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## EXECUTIVE SUMMARY

As part of the Wilbur Smith Associates (WSA) contract with the North Texas Tollway Authority (NTTA), WSA continually monitors the performance of the North Texas Tollway Authority System (NTTAS). Included in this effort is a review of annual transactions and toll revenue trends on all facilities included in the NTTAS, with particular attention paid to growth trends and variations on the facilities. The NTTAS includes the Dallas North Tollway (DNT), the President George Bush Turnpike (PGBT), the Addison Airport Toll Tunnel (AATT), and the Mountain Creek Lake Toll Bridge (MCLB). It also includes SH 121 and the Lewisville Lake Toll Bridge which are currently under construction.

### **NTTA System Traffic and Revenue**

On the DNT, MLP 2 and MLP 3 generate the most daily transactions. Historically, most plazas have experienced an overall positive growth, but the phased opening of the PGBT between 1998 and 2002 generated significant growths and declines at various locations on the DNT. On the PGBT, MLP 7 and MLP 8 generate the most traffic while MLP 6 and MLP 10, which are located at the eastern and western ends of the facility, generate the least. The ramps at Preston Road, Royal Lane and Garland Road are experiencing the highest growth rates on the facility while the ramps at Renner, Coit and Midway Road are currently showing the smallest recent growth.

### **DNT Phase 3 Performance**

To evaluate the performance of the DNT Phase 3 Extension, WSA compared traffic counts in the area before and after it opened. Following the opening of the extension, competing or parallel facilities showed reductions in traffic share. The share of traffic using Preston Road dropped from 58 percent in January 2006 to 28 percent in January 2008. The share using the DNT frontage roads also decreased from 17 percent to nine percent. The DNT mainlanes currently account for 26 percent of the total screenline volume. The observed shifts in screenline traffic share indicate that a significant portion of travelers shifted their trips to the DNT after the opening of the DNT Phase 3 Extension as expected, including those previously using both the frontage roads and parallel arterials.

### **NTTA System Characteristics**

Several factors contribute to traffic and revenue growth on the NTTA system. Most revenue growth is due to the natural growth in travel demand as population and development in the

corridors increase. There are a number of other factors, however, that also play a significant role in the revenue generation on the NTTAS.

The amount of traffic using a facility on the weekend can have a significant impact on its revenue generation. Weekend traffic is higher at the plazas that are closest to large retail areas, which are heavy attractors of weekend trips. It is important to note that due to continued development along each corridor, the amount of weekend traffic is increasing at most of the mainlane plazas.

Due to the difference in toll rates for TollTag and cash users on the NTTAS, the percentage of customers paying with TollTag can have a significant impact on revenue. The percentage of NTTAS customers paying with TollTags continues to increase on all NTTA facilities. Additionally, because the toll is lower for TollTag users, increases in TollTag use actually decrease the revenue generated by each plaza. However, due to the higher costs of processing cash transactions, the net effect is anticipated to be positive.

### **NTTA System Operations Review**

The DNT currently has several areas of severe congestion in both the morning and evening periods. The ongoing construction near MLP 1 is a primary cause of congestion in the south end. Elsewhere on the facility, congestion is caused by a number of factors. The PGBT also has several areas of severe congestion in both the morning and evening periods. The congestion is caused by a number of factors, and most of it occurs near the approaches to the interchanges with IH 35E, the DNT, and US 75. Both the Addison Airport Toll Tunnel and the Mountain Creek Lake Bridge operate below their respective capacities throughout the day and experience little or no congestion. In 2009, the NTTA will begin the process of converting its facilities from the current ETC/Cash toll collection system to an all-ETC system with video tolling. This implementation of ETC/Video tolling is expected to improve traffic flow on all of NTTA's facilities by eliminating the delay normally associated with manual cash toll collection systems.

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## **INTRODUCTION**

As part of the Wilbur Smith Associates (WSA) contract with the North Texas Tollway Authority (NTTA), WSA continually monitors the performance of the North Texas Tollway Authority System (NTTAS). Included in this effort is a review of annual transactions and toll revenue trends on all facilities included in the NTTAS, with particular attention paid to growth trends and variations on the facilities. The NTTAS includes the Dallas North Tollway (DNT), the President George Bush Turnpike (PGBT), the Addison Airport Toll Tunnel (AATT), and the Mountain Creek Lake Toll Bridge (MCLB). It also includes SH 121 and the Lewisville Lake Toll Bridge which are currently under construction.

The report is divided into four sections. Section 1 discusses the historical traffic and revenue performance of the NTTA system. Section 2 describes the initial performance of the DNT Phase 3 Extension that opened in September 2007. The third section includes information on other observed NTTA system characteristics such as TollTag penetration, weekend traffic and vehicle classification. The fourth section provides an overview of the current operational conditions of the NTTA system.

WSA hopes that this report provides a clear illustration of how the entire NTTAS is currently performing and how it has been evolving over the past few years.

# SECTION 1

## NTTA SYSTEM TRAFFIC AND REVENUE

The current North Texas Tollway Authority System (NTTAS) consists of the Dallas North Tollway (DNT), the President George Bush Turnpike (PGBT), the Addison Airport Toll Tunnel (AATT), and the Mountain Creek Lake Bridge (MCLB). It also includes SH 121 and the Lewisville Lake Toll Bridge which are currently under construction.

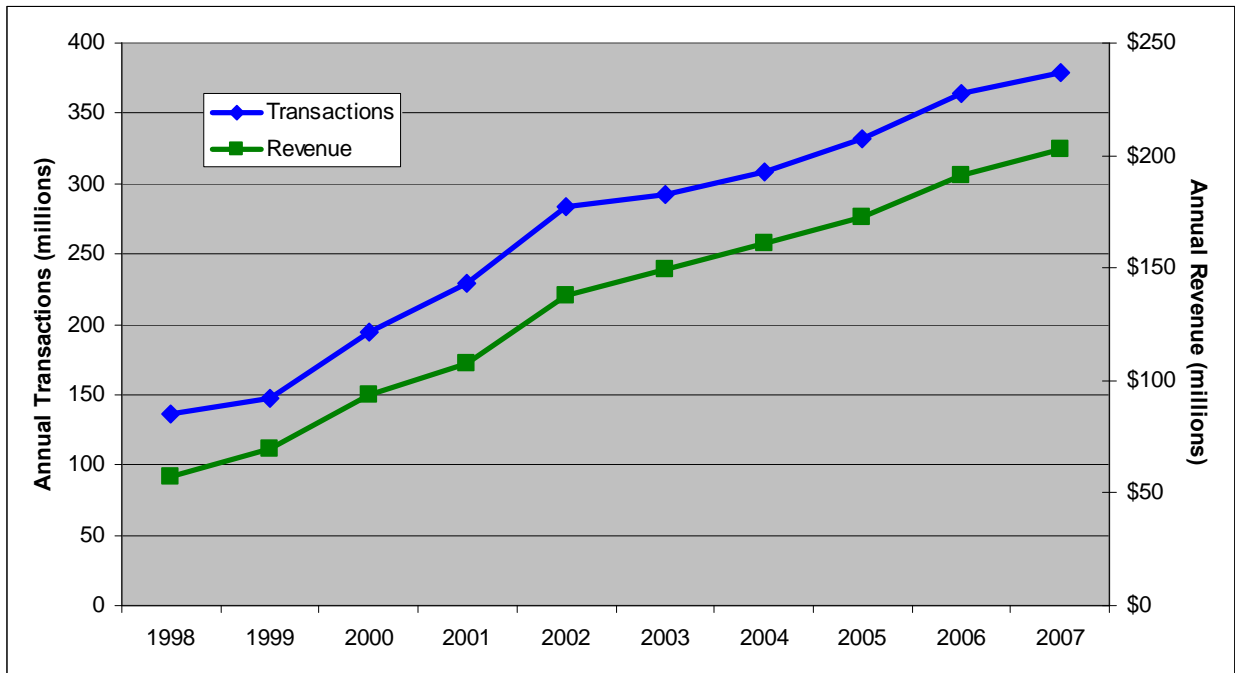
Table 1 shows the annual growth rates of both transactions and toll revenues on the NTTAS from 1998 to 2007. With the opening of some sections of the PGBT corridor in 1998 the DNT System began to grow at a high rate. The transactions jumped by 32.1 percent from 1999 to 2000. Toll revenue between 2001 and 2002 grew by 28.7 percent. It is important to mention that the toll revenue increase of 34.8 percent between 1999 and 2000 included the differential toll implementation on the DNT in 1999. The growth rates of transactions and revenues then dropped significantly after 2002. Transactions and revenue grew by 5.6 and 7.6 percent, respectively, from 2003 to 2004. They grew by 7.7 and 7.4 percent, respectively, between 2004 and 2005. However, growth rates jumped between 2005 and 2006 to 9.8 and 11.0 percent due to the opening of the PGBT Segment IV connection. Transactions on the NTTAS grew by 4.0 percent from 2006 to 2007 due to strong growth on the PGBT and the opening of the DNT Phase 3 Extension. Revenue grew at a higher rate of 5.9 percent due to the implementation of toll rate increases on the NTTAS. The other year-to-year variances in transaction and revenue growth rates are due primarily to changes in violation rates, truck percentages, TollTag penetration, and toll rates.

<b>Year</b>	<b>Transactions</b>	<b>Growth</b>	<b>Revenue</b>	<b>Growth</b>
1998	136,741,000	--	\$57,253,744	--
1999	146,957,321	7.5%	\$69,653,635	21.7%
2000	194,126,039	32.1%	\$93,901,576	34.8%
2001	228,982,907	18.0%	\$107,210,124	14.2%
2002	284,085,589	24.1%	\$137,945,439	28.7%
2003	291,705,979	2.7%	\$149,323,784	8.2%
2004	308,184,447	5.6%	\$160,695,030	7.6%
2005	331,872,251	7.7%	\$172,537,345	7.4%
2006	364,454,701	9.8%	\$191,434,120	11.0%
2007	379,028,009	4.0%	\$202,675,564	5.9%

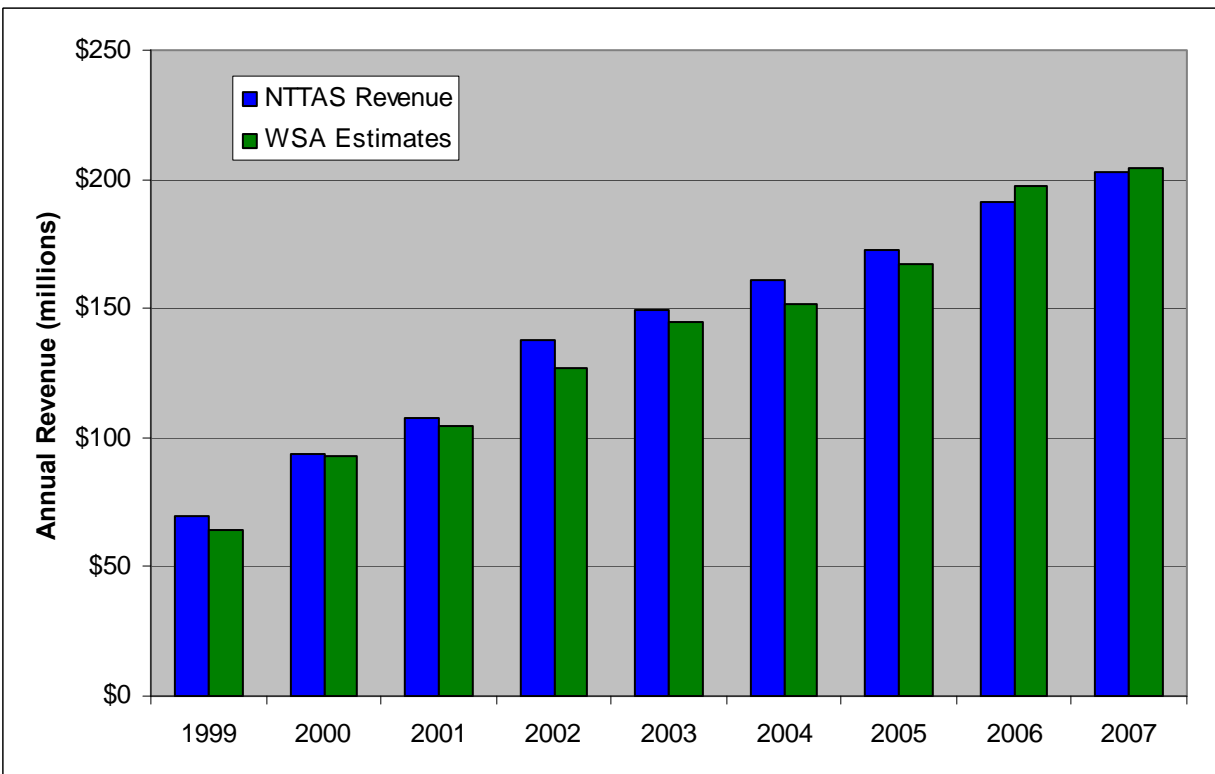
Figure 1 illustrates annual transactions and toll revenue trends for the entire system. Transactions have increased from 136.7 million in 1998 to 379.0 million in 2007 corresponding to approximately 177.2 percent increase. Toll revenues have increased from \$57.3 million in 1998 to \$202.7 million in 2007, equivalent to an increase of 254.0 percent over eleven years.

