Time_{TR}-Time_{FR}) + b *(Cost)/ln(Inc) + C_{TR} + C_{ETC}$
U (nonwork)	= $a * (Time_{TR}-Time_{FR}) + b *(Cost) + C_{TR} + C_{ETC}$
$Time_{TR}$	= Toll road travel time in minutes

$Time_{FR}$	= Nontoll road travel time in minutes
Cost	= Toll in dollars
Inc	= Annual income / 1000
C_{TR}	= Constant for toll road bias
C_{ETC}	= Constant for ETC bias
a,b	= Coefficients

Several adjustments to the existing procedures were implemented as part of the development process. As an initial step, the value of time for each purpose was adjusted to reflect the increase in household incomes in the Austin region between 1997, calibration year of the original 2002 Report, and the current calibration year 2013. The values of time were increased and the resulting weighted average of all trip purposes for autos ($16.93 per hour) is 59.9 percent of Austin's 2013 median household income of $58,821 per year, nearly identical to the percentage for 1997. Table 7.1 lists the coefficients for each trip purpose as well as the bias terms and equivalent minute values for the toll bias term and ETC bias term applicable to all payment methods. Note that the toll bias term discourages toll choice, but the ETC bias term encourages toll choice due to the ease of payment and the open road tolling aspects of transponder usage.

Table 7.1 Toll Diversion Model Coefficients

TRIP PURPOSE	(ALPHA) TIME (MIN)	(BETA) [1] COST ($)	VOT ($/HR)	BIAS TERMS			
				VALUES		EQUIVALENT MINUTES	
				TOLL	ETC	TOLL	ETC
HBW	0.1053	1.3378	$19.24	0.0000	-0.2960	0.0	-2.8
HBS	0.0754	0.3905	$11.59	0.0936	-0.2423	1.2	-3.2
HBSCH	0.0777	0.4375	$10.66	0.0816	-0.2226	1.1	-2.9
HBO	0.0441	0.1613	$16.40	0.0858	-0.1650	1.9	-3.7
NHBW	0.1396	1.8455	$18.49	0.0000	-0.3400	0.0	-2.4
NHBO	0.0872	0.2323	$22.52	0.1334	-0.2980	1.5	-3.4
TRUCK	0.0575	0.0699	$49.36	0.5063	0.0000	8.8	0.0

Notes: 1) HBW and WBO purposes use toll costs divided by LM (Income/1000).
2) All cost coefficients scaled from 1997 values in the original 2002 Report to the year 2013.
3) All time coefficients were retained as in the original 2002 report, except for truck.

For the 2013 calibration year, the model assumed two payment methods; ETC and PBM which is consistent with the payment options currently available. For the PBM market segment, the relevant surcharge was applied to the base toll at each pay point, and the positive bias term associated with transponder payments was also applied since these trips have the convenience of not needing to stop to pay tolls as they would if paying by cash.

The diversion model was modified to permit toll choice to occur where time savings were minimal or negative based on the observed ETC transactions data that were collected in 2013. Under the revised model, toll choice is permitted for paths where the toll path is up to 3.0 minutes longer than the non-toll path. The diversion model transitions the estimated choice

shares towards zero as the time savings approaches the minimum permitted value to ensure that the toll traffic and revenue stream has a lower contribution from trips with minimal or negative time savings.

Lastly, since the individual toll facilities have now been in operation for more than five years, a general bias against toll roads by those trips that have the highest frequency or are work related are not incorporated into the choice evaluation. These travelers, due to their frequency of travel, are now assumed to elect to use or avoid the toll road based strictly on the time savings and associated costs.

The toll shares for each auto purpose as a function of time savings for $2.00 toll are shown in Figure 7.2 through Figure 7.8. In each graph, two lines are shown depicting the shares for trips paying with ETC and with PBM. Since the PBM option includes a 33 percent toll surcharge, the share of toll traffic is lower than the ETC payment option. The predicted toll shares shown in these figures are also reduced further if the time difference between the tolled and non-tolled paths approaches the minimum time savings value.

For the truck trip purpose shown in Figure 7.8, the ETC toll rate for the example is $6.00, reflecting the higher cost of multi-axle trucks. The truck purpose has similar toll shares by time saving interval as this purpose has a higher value of time which partially offsets the higher toll rates.

Figure 7.2 Toll Diversion for Home Based Work (Auto) Trips - $2.00 Toll

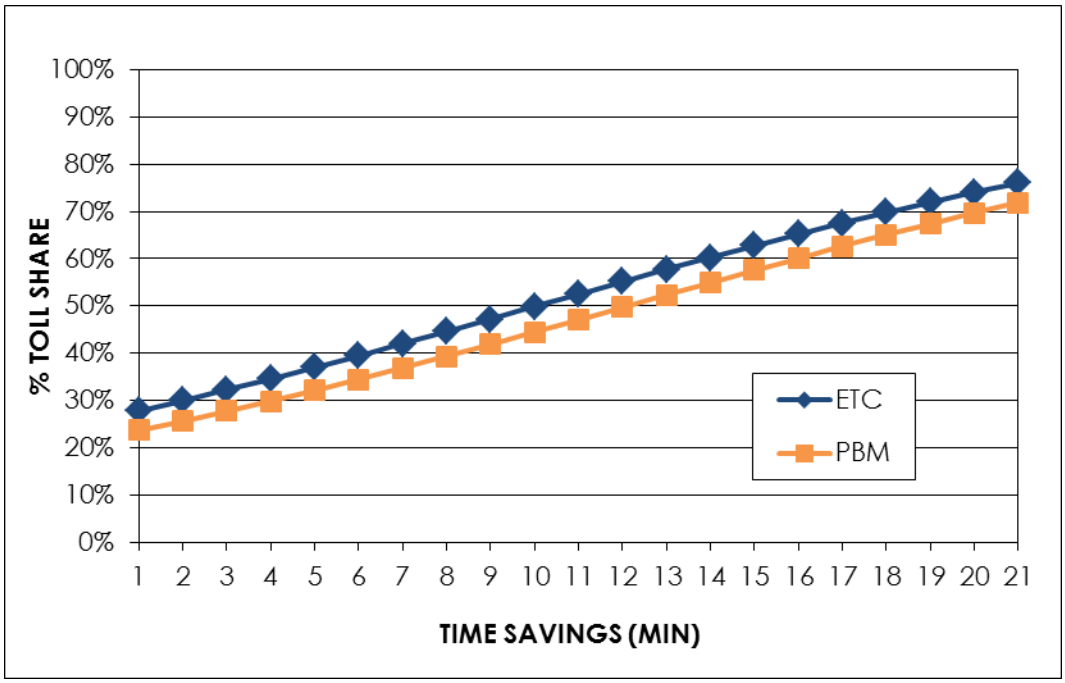


Figure 7.3 Toll Diversion for Home Based Shopping (Auto) Trips - $2.00 Toll

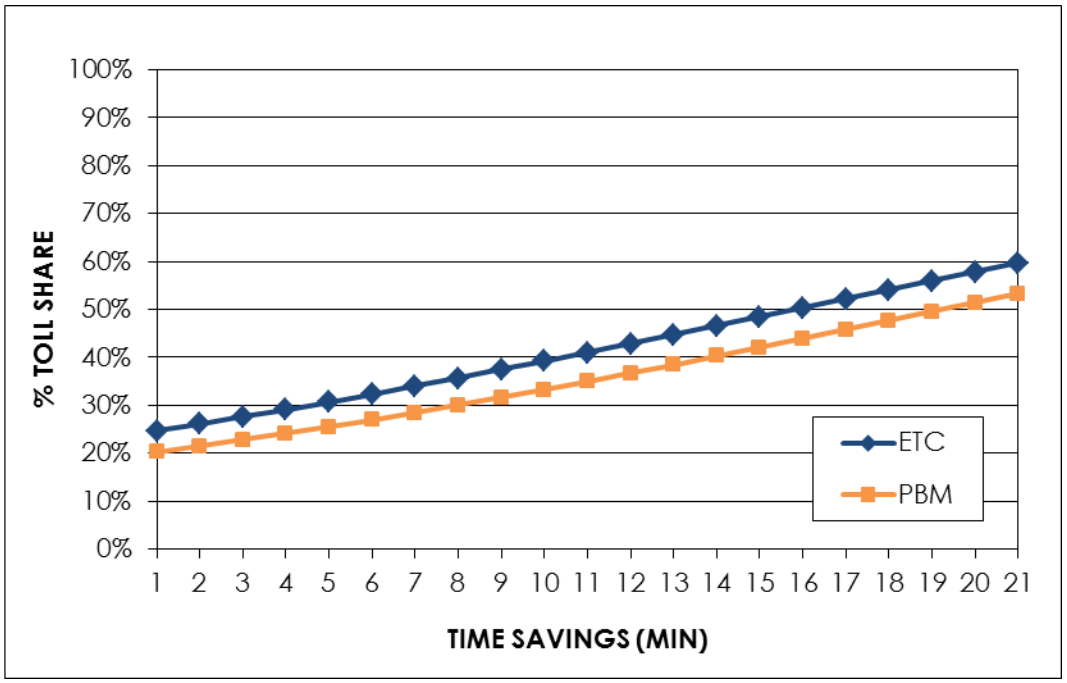


Figure 7.4 Toll Diversion for Home Based School (Auto) - $2.00 Toll

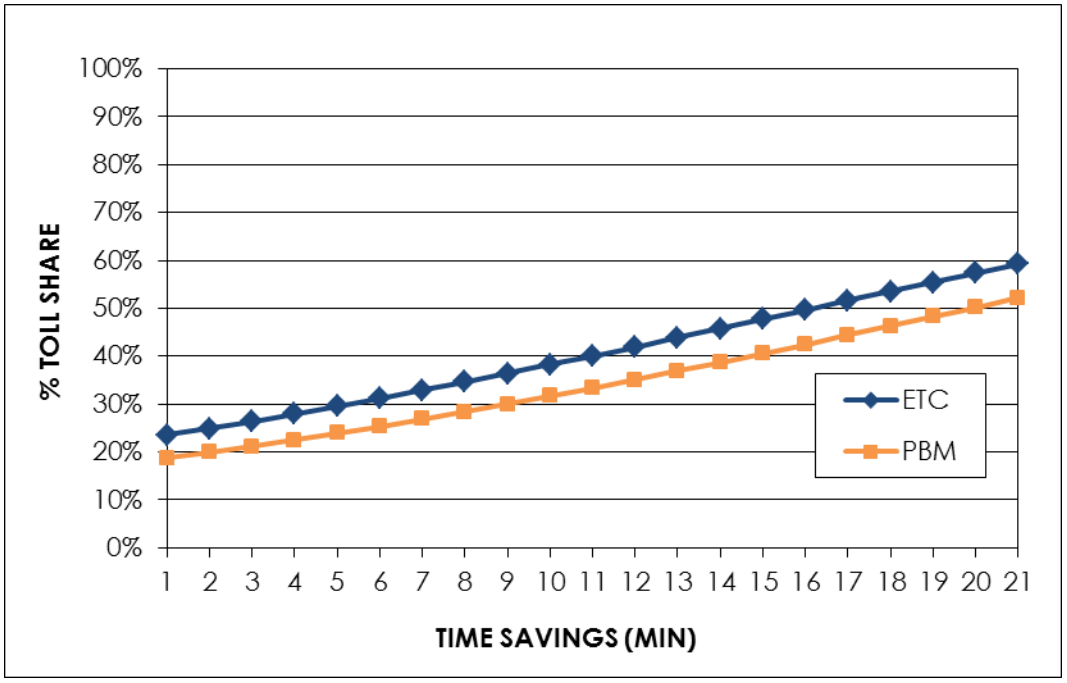


Figure 7.5 Toll Diversion for Home Based Other (Auto) - $2.00 Toll

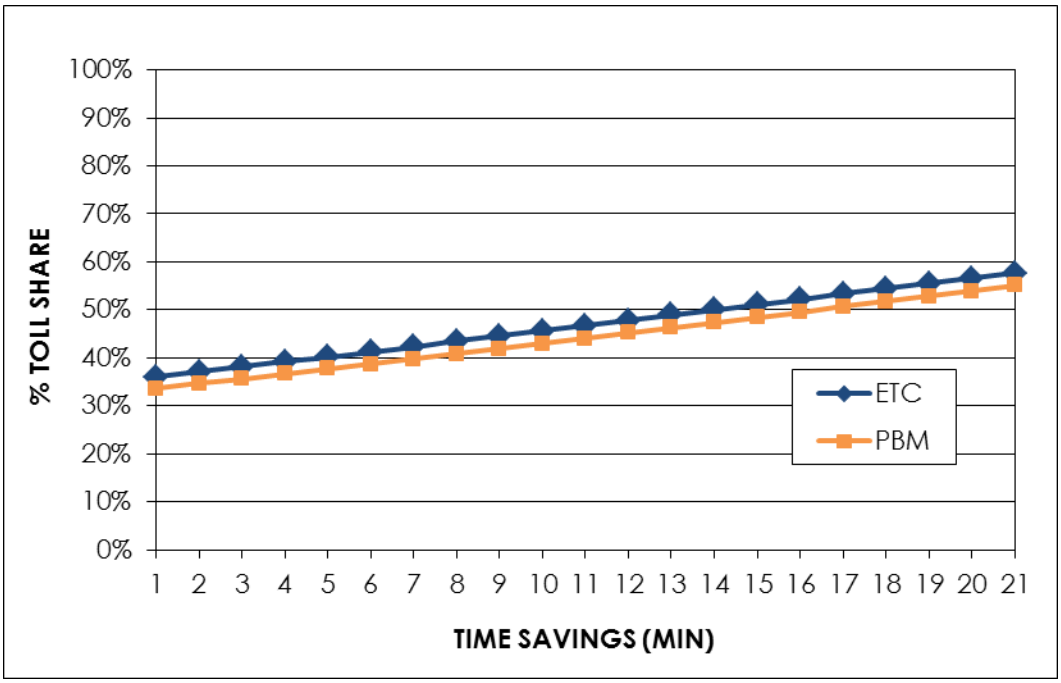


Figure 7.6 Toll Diversion for Work Based Other (Auto) - $2.00 Toll

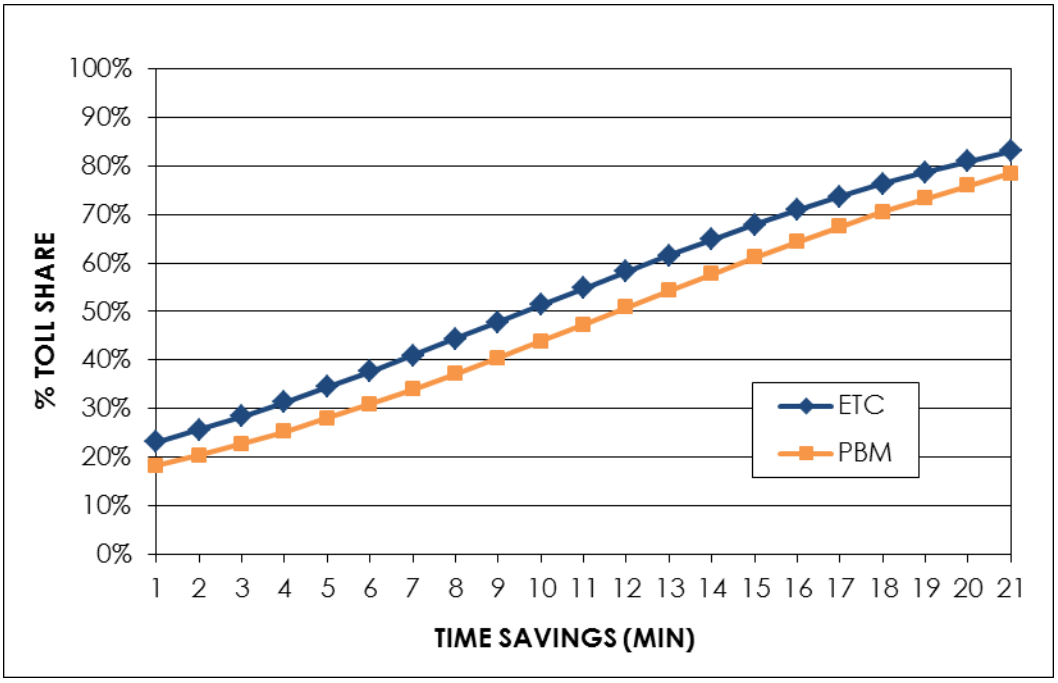


Figure 7.7 Toll Diversion for Other Based Other (Auto) - $2.00 Toll

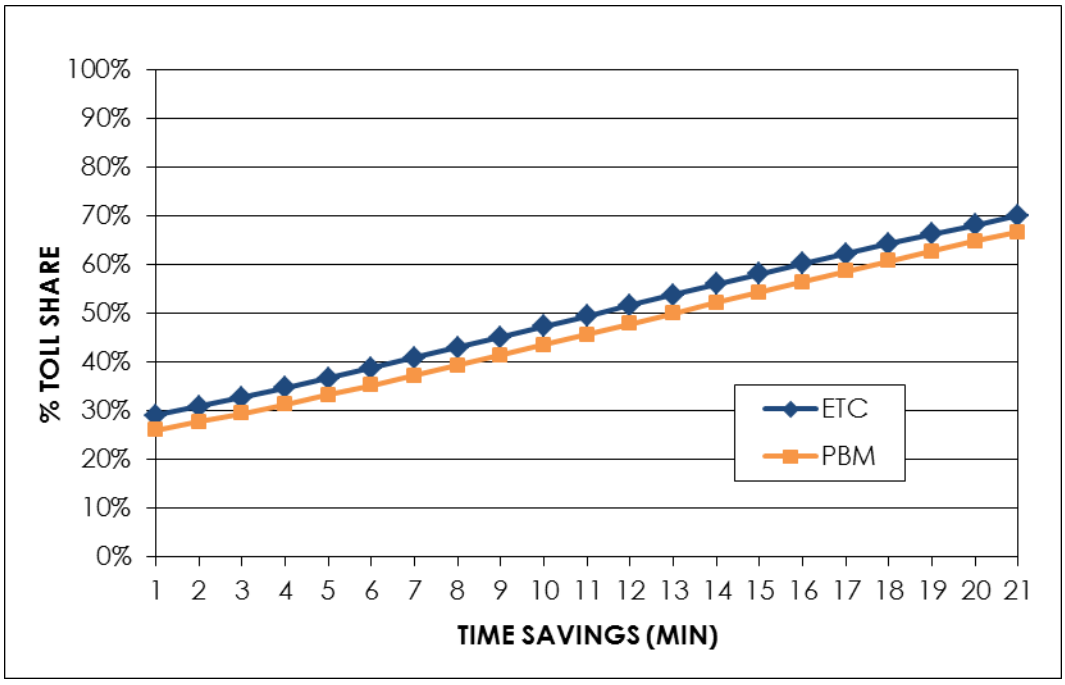
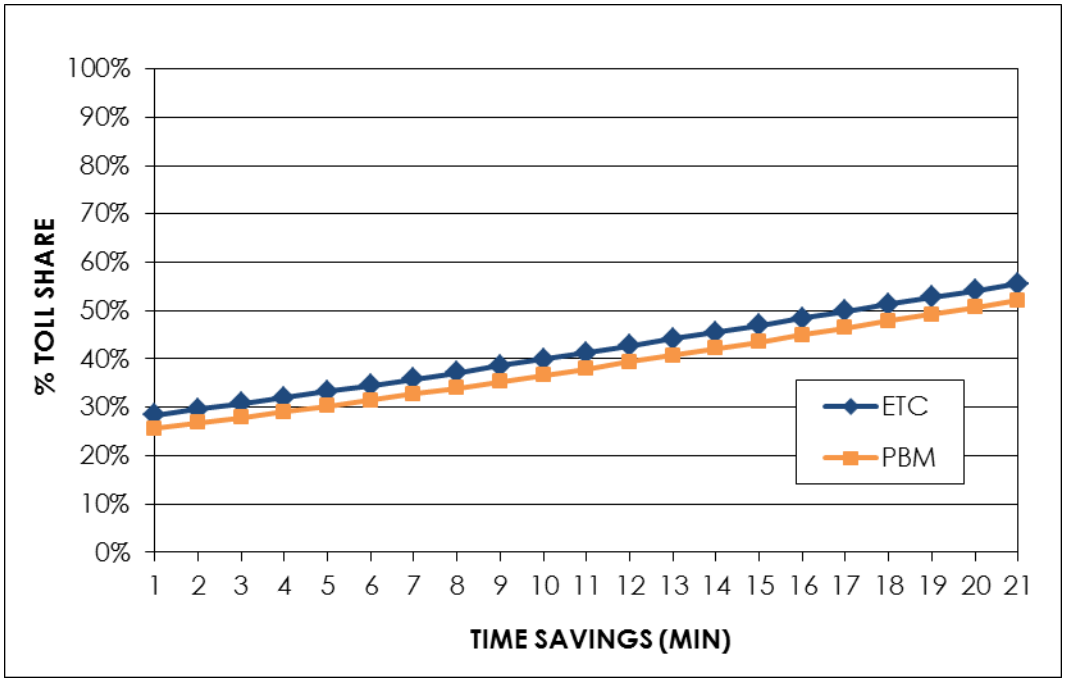


Figure 7.8 Toll Diversion for Trucks - $6.00 Toll



7.1.1 Highway Assignment Process Modifications

Consistent with the existing highway assignment process, trips are assigned to the network for three specific time-of-day conditions. The hours within each of these three periods are as follows:

- AM Peak (3-hour)– 6:00 AM to 9:00 AM
- PM Peak (3-hour)– 3:30 PM to 6:30 PM
- Off Peak (18 hours) – the remaining hours

The CAMPO Regional Model's current volume delay functions (VDFs) were adopted for the assignment and were augmented with a routine to estimate queuing at roadway intersections and merge points on limited access roadways. The queuing formula estimates the additional time encountered when traffic volumes exceed the physical capacity of a roadway segment. This modification is only enabled on a roadway segment if a traffic control device (signals, stop signs, or yield signs) is present and the roadway segment's volume/capacity ratio exceeds a value of 1.0. As part of the model calibration, the 'free flow' speeds, link capacities, and queuing routines were refined as necessary to ensure that the model adequately replicated both peak and off-peak speeds for the primary roadway facilities in each toll road corridor.

7.2 MODEL CALIBRATION

The objective of the model calibration was to ensure that the modeling process adequately replicates both the observed traffic volumes and the observed speeds by time of day for each of the project corridors. The calibration was also structured to replicate the observed traffic and transactions by payment method to the extent feasible for each toll road by pay point. It should be noted that the calibration was performed solely on the integrated model highway assignment process and toll diversion routines and no adjustments were made to the individual regional models.

7.2.1 Speed Calibration

The initial element of the calibration was to adjust the assumed free flow speeds were adjusted as necessary to replicate the off-peak speeds which reflect generally uncongested conditions. Peak speeds were adjusted in an iterative process including refinements to the capacity and the queuing formula to ensure that estimated congested speeds replicated the observed values and that the overall traffic assigned to the roadways replicated the observed volumes on a daily basis. This approach for calibration of peak speeds was adopted since period specific traffic counts were available only at a limited number of locations throughout the region. Volumes and vehicle-miles of travel (VMT) were also summarized on a regional basis to evaluate the assignment process on an aggregate level.

As part of the speed calibration effort, Stantec, assisted by our subconsultant Alliance Transportation Group, collected the observed speed data for corridors across the study region. Speed data were collected for both directions during three different time-of-day periods. Table

7.2 shows the results of the speed calibration in terms of observed an estimated travel time and speed by corridor and by time-of-day. These corridors were depicted earlier in Chapter 3. Note that most of the roadways shown are located primarily in the Austin region within the corridors of the individual roadways. Four roadway segments, as noted in the table, are south of Austin and include facilities that generally parallel the alignment of SH 130 Segments 5 and 6 (which are not part of the CTTS).

Table 7.2 Speed Calibration Summary

Route	Section Limits		Direction	AM [1]		PM [2]		Off-peak [3]	
				Observed	Estimated	Observed	Estimated	Observed	Estimated
IH 35	SH 130	MLK Blvd.	NB	66	62	53	50	65	61
			SB	50	56	54	55	60	61
	MLK Blvd.	SH 80	NB	53	60	59	56	64	65
			SB	69	65	47	46	65	65
	SH 80* [4]	Loop 1604* [4]	NB	70	71	67	64	71	70
			SB	64	63	64	69	70	70
Loop 1	SH 45 N	US 290 W	NB	53	52	43	50	66	62
			SB	52	58	43	46	68	63
SH 130*	IH 35	US 183	NB	73	74	72	74	71	74
			SB	72	73	72	74	71	74
SH 45 N*	US 183	SH 130	EB	66	71	68	71	71	72
			WB	68	69	66	72	74	71
US 183	SH 45 N	Manor Rd.	NB	67	67	47	56	67	65
			SB	56	59	68	63	66	63
	Manor Rd.	SH 130	NB	31	37	36	39	45	43
			SB	42	43	32	42	47	46
	SH 130 [4]	IH 10 [4]	NB	53	53	55	54	54	53
			SB	52	53	52	53	54	53
SH 21*	US 183	US 80	NB	57	56	58	56	60	56
			SB	60	56	58	57	61	56
SH 360*	US 183	Loop 1	NB	36	36	24	31	46	44
			SB	30	37	34	30	45	43
US 79*	IH 35	SH 130	EB	40	38	37	35	40	37
			WB	31	32	33	36	35	37
FM 973	US 290	US 183	NB	36	40	38	39	39	42
			SB	36	38	39	38	42	42
IH 10*	Loop 410 [4]	SH 123 [4]	EB	71	73	72	71	70	73
			WB	67	69	71	73	72	73
SH 123*	IH 35 [4]	IH 10 [4]	NB	54	51	53	51	51	50
			SB	53	51	52	51	52	51
FM 685*	SH 45 N/Kelly Ln.	US 290E	NB	35	36	27	34	34	37
			SB	24	33	32	36	37	36
RM 620*	SH 45 N	IH 35	EB	33	23	30	24	36	35
			WB	30	30	30	28	39	34
Gattis School Rd.	IH 35	SH 130	EB	29	33	25	30	30	33
			WB	29	27	26	32	34	33
Parmer Ln.*	FM 1431	Loop 1	NB	38	40	37	34	47	39
			SB	34	31	35	38	38	41
Loop 1 Frontage	SH 45 EB Frontage	US 183	NB	28	31	25	32	27	32
			SB	27	31	32	30	30	34
SH 45 SE*	IH 35	SH 130	EB	77	75	78	75	76	75
			WB	78	75	78	75	78	75
FM 1327*	IH 35	US 183	EB	56	57	52	57	55	57
			WB	54	56	52	58	55	58

Notes: 1) AM = Morning Peak Period (6AM – 9AM)
2) PM = Afternoon Peak Period (3:30PM – 6:30PM)
3) Off-Peak = Off-Peak Period (remaining hours)
4) Segments noted are south of Austin and include facilities that are generally parallel to the alignment of SH 130 Segments 5 and 6 (which are not part of the CTTS).
5) Travel time runs for segments shown with an asterisk (*) were conducted in 2012.

The results indicated that the estimated speed replicated the observed speed reasonably well in the off-peak period with all corridors have estimated speeds with 5 MPH (+/-) of the observed values. In the peak periods, most of the corridors have speed differences with 5 MPH (+/-) while there are several corridors in each peak period where the differences are with 5-10 MPH (+/-) of the observed values. The level of consistency is acceptable for the purposes of model calibration. The largest difference is on US 183 east of Austin between Manor Road and SH 130, where the PM peak estimated speed in the southbound direction is 10 MPH faster than the observed value.

7.2.2 Aggregate Calibration by Facility Type and Area Type

After the regional calibration analysis of speeds was completed, the calibration of traffic within each corridor was performed. This process included the replication of traffic by screenline total and individual roadways as well as by vehicle type. This analysis included the use of our in-house trip table adjustment routine to ensure that the aggregate travel across each screenline replicated the observed traffic by vehicle type.

The aggregate calibration by facility type and area type was performed for both traffic volumes as well as vehicle-miles travelled (VMT). This calibration utilized more than 2,240 link counts that were collected from several different sources. These data included the TxDOT 2012 AADT Traffic Maps and a limited set of classification counts provided by TxDOT, as well as other existing counts obtained from prior Stantec studies in the Austin region. Classification counts along the screenlines were also performed by Stantec's subconsultant, GRAM Traffic Counting, Inc. to provide current estimates for all roadways intersected by the screenlines. Stantec also obtained the 2013 transactions by paypoint for all toll facilities in the region, including all CTRMA facilities in operation in 2013. In situations where multiple counts were available for an individual roadway segment, the most reliable count data was determined using a hierarchy which used TxDOT transaction data first, then classification counts collected for this project, and then lastly either counts from previous studies or TxDOT counts.

The VMT and volume comparison summaries are listed in Table 7.3 and Table 7.4. Table 7.3 lists the aggregate comparison of volume and VMT by facility for the entire region. The replication of both volume and VMT is acceptable and for the limited-access facility type which includes toll roads, the estimated volume and VMT ratios are slightly less than observed at 0.97 and 0.98 respectively.

Table 7.3 Volume and VMT Comparison by Facility Type

FACILITY TYPE	NUMBER OF COUNTS	VOLUME			VMT		
		OBSERVED	ESTIMATED	EST/OBS	OBSERVED	ESTIMATED	EST/OBS
Limited-Access Facility	285	12,992,567	12,570,141	0.97	6,604,858	6,484,463	0.98
Expressway	16	436,235	423,669	0.97	142,210	133,997	0.94
Principal Arterial Divided	541	7,141,623	7,032,670	0.98	3,069,846	2,973,529	0.97
Principal Arterial Undivided	491	2,594,703	2,761,623	1.06	1,735,682	1,927,958	1.11
Minor Arterial Divided	44	354,698	325,724	0.92	142,401	131,462	0.92
Minor Arterial Undivided	571	1,064,435	978,893	0.92	1,028,427	942,838	0.92
Frontage Road	94	838,737	833,258	0.99	237,333	215,553	0.91
Collector/Local	85	82,141	94,712	1.15	101,268	127,802	1.26
Ramp	116	280,029	292,447	1.04	81,813	86,718	1.06
TOTAL	**2,243**	**25,785,168**	**25,313,137**	**0.98**	**13,143,838**	**13,024,320**	**0.99**

Table 7.4 provides a similar summary by area type. Except for the relatively small area of the region that is defined as CBD, all of the area type classifications are less than 5% different than the observed values.

Table 7.4 Volume and VMT Comparison by Area Type

FACILITY TYPE	NUMBER OF COUNTS	VOLUME			VMT		
		OBSERVED	ESTIMATED	EST/OBS	OBSERVED	ESTIMATED	EST/OBS
CBD	12	841,074	727,486	0.86	226,204	202,684	0.90
CBD Fringe	121	4,195,666	3,971,974	0.95	1,264,872	1,214,496	0.96
Urban	388	8,469,680	8,310,281	0.98	3,117,636	3,037,702	0.97
Suburban	854	9,312,088	9,090,697	0.98	5,408,933	5,191,315	0.96
Rural	868	2,966,660	3,212,699	1.08	3,126,193	3,378,123	1.08
TOTAL	**2,243**	**25,785,168**	**25,313,137**	**0.98**	**13,143,838**	**13,024,320**	**0.99**

While not listed separately in the tables, volumes and VMT for truck traffic by facility type and area type were performed and the level of variation was similar to the aggregate values listed in these tables. Overall truck VMT was with 1% of the observed value for the region.

While this calibration analysis in these tables includes the entire modeled area, the results by facility type and area type are generally consistent with the latest CAMPO model results available to Stantec. The regional ratio of estimated to observed VMT is 0.99, generally equal to CAMPO's results. The ratio of estimated to observed traffic volume is 0.98 compared to 1.00 in Campo's results. Recent calibrations statistics for the existing San Antonio Model are not currently available.

7.2.3 Screenline Calibration

The final element of the calibration was to adjust the toll diversion model equations to replicate the observed traffic by vehicle type and payment method across each of the toll corridors. This analysis resulted in adjustments to the assumed market segments by payment type in each subarea as well as minor adjustments to the toll bias constants and ETC bias constants.

The screenline calibration was performed to ensure that the aggregate demand within each toll road corridor replicates the observed traffic. As part of this calibration, an in-house routine was

applied to minimize any variation between estimated and observed demand across each of the screenlines. The adjustment provides a matrix of 'base year' trip changes (either increases or reductions) that is then retained for application in each of the horizon years. Since these trips are stored as a matrix, these additional trips are not tied to specific roadways and can be diverted to different routes in exactly the same manner as the trips estimated directly by the model. As a result of the screenline calibration, for origin-destination zonal pairs where trip changes were provided by the adjustment routine, the net change in trips was an increase of 1.1 percent with a decrease in autos being offset by an increase in truck trips. Note that since the magnitude of the additional trips is held constant for all future years, their contribution to the overall assignment results are further minimized in each successive horizon year as the underlying model trip tables continue to increase due to growth in the region's population and employment.

A series of screenlines were developed within each of the toll road corridors to intersect each of the mainline toll plazas and parallel locations on the adjacent non-tolled roads. Four screenlines were created for SH 130, two for SH 45 N, one for Loop 1, and one for SH 45 SE. These eight screenlines are a subset of all the screenlines analyzed in the region-wide calibration and are consistent with the CTTS screenlines displayed earlier in Chapter 3. Two additional screenlines were also created to quantify demand for the 183A toll facility for calibration purposes. Figure 7.9 shows the screenline locations within each toll road corridor. Table 7.5 and Table 7.6 list the screenline calibration results for total traffic and by mode. Table 7.5 summarizes the screenlines intercepting SH 130, including the two southernmost segments (Segments 5&6) which are not part of the CTTS system. Table 7.6 summarizes the Loop 1, SH 45 N, SH 45 SE, and 183A screenlines.

Total traffic on each of the CTTS element screenlines is well within acceptable tolerances of the total counts. The total estimated traffic for each screenline is slightly higher than the total observed traffic, except for the screenlines SH 130 A and SH 130 C. For each corridor, the distribution of traffic among competing roadways along the screenlines is also within acceptable tolerances and traffic volumes at the mainline plazas (shown in bold) on the toll facilities are estimated adequately.

The allocation of the traffic by vehicle type (auto and truck), provides an adequate replication of the observed data. At an aggregate level, the estimated truck percentage of total vehicles across screenlines is generally within 1 to 2 percent of the observed percentage for the CTTS elements, except the SH 45 SE screenline where the estimated trucks are 15.2 percent versus an observed value of 11.9 percent. The estimated truck percentages at the toll facilities were also estimated reasonably well. Note that the truck traffic presented in these summaries includes 2-axle 6-tire trucks, consistent with the definition of trucks in the individual regional models.

Figure 7.9 Calibration Screenline Locations

Table 7.5 Screenline Comparison – SH 130 Screenlines

	Route	Auto		Truck		% Truck		Total		% of Total	
		Observed	Estimated	Observed	Estimated	Observed	Estimated	Observed	Estimated	Observed	Estimated
	SH 130										
Screenline 130-A	IH 35	133,510	131,256	15,255	15,341	10.3%	10.5%	148,765	146,597	75.0%	74.5%
	CR 115	11,098	10,901	755	637	6.4%	5.5%	11,852	11,538	6.0%	5.9%
	FM 1460	11,622	11,795	990	1,082	7.8%	8.4%	12,611	12,878	6.4%	6.5%
	CR 110	3,193	3,047	284	273	8.2%	8.2%	3,476	3,319	1.8%	1.7%
	SH 130	**16,617**	**17,096**	**1,837**	**2,036**	**10.0%**	**10.6%**	**18,453**	**19,133**	**9.3%**	**9.7%**
	CR 100	655	900	85	80	11.5%	8.2%	740	980	0.4%	0.5%
	FM 1660	1,760	1,752	663	664	27.4%	27.5%	2,423	2,416	1.2%	1.2%
	Total	178,453	176,747	19,869	20,113	10.0%	10.2%	198,322	196,860	100.0%	100.0%
Screenline 130-B	IH 35	146,092	146,834	24,105	24,425	14.2%	14.3%	170,197	171,259	69.6%	68.4%
	Heatherwilde Blvd	10,370	9,710	1,405	987	11.9%	9.2%	11,775	10,697	4.8%	4.3%
	Dessau / FM 685	19,137	20,716	2,779	2,874	12.7%	12.2%	21,917	23,590	9.0%	9.4%
	Immanuel	3,963	4,079	347	346	8.1%	7.8%	4,310	4,425	1.8%	1.8%
	SH 130	**29,035**	**29,934**	**2,649**	**3,545**	**8.4%**	**10.6%**	**31,684**	**33,479**	**13.0%**	**13.4%**
	Cameron Rd	2,904	3,487	144	234	4.7%	6.3%	3,048	3,721	1.2%	1.5%
	Fuchs Grove	1,268	2,695	424	406	25.1%	13.1%	1,692	3,101	0.7%	1.2%
	Total	212,770	217,455	31,853	32,816	13.0%	13.1%	244,623	250,271	100.0%	100.0%
Screenline 130-C	IH 35	197,488	192,438	42,255	42,077	17.6%	17.9%	239,743	234,515	59.5%	58.3%
	Cameron Rd.	15,877	19,362	1,183	1,385	6.9%	6.7%	17,060	20,747	4.2%	5.2%
	Berkman Dr.	9,939	9,604	1,260	1,310	11.3%	12.0%	11,200	10,914	2.8%	2.7%
	Manor Rd.	9,746	9,794	277	421	2.8%	4.1%	10,024	10,215	2.5%	2.5%
	Springdale Rd.	8,500	8,576	287	400	3.3%	4.5%	8,787	8,977	2.2%	2.2%
	US 183	50,847	51,088	9,026	8,028	15.1%	13.6%	59,873	59,116	14.9%	14.7%
	Johnny Morris Rd.	4,887	4,941	295	296	5.7%	5.6%	5,182	5,237	1.3%	1.3%
	FM 3177	8,874	10,691	863	988	8.9%	8.5%	9,737	11,679	2.4%	2.9%
	FM 973	5,682	5,661	1,097	530	16.2%	8.6%	6,779	6,191	1.7%	1.5%
	SH 130	**26,011**	**26,206**	**2,444**	**2,455**	**8.6%**	**8.6%**	**28,454**	**28,661**	**7.1%**	**7.1%**
	FM 969	5,379	5,311	546	565	9.2%	9.6%	5,925	5,876	1.5%	1.5%
	Total	343,230	343,673	59,533	58,455	14.8%	14.5%	402,763	402,128	100.0%	100.0%
Screenline 130-D	IH 35	166,144	168,263	20,863	21,183	11.2%	11.2%	187,007	189,446	64.6%	64.9%
	Todd Ln.	10,102	10,670	1,048	1,081	9.4%	9.2%	11,150	11,751	3.9%	4.0%
	Stassney Ln.	18,836	20,278	2,123	2,609	10.1%	11.4%	20,959	22,887	7.2%	7.8%
	US 183	26,725	25,548	4,789	3,389	15.2%	11.7%	31,513	28,937	10.9%	9.9%
	FM 973	6,525	7,354	1,374	1,384	17.4%	15.8%	7,900	8,739	2.7%	3.0%
	SH 130	**16,420**	**15,652**	**2,209**	**2,198**	**11.9%**	**12.3%**	**18,630**	**17,850**	**6.4%**	**6.1%**
	Ross Rd.	11,738	11,851	667	666	5.4%	5.3%	12,405	12,517	4.3%	4.3%
	Total	256,491	259,616	33,073	32,511	11.4%	11.1%	289,563	292,127	100.0%	100.0%
Screenline 130-E	IH 35	122,551	118,719	7,664	9,868	5.9%	7.7%	130,215	128,587	77.4%	76.1%
	Goforth Rd (FM 157)	2,200	2,246	162	163	6.8%	6.8%	2,362	2,409	1.4%	1.4%
	SH 21	10,546	10,576	2,794	2,704	20.9%	20.4%	13,340	13,280	7.9%	7.9%
	FM 2001	1,878	2,357	534	511	22.1%	17.8%	2,412	2,868	1.4%	1.7%
	US 183 - SH130 Frontage	8,403	9,044	509	1,629	5.7%	15.3%	8,913	10,673	5.3%	6.3%
	SH 130 Seg 5 ML	**7,451**	**7,483**	**1,283**	**1,484**	**14.7%**	**16.5%**	**8,733**	**8,967**	**5.2%**	**5.3%**
	FM 1854	2,234	2,223	36	31	1.6%	1.4%	2,271	2,255	1.3%	1.3%
	Total	155,264	152,649	12,982	16,390	7.7%	9.7%	168,246	169,039	100.0%	100.0%
Screenline 130-F	IH 35	82,234	86,472	15,503	12,499	15.9%	12.6%	97,737	98,971	80.0%	79.8%
	SH 21	10,047	10,107	2,328	2,406	18.8%	19.2%	12,375	12,513	10.1%	10.1%
	FM 1984	1,217	1,216	169	133	12.2%	9.9%	1,385	1,349	1.1%	1.1%
	SH 1342	4,590	4,753	469	456	9.3%	8.8%	5,059	5,210	4.1%	4.2%
	SH 130 Seg 6 ML	**3,481**	**3,438**	**919**	**959**	**20.9%**	**21.8%**	**4,400**	**4,397**	**3.6%**	**3.5%**
	State Park Rd (FM 20)	1,024	1,515	129	87	11.2%	5.4%	1,152	1,601	0.9%	1.3%
	Total	102,593	107,501	19,517	16,540	16.0%	13.3%	122,110	124,042	100.0%	100.0%

Table 7.6 Screenline Comparison – SH 45 N, Loop 1, SH 45 SE, and 183A

Route		Auto		Truck		% Truck		Total		% of Total	
		Observed	Estimated	Observed	Estimated	Observed	Estimated	Observed	Estimated	Observed	Estimated
SH 45 N											
Screenline 45N-A	FM 1431	35,239	34,681	6,589	6,751	15.8%	16.3%	41,828	41,431	21.0%	19.0%
	Colonial Parkway	5,550	5,603	693	720	11.1%	11.4%	6,243	6,323	3.1%	2.9%
	Brushy Creek Rd.	10,066	11,306	2,091	2,076	17.2%	15.5%	12,156	13,383	6.1%	6.1%
	Avery Ranch Blvd.	11,310	18,793	1,658	1,664	12.8%	8.1%	12,968	20,458	6.5%	9.4%
	Lakeline Blvd.	8,809	10,870	899	868	9.3%	7.4%	9,707	11,739	4.9%	5.4%
	SH 45 NW ML	**36,934**	**40,316**	**1,082**	**2,249**	**2.8%**	**5.3%**	**38,017**	**42,565**	**19.1%**	**19.5%**
	SH 45 NW Frontage	28,893	32,742	1,621	1,700	5.3%	4.9%	30,514	34,441	15.3%	15.8%
	Anderson Mill Rd.	15,531	16,470	3,016	3,205	16.3%	16.3%	18,547	19,675	9.3%	9.0%
	McNeil Dr.	25,896	24,865	3,357	3,061	11.5%	11.0%	29,253	27,925	14.7%	12.8%
	Total	178,229	195,646	21,005	22,294	10.5%	10.2%	199,234	217,940	100.0%	100.0%
Screenline 45N-B	US 79	24,120	24,439	2,651	2,680	9.9%	9.9%	26,771	27,119	17.6%	17.3%
	CR 168/Gattis School Rd.	14,472	14,904	1,228	2,628	7.8%	15.0%	15,700	17,531	10.3%	11.2%
	SH 45 NE ML	**30,696**	**30,522**	**1,226**	**1,629**	**3.8%**	**5.1%**	**31,922**	**32,151**	**20.9%**	**20.5%**
	SH 45 NE Frontage	7,872	8,341	967	2,372	10.9%	22.1%	8,839	10,713	5.8%	6.8%
	Pflugerville Loop Rd.	10,265	12,012	1,597	1,739	13.5%	12.6%	11,862	13,751	7.8%	8.8%
	FM 1825/Pecan St.	18,400	18,237	3,527	3,496	16.1%	16.1%	21,928	21,733	14.4%	13.8%
	Wells Branch Pkwy	13,974	12,709	1,111	1,252	7.4%	9.0%	15,085	13,961	9.9%	8.9%
	Howard Lane	17,788	17,526	2,599	2,515	12.7%	12.6%	20,387	20,042	13.4%	12.8%
	Total	137,588	138,689	14,906	18,311	9.8%	11.7%	152,494	157,000	100.0%	100.0%
Loop 1											
Screenline Loop 1-A	US 183	144,620	154,961	10,915	12,286	7.0%	7.3%	155,535	167,247	28.6%	29.6%
	Parmer Lane	35,782	36,531	4,748	5,625	11.7%	13.3%	40,529	42,156	7.4%	7.5%
	Howard Lane	12,720	13,305	1,929	2,079	13.2%	13.5%	14,650	15,384	2.7%	2.7%
	FM 1325/Loop 1 SR	21,092	20,701	867	873	3.9%	4.0%	21,958	21,574	4.0%	3.8%
	Loop 1 Mainline Plaza	**55,775**	**55,763**	**796**	**1,655**	**1.4%**	**2.9%**	**56,571**	**57,418**	**10.4%**	**10.2%**
	Bratton Lane	6,766	7,586	562	748	7.7%	9.0%	7,328	8,334	1.3%	1.5%
	IH 35	146,092	146,834	24,105	24,425	14.2%	14.3%	170,197	171,259	31.2%	30.3%
	Heatherwilde	15,211	15,341	551	1,047	3.5%	6.4%	15,762	16,388	2.9%	2.9%
	N Railroad Rd	6,134	6,169	137	564	2.2%	8.4%	6,272	6,733	1.2%	1.2%
	FM 685	21,750	22,442	2,437	2,758	10.1%	10.9%	24,186	25,200	4.4%	4.5%
	SH 130	29,035	29,934	2,649	3,545	8.4%	10.6%	31,684	33,479	5.8%	5.9%
	Total	494,977	509,568	49,696	55,605	9.1%	9.8%	544,673	565,173	100.0%	100.0%
SH 45 SE											
Screenline 45SE-A	FM 1327	8,993	9,155	1,488	2,083	14.2%	18.5%	10,481	11,238	43.6%	44.2%
	SH 45 SE ML	**11,548**	**11,541**	**1,296**	**1,344**	**10.1%**	**10.4%**	**12,844**	**12,885**	**53.4%**	**50.6%**
	Turnersville Rd.	648	873	79	446	10.9%	33.8%	726	1,319	3.0%	5.2%
	Total	21,189	21,568	2,863	3,873	11.9%	15.2%	24,051	25,442	100.0%	100.0%
183A											
Screenline 183A-A	Lakeline Blvd	22,231	21,023	2,165	1,992	8.9%	8.7%	24,396	23,015	16.1%	14.2%
	US 183	32,810	45,322	9,372	9,387	22.2%	17.2%	42,182	54,708	27.8%	33.8%
	183A ML	**38,545**	**39,023**	**1,471**	**1,662**	**3.7%**	**4.1%**	**40,016**	**40,685**	**26.4%**	**25.1%**
	Vista Ridge Blvd	6,851	6,068	481	539	6.6%	8.2%	7,332	6,607	4.8%	4.1%
	Parmer Ln	32,815	32,028	4,796	4,982	12.8%	13.5%	37,610	37,010	24.8%	22.8%
	Total	133,252	143,464	18,284	18,561	12.1%	11.5%	151,536	162,025	100.0%	100.0%
Screenline 183A-B	Pecan Park Blvd	6,792	10,228	738	638	9.8%	5.9%	7,530	10,866	3.7%	4.5%
	US 183	67,467	67,362	5,649	5,891	7.7%	8.0%	73,115	73,253	35.5%	30.6%
	183A ML	**35,799**	**37,763**	**970**	**994**	**2.6%**	**2.6%**	**36,769**	**38,757**	**17.8%**	**16.2%**
	US 183 SB On-Ramp	25,188	45,104	2,109	3,535	7.7%	7.3%	27,297	48,639	13.2%	20.3%
	US 183/SH 45 DC	10,798	10,113	2,225	1,323	17.1%	11.6%	13,024	11,436	6.3%	4.8%
	Lake Creek Pkwy	11,656	17,920	1,186	1,379	9.2%	7.1%	12,843	19,299	6.2%	8.1%
	Parmer Ln	30,613	32,241	5,011	4,878	14.1%	13.1%	35,624	37,119	17.3%	15.5%
	Total	188,313	220,732	17,888	18,637	8.7%	7.8%	206,201	239,370	100.0%	100.0%

7.2.4 Calibration of Toll Transactions by Mode and by Payment Method

The final element of the calibration was focused on replicating toll transactions by both vehicle type and payment method. For this analysis, Stantec utilized the model-estimated number of transactions by paypoint, vehicle type, and payment method and compared these estimates to observed transaction data provided by TxDOT and CTRMA.

Table 7.7 and Table 7.8 provide a comparison of the estimated (EST) and observed (OBS) transactions by vehicle type at each CTTS element and all CTRMA facilities by paypoint. The estimated total transactions along SH 130 and SH 45N are approximately 4.2 percent and 7.2 percent higher respectively. SH 45 SE and Loop 1 total transaction are within 1 percent of the observed values. The allocation of auto and truck shares for SH 130 and SH 45 SE are close to the observed values, with trucks accounting for approximately 10 percent of the transactions. For Loop 1, SH 45 N and CTRMA's 183A toll road, estimated truck shares are approximately within 1-2 percent of the observed truck shares. While the total transactions for each toll road vary from the observed totals, the transactions by vehicle type on a percentage basis demonstrate a good replication of the observed data.

A summary of the shares total transactions by payment method and a separate summary by vehicle type are shown in Table 7.9 through Table 7.11. As shown in the tables, the model generally provides an adequate share of transactions by payment type for the total on each facility, as well as separately for autos and trucks. The largest difference is overestimation of PBM shares for trucks on SH 45 SE.

While the model estimates show some variation against the observed values by paypoint location and payment method for each CTTS elements, the resulting average toll per transaction for each roadway is relatively close to the observed values. The comparison for each CTTS element by vehicle type is shown in Table 7.12. The values for SH 130 and SH 45 SE reflect the temporary truck toll discount program that was in place during the 2013 calibration year. Note that the values are unadjusted model outputs and do not include any modifications for collection efficiency.

Table 7.7 Comparison of 2013 Average Weekday Toll Transactions by Pay Point and Vehicle Type

	CROSSROAD	TYPE	VEHICLE TYPE						TOTAL		
			AUTO			TRUCK					
			OBS	EST	%DIFF	OBS	EST	%DIFF	OBS	EST	%DIFF
SH 130	SH 29	Ramp	1,236	1,267	2.5%	101	86	-15.0%	1,337	1,353	1.2%
	FM 104	Ramp	124	153	23.3%	6	5	-22.1%	130	158	21.2%
	Chandler Rd	Ramp	634	635	0.1%	71	59	-16.6%	705	694	-1.6%
	N. of CR 109	**Mainline**	**16,401**	**17,096**	**4.2%**	**2,052**	**2,036**	**-0.8%**	**18,453**	**19,133**	**3.7%**
	US 79	Ramp	9,571	11,533	20.5%	657	1,137	73.0%	10,228	12,670	23.9%
	CR 138	Ramp	7,297	7,168	-1.8%	384	354	-7.9%	7,681	7,522	-2.1%
	Pecan St	Ramp	1,840	2,351	27.8%	105	209	99.3%	1,945	2,559	31.6%
	N. of Cameron Rd	**Mainline**	**28,658**	**29,934**	**4.5%**	**3,026**	**3,545**	**17.1%**	**31,684**	**33,479**	**5.7%**
	Cameron Rd	Ramp	323	402	24.4%	59	109	83.0%	382	511	33.5%
	Howard Ln / Gregg Manor	Ramp	461	596	29.3%	33	12	-62.5%	494	608	23.2%
	Blue Bluff Rd.	Ramp	151	143	-5.4%	12	6	-55.0%	163	148	-9.2%
	Bloor Rd / FM 973	Ramp	444	608	37.0%	39	33	-14.8%	483	641	32.9%
	N. of FM 969	**Mainline**	**25,672**	**26,206**	**2.1%**	**2,782**	**2,455**	**-11.8%**	**28,454**	**28,661**	**0.7%**
	FM 969	Ramp	3,134	3,083	-1.6%	261	421	61.3%	3,395	3,504	3.2%
	Harold Green Rd	Ramp	161	169	4.9%	232	273	17.8%	393	442	12.5%
	Pearce Ln.	Ramp	1,038	930	-10.4%	65	39	-40.1%	1,103	969	-12.2%
	N. of Elroy Rd	**Mainline**	**16,207**	**15,652**	**-3.4%**	**2,423**	**2,198**	**-9.3%**	**18,630**	**17,850**	**-4.2%**
	Elroy Rd	Ramp	403	350	-13.2%	33	49	46.5%	436	399	-8.6%
	FM 812	Ramp	401	569	41.8%	41	41	-0.4%	442	609	37.9%
	Moore Rd	Ramp	122	51	-58.2%	16	0	-99.9%	138	51	-63.1%
	TOTAL MAINLINE		**86,938**	**88,889**	**2.2%**	**10,283**	**10,234**	**-0.5%**	**97,221**	**99,123**	**2.0%**
	% Share MAINLINE		**89.4%**	**89.7%**		**10.6%**	**10.3%**				
	TOTAL RAMPS		**27,017**	**29,607**	**9.6%**	**2,056**	**2,723**	**32.4%**	**29,073**	**32,329**	**11.2%**
	% Share RAMPS		**92.9%**	**91.6%**		**7.1%**	**8.4%**				
	TOTAL		**114,278**	**118,897**	**4.0%**	**12,399**	**13,065**	**5.4%**	**126,677**	**131,963**	**4.2%**
	% Share TOTAL		**90.2%**	**90.1%**		**9.8%**	**9.9%**				
SH 45 SE	Turnersville Rd	Ramp	132	145	9.8%	11	13	21.4%	143	158	10.7%
	ML Plaza	**Mainline**	**11,398**	**11,541**	**1.3%**	**1,446**	**1,344**	**-7.0%**	**12,844**	**12,885**	**0.3%**
	FM 1625	Ramp	325	407	25.2%	137	21	-84.7%	462	428	-7.3%
	TOTAL MAINLINE		**11,398**	**11,541**	**1.3%**	**1,446**	**1,344**	**-7.0%**	**12,844**	**12,885**	**0.3%**
	% Share TOTAL		**88.7%**	**89.6%**		**11.3%**	**10.4%**				
	TOTAL RAMPS		**457**	**552**	**20.8%**	**148**	**34**	**-76.8%**	**605**	**586**	**-3.0%**
	% Share TOTAL		**75.6%**	**94.1%**		**24.4%**	**5.9%**				
	TOTAL		**11,855**	**12,093**	**2.0%**	**1,593**	**1,378**	**-13.5%**	**13,448**	**13,471**	**0.2%**
	% Share TOTAL		**88.2%**	**89.8%**		**11.8%**	**10.2%**				

Note: % SHARE = % of total by vehicle type

Table 7.8 Comparison of 2013 Average Weekday Toll Transactions by Pay Point and Vehicle Type (continued)

	CROSSROAD	TYPE	VEHICLE TYPE						TOTAL		
			AUTO			TRUCK					
			OBS	EST	%DIFF	OBS	EST	%DIFF	OBS	EST	%DIFF
SH 45 N	**W. ML Plaza**	**Mainline**	**36,454**	**40,316**	**10.6%**	**1,563**	**2,249**	**43.9%**	**38,017**	**42,565**	**12.0%**
	Parmer Ln.	Ramp	7,824	8,950	14.4%	263	558	111.8%	8,087	9,507	17.6%
	Howard Ln.	Ramp	7,337	7,564	3.1%	178	181	1.7%	7,515	7,746	3.1%
	Greenlawn	Ramp	7,242	6,667	-7.9%	196	347	76.8%	7,438	7,013	-5.7%
	CR 170	Ramp	8,397	9,145	8.9%	214	466	117.8%	8,611	9,611	11.6%
	Arterial A	Ramp	4,212	4,847	15.1%	104	355	240.9%	4,316	5,202	20.5%
	Heatherwilde	Ramp	7,770	7,824	0.7%	202	506	150.4%	7,972	8,331	4.5%
	E. ML Plaza	**Mainline**	**30,297**	**30,522**	**0.7%**	**1,625**	**1,629**	**0.2%**	**31,922**	**32,151**	**0.7%**
	TOTAL MAINLINE		**66,751**	**70,838**	**6.1%**	**3,188**	**3,878**	**21.6%**	**69,939**	**74,715**	**6.8%**
	% Share TOTAL		**95.4%**	**94.8%**		**4.6%**	**5.2%**				
	TOTAL RAMPS		**42,782**	**44,996**	**5.2%**	**1,158**	**2,413**	**108.4%**	**43,940**	**47,410**	**7.9%**
	% Share TOTAL		**97.4%**	**94.9%**		**2.6%**	**5.1%**				
	TOTAL		**109,533**	**115,834**	**5.8%**	**4,346**	**6,291**	**44.7%**	**113,879**	**122,125**	**7.2%**
	% Share TOTAL		**96.2%**	**94.8%**		**3.8%**	**5.2%**				
Loop 1 N	Shoreline Dr	Ramp	590	874	48.1%	18	44	144.5%	608	918	51.0%
	ML Plaza	**Mainline**	**55,050**	**55,763**	**1.3%**	**1,521**	**1,655**	**8.8%**	**56,571**	**57,418**	**1.5%**
	Howard	Ramp	4,359	2,990	-31.4%	165	137	-16.9%	4,524	3,127	-30.9%
	TOTAL MAINLINE		**55,050**	**55,763**	**1.3%**	**1,521**	**1,655**	**8.8%**	**56,571**	**57,418**	**1.5%**
	% Share TOTAL		**97.3%**	**97.1%**		**2.7%**	**2.9%**				
	TOTAL RAMPS		**4,949**	**3,864**	**-21.9%**	**183**	**181**	**-0.9%**	**5,132**	**4,045**	**-21.2%**
	% Share TOTAL		**96.4%**	**95.5%**		**3.6%**	**4.5%**				
	TOTAL		**59,999**	**59,626**	**-0.6%**	**1,704**	**1,836**	**7.8%**	**61,703**	**61,463**	**-0.4%**
	% Share TOTAL		**97.2%**	**97.0%**		**2.8%**	**3.0%**				
183 A	Crystal Falls Pkwy	Ramp	325	402	23.7%	29	109	274.6%	354	511	44.2%
	Crystal Falls ML	**Mainline**	**17,353**	**17,872**	**3.0%**	**1,301**	**1,019**	**-21.7%**	**18,654**	**18,891**	**1.3%**
	Scottsdale Dr	Ramp	995	696	-30.0%	27	9	-66.0%	1,022	705	-31.0%
	Park St. ML	**Mainline**	**38,044**	**39,023**	**2.6%**	**1,972**	**1,662**	**-15.7%**	**40,016**	**40,685**	**1.7%**
	Brushy Creek	Ramp	8,677	9,707	11.9%	228	311	36.6%	8,905	10,018	12.5%
	Lakeline ML	**Mainline**	**35,334**	**37,763**	**6.9%**	**1,435**	**994**	**-30.8%**	**36,769**	**38,757**	**5.4%**
	TOTAL MAINLINE		**90,731**	**94,659**	**4.3%**	**4,708**	**3,675**	**-22.0%**	**95,439**	**98,333**	**3.0%**
	% Share TOTAL		**95.1%**	**96.3%**		**4.9%**	**3.7%**				
	TOTAL RAMPS		**9,997**	**10,805**	**8.1%**	**284**	**429**	**51.1%**	**10,281**	**11,234**	**9.3%**
	% Share TOTAL		**97.2%**	**96.2%**		**2.8%**	**3.8%**				
	TOTAL		**100,728**	**105,464**	**4.7%**	**4,992**	**4,104**	**-17.8%**	**105,720**	**109,567**	**3.6%**
	% Share TOTAL		**95.3%**	**96.3%**		**4.7%**	**3.7%**				