Figure 2 shows the actual toll revenue collected on the NTTA System versus the toll revenue estimated by WSA. NTTAS revenue has exceeded WSA estimates for all years except 2006 and 2007. In 2006, actual revenues were 2.9 percent less than expected due slow ramp up on the PGBT Segment IV and construction at MLP 1 and MLP 2. In 2007, toll revenue collected was \$202,675,564, approximately 0.9 percent lower than anticipated. The primary causes for this discrepancy were the implementation of the ZipCash system at MLP 1, ongoing construction and MLP 1, the delayed opening of the Phase 3 Extension, and the delayed implementation of system-wide toll rate increases.

The annual transactions in 2006 and 2007 at each toll plaza in the NTTAS are shown in Table 2 in descending order. Mainlane Plaza 2 (MLP 2) produced the highest number of transactions on the system with 48.0 million, closely followed by MLP 3 and MLP 7 which generated 43.7 million and 42.8 million, respectively. The combined nine mainlane plazas on the DNT and PGBT generated 67.9 percent of the total transactions on the entire system during 2007. Gaylord Parkway was the highest producing ramp on the DNT, and Preston Road was the highest producing ramp on the PGBT.



**Figure 1. NTTAS Transactions and Revenue – Historical Trend**



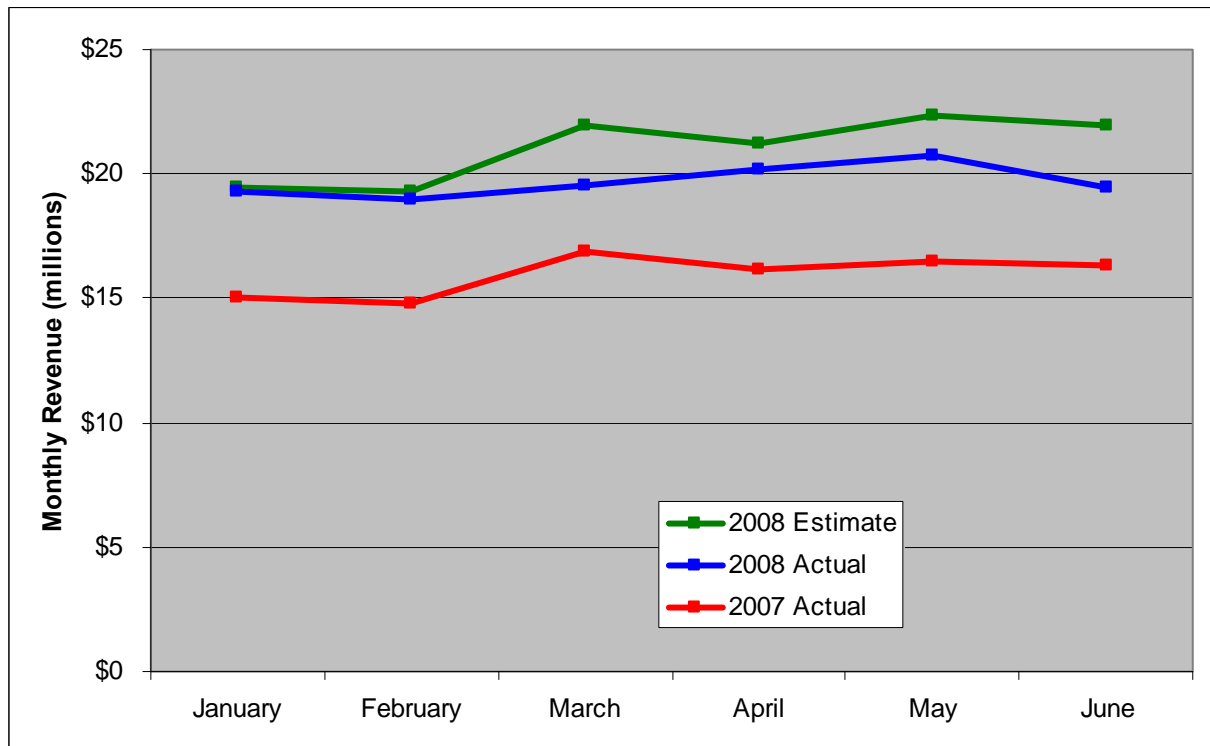
**Figure 2. Comparison of Actual Revenue to WSA Estimates**

**Table 2**  
**NTTA System**  
**Annual Transactions by Plaza**

Plaza Name	2006 Transactions	2007 Transactions	Growth
Mainlane Plaza 2	46,612,384	47,976,150	2.9%
Mainlane Plaza 3	41,743,746	43,652,066	4.6%
Mainlane Plaza 7	42,063,469	42,837,539	1.8%
Mainlane Plaza 8	34,847,402	36,121,483	3.7%
Mainlane Plaza 1	28,042,276	26,795,476	-4.4%
Mainlane Plaza 9	21,241,918	23,565,508	10.9%
Mainlane Plaza 6	17,665,584	18,119,115	2.6%
Mainlane Plaza 10	14,395,112	15,977,688	11.0%
Gaylord Parkway	14,358,325	11,773,952	-18.0%
Northwest Highway	8,063,672	8,224,121	2.0%
Mockingbird Lane	8,033,662	8,207,177	2.2%
Park Boulevard	7,714,795	7,724,955	0.1%
Frankford Road	7,597,920	7,709,301	1.5%
Belt Line Road	7,371,131	7,562,312	2.6%
Preston Road	5,800,413	6,016,273	3.7%
Midway Road	5,673,831	5,675,035	0.0%
Keller Springs Road	5,257,435	5,502,463	4.7%
Coit Road	4,726,749	4,751,010	0.5%
Marsh Lane	4,361,913	4,419,816	1.3%
Royal Lane (PGBT)	3,622,115	4,156,950	14.8%
Spring Valley	3,923,158	3,952,652	0.8%
Royal Lane (DNT)	3,765,011	3,936,976	4.6%
Kelly Boulevard	3,528,011	3,653,330	3.6%
Parker Road	3,365,203	3,642,785	8.2%
Renner Road West	3,133,063	3,194,425	2.0%
Mountain Creek Toll Bridge	2,915,449	2,960,859	1.6%
Shiloh Road	2,609,068	2,673,915	2.5%
Mainlane Plaza 4*	--	2,187,302	--
Addison Airport Toll Tunnel	2,046,741	2,097,047	2.5%
Josey Lane	1,766,759	1,957,488	10.8%
Garland Road	1,609,185	1,734,846	7.8%
Cotton Gin Road*	--	1,577,584	--
Independence Parkway	1,305,866	1,380,830	5.7%
South Belt Line Road	1,306,303	1,338,596	2.5%
Spring Creek Parkway	1,029,315	1,315,352	27.8%
Campbell Road	1,294,050	1,313,053	1.5%
North Belt Line Road	843,039	1,069,553	26.9%
Lebanon Road*	--	955,080	--
Renner Road East	820,628	826,328	0.7%
Stonebrook Parkway**	--	403,140	--
Eldorado Parkway*	--	88,478	--

\*Opened in September 2007  
\*\*Opened in October 2007

Figure 3 shows both the WSA estimated toll revenue for the first six months of 2008 and the actual toll revenue on the NTTA System for the first six months of 2007 and 2008. As shown in the figure, actual revenues on the NTTAS have grown significantly from 2007, but they are below the WSA estimates. For the first six months of 2008, revenue on the NTTAS was up by 23.5 percent over the same period in 2007 but was 6.4 percent less than estimated. There are several reasons for these differences. Slower than expected recovery of ZipCash payments at MLP 1 is dampening revenue growth on the DNT. Additionally, the ramp up on the Phase 3 Extension appears to be slower than originally estimated. Violations across the system also appear to be slightly higher than anticipated. Recent economic downturns may be impacting traffic growth on the system and recent spikes in gasoline prices may also be contributing, particularly in May and June. The average price of gasoline was 34 percent higher in June 2008 than it was in June 2007, and this likely caused a small reduction of trips on NTTAS. However, it is important to note that beginning in mid-July, gasoline prices began dropping noticeably.



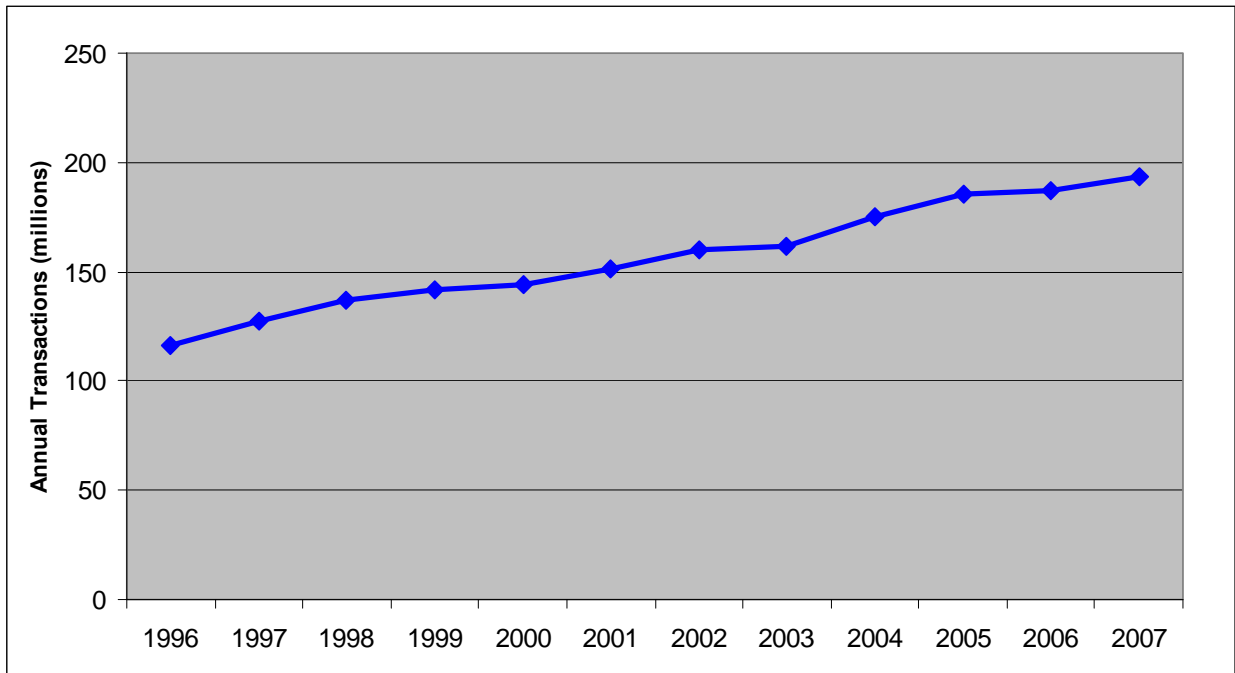
**Figure 3. 2008 Estimated and Actual Toll Revenue**

## **DALLAS NORTH TOLLWAY**

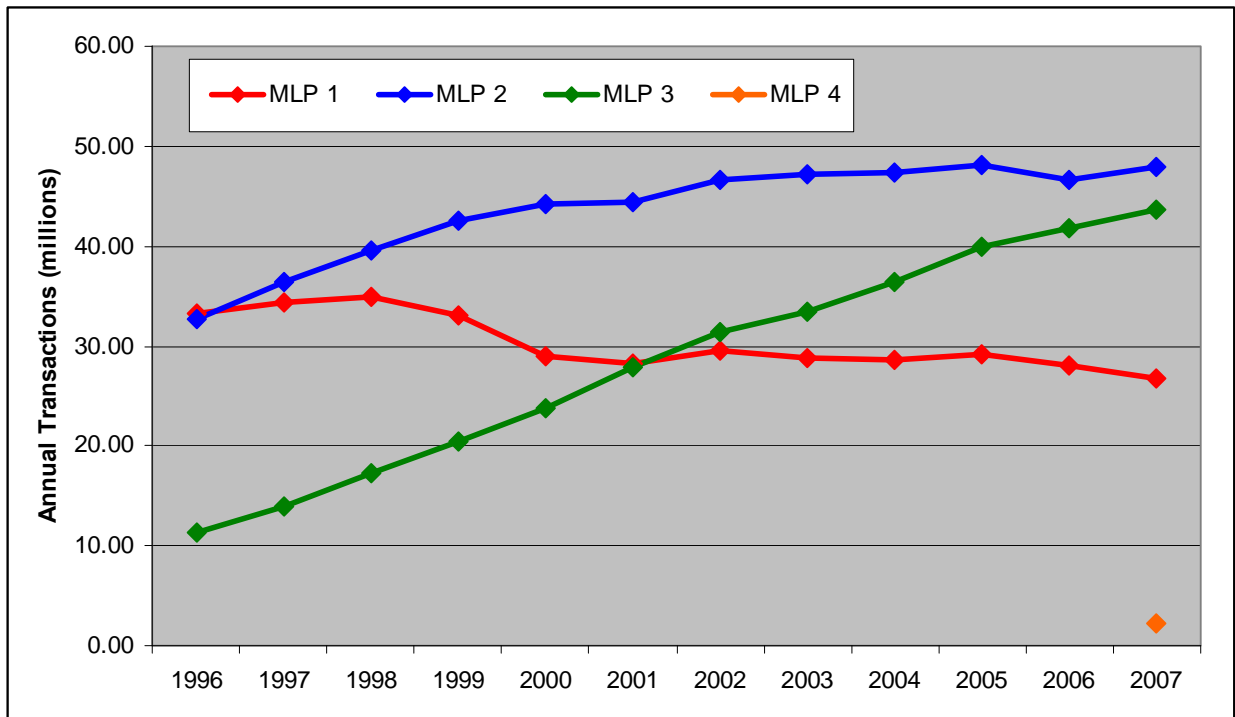
The Dallas North Tollway is currently a 31-mile, limited-access, high-speed toll facility which extends from a junction with IH 35E north of downtown Dallas to US 380 in Frisco. The facility contains four mainlane toll plazas, with ramp toll plazas to prohibit toll-free movements. The DNT Phase 3 Extension, which extended the Tollway from Gaylord Parkway to US 380, opened to traffic in September 2007.