Note: % SHARE = % of total by vehicle type

Table 7.9 Comparison of 2013 Average Weekday Toll Transactions by Payment Method Total Transactions

	CROSSROAD	TYPE	PAYMENT METHODS					
			ETC			PAY BY MAIL		
			OBS	EST	%DIFF	OBS	EST	%DIFF
SH 130	MAINLINE	Total	62,645	62,420	-0.4%	34,576	36,703	6.2%
		% Share	64.4%	63.0%		35.6%	37.0%	
	RAMPS	Total	20,242	23,856	17.9%	8,831	8,473	-4.1%
		% Share	69.6%	73.8%		30.4%	26.2%	
	TOTAL	**Total**	**83,139**	**86,642**	**4.2%**	**43,538**	**45,320**	**4.1%**
		% Share	**65.6%**	**65.7%**		**34.4%**	**34.3%**	
SH 45 SE	MAINLINE	Total	8,025	7,850	-2.2%	4,818	5,035	4.5%
		% Share	62.5%	60.9%		37.5%	39.1%	
	RAMPS	Total	376	327	-13.1%	228	259	13.5%
		% Share	62.2%	55.8%		37.8%	44.2%	
	TOTAL	**Total**	**8,402**	**8,177**	**-2.7%**	**5,047**	**5,294**	**4.9%**
		% Share	**62.5%**	**60.7%**		**37.5%**	**39.3%**	
SH 45 N	MAINLINE	Total	54,332	60,572	11.5%	15,607	14,143	-9.4%
		% Share	77.7%	81.1%		22.3%	18.9%	
	RAMPS	Total	35,049	38,701	10.4%	8,891	8,708	-2.1%
		% Share	79.8%	81.6%		20.2%	18.4%	
	TOTAL	**Total**	**89,381**	**99,274**	**11.1%**	**24,498**	**22,851**	**-6.7%**
		% Share	**78.5%**	**81.3%**		**21.5%**	**18.7%**	
Loop 1	MAINLINE	Total	45,199	45,588	0.9%	11,372	11,830	4.0%
		% Share	79.9%	79.4%		20.1%	20.6%	
	RAMPS	Total	3,825	3,367	-12.0%	1,307	679	-48.1%
		% Share	74.5%	83.2%		25.5%	16.8%	
	TOTAL	**Total**	**49,024**	**48,955**	**-0.1%**	**12,679**	**12,508**	**-1.3%**
		% Share	**79.5%**	**79.6%**		**20.5%**	**20.4%**	
183A	MAINLINE	Total	64,646	71,688	10.9%	30,793	26,645	-13.5%
		% Share	67.7%	72.9%		32.3%	27.1%	
	RAMPS	Total	7,666	8,374	9.2%	2,615	2,860	9.4%
		% Share	74.6%	74.5%		25.4%	25.5%	
	TOTAL	**Total**	**72,312**	**80,062**	**10.7%**	**33,408**	**29,505**	**-11.7%**
		% Share	**68.4%**	**73.1%**		**31.6%**	**26.9%**	

Table 7.10 Comparison of 2013 Average Weekday Toll Transactions by Payment Method
Auto Transactions

	CROSSROAD	TYPE	PAYMENT METHODS					
			ETC			PAY BY MAIL		
			OBS	EST	%DIFF	OBS	EST	%DIFF
SH 130	MAINLINE	Total	56,090	55,912	-0.3%	30,848	32,977	6.9%
		% Share	64.5%	62.9%		35.5%	37.1%	
	RAMPS	Total	18,829	21,832	16.0%	8,188	7,775	-5.1%
		% Share	69.7%	73.7%		30.3%	26.3%	
	TOTAL	**Total**	**75,131**	**78,041**	**3.9%**	**39,147**	**40,856**	**4.4%**
		% Share	**65.7%**	**65.6%**		**34.3%**	**34.4%**	
SH 45 SE	MAINLINE	Total	7,124	7,265	2.0%	4,274	4,275	0.0%
		% Share	62.5%	63.0%		37.5%	37.0%	
	RAMPS	Total	282	308	9.1%	175	244	39.5%
		% Share	61.7%	55.8%		38.3%	44.2%	
	TOTAL	**Total**	**7,406**	**7,573**	**2.3%**	**4,449**	**4,520**	**1.6%**
		% Share	**62.5%**	**62.6%**		**37.5%**	**37.4%**	
SH 45 N	MAINLINE	Total	51,869	57,573	11.0%	14,882	13,265	-10.9%
		% Share	77.7%	81.3%		22.3%	18.7%	
	RAMPS	Total	34,133	36,741	7.6%	8,649	8,255	-4.6%
		% Share	79.8%	81.7%		20.2%	18.3%	
	TOTAL	**Total**	**86,001**	**94,314**	**9.7%**	**23,532**	**21,520**	**-8.5%**
		% Share	**78.5%**	**81.4%**		**21.5%**	**18.6%**	
Loop 1	MAINLINE	Total	43,990	44,283	0.7%	11,060	11,479	3.8%
		% Share	79.9%	79.4%		20.1%	20.6%	
	RAMPS	Total	3,689	3,286	-10.9%	1,260	578	-54.1%
		% Share	74.5%	85.0%		25.5%	15.0%	
	TOTAL	**Total**	**47,679**	**47,569**	**-0.2%**	**12,320**	**12,057**	**-2.1%**
		% Share	**79.5%**	**79.8%**		**20.5%**	**20.2%**	
183A	MAINLINE	Total	62,040	69,613	12.2%	28,691	25,046	-12.7%
		% Share	68.4%	73.5%		31.6%	26.5%	
	RAMPS	Total	7,473	8,104	8.4%	2,524	2,701	7.0%
		% Share	74.8%	75.0%		25.2%	25.0%	
	TOTAL	**Total**	**69,513**	**77,717**	**11.8%**	**31,215**	**27,747**	**-11.1%**
		% Share	**69.0%**	**73.7%**		**31.0%**	**26.3%**	

Table 7.11 Comparison of 2013 Average Weekday Toll Transactions by Payment Method Truck Transactions

	CROSSROAD	TYPE	PAYMENT METHODS					
			ETC			PAY BY MAIL		
			OBS	EST	%DIFF	OBS	EST	%DIFF
SH 130	MAINLINE	Total	6,555	6,508	-0.7%	3,728	3,726	-0.1%
		% Share	63.7%	63.6%		36.3%	36.4%	
	RAMPS	Total	1,413	2,025	43.2%	643	698	8.5%
		% Share	68.7%	74.4%		31.3%	25.6%	
	TOTAL	**Total**	**8,007**	**8,601**	**7.4%**	**4,392**	**4,464**	**1.6%**
		% Share	**64.6%**	**65.8%**		**35.4%**	**34.2%**	
SH 45 SE	MAINLINE	Total	902	585	-35.1%	544	759	39.5%
		% Share	62.4%	43.5%		37.6%	56.5%	
	RAMPS	Total	94	19	-79.6%	53	15	-71.8%
		% Share	63.9%	56.2%		36.1%	43.8%	
	TOTAL	**Total**	**996**	**604**	**-39.4%**	**597**	**774**	**29.6%**
		% Share	**62.5%**	**43.8%**		**37.5%**	**56.2%**	
SH 45 N	MAINLINE	Total	2,464	3,000	21.8%	724	878	21.2%
		% Share	77.3%	77.4%		22.7%	22.6%	
	RAMPS	Total	916	1,960	113.9%	242	453	87.4%
		% Share	79.1%	81.2%		20.9%	18.8%	
	TOTAL	**Total**	**3,380**	**4,960**	**46.7%**	**966**	**1,331**	**37.7%**
		% Share	**77.8%**	**78.8%**		**22.2%**	**21.2%**	
Loop 1	MAINLINE	Total	1,209	1,305	7.9%	312	350	12.3%
		% Share	79.5%	78.8%		20.5%	21.2%	
	RAMPS	Total	135	81	-40.3%	48	101	111.2%
		% Share	74.0%	44.5%		26.0%	55.5%	
	TOTAL	**Total**	**1,344**	**1,386**	**3.1%**	**359**	**451**	**25.4%**
		% Share	**78.9%**	**75.5%**		**21.1%**	**24.5%**	
183A	MAINLINE	Total	2,606	2,075	-20.4%	2,102	1,599	-23.9%
		% Share	55.4%	56.5%		44.6%	43.5%	
	RAMPS	Total	193	270	40.0%	91	159	74.8%
		% Share	68.0%	63.0%		32.0%	37.0%	
	TOTAL	**Total**	**2,799**	**2,346**	**-16.2%**	**2,193**	**1,758**	**-19.8%**
		% Share	**56.1%**	**57.2%**		**43.9%**	**42.8%**	

Table 7.12 Comparison of Observed and Estimated Toll Cost Per Transaction

Roadway	AUTO		TRUCK		TOTAL	
	OBS	EST	OBS	EST	OBS	EST
SH 130	$1.62	$1.60	$1.70	$1.65	$1.62	$1.61
SH 45 SE	$1.11	$1.11	$1.09	$1.18	$1.11	$1.11
SH 45 N	$1.02	$1.01	$2.61	$2.57	$1.08	$1.09
Loop 1 N	$1.06	$1.07	$2.63	$2.66	$1.10	$1.11

7.3 ELASTICITY ANALYSIS

In order to develop toll elasticity curves for the CTTS Project, the transportation model was run using the final adjusted toll coefficients listed in Table 7.1 and a range of toll values above and below the existing toll rates for the 2013 calibration year as well with the future toll rates and networks for the year 2030. As a check on the reasonableness of the model outputs, tests were conducted on the CTTS elements separately and due to the length of the SH 130 element, elasticity was estimated for each of the four segments. These elasticity estimates for each year are a function of both the overall travel demand and network conditions, in terms of competing roadways and congestion that exist for both years. For this analysis, a number of alternative toll rates were expressed as multiples of the base tolls. The multiples range from 0.25 to 6.0 and reveal how traffic and revenues change at different toll levels. The results were plotted for the four facilities as shown in Figure 7.10 through Figure 7.13 Within each of these figures, the transactions and revenues for 2013 are shown in solid lines while the dashed lines represent the same values in 2030 horizon year.

Elasticity, as used herein, is the relationship between traffic volume and toll rate change, and represents the relative decrease in traffic corresponding to a given increase in toll. Elasticity is expressed as a negative value and the higher the absolute value, the more apt a facility is to lose traffic, which can be due to diversions to competing facilities, switches in travel modes, consolidation of trips and elimination of trips.

For 2013 Stantec performed elasticity analysis using the 2013 toll rates, which included the toll rate increases effective January 1, 2013 along with the discounted truck toll values for SH 130 and SH 45 SE that were active at that time. For that 2013 increase, three of the CTTS elements (SH 130, SH 45 N, and Loop 1) had toll rates increases for the first time since these roadways opened to traffic. Toll rates for SH 130 were increased 25 percent while Loop 1 and SH 45 N had toll rates increased 50 percent. Truck toll discounts in place during 2013 were terminated in January 2014. For the future year 2030, the auto and truck tolls are the values are derived from the assumed rates applied with the annual escalation policy over the period from 2015 to 2030.

Similar to our analysis in the prior 2012 Update, in 2013 Loop 1 has the lowest elasticity at approximately -0.27, while SH 130 is the most elastic with a value at approximately -0.50. The elasticity factor for SH 45 N is -0.32 and for SH 45 SE, the elasticity factor is -0.46. With respect to estimating the optimum point for future revenue forecasts, it is prudent to define points on the revenue curves that are less than the maximum revenue point in order to provide a degree of flexibility which allows for additional revenue to be generated if circumstances require that consideration. The SH 45 SE elasticity curves suggest that the roadway is already close to its optimal revenue, indicating that an increase in tolls would not produce higher revenue in the near term if tolls were increased substantially. Similarly, for 2013 the model estimates that SH 130 revenue is also close to its optimum revenue. In contrast, the model predicts that the SH 45 N optimum revenue is approximately 1.50 times the base toll. Loop 1, being the most inelastic among the four facilities, has optimum toll levels at approximately 2.0 times the base toll. The inelasticity of Loop 1 can be attributed primarily to the level of congestion on the competing roads, such as US 183 North, Parmer Lane, and I-35.

Figure 7.10 SH 130 Toll Sensitivity

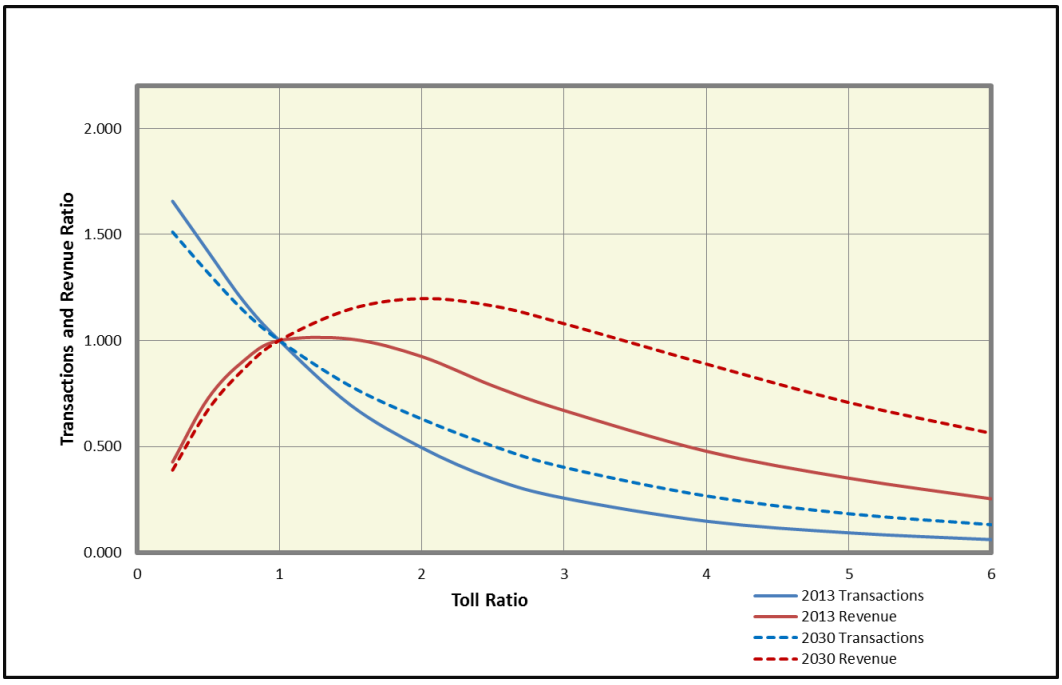


Figure 7.11 SH 45 N Toll Sensitivity

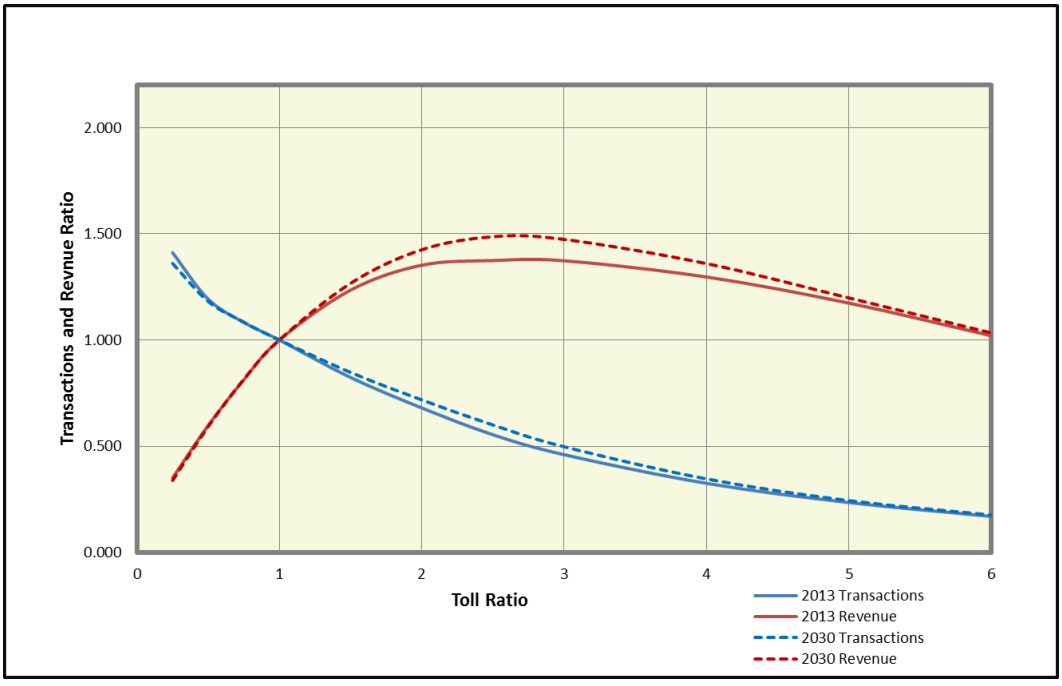


Figure 7.12 Loop 1 Toll Sensitivity

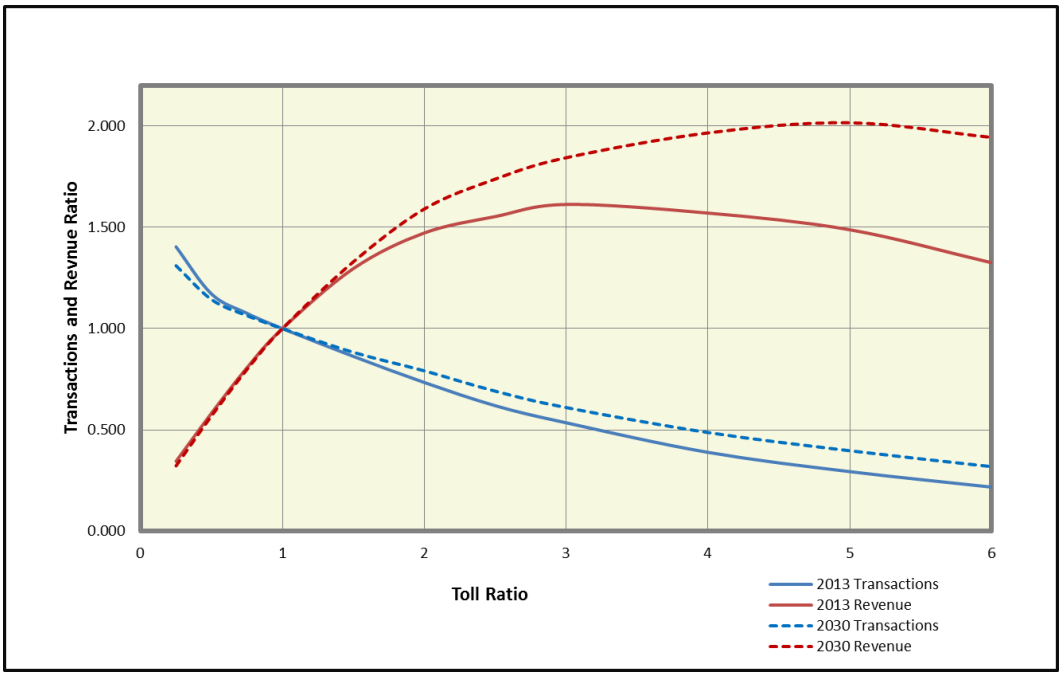
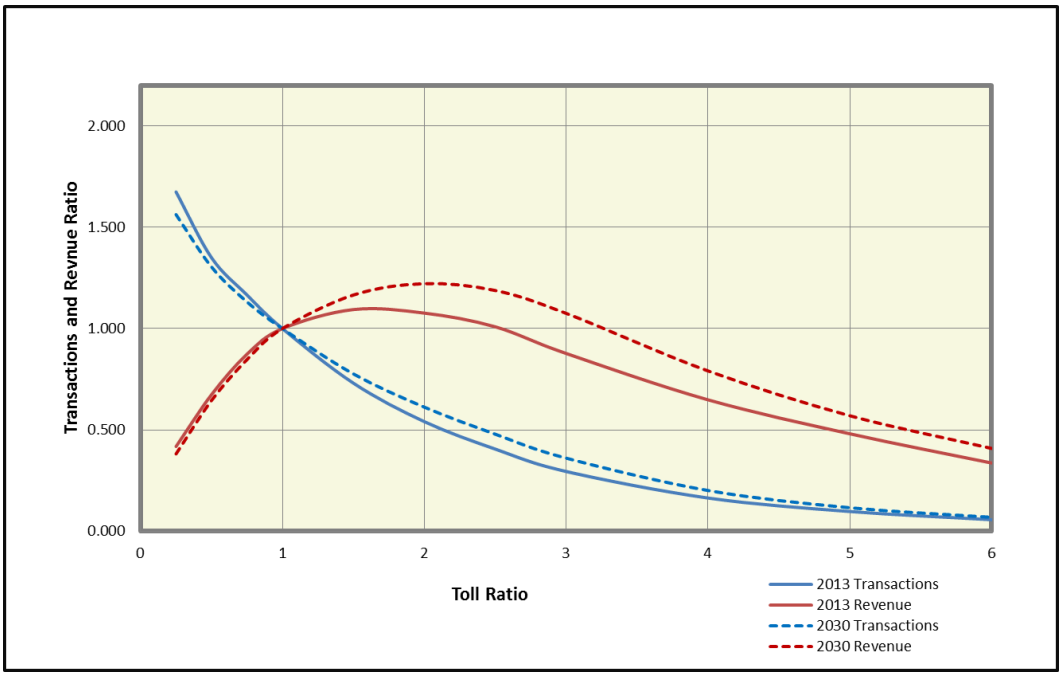


Figure 7.13 SH 45 SE Toll Sensitivity



For the future year 2030 conditions, the elasticity values decline indicating that the roadways become less elastic, due primarily due to increasing congestion on the competing roadways as a result of on-going development and growth in traffic. The elasticity for SH 130 is reduced significantly to -0.37 as the adjacent arterial roadways become congested with traffic from

development in what is currently a largely rural corridor. Elasticity for Loop 1, SH 45 North, and SH 45 SE will also decline to -0.21, -0.28, and -0.39 respectively. These reductions in elasticity indicate that under the future conditions, there will be more flexibility to increase tolls beyond the planned toll escalation assumed in the forecasts, particularly for SH 130. As shown in these figures, the optimum revenue points for each roadway increase most notably for SH 130 and Loop 1.

Due to the length of the SH 130 element and the varying degrees of competition in each of its four segments, separate elasticity calculations were performed to examine the sensitivity to toll rates in each segment for both 2013 and 2030. Figure 7.14 through Figure 7.17 display the transactions and revenue relationships for each segment. Segment 1 at the northern end of SH 130 has the lowest elasticity, ranging from -0.44 in 2013 to -0.33 in2030. This is likely due to the orientation of this segment and lack of adjacent arterials that would compete with it. In contrast, Segment 4 at the southern end of SH 130 has the most elastic with values ranging from -0.62 in 2013 to -0.50 in 2030. The higher level of elasticity is likely due to the competition provided by US 183, which intersects SH 130 at the interchange with SH 45 SE and provides a direct route into southeastern Austin. The elasticity values for Segments 2 and 3 are similar with 2013 values of -0.48 and -0.52 respectively. By 2030 these two segments have elasticity values of -0.36 and -0.33, respectively.

Figure 7.14 SH 130 Segment 1 Toll Sensitivity

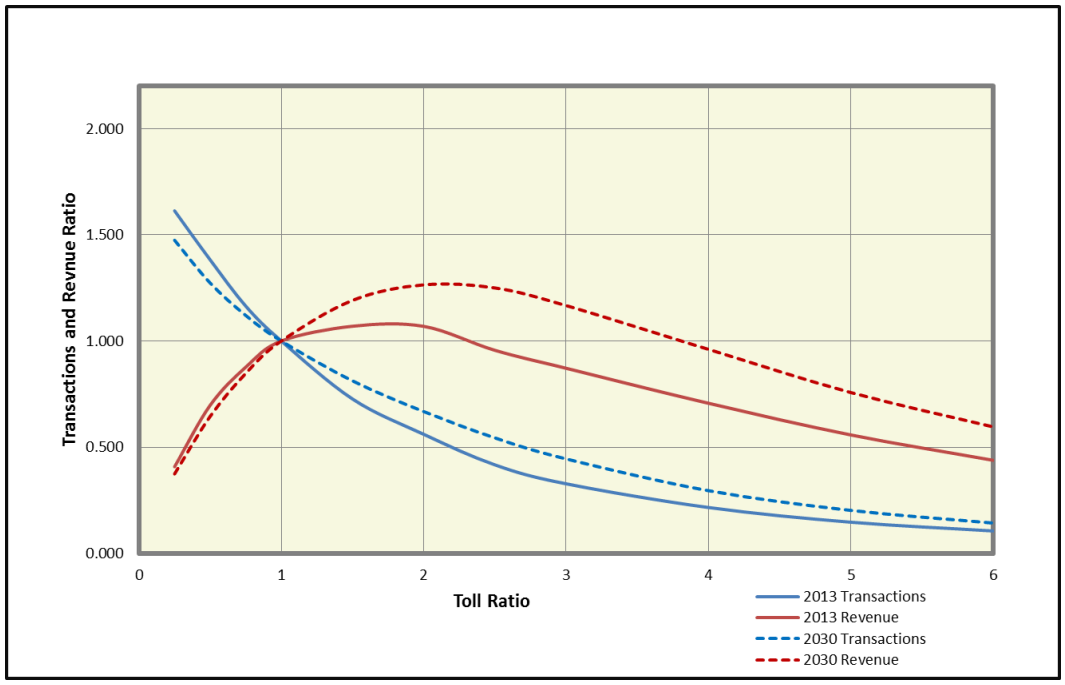


Figure 7.15 SH 130 Segment 2 Toll Sensitivity

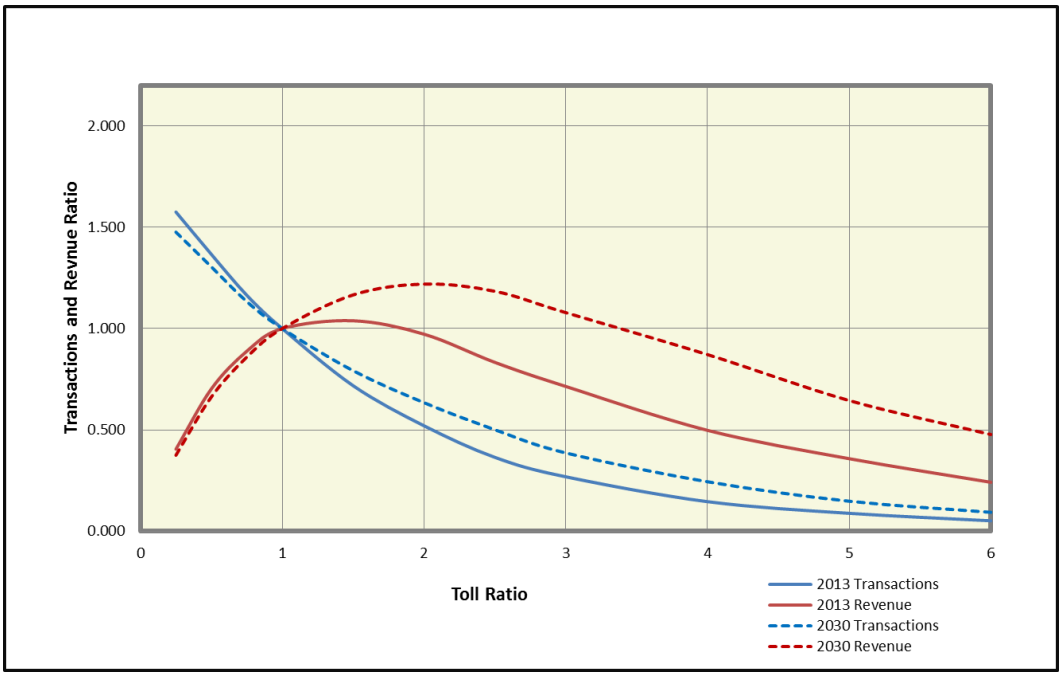


Figure 7.16 SH 130 Segment 3 Toll Sensitivity

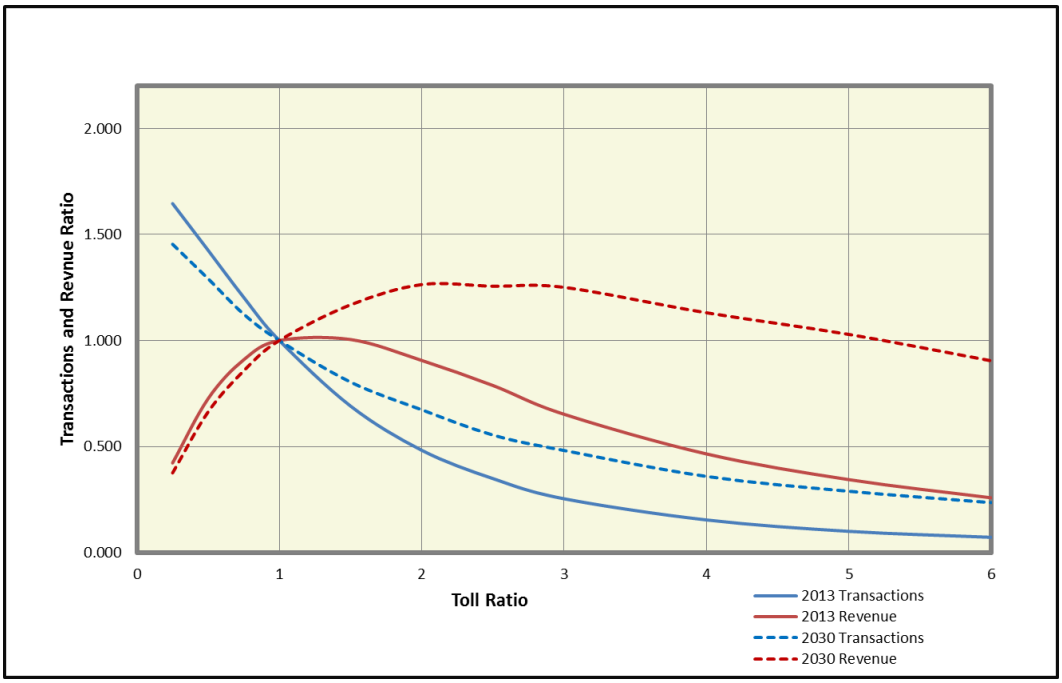
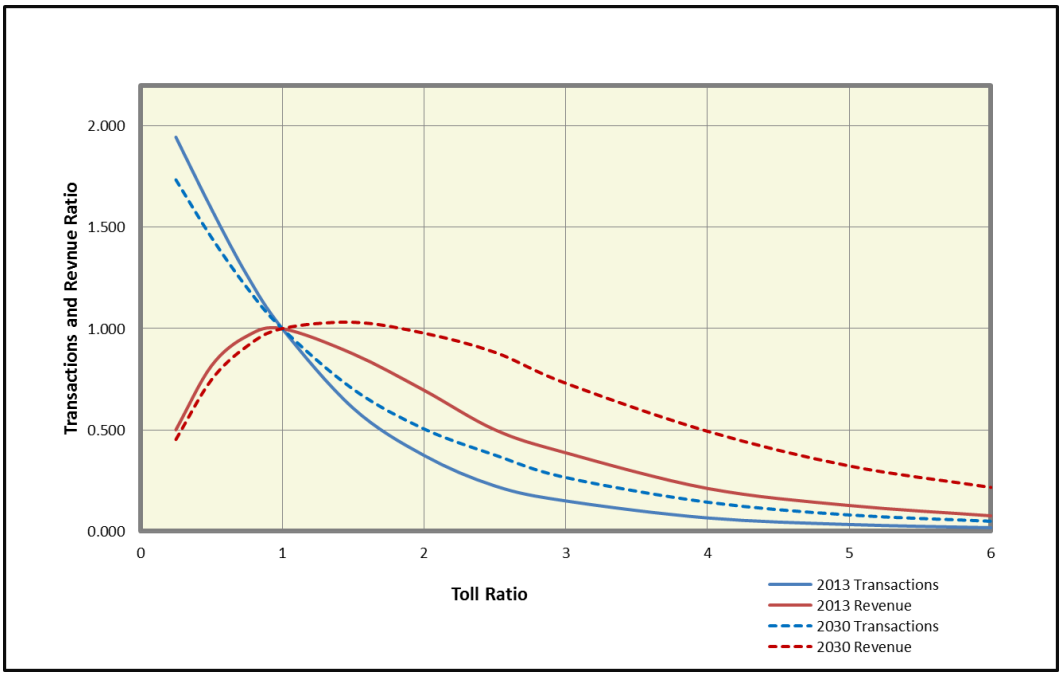


Figure 7.17 SH 130 Segment 4 Toll Sensitivity



8.0 TRAFFIC & REVENUE FORECASTS

Stantec developed traffic and toll revenue forecasts for each of the CTTS elements based on the travel demand model which incorporated the future year network assumptions discussed in Chapter 2 and the revised socioeconomic forecasts discussed in Chapter 6. The travel demand modeling process, including the application of the individual MPO models and the toll diversion model, were applied to selected horizon years (2015, 2020, 2030, and 2040) to create annual traffic estimates from 2015 to 2042. Intermediate year estimates were developed via interpolation techniques and the years beyond 2040 were estimated via extrapolation.

Stantec reviewed the model-based forecasts, summarized the estimated traffic for each of the corridor screenlines and reviewed the detailed schematic diagrams for each horizon year. In order to prepare the final transaction and revenue streams by vehicle type and payment type, the model-based forecasts were reviewed and adjusted as necessary to account for any unacceptable model variation. Transaction and revenue streams were then prepared for each CTTS roadway which include the key metrics related to payment type and vehicle type, along with both average weekday and annual estimates for total transactions and paying transactions using collection statistics provided by TxDOT.

The remaining sections of this chapter provide a separate summary of the model forecasts and transaction and revenue summary for each CTTS element. A combined forecast summing all roadways is provided along with a comparison to the 2012 Update. Also presented are the estimated Customer Service Center revenues which were prepared based on historical data provided by TxDOT. The estimated monthly transactions and revenue for FY 2015 are also provided for use in the CTTS quarterly and annual reports.

The final sections of this chapter discuss the general forecast assumptions and the disclaimers associated with these forecasts.

8.1 SH 45 N AND LOOP 1

SH 45 N and Loop 1 are integrated toll roads since they intersect and many vehicles use both roads for the same trip. As such, the model-produced traffic on these roadways was reviewed and analyzed together, rather than as separate elements, in order to develop the transaction and revenue forecasts for SH 45 N and Loop 1.

The toll diversion model produces traffic estimates for several model years including: 2015, 2020, 2030, and 2040. The initial model forecasts for SH 45 N and Loop 1 have been adjusted by post-processing to account for variations in the base year model calibration estimates and other minor variations in future trends. Specifically, adjustments were made to appropriately reflect the impacts of the recently constructed O'Connor Drive ramps which only just opened to traffic on August 21, 2014. Gross revenue estimates were then prepared by multiplying the traffic, in terms of transactions, at the toll locations by the effective toll structure by vehicle type and payment type for each year. Adjustments were also included to reflect the effective collection rates for both ETC and PBM transactions. Annual estimates of transactions and revenue for both SH 45 N and Loop 1 were generated using an annualization factor of 320.

8.1.1 SH 45 N and Loop 1 Schematic Traffic Diagrams

The schematic diagrams shown in Figure 8.1 through Figure 8.5 below show average weekday traffic along the individual segments of SH 45 N and Loop 1 for the model (calendar) years 2013, 2015, 2020, 2030, and 2040. These diagrams represent the unadjusted model outputs and are intended to provide the reader a sense of the scale of the traffic volumes across the entire facility as well as the entry/exit points. An approximation of the estimated growth for various segments of the roadway can be determined by reviewing these diagrams across the individual horizon years. The O'Connor Drive toll ramps, which have only recently opened on August 21, 2014, are first shown in the 2015 schematic in Figure 8.2.

Figure 8.1 SH 45 N and Loop 1 Average Weekday Traffic – 2013 Model Calibration Year

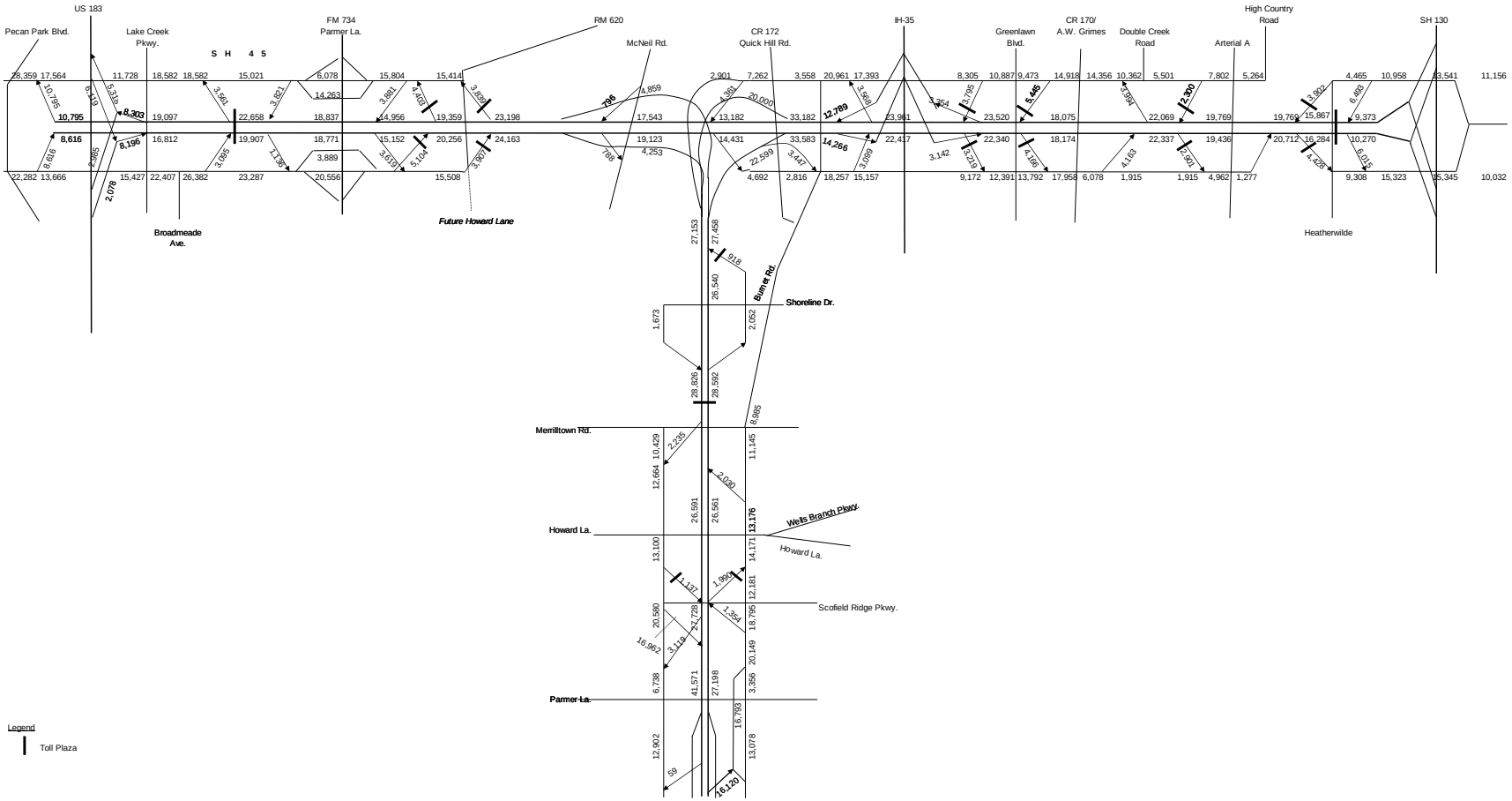


Figure 8.2 SH 45 N and Loop 1 Average Weekday Traffic – 2015 Model Year

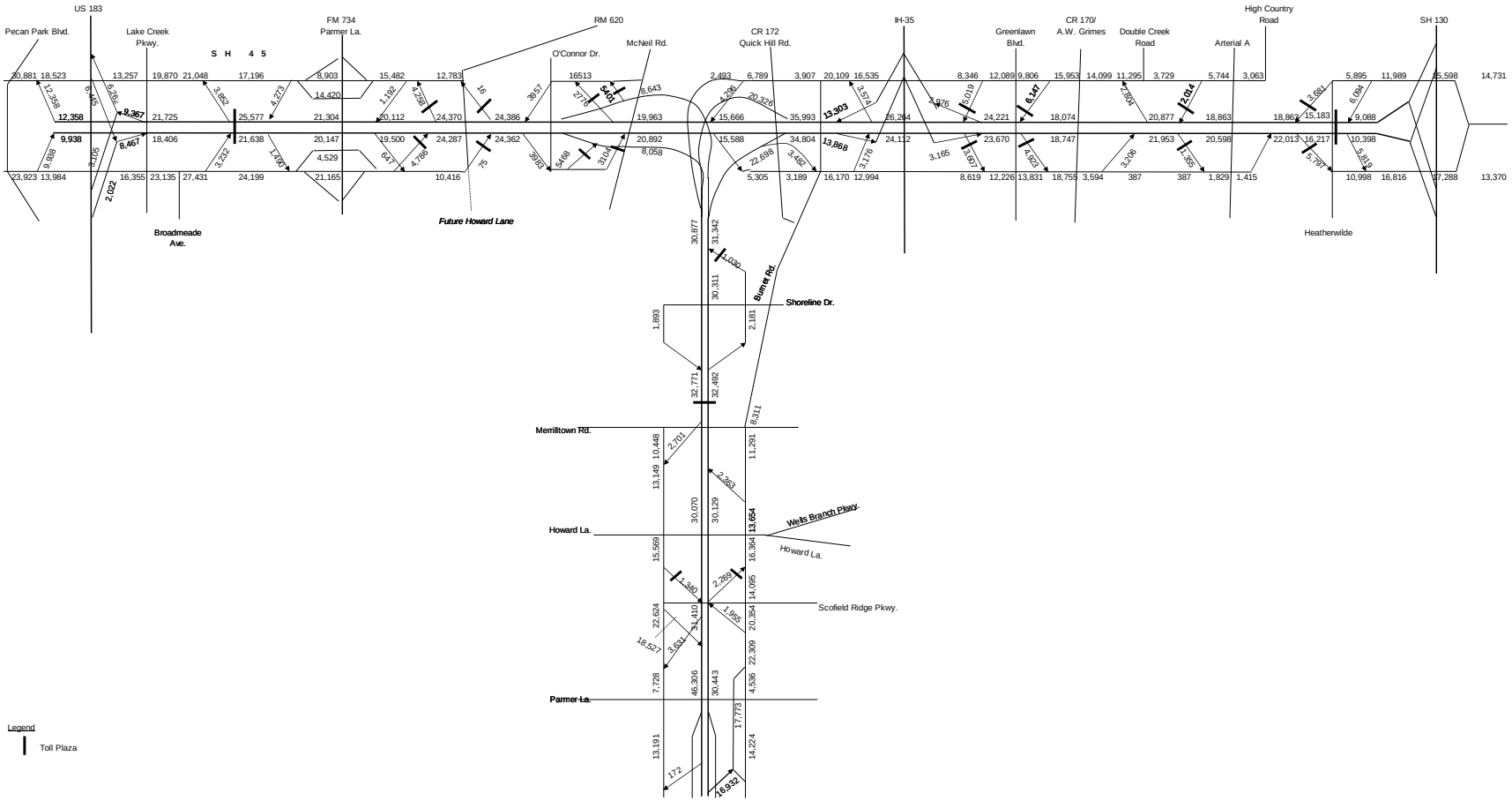


Figure 8.3 SH 45 N and Loop 1 Average Weekday Traffic – 2020 Model Year

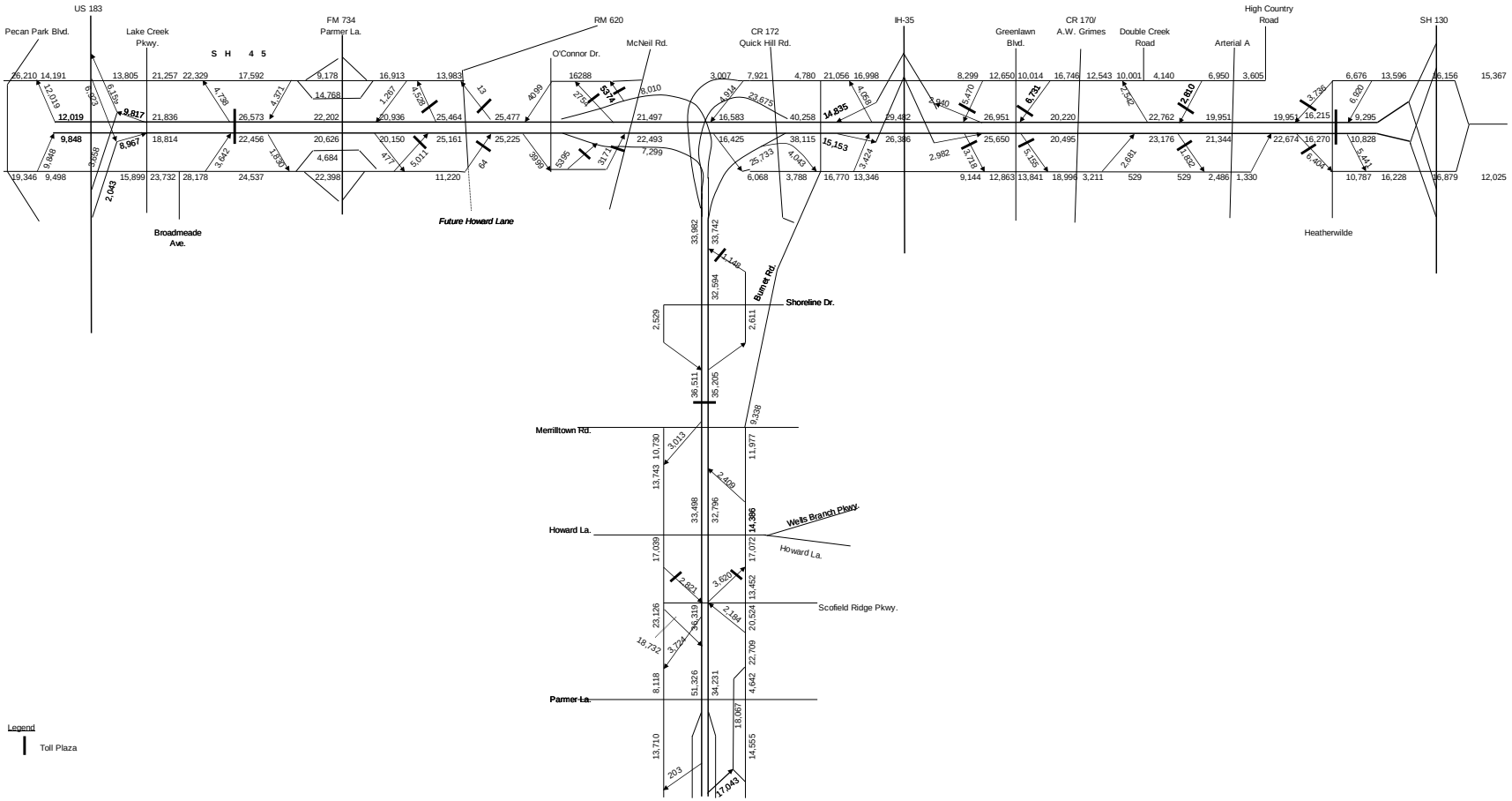


Figure 8.4 SH 45 N and Loop 1 Average Weekday Traffic – 2030 Model Year

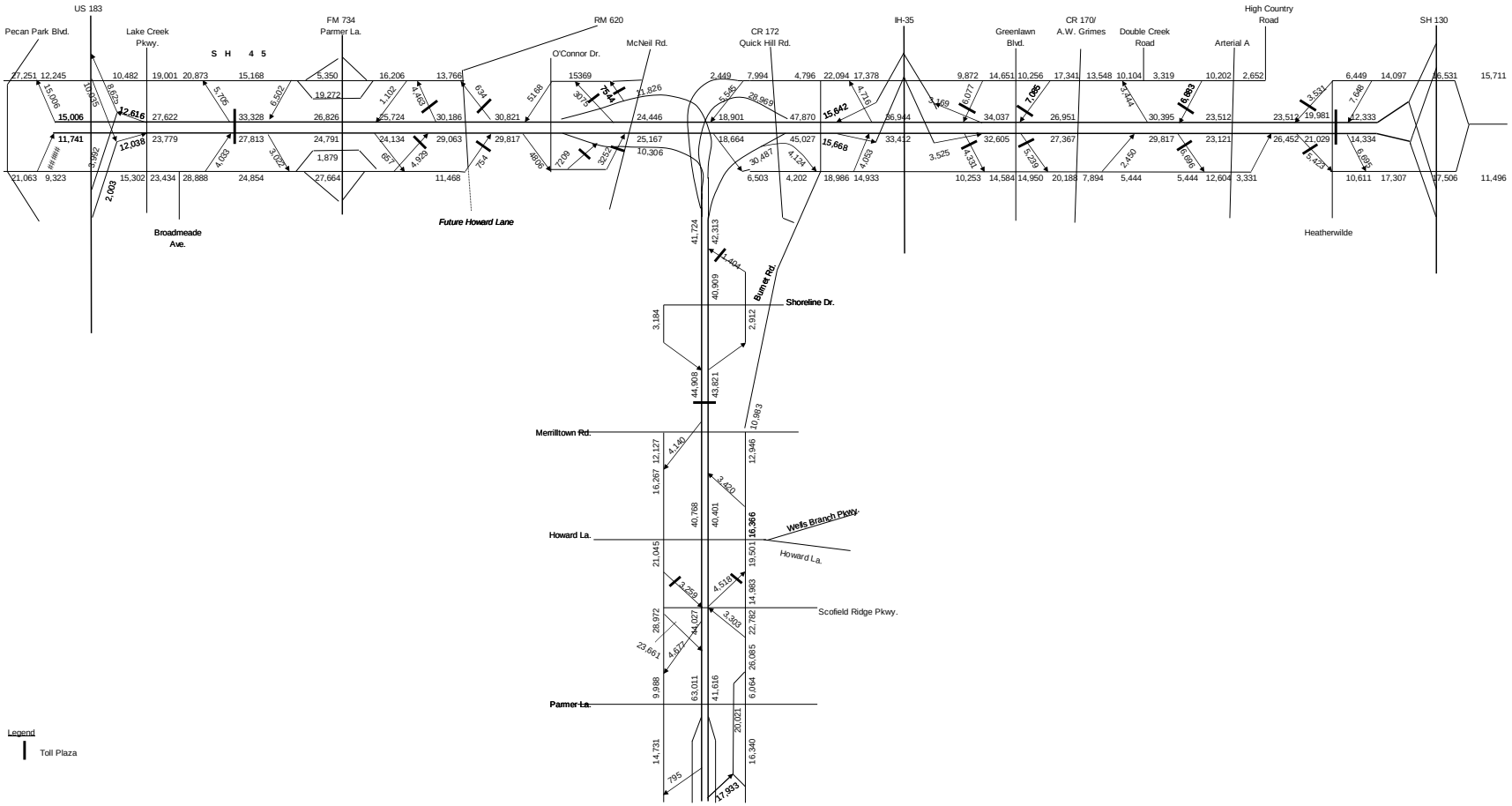
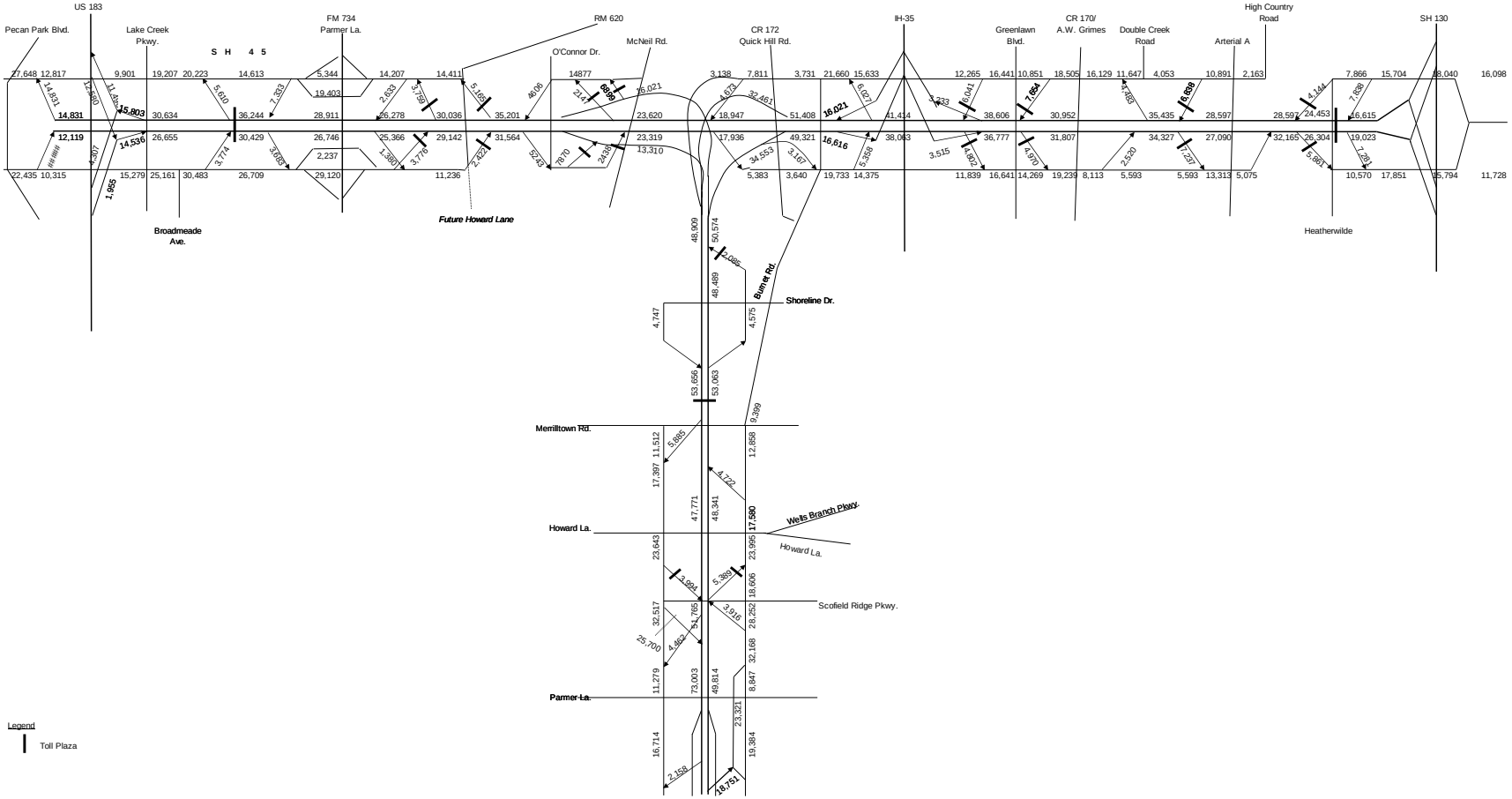


Figure 8.5 SH 45 N and Loop 1 Average Weekday Traffic – 2040 Model Year



8.1.2 SH 45 N and Loop 1 Screenline Analysis

As discussed previously in Chapter 7, a series of screenlines were developed within each of the toll road corridors to intersect each of the mainline toll plazas and parallel locations on the adjacent non-tolled roads. Four screenlines were created for SH 130, two for SH 45 N, one for Loop 1, and one for SH 45 SE. These eight screenlines were used during the model validation process, but also provide insight to how each CTTS element's share of screenline traffic changes throughout the forecast period. The location of these screenlines is shown in Figure 8.6.

As shown in Table 8.1, Screenline 45N-A crosses SH 45 N at its western toll plaza and has a total screenline volume of approximately 218,000 in 2013 and grows to approximately 362,000 in 2040, or about 1.9 percent annually. SH 45 N maintains a fairly constant share of this screenline with 19.5 percent in 2013 and 18.4 percent in 2040. When New Hope Drive opens by 2020, it draws 11 percent of the total screenline traffic off of the other roadways, including about 2 percent from SH 45 N. Another primary non toll road competitor is FM 1431. FM 1431 also sees a drop in screenline share in 2020 with the opening of New Hope Drive, but later increases its share due to a roadway expansion in 2040. Additional capacity improvements to Parmer Lane in 2020, a feeder to Avery Ranch Boulevard, and to Lakeline Boulevard in 2030 also impact the screenline distribution throughout the forecast.

As shown in Table 8.2, Screenline 45N-B crosses SH 45 N at its eastern toll plaza and carries much less traffic than the western end. In 2013, the total screenline traffic was approximately 157,000 and grows to approximately 270,000 in 2040, or about 2.0 percent compounded annually. SH 45 North's share of this screenline is currently the highest with 20.5 percent in 2013. The share of traffic then declines to 16.8 percent in 2020, then grows back to 18.8 percent by 2040. The drop in screenline share in 2020 is due to capacity improvements on or near Gattis School Road, Pflugerville Loop Road, and Howard Lane.

Figure 8.6 CTTS Facility Screenline Locations

Table 8.1 Screenline 45N-A Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
New Hope Drive	NA		NA		29,228	11.0%	35,114	11.0%	35,865	9.9%
FM 1431	41,431	19.0%	41,797	18.0%	29,899	11.3%	30,231	9.5%	45,057	12.4%
Colonial Parkway	6,323	2.9%	7,094	3.0%	7,479	2.8%	9,836	3.1%	11,511	3.2%
Brushy Creek Rd.	13,383	6.1%	15,400	6.6%	14,900	5.6%	23,025	7.2%	26,529	7.3%
Avery Ranch Blvd.	20,458	9.4%	20,490	8.8%	28,391	10.7%	31,245	9.8%	32,267	8.9%
Lakeline Blvd.	11,739	5.4%	12,930	5.6%	14,112	5.3%	29,294	9.2%	33,217	9.2%
SH 45 NW ML	**42,565**	**19.5%**	**47,215**	**20.3%**	**49,029**	**18.5%**	**61,140**	**19.2%**	**66,673**	**18.4%**
SH 45 NW Frontage	34,441	15.8%	36,870	15.8%	38,160	14.4%	39,811	12.5%	40,049	11.1%
Anderson Mill Rd.	19,675	9.0%	21,896	9.4%	23,635	8.9%	27,727	8.7%	30,941	8.5%
McNeil Dr.	27,925	12.8%	29,126	12.5%	30,461	11.5%	31,198	9.8%	39,890	11.0%
TOTAL	**217,940**	**100.0%**	**232,819**	**100.0%**	**265,293**	**100.0%**	**318,622**	**100.0%**	**361,999**	**100.0%**

Table 8.2 Screenline 45N-B Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
US 79	27,119	17.3%	29,388	17.6%	34,271	17.7%	42,237	17.8%	47,089	17.4%
CR 168/Gattis School Rd.	17,531	11.2%	25,590	15.3%	31,574	16.3%	33,163	14.0%	35,543	13.2%
SH 45 NE ML	**32,151**	**20.5%**	**31,399**	**18.8%**	**32,484**	**16.8%**	**41,010**	**17.3%**	**50,758**	**18.8%**
SH 45 NE Frontage	10,713	6.8%	15,146	9.1%	16,986	8.8%	16,723	7.0%	19,539	7.2%
Pflugerville Loop Rd.	13,751	8.8%	15,923	9.5%	19,916	10.3%	27,290	11.5%	31,483	11.7%
FM 1825/Pecan St.	21,733	13.8%	22,238	13.3%	21,669	11.2%	24,400	10.3%	26,850	9.9%
Wells Branch Pkwy	13,961	8.9%	12,615	7.5%	15,082	7.8%	25,187	10.6%	31,641	11.7%
Howard Lane	20,042	12.8%	14,973	9.0%	21,439	11.1%	27,283	11.5%	27,114	10.0%
TOTAL	**157,000**	**100.0%**	**167,271**	**100.0%**	**193,423**	**100.0%**	**237,293**	**100.0%**	**270,017**	**100.0%**

As shown in Table 8.3, Screenline Loop 1-A crosses Loop 1 at the mainline plaza south of McNeil Drive as well as other major roadways including US 183, I-35, and SH 130 with total traffic of approximately 565,000 in 2013 and growing at 1.6 percent annually to approximately 868,000 in 2040. IH-35 and US 183 have the highest share of traffic of about 30 percent each in 2013, then decreasing to 28.1 and 23.1 percent, respectively, in 2020 with the opening of the US 183 Express Lanes. Loop 1's traffic share of this screenline is nearly constant through 2020, most likely because the impact of the competing US 183 Express Lanes is offset by the opening of the MoPac Express Lanes by 2020, a feeder to Loop 1. Loop 1's share of traffic then gradually increases from 10.6 in 2020 to 12.3 in 2040. SH 130 also experiences similar growth across the forecast period at this screenline.

Table 8.3 Screenline Loop 1-A Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
US 183	167,247	29.6%	180,423	29.5%	156,075	23.1%	167,586	21.4%	194,707	22.4%
US 183 Express Lanes	NA		NA		50,511	7.5%	62,623	8.0%	64,391	7.4%
Parmer Lane	42,157	7.5%	41,473	6.8%	42,280	6.3%	47,255	6.0%	49,376	5.7%
Howard Lane	15,384	2.7%	20,872	3.4%	23,088	3.4%	28,750	3.7%	24,345	2.8%
FM 1325/Loop 1 SR	21,574	3.8%	21,739	3.5%	22,708	3.4%	25,074	3.2%	24,370	2.8%
Loop 1 Mainline Plaza	**57,418**	**10.2%**	**65,263**	**10.7%**	**71,715**	**10.6%**	**88,729**	**11.3%**	**106,719**	**12.3%**
Bratton Lane	8,334	1.5%	11,908	1.9%	12,808	1.9%	14,471	1.9%	10,754	1.2%
IH 35	171,259	30.3%	178,889	29.2%	189,809	28.1%	217,244	27.8%	241,785	27.8%
Heatherwilde	16,388	2.9%	18,975	3.1%	30,734	4.6%	34,781	4.4%	40,260	4.6%
N Railroad Rd	6,733	1.2%	7,338	1.2%	8,328	1.2%	9,676	1.2%	11,727	1.4%
FM 685	25,200	4.5%	27,514	4.5%	27,545	4.1%	35,391	4.5%	37,012	4.3%
SH 130	33,479	5.9%	38,104	6.2%	38,801	5.8%	50,194	6.4%	62,723	7.2%
TOTAL	**565,173**	**100.0%**	**612,498**	**100.0%**	**674,401**	**100.0%**	**781,773**	**100.0%**	**868,171**	**100.0%**

8.1.3 SH 45 N and Loop 1 Traffic and Revenue Assumptions

Table 8.4 and Table 8.5 provide concise summaries of the underlying assumptions in the transaction and revenue forecasts for SH 45 N and Loop 1, respectively. All truck-related values in the table relate to trucks defined as 3+axle vehicles, consistent with the transaction reports generated for each toll road by TxDOT. On both roadways, estimated truck transactions increase from approximately 3.8 percent in 2015 to 6.0 percent in 2040. While auto ETC payment shares are assumed to gradually increase, truck ETC share are assumed to remain relatively constant. The average truck toll multiplier is approximately 2.75 times the auto rate, which reflects the observed distribution of trucks by axle group. The PBM toll surcharge is assumed to remain at 33 percent of the ETC rate. The collection rates for PBM and ETC transactions reflect the latest available collection data provided by TxDOT and are held constant over the forecast period.

A full length trip using ETC on SH 45 N will cost $2.12 in 2015, and by 2040, the toll for the same trip increases to $4.22. The per mile rate for the 12.8 mile full length trip is $0.17 in 2015, increasing to $0.33 in 2040. On Loop 1, a full length trip would cost $1.06 in 2015 for ETC transactions, but will increase to $2.11 in 2040. The toll rate on Loop 1 for a full length trip of four miles is $0.26 in 2015 and will increase to $0.53 in 2040.

Table 8.4 SH 45 N Tolling and Traffic Characteristic Assumptions by Model Year

Model Year	2015	2020	2030	2040
Vehicle Type Distribution				
Autos	96.2%	95.4%	94.5%	94.0%
Trucks	3.8%	4.6%	5.5%	6.0%
Payment Type Distribution - Passenger Cars				
PBM	21.3%	18.0%	18.7%	18.6%
ETC	78.7%	82.0%	81.3%	81.4%
Payment Type Distribution - Trucks				
PBM	21.2%	21.2%	21.2%	21.2%
ETC	78.8%	78.8%	78.8%	78.8%
Toll Ratios				
Truck/Auto Ratio	2.75	2.75	2.75	2.75
PBM/ETC Toll Rate	1.33	1.33	1.33	1.33
Collection Rates				
PBM	47.7%	47.7%	47.7%	47.7%
ETC	99.7%	99.7%	99.7%	99.7%
Full Length Trip				
Distance	12.8	12.8	12.8	12.8
Rate per Mile	$0.17	$0.18	$0.25	$0.33
Toll Cost (ETC)	$2.12	$2.36	$3.14	$4.22
Annualization Factor	320	320	320	320

Table 8.5 Loop 1 Tolling and Traffic Characteristic Assumptions by Model Year

Model Year	2015	2020	2030	2040
Vehicle Type Distribution				
Autos	96.2%	95.4%	94.5%	94.0%
Trucks	3.8%	4.6%	5.5%	6.0%
Payment Type Distribution - Passenger Cars				
PBM	22.4%	17.2%	17.9%	17.8%
ETC	77.6%	82.8%	82.1%	82.2%
Payment Type Distribution - Trucks				
PBM	24.5%	24.5%	24.5%	24.5%
ETC	75.5%	75.5%	75.5%	75.5%
Toll Ratios				
Truck/Auto Ratio	2.75	2.75	2.75	2.75
PBM/ETC Toll Rate	1.33	1.33	1.33	1.33
Collection Rates				
PBM	47.7%	47.7%	47.7%	47.7%
ETC	99.7%	99.7%	99.7%	99.7%
Full Length Trip				
Distance	4.0	4.0	4.0	4.0
Rate per Mile	$0.27	$0.30	$0.39	$0.53
Toll Cost (ETC)	$1.06	$1.18	$1.57	$2.11
Annualization Factor	320	320	320	320

8.1.4 SH 45 N and Loop1 Transactions and Revenue by Paypoint

The SH 45 N and Loop 1 transaction and revenue statistics by paypoint and horizon year are listed in Table 8.6. Both total and paying transactions are provided, where paying transactions reflect the assumptions for collection efficiency for each payment type discussed above. The average toll rates represent a blend of the individual rates by payment type and vehicle type. These blended values include a 33 percent surcharge over the ETC rates for PBM patrons. The values shown are calendar year values, rather than the blended estimates created for each fiscal year shown in the next section.

Total transactions on SH 45 N range from 122,000 in 2013 to 201,000 in 2040 for an average weekday, representing an average annual growth rate of 1.9 percent. During the same time period, average weekday revenues range from $113,000 to $405,000, for a growth rate of 4.8 percent, representing transaction growth as well as annual toll rate escalation.

Loop 1 total transactions range from 61,000 in 2013 to 127,000 in 2040, representing an average annual growth rate of 2.7 percent. During the same timeframe, average weekday revenue range from $59,000 to $260,000 for a growth rate of 5.6 percent.

Table 8.6 SH 45 N and Loop 1 Average Weekday Transactions and Toll Revenue (Adjusted for Calibration)

Toll Location	2013				2015				2020				2030				2040			
	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue
	Total	Paying			Total	Paying			Total	Paying			Total	Paying			Total	Paying		
SH 45 N																				
Lake Creek ML Plaza	**42,565**	**38,308**	**$1.11**	**$42,438**	**49,183**	**43,598**	**$1.17**	**$51,141**	**51,073**	**46,108**	**$1.31**	**$60,581**	**63,689**	**57,263**	**$1.78**	**$101,797**	**69,453**	**62,458**	**$2.40**	**$150,170**
Parmer/FM 734	9,507	8,556	$0.96	$8,178	9,210	8,164	$1.01	$8,221	9,714	8,770	$1.12	$9,862	9,564	8,599	$1.52	$13,047	7,672	6,900	$2.05	$14,152
RM 620 (Howard Ln)	7,746	6,971	$0.96	$6,663	3,120	2,765	$1.01	$2,785	3,271	2,953	$1.12	$3,321	4,571	4,110	$1.52	$6,235	10,571	9,506	$2.05	$19,498
SH 45 N - O'Connor Dr					2,258	2,002	$1.03	$2,060	2,276	2,054	$1.16	$2,379	2,430	2,185	$1.55	$3,389	1,761	1,584	$2.10	$3,320
Loop 1 - O'Connor Dr					5,935	5,262	$1.03	$5,415	5,881	5,309	$1.16	$6,148	8,057	7,244	$1.55	$11,238	8,066	7,253	$2.10	$15,208
Greenlawn	7,013	6,312	$0.74	$4,662	7,970	7,065	$0.77	$5,473	8,489	7,664	$0.88	$6,742	9,616	8,646	$1.18	$10,181	10,017	9,008	$1.60	$14,371
AW Grimes (CR 170)	9,611	8,650	$0.74	$6,388	10,814	9,586	$0.77	$7,425	11,611	10,482	$0.88	$9,220	12,038	10,824	$1.18	$12,746	12,331	11,089	$1.60	$17,691
Schultz Ln (Arterial A)	5,202	4,681	$1.11	$5,186	2,858	2,534	$1.17	$2,972	3,939	3,556	$1.31	$4,672	11,521	10,358	$1.78	$18,414	11,941	10,739	$2.40	$25,820
Heatherwilde Ramps	8,331	7,497	$1.11	$8,306	9,804	8,691	$1.17	$10,194	10,490	9,470	$1.31	$12,443	9,262	8,328	$1.78	$14,804	10,350	9,307	$2.40	$22,378
Heatherwilde ML Plaza	**32,151**	**28,935**	**$1.11**	**$32,055**	**36,161**	**32,055**	**$1.17**	**$37,600**	**37,411**	**33,774**	**$1.31**	**$44,375**	**47,229**	**42,464**	**$1.78**	**$75,489**	**58,455**	**52,568**	**$2.40**	**$126,391**
SH 45 N Subtotal	**122,125**	**109,911**		**$113,875**	**137,313**	**121,721**		**$133,286**	**144,154**	**130,141**		**$159,743**	**177,977**	**160,020**		**$267,341**	**200,617**	**180,412**		**$409,000**
Annual Revenue in millions				**$36.4**				**$42.7**				**$51.1**				**$85.5**				**$130.9**
Loop 1																				
Shoreline Dr	918	818	$0.74	$606	1,008	887	$0.78	$688	1,123	1,017	$0.88	$893	1,373	1,239	$1.17	$1,455	2,039	1,840	$1.59	$2,928
Merrilltown ML Plaza	**57,418**	**51,169**	**$1.11**	**$56,849**	**67,079**	**59,037**	**$1.18**	**$69,376**	**73,711**	**66,780**	**$1.31**	**$87,541**	**91,198**	**82,253**	**$1.77**	**$145,877**	**109,689**	**98,966**	**$2.40**	**$237,350**
Howard/Wells Branch	3,127	2,787	$0.74	$2,064	5,968	5,252	$0.78	$4,076	10,652	9,650	$0.88	$8,469	12,862	11,600	$1.17	$13,628	15,517	14,000	$1.59	$22,278
Loop 1 Subtotal	**61,463**	**54,774**		**$59,519**	**74,054**	**65,175**		**$74,140**	**85,486**	**77,448**		**$96,902**	**105,433**	**95,092**		**$160,960**	**127,245**	**114,806**		**$262,556**
Annual Revenue in millions				**$19.0**				**$23.7**				**$31.0**				**$51.5**				**$84.0**
TOTAL (SH 45 N and Loop 1)																				
Total	**183,587**	**164,685**		**$173,395**	**211,366**	**186,896**		**$207,427**	**229,640**	**207,588**		**$256,646**	**283,410**	**255,112**		**$428,301**	**327,862**	**295,218**		**$671,555**
Annual Revenue in millions				**$55.5**				**$66.4**				**$82.1**				**$137.1**				**$214.9**

Note: The average toll is calculated by Revenue divided by Paying Transactions.

8.1.5 SH 45 N and Loop 1 Traffic and Revenue Forecasts

Table 8.7 and Table 8.8 provide the forecasted transactions and revenue for the entire 35-year forecast period on a fiscal year basis for SH 45 N and Loop 1, respectively. Average Weekday Traffic (AWT) statistics are provided on the left side of the table, and annual values are provided on the right side along with statistics related to truck traffic. The values for FY 2008 to FY 2014 are the observed transactions and reported revenue for the first seven years of operation. While TxDOT reports transactions in the fiscal year in which they occur, annual revenue is based on the fiscal year in which it is collected. The revenue collected in each fiscal year varies due to the delay in receipt of PBM tolls, the collection efficiency of the PBM transactions as well as other adjustments implemented by TxDOT. In contrast, the model forecasts assume that transactions and revenue occur simultaneously and therefore do not reflect the lagging pattern of receiving PBM toll revenue.

As shown in Table 8.7, SH 45 N shows an initially high transaction growth of 16.5 percent and revenue growth of 20.4 percent in FY 2015 due to the recent opening of the O'Connor Drive ramps in mid-August 2014. For the rest of the forecast period, the road shows steady transaction growth between 1.0 and 2.1 percent for most years which is consistent with the more recently slowing growth in FY 2014 of 2.8 percent. SH 45 N also shows steady revenue growth throughout the forecast between 3.7 and 5.3 percent. The assumed share of paying transactions is relatively constant at approximately 90 percent, as is the combined ETC share (autos and trucks) at approximately 81 percent. Trucks are approximately 3.6 percent of transactions in FY 2015 but increase to 5.9 percent over the forecast period. Truck revenue increases from 9.4 percent of the total revenue to 14.7 percent by FY 2042.

As shown in Table 8.8, and similar to SH 45 N, the recent opening of the O'Connor Drive ramps had an impact on Loop 1 as well. In FY 2015, Loop 1 shows an initially high transaction growth of 17.6 percent and revenue growth of 24.6 percent. For the rest of the forecast period, the road shows steady transaction growth between 1.9 and 2.9 percent for most years. Loop 1 also shows steady revenue growth throughout the forecast between 5.0 and 5.5 percent. The combined ETC share increases slightly from 77.5 in FY 2015 to 81.8 percent in 2042. The assumed share of paying transactions is relatively constant at approximately 90 percent. Trucks are approximately 3.6 percent of transactions in FY 2015 but increase to 5.7 percent over the forecast period. Truck revenue increases from 9.4 percent of the total revenue to 14.5 percent by FY 2042.

Table 8.7 SH 45 N Transaction and Revenue Forecasts

Fiscal Year	Average Weekday Transactions (AWT)					Annual Transactions & Revenue					
										3+ Axle Truck Percentage	
	Total Transactions	YOY Growth	Total Transactions ETC Share	Paying Transactions	Paying Percentage	Annual Total Transactions (in 000s)	Annual Paying Transactions (in 000s)	Annual Revenue (in $000s)	YOY Growth	Paying Transactions	Revenue
2008	***91,057***			*84,058*	*92%*	***29,458***	*27,194*	*$17,987*			
2009	***96,071***	***5.5%***	***77.0%***	*88,687*	*92%*	***31,270***	*28,866*	*$19,882*	***10.5%***		
2010	***98,446***	***2.5%***	***77.8%***	*90,879*	*92%*	***32,167***	*29,694*	***$19,799***	***-0.4%***		
2011	***102,344***	***4.0%***	***75.5%***	*94,478*	*92%*	***33,543***	*30,965*	***$20,268***	***2.4%***		
2012	***109,179***	***6.7%***	***75.9%***	*100,302*	*92%*	***35,790***	*32,880*	***$21,945***	***8.3%***		
2013	***113,674***	***4.1%***	***77.6%***	*100,665*	*89%*	***37,126***	*32,878*	***$29,075***	***32.5%***		
2014	***116,802***	***2.8%***	***75.6%***	*101,640*	*87%*	***38,256***	*33,290*	***$34,831***	***19.8%***		
2015	136,047	16.5%	78.7%	120,606	89%	43,535	38,594	$41,922	20.4%	3.6%	9.4%
2016	138,207	1.6%	79.2%	122,816	89%	44,226	39,301	$43,700	4.2%	3.9%	10.0%
2017	139,558	1.0%	79.8%	124,472	89%	44,658	39,831	$45,312	3.7%	4.0%	10.4%
2018	140,921	1.0%	80.4%	126,149	90%	45,095	40,368	$46,983	3.7%	4.2%	10.7%
2019	142,298	1.0%	81.0%	127,847	90%	45,535	40,911	$48,715	3.7%	4.3%	11.1%
2020	143,689	1.0%	81.7%	129,566	90%	45,980	41,461	$50,512	3.7%	4.5%	11.4%
2021	146,201	1.7%	81.8%	131,953	90%	46,784	42,225	$52,919	4.8%	4.6%	11.7%
2022	149,315	2.1%	81.8%	134,708	90%	47,781	43,107	$55,715	5.3%	4.7%	11.9%
2023	152,496	2.1%	81.7%	137,522	90%	48,799	44,007	$58,659	5.3%	4.8%	12.2%
2024	155,744	2.1%	81.6%	140,393	90%	49,838	44,926	$61,759	5.3%	4.9%	12.4%
2025	159,062	2.1%	81.6%	143,325	90%	50,900	45,864	$65,023	5.3%	5.0%	12.6%
2026	162,450	2.1%	81.5%	146,318	90%	51,984	46,822	$68,459	5.3%	5.1%	12.8%
2027	165,910	2.1%	81.4%	149,374	90%	53,091	47,800	$72,077	5.3%	5.2%	13.0%
2028	169,444	2.1%	81.3%	152,493	90%	54,222	48,798	$75,886	5.3%	5.2%	13.3%
2029	173,054	2.1%	81.3%	155,678	90%	55,377	49,817	$79,896	5.3%	5.3%	13.5%
2030	176,740	2.1%	81.2%	158,929	90%	56,557	50,857	$84,118	5.3%	5.4%	13.7%
2031	179,406	1.5%	81.2%	161,307	90%	57,410	51,618	$88,026	4.6%	5.5%	13.8%
2032	181,568	1.2%	81.2%	163,254	90%	58,102	52,241	$91,850	4.3%	5.5%	13.9%
2033	183,755	1.2%	81.2%	165,224	90%	58,802	52,872	$95,839	4.3%	5.6%	14.0%
2034	185,968	1.2%	81.2%	167,217	90%	59,510	53,510	$100,002	4.3%	5.6%	14.1%
2035	188,208	1.2%	81.2%	169,235	90%	60,227	54,155	$104,346	4.3%	5.7%	14.2%
2036	190,476	1.2%	81.2%	171,277	90%	60,952	54,809	$108,878	4.3%	5.7%	14.3%
2037	192,770	1.2%	81.2%	173,344	90%	61,686	55,470	$113,608	4.3%	5.7%	14.4%
2038	195,092	1.2%	81.2%	175,436	90%	62,430	56,139	$118,542	4.3%	5.8%	14.5%
2039	197,442	1.2%	81.2%	177,553	90%	63,182	56,817	$123,691	4.3%	5.8%	14.6%
2040	199,821	1.2%	81.2%	179,695	90%	63,943	57,502	$129,064	4.3%	5.9%	14.7%
2041	202,222	1.2%	81.2%	181,856	90%	64,711	58,194	$134,664	4.3%	5.9%	14.7%
2042	204,648	1.2%	81.2%	184,038	90%	65,488	58,892	$140,505	4.3%	5.9%	14.7%

Revenue for PBM patrons was not allocated by each toll facility until September 2009; therefore, annual revenues shown for FY 2008 - FY 2009 are estimated.

Actual Average Weekday Transactions and Annual Revenue

Table 8.8 Loop 1 Transaction and Revenue Forecasts

Fiscal Year	Average Weekday Transactions (AWT)					Annual Transactions & Revenue					
										3+ Axle Truck Percentage	
	Total Transactions	YOY Growth	Total Transactions ETC Share	Paying Transactions	Paying Percentage	Annual Total Transactions (in 000s)	Annual Paying Transactions (in 000s)	Annual Revenue (in $000s)	YOY Growth	Paying Transactions	Revenue
2008	***54,770***			*50,560*	*92%*	***17,195***	*15,873*	*$11,463*			
2009	***55,106***	***0.6%***	***78.0%***	*50,871*	*92%*	***17,381***	*16,045*	*$11,918*	***4.0%***		
2010	***56,900***	***3.3%***	***78.0%***	*52,527*	*92%*	***18,064***	*16,676*	***$11,937***	***0.2%***		
2011	***59,132***	***3.9%***	***76.4%***	*54,587*	*92%*	***18,883***	*17,432*	***$12,317***	***3.2%***		
2012	***62,275***	***5.3%***	***76.2%***	*57,291*	*92%*	***19,890***	*18,298*	***$13,015***	***5.7%***		
2013	***61,885***	***-0.6%***	***78.4%***	*55,032*	*89%*	***19,715***	*17,532*	***$16,143***	***24.0%***		
2014	***61,894***	***0.0%***	***76.4%***	*54,116*	*87%*	***19,839***	*17,346*	***$18,560***	***15.0%***		
2015	72,784	17.6%	77.5%	64,037	88%	23,291	20,492	$23,123	24.6%	3.6%	9.4%
2016	75,492	3.7%	78.2%	66,704	88%	24,157	21,345	$24,595	6.4%	3.8%	9.9%
2017	77,691	2.9%	79.2%	69,049	89%	24,861	22,096	$25,948	5.5%	4.0%	10.3%
2018	79,954	2.9%	80.2%	71,473	89%	25,585	22,871	$27,375	5.5%	4.1%	10.6%
2019	82,283	2.9%	81.2%	73,981	90%	26,330	23,674	$28,881	5.5%	4.2%	10.9%
2020	84,679	2.9%	82.2%	76,574	90%	27,097	24,504	$30,470	5.5%	4.4%	11.3%
2021	86,694	2.4%	82.4%	78,518	91%	27,742	25,126	$32,085	5.3%	4.5%	11.5%
2022	88,531	2.1%	82.4%	80,147	91%	28,330	25,647	$33,755	5.2%	4.6%	11.8%
2023	90,407	2.1%	82.3%	81,809	90%	28,930	26,179	$35,512	5.2%	4.7%	12.0%
2024	92,323	2.1%	82.2%	83,505	90%	29,543	26,722	$37,361	5.2%	4.7%	12.2%
2025	94,280	2.1%	82.1%	85,237	90%	30,170	27,276	$39,306	5.2%	4.8%	12.4%
2026	96,278	2.1%	82.1%	87,004	90%	30,809	27,841	$41,352	5.2%	4.9%	12.6%
2027	98,319	2.1%	82.0%	88,808	90%	31,462	28,419	$43,504	5.2%	5.0%	12.9%
2028	100,403	2.1%	81.9%	90,650	90%	32,129	29,008	$45,769	5.2%	5.1%	13.1%
2029	102,531	2.1%	81.8%	92,529	90%	32,810	29,609	$48,151	5.2%	5.2%	13.3%
2030	104,704	2.1%	81.7%	94,448	90%	33,505	30,223	$50,658	5.2%	5.3%	13.5%
2031	106,767	2.0%	81.7%	96,298	90%	34,166	30,815	$53,229	5.1%	5.4%	13.7%
2032	108,794	1.9%	81.7%	98,129	90%	34,814	31,401	$55,898	5.0%	5.4%	13.7%
2033	110,859	1.9%	81.7%	99,995	90%	35,475	31,999	$58,702	5.0%	5.5%	13.8%
2034	112,963	1.9%	81.7%	101,897	90%	36,148	32,607	$61,645	5.0%	5.5%	13.9%
2035	115,108	1.9%	81.7%	103,835	90%	36,834	33,227	$64,737	5.0%	5.5%	14.0%
2036	117,293	1.9%	81.8%	105,810	90%	37,534	33,859	$67,983	5.0%	5.6%	14.1%
2037	119,519	1.9%	81.8%	107,822	90%	38,246	34,503	$71,392	5.0%	5.6%	14.2%
2038	121,788	1.9%	81.8%	109,873	90%	38,972	35,159	$74,973	5.0%	5.6%	14.3%
2039	124,100	1.9%	81.8%	111,962	90%	39,712	35,828	$78,732	5.0%	5.7%	14.4%
2040	126,455	1.9%	81.8%	114,092	90%	40,466	36,509	$82,680	5.0%	5.7%	14.5%
2041	128,857	1.9%	81.8%	116,260	90%	41,234	37,203	$86,851	5.0%	5.7%	14.5%
2042	131,305	1.9%	81.8%	118,469	90%	42,018	37,910	$91,245	5.1%	5.7%	14.5%

Revenue for PBM patrons was not allocated by each toll facility until September 2009; therefore, annual revenues shown for FY 2008 - FY 2009 are estimated.

Actual Average Weekday Transactions and Annual Revenue

8.2 SH 130

As noted in the discussion of SH 45 N and Loop 1, the toll diversion model produces traffic estimates for several model years including: 2015, 2020, 2030, and 2040. The initial model forecasts for the SH 130 have been adjusted by post-processing to account for variations in the base year model calibration estimates and other minor variations in future trends. The model forecasts were also adjusted to transition from the current high levels of annual growth observed in recent years to a more logical trend of future growth predicted by the model. Gross revenue estimates were then prepared by multiplying the traffic, in terms of transactions, at the toll locations by the effective toll structure by vehicle type and payment type for each year. Adjustments were included to reflect the effective collection rates for both ETC and PBM transactions. Annual estimates of transactions and revenue for SH 130 were generated using an annualization factor of 330.

8.2.1 SH 130 Schematic Traffic Diagrams

Figure 8.7 through Figure 8.11 display the traffic along the individual segments of SH 130 for the model (calendar) years 2013, 2015, 2020, 2030, and 2040. These diagrams represent the unadjusted model outputs for average weekday transactions and are intended to provide the reader a sense of the scale of the traffic volumes across the entire facility as well as the entry/exit points. An approximation of the estimated growth for various segments of the roadway can be determined by reviewing these diagrams across the individual horizon years.

Figure 8.7 SH 130 Average Weekday Traffic – 2013 Model Calibration Year

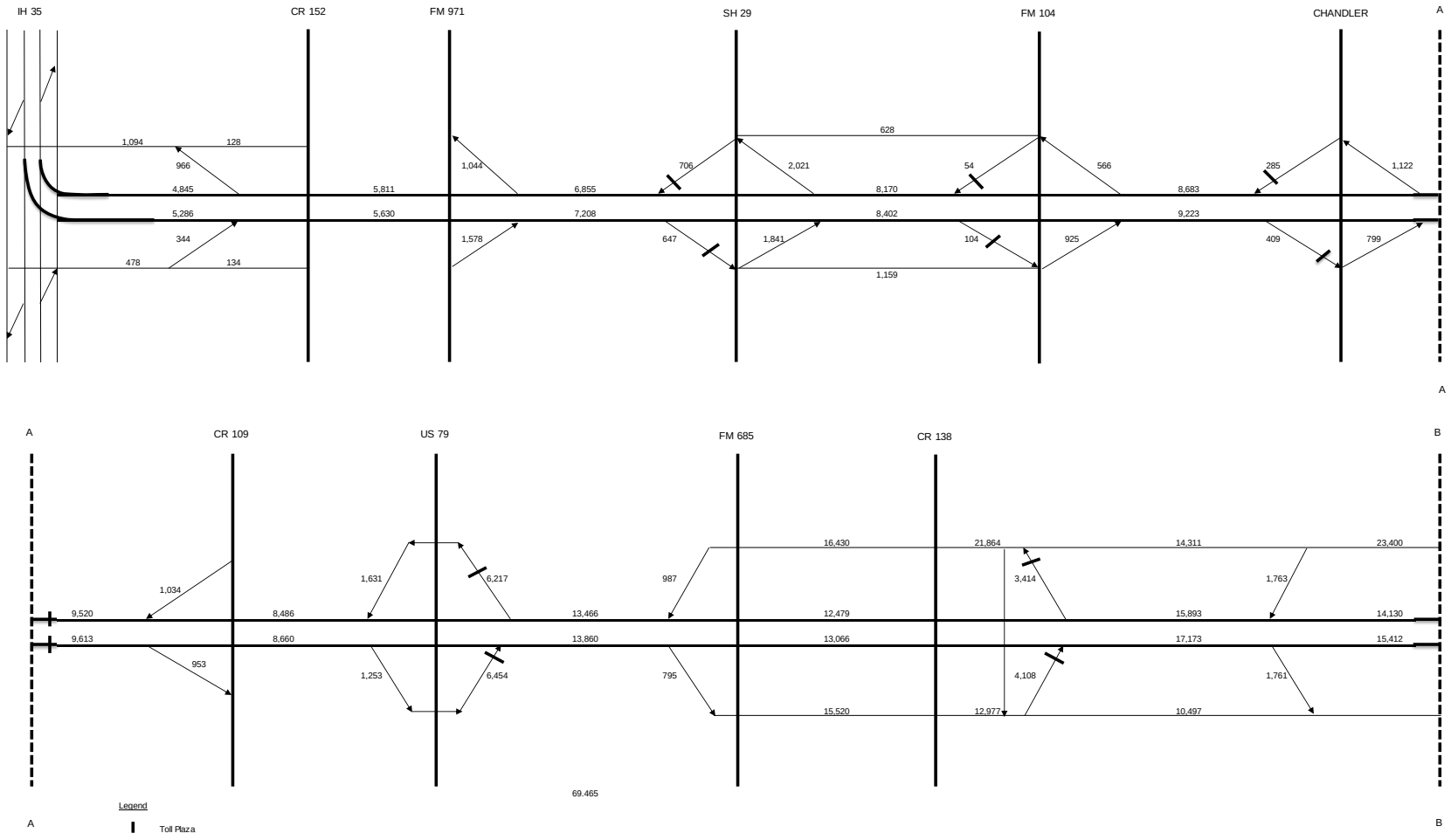


Figure 8.7 SH 130 Average Weekday Traffic – 2013 Model Calibration Year (continued)

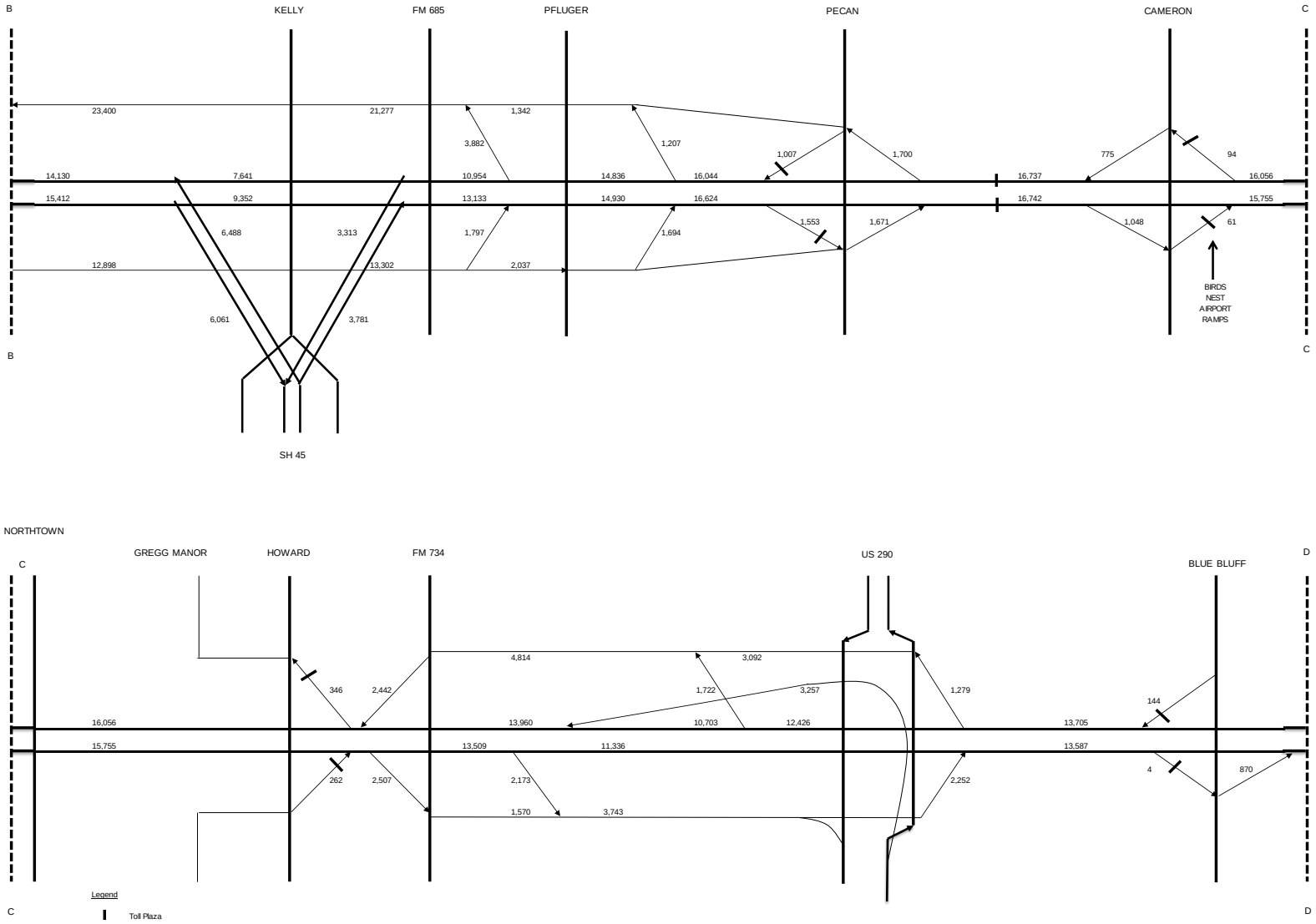


Figure 8.7 SH 130 Average Weekday Traffic – 2013 Model Calibration Year (continued)

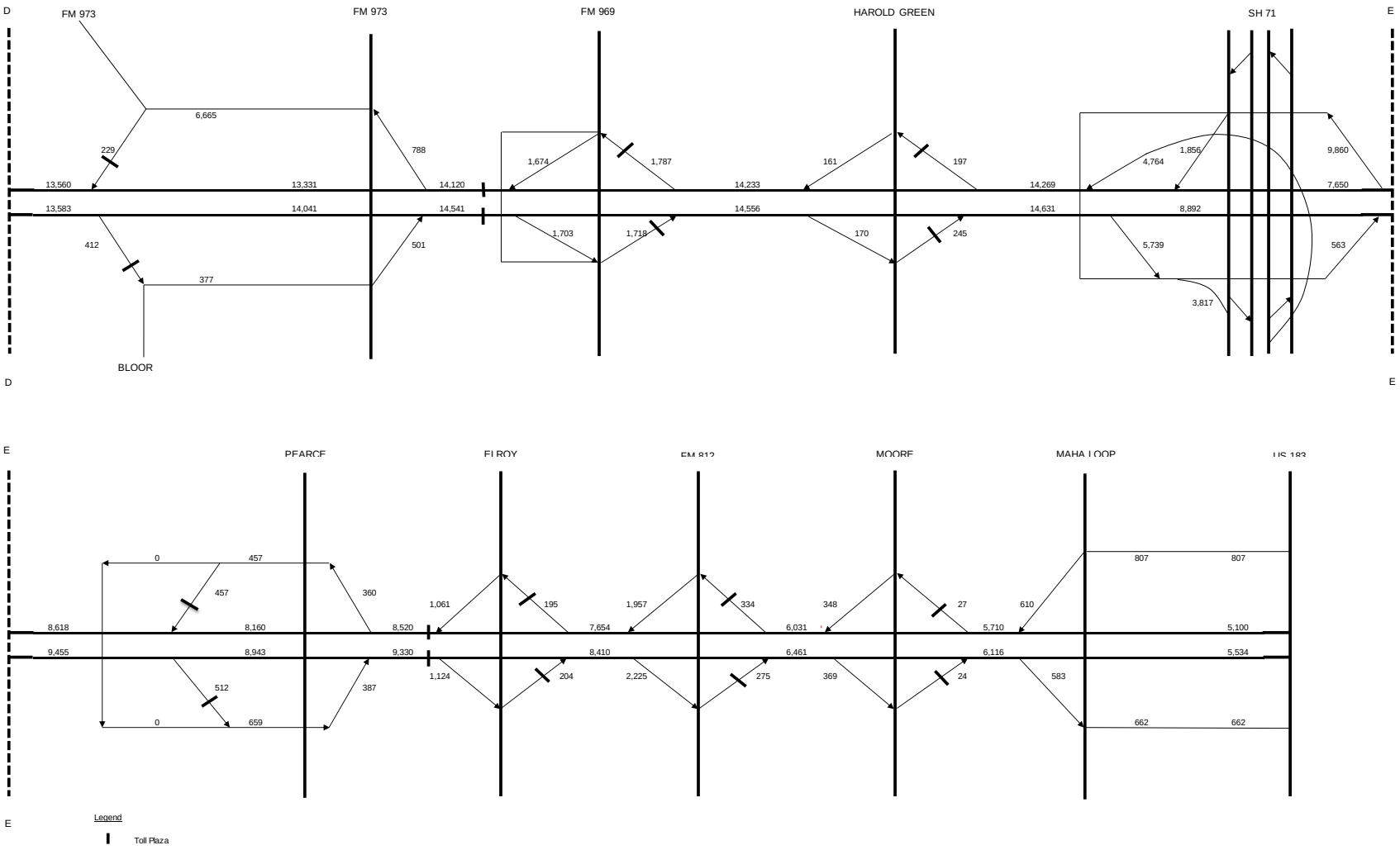


Figure 8.8 SH 130 Average Weekday Traffic – 2015 Model Year

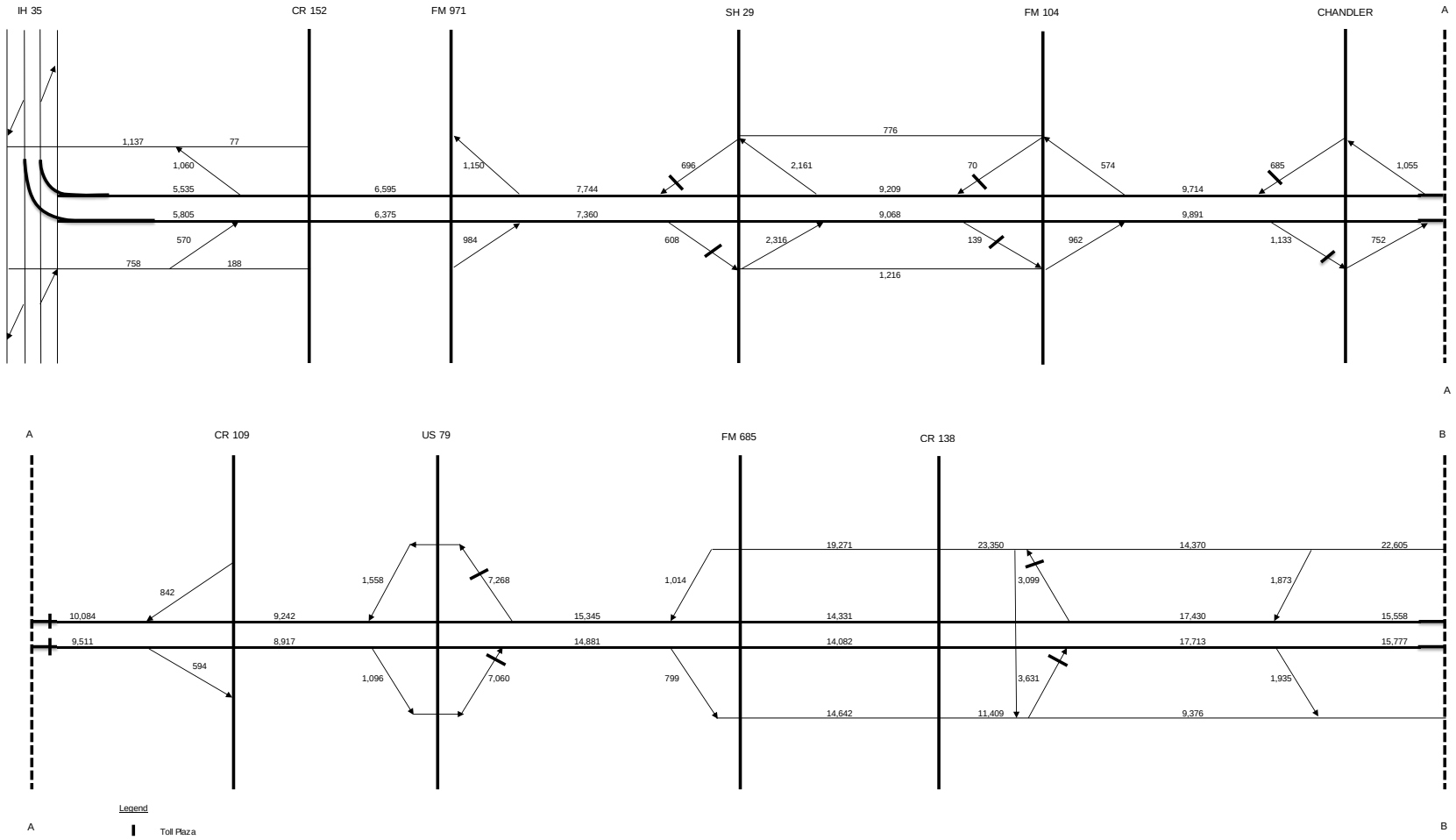


Figure 8.8 SH 130 Average Weekday Traffic – 2015 Model Year (continued)

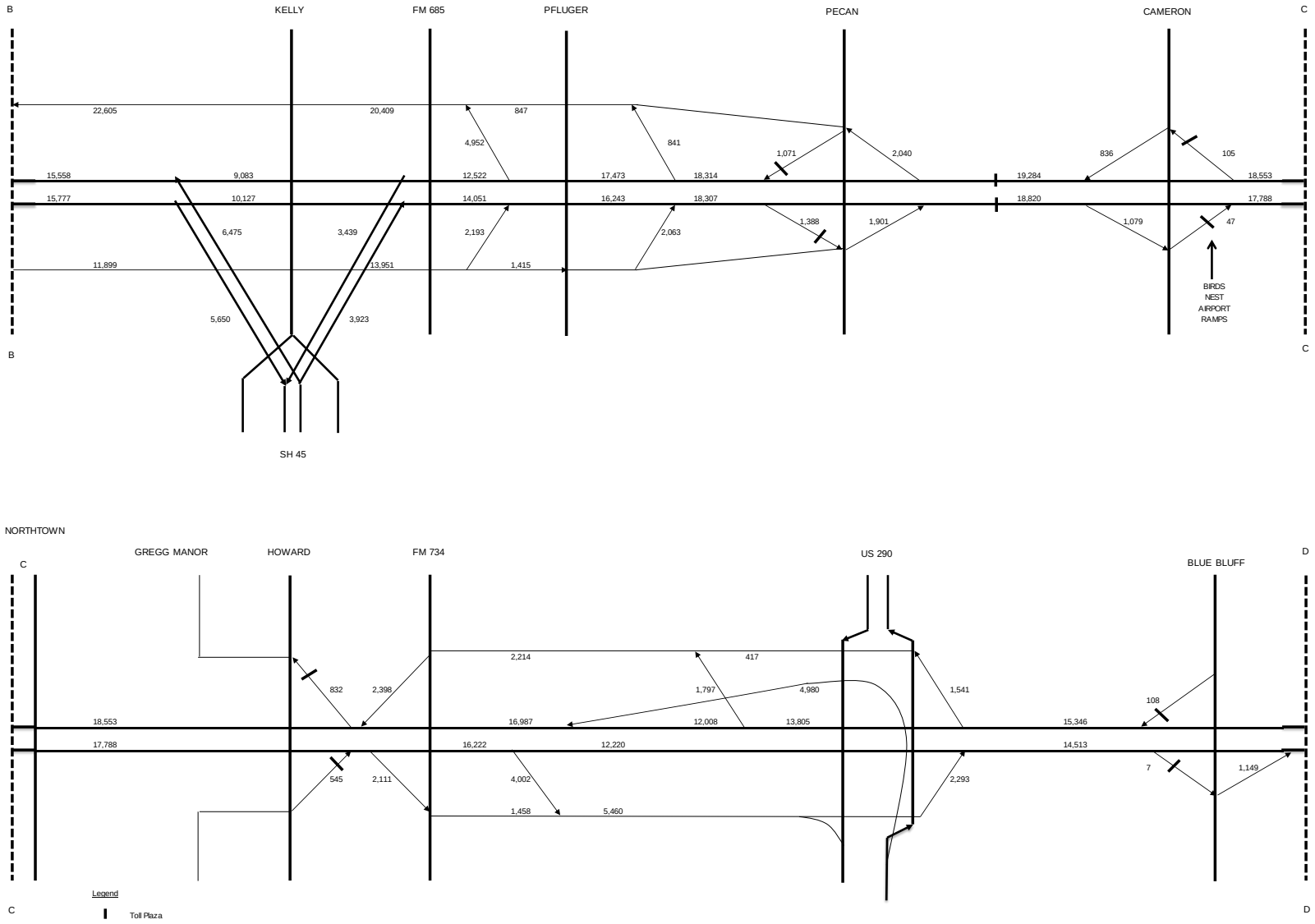


Figure 8.8 SH 130 Average Weekday Traffic – 2015 Model Year (continued)

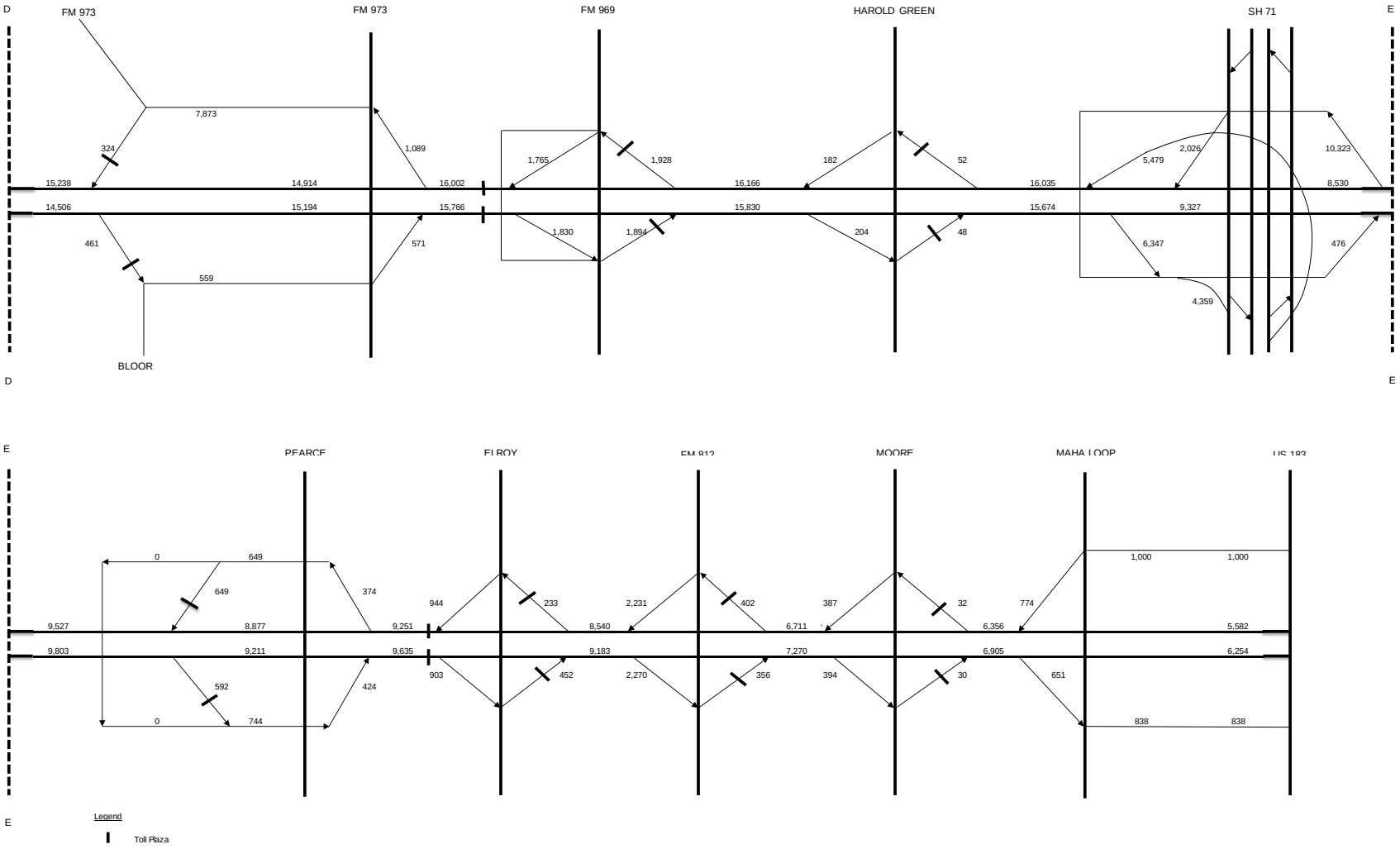


Figure 8.9 SH 130 Average Weekday Traffic – 2020 Model Year

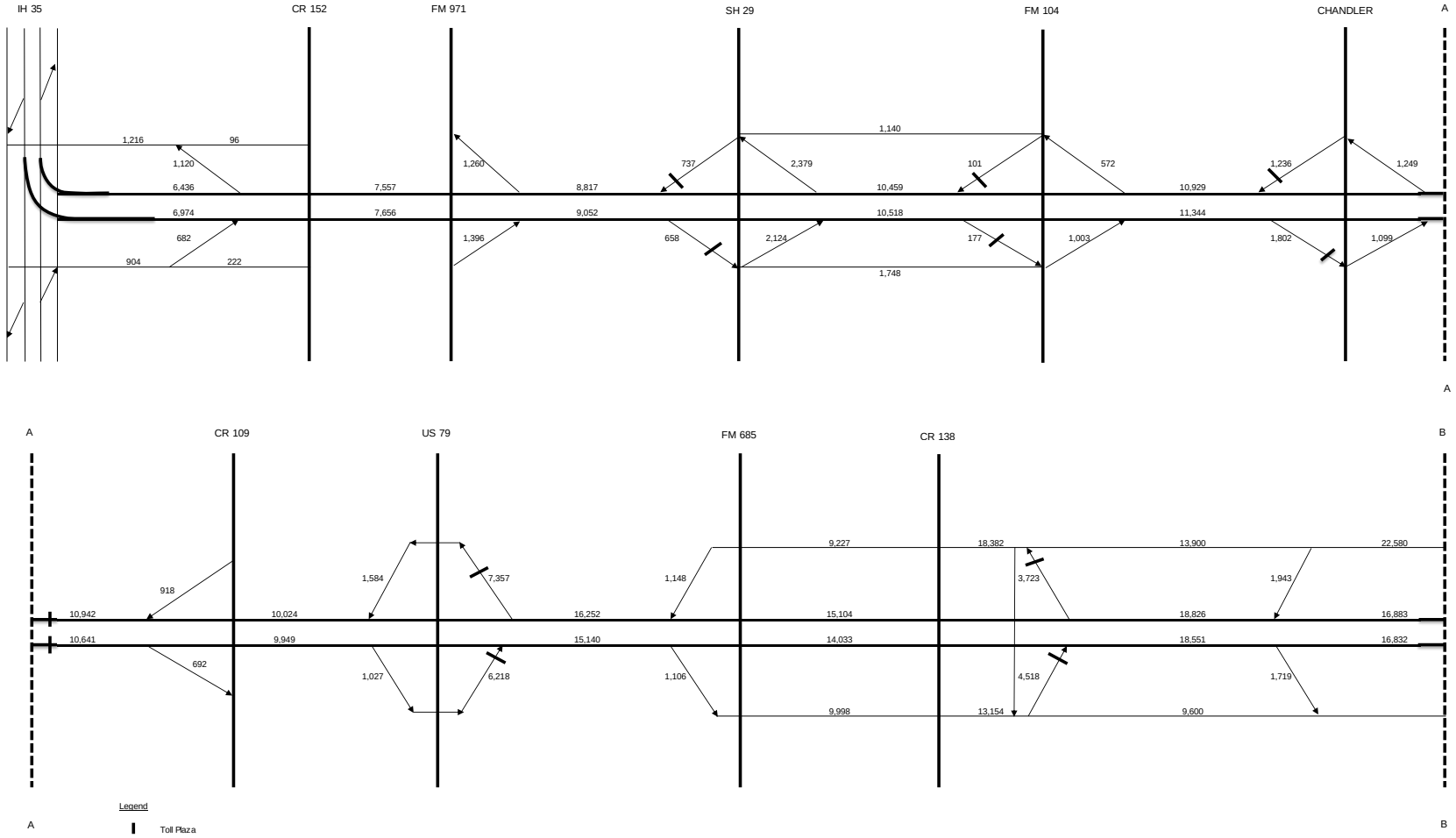


Figure 8.9 SH 130 Average Weekday Traffic – 2020 Model Year (continued)

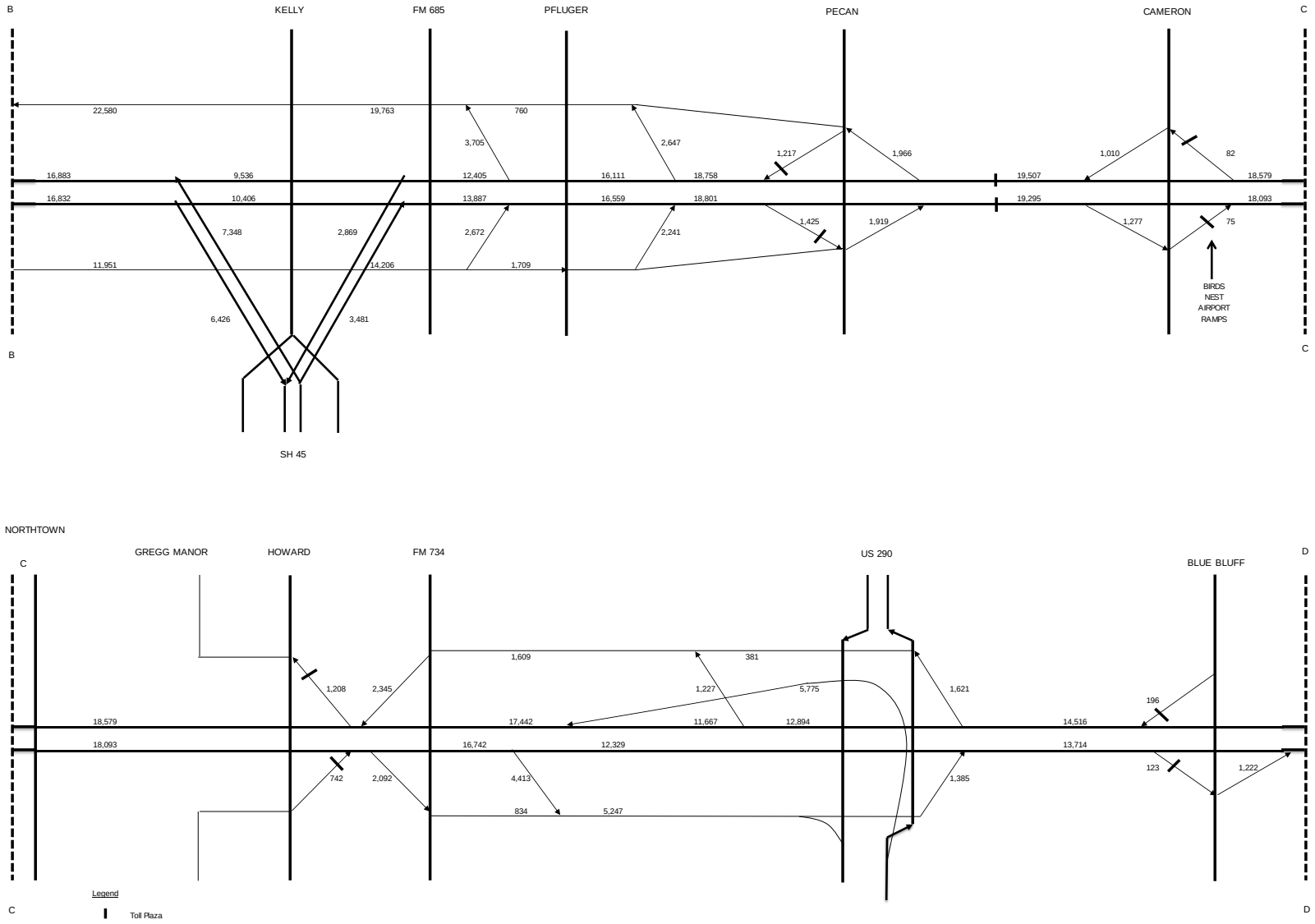


Figure 8.9 SH 130 Average Weekday Traffic – 2020 Model Year (continued)