Figure 4 shows the historical trend for transactions on the DNT. As shown in the figure, transactions on the facility have grown steadily since 1996. Figure 5 shows the transaction growth at each mainlane plaza. Traffic at MLP 1 has been slightly decreasing in recent years, most likely due to the ongoing construction, and MLP 2 continues to grow but is leveling off somewhat. MLP 3, however, continues to grow strongly and may surpass MLP 2 in total transactions within the next few years. Figures 6 and 7 illustrate the transaction growth at each of the ramp plazas on the DNT. As can be seen in the figures, the plazas in the northern portions of the corridor are experiencing the greatest amount of recent growth. Additionally, the ramps at Gaylord Parkway, which was the endpoint of the DNT mainlanes, experienced a sharp drop in transactions due to the opening of the Phase 3 Extension. Historically, most ramps have experienced an overall positive growth, but the phased opening of the PGBT between 1998 and 2002 generated significant growths and declines at various locations on the DNT. For instance, the Frankford, Keller Springs and Park plazas, which all lie close to the PGBT interchange, experienced very large growth. Conversely, Belt Line and Spring Valley showed significant declines.

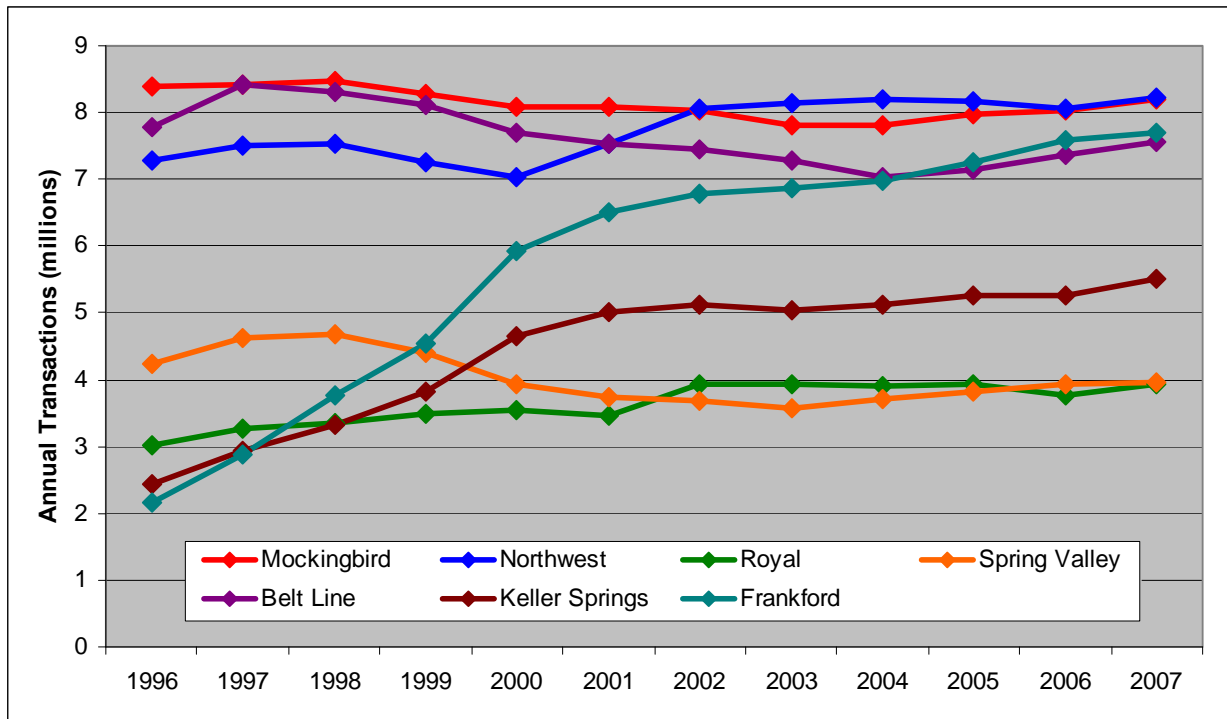
Table 3 lists the transactions and share for each plaza on the DNT. MLP 2 generated the most transactions on the DNT, and Gaylord Parkway was the highest producing ramp plaza. The mainlane plazas generated 62.4 percent of all transactions on the DNT in 2007. The Phase 3 Extension, which opened in the fall, accounted for 2.7 percent of the total annual transactions. However, because the Phase 3 Extension was only open for the last quarter of 2007, this share is expected to grow significantly in 2008.



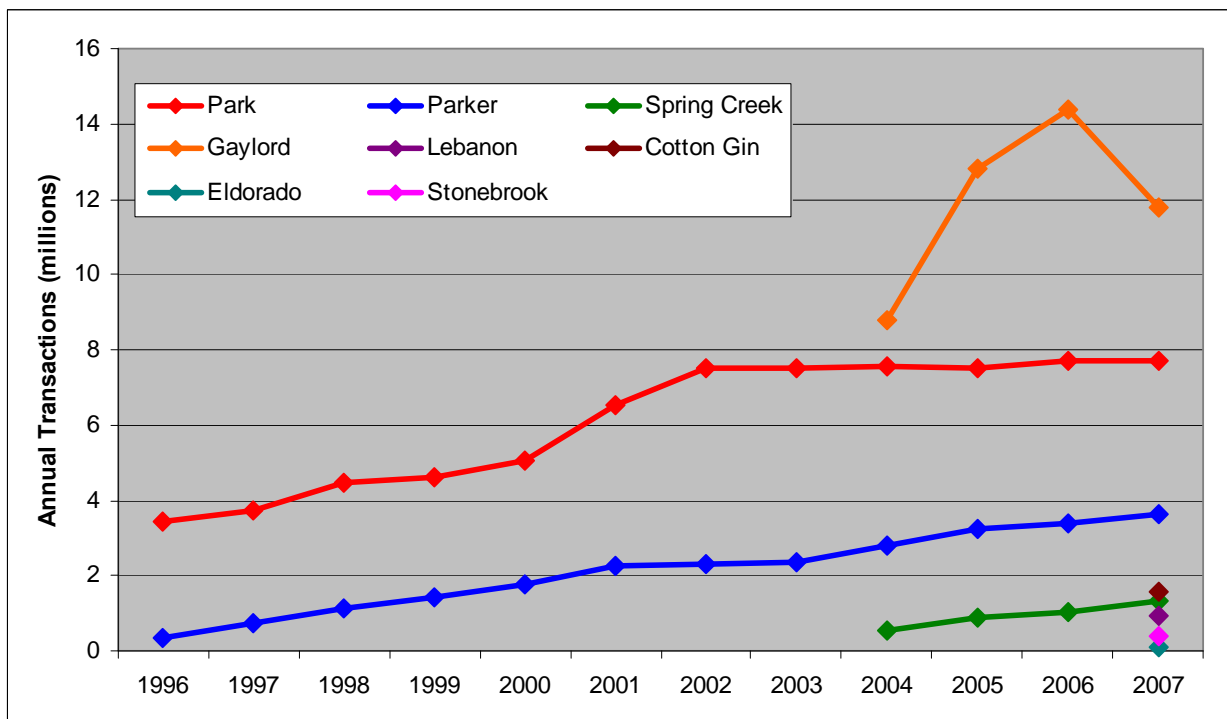
**Figure 4. DNT Transactions – Historical Trend**



**Figure 5. DNT Transactions – Mainlane Plazas**



**Figure 6. DNT Transactions – Ramp Plazas between IH 35E and PGBT**



**Figure 7. DNT Transactions – Ramp Plazas between PGBT and US 380**

**Table 3**  
**Dallas North Tollway**  
**2007 Annual Transactions by Plaza**

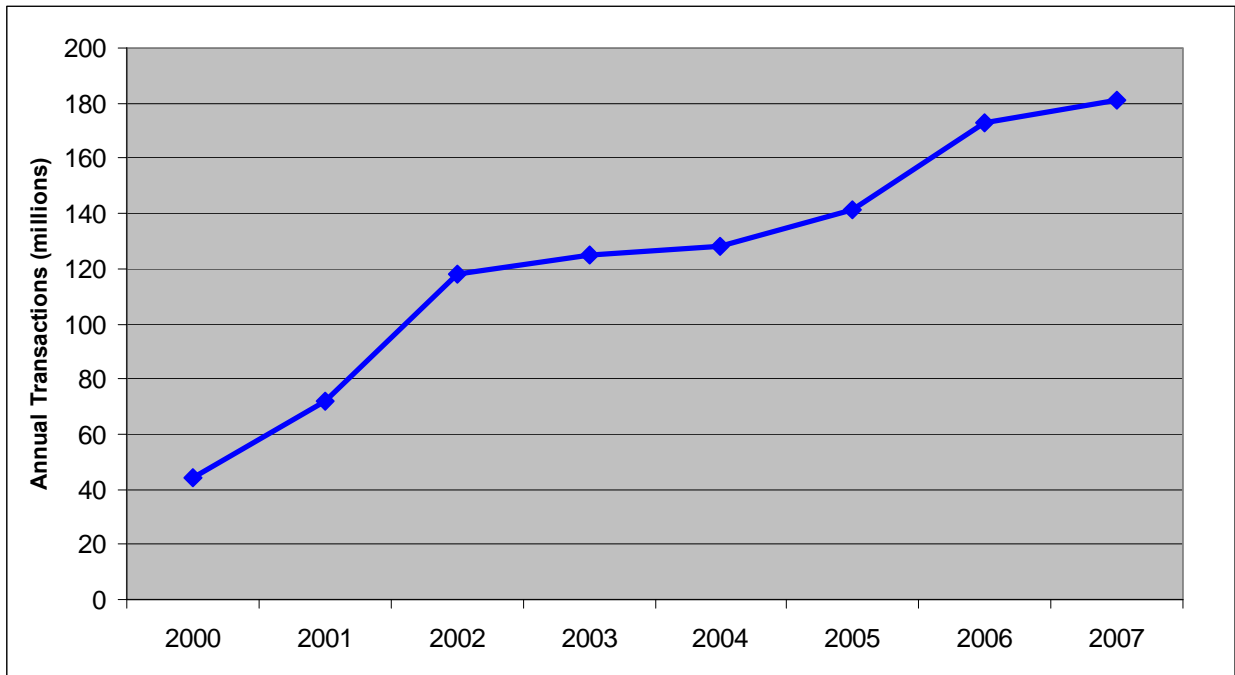
<b>Plaza Name</b>	<b>Transactions</b>	<b>Share</b>
Mainlane Plaza 2	47,976,150	24.8%
Mainlane Plaza 3	43,652,066	22.6%
Mainlane Plaza 1	26,795,476	13.9%
Gaylord Parkway	11,773,952	6.1%
Northwest Highway	8,224,121	4.3%
Mockingbird Lane	8,207,177	4.2%
Park Boulevard	7,724,955	4.0%
Frankford Road	7,709,301	4.0%
Belt Line Road	7,562,312	3.9%
Keller Springs Road	5,502,463	2.8%
Spring Valley	3,952,652	2.0%
Royal Lane	3,936,976	2.0%
Parker Road	3,642,785	1.9%
Mainlane Plaza 4*	2,187,302	1.1%
Cotton Gin Road*	1,577,584	0.8%
Spring Creek Parkway	1,315,352	0.7%
Lebanon Road*	955,080	0.5%
Stonebrook Parkway**	403,140	0.2%
Eldorado Parkway*	88,478	0.0%
*Opened in September 2007		
**Opened in October 2007		

## **PRESIDENT GEORGE BUSH TURNPIKE**

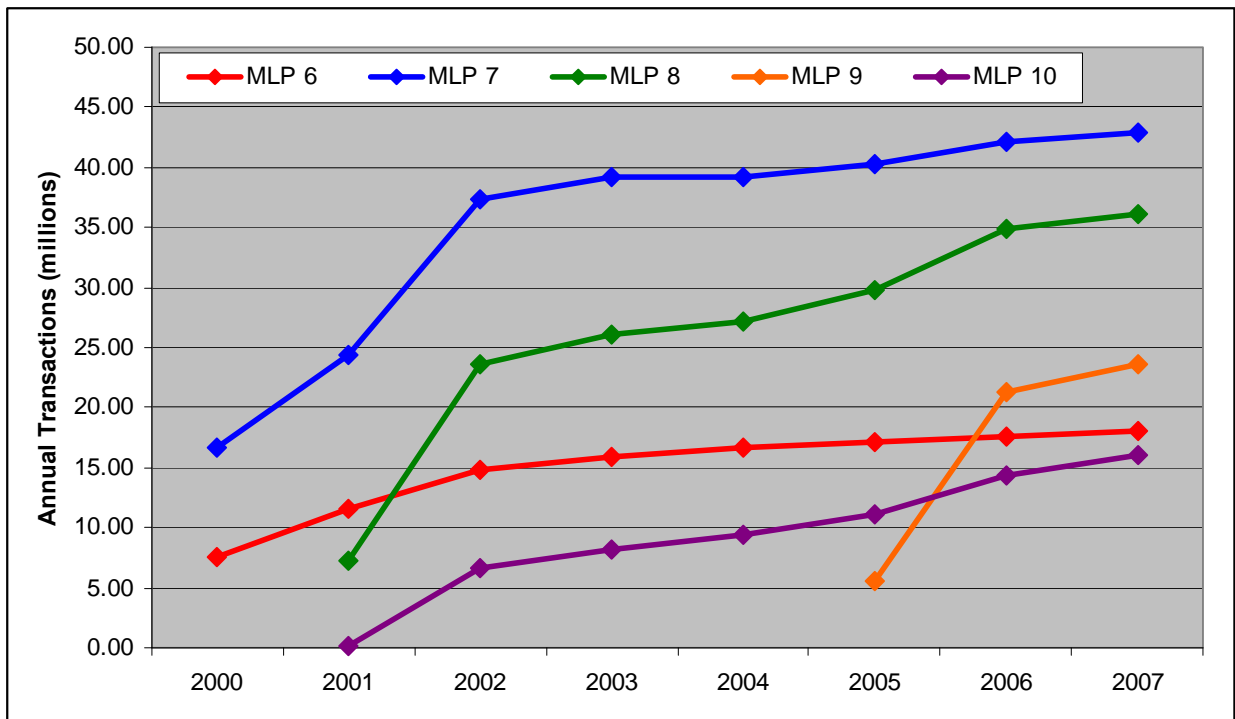
The President George Bush Turnpike (PGBT) is a 30-mile high-speed toll facility, extending from SH 78 in Garland to Belt Line Road in Irving. The first segment of the facility, from Midway to Preston Road, opened in December 1998. The segment from Preston Road to Campbell Road opened in 1999, and the segment from Campbell Road to SH 78 opened in 2000. The section between Midway to IH 35E opened in July 2001, and from IH 635 to Belt Line opened in January 2002. The most recent segment between IH 35E and IH 635 opened in September 2005.

Figure 8 shows the historical trend for transactions on the PGBT. As shown in the figure, transactions on the facility have grown significantly since 2000. Large growth can be seen between 2000 and 2002 when most of the segments opened, and an additional jump can be seen in 2006 following the opening of Segment IV between IH 635 and IH 35E. Figure 9 shows the transaction growth at each of the five mainlane plazas on the PGBT, all of which continue to grow steadily. MLP 7 and MLP 8 generate the most traffic on the PGBT while MLP 6 and MLP 10, which are located at the eastern and western ends of the facility, generate the least. It can be seen in the graphic that MLP 8 received the biggest boost in traffic due to the opening of Segment IV. Figures 10 and 11 show the transaction growth at each ramp plaza on the PGBT. The ramps at Preston Road, Royal Lane and Garland are experiencing the highest rates of growth on the facility while the ramps at Renner and Midway Road are currently showing the smallest recent growth.

Table 4 lists the transactions and share for each plaza on the PGBT. MLP 7 generated the most transactions on the PGBT, and Preston Road was the highest producing ramp plaza. The mainlane plazas generated 75.6 percent of all transactions on the PGBT in 2007. Generally, the ramp plazas east of US 75 and west of IH 35E produced fewer transactions than those in the central portion of the corridor.



**Figure 8. PGBT Transactions– Historical Trend**



**Figure 9. PGBT Transactions – Mainlane Plazas**

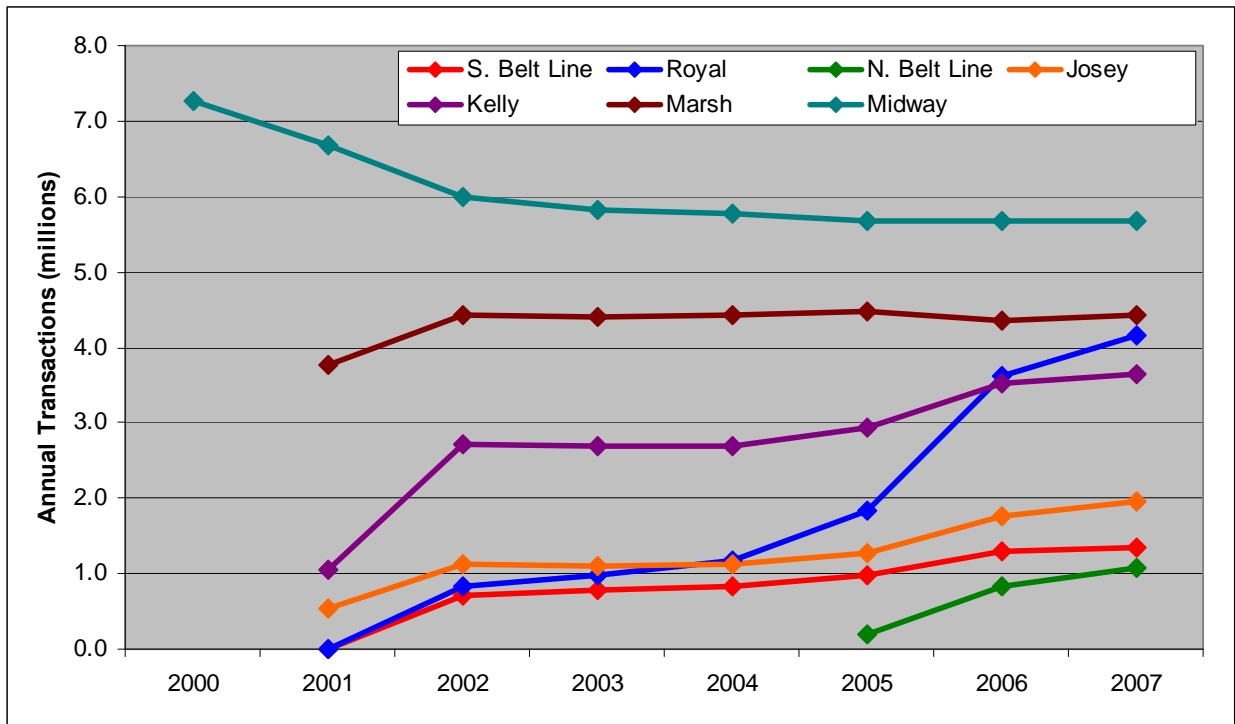


Figure 10. PGBT Transactions – Ramp Plazas between MLP 10 and DNT

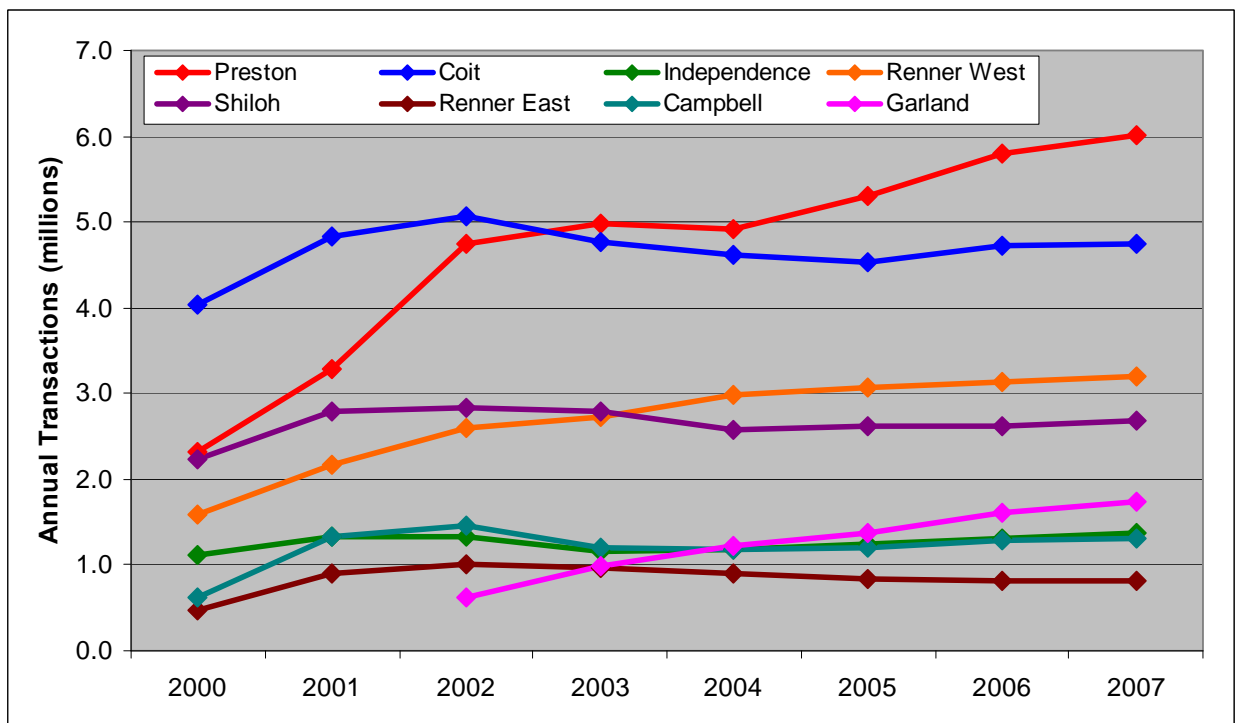


Figure 11. PGBT Transactions – Ramp Plazas between DNT and SH 78

**Table 4**  
**President George Bush Turnpike**  
**2007 Annual Toll Transactions by Plaza**

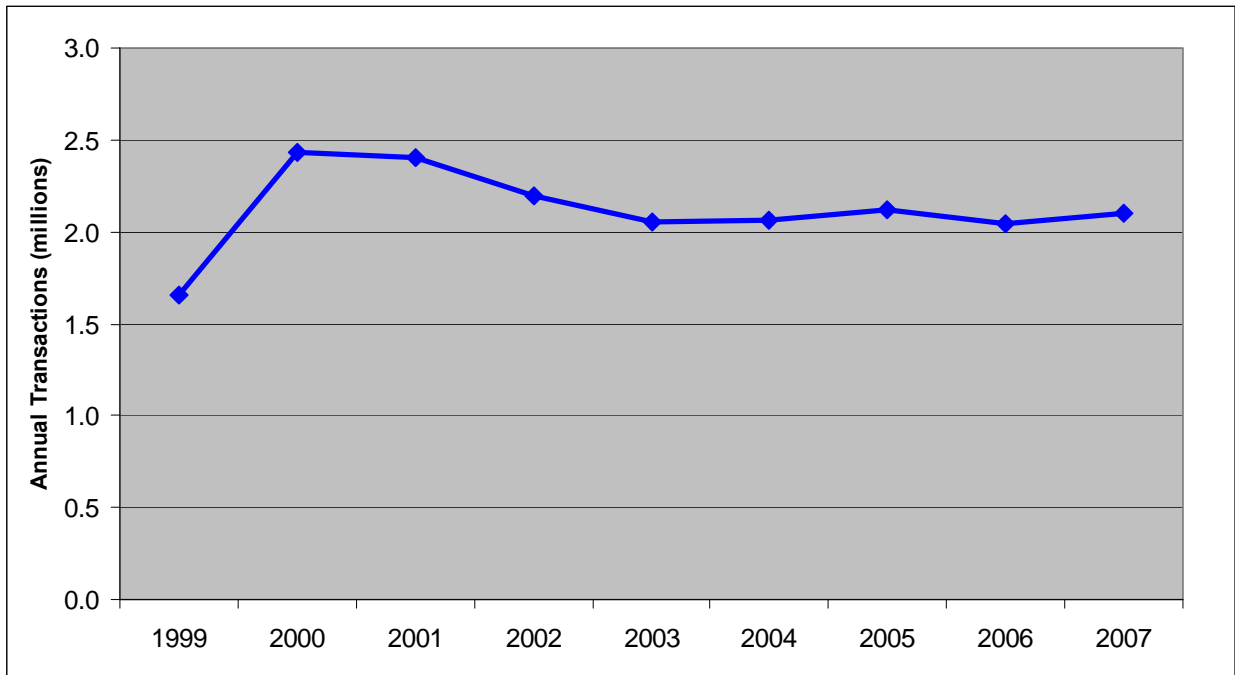
<b>Plaza Name</b>	<b>Transactions</b>	<b>Share</b>
Mainlane Plaza 7	42,837,539	23.7%
Mainlane Plaza 8	36,121,483	20.0%
Mainlane Plaza 9	23,565,508	13.0%
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Renner Road East	826,328	0.5%