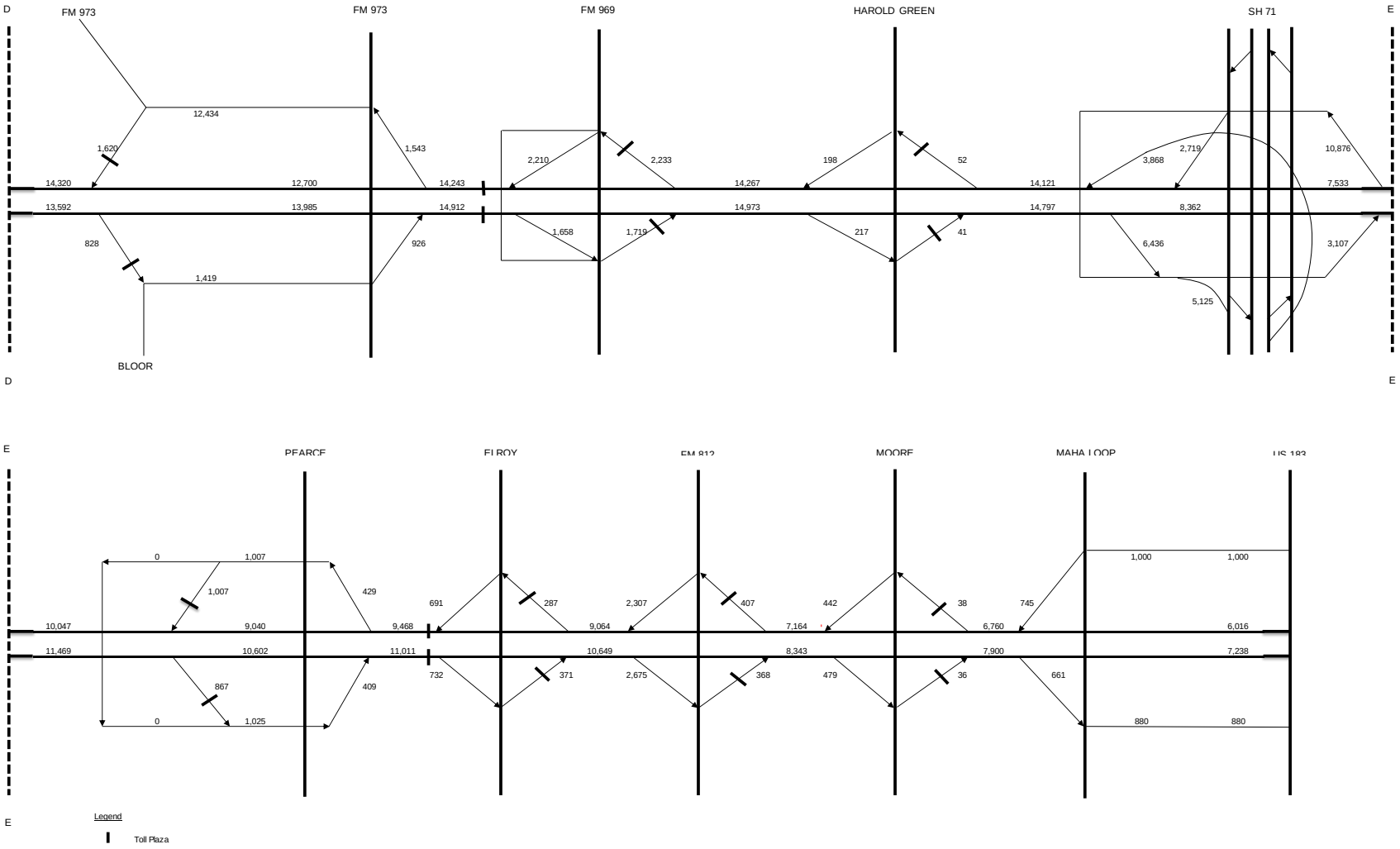


Figure 8.10 SH 130 Average Weekday Traffic – 2030 Model Year

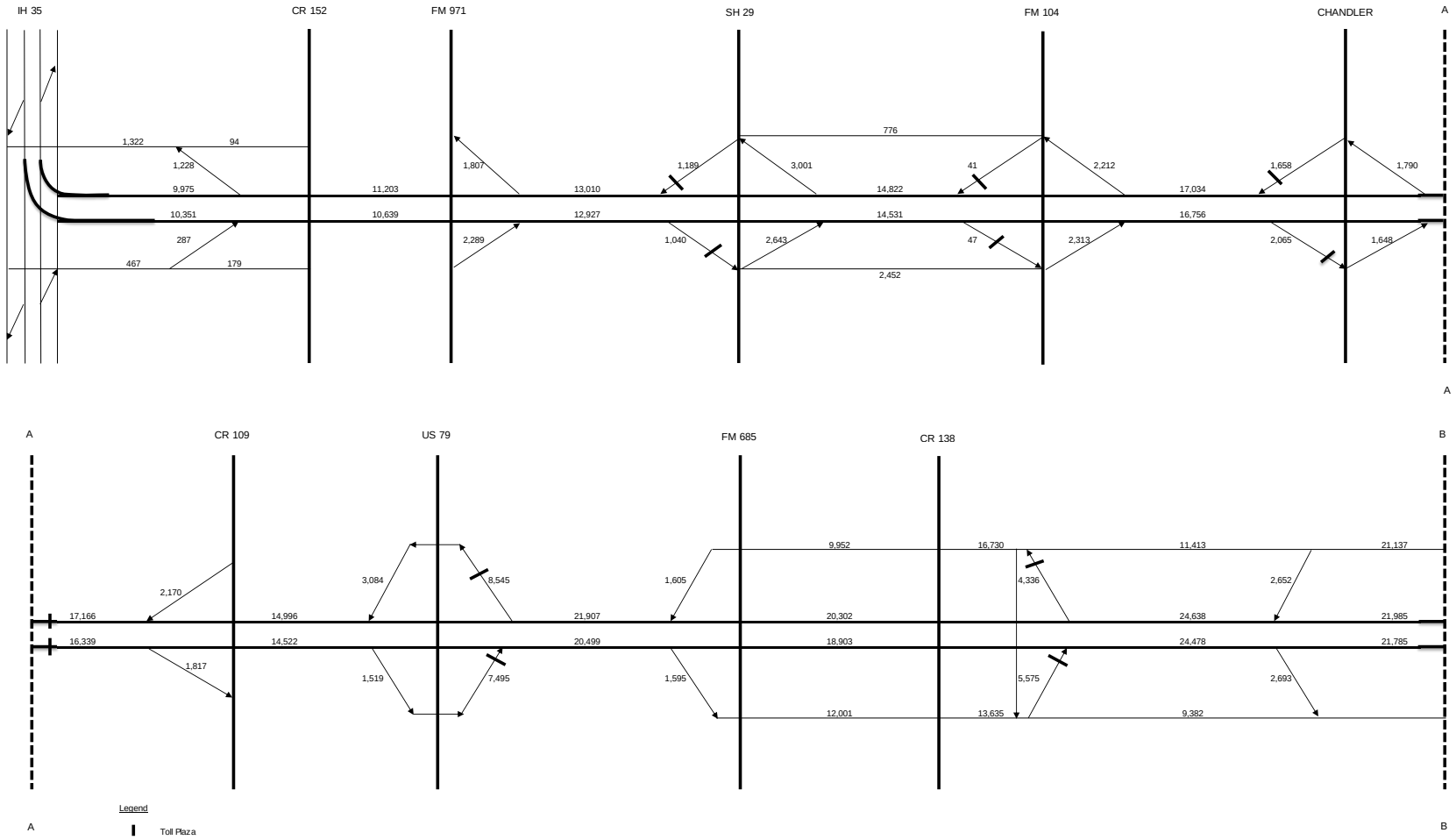


Figure 8.10 SH 130 Average Weekday Traffic – 2030 Model Year (continued)

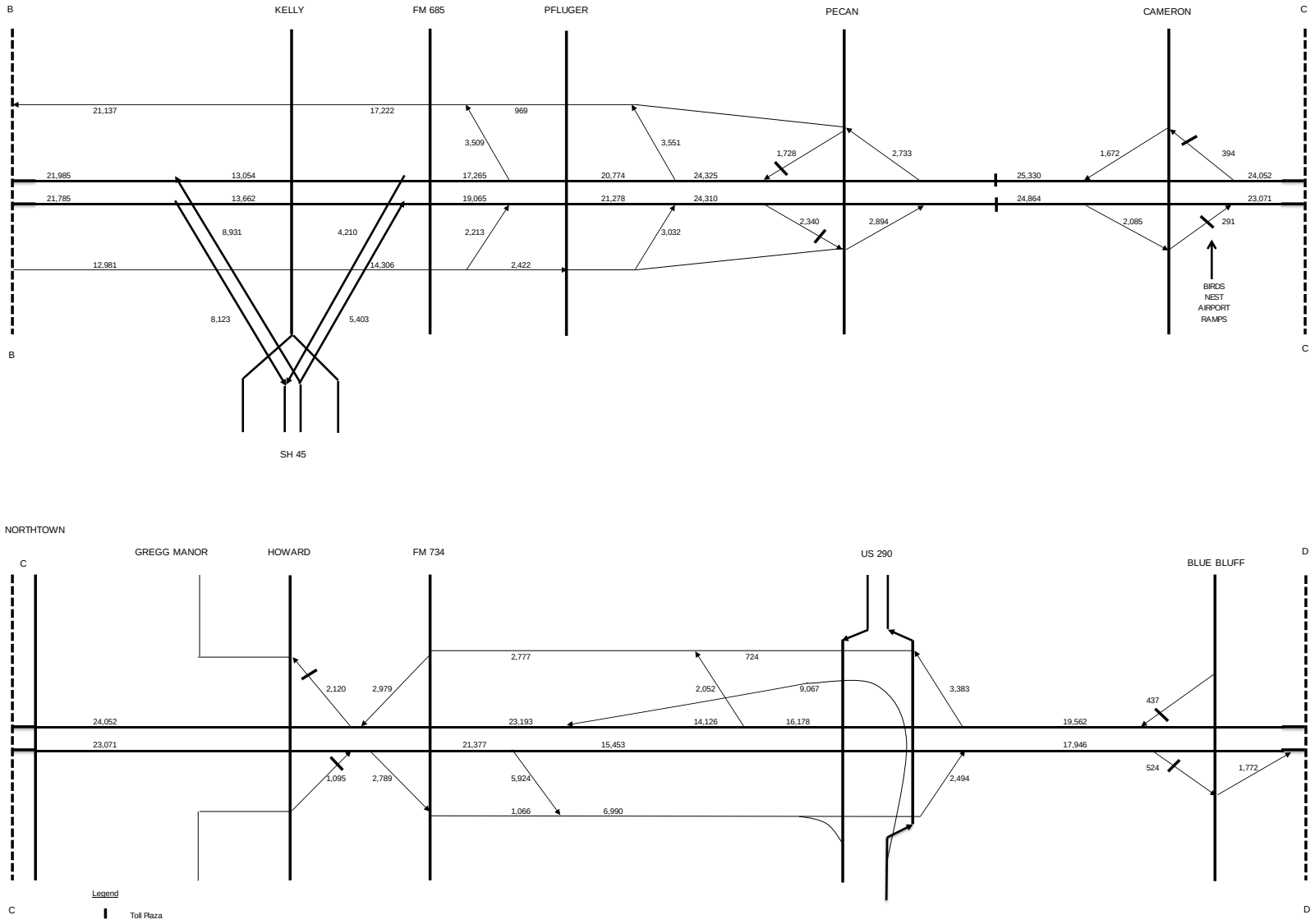


Figure 8.10 SH 130 Average Weekday Traffic – 2030 Model Year (continued)

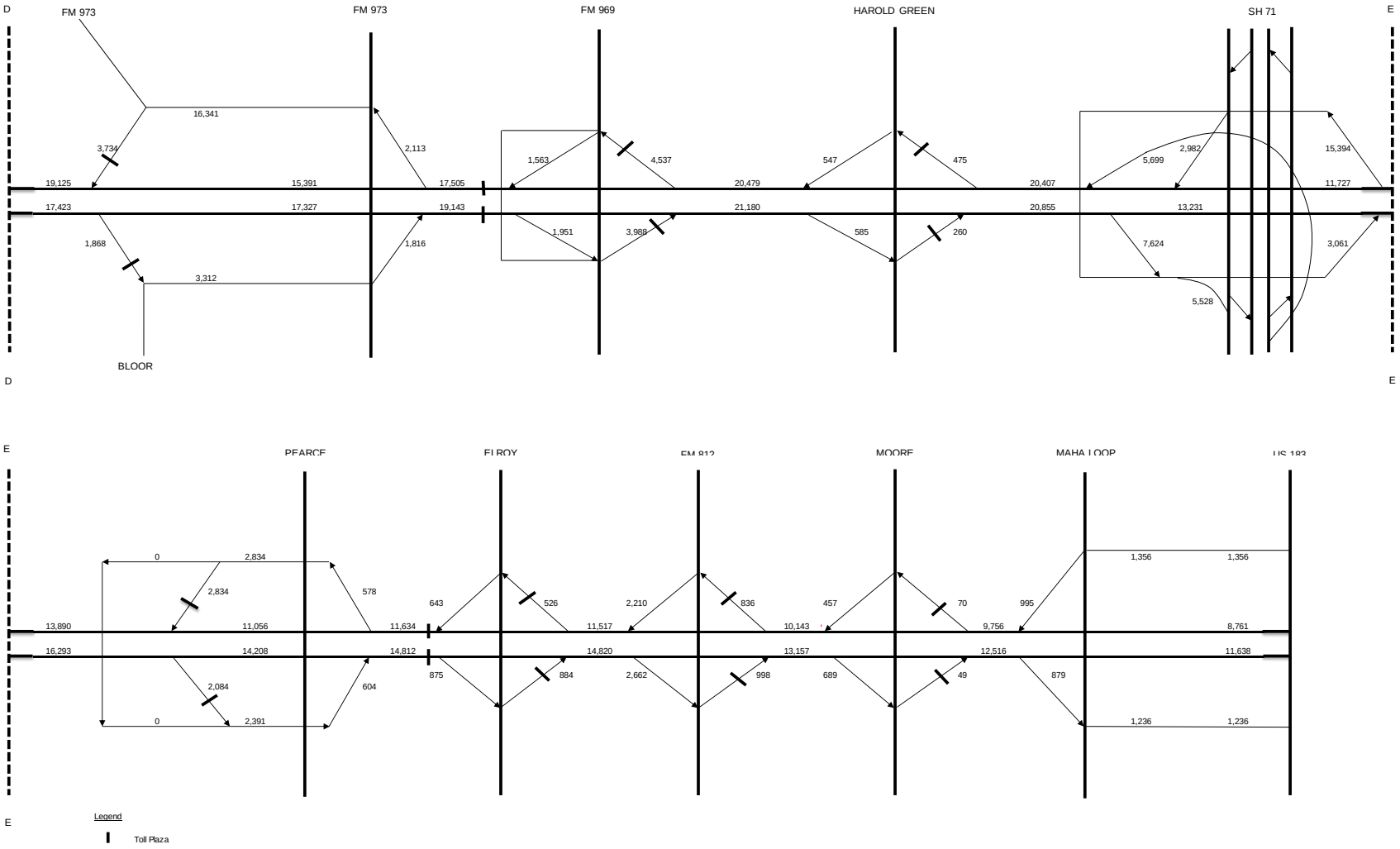


Figure 8.11 SH 130 Average Weekday Traffic – 2040 Model Year

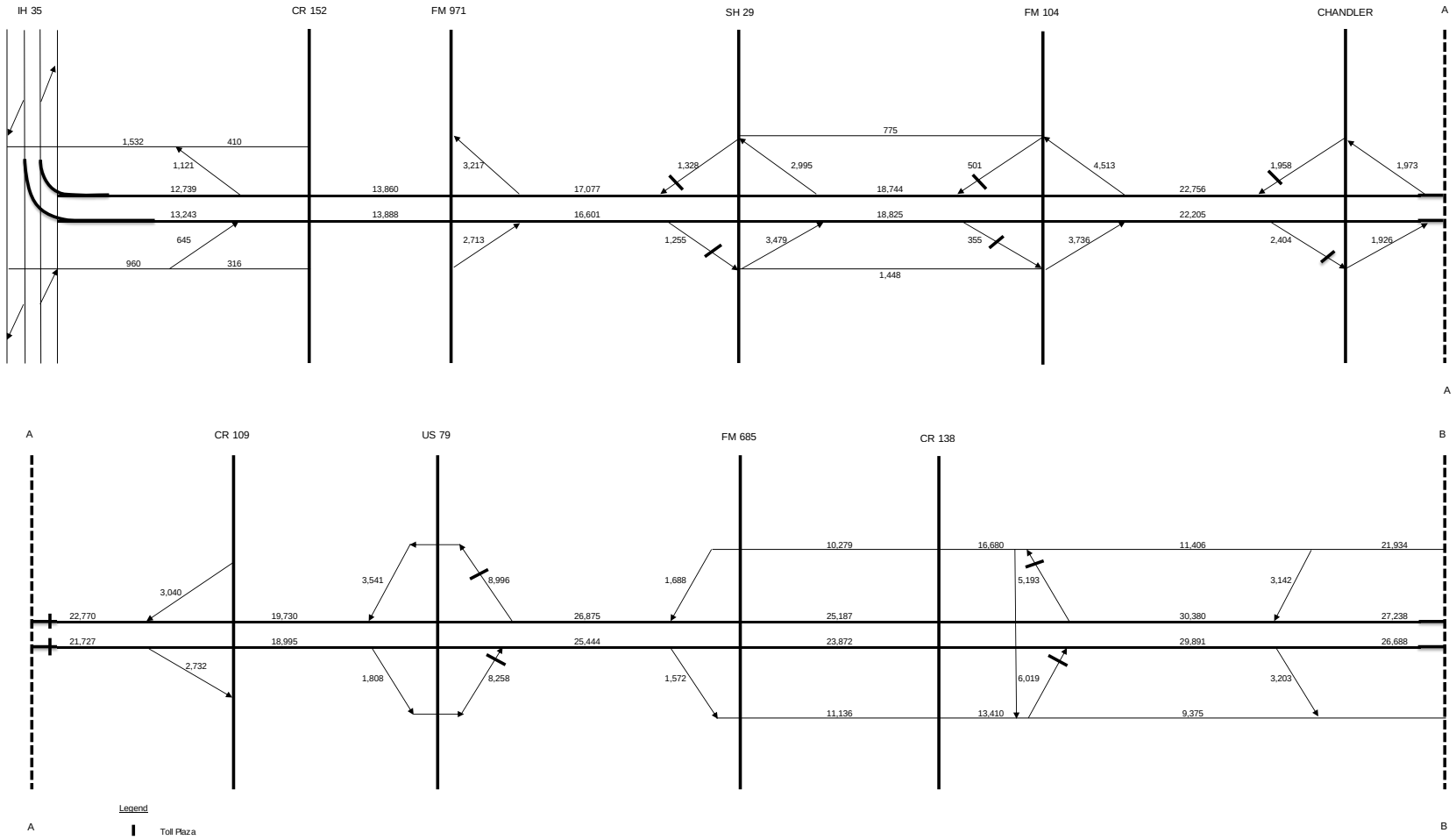


Figure 8.11 SH 130 Average Weekday Traffic – 2040 Model Year (continued)

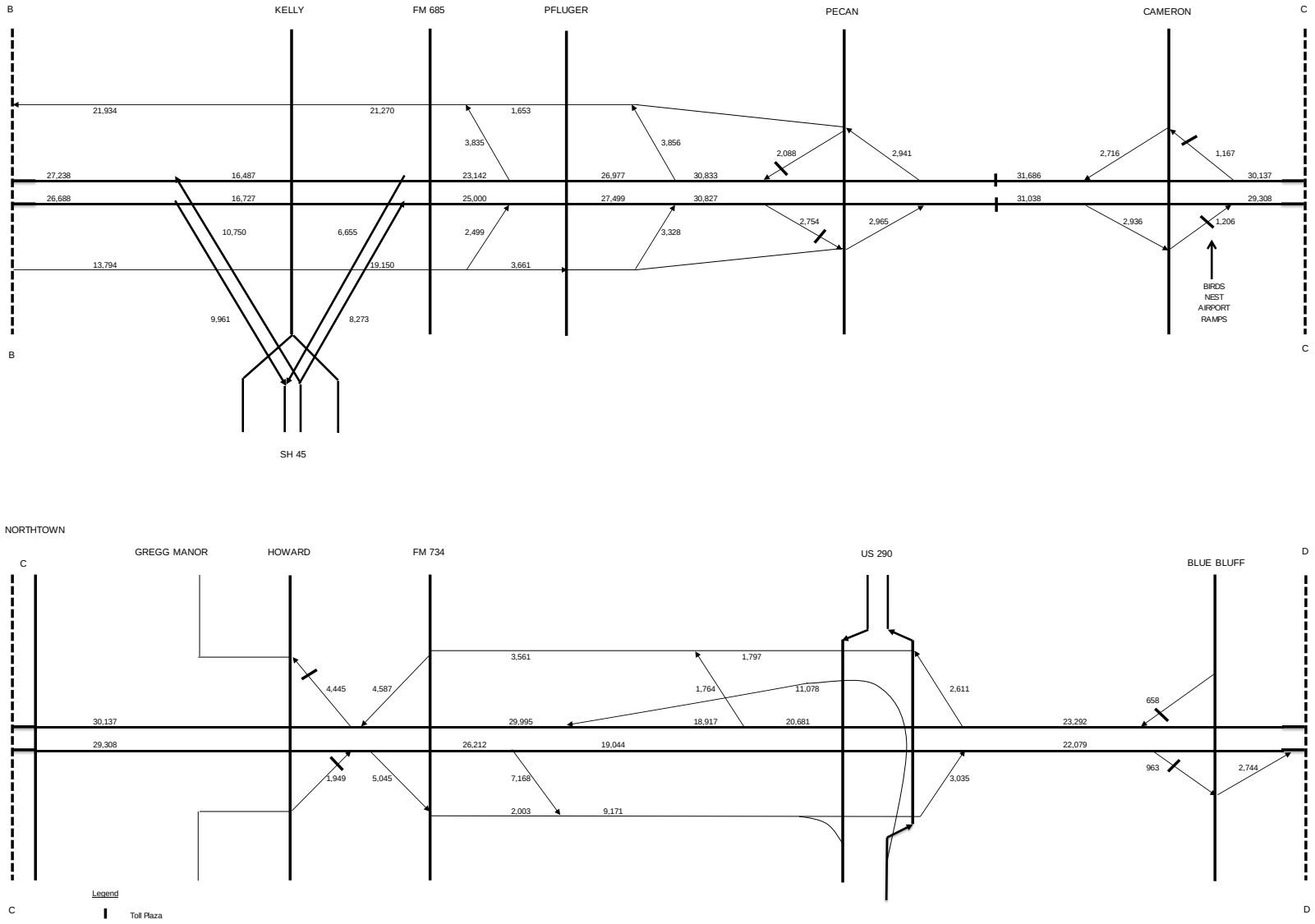
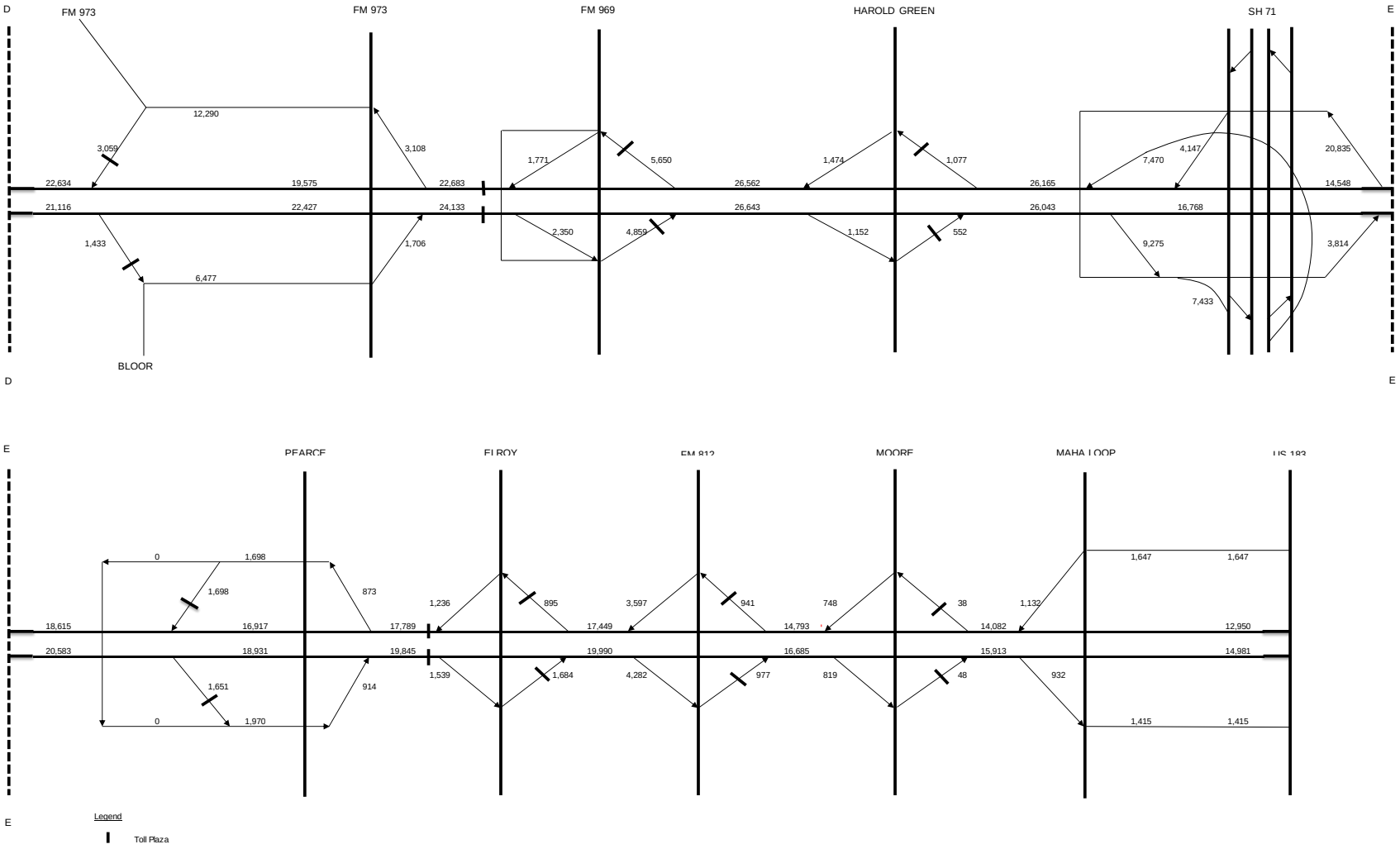


Figure 8.11 SH 130 Average Weekday Traffic – 2040 Model Year (continued)



8.2.2 SH 130 Screenline Analysis

Table 8.9, Table 8.10, Table 8.11, and Table 8.12 show the SH 130 corridor screenlines by horizon year. These screenlines are depicted earlier in this chapter as part of Figure 8.6. Note that these values are unadjusted model estimates for the model's calendar year forecasts and are intended to indicate the future demand of traffic in the corridor as estimated by the model as well as the share of traffic using SH 130.

In reviewing these tables, it is evident that IH-35 has the dominant share of traffic on each of the four screenlines, although SH 130 gradually increases its share of screenline traffic over the forecast period. The total traffic on Screenline 130-A increases from approximately 196,900 in 2013 to 342,600 in 2040, which implies an annual compounded growth rate of 2.1 percent over the 28-year period. SH 130 traffic is approximately 9.7 percent of the screenline in 2013 and eventually increases to approximately 13.0 percent in 2040. Screenline 130-B, which intersects roadways in the Round Rock area, increases from 250,300 in 2013 to 409,500 in 2040, compounding annually at approximately 1.8 percent. Traffic on SH 130 generally trends from 13 to 14 percent of the screenline total over the forecast period. Note that between 2015 and 2020, the traffic growth on SH 130 on screenline B is relatively flat. This is due to the completion of the Bergstrom Expressway within the US 183 alignment between US 290 and SH 71, which acts a competitor facility.

Table 8.9 Screenline 130-A Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
IH 35	146,597	74.5%	153,605	72.9%	163,734	70.2%	185,126	67.0%	212,059	61.9%
CR 115	11,538	5.9%	12,649	6.0%	13,523	5.8%	16,311	5.9%	19,796	5.8%
FM 1460	12,878	6.5%	11,746	5.6%	15,861	6.8%	17,852	6.5%	18,506	5.4%
Arterial A (Round Rock)	NA		NA		NA		NA		23,893	7.0%
CR 110	3,319	1.7%	2,969	1.4%	6,326	2.7%	9,755	3.5%	7,083	2.1%
SH 130	**19,133**	**9.7%**	**19,594**	**9.3%**	**21,583**	**9.3%**	**33,505**	**12.1%**	**44,497**	**13.0%**
CR 100	980	0.5%	8,177	3.9%	9,948	4.3%	10,947	4.0%	4,501	1.3%
FM 1660	2,416	1.2%	2,022	1.0%	2,342	1.0%	2,940	1.1%	12,231	3.6%
TOTAL	**196,860**	**100.0%**	**210,761**	**100.0%**	**233,317**	**100.0%**	**276,436**	**100.0%**	**342,566**	**100.0%**

Table 8.10 Screenline 130-B Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
IH 35	171,259	68.4%	178,889	66.4%	189,809	65.4%	217,244	62.8%	241,785	59.0%
Heatherwilde Blvd	10,697	4.3%	12,989	4.8%	18,785	6.5%	20,328	5.9%	20,600	5.0%
Dessau / FM 685	23,590	9.4%	27,039	10.0%	26,721	9.2%	36,757	10.6%	45,494	11.1%
Immanuel	4,425	1.8%	4,773	1.8%	6,381	2.2%	9,698	2.8%	11,009	2.7%
SH 130	**33,479**	**13.4%**	**38,104**	**14.1%**	**38,801**	**13.4%**	**50,194**	**14.5%**	**62,723**	**15.3%**
Cameron Rd	3,721	1.5%	3,914	1.5%	5,283	1.8%	6,438	1.9%	21,615	5.3%
Fuchs Grove	3,101	1.2%	3,687	1.4%	4,293	1.5%	5,301	1.5%	6,298	1.5%
TOTAL	**250,271**	**100.0%**	**269,396**	**100.0%**	**290,073**	**100.0%**	**345,959**	**100.0%**	**409,525**	**100.0%**

Table 8.11 Screenline 130-C Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
IH 35	234,515	58.3%	254,934	58.0%	270,391	56.4%	307,984	56.1%	335,360	53.0%
Cameron Rd.	20,747	5.2%	20,427	4.6%	20,723	4.3%	20,738	3.8%	21,173	3.3%
Berkman Dr.	10,914	2.7%	11,599	2.6%	13,360	2.8%	13,228	2.4%	15,752	2.5%
Manor Rd.	10,215	2.5%	11,470	2.6%	12,153	2.5%	18,186	3.3%	20,595	3.3%
Springdale Rd.	8,977	2.2%	10,406	2.4%	12,933	2.7%	10,977	2.0%	12,751	2.0%
US 183	59,116	14.7%	64,871	14.8%	41,822	8.7%	36,270	6.6%	42,913	6.8%
US 183 Express Lanes	NA		NA		36,309	7.6%	48,432	8.8%	62,583	9.9%
Johnny Morris Rd.	5,237	1.3%	5,013	1.1%	5,109	1.1%	6,108	1.1%	7,118	1.1%
FM 3177	11,679	2.9%	13,727	3.1%	18,070	3.8%	27,275	5.0%	28,934	4.6%
FM 973	6,191	1.5%	7,042	1.6%	8,887	1.9%	7,431	1.4%	8,962	1.4%
SH 130	**28,661**	**7.1%**	**31,768**	**7.2%**	**29,155**	**6.1%**	**36,648**	**6.7%**	**46,817**	**7.4%**
FM 969	5,876	1.5%	8,053	1.8%	10,638	2.2%	16,158	2.9%	29,341	4.6%
TOTAL	**402,128**	**100.0%**	**439,308**	**100.0%**	**479,549**	**100.0%**	**549,434**	**100.0%**	**632,298**	**100.0%**

Table 8.12 Screenline 130-D Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
IH 35	189,446	64.9%	208,740	65.8%	224,420	63.9%	257,066	62.5%	281,106	61.1%
Todd Ln.	11,751	4.0%	12,166	3.8%	20,166	5.7%	22,098	5.4%	24,594	5.3%
Stassney Ln.	22,887	7.8%	24,043	7.6%	25,568	7.3%	31,402	7.6%	34,776	7.6%
US 183	28,937	9.9%	31,181	9.8%	33,202	9.4%	38,698	9.4%	38,704	8.4%
FM 973	8,739	3.0%	10,658	3.4%	16,213	4.6%	19,412	4.7%	23,833	5.2%
SH 130	**17,850**	**6.1%**	**18,886**	**6.0%**	**20,479**	**5.8%**	**26,446**	**6.4%**	**37,635**	**8.2%**
Ross Rd.	12,517	4.3%	11,623	3.7%	11,326	3.2%	15,989	3.9%	19,648	4.3%
TOTAL	**292,127**	**100.0%**	**317,296**	**100.0%**	**351,375**	**100.0%**	**411,111**	**100.0%**	**460,296**	**100.0%**

Traffic along Screenline 130-C that encompasses Segment 3 increases from 402,100 in 2013 to 632,300 in 2040 at a rate of 1.7% annually, with SH 130 traffic remaining near 7 percent of the screenline total. With the completion of the Bergstrom Expressway in 2020, SH 130 Segment 3 has a decline in traffic, but the overall development in the corridor indicates that Segment 3 will resume the long term trend of growth by 2035. The southernmost screenline (Screenline 130-D) increases from 292,100 in 2013 to 460,300 in 2040 at a rate of 1.7 percent annually. SH 130 has approximately 6 to 8 percent share of this screenline's traffic.

8.2.3 SH 130 Traffic and Revenue Assumptions

Table 8.13 provides a concise summary of the underlying assumptions in the transaction and revenue forecasts for SH 130. All truck-related values in the table relate to the truck defined as 3+axle vehicles, consistent with the transaction reports generated for each toll road by TxDOT. Estimated truck transactions increase from approximately 8.6 percent in 2015 to 11.1 percent by 2040. While auto ETC payment shares are assumed to gradually increase to nearly 70 percent by 2040, truck ETC shares are assumed to remain relatively constant. The gradual increase of transponder shares is consistent with the near-term TxDOT policy objectives and resolution of issues related to the conversion to the Xerox system along with other isolated problems related to ETC billing of credit card accounts. Due to the limited data regarding trends in truck ETC usage, a decision was made to hold the truck ETC shares constant over the forecast period.

The average truck toll multiplier is approximately 2.67 times the auto rate, which reflects the observed distribution of trucks by axle group, and TxDOT's policy of capping truck tolls at the rate of a 4-axle vehicle for SH 130. There are no truck discounts similar to the temporary discounts provided during periods in 2012 and 2013 assumed during the forecast period. The PBM toll surcharge is assumed to remain at 33 percent of the ETC rate. The collection rates for PBM and ETC transactions reflect the latest available collection data provided by TxDOT and are held constant over the forecast period. Over the forecast period, the cost to traverse the full length of SH 130 Segments 1-4 will increase from $7.00 in 2015 to approximately 14.00 in 2040. This implies a rate of $0.14 per mile in 2015 which is increased to $0.28 by 2040.

Table 8.13 SH 130 Tolling and Traffic Characteristic Assumptions by Model Year

Model Year	2015	2020	2030	2040
Vehicle Type Distribution				
Autos	91.4%	91.4%	90.8%	88.9%
Trucks	8.6%	8.6%	9.2%	11.1%
Payment Type Distribution - Passenger Cars				
PBM	33.5%	30.9%	31.1%	30.5%
ETC	66.5%	69.1%	68.9%	69.5%
Payment Type Distribution - Trucks				
PBM	35.5%	35.5%	35.5%	35.5%
ETC	64.5%	64.5%	64.5%	64.5%
Toll Ratios				
Truck/Auto Ratio	2.67	2.67	2.67	2.67
PBM/ETC Toll Rate	1.33	1.33	1.33	1.33
Collection Rates				
PBM	47.7%	47.7%	47.7%	47.7%
ETC	99.7%	99.7%	99.7%	99.7%
Full Length Trip				
Distance	49.0	49.0	49.0	49.0
Rate per Mile	$0.14	$0.16	$0.21	$0.28
Toll Cost (ETC)	$7.00	$7.84	$10.36	$13.96
Annualization Factor	330	330	330	330

8.2.4 SH 130 Transactions and Revenue by Paypoint

The SH 130 transaction and revenue statistics by paypoint and horizon year are listed in Table 8.14. Both total and paying transactions are provided, where paying transactions reflect the assumptions for collection efficiency for each payment type. The average toll rate represents a blend of the individual rates by payment type and vehicle type. This blended value includes a 33 percent surcharge over the ETC rates for PBM patrons. The values shown are calendar year values, rather than the blended estimates created for each fiscal year shown in the next section.

Average weekday total transactions on SH 130 range from 127,700 in 2013 to 388,800 in 2040, representing a compounded annual growth rate of 4.2 percent. During the same timeframe, average weekday revenues range from $159,200 to $1,114,100 and exhibit a compounded annual growth rate of 7.5 percent.

Table 8.14 SH 130 Average Weekday Total Transactions and Toll Revenue (Adjusted for Calibration)

Toll Location	2013				2015				2020				2030				2040			
	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue
	Total	Paying			Total	Paying			Total	Paying			Total	Paying			Total	Paying		
SH 29	1,313	1,139	$0.47	$536	1,410	1,205	$0.52	$632	2,026	1,743	$0.58	$1,004	3,236	2,734	$0.77	$2,098	3,751	3,167	$1.03	$3,267
FM 104	153	126	$0.59	$75	226	182	$0.65	$118	404	323	$0.73	$236	128	101	$0.97	$98	1,244	1,020	$1.33	$1,352
Chandler Rd.	673	554	$0.78	$430	1,965	1,629	$0.86	$1,399	4,411	3,667	$0.98	$3,600	5,406	4,501	$1.30	$5,863	6,334	5,273	$1.71	$9,034
N of CR 109 (ML Plaza)	**18,559**	**15,335**	**$1.80**	**$27,537**	**21,183**	**17,211**	**$2.07**	**$35,622**	**31,340**	**25,913**	**$2.31**	**$59,819**	**48,651**	**40,377**	**$3.04**	**$122,574**	**64,611**	**53,950**	**$4.12**	**$222,156**
US 79	12,290	10,762	$0.76	$8,186	15,490	13,624	$0.86	$11,755	19,711	17,664	$0.96	$16,895	23,291	20,914	$1.28	$26,834	25,053	22,720	$1.75	$39,671
CR 138	7,296	6,474	$0.76	$4,903	7,276	6,423	$0.82	$5,259	11,965	10,695	$0.92	$9,816	14,391	12,787	$1.23	$15,694	16,280	14,522	$1.64	$23,811
Pecan St.	2,483	2,206	$0.58	$1,281	2,658	2,331	$0.64	$1,495	3,836	3,380	$0.72	$2,445	5,907	5,138	$0.97	$4,978	7,030	6,126	$1.30	$7,945
N. of Cameron Rd. (ML Plaza)	**32,475**	**26,861**	**$1.80**	**$48,217**	**41,194**	**34,244**	**$2.05**	**$70,208**	**56,341**	**47,516**	**$2.28**	**$108,354**	**72,883**	**61,612**	**$3.03**	**$186,911**	**91,076**	**77,186**	**$4.14**	**$319,402**
Birds' Nest Airport	150	118	$1.83	$216	164	136	$2.44	$332	227	192	$2.72	$522	996	873	$3.04	$2,656	3,446	3,083	$3.86	$11,906
Howard Ln/Gregg Manor	590	480	$0.60	$287	1,489	1,240	$0.66	$824	2,831	2,351	$0.75	$1,755	4,669	3,866	$0.98	$3,801	9,283	7,747	$1.32	$10,252
Blue Bluff Rd.	144	131	$0.46	$61	124	111	$0.51	$57	462	415	$0.56	$231	1,394	1,259	$0.75	$941	2,354	2,133	$1.01	$2,156
Bloor Rd/FM 973	622	564	$0.58	$325	849	761	$0.64	$487	3,555	3,206	$0.73	$2,348	8,134	7,218	$0.96	$6,899	6,522	5,747	$1.41	$8,110
N. of FM 969 (ML Plaza)	**27,801**	**21,750**	**$1.83**	**$39,811**	**34,344**	**27,178**	**$2.07**	**$56,161**	**42,333**	**33,789**	**$2.31**	**$78,032**	**53,214**	**42,532**	**$3.09**	**$131,564**	**67,979**	**54,593**	**$4.23**	**$230,972**
FM 969	3,399	2,570	$0.61	$1,578	4,132	3,165	$0.70	$2,220	5,739	4,572	$0.75	$3,427	12,379	9,820	$1.00	$9,826	15,260	12,183	$1.34	$16,312
Harold Green Rd.	428	380	$0.47	$177	108	81	$0.54	$44	135	106	$0.61	$65	1,067	854	$0.91	$775	2,365	1,901	$1.20	$2,284
Pearce Ln.	940	688	$0.62	$428	1,342	1,015	$0.67	$676	2,721	2,072	$0.75	$1,546	7,142	5,313	$0.99	$5,279	4,863	3,698	$1.32	$4,889
N. of Elroy Rd (ML Plaza)	**17,314**	**13,402**	**$1.84**	**$24,625**	**20,418**	**16,169**	**$2.09**	**$33,779**	**29,736**	**23,900**	**$2.35**	**$56,204**	**38,400**	**30,803**	**$3.16**	**$97,447**	**54,647**	**43,851**	**$4.37**	**$191,572**
Elroy Rd.	387	348	$0.75	$262	740	668	$0.88	$588	955	877	$0.97	$850	2,047	1,850	$1.26	$2,335	3,746	3,288	$1.73	$5,689
FM 812	591	525	$0.58	$305	820	764	$0.64	$485	1,125	1,056	$0.71	$751	2,664	2,389	$0.98	$2,330	2,785	2,452	$1.32	$3,247
Moore Rd.	50	44	$0.47	$21	66	63	$0.49	$31	107	101	$0.54	$55	172	162	$0.73	$118	124	116	$0.99	$115
SH 130 Total	**127,659**	**104,458**		**$159,259**	**156,000**	**128,201**		**$222,174**	**219,963**	**183,538**		**$347,954**	**306,169**	**255,105**		**$629,021**	**388,752**	**324,757**		**$1,114,141**
Annual Revenue in Millions				**$52.6**				**$73.3**				**$114.8**				**$207.6**				**$367.7**

Note: The average toll is calculated by Revenue divided by Paying Transactions.

8.2.5 SH 130 Traffic and Revenue Forecasts

Table 8.15 provides the forecasted transactions and revenue for the entire 35-year forecast period on a fiscal year basis. Average Weekday Traffic (AWT) statistics are provided on the left side of the table, and annual values are provided on the right side along with statistics related to truck traffic. The values for FY 2008 to FY 2014 are the observed transactions and reported revenue for the first seven years of operation. While TxDOT reports transactions in the fiscal year in which they occur, annual revenue is based on the fiscal year in which it is collected. The revenue collected in each fiscal year varies due to the delay in receipt of PBM tolls, the collection efficiency of the PBM transactions as well as other adjustments implemented by TxDOT. In contrast, the model forecasts assume that transactions and revenue occur simultaneously and therefore do not reflect the lagging pattern of receiving PBM toll revenue. Note that the forecasted revenue does account for the loss of revenue from uncollected transactions.

As shown in Table 8.15, SH 130 continues to show significant growth, reflecting the on-going development in the corridor. Transaction growth of 20.1 percent occurred in FY 2013 which included the implementation of the 25 percent increase in toll rates. Similarly, FY 2014 also demonstrated transaction growth of approximately 13 percent that occurred during the first year of the CPI-based annual toll escalation of 1.5 percent. From 2009 to 2014, SH 130 has a compounded annual growth rate of nearly 14 percent despite the effects of the 2008 recession and the 25 percent toll increase in 2013. This growth rate is likely related to the significant development that is occurring in the corridor.

In the forecast period beginning in FY 2015, Stantec adjusted that growth trend downward to intercept the model-based forecasts by FY 2021. The forecasted transaction growth then transitions downward to approximately 2.0 percent per year by 2042. The assumed share of paying transactions is relatively constant at approximately 83 percent, and the combined ETC share (autos and trucks) increases gradually to nearly 70 percent by 2042 from 66 percent in 2015. For FY 2015, revenue growth is estimated at 5.2 percent due to the difference in the reporting basis of revenue between TxDOT and the assumptions in the modeling process, as described above. Beyond FY 2015, revenue growth generally follows a trend established by a sum of transaction growth and the annual toll escalation assumed for each year. The truck percentage share of paying transactions and revenue is shown in the last two columns of the table. Trucks are approximately 8 percent of transactions in FY 2015 but increase to 11 percent over the forecast period. Truck revenue increases from 17 percent of the total revenue to 21 percent by FY 2042.

Table 8.15 SH 130 Transaction and Revenue Forecasts

Fiscal Year	Average Weekday Transactions (AWT)					Annual Transactions & Revenue					
										3+ Axle Truck Percentage	
	Total Transactions	YOY Growth	Total Transactions ETC Share	Paying Transactions	Paying Percentage	Annual Total Transactions (in 000s)	Annual Paying Transactions (in 000s)	Annual Revenue (in $000s)	YOY Growth	Paying Transactions	Revenue
2008	***58,306***		***67.0%***	*51,747*	*89%*	***19,287***	*17,117*	*$19,456*			
2009	***73,099***	***25.4%***	***67.0%***	*64,875*	*89%*	***24,457***	*21,706*	*$27,114*	***39.4%***		
2010	***83,997***	***14.9%***	***67.4%***	*74,547*	*89%*	***28,298***	*25,115*	***$34,408***	***26.9%***		
2011	***89,961***	***7.1%***	***64.3%***	*79,840*	*89%*	***30,583***	*27,142*	***$36,237***	***5.3%***		
2012	***101,957***	***13.3%***	***64.0%***	*89,000*	*87%*	***34,352***	*29,986*	***$40,735***	***12.4%***		
2013	***122,476***	***20.1%***	***64.5%***	*100,861*	*82%*	***41,366***	*34,065*	***$54,492***	***33.8%***		
2014	***138,223***	***12.9%***	***63.0%***	*111,557*	*81%*	***46,211***	*37,296*	***$67,092***	***23.1%***		
2015	151,253	9.4%	65.9%	123,955	82%	49,913	40,905	$70,573	5.2%	8.5%	17.1%
2016	165,488	9.4%	66.7%	136,297	82%	54,611	44,978	$78,930	11.8%	8.5%	17.2%
2017	179,452	8.4%	67.1%	148,256	83%	59,219	48,924	$87,431	10.8%	8.5%	17.2%
2018	192,802	7.4%	67.6%	159,756	83%	63,625	52,719	$95,948	9.7%	8.5%	17.2%
2019	205,220	6.4%	68.1%	170,526	83%	67,723	56,273	$104,280	8.7%	8.4%	17.2%
2020	216,390	5.4%	68.6%	180,367	83%	71,409	59,521	$112,226	7.6%	8.4%	17.3%
2021	225,743	4.3%	68.7%	188,340	83%	74,495	62,152	$119,705	6.7%	8.4%	17.3%
2022	234,406	3.8%	68.7%	195,538	83%	77,354	64,527	$127,186	6.2%	8.4%	17.3%
2023	243,059	3.7%	68.7%	202,722	83%	80,209	66,898	$135,042	6.2%	8.4%	17.4%
2024	251,700	3.6%	68.6%	209,894	83%	83,061	69,265	$143,245	6.1%	8.5%	17.6%
2025	260,329	3.4%	68.6%	217,057	83%	85,909	71,629	$151,753	5.9%	8.6%	17.8%
2026	268,948	3.3%	68.6%	224,211	83%	88,753	73,990	$161,100	6.2%	8.7%	17.9%
2027	277,556	3.2%	68.6%	231,355	83%	91,593	76,347	$171,097	6.2%	8.8%	18.1%
2028	286,152	3.1%	68.5%	238,491	83%	94,430	78,702	$181,525	6.1%	8.8%	18.2%
2029	294,738	3.0%	68.5%	245,617	83%	97,263	81,054	$192,402	6.0%	8.9%	18.4%
2030	303,312	2.9%	68.5%	252,733	83%	100,093	83,402	$203,744	5.9%	9.0%	18.5%
2031	311,674	2.8%	68.5%	259,748	83%	102,853	85,717	$216,195	6.1%	9.1%	18.8%
2032	319,933	2.6%	68.6%	266,713	83%	105,578	88,015	$229,529	6.2%	9.3%	19.1%
2033	328,191	2.6%	68.6%	273,679	83%	108,303	90,314	$243,491	6.1%	9.5%	19.5%
2034	336,449	2.5%	68.7%	280,644	83%	111,028	92,613	$258,109	6.0%	9.7%	19.8%
2035	344,708	2.5%	68.7%	287,609	83%	113,754	94,911	$273,409	5.9%	9.9%	20.0%
2036	352,966	2.4%	68.8%	294,574	83%	116,479	97,210	$289,419	5.9%	10.1%	20.3%
2037	361,224	2.3%	68.8%	301,540	83%	119,204	99,508	$306,171	5.8%	10.3%	20.6%
2038	369,483	2.3%	68.8%	308,505	83%	121,929	101,807	$323,694	5.7%	10.4%	20.8%
2039	377,741	2.2%	68.9%	315,470	84%	124,654	104,105	$342,021	5.7%	10.6%	21.0%
2040	385,999	2.2%	68.9%	322,435	84%	127,380	106,404	$361,184	5.6%	10.7%	21.3%
2041	393,806	2.0%	68.9%	328,979	84%	129,956	108,563	$379,943	5.2%	10.7%	21.3%
2042	401,353	1.9%	68.9%	335,284	84%	132,446	110,644	$398,840	5.0%	10.7%	21.3%

Revenue for PBM patrons was not allocated by each toll facility until September 2009; therefore, annual revenues shown for FY 2008 - FY 2009 are estimated.

Actual Average Weekday Transactions and Annual Revenue

8.3 SH 45 SE

Similar to the other roadways, the toll diversion model produces traffic estimates for several model years including: 2015, 2020, 2030, and 2040. The initial model forecasts for the SH 45 SE have been adjusted by post-processing to account for variations in the base year model calibration estimates and other minor variations in future trends. The model forecasts were also adjusted to transition from the current high levels of annual growth observed in recent years to a more logical trend of future growth predicted by the model. Gross revenue estimates were then prepared by multiplying the traffic, in terms of transactions, at the toll locations by the effective toll structure by vehicle type and payment type for each year. Adjustments were included to reflect the effective collection rates for both ETC and PBM transactions. Similar to SH 130, annual estimates of transactions and revenue for were generated using an annualization factor of 330.

8.3.1 SH 45 SE Schematic Traffic Diagrams

Figure 8.12 through Figure 8.16 display the traffic along SH 45 SE for the model (calendar) years 2013, 2015, 2020, 2030, and 2040. These diagrams represent the unadjusted model outputs for average weekday transactions and are intended to provide the reader a sense of the scale of the traffic volumes across the facility as well as the interchange areas.

Figure 8.12 SH 45 SE Average Weekday Traffic – 2013 Model Calibration Year

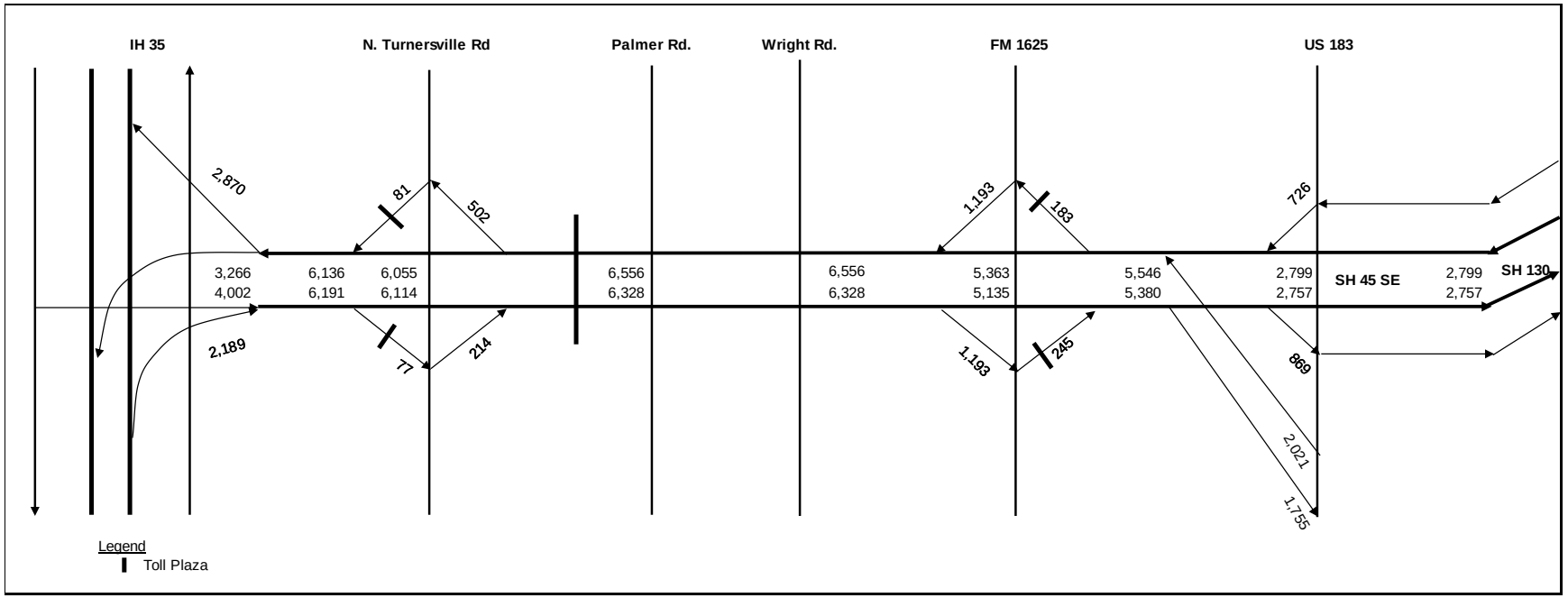


Figure 8.13 SH 45 SE Average Weekday Traffic – 2015 Model Year

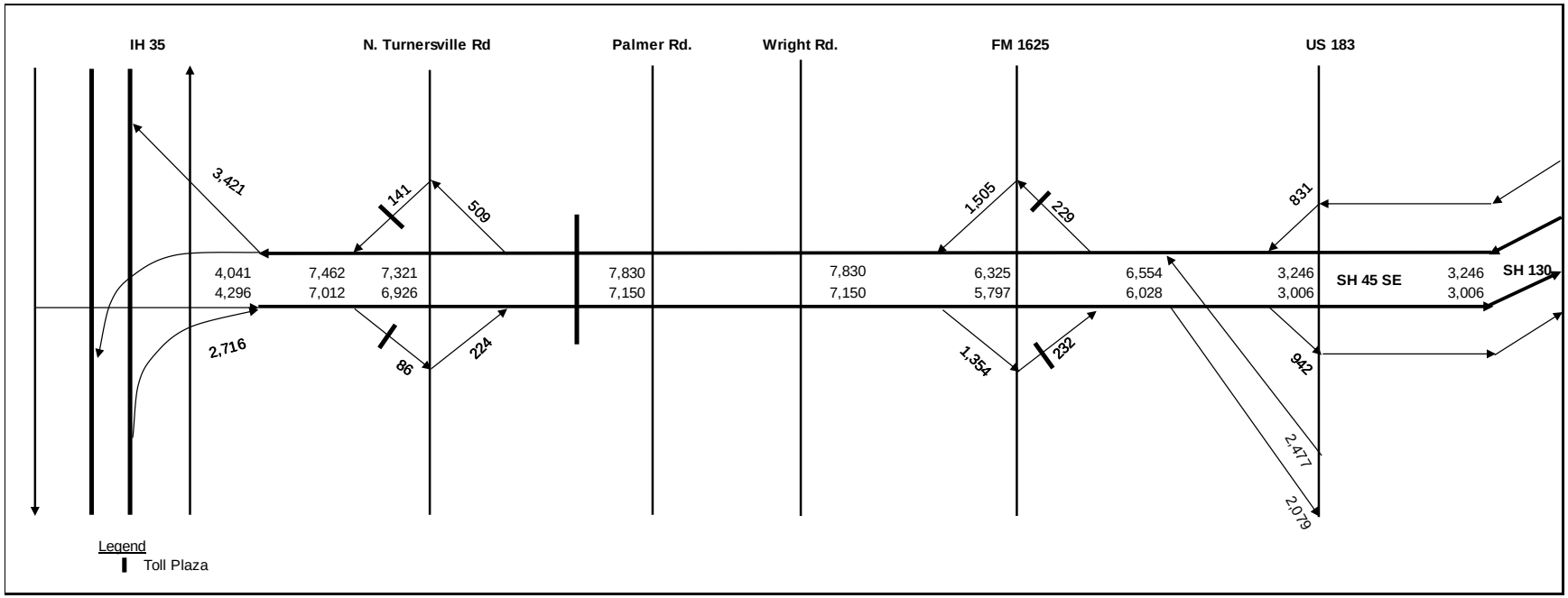


Figure 8.14 SH 45 SE Average Weekday Traffic – 2020 Model Year

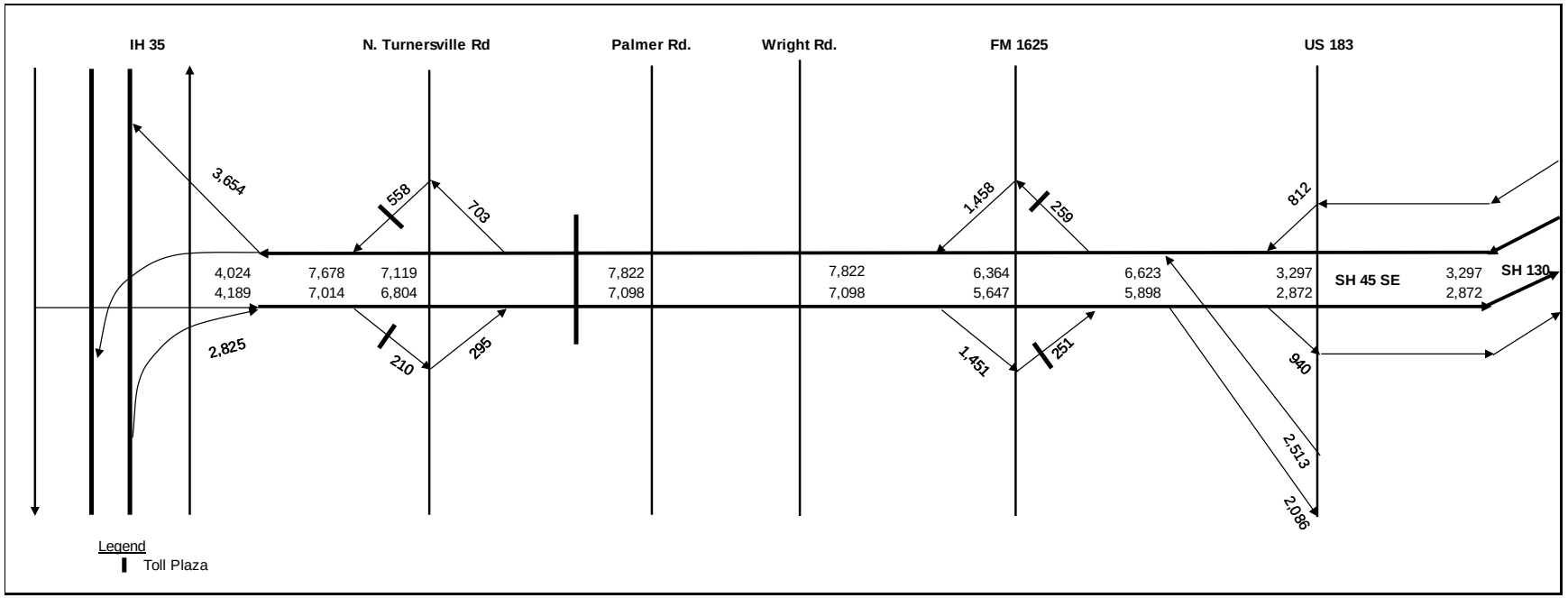


Figure 8.15 SH 45 SE Average Weekday Traffic – 2030 Model Year

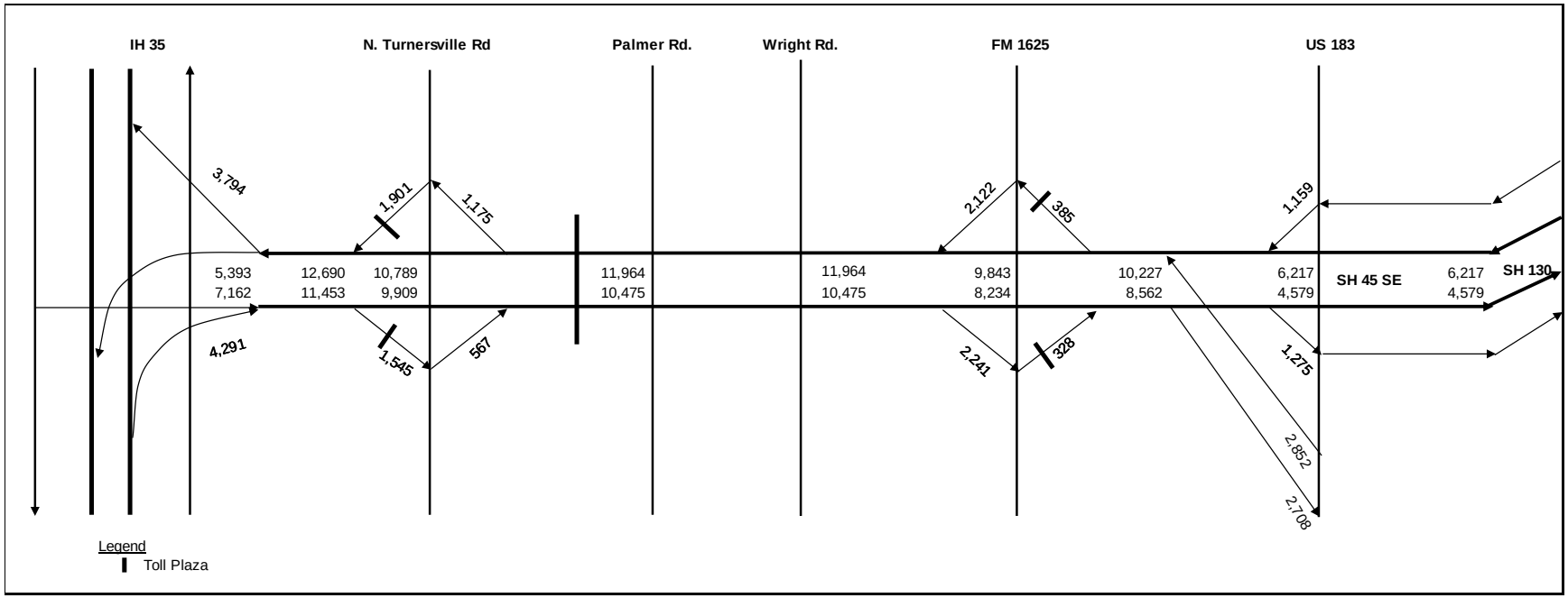
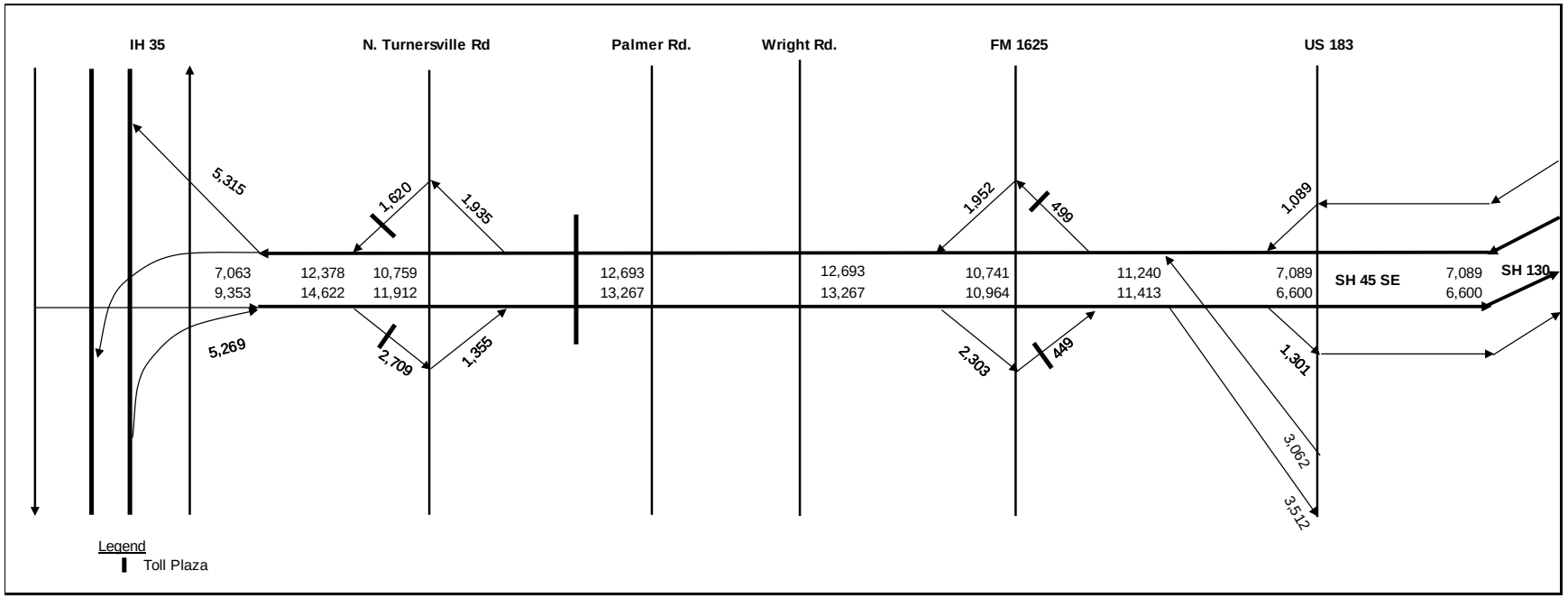


Figure 8.16 SH 45 SE Average Weekday Traffic – 2040 Model Year



8.3.2 SH 45 SE Screenline Analysis

Table 8.16 provides a listing of the traffic for the SH 45 SE corridor screenline by horizon year. This screenline is depicted earlier in this chapter as part of Figure 8.6. Note that these values are unadjusted model estimates for the model's calendar year forecasts and are intended to indicate the future demand of traffic in the corridor as estimated by the model as well as the share of traffic using SH 45 SE. From this table, SH 45 SE is the dominant roadway in this largely rural and undeveloped corridor. SH 45 SE gradually increases its share of traffic from 50 percent to 56 percent over the forecast period. Total screenline traffic increases from approximately 25,400 in 2013 to 46,300 in 2040, which implies an annual compounded growth rate of 2.2 percent over the 28-year period.