## **ADDISON AIRPORT TOLL TUNNEL**

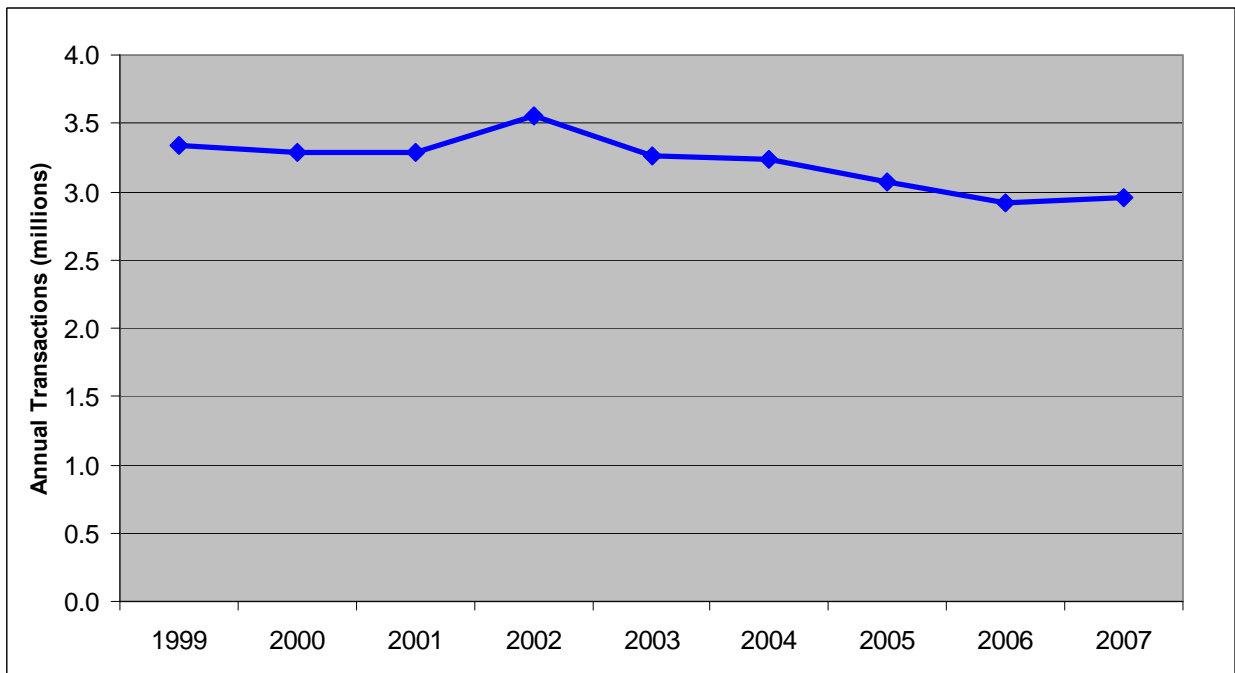
Between 2006 and 2007, annual transactions at the Addison Airport Toll Tunnel (AATT) increased by 2.5 percent from 2.05 million to 2.10 million. Toll revenues increased from \$977,000 in 2005 to \$985,000 in 2007. Figure 12 shows the historical trend of transactions on the AATT. As seen in the figure, transactions on the AATT dropped steadily between 2000 and 2003 but have not experienced significant positive or negative growth over the last five years.

## **MOUNTAIN CREEK LAKE BRIDGE**

Transactions on the Mountain Creek Lake Bridge have been decreasing over the last five years, reaching a historic low in 2006 of 2.92 million, as shown in Figure 13. However, transactions grew slightly in 2007, increasing by 1.6 percent to 2.96 million.



**Figure 12. AATT Transactions – Historical Trend**



**Figure 13. MCLB Transactions – Historical Trend**

## SECTION 2

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### DNT PHASE 3 PERFORMANCE

The Dallas North Tollway (DNT) Extension Phase 3, which opened to traffic on September 28, 2007, extended the DNT north to US 380 and included the opening of a new mainlane plaza (MLP 4) and four pairs of ramp plazas. To evaluate the extension's impact on local travel patterns, WSA compared traffic counts in the area before and after the opening of DNT Phase 3 Extension. WSA also compared its estimates of DNT Phase 3 Extension traffic to actual transactions for December 2007.

#### SCREENLINE COMPARISON

Table 1 shows a comparison of the traffic share held by routes parallel to the DNT before and after the opening of the DNT Phase 3 Extension. For this comparison, a screenline was chosen between Eldorado Parkway and Main Street. As shown in the table, competing or parallel facilities showed reductions in traffic share following the opening of the extension. The share of traffic using Preston Road dropped from 59 percent in January 2006 to 28 percent in January 2008. The share using the DNT frontage roads also decreased, from 17 percent to nine percent. Traffic on FM 423 increased in share from 24 percent to 29 percent, but this is due primarily to a very large increase in traffic on FM 423 (121 percent) that can be attributed to significant development in the area between 2006 and 2008. The DNT mainlanes currently account for 26 percent of the total screenline volume. Legacy Drive between Eldorado Parkway and Main Street, which was not open at the time of the previous traffic counts, currently carries eight percent of the screenline volume. The observed shifts in screenline traffic share indicate that a significant portion of travelers shifted their trips to the DNT after the opening of the DNT Phase 3 Extension as expected, including those previously using both the frontage roads and parallel arterials.

**Table 5**  
**Screenline Share Comparison between Eldorado Parkway and Main Street**

<b>Location</b>	<b>Before Phase 3: January 2006</b>	<b>After Phase 3: January 2008</b>	<b>Change in Market Share</b>
FM 423	24%	29%	5%
Legacy Drive	--	8%	8%
Dallas North Tollway Frontage Roads	17%	9%	-8%
Dallas North Tollway Mainlanes	--	26%	26%
Preston Road	59%	28%	-31%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## DAILY TRANSACTIONS COMPARISON

The performance of the DNT Phase 3 Extension was also evaluated by comparing the average weekday transactions estimated by WSA as part of the DNT System Investment Grade Report dated October 30, 2007 and the actual average weekday transactions observed on the facility for the first three weeks of December 2007. The combined transaction totals were calculated for MLP 4 and the ramp plazas at Eldorado Parkway, Cotton Gin Road, Stonebrook Parkway, and John Hickman Parkway. WSA projected the average total weekday transactions on the DNT Phase 3 Extension at 69,100 transactions per day for 2007. This value corresponds to a ramp-up assumption of 75 percent for 2007. The actual weekday transaction totals averaged 65,500 transactions per day in December 2007, indicating an observed ramp-up of 71 percent.

# SECTION 3

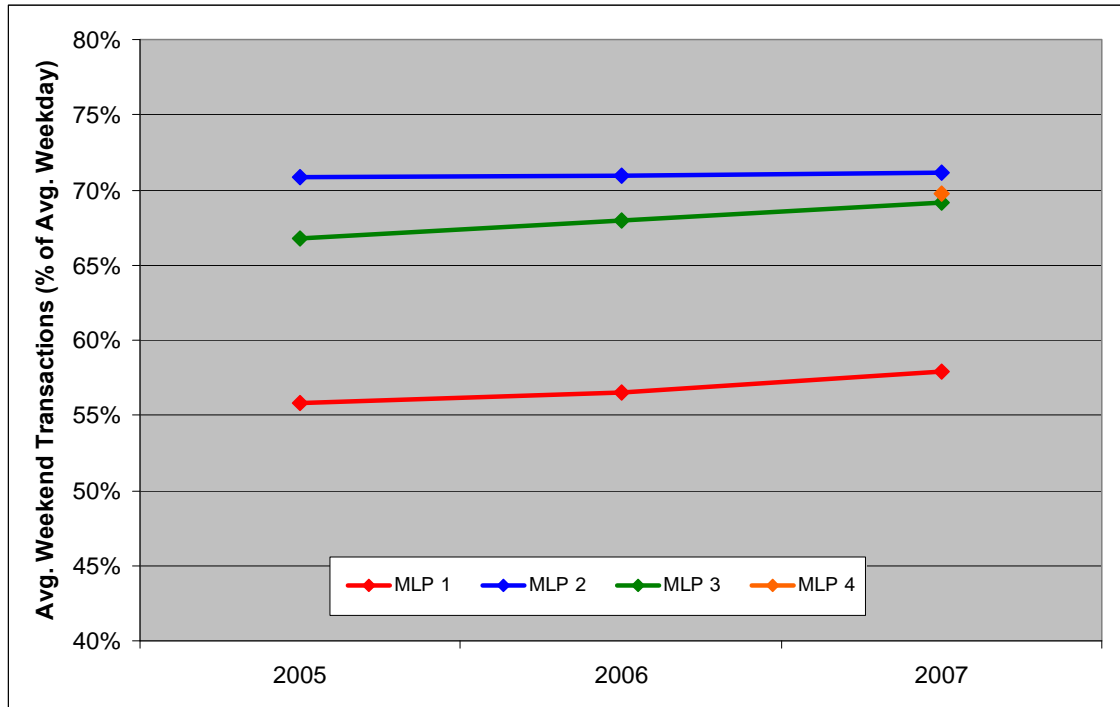
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## NTTA SYSTEM CHARACTERISTICS

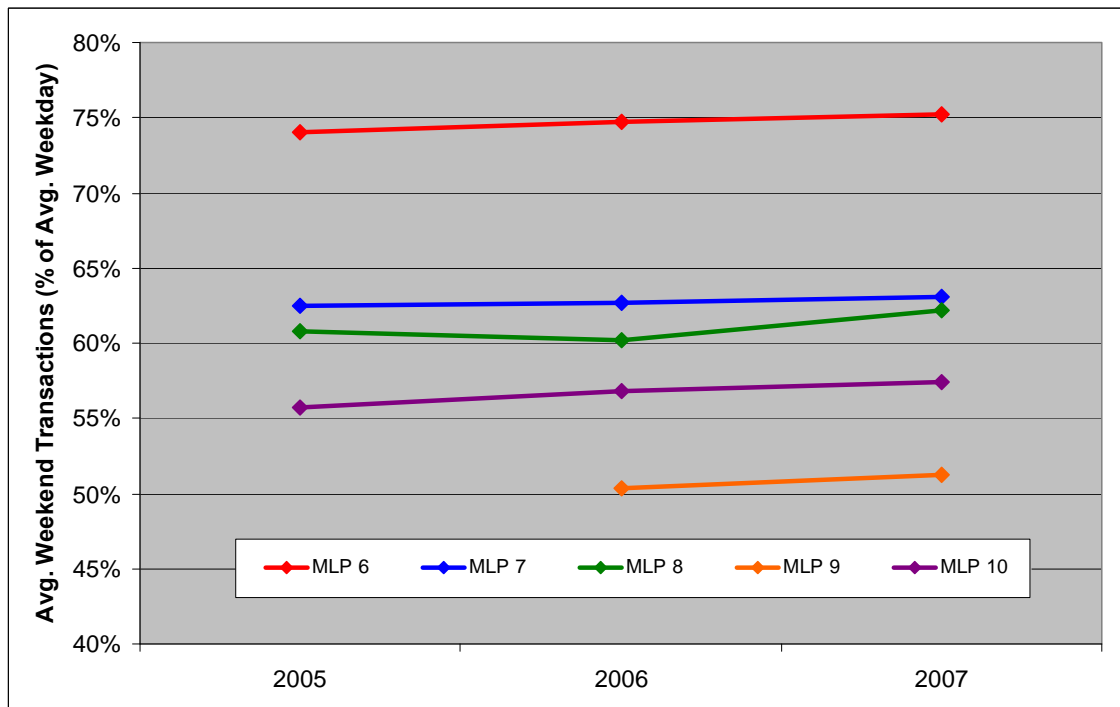
Several factors contribute to traffic and revenue growth on the NTTA system. Most revenue growth is due to the natural growth in travel demand as population and development in the corridors increase. There are a number of other factors, however, that also play a significant role in the revenue generation on the NTTAS.

### WEEKEND TRANSACTIONS

The amount of traffic using a facility on the weekend can have a significant impact on its revenue generation. Figures 14 and 15 show the average weekend transactions (as a percentage of the average weekday transactions) from 2005 to 2007 for the DNT and PGBT mainlane plazas, respectively. As shown in the graphs, weekend traffic is higher at the plazas that are closest to large retail areas, which are heavy attracters of weekend trips. On the DNT, MLPs 2, 3 and 4, which are all near major retail areas, have much higher weekend traffic than MLP 1, which is near downtown Dallas. On the PGBT, MLP 6 has the greatest amount of weekend traffic, likely due to its proximity to the Firewheel retail complex. MLP 9, which is located in an area with very little commercial development, has the lowest percentage of weekend traffic of all PGBT mainlane plazas. It is important to note that due to continued development along each corridor, the amount of weekend traffic is increasing at most of the mainlane plazas.



**Figure 14. Average Weekend Transactions on the DNT**



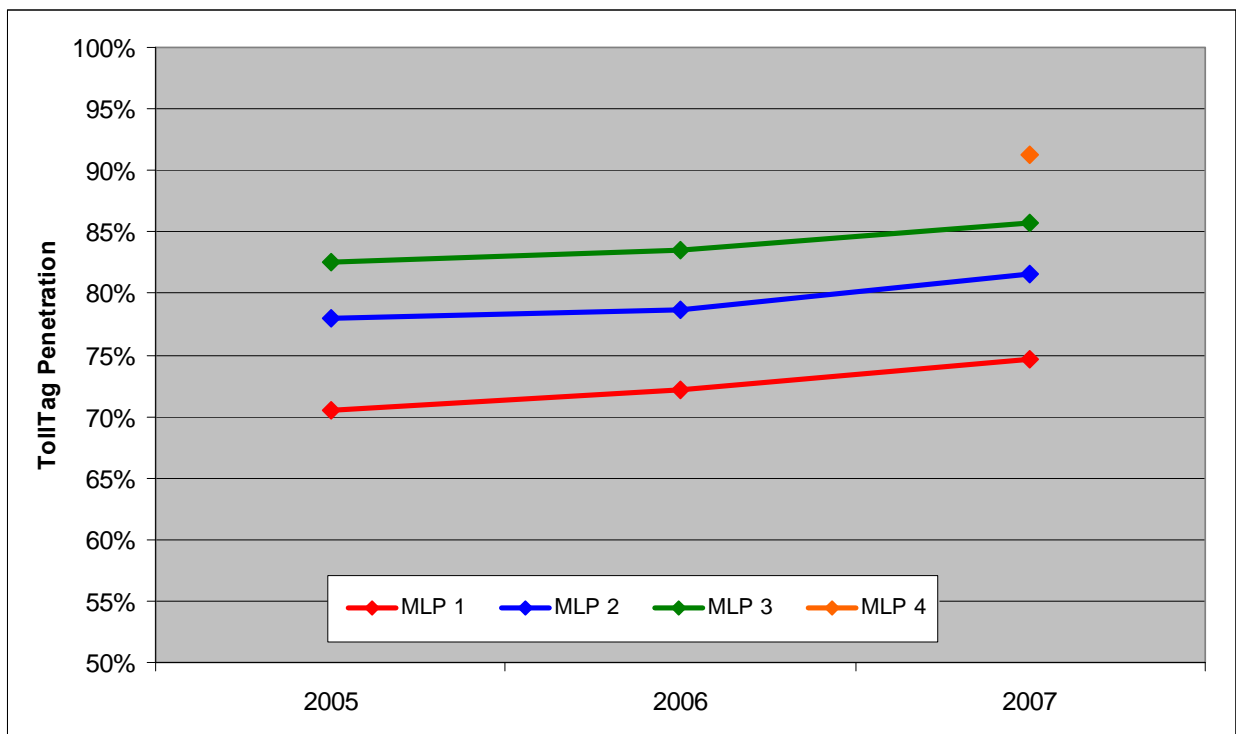
**Figure 15. Average Weekend Transactions on the PGBT**

## TOLLTAG PENETRATION

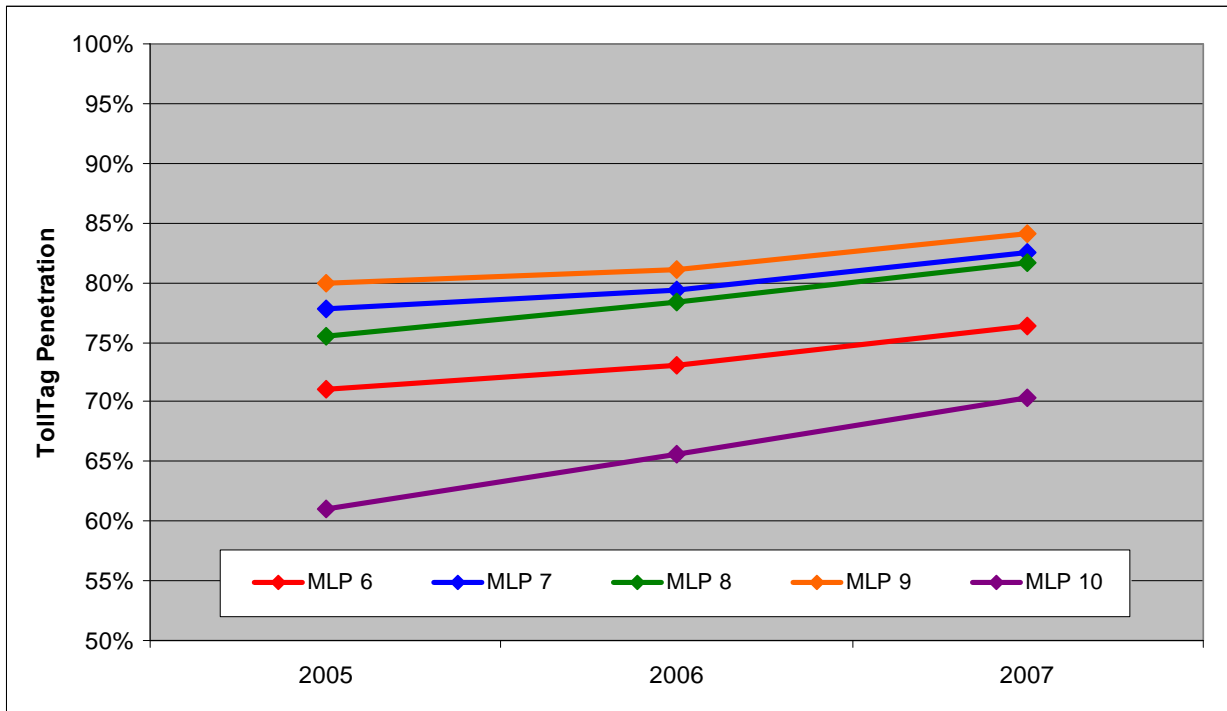
Due to the difference in toll rates for TollTag and cash users on the NTTAS, the percentage of customers paying with TollTag can have a significant impact on revenue. The percentage of NTTAS customers paying with TollTags continues to increase on all NTTA facilities. Additionally, because the toll is lower for TollTag users, increases in TollTag use actually decrease the revenue generated by each plaza. However, due to the higher costs of processing cash transactions, the net effect is anticipated to be positive.

The percentage of customers using TollTag from 2005 to 2007 is shown in Figures 16 through 18. On the DNT, TollTag penetration is highest at the northern areas of the corridor and lowest at MLP 1. As seen in the figures, TollTag use on the PGBT is highest at the locations that are nearest to the DNT and lowest at MLP 10, the westernmost mainlane plaza. The AATT, which is very close to the DNT, has relatively high TollTag participation while the MCLB, which is far removed from the rest of the NTTAS, has less than 20 percent TollTag use.

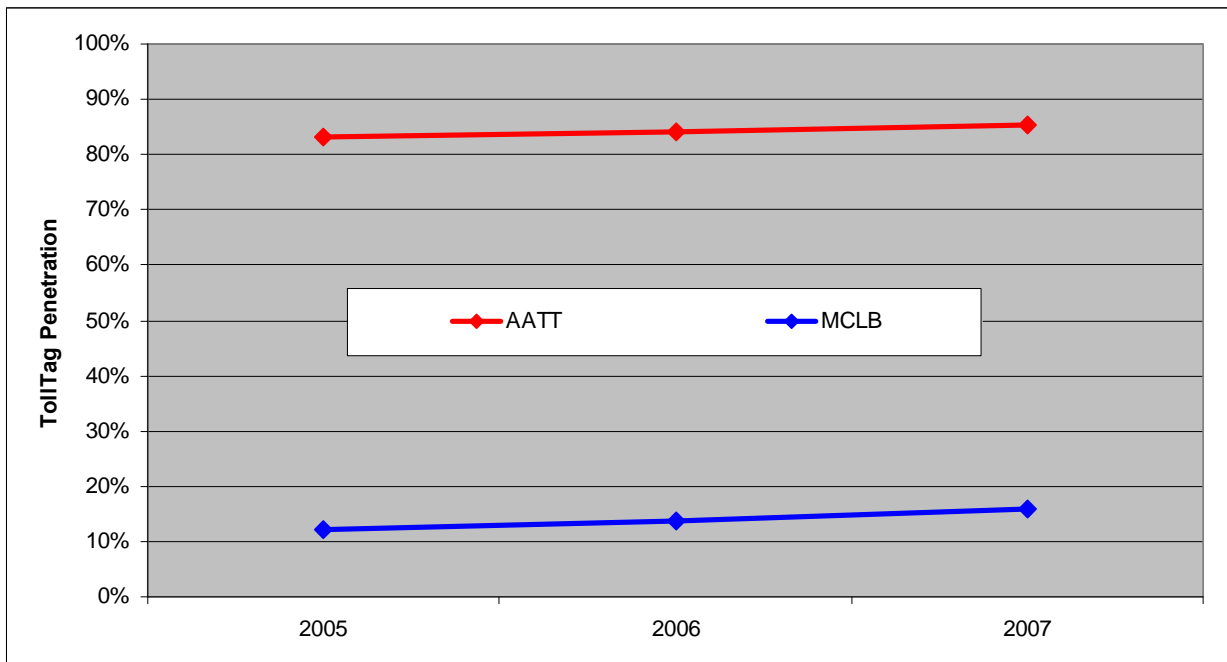
Figures 19 through 21 show the average daily variation in TollTag percentage for NTTA's facilities based on data from October and November 2007. As shown in Figures 18 and 19, the DNT and PGBT reach their highest levels of TollTag usage during the morning and peak periods, and their lowest levels during the late evening and early morning. Alternatively, the AATT and MCLB maintain relatively constant TollTag percentages throughout the day.