Table 8.16 Screenline 45SE-A Unadjusted Model Output

Locations	2013	% of Screenline	2015	% of Screenline	2020	% of Screenline	2030	% of Screenline	2040	% of Screenline
FM 1327	11,238	44.2%	13,277	44.7%	13,382	43.8%	13,503	34.2%	12,959	28.0%
SH 45 SE ML	**12,885**	**50.6%**	**14,980**	**50.5%**	**14,920**	**48.8%**	**22,440**	**56.8%**	**25,960**	**56.1%**
Turnersville Rd.	1,319	5.2%	1,423	4.8%	2,260	7.4%	3,596	9.1%	7,396	16.0%
TOTAL	**25,442**	**100.0%**	**29,680**	**100.0%**	**30,562**	**100.0%**	**39,539**	**100.0%**	**46,316**	**100.0%**

8.3.3 SH 45 SE Traffic and Revenue Assumptions

Table 8.17 provides a brief summary of the underlying assumptions in the transaction and revenue forecasts for SH 45 SE. All truck-related values in the table relate to the truck defined as 3+axle vehicles, consistent with TxDOT's transaction reports. Total estimated truck transactions increase from approximately 10.9 percent in 2015 to 12.9 percent by 2040. While auto ETC payment shares are assumed to gradually increase to nearly 70 percent by 2040, truck ETC share are assumed to remain relatively constant at approximately 59 percent. The average truck toll multiplier is approximately 2.72 times the auto rate, which reflects the observed distribution of trucks by axle group and current limitation for truck tolls capped at the rate of a 4-axle vehicle for SH 45 SE. The PBM toll surcharge is assumed to remain at 33 percent of the ETC rate. Similar to the other CTTS toll roads, the collection rates for PBM and ETC transactions are held constant over the forecast period. Over the forecast period the cost to traverse the full length of SH 45 SE will increase from $1.04 in 2015 to approximately $2.07 in 2040. This implies a rate of $0.15 per mile in 2015 which is increased to $0.30 by 2040. For the 2012 Update, Stantec had assumed an annualization factor of 300, given the limited amount of detailed data by vehicle type due to the shaped-based toll plan in place at that time, whereby vehicles are tolled based on their shape (such as single unit truck, one-trailer, etc.). For the 2014 Study, adequate data were available to justify an annualization factor of 330, consistent with the value used for SH 130.

Table 8.17 SH 45 SE Tolling and Traffic Characteristic Assumptions by Model Year

Model Year	2015	2020	2030	2040
Vehicle Type Distribution				
Autos	89.1%	89.1%	88.6%	87.1%
Trucks	10.9%	10.9%	11.4%	12.9%
Payment Type Distribution - Passenger Cars				
PBM	35.4%	34.4%	32.3%	30.2%
ETC	64.6%	65.6%	67.7%	69.8%
Payment Type Distribution - Trucks				
PBM	40.6%	40.6%	40.6%	40.6%
ETC	59.4%	59.4%	59.4%	59.4%
Toll Ratios				
Truck/Auto Ratio	2.72	2.72	2.72	2.72
PBM/ETC Toll Rate	1.33	1.33	1.33	1.33
Collection Rates				
PBM	47.7%	47.7%	47.7%	47.7%
ETC	99.7%	99.7%	99.7%	99.7%
Full Length Trip				
Distance	7.0	7.0	7.0	7.0
Rate per Mile	$0.15	$0.17	$0.22	$0.30
Toll Cost (ETC)	$1.04	$1.16	$1.54	$2.07
Annualization Factor	330	330	330	330

8.3.4 SH 45 SE Transactions and Revenue by Paypoint

SH 45 SE transaction and revenue statistics by paypoint and horizon year are listed in Table 8.18. Both total and paying transactions are provided, where paying transactions reflect the assumptions for collection efficiency for each payment type. The average toll rate represents a blend of the individual rates by payment type and vehicle type. This blended value includes a 33 percent surcharge over the ETC rates for PBM patrons. These values are calendar year values, rather than the blended estimates created for each fiscal year shown in the next section.

Average weekday total transactions on SH 45 SE range from 13,100 in 2013 to 45,860 in 2040, representing a compounded annual growth rate of 4.8 percent. During the same timeframe, average weekday revenues range from $11,000 to $91,000 and exhibit a compounded annual growth rate of 8.1 percent.

Table 8.18 SH 45 SE Average Weekday Total Transactions and Toll Revenue (Adjusted for Calibration)

Toll Location	2013				2015				2020				2030				2040			
	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue	Transactions		Avg. Toll	Revenue
	Total	Paying			Total	Paying			Total	Paying			Total	Paying			Total	Paying		
Turnersville Rd	154	123	$0.71	$87	230	197	$0.78	$154	1,129	957	$0.90	$859	5,058	4,423	$1.11	$4,911	6,356	5,533	$1.53	$8,464
Mainline Plaza - 45 SE	**12,498**	**9,921**	**$1.08**	**$10,690**	**15,176**	**12,289**	**$1.26**	**$15,484**	**21,905**	**17,823**	**$1.40**	**$24,983**	**32,945**	**26,943**	**$1.89**	**$50,945**	**38,113**	**31,551**	**$2.57**	**$80,930**
FM 1625	415	313	$0.72	$227	466	372	$0.78	$291	748	597	$0.87	$517	1,046	815	$1.17	$954	1,392	1,108	$1.58	$1,752
SH 45 SE Total	**13,067**	**10,357**		**$11,004**	**15,873**	**12,858**		**$15,929**	**23,781**	**19,377**		**$26,359**	**39,048**	**32,180**		**$56,810**	**45,860**	**38,192**		**$91,146**
Annual Revenue in Millions				**$3.6**				**$5.3**				**$8.7**				**$18.7**				**$30.1**

Note: The average toll is calculated by Revenue divided by Paying Transactions.

8.3.5 SH 45 SE Traffic and Revenue Forecasts

Table 8.19 provides the forecasted transactions and revenue for the entire 35-year forecast period on a fiscal year basis. Average weekday traffic statistics are provided on the left side of the table and annual values are provided on the right side along with statistics related to truck traffic. The values for the years FY 2008 to FY 2014 are the observed transactions and reported revenue for the first seven years of operation.

As shown in the table, SH 45 SE continues to show significant growth, reflecting the development potential in this corridor. Transaction growth of 11.8 percent occurred in FY 2013, and FY 2014 also demonstrated growth of approximately 11.3 percent. In the forecast period beginning in FY 2015, Stantec adjusted the growth trend downward to intercept the model-based forecasts by FY 2021. Following the assumed completion of SH 45 SW in 2030, the forecasted transaction growth then transitions downward to approximately 1.5 percent per year by FY 2042. The assumed share of paying transactions is relatively consistent ranging from 80 to 83 percent, and the combined ETC share (autos and trucks) increases gradually to 68 percent by FY 2042. For FY 2015, revenue growth is estimated at 7.8 percent due to the difference in the reporting basis of revenue between TxDOT and the assumptions in the modeling process, as described in the SH 130 discussion, regarding revenue recognition differences. Beyond FY 2015, revenue growth generally follows a trend established by a sum of transaction growth and the annual toll escalation assumed for each year. The truck percentage share of paying transactions and revenue is shown in the last two columns of the table. Paying truck transactions are approximately 11 percent of total paying transactions in FY 2015 but increase to 12 percent over the forecast period. Truck revenue increases from 21 percent of the total revenue to 25 percent by FY 2042.

Table 8.19 SH 45 SE Transaction and Revenue Forecasts

Fiscal Year	Average Weekday Transactions (AWT)					Annual Transactions & Revenue					
										3+ Axle Truck Percentage	
	Total Transactions	YOY Growth	Total Transactions ETC Share	Paying Transactions	Paying Percentage	Annual Total Transactions (in 000s)	Annual Paying Transactions (in 000s)	Annual Revenue (in $000s)	YOY Growth	Paying Transactions	Revenue
2008											
2009				*6,609*				***$475***			
2010	***8,553***		***63.6%***	*6,952*	*81%*	***2,864***	*2,328*	***$3,210***			
2011	***9,423***	***10.2%***	***62.7%***	*7,659*	*81%*	***3,178***	*2,583*	***$3,596***	***12.0%***		
2012	***11,302***	***19.9%***	***56.6%***	*9,037*	*80%*	***3,842***	*3,072*	***$4,246***	***18.1%***		
2013	***12,636***	***11.8%***	***61.8%***	*10,061*	*80%*	***4,300***	*3,424*	***$4,274***	***0.7%***		
2014	***14,069***	***11.3%***	***61.0%***	*11,203*	*80%*	***4,743***	*3,777*	***$4,680***	***9.5%***		
2015	15,395	9.4%	63.0%	12,385	80%	5,080	4,087	$5,046	7.8%	10.6%	21.1%
2016	16,882	9.7%	64.2%	13,686	81%	5,571	4,516	$5,675	12.4%	10.6%	21.2%
2017	18,427	9.2%	64.4%	14,956	81%	6,081	4,935	$6,329	11.5%	10.7%	21.3%
2018	20,011	8.6%	64.5%	16,260	81%	6,604	5,366	$7,024	11.0%	10.7%	21.5%
2019	21,621	8.0%	64.7%	17,588	81%	7,135	5,804	$7,744	10.3%	10.7%	21.5%
2020	23,241	7.5%	64.9%	18,929	81%	7,669	6,247	$8,461	9.3%	10.6%	21.1%
2021	24,808	6.7%	65.1%	20,229	82%	8,187	6,676	$9,231	9.1%	10.6%	21.1%
2022	26,346	6.2%	65.3%	21,508	82%	8,694	7,098	$10,051	8.9%	10.6%	21.3%
2023	27,881	5.8%	65.4%	22,787	82%	9,201	7,520	$10,905	8.5%	10.7%	21.4%
2024	29,413	5.5%	65.6%	24,066	82%	9,706	7,942	$11,794	8.2%	10.7%	21.6%
2025	30,942	5.2%	65.8%	25,346	82%	10,211	8,364	$12,719	7.8%	10.7%	21.7%
2026	32,469	4.9%	66.0%	26,627	82%	10,715	8,787	$13,726	7.9%	10.8%	21.8%
2027	33,992	4.7%	66.2%	27,908	82%	11,217	9,210	$14,800	7.8%	10.8%	22.0%
2028	35,512	4.5%	66.3%	29,189	82%	11,719	9,632	$15,924	7.6%	10.8%	22.1%
2029	37,029	4.3%	66.5%	30,471	82%	12,220	10,055	$17,100	7.4%	10.9%	22.2%
2030	38,544	4.1%	66.7%	31,753	82%	12,719	10,478	$18,331	7.2%	10.9%	22.3%
2031	39,502	2.5%	66.9%	32,578	82%	13,036	10,751	$19,372	5.7%	11.0%	22.5%
2032	40,184	1.7%	67.0%	33,175	83%	13,261	10,948	$20,334	5.0%	11.1%	22.8%
2033	40,865	1.7%	67.2%	33,772	83%	13,485	11,145	$21,337	4.9%	11.3%	23.0%
2034	41,546	1.7%	67.4%	34,371	83%	13,710	11,343	$22,382	4.9%	11.4%	23.3%
2035	42,227	1.6%	67.5%	34,972	83%	13,935	11,541	$23,471	4.9%	11.5%	23.5%
2036	42,908	1.6%	67.7%	35,573	83%	14,160	11,739	$24,605	4.8%	11.7%	23.7%
2037	43,590	1.6%	67.9%	36,175	83%	14,385	11,938	$25,785	4.8%	11.8%	23.9%
2038	44,271	1.6%	68.0%	36,779	83%	14,609	12,137	$27,015	4.8%	11.9%	24.1%
2039	44,952	1.5%	68.2%	37,384	83%	14,834	12,337	$28,295	4.7%	12.0%	24.3%
2040	45,633	1.5%	68.4%	37,990	83%	15,059	12,537	$29,628	4.7%	12.1%	24.5%
2041	46,319	1.5%	68.4%	38,574	83%	15,285	12,729	$30,990	4.6%	12.2%	24.6%
2042	47,014	1.5%	68.4%	39,152	83%	15,515	12,920	$32,398	4.5%	12.2%	24.6%

Revenue for PBM patrons was not allocated by each toll facility until September 2009; therefore, annual revenues shown for FY 2008 - FY 2009 are estimated.

Actual Average Weekday Transactions and Annual Revenue

8.4 TOTAL CTTS TRAFFIC & REVENUE FORECASTS

Table 8.20 lists the paying AWT transactions and revenue by CTTS roadway, along with a grand total for the system. The growth rate for each estimate is provided as well.

Table 8.21 lists the total transactions and annual revenue for the combined CTTS. This table provides all of the statistics is the same format shown for the individual elements and provides system-wide statistics for total and paying transactions as well as ETC share and truck usage estimates.

Table 8.22 provides a comparison of the paying AWT transactions and annual revenue between the 2012 Update and the current forecasts. As shown in the table, the system-wide value of paying transactions is approximately 16 percent higher in the early years of the forecast due primarily to the higher level of recent growth in both SH 130 and SH 45 SE. The difference in paying transactions does decrease to about 12 percent by FY 2030 and generally is about 9 to 10 percent higher thereafter to 2042. In contrast, revenue is approximately 11 percent higher in FY 2015 and then gradually declines to equal the values from the 2012 Update by FY 2025. This gradual decline towards the prior forecast values is due to several changes in the forecasting assumptions from the conditions used in the prior forecasts. These changes include:

- Lower toll escalation rates in the early forecast years. In the 2012 Update it was assumed that the annual toll escalation would be approximately 3.0 percent per year. The 2014 Study assumes starting values at 1.7 percent per year with a gradual escalation up to 3.0 percent by the year 2030, as discussed previously in Chapter 4.

- Lower share of ETC transactions. The 2012 Update had assumed that the ETC share of transactions would increase towards approximately 80 percent over the forecast period, except for SH 45 SE. Recent trends indicate that ETC shares are stable or declining slightly. As a result, the 2014 Study assumed that ETC shares will gradually increase towards 75 percent by 2020 and then remain relatively constant over the remainder of the forecast period.

- Lower level of collected PBM transactions. Analysis of the PBM collections data for the 2012 Update indicated that approximately 55 percent of the PBM transactions were collected, while the latest data for the first 6 months of FY 2014 indicate that collection for PBM transactions is approximately 48 percent. For the 2014 Study, Stantec assumed the PBM collection percent would remain at approximately 48 percent.

- Reduced share of SH 130 truck traffic in the current forecast. Stantec reviewed the estimation of truck trips in the CAMPO regional model and determined that this model is likely over-predicting truck traffic in the future and reduced the truck trip generation to be consistent with the overall trip generation of the non-commercial trip purposes.

Table 8.20 Paying Transactions and Revenue Forecasts by CTTS Roadway

Fiscal Year	Average Weekday Paying Transactions						Annual Revenue (in $000s)					
	SH 45 N	Loop 1	SH 130	45 SE	CTTS Total	YOY Growth	SH 45 N	Loop 1	SH 130	45 SE	CTTS Total	YOY Growth
2008	*84,058*	*50,560*	*51,747*		*186,366*		***$17,987***	***$11,463***	***$19,456***		***$48,906***	
2009	*88,687*	*50,871*	*64,875*	*6,609*	*204,433*	*9.7%*	***$19,882***	***$11,918***	***$27,114***	***$475***	***$58,914***	***20.5%***
2010	*90,879*	*52,527*	*74,547*	*6,952*	*217,953*	*6.6%*	***$19,799***	***$11,937***	***$34,408***	***$3,210***	***$66,144***	***12.3%***
2011	*94,478*	*54,587*	*79,840*	*7,659*	*228,905*	*5.0%*	***$20,268***	***$12,317***	***$36,237***	***$3,596***	***$68,822***	***4.0%***
2012	*100,302*	*57,291*	*89,000*	*9,037*	*246,593*	*7.7%*	***$21,945***	***$13,015***	***$40,735***	***$4,246***	***$75,695***	***10.0%***
2013	*100,665*	*55,032*	*100,861*	*10,061*	*266,619*	*8.1%*	***$29,075***	***$16,143***	***$54,492***	***$4,274***	***$103,985***	***37.4%***
2014	*101,640*	*54,116*	*111,557*	*11,203*	*278,516*	*4.5%*	***$34,831***	***$18,560***	***$67,092***	***$4,680***	***$125,163***	***20.4%***
2015	120,606	64,037	123,955	12,385	320,983	15.2%	$41,922	$23,123	$70,573	$5,046	$140,665	12.4%
2016	122,816	66,704	136,297	13,686	339,503	5.8%	$43,700	$24,595	$78,930	$5,675	$152,900	8.7%
2017	124,472	69,049	148,256	14,956	356,732	5.1%	$45,312	$25,948	$87,431	$6,329	$165,020	7.9%
2018	126,149	71,473	159,756	16,260	373,638	4.7%	$46,983	$27,375	$95,948	$7,024	$177,330	7.5%
2019	127,847	73,981	170,526	17,588	389,942	4.4%	$48,715	$28,881	$104,280	$7,744	$189,621	6.9%
2020	129,566	76,574	180,367	18,929	405,435	4.0%	$50,512	$30,470	$112,226	$8,461	$201,669	6.4%
2021	131,953	78,518	188,340	20,229	419,040	3.4%	$52,919	$32,085	$119,705	$9,231	$213,939	6.1%
2022	134,708	80,147	195,538	21,508	431,900	3.1%	$55,715	$33,755	$127,186	$10,051	$226,707	6.0%
2023	137,522	81,809	202,722	22,787	444,839	3.0%	$58,659	$35,512	$135,042	$10,905	$240,119	5.9%
2024	140,393	83,505	209,894	24,066	457,859	2.9%	$61,759	$37,361	$143,245	$11,794	$254,159	5.8%
2025	143,325	85,237	217,057	25,346	470,965	2.9%	$65,023	$39,306	$151,753	$12,719	$268,800	5.8%
2026	146,318	87,004	224,211	26,627	484,160	2.8%	$68,459	$41,352	$161,100	$13,726	$284,637	5.9%
2027	149,374	88,808	231,355	27,908	497,445	2.7%	$72,077	$43,504	$171,097	$14,800	$301,477	5.9%
2028	152,493	90,650	238,491	29,189	510,823	2.7%	$75,886	$45,769	$181,525	$15,924	$319,104	5.8%
2029	155,678	92,529	245,617	30,471	524,295	2.6%	$79,896	$48,151	$192,402	$17,100	$337,549	5.8%
2030	158,929	94,448	252,733	31,753	537,863	2.6%	$84,118	$50,658	$203,744	$18,331	$356,850	5.7%
2031	161,307	96,298	259,748	32,578	549,931	2.2%	$88,026	$53,229	$216,195	$19,372	$376,822	5.6%
2032	163,254	98,129	266,713	33,175	561,271	2.1%	$91,850	$55,898	$229,529	$20,334	$397,611	5.5%
2033	165,224	99,995	273,679	33,772	572,670	2.0%	$95,839	$58,702	$243,491	$21,337	$419,370	5.5%
2034	167,217	101,897	280,644	34,371	584,130	2.0%	$100,002	$61,645	$258,109	$22,382	$442,139	5.4%
2035	169,235	103,835	287,609	34,972	595,651	2.0%	$104,346	$64,737	$273,409	$23,471	$465,962	5.4%
2036	171,277	105,810	294,574	35,573	607,234	1.9%	$108,878	$67,983	$289,419	$24,605	$490,885	5.3%
2037	173,344	107,822	301,540	36,175	618,881	1.9%	$113,608	$71,392	$306,171	$25,785	$516,956	5.3%
2038	175,436	109,873	308,505	36,779	630,592	1.9%	$118,542	$74,973	$323,694	$27,015	$544,224	5.3%
2039	177,553	111,962	315,470	37,384	642,369	1.9%	$123,691	$78,732	$342,021	$28,295	$572,739	5.2%
2040	179,695	114,092	322,435	37,990	654,212	1.8%	$129,064	$82,680	$361,184	$29,628	$602,557	5.2%
2041	181,856	116,260	328,979	38,574	665,668	1.8%	$134,664	$86,851	$379,943	$30,990	$632,448	5.0%
2042	184,038	118,469	335,284	39,152	676,943	1.7%	$140,505	$91,245	$398,840	$32,398	$662,988	4.8%

Notes: 1) SH 45 SE opened in May 2009 but did not become part of the CTTS until September 2012; therefore, it is not included in CTTS totals until FY 2013.
2) Revenue includes PBM surcharge (33 percent of ETC toll).
3) ***Actual Annual Revenue***

Table 8.21 Total CTTS Transaction and Revenue Forecasts

Fiscal Year	Average Weekday Transactions (AWT)					Annual Transactions & Revenue					
										3+ Axle Truck Percentage	
	Total Transactions	YOY Growth	Total Transactions ETC Share	Paying Transactions	Paying Percentage	Annual Total Transactions (in 000s)	Annual Paying Transactions (in 000s)	Annual Revenue (in $000s)	YOY Growth	Paying Transactions	Revenue
2008	***204,133***			*186,366*	*91%*	***65,940***	*60,185*	***$48,906***			
2009	***224,276***	***9.9%***	***73.7%***	*204,433*	*91%*	***73,108***	*66,617*	***$58,914***	***20.5%***		
2010	***239,343***	***6.7%***	***74.1%***	*217,953*	*91%*	***78,529***	*71,485*	***$66,144***	***12.3%***		
2011	***251,437***	***5.1%***	***71.6%***	*228,905*	*91%*	***83,010***	*75,539*	***$68,822***	***4.0%***		
2012	***273,411***	***8.7%***	***71.4%***	*246,593*	*90%*	***90,032***	*81,164*	***$75,695***	***10.0%***		
2013	***310,671***	***13.6%***	***71.8%***	*266,619*	*86%*	***102,507***	*87,898*	***$103,985***	***37.4%***		
2014	***330,988***	***6.5%***	***70.0%***	*278,516*	*84%*	***109,049***	*91,708*	***$125,163***	***20.4%***		
2015	375,479	13.4%	72.7%	320,983	85%	121,820	104,078	$140,665	12.4%	5.8%	13.7%
2016	396,069	5.5%	73.1%	339,503	86%	128,566	110,141	$152,900	8.7%	6.0%	14.1%
2017	415,127	4.8%	73.5%	356,732	86%	134,819	115,786	$165,020	7.9%	6.1%	14.4%
2018	433,688	4.5%	73.9%	373,638	86%	140,908	121,324	$177,330	7.5%	6.3%	14.6%
2019	451,422	4.1%	74.4%	389,942	86%	146,723	126,662	$189,621	6.9%	6.4%	14.9%
2020	467,999	3.7%	74.9%	405,435	87%	152,156	131,732	$201,669	6.4%	6.5%	15.1%
2021	483,445	3.3%	75.0%	419,040	87%	157,208	136,179	$213,939	6.1%	6.6%	15.2%
2022	498,598	3.1%	74.9%	431,900	87%	162,159	140,379	$226,707	6.0%	6.6%	15.3%
2023	513,843	3.1%	74.8%	444,839	87%	167,139	144,603	$240,119	5.9%	6.7%	15.5%
2024	529,180	3.0%	74.7%	457,859	87%	172,149	148,854	$254,159	5.8%	6.8%	15.7%
2025	544,613	2.9%	74.6%	470,965	86%	177,189	153,133	$268,800	5.8%	6.9%	15.9%
2026	560,145	2.9%	74.5%	484,160	86%	182,261	157,440	$284,637	5.9%	7.0%	16.1%
2027	575,777	2.8%	74.4%	497,445	86%	187,364	161,775	$301,477	5.9%	7.1%	16.3%
2028	591,511	2.7%	74.3%	510,823	86%	192,500	166,140	$319,104	5.8%	7.2%	16.5%
2029	607,351	2.7%	74.3%	524,295	86%	197,670	170,535	$337,549	5.8%	7.3%	16.7%
2030	623,299	2.6%	74.2%	537,863	86%	202,874	174,961	$356,850	5.7%	7.4%	16.9%
2031	637,351	2.3%	74.2%	549,931	86%	207,464	178,901	$376,822	5.6%	7.5%	17.1%
2032	650,478	2.1%	74.2%	561,271	86%	211,754	182,605	$397,611	5.5%	7.7%	17.4%
2033	663,670	2.0%	74.2%	572,670	86%	216,065	186,329	$419,370	5.5%	7.8%	17.6%
2034	676,927	2.0%	74.2%	584,130	86%	220,397	190,072	$442,139	5.4%	7.9%	17.8%
2035	690,251	2.0%	74.2%	595,651	86%	224,750	193,834	$465,962	5.4%	8.0%	18.1%
2036	703,643	1.9%	74.2%	607,234	86%	229,124	197,616	$490,885	5.3%	8.2%	18.3%
2037	717,103	1.9%	74.2%	618,881	86%	233,521	201,419	$516,956	5.3%	8.3%	18.5%
2038	730,634	1.9%	74.2%	630,592	86%	237,940	205,242	$544,224	5.3%	8.4%	18.7%
2039	744,235	1.9%	74.3%	642,369	86%	242,382	209,087	$572,739	5.2%	8.5%	18.9%
2040	757,909	1.8%	74.3%	654,212	86%	246,847	212,952	$602,557	5.2%	8.6%	19.1%
2041	771,204	1.8%	74.3%	665,668	86%	251,186	216,689	$632,448	5.0%	8.6%	19.1%
2042	784,320	1.7%	74.2%	676,943	86%	255,466	220,366	$662,988	4.8%	8.6%	19.1%

Notes: 1) SH 45 SE opened in May 2009 but did not become part of the CTTS until September 2012; therefore, it is not included in CTTS totals until FY 2013.
2) Revenue includes PBM surcharge (33 percent of ETC toll).
3) ***Actual Average Weekday Transactions and Annual Revenue***

Table 8.22 Comparison of 2012 and 2014 CTTS Transaction and Toll Revenue Forecasts

Fiscal Year	Average Weekday Paying Transactions			Annual Toll Revenue (in $000s)		
	2012 Update	2014 Study	% Difference	2012 Update	2014 Study	% Difference
2008	*186,366*	*186,366*	0%	***$48,906***	***$48,906***	0%
2009	*204,433*	*204,433*	0%	***$58,914***	***$58,914***	0%
2010	*217,953*	*217,953*	0%	***$66,144***	***$66,144***	0%
2011	*228,905*	*228,905*	0%	***$68,822***	***$68,822***	0%
2012	247,917	*246,593*	-1%	$74,229	***$75,695***	2%
2013	247,592	*266,619*	8%	$96,685	***$103,985***	8%
2014	258,034	*278,516*	8%	$115,359	***$125,163***	8%
2015	276,119	320,983	16%	$127,138	$140,665	11%
2016	290,229	339,503	17%	$138,980	$152,900	10%
2017	303,647	356,732	17%	$151,984	$165,020	9%
2018	317,267	373,638	18%	$165,261	$177,330	7%
2019	331,096	389,942	18%	$178,827	$189,621	6%
2020	345,142	405,435	17%	$192,703	$201,669	5%
2021	359,413	419,040	17%	$206,909	$213,939	3%
2022	373,917	431,900	16%	$221,468	$226,707	2%
2023	388,663	444,839	14%	$236,403	$240,119	2%
2024	403,659	457,859	13%	$251,740	$254,159	1%
2025	418,917	470,965	12%	$267,506	$268,800	0%
2026	431,392	484,160	12%	$285,323	$284,637	0%
2027	443,670	497,445	12%	$303,395	$301,477	-1%
2028	456,124	510,823	12%	$321,892	$319,104	-1%
2029	468,761	524,295	12%	$340,839	$337,549	-1%
2030	481,585	537,863	12%	$360,263	$356,850	-1%
2031	494,601	549,931	11%	$380,193	$376,822	-1%
2032	507,815	561,271	11%	$400,659	$397,611	-1%
2033	521,233	572,670	10%	$421,693	$419,370	-1%
2034	534,860	584,130	9%	$443,329	$442,139	0%
2035	548,701	595,651	9%	$465,605	$465,962	0%
2036	558,849	607,234	9%	$485,554	$490,885	1%
2037	567,769	618,881	9%	$504,918	$516,956	2%
2038	576,720	630,592	9%	$524,617	$544,224	4%
2039	585,702	642,369	10%	$544,666	$572,739	5%
2040	594,716	654,212	10%	$565,077	$602,557	7%
2041	603,761	665,668	10%	$585,867	$632,448	8%
2042	612,837	676,943	10%	$607,049	$662,988	9%

Notes: 1) SH 45 SE opened in May 2009 but did not become part of the CTTS until September 2012; therefore, it is not included in CTTS totals until FY 2013.
2) Revenue includes PBM surcharge (33 percent of ETC toll).
3) ***Actual Annual Revenue***

Table 8.23 provides a comparison of the total annual transactions by payment method between the 2012 Update and the current forecasts. Since cash was eliminated as a payment option in January 2013, only the historical breakdown of ETC and PBM transactions for FY 2014 is comparable to the forecasted distribution. As shown in the table, FY 2013 total transactions (including cash transactions) were 15.4 percent higher, and FY 2014 total transactions were 17.6 percent higher than forecasted in the 2012 Update. FY 2014 ETC transactions are approximately 3.4 percent greater than forecasted in the 2012 Update. The 2014 Study estimates that ETC transactions will be 12.0 percent greater in 2015 and 6.6 percent greater in 2042 than the 2012 Update. PBM transactions are 64.1 percent greater in 2015 and 59.9 percent greater in 2042.

Table 8.23 Comparison of 2012 and 2014 CTTS Total Annual Transactions Forecasts

Fiscal Year	Total Annual Transactions (in 000's)								
	ETC			PBM			Total		
	2012 Update	2014 Study	% Difference	2012 Update	2014 Study	% Difference	2012 Update	2014 Study	% Difference
2013	68,547	***76,109***	11.0%	20,258	***26,398***	30.3%	88,805	***102,507***	15.4%
2014	73,803	***76,331***	3.4%	18,927	***32,717***	72.9%	92,730	***109,049***	17.6%
2015	78,898	88,404	12.0%	20,368	33,416	64.1%	99,266	121,820	22.7%
2016	82,968	93,875	13.1%	21,360	34,691	62.4%	104,328	128,566	23.2%
2017	86,850	98,995	14.0%	22,286	35,824	60.7%	109,136	134,819	23.5%
2018	90,801	104,060	14.6%	23,212	36,848	58.7%	114,013	140,908	23.6%
2019	94,824	108,991	14.9%	24,137	37,732	56.3%	118,961	146,723	23.3%
2020	98,921	113,757	15.0%	25,063	38,398	53.2%	123,984	152,156	22.7%
2021	103,094	117,674	14.1%	25,989	39,534	52.1%	129,083	157,208	21.8%
2022	107,346	121,209	12.9%	26,916	40,950	52.1%	134,262	162,159	20.8%
2023	111,680	124,766	11.7%	27,845	42,373	52.2%	139,525	167,139	19.8%
2024	116,098	128,345	10.5%	28,777	43,804	52.2%	144,875	172,149	18.8%
2025	120,603	131,950	9.4%	29,711	45,239	52.3%	150,314	177,189	17.9%
2026	124,267	135,580	9.1%	30,429	46,681	53.4%	154,696	182,261	17.8%
2027	127,873	139,236	8.9%	31,126	48,128	54.6%	158,999	187,364	17.8%
2028	131,543	142,918	8.6%	31,827	49,582	55.8%	163,369	192,500	17.8%
2029	135,276	146,628	8.4%	32,531	51,042	56.9%	167,807	197,670	17.8%
2030	139,075	150,365	8.1%	33,240	52,509	58.0%	172,314	202,874	17.7%
2031	142,940	153,732	7.6%	33,952	53,732	58.3%	176,892	207,464	17.3%
2032	146,873	156,921	6.8%	34,670	54,833	58.2%	181,542	211,754	16.6%
2033	150,874	160,127	6.1%	35,392	55,938	58.1%	186,266	216,065	16.0%
2034	154,946	163,351	5.4%	36,119	57,046	57.9%	191,065	220,397	15.4%
2035	159,090	166,593	4.7%	36,851	58,156	57.8%	195,941	224,750	14.7%
2036	162,024	169,854	4.8%	37,547	59,270	57.9%	199,571	229,124	14.8%
2037	164,621	173,134	5.2%	38,165	60,387	58.2%	202,786	233,521	15.2%
2038	167,227	176,432	5.5%	38,785	61,508	58.6%	206,012	237,940	15.5%
2039	169,842	179,751	5.8%	39,407	62,632	58.9%	209,249	242,382	15.8%
2040	172,467	183,088	6.2%	40,031	63,759	59.3%	212,498	246,847	16.2%
2041	175,100	186,295	6.4%	40,657	64,891	59.6%	215,758	251,186	16.4%
2042	177,743	189,440	6.6%	41,285	66,026	59.9%	219,029	255,466	16.6%

Notes: 1) Cash payment option was eliminated in January 2013. ETC transactions shown for FY 2013 include cash transactions.

2) ***Actual Annual Transactions***

3) Transactions shown for the 2012 Update are estimated from data shown in the 2012 Update.

8.5 CUSTOMER SERVICE CENTER REVENUE FORECASTS

In addition to the toll revenues generated by CTTS, TxDOT also generates revenue from various fees charged to patrons by the CSC, as discussed previously in Chapter 4 of this report. This

additional revenue includes various fees and charges associated with the acquisition and use of the transponders for the ETC payment option and the use of PBM payment option[1].

Table 8.24 shows the estimated Toll plus Customer Service Center (CSC) revenues prepared for this report and how they compare to the 2012 Update. The latest fee information for FY 2014 indicates that CSC revenue was approximately $0.065 per ETC transaction and $0.305 per PBM transaction. The CSC forecasts held these values constant during the forecast period, as TxDOT has not yet established a policy to escalate these fees over time.

Table 8.24 Estimated Toll plus Customer Service Center Revenue

Fiscal Year	Toll Revenue		CSC Revenue		Total Revenue			Annual Revenue Growth	
	2012 Update	2014 Study	2012 Update	2014 Study	2012 Update	2014 Study	% Diff.	2012 Update	2014 Study
2008	***$48,906***	***$48,906***			***$48,906***	***$48,906***	***0.0%***		
2009	***$58,914***	***$58,914***	***$5,320***	***$5,320***	***$64,234***	***$64,234***	***0.0%***	***31.3%***	***31.3%***
2010	***$66,144***	***$66,144***	***$7,172***	***$7,172***	***$73,316***	***$73,316***	***0.0%***	***14.1%***	***14.1%***
2011	***$68,822***	***$68,822***	***$6,562***	***$6,562***	***$75,384***	***$75,384***	***0.0%***	***2.8%***	***2.8%***
2012	$74,229	***$75,695***	$10,800	***$10,800***	$85,029	***$86,495***	1.7%	12.8%	***14.7%***
2013	$96,685	***$103,985***	$10,429	***$13,290***	$107,114	***$117,275***	9.5%	26.0%	***35.6%***
2014	$115,359	***$125,163***	$10,869	***$12,710***	$126,227	***$137,873***	9.2%	17.8%	***17.6%***
2015	$127,138	$140,665	$11,631	$15,961	$138,768	$156,626	12.9%	9.9%	13.6%
2016	$138,980	$152,900	$12,225	$16,707	$151,205	$169,607	12.2%	9.0%	8.3%
2017	$151,984	$165,020	$12,790	$17,386	$164,774	$182,406	10.7%	9.0%	7.5%
2018	$165,261	$177,330	$13,364	$18,028	$178,624	$195,358	9.4%	8.4%	7.1%
2019	$178,827	$189,621	$13,946	$18,619	$192,773	$208,240	8.0%	7.9%	6.6%
2020	$192,703	$201,669	$14,538	$19,132	$207,241	$220,801	6.5%	7.5%	6.0%
2021	$206,909	$213,939	$15,139	$19,734	$222,048	$233,673	5.2%	7.1%	5.8%
2022	$221,468	$226,707	$15,750	$20,397	$237,218	$247,104	4.2%	6.8%	5.7%
2023	$236,403	$240,119	$16,371	$21,063	$252,774	$261,182	3.3%	6.6%	5.7%
2024	$251,740	$254,159	$17,003	$21,733	$268,743	$275,892	2.7%	6.3%	5.6%
2025	$267,506	$268,800	$17,645	$22,406	$285,151	$291,206	2.1%	6.1%	5.6%
2026	$285,323	$284,637	$18,171	$23,083	$303,494	$307,720	1.4%	6.4%	5.7%
2027	$303,395	$301,477	$18,688	$23,763	$322,083	$325,240	1.0%	6.1%	5.7%
2028	$321,892	$319,104	$19,213	$24,446	$341,105	$343,550	0.7%	5.9%	5.6%
2029	$340,839	$337,549	$19,745	$25,134	$360,584	$362,683	0.6%	5.7%	5.6%
2030	$360,263	$356,850	$20,285	$25,825	$380,548	$382,675	0.6%	5.5%	5.5%
2031	$380,193	$376,822	$20,833	$26,418	$401,026	$403,240	0.6%	5.4%	5.4%
2032	$400,659	$397,611	$21,390	$26,962	$422,048	$424,573	0.6%	5.2%	5.3%
2033	$421,693	$419,370	$21,955	$27,508	$443,648	$446,878	0.7%	5.1%	5.3%
2034	$443,329	$442,139	$22,529	$28,056	$465,858	$470,195	0.9%	5.0%	5.2%
2035	$465,605	$465,962	$23,112	$28,606	$488,717	$494,568	1.2%	4.9%	5.2%
2036	$485,554	$490,885	$23,540	$29,159	$509,093	$520,044	2.2%	4.2%	5.2%
2037	$504,918	$516,956	$23,915	$29,714	$528,833	$546,670	3.4%	3.9%	5.1%
2038	$524,617	$544,224	$24,292	$30,271	$548,909	$574,495	4.7%	3.8%	5.1%
2039	$544,666	$572,739	$24,671	$30,830	$569,336	$603,569	6.0%	3.7%	5.1%
2040	$565,077	$602,557	$25,050	$31,391	$590,128	$633,948	7.4%	3.7%	5.0%
2041	$585,867	$632,448	$25,431	$31,946	$611,298	$664,394	8.7%	3.6%	4.8%
2042	$607,049	$662,988	$25,814	$32,497	$632,862	$695,485	9.9%	3.5%	4.7%

Notes: 1) SH 45 SE opened in May 2009 but did not become part of the CTTS until September 2012; therefore, it is not included in CTTS totals until FY 2013.
2) Historical Total Revenues differ from Audited Financial Reports due to accrued toll revenue receivables.
3) ***Actual Annual Revenue***

[1] Minute Order No. 110816 and Minute Order No. 112971

8.6 MONTHLY TRANSACTION AND REVENUE FORECASTS

This report presents forecasts of transactions and revenue in several formats. Transactions are provided on an AWD as well as annual basis, while revenue is provided on an annual basis. In order to provide estimates of monthly transactions and revenue consistent with the values in the CTTS quarterly reports issued by TxDOT, Stantec developed a procedure to disaggregate the annual values in this report for selected fiscal years utilizing observed data from TxDOT quarterly reports. The process implicitly accounts for seasonal variation in traffic due holiday travel and weather conditions as well as variation in revenue collection due to a number of factors, including the variation of travel by PBM patrons, which could also be influenced by seasonal travel.

The monthly allocation process utilizes a three-year rolling average distribution pattern that provides a stable allocation method derived from a broad base of historical data. This approach ensures that any exceptional conditions in the patterns of any one year do not distort the overall trends under typical conditions. Since the distribution pattern is based on a rolling three-year period of data for each CTTS roadway, the pattern can change over time to reflect changes in travel patterns as the individual facilities mature and also recognize changes in the efficiency of the PBM collection system. As an example, the SH 130 element currently has a lower percentage of ETC transactions than either Loop 1 or SH 45 North, suggesting that more travelers in this corridor are infrequent users, but with possibly more usage during holiday travel periods. As development in the SH 130 corridor continues, it is possible that more transactions will be related to local travelers making more frequent trips and using ETC. This transition would likely have an impact on the monthly allocation of both transactions and revenue as the transponder patrons would likely exhibit different monthly usage patterns and have a lower toll rate per transaction. Also, revenue collection would be more efficient for ETC transactions than for PBM transactions. For the 2014 Study, the three-year rolling average period encompassed FY 2012 – FY 2014. During this period, the rolling average calculations were influenced by several notable factors. These factors include:

- During the FY 2013, on January 1, 2013 toll rates were increased significantly for Loop 1, SH 45 North, and SH 130. Tolls were increased by 50 percent on Loop 1 and by 25 percent on SH 130 and SH 45 North.

- During the first quarter of FY 2014 (December 2013 – February 2014), the weather patterns in Texas and most of the nation were much colder than seasonal norms and there were excessive snowstorms that had an impact on overall travel.

- In September 2013, TxDOT selected a new toll systems operator responsible for collecting tolls for the PBM transactions and the FY 2014 statistics during the transition period may impact the patterns in the near-term.

- A pilot program of discounted truck tolls on SH 130 and SH 45 SE in effect April to December 2013; former toll schedule back in place on January 1, 2014.

Table 8.25 provides an example of the three-year rolling average factor calculations for SH 130. The top part of the table lists the monthly SH 130 AWT for each of the last three fiscal years (FY 2012 – FY 2014) as provided by the CTTS quarterly reports. From these values, an annual AWT for each year is calculated which is weighted by number of weekdays in each month. Note that the number of weekdays for each month will vary by year due to the number of weekend days that occur in each month and the extra day from a leap year, if it occurs within the three-year period. The values for each month across all three years are summed along with all the total values for all three years. The monthly indexes are then calculated by dividing the monthly total for the three-year period by the total AWT for all three years, as shown in the last row of this section of the table.

Table 8.25 Monthly Variance for SH 130

SH 130 Average Weekday Transactions (AWT) by Month														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Annual**
Monthly AWT Transactions by Fiscal Year	FY 2012	93,233	92,657	95,945	94,714	90,245	96,797	105,065	107,062	109,359	113,856	109,197	113,239	102,027
	FY 2013	111,510	115,919	128,511	115,081	106,100	118,428	128,271	125,366	130,644	130,520	125,521	131,214	122,422
	FY 2014	129,924	129,967	138,575	125,572	116,028	127,060	142,216	145,035	146,089	152,353	150,814	151,881	138,223
Monthly AWT Index	'12-'14 avg.	0.92	0.93	1.00	0.92	0.86	0.94	1.04	1.04	1.06	1.09	1.06	1.09	1.00

SH 130 Total Transactions by Month														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Transactions by Fiscal Year (in 000s)	FY 2012	2,604	2,647	2,688	2,661	2,474	2,537	3,039	2,987	3,149	3,182	3,113	3,272	34,352
	FY 2013	3,001	3,390	3,693	3,258	2,943	3,007	3,713	3,594	3,761	3,624	3,612	3,769	41,366
	FY 2014	3,513	3,748	3,790	3,502	3,210	3,231	4,059	4,075	4,158	4,273	4,339	4,314	46,211
Monthly Transaction Percentages	'12-'14 avg.	7.5%	8.0%	8.3%	7.7%	7.1%	7.2%	8.9%	8.7%	9.1%	9.1%	9.1%	9.3%	100.0%

SH 130 Toll Revenues by Month														
Revenue Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Revenue by Fiscal Year (in $000s)	FY 2012	3,237	3,160	3,095	3,181	2,872	2,990	3,536	3,427	3,612	3,531	3,790	4,304	40,735
	FY 2013	3,788	4,140	4,106	3,806	4,310	3,677	4,996	5,144	5,698	5,389	4,876	4,563	54,492
	FY 2014	6,088	6,145	5,825	4,296	4,887	4,988	5,892	5,761	5,763	6,981	5,384	5,083	67,092
Monthly Revenue Percentages	'12-'14 avg.	8.1%	8.3%	8.0%	7.0%	7.4%	7.2%	8.9%	8.8%	9.3%	9.8%	8.7%	8.6%	100.0%

The second section of this table provides the data used to derive the average monthly transaction percentage calculations. The first three rows provide the observed monthly transactions for each of the last three fiscal years (FY 2012 – FY 2014) as provided by the CTTS quarterly reports. The values for each month across all three years are summed along with all three years. The monthly percentages are then calculated by dividing the monthly total for the three-year period by the total transactions for all three years, yielding the percentages shown in the last row of this section of the table.

The final section of this table provides the data used to derive the average monthly revenue percentage calculations. The first three rows contain the observed monthly revenue values for each of the last three fiscal years (FY 2012 – FY 2014) from the CTTS quarterly reports. Similar to the monthly transaction calculations, the values for each month across all three years are summed along with the totals for all three years and the monthly percentages are then calculated. It should be noted that due to variations in the types of transactions (auto versus trucks, ETC versus PBM), the collections processing and the lagging period for recognizing PBM revenue, there will be some variation between the monthly percentage distribution for transactions and revenue.

Table 8.26 lists the AWT by month for each CTTS element. These values include all transactions generated on the toll facilities. In order to develop a monthly pattern demonstrating the expected variation due to seasonal travel, the annual average weekday transactions are calculated initially and an index value is developed by dividing the monthly value by annual average weekday transactions. With an index value of 1.0 representing the annual average value, any months where the index value is greater than 1.0 indicates that the average weekday exceeds the annual average value while an index value less than 1.0 indicates that average weekday transactions are less than the annual average.

Table 8.26 Estimated Monthly Average Weekday Transactions, 2015

SH 45 N														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Value**
Monthly AWT Index	2014 Obs.	1.00	1.00	0.99	0.94	0.91	0.96	0.99	1.04	1.05	1.04	1.03	1.05	1.00
	2014 Est. ('12-'14 avg.)	1.00	0.99	0.99	0.96	0.94	0.98	1.00	1.03	1.04	1.03	1.00	1.04	1.00
Monthly AWT Transactions by Fiscal Year	2014 Obs.	116,671	116,577	115,937	109,855	105,748	111,546	115,797	120,904	123,201	121,232	120,257	122,959	**116,802**
	2014 Est.	116,388	116,191	115,105	111,757	109,481	114,622	116,777	120,083	121,985	119,956	116,739	121,547	**116,802**
	2014 Est. (2012 Update)	**99,702**	**99,926**	**98,052**	**96,521**	**95,601**	**98,008**	**100,891**	**103,268**	**103,795**	**102,349**	**99,324**	**103,083**	**100,115**
	2015 Est.	**135,565**	**135,336**	**134,070**	**130,170**	**127,520**	**133,508**	**136,018**	**139,869**	**142,084**	**139,720**	**135,974**	**141,574**	**136,047**

Loop 1														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Value**
Monthly AWT Index	2014 Obs.	1.01	1.01	1.00	0.95	0.92	0.97	1.00	1.03	1.04	1.03	1.02	1.03	1.00
	2014 Est. ('12-'14 avg.)	1.01	1.00	0.99	0.96	0.95	0.99	1.00	1.02	1.03	1.02	1.00	1.03	1.00
Monthly AWT Transactions by Fiscal Year	2014 Obs.	62,362	62,302	61,822	58,920	57,186	60,036	61,785	63,452	64,063	63,678	63,181	63,630	**61,894**
	2014 Est.	62,321	61,891	61,234	59,579	58,890	61,371	61,849	63,172	63,497	63,216	61,856	63,481	**61,894**
	2014 Est. (2012 Update)	**59,470**	**59,468**	**58,323**	**57,464**	**57,375**	**58,610**	**59,777**	**60,908**	**60,717**	**60,636**	**59,282**	**60,823**	**59,441**
	2015 Est.	**73,286**	**72,780**	**72,008**	**70,061**	**69,252**	**72,169**	**72,732**	**74,287**	**74,669**	**74,338**	**72,739**	**74,651**	**72,784**

SH 130														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Value**
Monthly AWT Index	2014 Obs.	0.94	0.94	1.00	0.91	0.84	0.92	1.03	1.05	1.06	1.10	1.09	1.10	1.00
	2014 Est. ('12-'14 avg.)	0.92	0.93	1.00	0.93	0.86	0.95	1.04	1.04	1.07	1.10	1.06	1.09	1.00
Monthly AWT Transactions by Fiscal Year	2014 Obs.	129,924	129,967	138,575	125,572	116,028	127,060	142,216	145,035	146,089	152,353	150,814	151,881	**138,223**
	2014 Est.	127,429	128,844	137,940	127,992	119,409	130,689	143,184	143,933	147,309	151,383	146,883	151,208	**138,223**
	2014 Est. (2012 Update)	**108,031**	**109,965**	**114,867**	**108,295**	**100,994**	**107,495**	**119,679**	**120,120**	**121,628**	**123,232**	**120,186**	**121,467**	**114,823**
	2015 Est.	**139,442**	**140,990**	**150,944**	**140,057**	**130,665**	**143,009**	**156,682**	**157,501**	**161,196**	**165,654**	**160,729**	**165,462**	**151,253**

SH 45 SE														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Value**
Monthly AWT Index	2014 Obs.	0.94	0.94	1.03	0.89	0.83	0.93	1.05	1.05	1.06	1.08	1.09	1.08	1.00
	2014 Est. ('12-'14 avg.)	0.94	0.94	0.98	0.90	0.85	0.94	1.05	1.00	1.06	1.11	1.08	1.11	1.00
Monthly AWT Transactions by Fiscal Year	2014 Obs.	13,269	13,260	14,538	12,524	11,741	13,074	14,747	14,712	14,938	15,251	15,304	15,179	**14,069**
	2014 Est.	13,283	13,275	13,768	12,679	11,963	13,224	14,837	14,137	14,968	15,597	15,245	15,548	**14,069**
	2014 Est. (2012 Update)	**11,969**	**11,955**	**12,312**	**11,739**	**10,805**	**11,600**	**13,386**	**12,785**	**13,332**	**13,822**	**13,645**	**13,589**	**12,600**
	2015 Est.	**14,535**	**14,527**	**15,066**	**13,874**	**13,091**	**14,470**	**16,235**	**15,470**	**16,379**	**17,067**	**16,683**	**17,014**	**15,395**

The first row for each section of Table 8.26 is the observed monthly index values for FY 2014, and second row is the estimated FY 2014 values based on the data from the three-year rolling average for FY 2012 – FY 2014. While there is some variation between the two indexes for several months, the patterns are largely consistent.

The last four rows of each section contain the AWT values for several conditions. The row labeled '2014 Obs.' lists the 2014 observed monthly AWT for FY 2014. The next row labeled '2014 Est.' is a hypothetical allocation of the 2014 observed data, using the FY 2012 – FY 2014 rolling average patterns, which simply demonstrates the degree of replication provided by the pattern. The following row labeled '2014 Est. (2012 Update)' is provided as a reference to the 2014 estimated monthly AWT from the 2012 Update. Note that these values are based on the prior model forecasts and use the previous rolling average pattern derived from the FY 2011 – FY 2013 period. The final row lists the FY 2015 estimates using the current model forecasts and the FY 2012 – FY

2014 pattern. The FY 2015 estimated transactions will be used as the expected monthly AWT transactions for the FY 2015 quarterly reports issued by TxDOT.

A similar procedure was used to develop monthly patterns for total transactions and toll revenue; however the monthly percentage distribution was used instead of the index values. The findings are shown in Table 8.27 for total transactions and in Table 8.28 for toll revenues. The FY 2015 estimated transactions and revenue were prepared, based on weekday data, to provide expected monthly values that can be used by TxDOT for the FY 2015 quarterly and annual reports.

Table 8.27 Estimated Monthly Total Transactions, 2015

SH 45 N														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Transaction Percentages	2014 Obs.	8.1%	8.6%	8.0%	7.9%	7.7%	7.5%	8.4%	8.7%	9.0%	8.6%	8.7%	9.0%	100.0%
	2014 Est. ('12-'14 avg.)	8.0%	8.5%	8.0%	8.0%	7.9%	7.7%	8.5%	8.6%	8.9%	8.5%	8.4%	8.9%	100.0%
Monthly Transactions by Fiscal Year (in 000s)	2014 Obs.	3,087	3,296	3,066	3,017	2,944	2,853	3,216	3,314	3,426	3,281	3,327	3,429	**38,256**
	2014 Est.	3,077	3,264	3,077	3,072	3,011	2,940	3,254	3,280	3,406	3,239	3,222	3,413	**38,256**
	2014 Est. (2012 Update)	**2,694**	**2,830**	**2,620**	**2,647**	**2,679**	**2,482**	**2,827**	**2,852**	**2,909**	**2,796**	**2,813**	**2,889**	**33,038**
	2015 Est.	**3,502**	**3,715**	**3,502**	**3,496**	**3,427**	**3,346**	**3,703**	**3,733**	**3,876**	**3,685**	**3,667**	**3,884**	**43,535**

Loop 1														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Transaction Percentages	2014 Obs.	8.1%	8.7%	8.0%	7.9%	7.9%	7.6%	8.5%	8.6%	8.8%	8.5%	8.6%	8.8%	100.0%
	2014 Est. ('12-'14 avg.)	8.1%	8.6%	8.1%	8.0%	8.0%	7.8%	8.5%	8.5%	8.8%	8.4%	8.4%	8.8%	100.0%
Monthly Transactions by Fiscal Year (in 000s)	2014 Obs.	1,611	1,731	1,596	1,576	1,564	1,508	1,677	1,705	1,742	1,679	1,708	1,742	**19,839**
	2014 Est.	1,609	1,706	1,599	1,596	1,587	1,544	1,688	1,692	1,738	1,663	1,669	1,751	**19,839**
	2014 Est. (2012 Update)	**1,607**	**1,684**	**1,559**	**1,576**	**1,608**	**1,484**	**1,675**	**1,682**	**1,701**	**1,657**	**1,679**	**1,704**	**19,616**
	2015 Est.	**1,889**	**2,003**	**1,877**	**1,873**	**1,863**	**1,812**	**1,982**	**1,986**	**2,041**	**1,952**	**1,959**	**2,055**	**23,291**

SH 130														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Transaction Percentages	2014 Obs.	7.6%	8.1%	8.2%	7.6%	6.9%	7.0%	8.8%	8.8%	9.0%	9.2%	9.4%	9.3%	100.0%
	2014 Est. ('12-'14 avg.)	7.5%	8.0%	8.3%	7.7%	7.1%	7.2%	8.9%	8.7%	9.1%	9.1%	9.1%	9.3%	100.0%
Monthly Transactions by Fiscal Year (in 000s)	2014 Obs.	3,513	3,748	3,790	3,502	3,210	3,231	4,059	4,075	4,158	4,273	4,339	4,314	**46,211**
	2014 Est.	3,456	3,698	3,844	3,574	3,275	3,334	4,098	4,036	4,198	4,200	4,187	4,308	**46,211**
	2014 Est. (2012 Update)	**2,920**	**3,115**	**3,071**	**2,971**	**2,831**	**2,723**	**3,355**	**3,318**	**3,409**	**3,368**	**3,405**	**3,405**	**37,892**
	2015 Est.	**3,733**	**3,995**	**4,152**	**3,860**	**3,538**	**3,601**	**4,427**	**4,359**	**4,535**	**4,537**	**4,523**	**4,654**	**49,913**

SH 45 SE														
Transaction Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Transaction Percentages	2014 Obs.	7.6%	8.1%	8.5%	7.5%	6.8%	7.1%	8.9%	8.8%	9.0%	9.1%	9.3%	9.2%	100.0%
	2014 Est. ('12-'14 avg.)	7.7%	8.1%	8.2%	7.5%	6.9%	7.1%	9.0%	8.4%	9.1%	9.2%	9.2%	9.5%	100.0%
Monthly Transactions by Fiscal Year (in 000s)	2014 Obs.	362	385	403	357	323	335	424	416	428	432	441	437	**4,743**
	2014 Est.	365	384	389	357	327	339	429	401	431	436	437	449	**4,743**
	2014 Est. (2012 Update)	**324**	**339**	**329**	**322**	**303**	**294**	**375**	**353**	**374**	**378**	**387**	**381**	**4,158**
	2015 Est.	**391**	**412**	**417**	**382**	**350**	**363**	**459**	**429**	**462**	**467**	**468**	**481**	**5,080**

Table 8.28 Estimated Monthly Toll Revenue, 2015

SH 45 N														
Revenue Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Revenue Percentages	2014 Obs.	8.6%	9.1%	8.1%	8.8%	7.8%	7.6%	8.5%	8.3%	8.1%	9.5%	7.7%	7.8%	100.0%
	2014 Est. ('12-'14 avg.)	7.7%	8.1%	7.4%	7.7%	8.2%	7.9%	8.9%	8.6%	9.1%	9.3%	8.4%	8.7%	100.0%
Monthly Revenue by Fiscal Year (in $000s)	2014 Obs.	2,981	3,181	2,810	3,072	2,719	2,630	2,974	2,898	2,834	3,325	2,695	2,711	**34,831**
	2014 Est.	2,680	2,807	2,572	2,688	2,868	2,767	3,109	2,997	3,160	3,227	2,937	3,017	**34,831**
	2014 Est. (2012 Update)	**2,487**	**2,559**	**2,408**	**2,474**	**2,732**	**2,567**	**2,962**	**2,890**	**3,033**	**2,919**	**2,839**	**2,971**	**32,840**
	2015 Est.	**3,200**	**3,351**	**3,070**	**3,209**	**3,425**	**3,304**	**3,712**	**3,578**	**3,773**	**3,853**	**3,506**	**3,602**	**41,585**

Loop 1														
Revenue Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Revenue Percentages	2014 Obs.	8.8%	9.3%	8.2%	8.2%	8.0%	7.7%	8.6%	8.3%	8.1%	9.5%	7.7%	7.6%	100.0%
	2014 Est. ('12-'14 avg.)	7.8%	8.2%	7.5%	7.6%	8.4%	8.0%	8.9%	8.6%	9.0%	9.1%	8.3%	8.5%	100.0%
Monthly Revenue by Fiscal Year (in $000s)	2014 Obs.	1,626	1,730	1,518	1,526	1,493	1,429	1,588	1,543	1,499	1,768	1,424	1,417	**18,560**
	2014 Est.	1,447	1,530	1,395	1,408	1,556	1,491	1,657	1,590	1,661	1,688	1,550	1,586	**18,560**
	2014 Est. (2012 Update)	**1,579**	**1,644**	**1,545**	**1,581**	**1,750**	**1,662**	**1,881**	**1,796**	**1,903**	**1,824**	**1,782**	**1,868**	**20,815**
	2015 Est.	**1,790**	**1,892**	**1,725**	**1,741**	**1,925**	**1,844**	**2,049**	**1,967**	**2,055**	**2,088**	**1,917**	**1,962**	**22,954**

SH 130														
Revenue Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Revenue Percentages	2014 Obs.	9.1%	9.2%	8.7%	6.4%	7.3%	7.4%	8.8%	8.6%	8.6%	10.4%	8.0%	7.6%	100.0%
	2014 Est. ('12-'14 avg.)	8.0%	8.2%	7.9%	7.1%	7.4%	7.2%	8.9%	8.8%	9.3%	9.6%	8.8%	8.9%	100.0%
Monthly Revenue by Fiscal Year (in $000s)	2014 Obs.	6,088	6,145	5,825	4,296	4,887	4,988	5,892	5,761	5,763	6,981	5,384	5,083	**67,092**
	2014 Est.	5,361	5,482	5,327	4,741	4,975	4,813	5,956	5,913	6,243	6,461	5,878	5,941	**67,092**
	2014 Est. (2012 Update)	**4,394**	**4,504**	**4,407**	**4,351**	**4,276**	**3,933**	**5,064**	**5,083**	**5,225**	**5,137**	**5,057**	**5,226**	**56,656**
	2015 Est.	**5,638**	**5,765**	**5,601**	**4,985**	**5,231**	**5,061**	**6,263**	**6,218**	**6,564**	**6,794**	**6,181**	**6,247**	**70,548**

SH 45 SE														
Revenue Value	**FY Term**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Total**
Monthly Revenue Percentages	2014 Obs.	6.7%	7.3%	8.3%	7.3%	7.3%	7.5%	9.1%	12.3%	8.7%	10.4%	8.0%	7.2%	100.0%
	2014 Est. ('12-'14 avg.)	8.2%	8.6%	8.5%	8.0%	7.6%	7.4%	8.9%	9.8%	8.6%	9.0%	7.8%	7.6%	100.0%
Monthly Revenue by Fiscal Year (in $000s)	2014 Obs.	311	341	389	344	342	353	424	574	407	485	374	338	**4,680**
	2014 Est.	385	402	395	374	357	344	419	460	402	419	365	355	**4,680**
	2014 Est. (2012 Update)	**444**	**450**	**423**	**420**	**397**	**360**	**450**	**434**	**428**	**425**	**403**	**413**	**5,047**
	2015 Est.	**416**	**434**	**427**	**404**	**385**	**372**	**452**	**497**	**434**	**452**	**394**	**384**	**5,050**

The observed revenue by month for FY 2014 and the estimated patterns from the rolling average process include variations in collections processing as well as any periodic accounting adjustments. As an example, revenue from the PBM collection process is recognized during the month when the revenue is received whereas the transactions are recognized during the month that they occurred. For these reasons, the monthly variations in revenue are not directly correlated to the monthly variations in transactions.

8.7 GENERAL ASSUMPTIONS

The estimates of traffic and toll revenue presented in this report have been prepared by Stantec based on certain assumptions regarding tolling and traffic characteristics and additional assumptions regarding future toll road and local and national conditions.

The assumptions for each CTTS element regarding toll rates and traffic characteristics summarized in Table 8.29 include the truck toll multiplier, PBM surcharge, payment type distribution (PBM, ETC), vehicle type distribution (autos, trucks), toll evasion, and annualization factors. These factors were developed for each CTTS element based on observed traffic conditions as discussed previously in this report. Assumptions for future years are based on discussions with TxDOT and local government agencies and Stantec judgment.

Table 8.29 Summary of Tolling and Traffic Characteristic Assumptions: Base Case - 2015

Assumptions Related to	Element			
	SH 45 N	Loop 1	SH 130	SH 45 SE
Vehicle Type Distribution				
Autos	96.2%	96.2%	91.4%	89.1%
Trucks	3.8%	3.8%	8.6%	10.9%
Payment Type Distribution - Passenger Cars				
PBM	21.3%	22.4%	33.5%	35.4%
ETC	78.7%	77.6%	66.5%	64.6%
Payment Type Distribution - Trucks				
PBM	21.2%	24.5%	35.5%	40.6%
ETC	78.8%	75.5%	64.5%	59.4%
Toll Ratios				
Truck/Auto Ratio	2.75	2.75	2.67	2.72
PBM/ETC Toll Rate	1.33	1.33	1.33	1.33
Collection Rates				
PBM	47.7%	47.7%	47.7%	47.7%
ETC	99.7%	99.7%	99.7%	99.7%
Full Length Trip				
Distance	12.8	4.0	49.0	7.0
Rate per Mile	$0.17	$0.27	$0.14	$0.15
Toll Cost (ETC)	$2.12	$1.06	$7.00	$1.04
Annualization Factor	320	320	330	330

The estimates of CTTS transactions and toll revenue presented in this report have been prepared by Stantec based on the following assumptions and conditions:

1. Toll rates on the CTTS elements will be escalated on an annual basis on January 1st of each year based on the CPI-U. It is estimated that the rate of inflation will increase as presented in Table 4.6.

2. Toll collection on the CTTS elements will be by Electronic Toll Collection (ETC) or Pay by Mail (PBM); there will be no cash toll collection as discussed in Chapter 4.

3. The surcharge for PBM/Video transactions will remain at 33 percent throughout the forecast period as discussed in Chapter 4.

4. ETC market shares for 2015 will be as presented in Table 8.29 and remain relatively constant for future years as presented earlier in this section.

5. The traffic mix using the CTTS elements will result in toll multipliers (used for toll revenue estimation purposes) for trucks with 3+ axles as presented in Table 8.29 for 2015 and as presented earlier in this section for future years.

6. The current Truck Toll Policy uses an axle-based (N-1) formula whereby tolls for trucks are calculated as (Axles-1) times the auto toll rate. The current policy that limits truck tolls to the 4-axle rate for SH 130 and SH 45 SE will remain in place. There will be no other discounts or changes to the truck toll policy.

7. The socioeconomic growth discussed in Chapter 6 will occur as forecasted.

8. The CTTS highway network improvements and the background network improvements will be constructed as planned and in accordance with the schedule discussed in Chapter 2 of this report. The I-35 Managed Lane project in Austin will not be constructed.

9. The Speed Limit Policy on limited access roadways will be maintained at current levels.

10. The CTTS elements will be efficiently maintained and operated, but even under the most efficient operation, there will be some toll evasion and revenue "leakage." This has been accounted for in the traffic and revenue forecasts by collection rate adjustments. Assumed collection rate adjustments for 2015 are presented in Table 8.29 and are assumed constant throughout the forecast period.

11. Motor fuel will remain in adequate supply during the forecast period, and motor fuel prices (i.e., the average price for regular gasoline) will not be more than $4.50 per gallon, adjusted for inflation, for sustained periods.

12. Increases in Federal and State motor fuel taxes will not be to the extent that, together with fuel price increases, motor fuel prices will exceed $4.50, adjusted for inflation, for sustained periods.

13. No radical change in travel modes that would drastically curtail motor vehicle use will occur during the forecast period.

14. In the long term, generally normal economic conditions will prevail in the State and the United States, and a major depression, national or State emergency or prolonged fuel shortage will not occur.

15. Consistent with current agreements, TxDOT will reimburse the appropriate CTTS account the cost of tolls not paid by those customers with eligible specialty license plates registered with Texas Department of Motor Vehicles (TxDMV) to disabled veterans, Purple Heart recipients, and Medal of Honor recipients. TxDOT will also reimburse the appropriate CTTS account for the cost of tolls not paid due to any periodic truck toll rate discounts offered.

16. Customer Service Center revenues will be in line with the forecasts provided by TxDOT and current fees and policies will be held constant.

17. The projects listed in sections 2.4.2 through 2.4.5 will be completed as listed.

8.8 DISCLAIMER

It is Stantec's opinion that the revenue projections presented in this report are reasonable and have been prepared in accordance with accepted practice for investment-grade studies. However, given the uncertainties within the current international and economic climate, Stantec

considers it is necessary to state that the traffic and revenue projections are based on the following caveats:

- This report presents the results of Stantec's consideration of the information available to us as of the date hereof and the application of Stantec's experience and professional judgment to that information. It is not a guarantee of any future events or trends.

- The traffic and revenue forecasts will be subject to future economic and social conditions and demographic developments that cannot be predicted with certainty.

- The projections contained in this report, while presented with numerical specificity, are based on a number of estimates and assumptions which, though considered reasonable to us, are inherently subject to significant economic and competitive uncertainties and contingencies, many of which will be beyond Stantec's control and that of TxDOT. In many instances, a broad range of alternative assumptions could be considered reasonable. Changes in the assumptions used could result in material differences in projected outcomes.

- If, for any reason, any of these conditions should change due to changes in the economy or competitive environment, or other factors, the consultant team's opinions or estimates may require amendment or further adjustments.

- Stantec's toll revenue projections only represent its best judgment and Stantec does not warrant or represent that actual toll revenues will not vary from its projections, estimates and forecasts.

Many statements contained in this report, which are not historical facts, are forward-looking statements, which are based on Stantec's opinions, as well as assumptions made by, and information currently available to, the management and staff of Stantec. Because the statements are based on expectations about future events and economic performance and are not statements of fact, actual results may differ materially from those projected. The words "anticipate", "assume", "estimate", "expect", "objective", "projection", "plan", "forecast", "goal", "budget", or similar words are intended to identify forward-looking statements. The words or phrases "to date", "now", "currently", and the like are intended to mean as of the date of this report.

Stantec shall have the right to review, and to require any changes it believes appropriate be made to any official statement, prospectus, private placement memorandum or other document used in connection with any such financing that refers to Stantec, its reports, opinions or other documents, or services. TxDOT shall provide copies of any such materials to Stantec for review by Stantec and its legal counsel at a reasonable time prior to its use of any such materials. Stantec shall have the right to retain copies of all such materials

9.0 SENSITIVITY ANALYSIS

The assumptions upon which the 2014 CTTS transaction and revenue forecasts were based are presented in Chapter 8 of this report. In many instances, a broad range of alternative assumptions could be considered reasonable, which would result in material differences in the forecasts. This chapter of the report provides estimates of the forecast's sensitivity to changes in selected assumptions.

9.1 OVERVIEW OF ANALYSES

As a result of discussions with TxDOT staff and the financing team, as decision was made to conduct sensitivity trials to assess the impacts to the forecasts for the following three conditions:

- Reduced CPI Growth
- Reduced Trip Growth
- Reduced Value of Time

These sensitivity trials were conducted for the 2020, 2030, and 2040 model years. Average weekday toll revenues for each sensitivity trial and the corresponding percent change in toll revenue when compared to the unadjusted base forecast are provided in Table 9.1.

Table 9.1 Average Weekday Revenue Comparison for the Sensitivity Trials

Model Year	AVERAGE WEEKDAY TOLL REVENUE						
	Base Revenue	Sensitivity 1 (Reduced CPI)		Sensitivity 2 (Reduced Trip Growth)		Sensitivity 3 (Reduced VOT)	
		Revenue	% Difference	Revenue	% Difference	Revenue	% Difference
2020	$496,904	$487,786	-1.8%	$463,971	-6.6%	$476,566	-4.1%
2030	$872,656	$845,349	-3.1%	$775,700	-11.1%	$848,962	-2.7%
2040	$1,449,385	$1,393,799	-3.8%	$1,232,748	-14.9%	$1,419,541	-2.1%

9.2 REDUCED CPI GROWTH

As part of the base forecast, toll rates are escalated annually based on the change in the CPI-U value. The household income of travelers, which influences the ability to pay tolls, is also anticipated to increase over time. As discussed in Chapter 4, Stantec has obtained CPI data from 1970 to 2014. Over the longer term, the annual change in CPI has been 3 to 4 percent, while the most recent 20-year period indicates that CPI average annual growth rate is less than 2.5 percent. For the period between 2010 and 2014, CPI increase is 2.1 percent and for the most recent CTTS annual toll escalation for FY 2015, the CPI increase was 1.7 percent. The base forecast in the 2014 Study utilizes the longer term data along with current CPI trends to create a forecast that assumed that the CPI would increase at 2.0 percent for 2016, followed by small increases that increased CPI growth to 2.5 percent by 2020. From 2025 to 2026, CPI growth is assumed to increase gradually to 3.0 percent and remain at that growth rate for the remainder

of the forecast period. For this sensitivity trial, CPI growth is 0.25 percent lower than the assumed escalations in the base forecast. For example, the CPI between 2016 was reduced from 2.0 percent to 1.75 percent. Consistent with the base forecast, household income growth is assumed to equal the CPI growth rate in this sensitivity.

As expected, this sensitivity trial results in revenue estimates ranging from 1.8 percent less than the base case in 2020 to 3.8 percent less in 2040. The losses are due to lower toll rates from the reduced escalation rate. There is less impact in 2020 when compared to the base forecast as the change in toll rates are less than in the later years of the forecast.

9.3 REDUCED TRIP GROWTH

Under this sensitivity trial, the projected growth of trips was reduced by 25 percent. This reduction implies a lower level of population and employment growth, which generates a lower level of trip growth.

The lower level of trip growth from this sensitivity trial results in lower revenue estimates in response to lower traffic levels in the study area. This leads to fewer available trips for each facility and less congestion on competing facilities, making it less advantageous to use the CTTS facilities. The reduced revenue ranges from 6.6 percent in 2020 to 14.9 percent in 2040. The impact is less significant in 2020 since the difference in the number of trips is less in the early years than in the more distant horizon years.

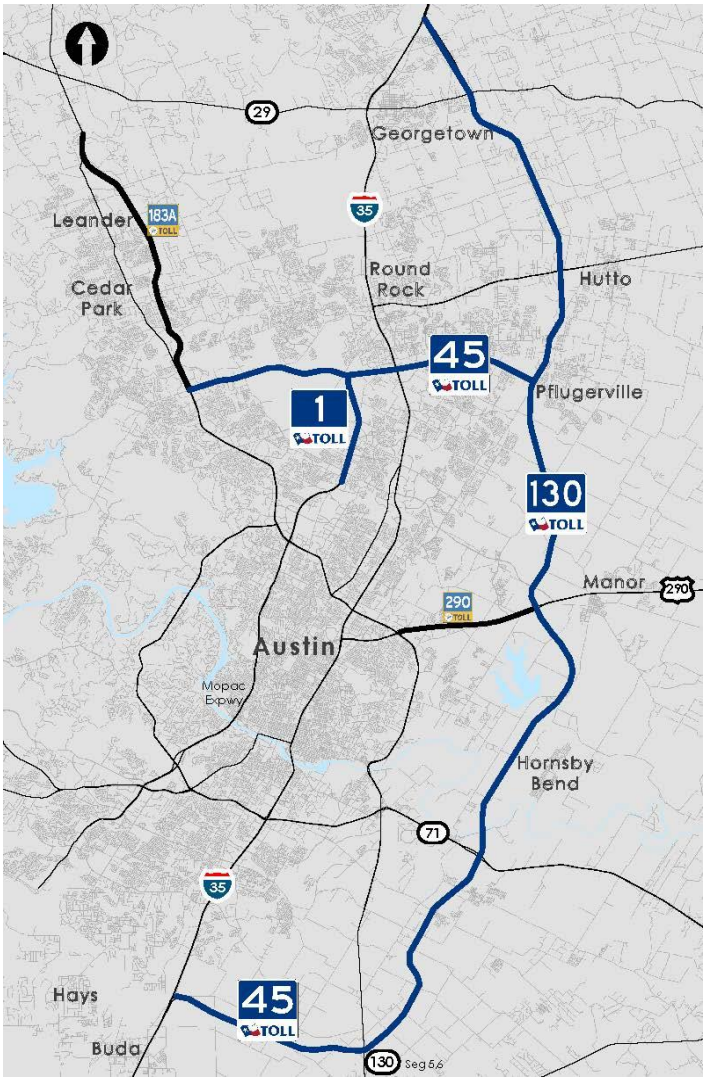
9.4 REDUCED VALUE OF TIME

For this sensitivity trial, the estimated value of time for all trip purposes and trucks was reduced by 10 percent. The value of time would still increase throughout the forecast, but the reduced values would remain 90 percent of the values used in the base forecast.

The reduction in the value of time translates to a lower willingness by drivers to pay tolls in order to save travel time, resulting in less revenue. The loss of revenue is less variable than the other sensitivities among model years with losses of 4.1 percent, 2.7 percent, and 2.1 percent in 2020, 2030, and 2040 respectively. This more uniform response is due to the general reduction of the value of time across horizon years, which tends to have a relatively equal impact on the diversion estimates. The slightly lower levels of response in the more distant horizon years reflect the increasing congestion on the background network which tends to make the CTTS more attractive compared to the non-tolled routes in the future.

Central Texas Turnpike System
2014 Traffic & Revenue Study Appendices

Texas Department of Transportation



Stantec

Prepared by:

Stantec Consulting Services Inc.

December 30, 2014

APPENDIX A

Technical Memorandum on Socioeconomic Data from Michael Bomba, PhD

TECHNICAL MEMORANDUM

REVIEW OF THE CAPITAL AREA MPO AND SAN ANTONIO/BEXAR COUNTY MPO SOCIOECONOMIC DATA FOR THE CTTS STUDY AREA

This technical memorandum provides an overview of the assessment and adjustment of population and employment data from the Capital Area Metropolitan Planning Organization's (CAMPO) and the San Antonio/Bexar County Metropolitan Planning Organization's (SABC MPO) travel demand models for the 2014 CTTS Update. The first portion of the memorandum provides regional background information and context that describe current population and employment trends in the two regions. The second portion of the memo provides a discussion of recent sectoral employment trends. The third portion of the memo describes the methodology used during the assessment and adjustment of the county control totals and the socioeconomic data at the individual Traffic Analysis Zone (TAZ).

POPULATION TRENDS

Historic Population Trends

In only three decades (1980-2010), the combined population of the five counties in the CAMPO study area tripled from 585,051 residents to 1,716,289 residents (See Table 1). More than half of the population growth during this period was in Travis County, with Williamson County accounting for an additional 30 percent of the growth. Williamson County also experienced the highest rate of population growth, increasing almost six-fold between 1980 and 2010 to 422,679 residents, while Hays County's population increased four-fold to 157,107 residents. Bastrop County's population grew three-fold to 74,171 residents during this same period and Caldwell County had the slowest growth rate, but still increased by 61 percent to 38,066 residents.

Population in the San Antonio/Bexar County MPO study area[1] also grew strongly between 1980 and 2010, although at a more measured pace. Table 2 shows the historic populations of Bexar, Comal, Guadalupe, Kendall, and Wilson Counties. Collectively, the population of these five counties grew from 1.1 million residents in 1980 to more than 2.0 million residents during 2010. Almost 78 percent of that population growth occurred in Bexar County, which had a population of 1,714,773 residents in 2010. Among the five counties, Kendall County's population grew most quickly, increasing three-fold during this period to 33,410 residents. Guadalupe County, the second largest county in the region, increased its population by 182 percent to 131,533 residents between 1980 and 2010, while Comal County (the third largest county) increased by 198 percent to 108,472 residents during this same period. Kendall County also grew strongly, although at a slightly slower pace and had 42,918 residents during 2010.

[1] In addition to the five counties in the San Antonio/Bexar County MPO study area (Bexar, Guadalupe, Comal, Kendall, and Wilson), the San Antonio-New Braunfels MSA also contains Atascosa, Bandera, and Medina Counties.

Table 1: Historic Population for Counties in the Austin-Round Rock MSA, 1980-2010

			TOTAL POPULATION			
	Bastrop County	**Caldwell County**	**Hays County**	**Travis County**	**Williamson County**	**Total**
1980	24,726	23,637	40,594	419,573	76,521	585,051
1990	38,263	26,392	65,614	576,407	139,551	846,227
2000	57,733	32,194	97,589	812,281	249,967	1,249,764
2010	74,171	38,066	157,107	1,024,266	422,679	1,716,289
			TOTAL CHANGE			
	Bastrop County	**Caldwell County**	**Hays County**	**Travis County**	**Williamson County**	**Total**
1980-1990	13,537	2,755	25,020	156,834	63,030	261,176
1990-2000	19,470	5,802	31,975	235,874	110,416	403,537
2000-2010	16,438	5,872	59,518	211,985	172,712	466,525
			COMPOUNDED ANNUAL GROWTH RATE			
	Bastrop County	**Caldwell County**	**Hays County**	**Travis County**	**Williamson County**	**Total**
1980-1990	4.46%	1.11%	4.92%	3.23%	6.19%	3.76%
1990-2000	4.20%	2.01%	4.05%	3.49%	6.00%	3.98%
2000-2010	2.54%	1.69%	4.88%	2.35%	5.39%	3.22%

Source: U.S. Census Bureau, 2010.

Table 2: Historic Population for Select Counties in the San Antonio-New Braunfels MSA, 1980-2010

			TOTAL POPULATION			
	Bexar County	**Comal County**	**Guadalupe County**	**Kendall County**	**Wilson County**	**Total**
1980	988,971	36,446	46,708	10,635	16,756	1,099,516
1990	1,185,394	51,832	64,873	14,589	22,650	1,339,338
2000	1,392,931	78,021	89,023	23,743	32,408	1,616,126
2010	1,714,773	108,472	131,533	33,410	42,918	2,031,106
			TOTAL CHANGE			
	Bexar County	**Comal County**	**Guadalupe County**	**Kendall County**	**Wilson County**	**Total**
1980-1990	196,423	15,386	18,165	3,954	5,894	239,822
1990-2000	207,537	26,189	24,150	9,154	9,758	276,788
2000-2010	321,842	30,451	42,510	9,667	10,510	414,980
			COMPOUNDED ANNUAL GROWTH RATE			
	Bexar County	**Comal County**	**Guadalupe County**	**Kendall County**	**Wilson County**	**Total**
1980-1990	1.83%	3.58%	3.34%	3.21%	3.06%	1.99%
1990-2000	1.63%	4.17%	3.22%	4.99%	3.65%	1.90%
2000-2010	2.10%	3.35%	3.98%	3.47%	2.85%	2.31%

Source: U.S. Census Bureau, 2010.

Recent Population Trends

More recent estimates show that the population of the CAMPO study area has continued to grow since 2010, but the overall growth rate has slowed as the 2008-2009 Recession greatly reduced the mobility of households. The data in Table 3 provides population counts from the 2000 and 2010 decennial U.S. Censuses, as well as the U.S. Census Bureau's 2013 population estimates. These data show that the population of counties in the region grew strongly between the 2010 and 2013. The largest overall population increase occurred in Travis County, with more than 96,000 new residents between the 2010 decennial Census and the 2013 estimates. Williamson County also grew strongly during this same period with approximately 48,000 new residents between 2010 and 2013, followed by Hays County with almost 19,000 new residents. However, since the 2010 U.S. Census, the rate of population growth in all of the counties, with the exception of Travis County, has slowed. During this period, Travis County's population growth accelerated slightly from a CAGR of 2.35 percent between 2000 and 2010 to an estimated CAGR of 2.61 percent between 2010 and 2013. Williamson County's population growth, on the other hand, declined from a 5.39 percent CAGR between 2000 and 2010 to 3.14 percent CAGR from 2010 to 2013. Bastrop County's population growth also slowed considerably from a 2.54 percent CAGR between 2000 and 2010 to a 0.63 percent CAGR between 2010 and 2013. Between 2010 and 2013, Bastrop County only added 1,600 residents, while Caldwell County only added 1,100 residents.

Table 3: Recent Population Trends for Select Counties in the Austin-Round Rock MSA, 2000-2013

	TOTAL POPULATION			TOTAL CHANGE	AVERAGE ANNUAL CHANGE		CAGR	
COUNTY	2000	2010	2013	2000-13	2000-10	2010-13	2000-10	2010-13
Bastrop	57,733	74,171	75,825	18,092	1,644	473	2.54%	0.63%
Caldwell	32,194	38,066	39,232	7,038	587	333	1.69%	0.87%
Hays	97,589	157,107	176,026	78,437	5,952	5,405	4.88%	3.30%
Travis	812,281	1,024,266	1,120,954	308,673	21,199	27,625	2.35%	2.61%
Williamson	249,967	422,679	471,014	221,047	17,271	13,810	5.39%	3.14%

Source: U.S. Census Bureau, 2010 and 2013.

U.S. Census Bureau data show that the populations of counties in the San Antonio MSA also grew strongly between the 2010 and 2013, adding 131,000 new residents (See Table 4). Most of this population growth occurred in Bexar County, which added 102,000 residents since the 2010 decennial Census. Guadalupe and Comal Counties also increased their populations during this period, adding 11,000 and 10,000 new residents, respectively. However, since 2010, the rate of population growth has slowed in all of the counties, with the exception of Kendall County. Kendall County's population growth accelerated slightly from a CAGR of 3.47 percent between 2000 and 2010 to an estimated CAGR of 3.56 percent between 2010 and 2013.

Table 4: Recent Population Trends for Select Counties in the San Antonio-New Braunfels MSA, 2000-2013

	TOTAL POPULATION			TOTAL CHANGE	AVERAGE ANNUAL CHANGE		CAGR	
COUNTY	2000	2010	2013	2000-13	2000-10	2010-13	2000-10	2010-13
Bexar	1,392,931	1,714,773	1,817,610	424,679	32,184	29,382	2.10%	1.68%
Comal	78,021	108,472	118,480	40,459	3,045	2,859	3.35%	2.55%
Guadalupe	89,023	131,533	143,183	54,160	4,251	3,329	3.98%	2.45%
Kendall	23,743	33,410	37,766	14,023	967	1,245	3.47%	3.56%
Wilson	32,408	42,918	45,418	13,010	1,051	714	2.85%	1.63%

Source: U.S. Census Bureau, 2010 and 2013.

Placing the growth that has occurred in Central Texas into a national context, between 2000 and 2013, the Austin-Round Rock MSA had the 12th largest population increase in the nation and the San Antonio-New Braunfels MSAs was ranked 15th (See Table 5). Other Texas MSAs in the list include the Dallas-Fort Worth MSA, which had the nation's largest population increase during this period, with more than 1.6 million new residents. The Houston-The Woodlands-Sugar Land, TX MSA (hereafter referred to as the Houston MSA) ranked third with almost 1.6 million additional residents.

Table 5: Fastest Growing Metropolitan Areas in the United States, 2000-2013

RANK	MSA	TOTAL POPULATION			TOTAL CHANGE	AVERAGE ANNUAL CHANGE		CAGR	
		2000	2010	2013	2000-13	2000-10	2010-13	2000-10	2010-13
1	Dallas-Fort Worth-Arlington, TX	5,161,544	6,426,214	6,810,913	1,649,369	126,467	118,369	2.22%	1.81%
2	New York-Newark-Jersey City, NY-NJ-PA	18,323,002	19,567,410	19,949,502	1,626,500	124,441	117,567	0.66%	0.60%
3	Houston-The Woodlands-Sugar Land, TX	4,715,407	5,920,416	6,313,158	1,597,751	120,501	120,844	2.30%	2.00%
4	Atlanta-Sandy Springs-Roswell, GA	4,247,981	5,286,728	5,522,942	1,274,961	103,875	72,681	2.21%	1.35%
5	Washington-Arlington-Alexandria, DC-VA-MD-WV	4,796,183	5,636,232	5,949,859	1,153,676	84,005	96,501	1.63%	1.68%
6	Phoenix-Mesa-Scottsdale, AZ	3,251,876	4,192,887	4,398,762	1,146,886	94,101	63,346	2.57%	1.49%
7	Riverside-San Bernardino-Ontario, CA	3,254,821	4,224,851	4,380,878	1,126,057	97,003	48,008	2.64%	1.12%
8	Charlotte-Concord-Gastonia, NC-SC	1,330,448	2,217,012	2,335,358	1,004,910	88,656	36,414	5.24%	1.61%
9	Miami-Fort Lauderdale-West Palm Beach, FL	5,007,564	5,564,635	5,828,191	820,627	55,707	81,094	1.06%	1.43%
10	Los Angeles-Long Beach-Anaheim, CA	12,365,627	12,828,837	13,131,431	765,804	46,321	93,106	0.37%	0.72%
11	Las Vegas-Henderson-Paradise, NV	1,375,765	1,951,269	2,027,868	652,103	57,550	23,569	3.56%	1.19%
12	**Austin-Round Rock, TX**	**1,249,763**	**1,716,289**	**1,883,051**	**633,288**	**46,653**	**51,311**	**3.22%**	**2.89%**
13	Orlando-Kissimmee-Sanford, FL	1,644,561	2,134,411	2,267,846	623,285	48,985	41,057	2.64%	1.88%
14	Seattle-Tacoma-Bellevue, WA	3,043,878	3,439,809	3,610,105	566,227	39,593	52,399	1.23%	1.50%
15	**San Antonio-New Braunfels, TX**	**1,711,703**	**2,142,508**	**2,277,550**	**565,847**	**43,081**	**41,551**	**2.27%**	**1.90%**

Source: U.S. Census Bureau, 2010 and 2014.

Population Projections

Recent population projection scenarios from the Texas State Data Center (TxSDC) for the Austin-Round Rock MSA suggest strong rates of population growth into the future. The projected population for the Austin-Round Rock MSA is expected to be between 2.1 million and 4.0 million residents in 2040 (See Table 6). The most conservative scenario, the 0.0 migration scenario, assumes that there will be no net migration and the population will grow solely based upon the number of births and deaths in the region. Given historic migration trends for the region, this scenario seems unlikely. The 0.5 migration scenario assumes that future net migration will be one-half the rate that occurred between the 2000 and 2010 decennial U.S. Censuses and the 1.0 migration scenario assumes that future net migration will be equal to the net migration rate between 2000 and 2010. The historic population growth rate for the Austin-Round Rock MSA suggests that the region's population will likely grow at a rate between the 0.5 and 1.0 migration scenarios, which would add between 1.1 million and 2.3 million residents between 2010 and 2040.

Table 6: Population Projections for the Austin-Round Rock MSA, 2010-2040

		TOTAL POPULATION	
Year	**0.0 Migration Scenario**	**0.5 Migration Scenario**	**1.0 Migration Scenario**
2010	1,716,289	1,716,289	1,716,289
2015	1,807,478	1,900,046	1,998,629
2020	1,886,493	2,090,278	2,322,988
2025	1,950,214	2,278,451	2,680,481
2030	2,005,249	2,470,562	3,077,805
2035	2,053,094	2,670,218	3,528,046
2040	2,095,218	2,881,441	4,046,649
		ANNUAL AVERAGE GROWTH	
Year	**0.0 Migration Scenario**	**0.5 Migration Scenario**	**1.0 Migration Scenario**
2010-2015	18,238	36,751	56,468
2015-2020	15,803	38,046	64,872
2020-2025	12,744	37,635	71,499
2020-2030	11,007	38,422	79,465
2030-2035	9,569	39,931	90,048
2035-2040	8,425	42,245	103,721
		COMPOUNDED ANNUAL GROWTH RATE	
Year	**0.0 Migration Scenario**	**0.5 Migration Scenario**	**1.0 Migration Scenario**
2010-2015	1.04%	2.06%	3.09%
2015-2020	0.86%	1.93%	3.05%
2020-2025	0.67%	1.74%	2.90%
2020-2030	0.56%	1.63%	2.80%
2030-2035	0.47%	1.57%	2.77%
2035-2040	0.41%	1.53%	2.78%

Source: Texas State Data Center, 2014.

Table 7 breaks down the TxSDC's population projections for each of the five counties in the Austin-Round Rock MSA. The TxSDC's population projections anticipate that suburban counties, particularly Williamson and Hays Counties, will generate the most population growth in the future. Assuming that net future migration rates in Williamson County and Hays County are equal to past migration rates, then Williamson County will grow by almost 1.0 million residents between 2010 and 2040 and Hays County will grow by more than 470,000 residents. Travis County's growth, despite its larger population, is expected to increase by approximately 700,000 residents under the most optimistic scenario. Under the less optimistic 0.5 migration scenario, Travis County would experience a total population growth of 460,000 new residents, while Williamson County's population would grow by 420,000 residents and Hays County's population would increase by almost 213,000 residents. Bastrop County's population is projected to grow between 9,000 and 126,000 residents by 2040, depending upon the growth scenario. Caldwell County has a narrower range with the population projected between roughly 5,000 and 40,000 new residents in 2040.

Table 7: Population Projections for Counties in the Austin-Round Rock MSA, 2010-2040

			0.0 MIGRATION SCENARIO			
	Bastrop County	**Caldwell County**	**Hays County**	**Travis County**	**Williamson County**	**Total**
2010	74,171	38,066	157,107	1,024,266	422,679	1,716,289
2015	76,070	39,207	169,793	1,083,076	439,332	1,807,478
2020	78,112	40,393	183,237	1,132,853	451,898	1,886,493
2025	80,290	41,461	193,240	1,171,340	463,883	1,950,214
2030	82,133	42,244	202,649	1,202,423	475,800	2,005,249
2035	83,264	42,730	211,031	1,229,960	486,109	2,053,094
2040	83,825	42,999	219,275	1,256,304	492,815	2,095,218
			0.5 MIGRATION SCENARIO			
	Bastrop County	**Caldwell County**	**Hays County**	**Travis County**	**Williamson County**	**Total**
2010	74,171	38,066	157,107	1,024,266	422,679	1,716,289
2015	81,196	41,192	185,107	1,113,392	479,159	1,900,046
2020	89,066	44,538	216,983	1,200,883	538,808	2,090,278
2025	98,024	48,105	249,459	1,278,723	604,140	2,278,451
2030	107,906	51,665	285,920	1,348,207	676,864	2,470,562
2035	118,100	54,948	325,744	1,415,236	756,190	2,670,218
2040	128,712	58,006	369,861	1,484,854	840,008	2,881,441
			1.0 MIGRATION SCENARIO			
	Bastrop County	**Caldwell County**	**Hays County**	**Travis County**	**Williamson County**	**Total**
2010	74,171	38,066	157,107	1,024,266	422,679	1,716,289
2015	86,729	43,466	202,000	1,144,419	522,015	1,998,629
2020	101,908	49,478	257,643	1,273,260	640,699	2,322,988
2025	120,668	56,222	323,550	1,396,384	783,657	2,680,481
2030	143,212	63,441	406,051	1,508,642	956,459	3,077,805
2035	169,675	70,649	506,459	1,617,945	1,163,318	3,528,046
2040	200,583	77,903	628,309	1,732,860	1,406,994	4,046,649

Source: Texas State Data Center, 2014

The population of the San Antonio-New Braunfels MSA's is not anticipated to grow as rapidly as will the population of the Austin-Round Rock MSA. In fact, the population of the Austin-Round Rock MSA could potentially eclipse the San Antonio-New Braunfels MSA in size. Table 8 shows that the projected population for the San Antonio-New Braunfels MSA is expected to grow to between 2.6 million and 3.8 million residents by 2040. As with the Austin-Round Rock MSA, the conservative 0.0 migration scenario is unlikely in the San Antonio-New Braunfels MSA, given its historic role as a destination for migrants and its continued attractiveness into the future. The 0.5 migration scenario projects that the region would add 1.0 million new residents between 2010 and 2040, while the 1.0 migration scenario would result in 1.6 million new residents in the region. Given the region's historic population growth trends and its prospects for future growth, it will likely grow at a rate between the 0.5 and 1.0 migration scenarios.

Table 8: Population Projections for the San Antonio-New Braunfels MSA, 2010-2040

		TOTAL POPULATION	
Year	**0.0 Migration Scenario**	**0.5 Migration Scenario**	**1.0 Migration Scenario**
2010	2,142,508	2,142,508	2,142,508
2015	2,236,245	2,309,682	2,384,493
2020	2,324,068	2,481,286	2,645,041
2025	2,404,452	2,654,768	2,920,952
2030	2,474,476	2,825,089	3,204,283
2035	2,532,228	2,986,717	3,486,276
2040	2,580,358	3,142,324	3,767,306
		ANNUAL AVERAGE GROWTH	
Year	**0.0 Migration Scenario**	**0.5 Migration Scenario**	**1.0 Migration Scenario**
2010-2015	18,747	33,435	48,397
2015-2020	17,565	34,321	52,110
2020-2025	16,077	34,696	55,182
2020-2030	14,005	34,064	56,666
2030-2035	11,550	32,326	56,399
2035-2040	9,626	31,121	56,206
		COMPOUNDED ANNUAL GROWTH RATE	
Year	**0.0 Migration Scenario**	**0.5 Migration Scenario**	**1.0 Migration Scenario**
2010-2015	0.86%	1.51%	2.16%
2015-2020	0.77%	1.44%	2.10%
2020-2025	0.68%	1.36%	2.00%
2020-2030	0.58%	1.25%	1.87%
2030-2035	0.46%	1.12%	1.70%
2035-2040	0.38%	1.02%	1.56%

Source: Texas State Data Center, 2014.

Table 9 shows the SDC's population projections for five select counties in the San Antonio MSA. Unlike the Austin-Round Rock MSA, most of the future population growth is expected in the core (i.e. Bexar County), with less total population growth in the suburban counties. Bexar

County is projected to add between 400,000 and 1.1 million new residents, depending upon the growth scenario. The region as a whole is projected to add between 423,000 and 1.5 million resident, which demonstrates the future influence of Bexar County on the region's population growth.

Table 9: Population Projections for Select Counties in the San Antonio-New Braunfels MSA, 2010-2040

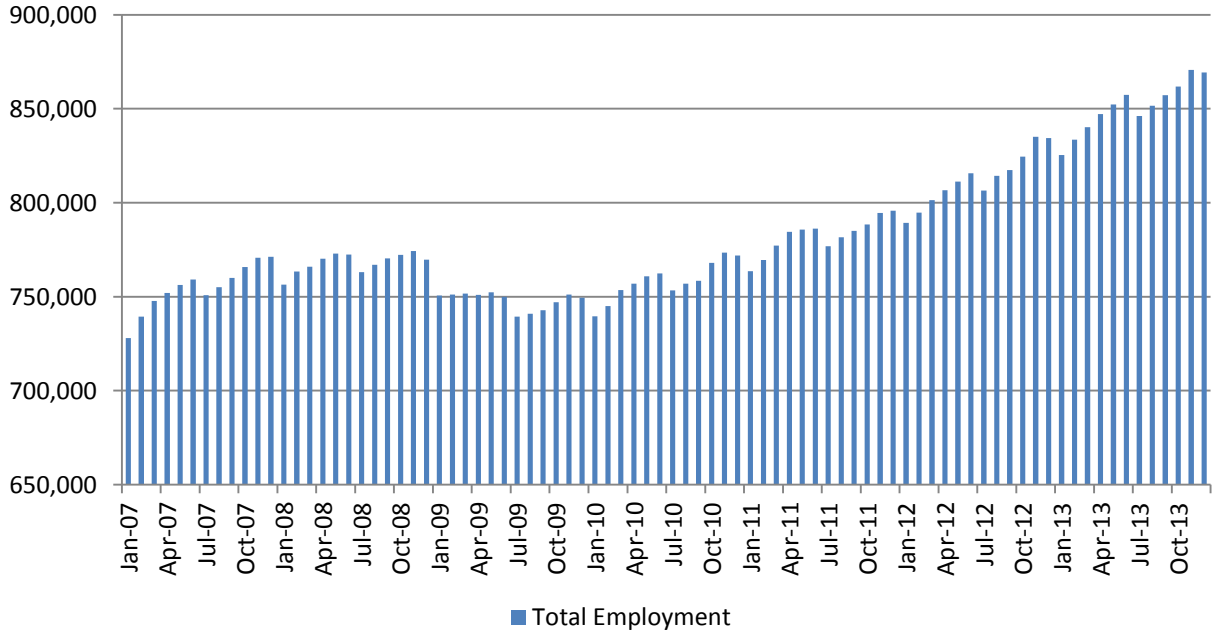
			0.0 MIGRATION SCENARIO			
	Bexar County	**Comal County**	**Guadalupe County**	**Kendall County**	**Wilson County**	**Total**
2010	1,714,773	108,472	131,533	33,410	42,918	2,031,106
2015	1,800,816	109,757	134,880	33,445	43,385	2,122,283
2020	1,880,182	111,040	138,177	33,685	44,051	2,207,135
2025	1,951,207	112,485	141,601	34,113	44,882	2,284,288
2030	2,013,760	113,486	144,418	34,479	45,503	2,351,646
2035	2,067,749	113,592	146,084	34,528	45,611	2,407,564
2040	2,115,302	113,107	146,589	34,246	45,168	2,454,412
			0.5 MIGRATION SCENARIO			
	Bexar County	**Comal County**	**Guadalupe County**	**Kendall County**	**Wilson County**	**Total**
2010	1,714,773	108,472	131,533	33,410	42,918	2,031,106
2015	1,843,080	118,919	145,520	36,163	46,652	2,190,334
2020	1,974,041	129,723	160,265	39,046	50,596	2,353,671
2025	2,104,629	141,045	176,129	42,118	54,709	2,518,630
2030	2,231,550	152,464	192,682	45,266	58,852	2,680,814
2035	2,351,770	163,100	209,380	48,304	62,665	2,835,219
2040	2,468,254	173,049	225,850	51,119	65,974	2,984,246
			1.0 MIGRATION SCENARIO			
	Bexar County	**Comal County**	**Guadalupe County**	**Kendall County**	**Wilson County**	**Total**
2010	1,714,773	108,472	131,533	33,410	42,918	2,031,106
2015	1,884,758	128,893	156,916	39,140	50,121	2,259,828
2020	2,065,849	151,926	185,504	45,323	57,935	2,506,537
2025	2,255,359	177,231	217,702	51,950	66,210	2,768,452
2030	2,446,467	204,334	253,290	59,160	74,822	3,038,073
2035	2,633,172	232,152	292,034	66,706	83,538	3,307,602
2040	2,817,067	260,075	333,880	74,494	92,113	3,577,629

Source: Texas State Data Center, 2014

EMPLOYMENT TRENDS

The Austin region's economy is generally recognized as one of the most resilient in the nation, particularly during and following the 2008-2009 Recession. The data in Figure 1 show total employment in the Austin-Round Rock MSA between 2007 and 2013 based upon the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) figures. The overall trend for the region has been mostly positive during this period, with the obvious exception of the 2008-2009 Recession. The region had approximately 728,000 jobs during January 2007, which grew to a peak of 774,000 jobs during November 2008. A sharp decline occurred in December 2008 when the region lost 19,000 jobs. While a decline in the number of workers between December and January is typical (since it is a period of seasonal employment) the lack of recovery during subsequent months demonstrated that these job cuts were permanent. The region's total employment fell to its lowest level during July 2009, when it reached 739,000 jobs. In the months that followed, through December 2013, total employment in the Austin-Round Rock MSA grew to 870,000 jobs. It is worth noting that the Austin region surpassed its earlier peak (prior to the 2008-2009 Recession) in 2011 and has added nearly 100,000 more jobs since then. The U.S. economy, on the other hand, did not surpass its pre-recession employment peak until 2014 (based upon Current Employment Statistics data).

Figure 1: Total Employment in the Austin-Round Rock MSA, 2007-2013

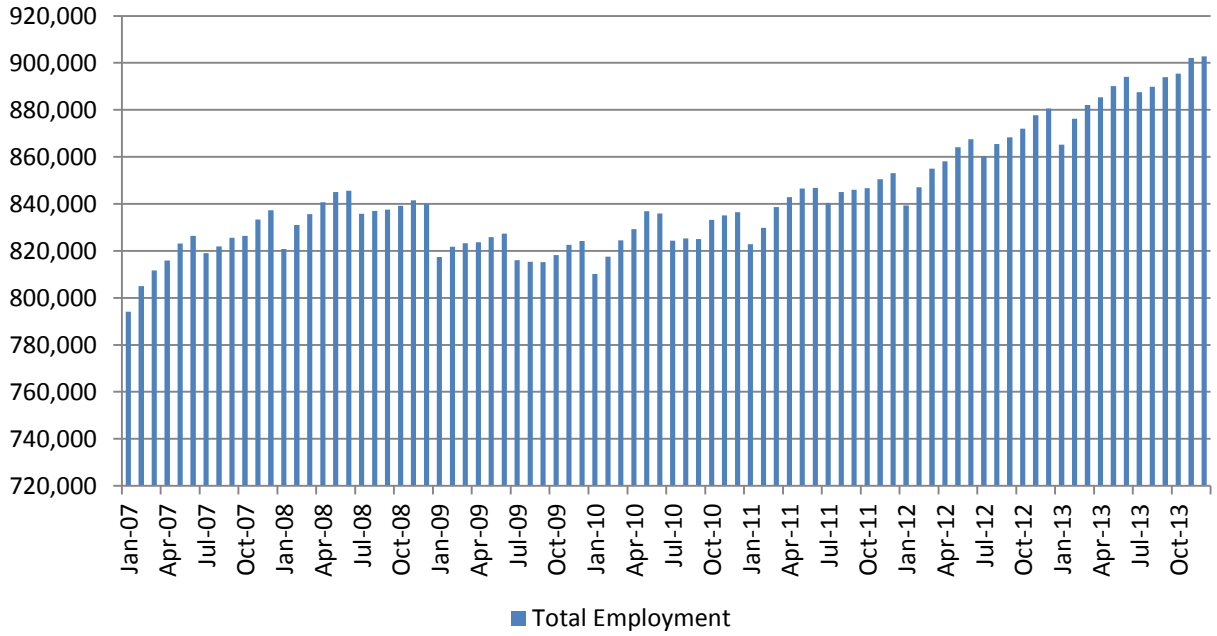


Note: Figure based upon Quarterly Census of Employment and Wages (QCEW) data.
Source: U.S. Bureau of Labor Statistics, 2014.

The workforce in the San Antonio-New Braunfels MSA also fared comparatively well during the 2008-2009 Recession. The San Antonio-New Braunfels MSA had approximately 794,000 jobs during January 2007, which grew to a peak of 845,000 jobs during June 2008 (See Figure 2). Like the Austin-Round Rock MSA, there was a sharp decline in the number of employed during

December 2008 and the region lost 22,000 jobs. The region's total employment fell to its lowest level during January 2010, when it reached 810,000 jobs. In the months that followed, through December 2013, total employment in the San Antonio-New Braunfels MSA grew to 902,000 jobs. However, it was not until May 2011 that regional employment surpassed the earlier peak and has since added more than 55,000 jobs.

Figure 2: Total Employment in the San Antonio-New Braunfels MSA, 2007-2013

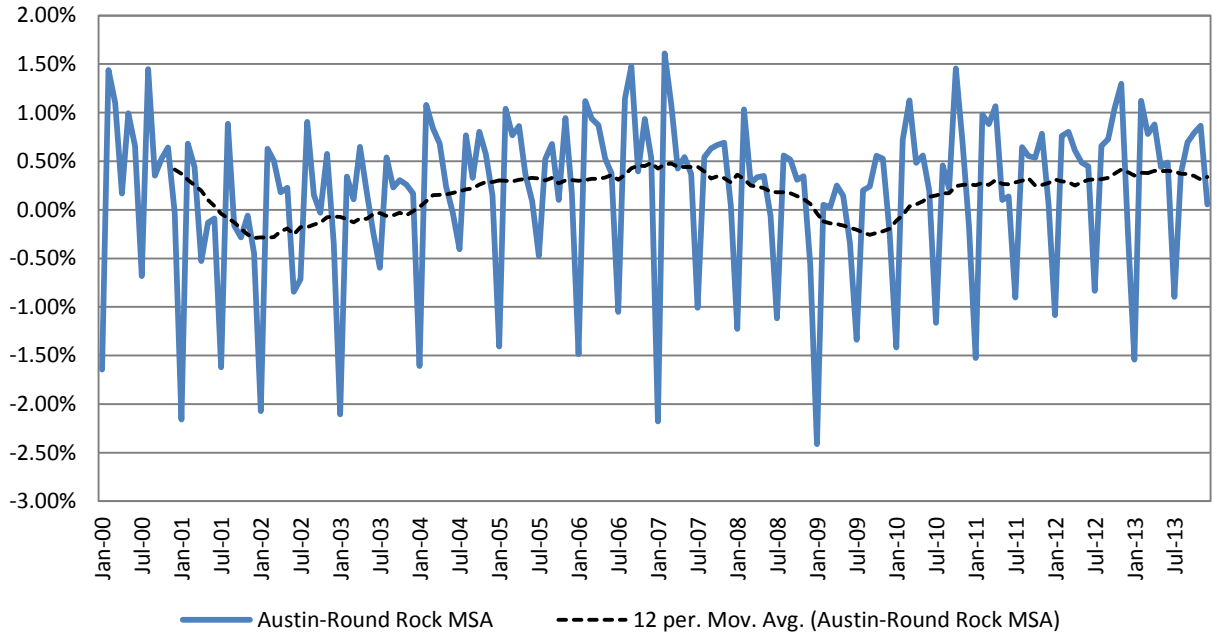


Note: Figure based upon Quarterly Census of Employment and Wages (QCEW) data.
Source: U.S. Bureau of Labor Statistics, 2014.

Figure 3 shows a longer period of employment data using the Texas Workforce Commission's Current Employment Estimates (CES) data. The CES data differ from the QCEW data because they are based upon surveys of employers rather than the actual count of employees, as the QCEW data are. Nonetheless, the discrepancies between the actual and estimated employment numbers tend to be relatively consistent, so the CES data can provide a reasonable surrogate for understanding employment trends when longer term QCEW data are not available. The data in Figure 3 show the percentage month-on-month employment change between January 2000 and December 2013. The unadjusted employment change shows considerable volatility, due to seasonal and academic employment. However, by adding a trend line showing the 12-month moving average, this volatility can be smoothed and the trends can be discerned. The 12-month moving average trend line shows that the Austin-Round Rock region suffered a prolonged period of job loss between 2001 and 2003, due to the downturn in the computer and telecommunications industries, in addition to the recessionary effects of the September 11, 2001 terrorist attacks. The region's economy recovered by early 2004 and enjoyed a period of sustained employment growth until 2008, when the national recession took hold. The job loss of the 2008-2009 Recession occurred over a briefer period than the previous

recession and the recovery came quicker. Since early 2010, the Austin-Round Rock MSA has experienced another sustained period of employment growth similar to the mid-2000s.

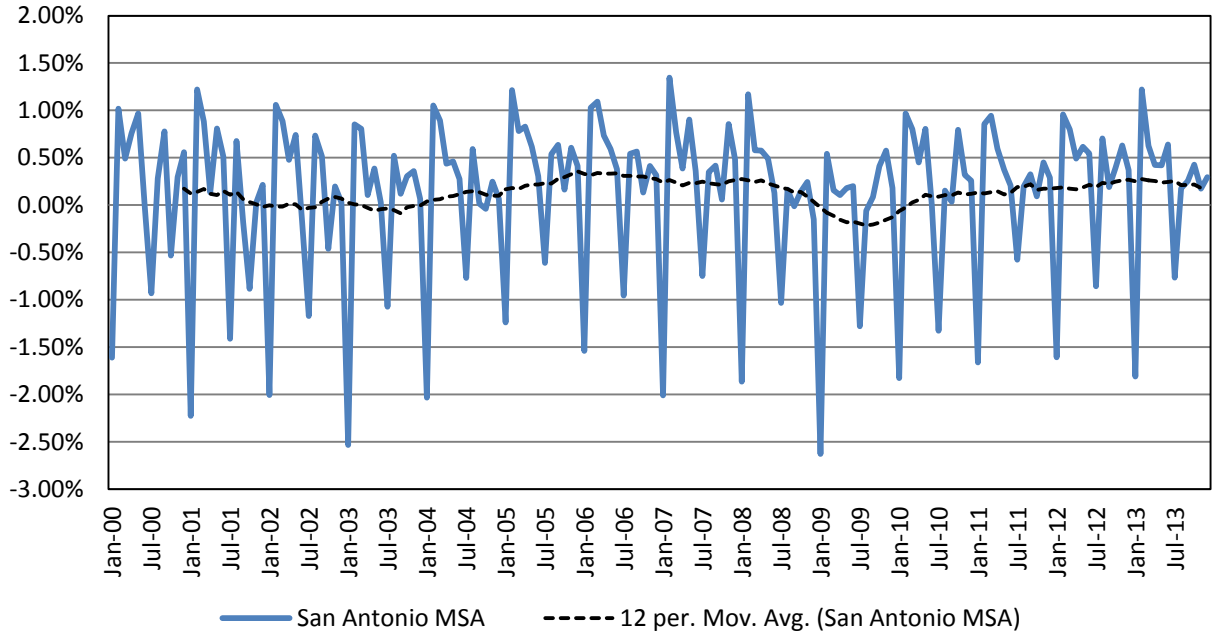
Figure 3: Month-on-Month Employment Change for Austin-Round Rock MSA, January 2000 to December 2013



Note: Figure based upon Current Employment Statistics (CES) data.
Source: Bureau of Labor Statistics, 2014.

Figure 4 shows the CES data over the same period for the San Antonio-New Braunfels MSA. The 12-month moving average trend line shows that the San Antonio region suffered a period of job growth stagnation more than job loss between 2001 and 2003, unlike the Austin-Round Rock MSA. The region's economy entered into a very modest recovery by early 2004 and enjoyed a period of sustained employment growth between 2006 and 2008, when the national recession took hold. During the recession the region's job loss was sustained between 2008 and 2009 and began a tepid recovery during 2010. Since early 2010, the San Antonio MSA has experienced another sustained period of employment growth, although it has been less robust than the growth in the Austin-Round Rock MSA.