**Figure 16. TollTag Penetration on the DNT**



**Figure 17. TollTag Penetration on the PGBT**



**Figure 18. TollTag Penetration on the AATT and MCLB**

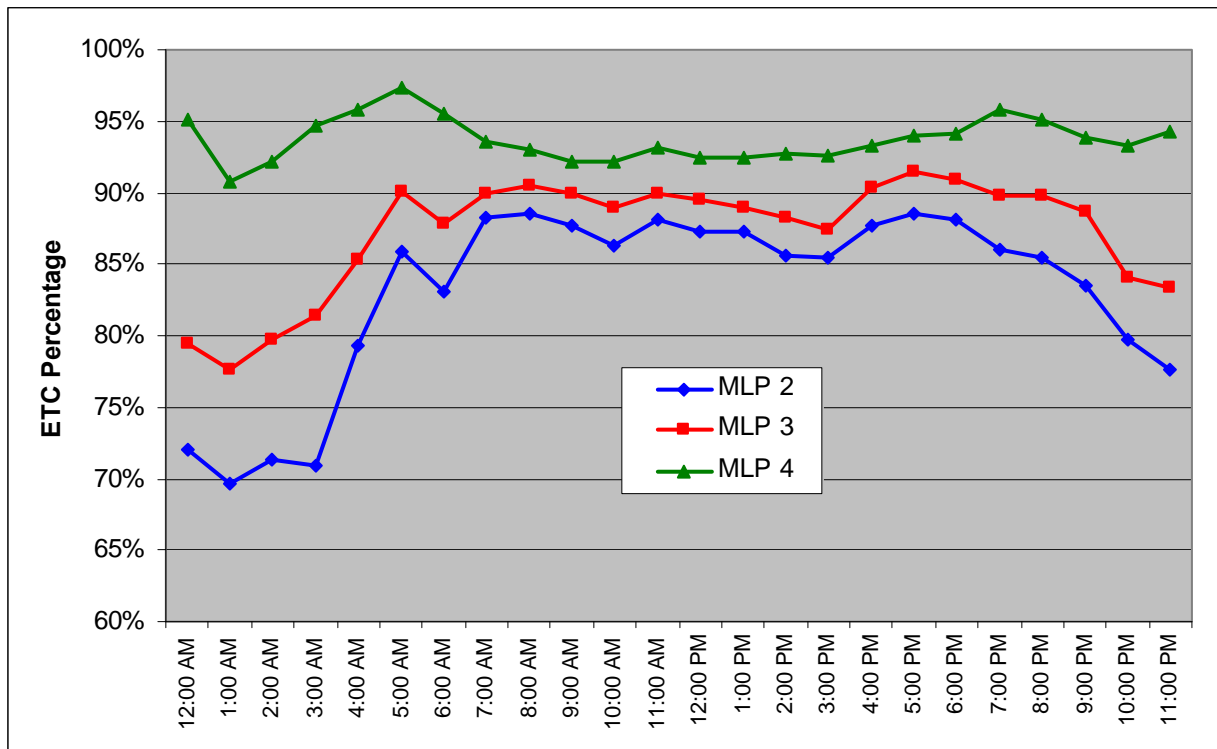


Figure 19. Hourly ETC Percentage on the DNT

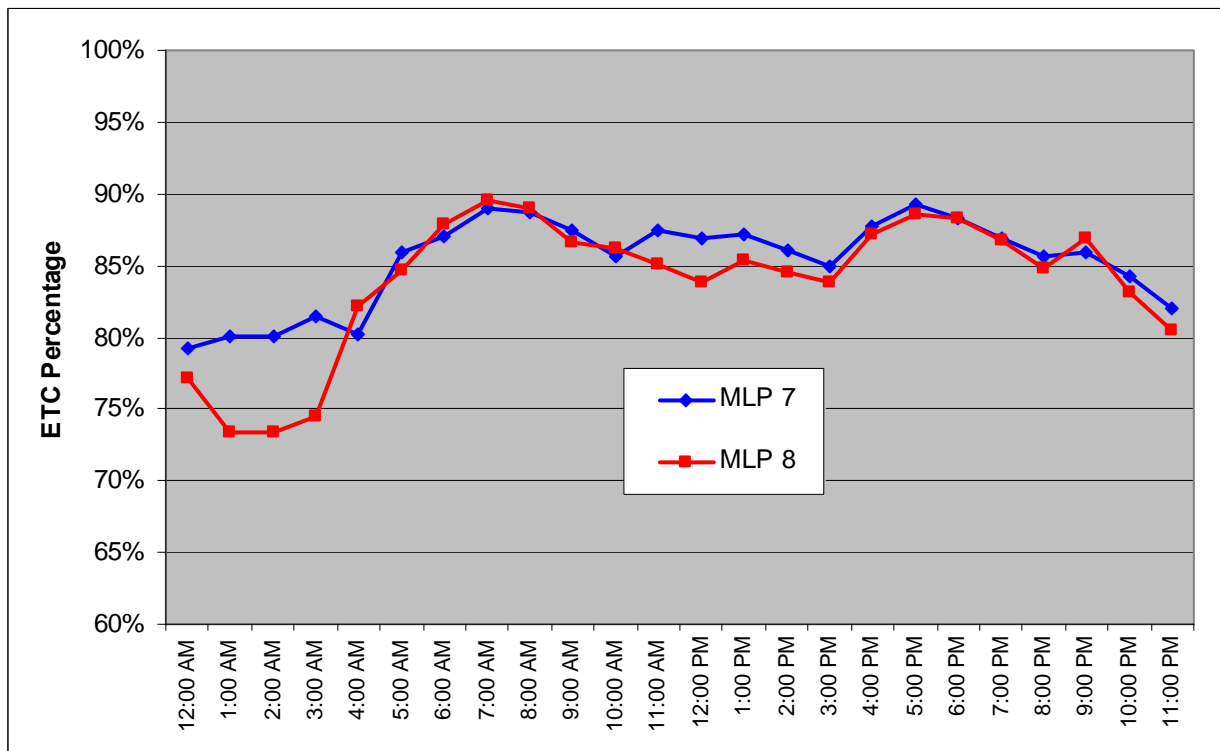
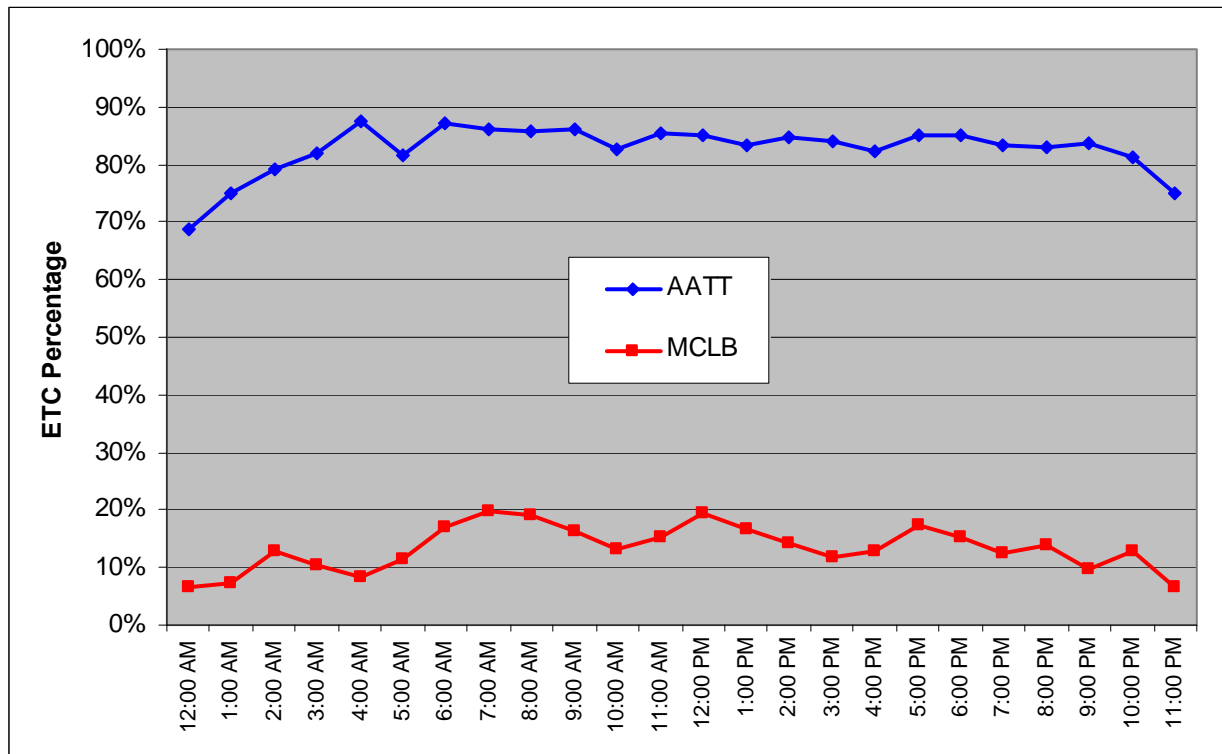


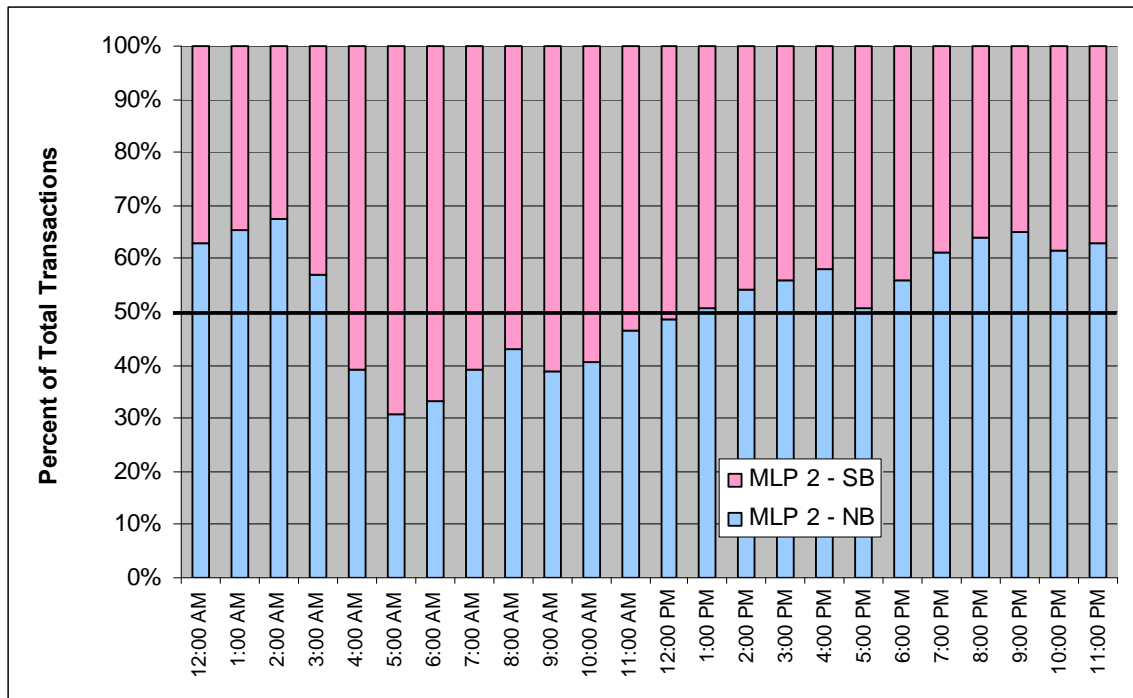
Figure 20. Hourly ETC Percentage on the PGBT



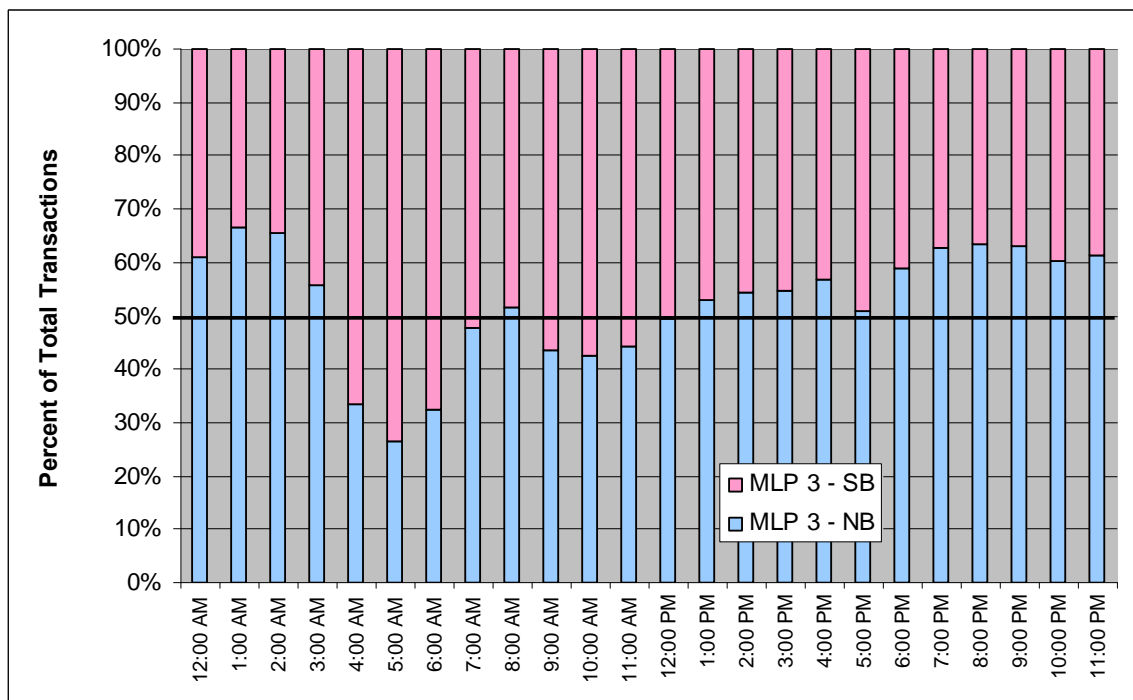
**Figure 21. Hourly ETC Percentage on the AATT and MCLB**

## DIRECTIONALITY OF TRAFFIC FLOW

Figures 22 through 26 show the directional split of transactions for mainlane plazas 2, 3, 4, 7 and 8. On the DNT, traffic volume is heavier in the southbound direction during the morning peak period and heavier in the northbound directions during the evening peak period. MLP 4, which lies near the northern terminus of the Tollway, is much more directional than MLP 2 or 3. MLP 2, between IH 635 and the PGBT does not exceed 70 percent in either direction for any hour of the day. This could be indicative of gentrification of the older established areas of central Dallas and increased suburban job growth. Directionality also remains under 70 percent throughout the day on the PGBT, which is not unexpected on a circumferential transportation facility. However, the westbound direction is slightly favored in the morning while the eastbound direction is heavier during the evening peak period.