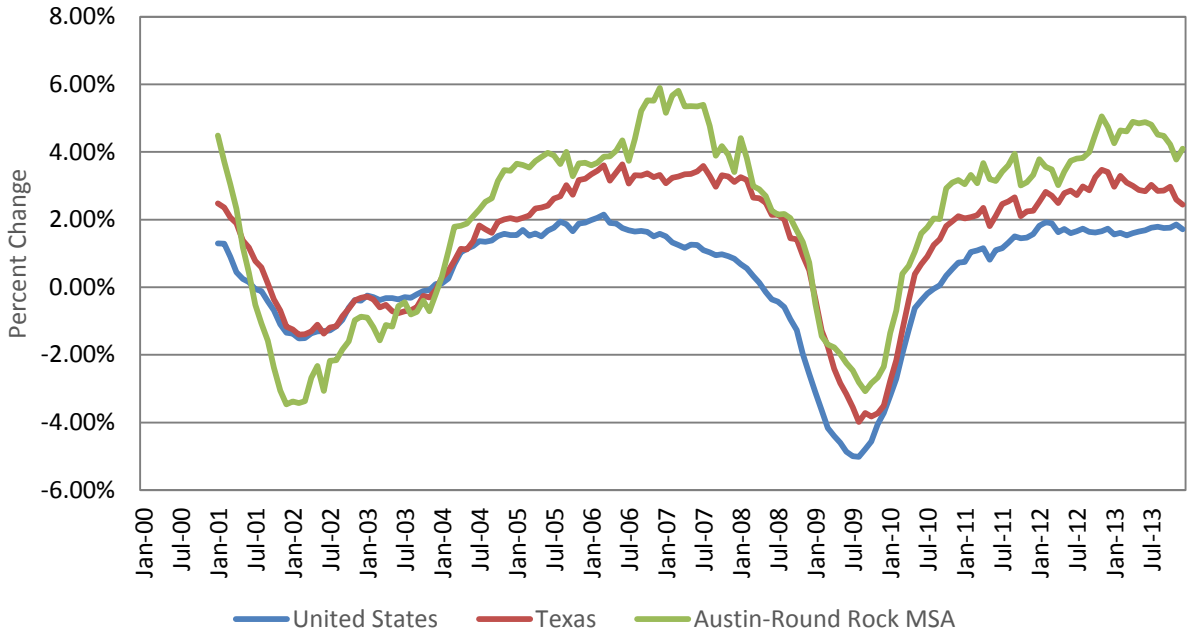
Figure 4: Month-on-Month Employment Change for San Antonio-New Braunfels MSA, January 2000 to December 2013



Note: Figure based upon Current Employment Statistics (CES) data.
Source: Bureau of Labor Statistics, 2014.

Figure 5 shows year-on-year employment change for the United States, Texas, and the Austin-Round Rock MSA. These data show that the recession, which began in 2001, had a more significant effect on the Austin-Round Rock region than it did on the United States or Texas economies. After recovering, the region's employment grew more quickly than did the nation or the state overall, for a four-year period between 2004 and 2008. The Austin-Round Rock MSA region even outperformed the U.S. economy during the period of labor force contraction, (as did the state of Texas), experiencing smaller proportional share of job losses and a quicker recovery. Since positive job growth returned in early-2010, the rate of job growth in the Austin-Round Rock MSA has outperformed the state and the nation.

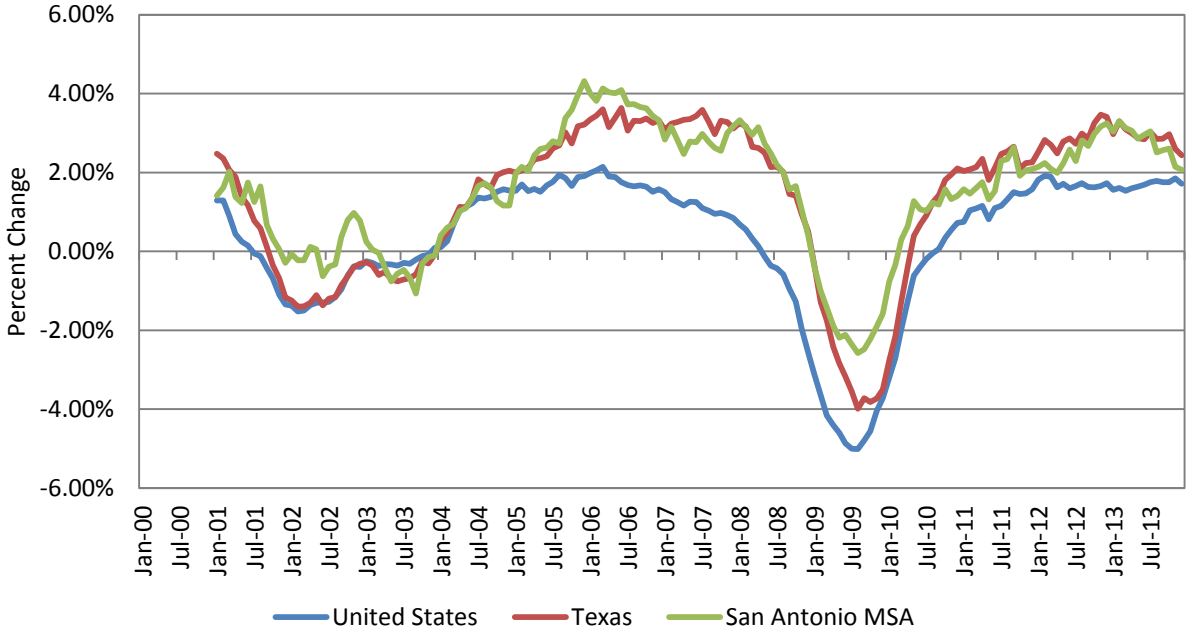
Figure 5: Year-on-Year Employment Change for the United States, Texas, and the Austin-Round Rock MSA, January 2000 to December 2013



Note: Figure based upon Current Employment Statistics (CES) data.
Source: Bureau of Labor Statistics, 2014.

Figure 6 shows the year-on-year employment change for the United States, Texas, and the San Antonio-New Braunfels MSA. These data again show that the San Antonio-New Braunfels MSA economy was less severely affected by the 2001 Recession than were the Texas and U.S. economies. Following its recovery, the region's employment grew strongly through the mid-2000s, similar to the overall state rate and more strongly than the nation. Like the Austin-Round Rock MSA's economy, the San Antonio-New Braunfels MSA's economy suffered a lower rate of employment loss and recovered from the 2008-2009 Recession more quickly than did the state and the nation. Since the recovery began, the region performed similarly to the Texas economy.

Figure 6: Year-on-Year Employment Change for the United States, Texas, and the San Antonio-New Braunfels MSA, January 2000 to December 2013



Note: Figure based upon Current Employment Statistics (CES) data.
Source: Bureau of Labor Statistics, 2014.

For comparison purposes, Table 10 shows historic employment data for the four largest MSAs in Texas during the period between 2007 and 2013. The data show that the Austin-Round Rock MSA had a net employment increase of 96,334 jobs between 2007 and 2013, which is actually the third largest net increase among the four largest MSAs. However, the data also reveal that the Austin-Round Rock MSA had the fastest CAGR at 2.02 percent. The San Antonio-New Braunfels MSA ranked fourth, in terms of overall employment growth during this period and third highest rate of employment growth.

Table 10: Total Employment in Largest Texas MSAs, 2007-2013

		TOTAL EMPLOYMENT		
Year	**Austin MSA**	**Dallas Fort Worth MSA**	**Houston MSA**	**San Antonio MSA**
2007	754,675	2,882,016	2,493,764	819,962
2008	768,189	2,927,566	2,553,210	837,490
2009	748,101	2,806,958	2,487,899	820,893
2010	758,381	2,806,620	2,478,444	827,805
2011	782,423	2,874,730	2,543,721	842,408
2012	812,600	2,955,863	2,642,469	862,961
2013	851,009	3,058,105	2,738,348	888,730
		TOTAL EMPLOYMENT CHANGE		
Year	**Austin MSA**	**Dallas Fort Worth MSA**	**Houston MSA**	**San Antonio MSA**
2007-2008	13,514	45,550	59,446	17,528
2008-2009	-20,088	-120,608	-65,311	-16,597
2009-2010	10,280	-338	-9,455	6,912
2010-2011	24,042	68,110	65,277	14,603
2011-2012	30,177	81,133	98,748	20,553
2012-2013	38,409	102,242	95,879	25,769
2007-2013	**96,334**	**176,089**	**244,584**	**68,768**
		COMPUNDED ANNUAL GROWTH RATE		
Year	**Austin MSA**	**Dallas Fort Worth MSA**	**Houston MSA**	**San Antonio MSA**
2007-2008	1.79%	1.58%	2.38%	2.14%
2008-2009	-2.61%	-4.12%	-2.56%	-1.98%
2009-2010	1.37%	-0.01%	-0.38%	0.84%
2010-2011	3.17%	2.43%	2.63%	1.76%
2011-2012	3.86%	2.82%	3.88%	2.44%
2012-2013	4.73%	3.46%	3.63%	2.99%
2007-2013	**2.02%**	**0.99%**	**1.57%**	**1.35%**

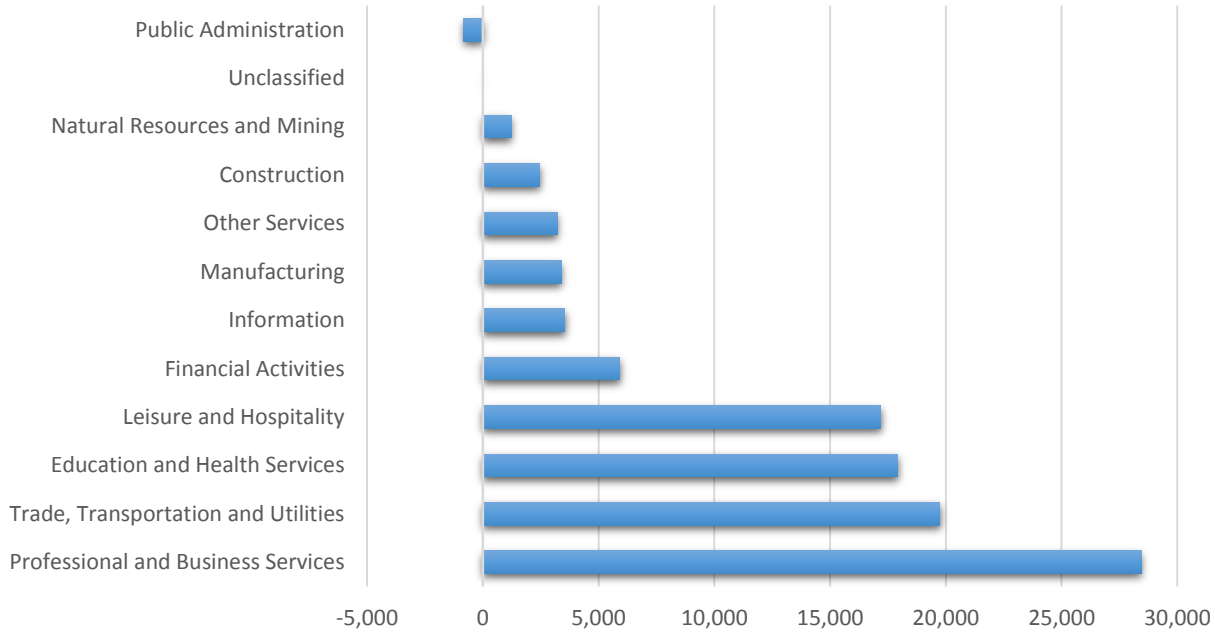
Source: Bureau of Labor Statistics, 2014.

RECENT SECTORAL EMPLOYMENT TRENDS IN THE AUSTIN-ROUND ROCK, TX MSA

This section provides detail on the recent sectoral employment patterns and trends in the Austin-Round Rock, TX MSA. Despite the effects of the 2008-2009 Recession, the Austin-Round Rock MSA experienced significant employment growth between 2009 and 2013. Overall, the region had a net employment increase of 102,221 jobs or an increase of 13.8 percent during this four-year period. Figure 7 further breaks down the employment growth, showing the absolute employment change by industry sector in the Austin-Round Rock MSA between 2009 and 2013. The Professional and Business Services sector gained the most employment with 28,448 new jobs, followed by the Trade, Transportation, and Utilities sector, which added 19,749 jobs. The next two high-growth employment sectors were Education and Health Services with 17,926 added jobs and Leisure and Hospitality with 17,201 new jobs. Surprisingly,

despite the large number of workers in state and local government, the region's Public Administration sector lost jobs.

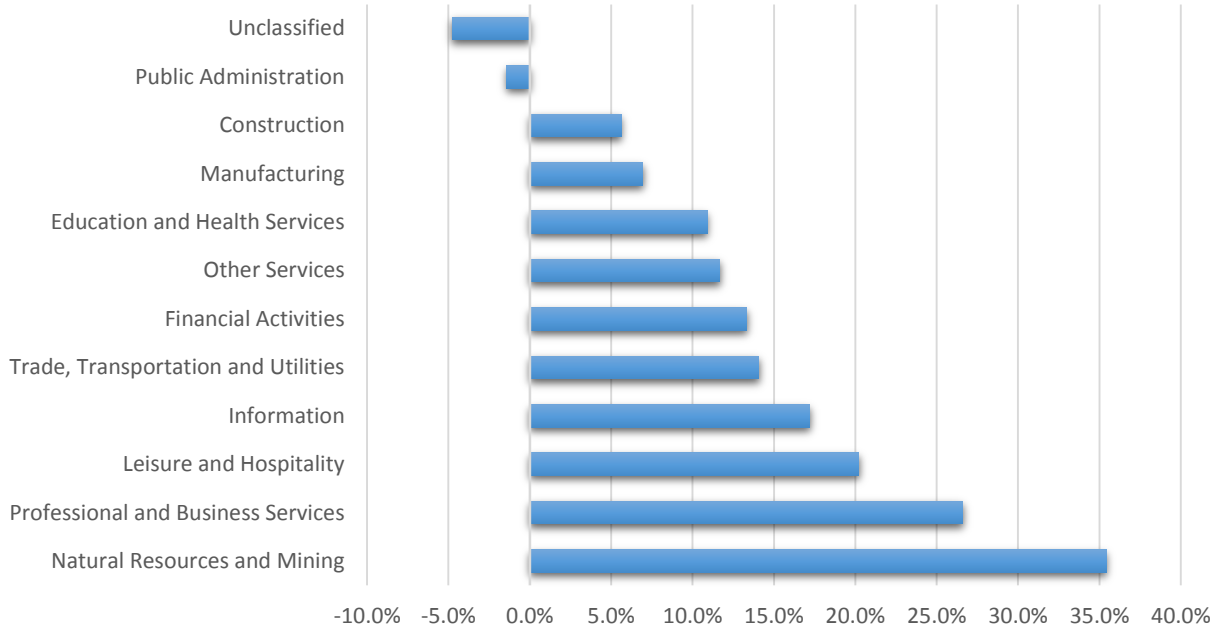
Figure 7: Absolute Employment Change in the Austin-Round Rock MSA by Sector, 2009 vs. 2013



Source: Texas Workforce Commission, 2015.

Figure 8 shows the percentage of employment change by sector between 2009 and 2013. The Natural Resources and Mining sector grew by 35.4 percent, which was the largest increase in the local economy. However, in terms of absolute change, the Natural Resources and Mining Sector increased by only 1,223 jobs or 1.2 percent of the region's overall employment growth. Other employment sectors in the region with large percentage increases, as well as absolute change, were Professional and Business Services; Leisure and Hospitality; Trade, Transportation, and Utilities; Financial Activities; and Education and Health Services.

Figure 8: Percent Employment Change in the Austin-Round Rock MSA by Sector, 2009 vs. 2013



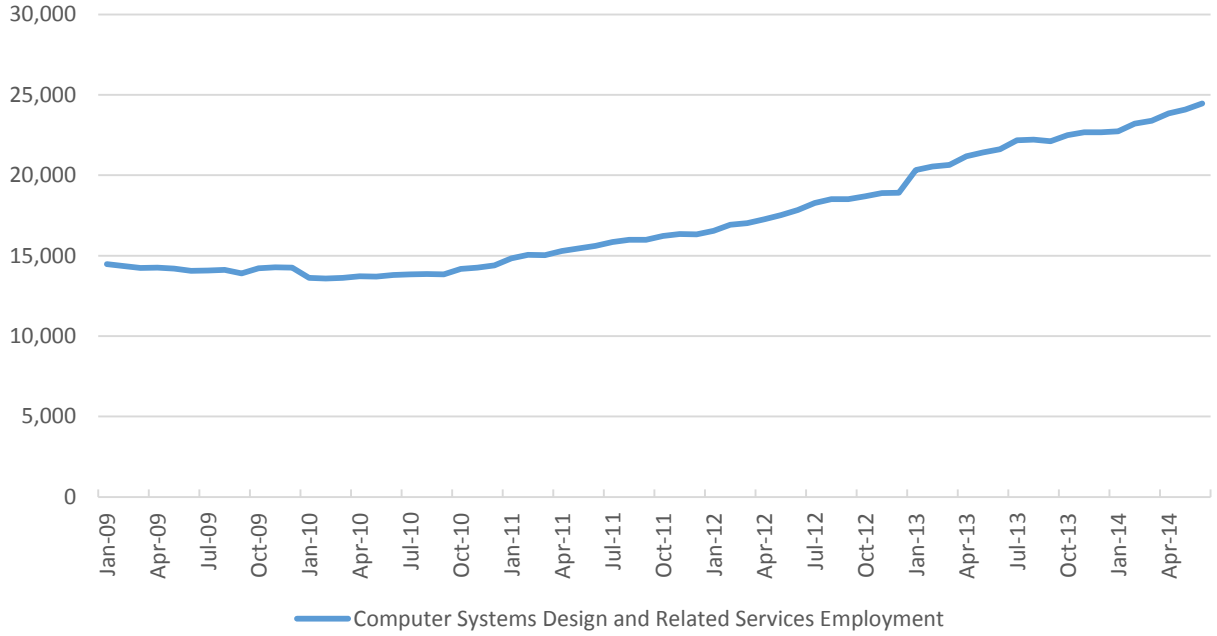
Source: Texas Workforce Commission 2015.

The remaining sections of this appendix provide additional detail on the individual employment sectors that experienced the largest absolute growth. Additionally, it will also include a discussion of the Government sector and the Natural Resources and Mining sector, which could be affected by recent drops in global oil prices.

Professional Business Services

The professional business services sector includes a wide range of industries that are mostly white-collar, such as law, accounting, architecture, engineering, computer systems design, consulting, public relations and advertising, and business management and services. As described above, the Professional Business Services sector increased by 28,448 jobs between 2009 and 2013. Total employment in the Professional Business Services sector was 143,588 jobs during the Second Quarter of 2014. Within the Professional Business Services sector, employment in the Computer Systems Design and Related Services subsector experienced significant growth between 2009 and 2013. This growth is not surprising, given Austin's specialization in the computer industry. The average employment in this subsector during 2009 was 14,204 employees, increasing to an average employment 21,676 employees during 2013 (See Figure 9). The absolute change was an increase of 7,472 jobs over these four years or an increase of 52.6 percent. The total employment in this subsector during June 2014 was 24,464 jobs.

Figure 9: Employment in the Computer Systems Design and Related Services Subsector, January 2009 through June 2014

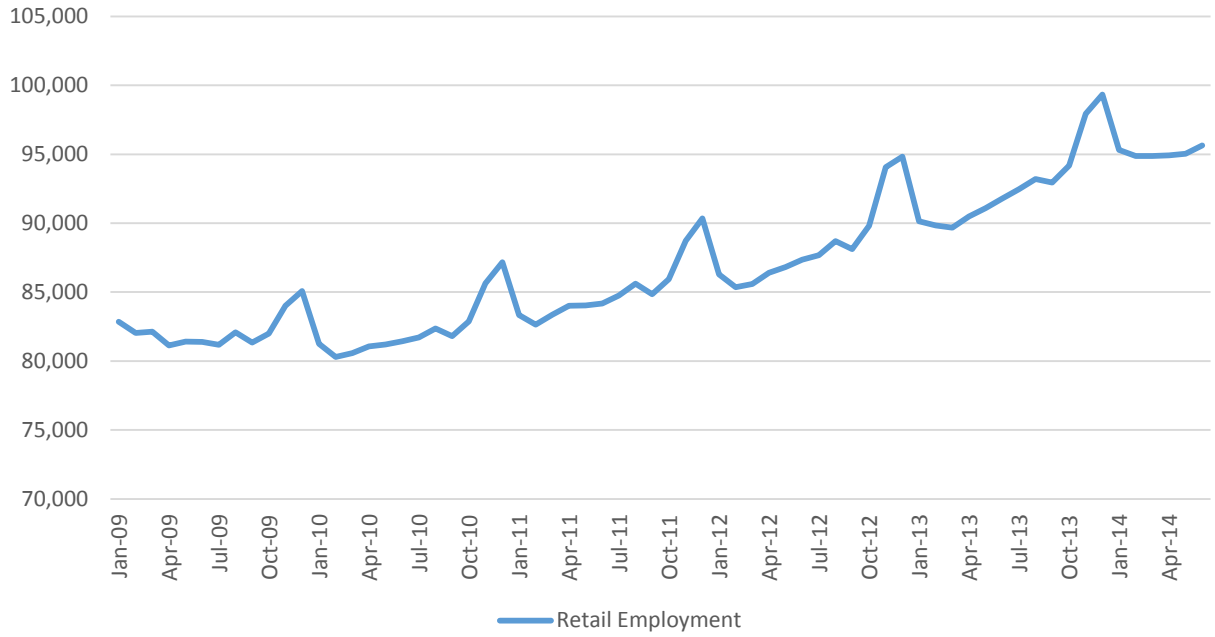


Source: Texas Workforce Commission, 2015.

Trade, Transportation, Utilities

The Trade, Transportation, and Utilities sector added 19,749 employees between 2009 and 2013. Within this sector, more than half of the new employment was added in the Retail subsector, which grew by 10,538 jobs during this period or an increase of 12.8 percent (See Figure 10). Since 2009, there have been relatively few new shopping centers built in the Austin MSA. Among those retail centers that have been built since 2009, the notable ones include Kyle Crossing (743,415 square feet), Burleson Crossing (Bastrop – 550,000 square feet), Cedar Park Town Center (325,000 square feet), and Parkline (Austin – 300,000 square feet). Other retail employment growth has resulting from adding employees to existing staff, absorbing vacant retail space, and constructing new free-standing retail buildings. Total employment in the Retail subsector was 95,637 jobs during June 2014. The noticeable employment peaks at the end and beginning of each year are the result of temporary hiring around the holidays.

Figure 10: Employment in the Retail Subsector, January 2009 through June 2014

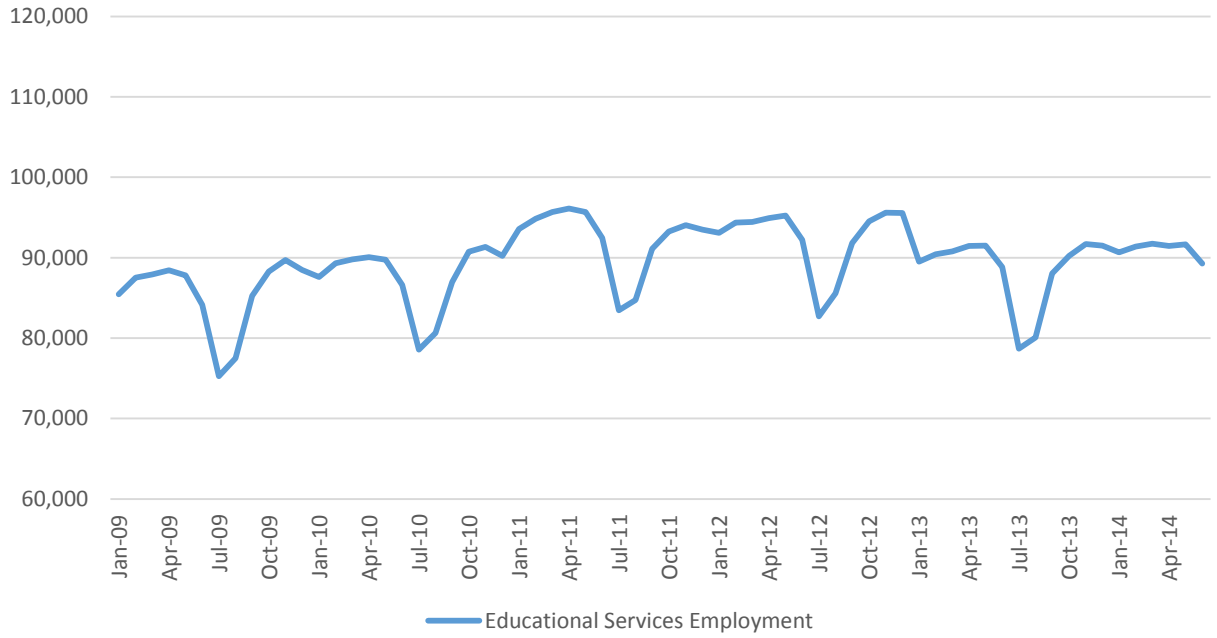


Source: Texas Workforce Commission, 2015.

Education and Health Services

Typically, the Education and Health Services sector is one of the largest and fastest growing employment sectors in a region, especially when the region is rapidly adding population. The total employment for this sector was 187,632 jobs during the Second Quarter of 2014 (See Figure 11). Usually growth is strong in both the Education and the Health Services subsectors. However, due to the 2008-2009 Recession, many school districts in the Austin-Round Rock MSA curtailed the hiring of new staff or reduced their workforce. Despite the region adding approximately 195,000 new residents (or an increase of 11.6 percent) between 2009 and 2013, the Educational Services subsector only added 3,083 workers or an increase of 3.6 percent. The cyclical element of this subsector, visible in Figure 11, is due employment changes between academic years.

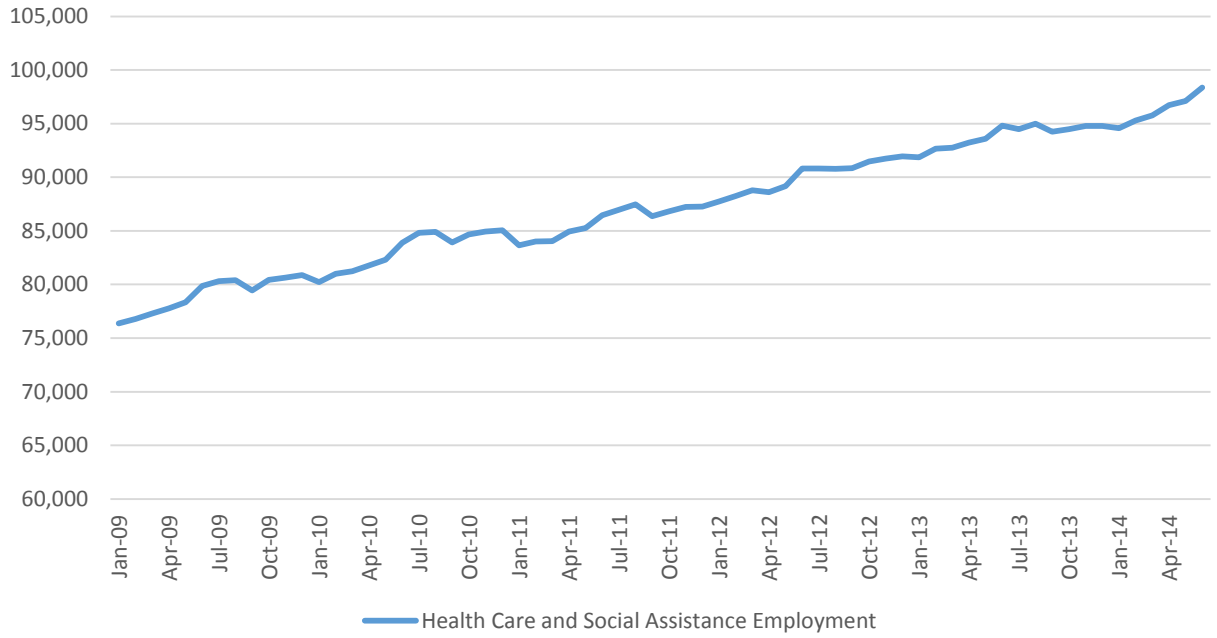
Figure 11: Educational Services Subsector Employment in Austin-Round Rock MSA, January 2009 through June 2014



Source: Texas Workforce Commission, 2015.

The Health Care and Social Assistance subsector, on the other hand, grew significantly between 2009 and 2013, adding 14,843 jobs between 2009 and 2013 or an increase of 18.8 percent (See Figure 12). Growth in the Health Care and Social Assistance subsector also outpaced population growth (the aforementioned 11.6 percent). In addition to keeping pace with population growth, the additional employment in this sector was likely due to a growing number of elderly, the opening of Seton Medical Center in Hays County and a small private hospital in Austin, and expansions of existing hospitals in the region. Total employment in the subsector was 98,371 workers during June 2014.

Figure 12: Health Care and Social Assistance Subsector Employment in Austin-Round Rock MSA, January 2009 through June 2014



Source: Texas Workforce Commission, 2015.

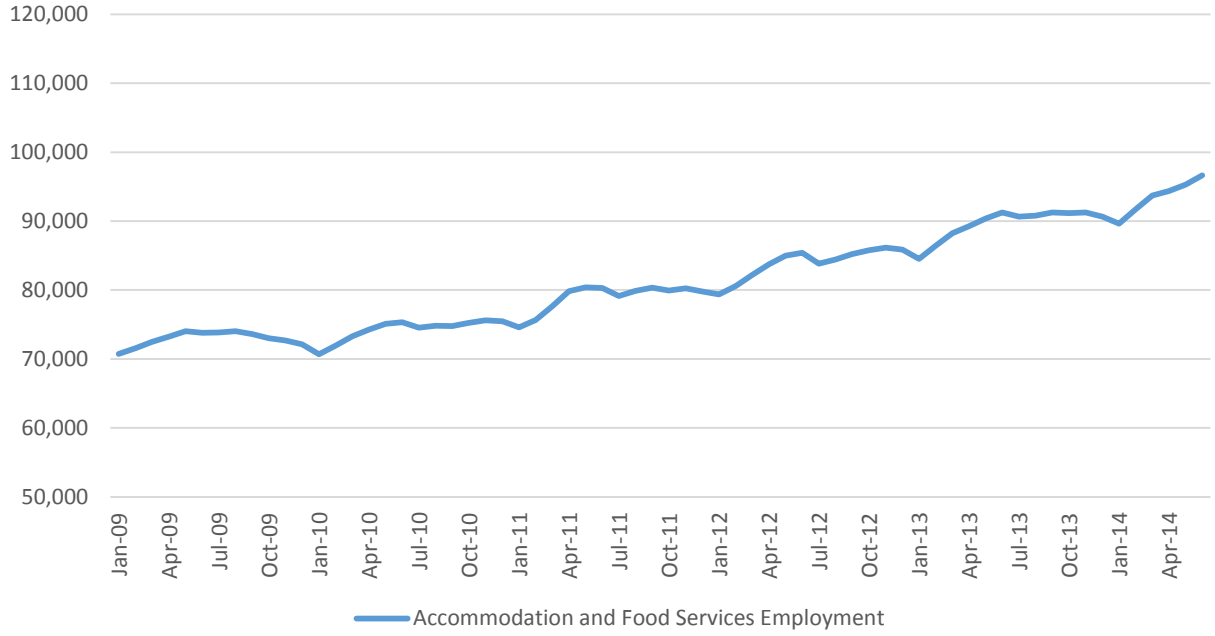
Leisure and Hospitality Sector

The Leisure and Hospitality Sector has been one of the fastest growing employment sectors in the Austin-Round Rock MSA. Events held in the city of Austin attract attendees not only from Texas, but nationally and internationally. The SXSW festival (which contains separate music, film, and interactive conferences) is one Austin's best known events. During the 2014 SXSW conferences, there were an estimated 376,600 attendees who booked an estimated 60,450 room nights at local hotels.[2] The daily attendance at the Austin City Limits Festival, another major event that now occupies two three-day weekends, is approximately 75,000 persons.[3] Additionally, the Formula 1 racing at the newly built Circuit of the Americas (COTA) track, which also hosted the 2014 X-Games and various concerts, is another major venue. Counting attendees to Formula 1 races, motorsport/sporting events, concerts, and other smaller events, the total attendance was 1,109,934 person days (i.e. a person's multi-day visits are counted as a one visit during each day) and COTA estimates that each Formula 1 race attendee (about a third of the total) spends an average of 3.82 nights in Austin.[4] Home football games at the University of Texas at Austin are another major event that attracts approximately 36,000 out-of-town

[2] Greyhill Advisors. 2014. Analysis of the Economic Benefit to the City of Austin from South by Southwest 2014. http://www.sxsw.com/sites/default/files/attachments/2014%20SXSW%20Economic%20Impact%20Analysis.pdf.
[3] Dinges, Gary. ACL Fest's expansion to 2 weekends has benefits, drawbacks. Austin American-Statesman. 29 September 2013. http://www.statesman.com/news/business/acl-fests-expansion-to-2-weekends-has-benefits-dra/nbBC4/.
[4] Greyhill Advisors. 2014. The Economic Impact of Circuit of the Americas. http://ea80e97cace747c2c244-5483548c70a81fe49af7816b21fff1c8.r64.cf1.rackcdn.com/COTA-Economic-Impact_Greyhill-Advisors.pdf.

visitors, who collectively create a $24 million economic impact on the local economy during each game.[5] All of these visitors to the city of Austin are in addition to the others who visit for conferences, other events, or simply as tourists. Within the Leisure and Hospitality sector, most of the growth has been in the Accommodation and Food Services subsector. Figure 13 shows that employment in the subsector grew by 16,724 jobs or an increase of 22.9 percent. Given Austin's healthy tourism sector, there are a number of new hotels in the construction or planning process. According to the *Austin Business Journal*, there are currently 8,649 rooms in the development pipeline within the region. One recently opened hotel is the 17-story Hyatt Place hotel in downtown Austin. Other hotels that are in the construction phase include the 1,012-room JW Marriott convention hotel (expected February 2015), a 1,066-room Fairmont convention hotel (expected June 2017), a 366-room Westin hotel (expected summer 2015), the 322-room Hotel Van Zandt, a 167-room Holiday Inn Express, and a 133-room Hotel Indigo.[6] A number of other hotels are currently planned for downtown Austin and its environs.

Figure 13: Employment in the Accommodation and Food Services Subsector, January 2009 through June 2014



Source: Texas Workforce Commission, 2015.

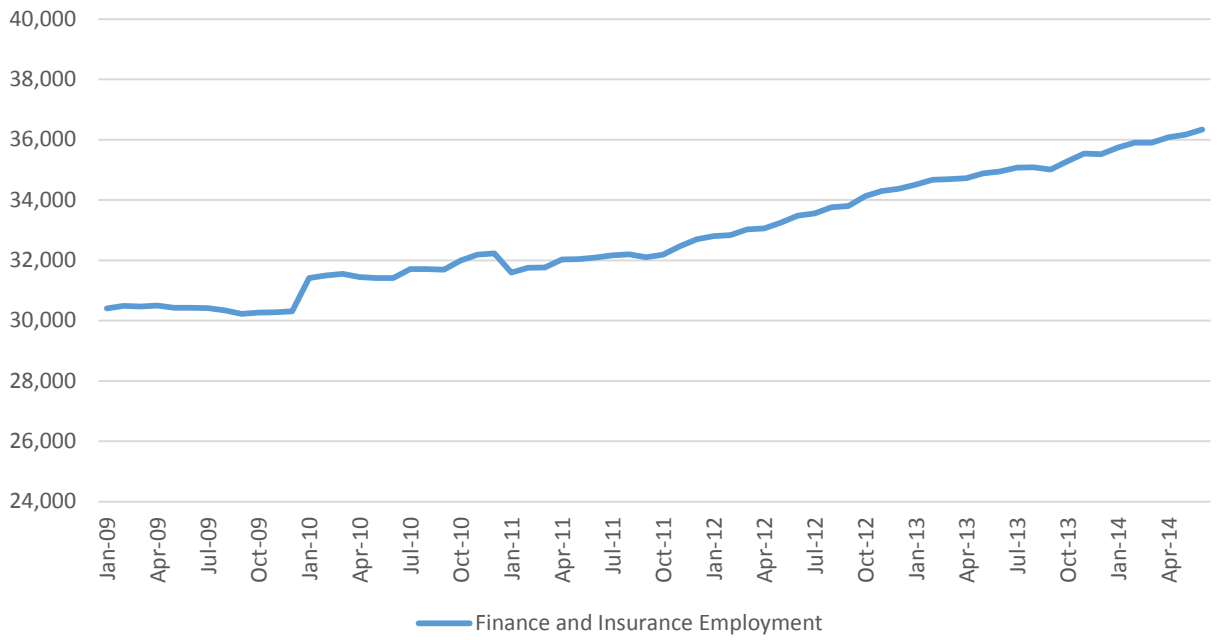
Finance and Insurance

The Finance and Insurance Sector has not traditionally had a disproportionate role in the local economy. Most employment in this sector is geared towards retail and commercial banking and insurance, along with public finance for the state and local government and managing

[5] University of Texas System. The University of Texas at Austin: impact on Austin. http://www.utsystem.edu/sites/utsfiles/news/ImpactSheetAustin0611.pdf.
[6] Buchholz, Jan. "Austin's New Roomy Interior". *Austin Business Journal*. 2 January 2015.

public pension plans. However, some new financial service activities have been added to the local economy. More recently Charles Schwab announced plans to add 800 more employees in Austin, where it currently has 1,100 employees. Charles Schwab has cited Austin's affordability with quality of life, compared to more expensive locations that traditionally attract the financial sector, as a primary reason for this expansion. Total employment in the Finance and Insurance sector during June 2014 was 36,341 jobs.

Figure 14: Employment in the Finance and Insurance Subsector, January 2009 through June 2014

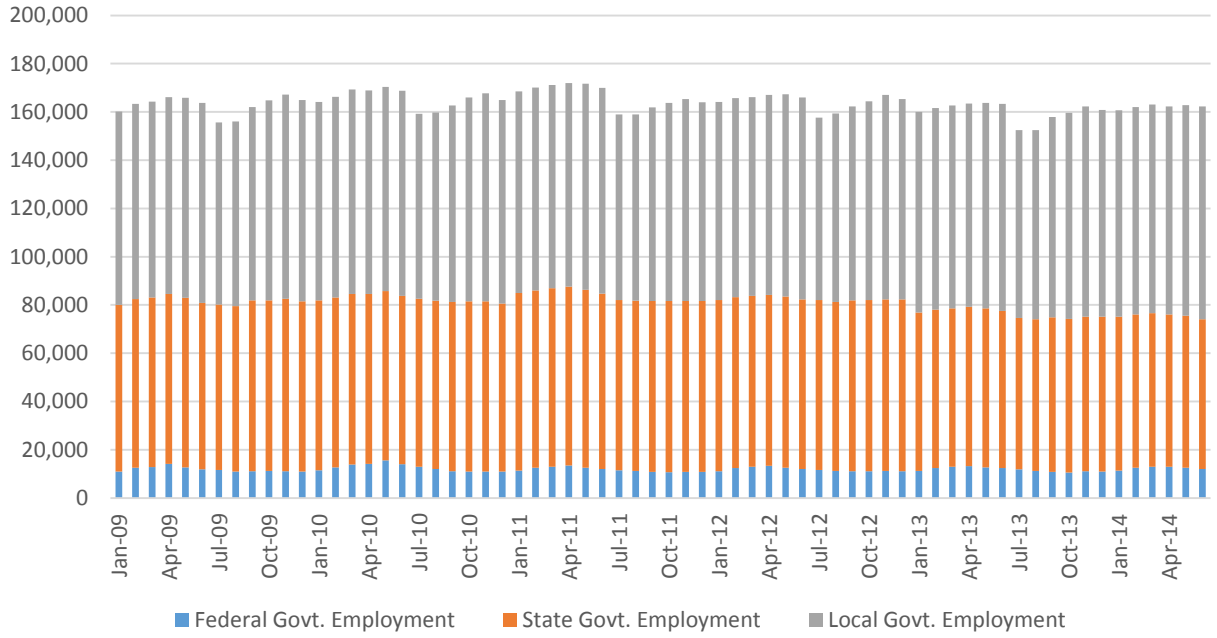


Source: Texas Workforce Commission, 2015.

Public Sector Employment

As the state capital of Texas, the Austin-Round Rock MSA has a large number of government employees. During June 2014, there were 62,157 state workers in the region. The presence of federal employment, however, is much smaller with only 11,983 workers during the same month. Many of these federal employees work at an IRS processing facility in Austin. Local government, however, was the largest sector of public workers with 88,184 employees during June 2014. While there is a common perception that public sector employment grows continuously, Figure 15 shows that public sector employment in the Austin-Round MSA actually declined modestly from an average of 162,852 workers during 2009 to an average of 160,040 workers during 2013.

Figure 15: Federal, State, and Local Government Employment in the Austin-Round Rock MSA, January 2009 through June 2014



Source: Texas Workforce Commission, 2015.

Natural Resources and Mining

The recent decline in global oil prices has generated questions about the viability of Texas's petroleum extraction industry, given its prominence in the state's economy and its role in supporting the Texas economy during the 2008-2009 Recession. Over the past decade, the widespread use of horizontal drilling and hydraulic fracturing has been used to produce significant volumes of oil and gas from shale plays that were previously untapped. In Texas, there are three major shale plays with significant drilling and production activity: the Barnett shale play, located in north Texas around the Dallas-Fort Worth region; the Permian Basin shale play, located in West Texas around the cities of Midland and Odessa; and the Eagle Ford shale play, located south of San Antonio toward the Texas-Mexico border. While there are also shale deposits deep under the Austin-Round Rock MSA, the geology of the region is not conducive to cheaply extracting any oil and gas that might exist. As a result, there is very little oil production in the Austin-Round Rock MSA, with the notable exception of southern Caldwell County. On the business side of the oil extraction industry (management, finance, engineering, support services, etc.), most major corporations are headquartered in Houston or Dallas. Houston, in particular, serves as a global center for the petroleum industry.

Nationally, during the second quarter of 2014, there were 195,215 workers employed in the oil and gas extraction sector (NAICS 211), which was 0.14 percent of the U.S. workforce. There were also 431,702 workers in the Support Activities for Mining (NAICS 213) sector, which made

up 0.32 percent of the U.S. workforce (See Table 11). As would be expected, Texas had a large share of these workers. Despite having more than half the nation's workers (101,008 jobs) in the Oil and Gas Extraction subsector, it made up less than 1.0 percent of the state's workforce. The Austin-Round Rock MSA, by comparison, had only 1,237 workers in NAICS 211, which was 0.14 percent of the region's workforce. During the same period, 1.67 percent of the state's employment worked in the NAICS 213 subsector. Only 0.18 percent of the Austin-Round Rock MSA's workforce was employed in NAICS 213.

Table 11: Total Second Quarter Employment and Employment in the Oil and Gas Extraction Subsector (NAICS 211) and the Support Activities for Mining Subsector (NAICS 213)

	EMPLOYMENT			SHARE OF TOTAL EMPLOYMENT	
Area	**Total**	**NAICS 211**	**NAICS 213**	**NAICS 211**	**NAICS 213**
United States	137,016,512	195,215	431,702	0.14%	0.32%
Texas	11,353,586	101,008	189,674	0.89%	1.67%
Austin-Round Rock MSA	879,792	1,237	1,580	0.14%	0.18%

Source: U.S. Bureau of Labor Statistics and the Texas Workforce Commission, 2014.

Note: Employment data for Texas and the Austin-Round Rock MSA was obtained from the Texas Workforce Commission and data for the United States was obtained from the U.S. Bureau of Labor Statistics. Figures from both data sources were based upon the Quarterly Census of Employment and Wages (QCEW) dataset. The BLS does not disclose data from NAICS 211 for the Austin-Round Rock MSA but the TWC does report these employment figures.

Table 12 shows the actual employment in each subsector between 2009 and 2013. The data show that NAICS 211 added 255 jobs during this period, while NAICS 213 added 734 jobs. Collectively, this increase accounted for less than 1.0 percent of the regions total employment growth during this period.

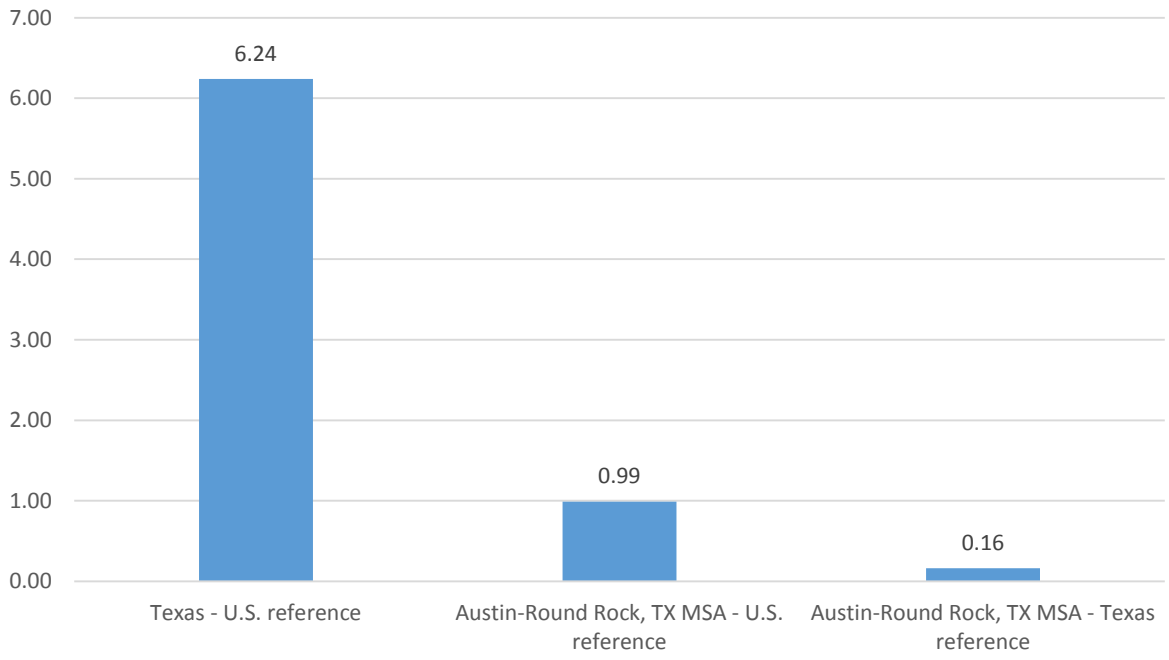
Table 12: Annual Average Employment in NAICS 211 and NAICS 213 Subsectors in Austin-Round Rock MSA, 2009-2013

Year	**NAICS 211 Oil and Gas Extraction**	**NAICS 213 Support Activities for Mining**
2009	888	629
2010	887	652
2011	975	806
2012	1,054	1,043
2013	1,143	1,363
Change 2009-13	255	734

Source: Texas Workforce Commission, 2015

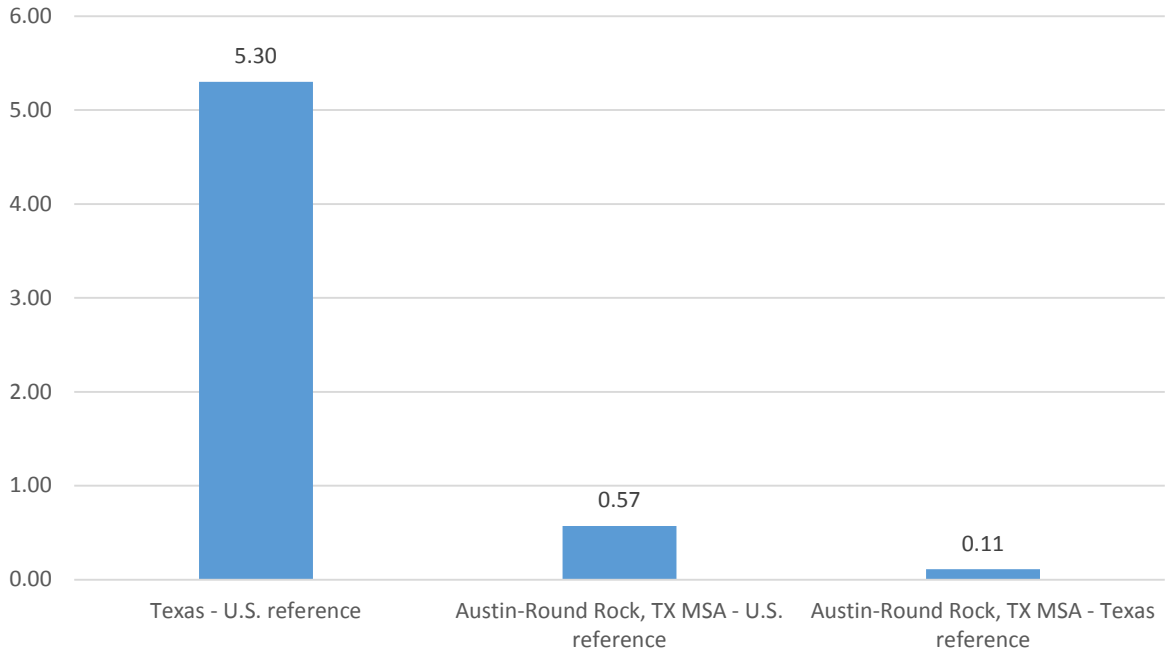
Another measure of the oil and gas extraction sector's importance to the Austin-Round Rock MSA economy is to calculate its location quotient. A location quotient is a measure of a region's employment specialization, compared to another (larger) region's employment. If the location quotient for an industry in a region is higher than 1.0, it is considered specialized within that employment sector. If the location quotient is below 1.0, the region is not considered specialized. In Figure 16, the data show that the state of Texas is highly specialized in the oil and gas extraction sector, compared to the United States overall. Texas location quotient for NAICS 211 was 6.24 during the second quarter of 2014 (See Figure 16). However, the location quotient for the Austin-Round MSA in NAICS 211 was 0.99, using the overall U.S. economy as a reference region. This number means the Austin-Round Rock MSA has roughly the number of employees in NAICS 211 that one would expect for an economy of its size. When the Austin-Round Rock MSA's employment in NAICS211 is compared to the Texas economy, it has a location quotient of 0.16, which means it has significantly less employment specialization in this sector than the state overall. The data show the specialization of the local economy in the NAICS 213 sector is even less than NAICS 211 (See Figure 17). The Austin-Round Rock MSA has a location quotient of 0.57 for NAICS 213 compared to the U.S. economy and a location quotient of 0.11 compared to the Texas economy. It should be pointed that this analysis does not account for the potential losses of indirect and induced labor nor lost income. But, given the modest role the petroleum extraction industry has in the local economy, these losses are not expected to be significant.

Figure 16: Location Quotients for NAICS 211 Oil and Gas Extraction – Second Quarter 2014



Source: Calculated using data from the U.S. Bureau of Labor Statistics and the Texas Workforce Commission, 2015.

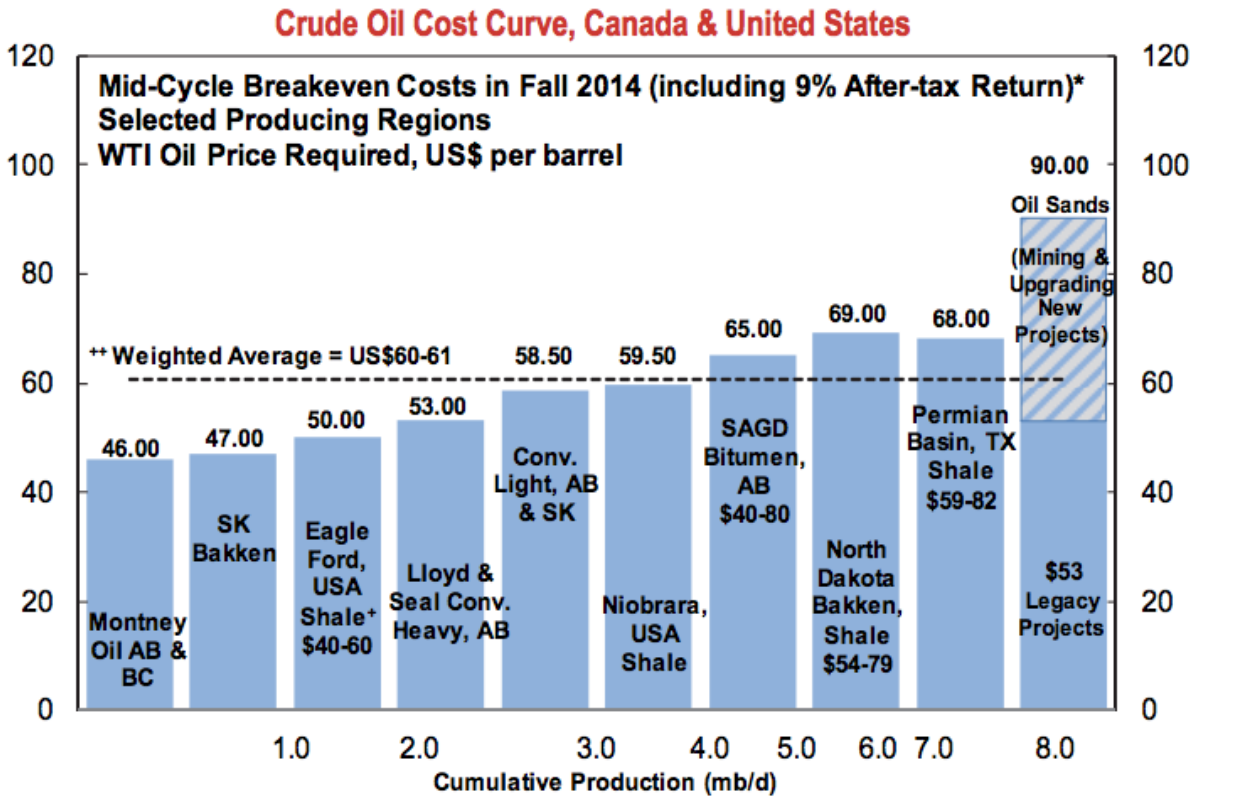
Figure 17: Location Quotients for NAICS 213 Support Activities for Mining – Second Quarter 2014



Source: Calculated using data from the U.S. Bureau of Labor Statistics and the Texas Workforce Commission, 2015.

Oil and gas production in Texas is undoubtedly influenced by the price of oil, although the impacts of falling crude oil prices on production vary by location. In other words, the cost of producing a barrel of oil is not the same across the state. The cost to produce a barrel of crude oil depends on the location of the drilling and the individual circumstances of the firms drilling the wells (e.g. are they using their own or leased equipment; are they self-financed or do they have investors, etc.). The figure below, using data from and produced by Scotiabank Equity Research and Scotiabank Economics, shows cost estimates for producing crude oil in various locations. The Permian Basin shale play is a relatively expensive location, but it is estimated that some producers in the Eagle Ford shale play could weather oil prices as low as $40 per barrel (See Figure 18). Anecdotally, there are reports of even lower costs of production in the Eagle Ford shale play, but the actual cost does literally differ from well to well.

Figure 18: Estimates of Crude Oil Production Costs in Canada and the United States, Fall 2014



* Excludes 'up-front' costs (initial land acquisition, seismic and infrastructure costs): treats 'up-front' costs as 'sunk'. Rough estimate of 'up-front' costs = US$5-10 per barrel, though wide regional differences exist. Includes royalties, which are more advantageous in Alberta/Saskatchewan.
\+ Liquids-rich Eagle Ford plays, assuming natural gas prices of US$3.80 per mmbtu.
++ Weighted avg. = US$60-61 including existing Integrated Oil Sands at C$53 per barrel.
Saudi Arabia: US$10-25 per barrel.
Data source: Scotiabank Equity Research and Scotiabank Economics.

Employment data from the BLS and the TWC suggests that the Austin-Round Rock MSA does not have a high exposure to employment loss from diminished oil and gas extraction. According to TWC data, there are only 1,237 employees in the Oil and Gas Extraction sector of the Austin-Round Rock MSA during the second quarter of 2014. Similarly, the Support Activities for Mining subsector only had 1,580 employees during the same period. These workers constituted approximately 0.14 percent and 0.18 percent of the region's total employment, respectively. The location quotient analysis shows the Austin-Round MSA's concentration in the Oil and Gas Extraction sector is essentially the same as the nation overall and it has significantly less employment concentration in this sector than the state overall. An even weaker pattern exists for the Support Activities for Mining sector. Nonetheless, while the region is fairly insulated from employment losses, if oil production in the state curtails, there

will likely to be some economic impacts to the region, as less money from this sector flows into the local economy (directly, indirectly, or through induced activities) and fewer taxes are paid by oil producers. However, the overall impact on the region from diminished oil production is not expected to significantly hinder the region's continued growth.

Figure 19 and Table 13 show the locations of selected major employers in the Austin region and their number of employees and announced expansions. Many of these employers are expanding and some, like General Motors (GM), are new to the area. This testifies to the Austin area's attractiveness and competitiveness with other regions in the United States and globally. Geographically, many of the major employers are located near one of the CTTS facilities.

Figure 19: Locations of Selected Additions or Expansions to the Regional Workforce

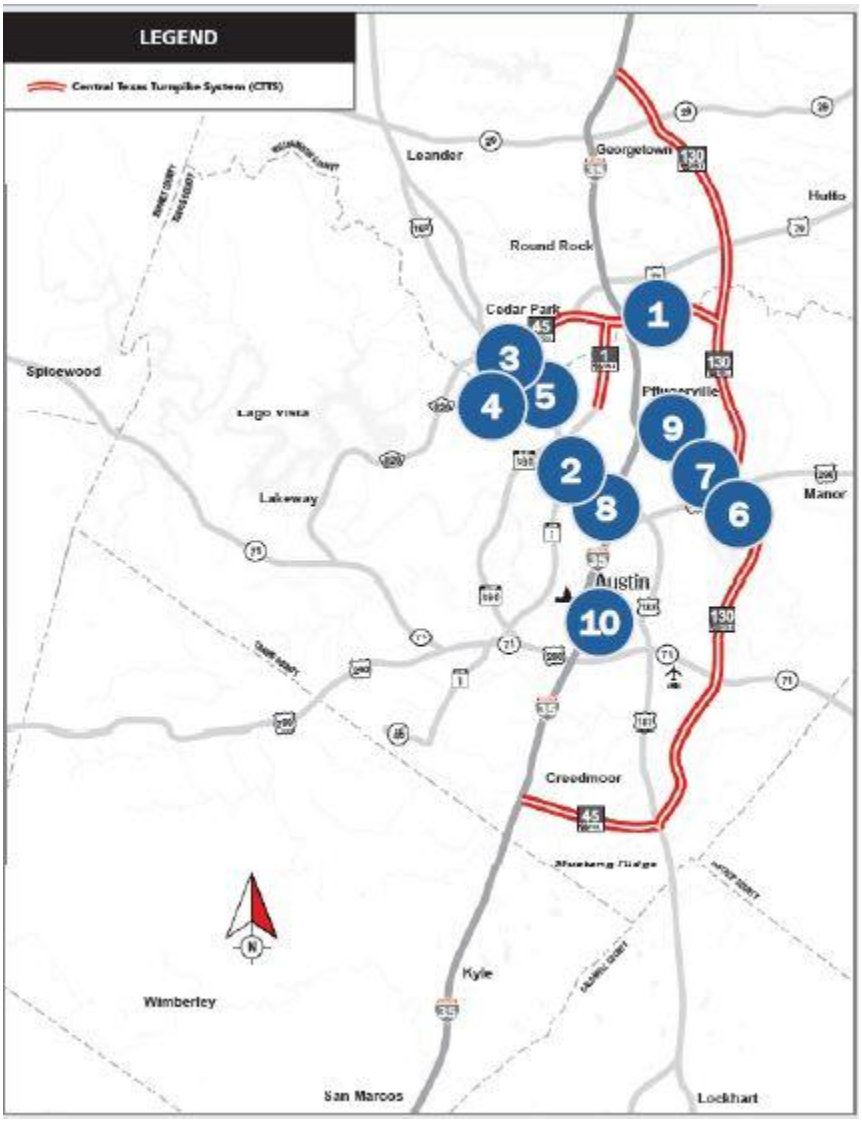


Table 13: Additions or Expansions of Regional Workforce for Selected Major Employers

Map #	Employer	Estimated Employees
1	Dell Computer	14,000
2	IBM	6,000 adding 900
3	Freescale Semiconductor	5,000
4	Flextronics	4,700 adding 800
5	Apple	4,000 adding 2,000
6	Applied Materials	2,700
7	Samsung	2,600
8	Charles Schwab	1,100 adding 800
9	GM	Adding 1,400
10	UT Austin	24,000 & adding new medical school

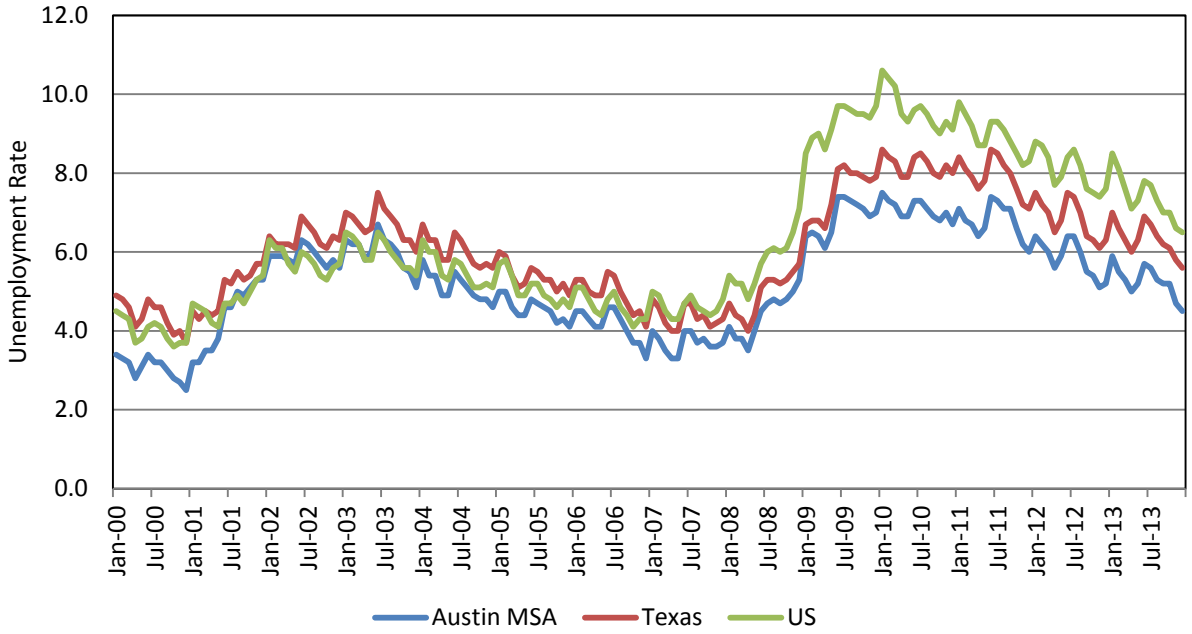
Source: Greater Austin Chamber of Commerce, 2014.

Additional expansions may be planned, but they have not been announced publically.

UNEMPLOYMENT

Figure 20 shows the unemployment rates for the United States, Texas, and the Austin-Round Rock MSA. These data show the unemployment rate in the region has been below the overall unemployment rate in Texas during most of the period between January 2000 and December 2013. The Austin MSA experienced its lowest unemployment rate during December 2000, when it fell to 2.5 percent. During the recession that began in 2001, the regional unemployment rate peaked at 6.7 percent in June 2003. As the regional and national economy recovered and the employment expanded during the mid-2000s, the regional unemployment rate fell to less than 4.0 percent, before significantly increasing during 2008 and 2009. During the 2008-2009 Recession, the regional unemployment rate reached 7.4 percent in June 2009 but was not sustained for a prolonged period of time. Between 2011 and 2013, the regional unemployment rate began to fall and reached a desirable 4.5 percent during December 2013.

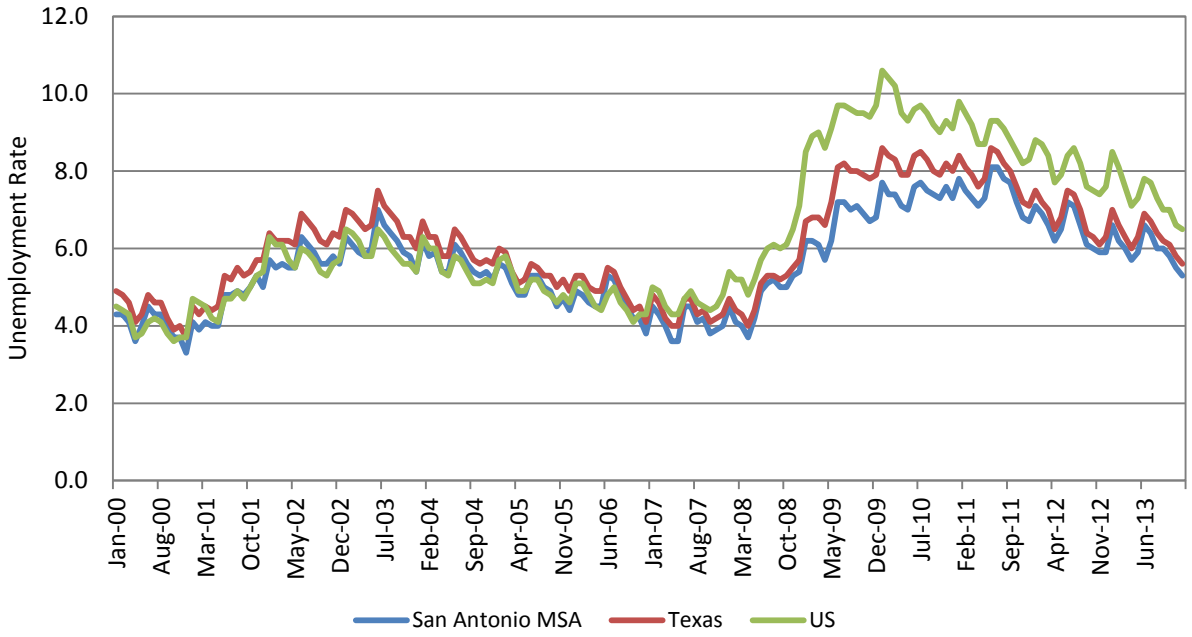
Figure 20: Unemployment Rate of Austin-Round Rock MSA, Texas, and the United States



Note: The unemployment rate data in Figure 20 are based upon seasonally unadjusted unemployment rates. The unadjusted figures were used to maintain consistency between the three geographies of the United States, Texas, and the Austin-Round Rock MSA. While seasonally adjusted data are available from the Texas Workforce Commission for the United States and Texas, they are not available for Texas's MSAs.
Source: Texas Workforce Commission, 2014.

Figure 21 shows the unemployment rates for the United States, Texas, and the San Antonio-New Braunfels MSA. These data show the unemployment rate in the region has been below the overall unemployment rate in Texas during most of the period between January 2000 and December 2013. The San Antonio-New Braunfels MSA experienced its lowest unemployment rate during December 2000, when it fell to 3.3 percent. During the recession that began in 2001, the regional unemployment rate peaked at 7.0 percent in June 2003. As the regional and national economy recovered and employment expanded during the mid-2000s, the regional unemployment rate fell to 3.6 percent before increasing rapidly during 2008 and 2009. During the 2008-2009 Recession, the regional unemployment rate reached 7.2 percent in June and July 2009. Unemployment rates remained between 7.0 and 8.0 percent through 2011, peaking at 8.1 percent in June and July 2011. Since mid-2012 to 2013, the regional unemployment rate has fallen and was 5.3 percent during December 2013.

Figure 21: Unemployment Rate of San Antonio-New Braunfels MSA, Texas, and the United States



Note: The unemployment rate data in Figure 21 are based upon seasonally unadjusted unemployment rates. The unadjusted figures were used to maintain consistency between the three geographies of the United States, Texas, and the San Antonio-New Braunfels MSA. While seasonally adjusted data are available from the Texas Workforce Commission for the United States and Texas, they are not available for Texas's MSAs.
Source: Texas Workforce Commission, 2014.

REAL ESTATE TRENDS

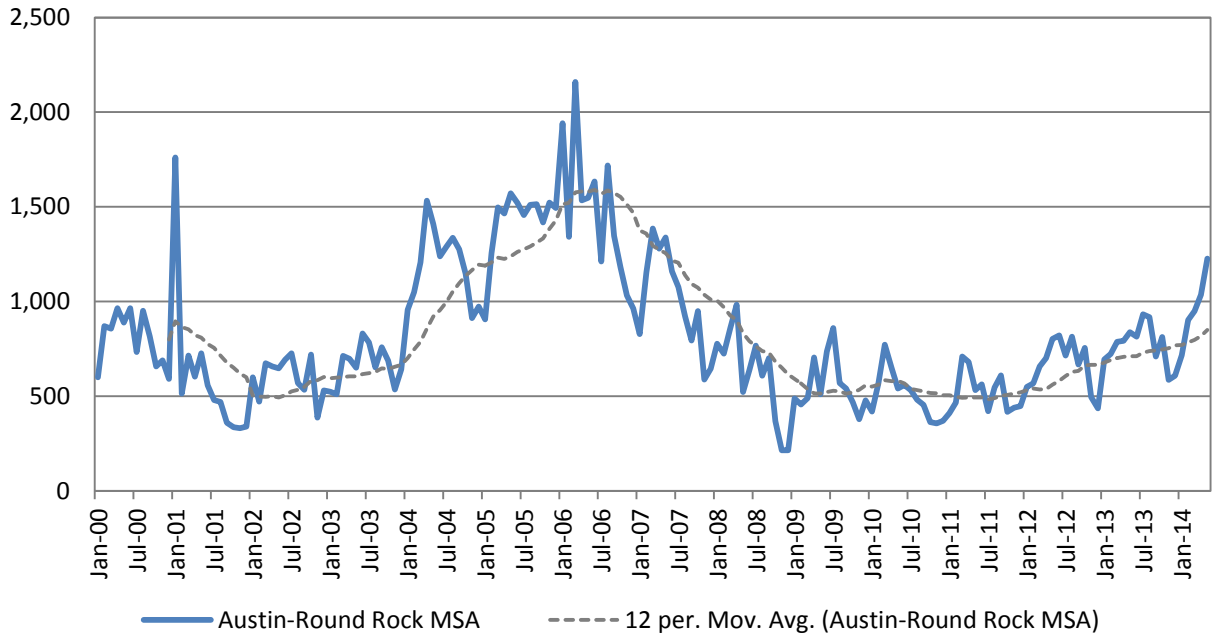
Like almost every metropolitan area in the United States, the 2008-2009 Recession had a profound impact on the regional housing market, as well as commercial real estate. The near collapse of the nation's financial system and the severe curtailment of demand due to the subsequent recession led to a sharp reduction in the number of new single-family homes built after 2006. Multifamily construction was also severely impacted by the recession, although it later benefitted because fewer households were able to secure the financing to purchase new homes. Similarly, all aspects of commercial real estate were affected by the recession, either due to tight credit markets or financially stressed tenants. Fortunately, the nation's commercial real estate market did not experience the same collapse as the residential market (a real and significant threat at the time) and it has been showing a consistently positive movement during the recent past.

Residential Trends

The U.S. Census Bureau's single-family building permit data from Real Estate Center at Texas A&M University are shown in Figure 22, which compares the number of monthly single-family building permits issued in the Austin-Round Rock MSA. While an issued building permit does not guarantee that a structure was constructed (a certificate of occupancy would provide that

proof), it provides of gauge of builder interest that can be used to compare activity in a region over time. The data generally show what one would expect, which is that the monthly issuance of building permits in the Austin-Round Rock MSA grew during the "Housing Bubble", reaching a peak of more than 2,000 permits in mid-2006. Then the number of permits issued began to decline quickly, even taking into consideration seasonal influences. The local housing market reached its lowest level during early-2009, when only a couple hundred building permits were issued each month. Since then, the local housing markets has moved towards recovery with approximately 1,200 building permits issued each month during mid-2014, which is still far from previous levels of activity. While this recovery could be interpreted as construction industry that is still under pressure from the last recession, the period leading up to 2006 was not sustainable and is not a reasonable comparison.

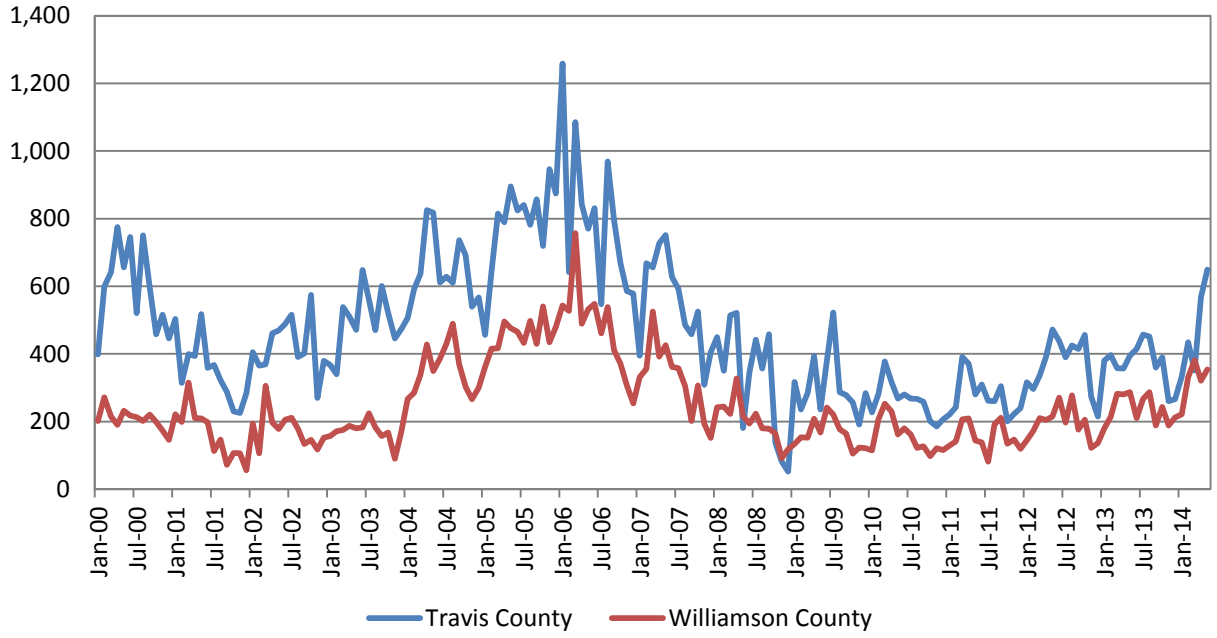
Figure 22: Single-Family Building Permits Issued in Austin-Round Rock MSA, January 2000 to May 2014



Note: MSA data based on 2013 CBSA definitions.
Source: Texas A&M Real Estate Center, 2014.

Figure 23 provides additional, detailed data showing the number of single-family building permits issued in Travis and Williamson Counties. These data show that monthly building permit activity peaked during mid-2006, at more than 1,200 permits in Travis County and almost 800 permits in Williamson County. But, the issuance of permits began to decline immediately thereafter to typically between 200 and 400 permits per month in Travis County and 100 to 300 permits per month in Williamson County.

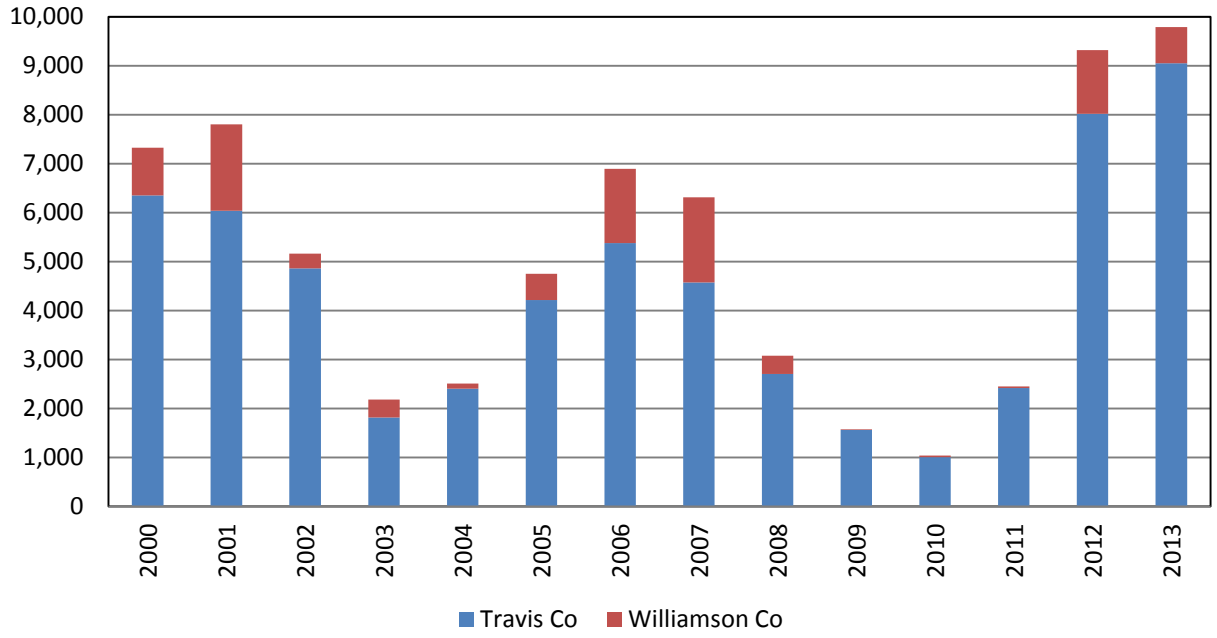
Figure 23: Single-Family Building Permits Issued in Travis and Williamson Counties, January 2000 to May 2014



Note: Monthly data for Hays, Bastrop, and Caldwell Counties were not available.
Source: Texas A&M Real Estate Center, 2014.

The number of permitted multifamily units in Travis and Williamson Counties has typically followed the housing market, until the past few years. Figure 24 shows the total number of multifamily units permitted in Travis and Williamson Counties. As would be expected, the number of multifamily permits increased sharply during the early-2000s with the technology-fueled expansion and again during the mid-2000s as a component of the Housing Bubble (at a slightly lower volume). But even more multifamily units were permitted during 2012 and 2013. This expansion is likely due to the constrained supply of single-family homes for lower-income households and households with poor credit who cannot enter the housing market, as well as decisions by more affluent households to rent their dwelling rather than buy one.

Figure 24: Multifamily Units Permitted in Travis and Williamson Counties, 2000-2013



Source: Texas A&M Real Estate Center, 2013.

Finally, Table 14 shows multifamily housing market conditions during the second quarter of 2014 within the various submarkets in the Austin region. According to the real estate firm Marcus & Millichap, the region had an overall vacancy rate of 4.9 percent during the first quarter of 2014. It anticipated that developers will deliver 14,120 units to the market during 2014. The data in Table 14 also show the lowest vacancy rate for multifamily was in the Downtown/University submarket at 2.6 percent, which also had the highest effective monthly rents at $2,022.

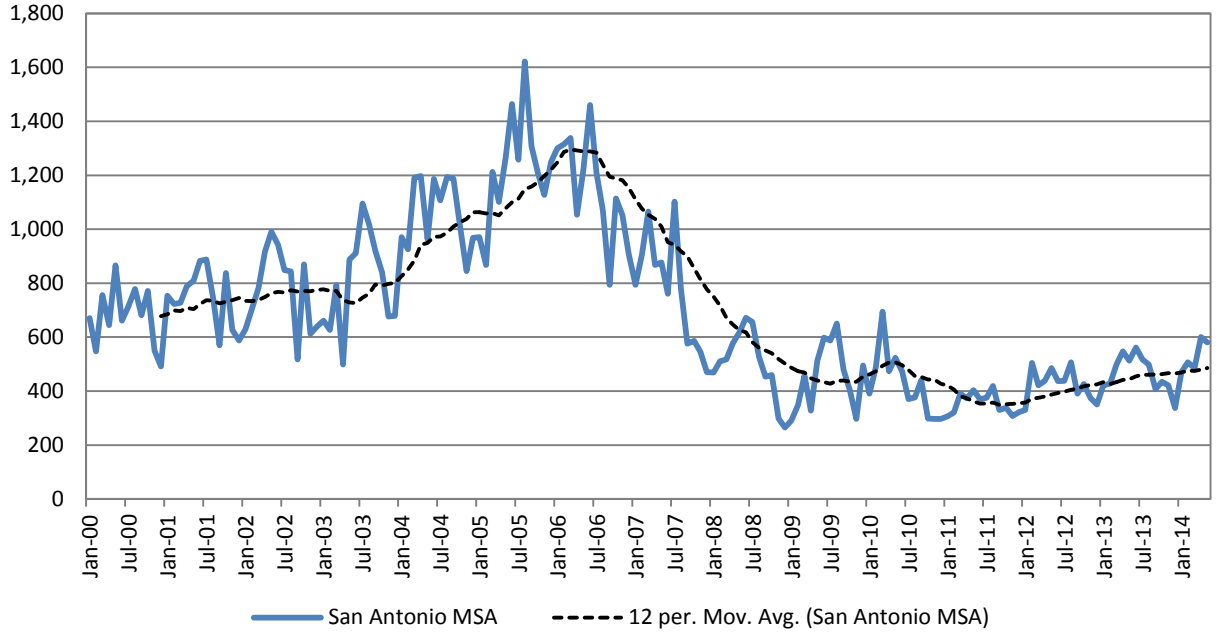
Table 14: Overview of the Austin Apartment Market during the First Quarter 2014

RANK	SUBMARKET	VACANCY RATE	Y-O-Y BASIS POINT CHANGE	EFFECTIVE RENTS	Y-O-Y PERCENT CHANGE
1	Downtown/University	2.6%	50	$2,022	1.9%
2	Arboretum	3.8%	-50	$1,019	4.2%
3	Near North Austin	4.1%	-10	$1,098	6.4%
4	Far South Austin	4.2%	-130	$1,016	5.9%
5	Pflugerville/Wells Branch	4.3%	-160	$934	7.7%
6	South Austin	4.3%	-280	$1,138	3.0%
7	Round Rock/Georgetown	4.4%	-170	$955	6.1%
8	Southwest Austin	4.4%	-80	$1,188	4.2%
9	North Central Austin	4.7%	-50	$817	6.0%
10	Northwest Austin	4.9%	-90	$1,002	7.6%
11	Far West Austin	5.0%	-60	$1,002	1.2%
12	East Austin	5.1%	-120	$948	6.5%
13	Southeast Austin	5.2%	-50	$975	8.0%
14	San Marcos	6.4%	110	$1,074	5.4%
15	Cedar Park	9.0%	450	$979	6.2%

Source: Marcus & Millichap, 2014.

Figure 25 shows these same data for the San Antonio-New Braunfels MSA. As might be expected from the data shown in the previous figures, the 2001 Recession had relatively little impact on the number of single-family building permits issued in the region. Starting in mid-2003, the number of issued building permits began to grow. The single-family housing market actually peaked during 2005 with more than 1,600 permits issued in a single month. The market then began a slow decline that accelerated in 2007, until it bottomed out in early 2009. Since then, the overall trend has been one of modest improvement. However, substantially fewer building permits were issued in the San Antonio-New Braunfels MSA in recent months, than were issued during the early-2000s and prior to the Housing Bubble.

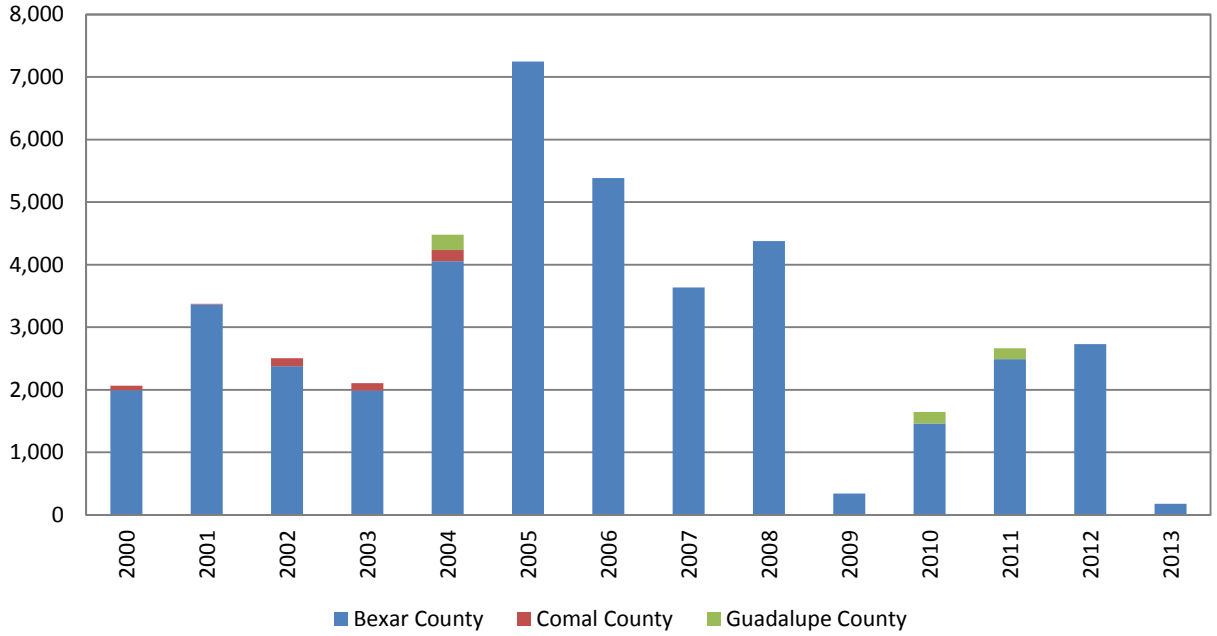
Figure 25: Single-Family Building Permits Issued in San Antonio MSA, January 2000 to May 2014



Note: MSA data based on 2013 CBSA definitions.
Source: Texas A&M Real Estate Center, 2014.

The number of permitted multifamily units in Bexar, Comal, and Guadalupe Counties are shown in Figure 26, but almost all the units were located in Bexar County. As with single-family housing, the number of building permits issued for multifamily units was not greatly impacted by the 2001 Recession, although there was potentially some impact during 2002 and 2003. Responding to the expansion of the housing market, the number of permitted multifamily units increased and peaked in 2005. The number of permitted units dropped sharply between 2008 and 2009, before a modest recover in subsequent years. Interestingly, despite the strong economy and housing market, the data show there were very few permitted multifamily units during 2013.

Figure 26: Multifamily Units Permitted in Bexar, Comal, and Guadalupe Counties, 2000-2013



Source: Texas A&M Real Estate Center, 2013.

Table 15 provides recent market conditions for multifamily housing within the various submarkets in the San Antonio region during the first quarter of 2014. Marcus & Millichap estimated that the region had an overall vacancy rate of 8.1 percent during the first quarter of 2014. It anticipated that developers will deliver 14,120 units to the market during this year. The data in Table 15 also show the lowest vacancy rate for multifamily was in the Central San Antonio submarket at 4.9 percent, while the submarket with the highest effective monthly rents was Far North Central San Antonio at $1,115.

Table 15: Overview of the San Antonio Apartment Market during the Second Quarter 2014

RANK	SUBMARKET	VACANCY RATE	Y-O-Y BASIS POINT CHANGE	EFFECTIVE RENTS	Y-O-Y PERCENT CHANGE
1	Central San Antonio	4.9%	-160	$993	12.3%
2	North Central San Antonio	6.3%	190	$845	1.2%
3	Airport Area	6.5%	-60	$747	3.6%
4	Far Northwest San Antonio	6.7%	30	$1,069	-3.2%
5	Alamo Heights	7.0%	290	$1,083	2.3%
6	Far West San Antonio	7.0%	160	$851	4.0%
7	Northwest San Antonio	7.0%	70	$773	1.8%
8	Medical Center	8.3%	140	$772	2.4%
9	New Braunfels/Universal City	8.5%	220	$863	5.8%
10	Northeast San Antonio	8.6%	90	$725	4.2%
11	West San Antonio	8.9%	30	$656	5.3%
12	Southwest San Antonio	9.0%	-230	$635	2.8%
13	Far North Central San Antonio	10.1%	400	$1,115	-5.7%
14	South San Antonio	12.2%	90	$686	2.7%

Source: Marcus & Millichap, 2014.

Office Trends

According to the real estate firm Transwestern, the Austin area office market had an overall vacancy rate of 11.9 percent during the first quarter of 2014 (See Table 16). In total, the Austin area market contained 51.8 million square feet of rentable space and at the end of the second quarter of 2014, the yield-to-date net absorption (the difference between the amount of newly leased space in the market and new constructed space or formerly leased space that has returned to the market) in the Austin area market was 529,192 square feet. Geographically, the largest concentrations of office space in the Austin market are in the Northwest & Far Northwest submarkets, the Central Business District, and the Southwest market. Austin's South submarket had the highest occupancy rate at 96.5 percent and its Southeast submarket had the lowest occupancy rate in the region at 62.4 percent.

Table 16: Overview of the Austin Area Office Market during the Second Quarter 2014

SUBMARKET	TOTAL RENTABLE SF	TOTAL OCCUPANCY	YTD 2014 TOTAL NET ABSORPTION	NET RENTAL RATE PSF
Central Business District	10,096,625	89.9%	195,215	$26.33
Central & West Central	3,324,924	88.1%	72,606	$20.68
North	5,485,809	88.3%	(29,473)	$19.16
Northeast & East	3,217,059	79.8%	18,658	$12.49
Northwest & Far Northwest	15,916,320	88.8%	161,666	$19.37
Round Rock & Cedar Park	1,586,807	87.9%	15,962	$15.15
South	2,230,392	96.5%	15,036	$16.50
Southeast	1,486,072	62.4%	7,334	$15.94
Southwest	8,472,925	89.7%	72,188	$21.83
MARKET TOTAL	**51,816,933**	**88.1%**	**529,192**	**$20.11**

Source: Transwestern, 2014.

The San Antonio region's supply of office space is slightly more than half the total rentable square footage of Austin's supply (See Table 17). The region also has a higher overall vacancy rate at 81.6 percent, although surprisingly the net rental rate in San Antonio was only slightly lower than Austin. The largest supply of the region's office space is located in the North Central submarket (8,479,825 square feet), followed by the Northwest submarket (8,004,701 square feet). San Antonio's Central Business District is the third largest submarket with 5,728,263 square feet of rentable spaced. Total net absorption during the first quarter of 2014 was 335,672 square feet.

Table 17: Overview of the San Antonio Area Office Market during the First Quarter 2014

SUBMARKET	TOTAL RENTABLE SF	TOTAL OCCUPANCY	YTD 2014 TOTAL NET ABSORPTION	NET RENTAL RATE PSF
North Central	8,479,825	86.7%	99,471	$19.76
Central Business District	5,728,263	72.1%	120,222	$19.86
Northwest	8,004,701	79.4%	83,361	$18.53
Far North Central	2,699,542	89.7%	26,842	$23.53
Northeast	1,838,766	84.2%	9,649	$16.38
Far West	333,124	90.5%	(656)	$19.70
Southwest	306,411	84.7%	(3,217)	$24.50
Southeast	503,856	77.6%	0	$16.52
Far Northwest	384,554	83.1%	0	$31.65
MARKET TOTAL	**28,279,042**	**81.6%**	**335,672**	**$19.77**

Source: Transwestern, 2014.

Industrial/Warehousing Trends

The Austin region has a sizeable amount of industrial/warehouse space totaling 49.7 million square feet during the first quarter of 2014, although a significant share is "flex space" which can also be converted into offices (See Table 18). The regional industrial/warehousing vacancy rate was 11.6 percent and there was almost 5.8 million square feet of available space. During the first quarter of 2014, the region returned 109,469 square feet to the market (Transwestern, 2014).

Table 18: Overview of the Austin Industrial Market during the First Quarter 2014

SUBMARKET	NET RENTABLE SF	TOTAL VACANCY SF	TOTAL VACANCY RATE JUNE 2013	2013 YTD TOTAL NET ABSORPTION
Central Business District	26,776	0	0.0%	3,700
Central	1,426,566	115,404	8.1%	5,239
East	3,554,975	858,706	24.2%	35,533
Far Northeast	2,476,336	336,264	13.6%	106,161
Far Northwest	510,465	13,844	2.7%	5,000
Georgetown	1,238,554	8,200	0.7%	16,927
Hays County	593,663	194,574	32.8%	(185,474)
North	13,812,271	1,078,469	7.8%	158,582
Northeast	7,830,210	1,346,767	17.2%	(309,704)
Northwest	2,600,971	194,970	7.5%	(65,021)
Round Rock	3,274,070	394,233	12.0%	55,905
South	1,751,200	24,613	1.4%	3,470
Southeast	10,210,364	1,157,688	11.3%	52,463
Southwest	415,046	37,961	9.1%	7,750
Market Total	49,721,467	5,761,693	11.6%	(109,469)

Source: Transwestern, 2014.

The San Antonio industrial market had almost 33.7 million square feet of space during the second quarter of 2014 (See Table 19). The market was had a citywide vacancy rate of 5.9 percent or less than 2.0 million square feet of available space. Almost 450,000 square feet of space was absorbed during the second quarter of 2014.

Table 19: Overview of the San Antonio Industrial Market during the Second Quarter 2014

MARKET	INVENTORY SF	DIRECT VACANT SF	YTD TOTAL NET ABSORPTION	AVERAGE NET RENT
Central Business District	233,395	0	28,548	$3.60
Non-CBD	33,451,634	1,977,334	419,460	$7.87
Citywide	33,685,029	1,977,334	448,008	$7.83

Source: REOC San Antonio, 2014.

Retail Trends

Similar to the Austin office market, CBRE estimated that the market for commercial retail space experienced modest absorption during the August 2014, with only 97,775 square feet of space coming off the market (See Table 20). Overall, the region had 50.5 million square feet of retail space and the regional vacancy rate was 4.8 percent. The highest occupancy rates were in the southeast, southwest, and south market subareas.

Table 20: Overview of the Austin Retail Market during August 2014

MARKET	INVENTORY SF	TOTAL OCCUPANCY SF	YTD TOTAL NET ABSORPTION	AVERAGE NET RENT
Central Business District	773,895	94.0%	27,949	$32.61
Central & West Central	6,664,394	95.6%	68,058	$16.45
North	5,032,427	94.9%	(69,109)	$14.18
Northeast & East	4,469,783	95.7%	7,859	$13.29
Northwest & Far NW	6,831,266	91.9%	95,751	$15.95
Round Rock & Cedar Park	11,619,069	93.8%	(8,418)	$16.58
South	7,774,195	97.2%	(87,538)	$17.25
Southeast	1,651,674	99.8%	30,258	$15.83
Southwest	5,674,823	97.4%	32,965	$19.40
MARKET TOTAL	**50,491,526**	**95.2%**	**97,775**	**$16.00**

Source: CBRE, 2014.

Less detailed information was available for the San Antonio retail market. Most of retail space in the San Antonio market is located on the north side of the city and outside of the Central Business district. The vacancy rate for retail space during the second quarter of 2014 was 9.9 percent, with most of the available retail space located in the CBD or south San Antonio (See Table 21).

Table 21: Overview of the San Antonio Retail Market during the Second Quarter 2014

MARKET	INVENTORY SF	DIRECT VACANT SF	YTD TOTAL NET ABSORPTION	AVERAGE NET RENT
CBD/South	6,375,326	3,922,128	329,190	$15.50
Non-CBD/North	40,789,626	757,115	41,853	$16.67
Citywide	47,164,952	4,679,243	371,043	$16.58

Source: REOC San Antonio, 2014.

ASSESSMENT AND ADJUSTMENT OF THE POPULATION AND EMPLOYMENT CONTROL TOTALS

The first step of the socioeconomic data review was to assess the reasonableness of the population and employment control totals in the CAMPO model. Since traffic counts for the CTTS study were conducted during 2013, this became the travel demand model's base year. New 2013 population and employment control totals were developed for each county, using data from the U.S. Census Bureau, the U.S. Bureau of Labor Statistics, and the Texas Workforce Commission. With these data, each counties' 2013 population and employment control totals were adjusted to either an agency estimate for that year or an estimate based upon other recent data. The end result was that all ten counties had some adjustment to their base year population control total, typically to reflect the 2013 U.S. Census Bureau estimates, with Travis County having its population adjusted by the largest amount (increased by 45,530 residents)

compared to the 2012 CTTS study[7] (See Table 22). Travis County also had the largest upward adjustment to its employment control total with almost 67,000 additional jobs, followed by Bexar County with 24,877 additional jobs. During the development of the 2013 control totals, 2013 employment counts for the entire year were not yet released by TWC or the BLS, so the revised control total figures were based upon the 2013 employment data that were available and professional judgment.

[7] The 2012 CTTS values for 2013 are based upon an interpolation between the study's 2010 base year and its 2015 forecast.

Table 22: Adjustments to 2013 Baseline County Population, Households, and Employment Control Totals

	2013 POPULATION			2013 HOUSEHOLDS			2013 EMPLOYMENT		
County	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**
Travis	1,075,362	1,120,892	45,530	428,055	448,011	19,956	568,294	635,250	66,956
Williamson	469,783	465,263	-4,520	168,980	170,706	1,726	131,233	139,191	7,958
Hays	172,056	175,837	3,781	62,625	64,488	1,863	48,526	54,565	6,039
Bastrop	81,492	75,825	-5,667	29,549	28,011	-1,538	17,171	15,058	-2,113
Caldwell	39,627	39,226	-401	14,119	14,046	-73	7,429	7,966	537
Bexar	1,766,417	1,775,596	9,179	635,646	642,890	7,244	746,285	771,162	24,877
Comal	119,210	117,419	-1,791	43,730	45,437	1,707	44,956	40,379	-4,577
Guadalupe	144,446	141,300	-3,146	51,642	50,668	-974	30,284	31,080	796
Kendall	37,055	37,246	191	13,373	14,277	904	11,326	12,162	836
Wilson	45,993	44,869	-1,124	15,873	15,908	35	6,918	6,930	12
TOTAL	**3,951,441**	**3,993,473**	**42,032**	**1,463,592**	**1,494,442**	**30,850**	**1,612,422**	**1,713,743**	**101,321**

Table 23 and Table 24 shows the differences between the 2012 CTTS Update study's county population and employment control totals and the adjusted county control totals for the 2014 CTTS Update study. During each forecast year, the total population in the 10-county area is higher in the revised socioeconomic data than it was in the 2012 CTTS Update study. Most of the difference is due to higher population forecasts for Travis County, accounting for a higher baseline population estimate, and substantially higher population projections for Bexar County. The higher population projections for Bexar County were due to the TxSDC taking into account updated migration data when preparing its most recent population projections. This new information had a significant impact on the population projected for Bexar County. For the remainder of the counties, most of the population control totals were adjusted downward from the 2012 CTTS Update study, reflecting the reduction in recent population growth rates as was described in Tables 3 and 4. The forecasted control totals for households were also higher. The household control total figures were not imposed from above but were the summed at the TAZ level. As a result, they do not necessarily change in proportion with the population. The 2014 CTTS Update employment control totals were also higher than the 2012 CTTS Update study, due to more recent data that show strong employment growth during the past few years. Travis and Bexar Counties are the major source of the additional employment but most of the other counties contributed positively, as well.

Table 23: Adjustments to Forecasted County Population and Employment Control Totals

	2015 POPULATION			2015 HOUSEHOLDS			2015 EMPLOYMENT		
County	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**
Travis	1,113,248	1,170,298	57,050	439,621	467,369	27,748	579,678	660,559	80,881
Williamson	499,478	492,382	-7,096	178,181	180,180	1,999	136,815	147,884	11,069
Hays	185,385	188,375	2,990	66,553	68,978	2,425	50,989	58,102	7,113
Bastrop	87,087	77,898	-9,189	31,719	28,798	-2,921	17,984	15,797	-2,187
Caldwell	41,290	39,969	-1,321	14,751	14,327	-424	7,766	8,373	607
Bexar	1,822,842	1,832,203	9,361	653,456	663,284	9,828	764,199	796,244	32,045
Comal	126,468	123,502	-2,966	45,425	47,797	2,372	48,014	43,258	-4,756
Guadalupe	153,714	147,921	-5,793	55,315	53,012	-2,303	31,471	32,728	1,257
Kendall	39,638	39,827	189	13,813	15,266	1,453	11,828	12,842	1,014
Wilson	48,274	46,215	-2,059	16,391	16,386	-5	7,230	7,214	-16
TOTAL	**4,117,424**	**4,158,590**	**41,166**	**1,515,225**	**1,555,397**	**40,172**	**1,655,974**	**1,783,001**	**127,027**
	2020 POPULATION			**2020 HOUSEHOLDS**			**2020 EMPLOYMENT**		
County	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**
Travis	1,204,515	1,273,336	68,821	474,742	507,727	32,985	639,031	717,497	78,466
Williamson	580,652	566,298	-14,354	206,509	206,673	164	161,690	168,721	7,031
Hays	217,009	220,507	3,498	77,929	79,598	1,669	60,394	66,937	6,543
Bastrop	102,473	85,583	-16,890	37,358	31,645	-5,713	21,404	18,221	-3,183
Caldwell	44,425	42,471	-1,954	15,974	15,260	-714	9,266	9,511	245
Bexar	1,907,226	1,957,968	50,742	689,396	707,980	18,584	815,641	856,370	40,729
Comal	144,503	138,646	-5,857	52,405	53,751	1,346	57,969	50,662	-7,307
Guadalupe	177,246	169,057	-8,189	64,858	60,483	-4,375	34,914	36,668	1,754
Kendall	45,503	45,117	-386	16,431	17,296	865	12,222	14,517	2,295
Wilson	53,702	50,898	-2,804	18,191	18,046	-145	8,154	8,042	-112
TOTAL	**4,477,254**	**4,549,881**	**72,627**	**1,653,793**	**1,698,459**	**44,666**	**1,820,685**	**1,947,146**	**126,461**

Table 24: Adjustments to Forecasted County Population and Employment Control Totals (Continued)

	2030 POPULATION			2030 HOUSEHOLDS			2030 EMPLOYMENT		
County	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**
Travis	1,400,771	1,474,365	73,594	550,719	586,277	35,558	764,818	839,247	74,429
Williamson	774,375	739,143	-35,232	271,055	270,279	-776	215,120	211,554	-3,566
Hays	289,315	288,990	-325	104,733	103,230	-1,503	81,028	86,092	5,064
Bastrop	136,088	103,220	-32,868	49,904	38,389	-11,515	28,823	24,358	-4,465
Caldwell	50,126	48,235	-1,891	18,216	17,393	-823	12,504	12,300	-204
Bexar	2,047,084	2,196,665	149,581	749,816	793,624	43,808	926,217	982,096	55,879
Comal	177,697	168,731	-8,966	65,977	65,515	-462	76,807	67,780	-9,027
Guadalupe	224,321	214,674	-9,647	84,050	76,406	-7,644	42,420	45,225	2,805
Kendall	56,285	55,789	-496	20,883	21,384	501	15,298	18,255	2,957
Wilson	64,190	60,663	-3,527	22,152	21,507	-645	9,733	9,592	-141
TOTAL	**5,220,252**	**5,350,475**	**130,223**	**1,937,505**	**1,994,004**	**56,499**	**2,172,768**	**2,296,499**	**123,731**
	2040 POPULATION			**2040 HOUSEHOLDS**			**2040 EMPLOYMENT**		
County	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**	**2012 CTTS**	**2014 CTTS**	**Difference**
Travis	1,610,749	1,669,612	58,863	632,433	661,446	29,013	897,688	962,917	65,229
Williamson	999,473	952,122	-47,351	343,492	347,180	3,688	272,229	254,472	-17,757
Hays	370,679	364,369	-6,310	135,589	129,632	-5,957	103,485	108,533	5,048
Bastrop	172,545	124,358	-48,187	63,719	46,475	-17,244	36,821	33,126	-3,695
Caldwell	55,260	55,111	-149	20,254	19,938	-316	15,982	15,958	-24
Bexar	2,158,032	2,471,362	313,330	798,776	892,021	93,245	1,044,487	1,116,034	71,547
Comal	208,015	197,279	-10,736	79,160	76,873	-2,287	94,574	88,534	-6,040
Guadalupe	271,408	265,018	-6,390	103,350	94,291	-9,059	50,546	54,802	4,256
Kendall	66,120	66,740	620	24,553	25,581	1,028	20,663	22,642	1,979
Wilson	74,312	71,049	-3,263	26,474	25,192	-1,282	11,043	10,972	-71
TOTAL	**5,986,593**	**6,237,020**	**250,427**	**2,227,800**	**2,318,629**	**90,829**	**2,547,518**	**2,667,990**	**120,472**

ASSESSMENT AND ADJUSTMENT OF ZONAL POPULATION AND EMPLOYMENT DATA

The project study area for the socioeconomic review consisted of a very large region that covered significant portions of eight counties and more than 800 TAZs. The northern extent of the project study area was north of the city of Georgetown and it extended southward to the northeast quadrant of San Antonio, a distance of more than 100 miles along IH 35. The width of the CTTS study varied, but was as wide as 15 miles or more in some locations.

Since the base year for the previous 2012 CTTS study was 2010, one of the first tasks for the 2014 CTTS study was to update the base year population and employment data to 2013. During the 2012 CTTS Update study, the zonal population, household, and median household income estimates in the study area were updated using GIS and information from the 2010 decennial Census counts and the American Community Survey. The 2014 CTTS required revising these data once again to the new 2013 base year. To do this, a visual housing count of new single-family and multifamily dwelling units was undertaken, comparing 2010 and 2012 digital aerial photography. New residential development was delineated on the maps and the single-family units were counted. Dwelling unit counts for multifamily projects were derived from data provided by local governments, industry market research, company websites, or apartment locator websites. The adjustment also took into account a tightening housing market throughout the region and assumed a small share of new population growth was absorbed by vacant housing units throughout the study area. The final adjustments of the 2013 zonal population estimates incorporated the count data and other information about recent development trends, as well as professional judgment, to develop the 2013 base year population and household estimates for the entire project study area. Outside of the project study area, the populations of the TAZs were adjusted to subarea population control totals. In reconciling the zonal population estimates to the county subarea control totals, they also summed to the revised county control totals. The 2013 employment data were adjusted by assuming a portion of employment growth was absorbed into vacant commercial space or was added to firm rosters without requiring additional floor space. Additionally, new commercial developments were identified during the housing count using the digital aerial photography. Once these commercial facilities or schools were identified, 2012 firm-level employment data from the Texas Workforce Commission were used to produce employment estimates or, if they were schools, data from the Texas Education Agency. However, the TWC data (as provided by TxDOT) could not be used directly to update the study area employment estimates because not all of the data were accurately geocoded or could be geocoded. Therefore, using the TWC data and Google Maps as a reference, as well as professional judgment, the CAMPO TAZ employment data were assessed and adjusted as necessary. A similar review of the 2010 employment data was performed during the 2012 CTTS Update study. Finally, estimates of median household income in the study area were updated from the 2012 CTTS Update study by inflating the values by the CPI to 2013 dollars. The median household income assigned to a TAZ was based upon the census tract where its centroid fell.

The assessment and adjustments to the zonal population and employment forecasts relied upon a variety of data sources, which included: the digital aerial photography, limited field

surveys; zoning, future land use, and floodplain maps; and other planning reports and documents. The data collection for reviewing the forecasts also involved a large number of interviews with local planning officials across the study area. Table 25 provides a list of the 27 local governments that were interviewed. As with the baseline data, the forecasts for each TAZ were reviewed individually, drawing upon the listed resources. All TAZ forecasts were reconciled to the forecasted population and employment control totals at the subarea and county levels.

Table 25: Interviews with Local Governments in CTTS Study Area

Jurisdiction	Lead Contact/Position	Date
City of Lockhart	Dan Gibson (City Planner)	4/7/2014
City of Round Rock	Clyde von Rosenberg (Senior Planner)	4/8/2014
Williamson County	Joe England (County Engineer)	4/8/2014
City of Georgetown	Andrew Spurgin (Planning Director)	4/8/2014
City of Hutto	Erika Ragsdale (Senior Planner)	4/14/2014
City of Manor	Thomas Bolt (Interim City Manager)	4/14/2014
City of Kyle	Sofia Nelson (Director of Planning)	4/14/2014
City of San Marcos	Kristy Stark (Assistant Director of Planning & Development Services)	4/15/2014
City of Austin	Paul Frank (Principal Planner)	4/15/2014
Travis County	Charlie Watts (Senior Planner)	4/28/2014
Caldwell County	Dwight Jeffrey (Unit Road Supervisor)	4/28/2014
Guadalupe County	Shelly Coleman (Environmental Health Director)	4/28/2014
City of Pflugerville	Emily Barron (Planning Director)	4/29/2014
City of Buda	Chance Sparks (Director of Planning)	4/29/2014
Hays County	Clint Garza (Development Services Director)	
City of Live Oak	Scott Wayman (Assistant City Manager)	6/3/2014
City of Schertz	Lesa Wood (Senior Planner)	6/3/2014
City of Cedar Park	Amy Link (Assistant Director of Development Services)	6/3/2014
City of Liberty Hill	Amber Lewis (Senior City Planner) and Greg Boatright (Interim City Manager)	6/10/2014
City of Leander	Tom Yantis (Director of Development Services) and Robin Griffin (Senior Planner)	6/10/2014
City of Seguin	Pamela Centeno (Director of Planning/Codes)	6/11/2014
City of Universal City	Kim Turner (Development Services Director)	6/11/2014
City of Garden Ridge	Nancy Cain (City Administrator)	6/11/2014
City of Selma	Larry Verner (City Engineer)	6/11/2014
City of Cibolo	Lisa Ann Gonzalez (City Planner)	6/19/2014
City New Braunfels	Shannon Mattingly (Director of Planning and Community Development)	6/19/2014
City of San Antonio	Rudy Nino, Jr. (Planning Manager)	6/19/2014

CONCLUSIONS

The overall trends in the CTTS study area continue to be positive, as they have been since emerging from the 2008-2009 Recession. Although the region did experience negative employment growth and diminished residential and commercial construction during the

recession, the local effects were comparable to (or perhaps even milder than) the 2001 Recession, which impacted the Austin region more severely than other areas of the nation. While there are some recent signs that the region's current expansion is slowing, the rate of population and employment growth is expected to continue outperforming the state and the nation. The Austin region's ability to attract a young and highly skilled labor force, a steady stream of industry relocations and expansions, and the ability to generate new firms appears to be self-sustaining, although the region's rising cost of living, water supply, and traffic congestion are issues to monitor. Most of the threats to the region's future growth will likely come as a consequence of factors at the national or global level. Rising interest rates, inflation risks, geopolitical insecurity, and the future impacts of climate change are all issues that could impose future downstream impacts. While the Austin region, like all regions in the nation, cannot avoid these potential impacts, it is generally well-positioned to weather them.

New population and employment growth have been strong throughout most of the CTTS study area. In particular, the areas around Georgetown and Round Rock, the eastern side of Pflugerville, northeastern Travis County, and northern Hays County have all performed well. There are also signs that some major proposed projects in eastern Travis County are starting to move forward and, if market conditions can persist for another 1 to 3 years, will likely begin construction. However, development in southeastern Travis County continues to lag the larger region, with the notable exception of the Circuit of the Americas Formula 1 racetrack. Nonetheless, for the reasons cited above, development in the region and in the CTTS study area is expected to be favorable over the foreseeable future.

APPENDIX B

Minute Order 114073

VARIOUS Counties

VARIOUS Districts

TEXAS TRANSPORTATION COMMISSION
MINUTE ORDER

Transportation Code §228.057(d) provides that the Texas Department of Transportation (department) may charge reasonable fees for administering electronic toll collection customer accounts.

Title 43, Texas Administrative Code, §27.82(c) provides that the Texas Transportation Commission (commission) by minute order will establish customer account fees. In establishing customer account fees, the commission will consider the cost of operations, including the estimated cost to the department for labor, materials, storage, and bank fees, as well as the requirements of project bond covenants. In Minute Order 112971, dated January 26, 2012, the commission authorized the existing fee structure.

The department recently conducted an analysis of annual operational costs and recommends increasing the fee for checks returned for insufficient funds from $25.00 per check to $30.00 per check. In addition, the department has determined that an account reactivation fee is not needed under the current operational structure and recommends suspending assessment of the fee.

IT IS THEREFORE ORDERED by the commission that the department is authorized to charge a fee of $30.00 per check for checks returned for insufficient funds.

IT IS FURTHER ORDERED that assessment of the account reactivation fee is hereby suspended.

IT IS FURTHER ORDERED that all other customer account fees authorized by Minute Order 112971 remain unchanged.

Submitted and reviewed by:

Director, Toll Operations Division

Recommended by:

Executive Director

114073 SEP 1814

Minute Number | Date Passed

APPENDIX C

Minute Order 114117

TEXAS TRANSPORTATION COMMISSION

TRAVIS and WILLIAMSON Counties | **MINUTE ORDER** |

AUSTIN District

Title 43, Texas Administrative Code, §27.82(d) provides that the Texas Transportation Commission (commission) will establish toll rates for the use of a toll project on the state highway system. In setting toll rates, the commission is required to consider: (1) the results of traffic and revenue studies and any schedule of toll rates established in traffic and revenue reports; (2) the requirements of project bond covenants, if applicable; and (3) vehicle classifications, type and location of the facility, and similar criteria that apply to a specific project.

The Central Texas Turnpike System (CTTS) consists of the following elements: SH 130, which runs from I-35 North of Georgetown to the intersection of US 183 and SH 130 at SH 45 Southeast; SH 45 North, which runs from west of US 183 to SH 130 / SH 45 North interchange; Loop 1, which runs from existing Loop 1 and Farm to Market 734 (Parmer Lane) to the Loop 1 / SH 45 North interchange; and SH 45 Southeast, which runs from I-35 at FM 1327 south of Austin to the SH 130 / US 183 interchange.

Minute Order 113244, dated August 30, 2012, authorized the executive director to annually escalate toll rates on the CTTS in accordance with established indices and the toll escalation policy set forth in the minute order. The Texas Department of Transportation (department) has established a toll rate escalation percentage of 1.7% (toll rate escalation percentage) to be applied to the current base toll rates for each CTTS element and paypoint, generating the schedule of increased toll rates for calendar year 2015 shown on Exhibit A. The toll rate escalation percentage and the escalated toll rate table shown in Exhibit A for each CTTS element have been prepared in accordance with the toll escalation policy established in Minute Order 113244. As provided in Minute Order 113244, the percentage increase in the toll rates will be effective automatically on January 1 of the next calendar year and implemented by the executive director, unless the commission affirmatively votes prior to January 1 to modify the toll rate escalation percentage.

IT IS THEREFORE ORDERED by the commission that the schedule of escalated toll rates for each CTTS element, attached as Exhibit A, is accepted replacing the current rate tables with the escalated toll rates on January 1, 2015.

Submitted and reviewed by:

Director, Toll Operations Division

Recommended by:

Executive Director

114117 OCT 30 14

Minute Number | Date Passed

Exhibit A

Rates Effective January 1, 2015										
Tolling Point	**Two-Axle**		**Three-Axle**		**Four-Axle**		**Five-Axle**		**Six-Axle**	
	TxTag	**PBM**	**TxTag**	**PBM**	**TxTag**	**PBM**	**TxTag**	**PBM**	**TxTag**	**PBM**
SH 130 (Segments 1-4) Toll Rates										
SH 130 (Segments 1-4) From I-35 at SH 195 to US 183: Mainline Plazas and Entrance and Exit Ramps at: Cameron Rd.	$1.75	$2.33	$3.50	$4.66	$5.25	$6.98	$5.25	$6.98	$5.25	$6.98
Entrance and Exit Ramps at: SH 29, Blue Bluff, Harold Green, and Moore Rd.	$0.47	$0.63	$0.94	$1.25	$1.41	$1.88	$1.41	$1.88	$1.41	$1.88
Entrance and Exit Ramps at: FM 104, Pecan St./Pflugerville, Gregg Manor, FM 973, Fm 969, Pearce Ln, and FM 812	$0.58	$0.77	$1.16	$1.54	$1.74	$2.31	$1.74	$2.31	$1.74	$2.31
Entrance and Exit Ramps at:US 79, CR 138, Chandler Rd., and Elroy Rd.	$0.75	$1.00	$1.50	$2.00	$2.25	$2.99	$2.25	$2.99	$2.25	$2.99
SH 45 Southeast Toll Rates										
Mainline Plaza between N. Turnersville Road and Palmer Road	$1.04	$1.38	$2.08	$2.77	$3.12	$4.15	$3.12	$4.15	$3.12	$4.15
Entrance and Exit Ramps at: N. Turnersville Road, and FM 1625	$0.68	$0.90	$1.36	$1.81	$2.04	$2.71	$2.04	$2.71	$2.04	$2.71
SH 45 North Toll Rates										
Mainline Plazas: Lake Creek and Heatherwilde	$1.06	$1.41	$2.12	$2.82	$3.18	$4.23	$4.24	$5.64	$5.30	$7.05
Entrance and Exit Ramps at: Parmer Ln.(FM 734), and RM 620	$0.91	$1.21	$1.82	$2.42	$2.73	$3.63	$3.64	$4.84	$4.55	$6.05
Entrance and Exit Ramps at: O'Connor Drive	$0.93	$1.24	$1.86	$2.47	$2.79	$3.71	$3.72	$4.95	$4.65	$6.18
Entrance and Exit Ramps at: Greenlawn, and AW Grimes	$0.70	$0.93	$1.40	$1.86	$2.10	$2.79	$2.80	$3.72	$3.50	$4.66
Entrance and Exit Ramps at: Schultz Lane, Wilke Lane (Heatherwilde)	$1.06	$1.41	$2.12	$2.82	$3.18	$4.23	$4.24	$5.64	$5.30	$7.05
Loop 1 Toll Rates										
Mainline Plaza at: Merrilltown	$1.06	$1.41	$2.12	$2.82	$3.18	$4.23	$4.24	$5.64	$5.30	$7.05
Entrance and Exit Ramps at: Shoreline Drive, and Howard Ln./Wells Branch	$0.70	$0.93	$1.40	$1.86	$2.10	$2.79	$2.80	$3.72	$3.50	$4.66
Entrance and Exit Ramps at: O'Connor Drive	$0.93	$1.24	$1.86	$2.47	$2.79	$3.71	$3.72	$4.95	$4.65	$6.18

Notes:

1.) Pay By Mail (PBM) rates do not include $1.15 statement fee.

2.) A 33% surcharge (for PBM) over the TxTag rate is applied.