**Figure 22. MLP 2 Traffic Flow Directionality**



**Figure 23. MLP 3 Traffic Flow Directionality**

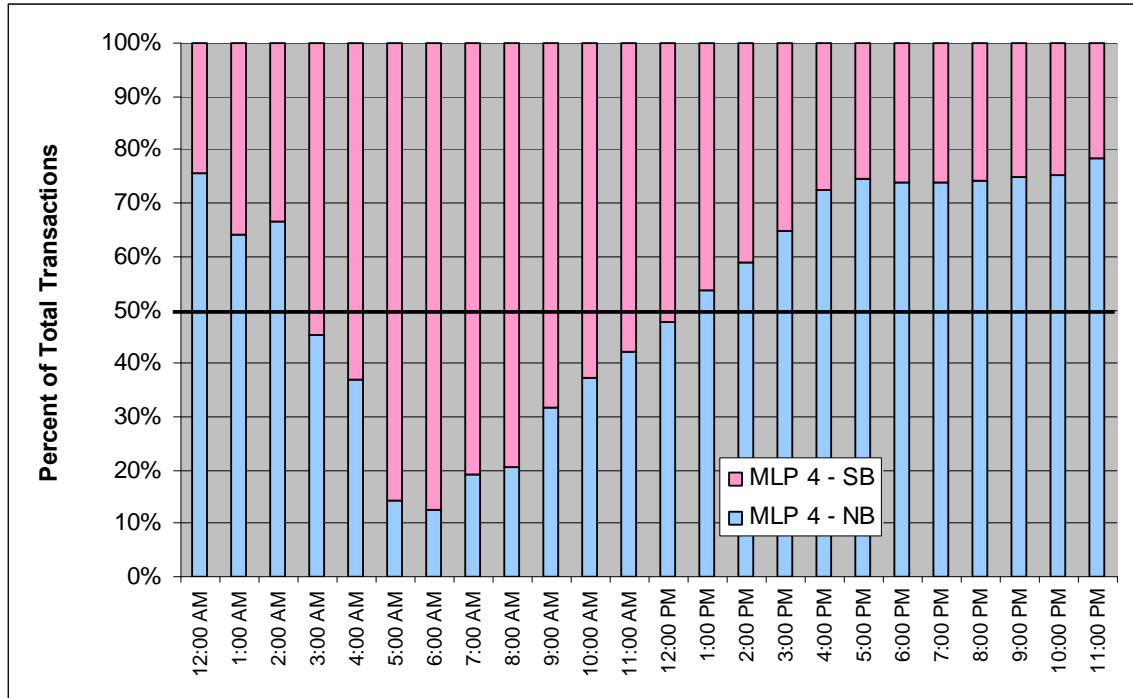


Figure 24. MLP 4 Traffic Flow Directionality

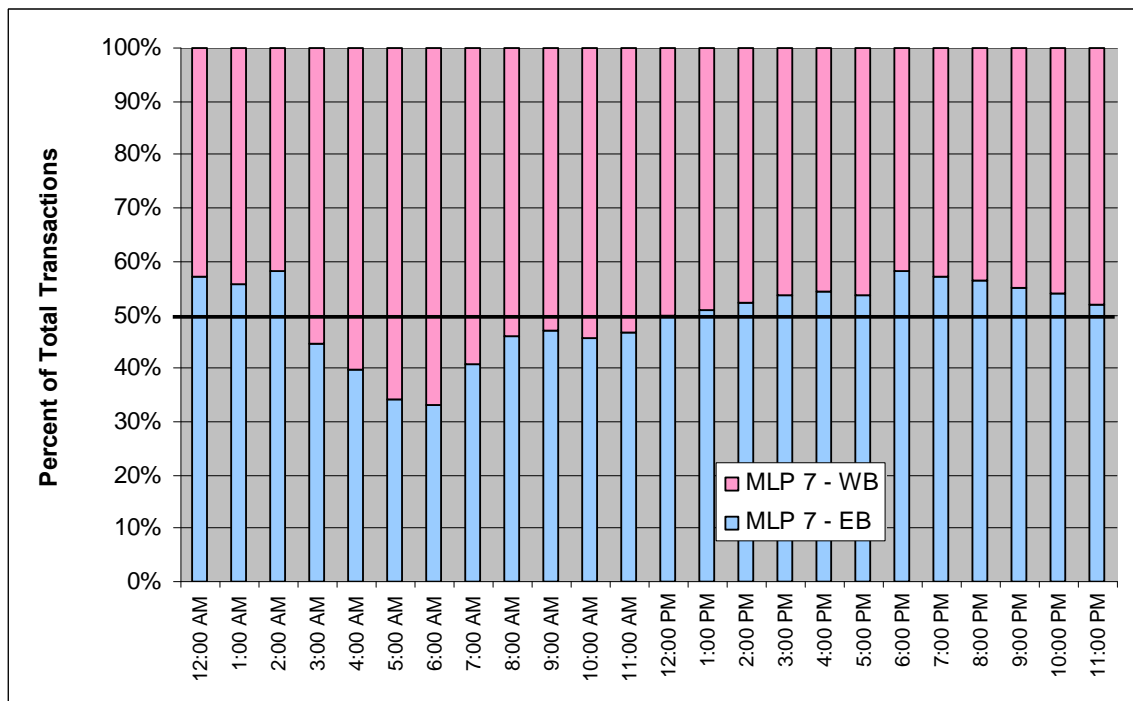
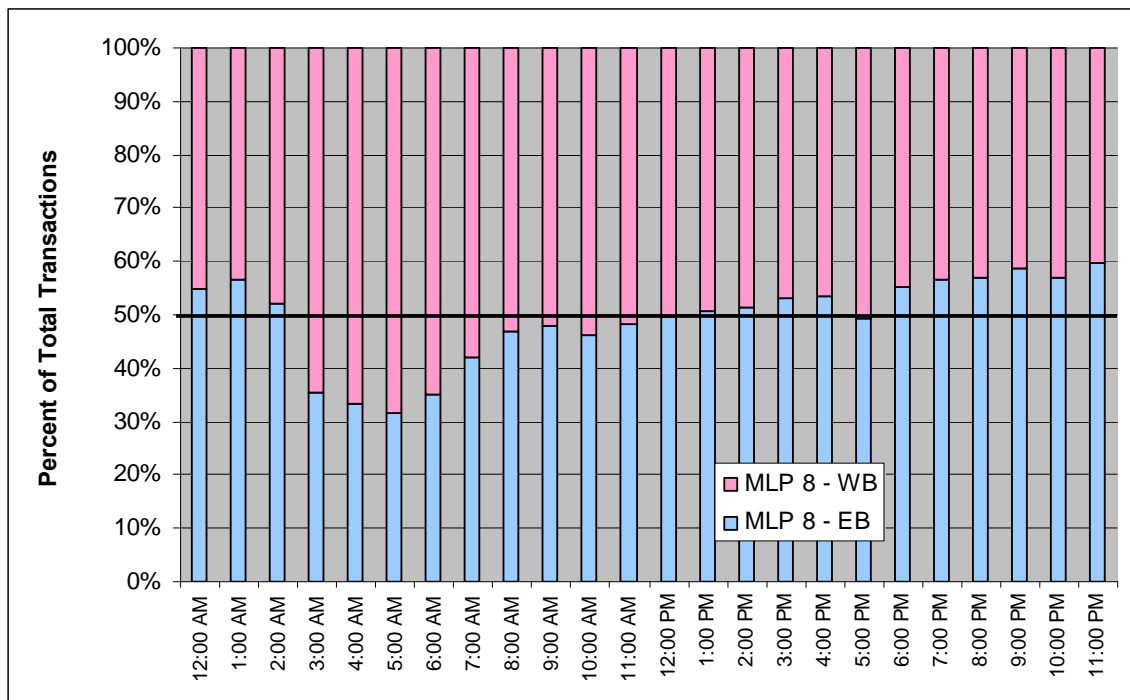


Figure 25. MLP 7 Traffic Flow Directionality



**Figure 26. MLP 8 Traffic Flow Directionality**

## VEHICLE CLASSIFICATION

All trucks with more than two axles pay an increased toll to use NTTA facilities. For all trucks, the toll is calculated by multiplying the two-axle toll rate by a factor of one less than the number of axles on any particular vehicle. For example, a truck with four axles would pay a toll equal to three times the two-axle toll. Because of the much higher tolls paid by trucks, the impact of truck percentage on NTTA facilities can be material. Table 6 shows the vehicle classification on all NTTA facilities based on data collected in October 2007. As seen in the table, two-axle vehicles (who would pay the normal toll rate) account for over 98 percent of the traffic on all NTTAS facilities. Trucks with three or more axles make up 1.4 percent of all vehicles using the NTTA System, but the percentages vary by facility. The PGBT currently accommodates 1.76 percent trucks which is the highest in the NTTAS, while the MCLB carries the lowest with only 0.18 percent. Table 7 shows the truck percentages at all mainlane plazas on the DNT and PGBT. As shown in the table, the DNT has less than one percent trucks at mainlane plazas 1 and 2 but has 4.5 percent at mainlane plaza 4.

**Table 6**  
**Vehicle Classification on the NTTA System**

Facility	Number of Axles					Total	Trucks (3+ axles)
	2	3	4	5	6+		
DNT	98.91%	0.42%	0.33%	0.30%	0.04%	100%	1.09%
PGBT	98.24%	0.66%	0.50%	0.57%	0.03%	100%	1.76%
AATT	99.45%	0.27%	0.25%	0.03%	0.00%	100%	0.55%
MCLB	99.82%	0.08%	0.00%	0.10%	0.00%	100%	0.18%
<b>NTTA System</b>	<b>98.60%</b>	<b>0.53%</b>	<b>0.41%</b>	<b>0.42%</b>	<b>0.03%</b>	<b>100%</b>	<b>1.40%</b>

Notes: Based on the vehicle classification data collected on October 17, 2007

**Table 7**  
**Vehicle Classification on the DNT and PGBT Mainlane Plazas**

Facility	Plaza	Number of Axles					Total	Trucks (3+ axles)
		2	3	4	5	6+		
DNT	MLP 1	99.07%	0.43%	0.30%	0.20%	0.00%	100%	0.93%
	MLP 2	99.08%	0.36%	0.30%	0.24%	0.01%	100%	0.92%
	MLP 3	98.69%	0.53%	0.42%	0.34%	0.02%	100%	1.31%
	MLP 4	95.52%	1.30%	0.83%	2.30%	0.05%	100%	4.48%
PGBT	MLP 6	98.50%	0.61%	0.55%	0.31%	0.03%	100%	1.50%
	MLP 7	98.25%	0.65%	0.53%	0.53%	0.03%	100%	1.75%
	MLP 8	97.90%	0.70%	0.59%	0.77%	0.04%	100%	2.10%
	MLP 9	98.07%	0.64%	0.52%	0.74%	0.04%	100%	1.93%
	MLP 10	97.17%	0.96%	0.65%	1.19%	0.04%	100%	2.83%

# SECTION 4

## NTTA SYSTEM OPERATIONS REVIEW

This section provides a review of the current operational characteristics of the Dallas North Tollway System. This review is based upon observed conditions during both the morning and evening peak travel periods.

### DALLAS NORTH TOLLWAY

The DNT currently has several areas of severe congestion in both the morning and evening periods. The ongoing construction near MLP 1 is a primary cause of congestion in the south end. Elsewhere in the facility, congestion is caused by a number of factors. The following describes some of the problem areas and offers some suggestions for potential improvements:

#### *Problem Areas*

- Due to the large TollTag penetration in the area, the two TollTag express lanes in the peak direction at MLP 3 are heavy while the cash lanes remain mostly clear.
- The southbound weaving area between the entrance from Park and exit to PGBT is heavily congested during both the morning and evening peak periods.
- The northbound weaving area between the entrance from PGBT and exit to Park is heavily congested during the evening peak period.
- The southbound direction in the morning peak period experiences heavy congestion approaching the Frankford exit, possibly due to the weaving area between PGBT and Frankford being over capacity and/or queueing at the Frankford Plaza.
- MLP 2 shows similar congestion to MLP 3 during the peak periods, due to the heavy use of the two TollTag lanes.
- South of MLP 2, the horizontal and vertical curvature of the roadway, as well as the lack of an inside shoulder, appear to reduce capacity and increase congestion.

- Due to a lack of completed cross streets and traffic signals, the DNT frontage roads north of Warren Parkway operate extremely efficiently which could potentially negatively impact mainlane traffic.
- The left turn lane on westbound US 380 at the DNT is extremely congested during the morning peak period. This could potentially drive potential DNT customers to alternate routes.

### ***Suggestions for Improvement***

- The addition of a third TollTag express lane at MLP 2 and MLP 3 would help reduce the approach congestions at those locations.
- Additional examination of the weaving area problems near the PGBT should be undertaken to determine any improvements that could be made.
- A study of possible improvements to the curvature problems north of IH 635 should be undertaken.
- Conversion to an all-electronic toll collection system could greatly improve operations throughout the facility.
- Demand is extremely high during the peak periods and could be managed through the use of congestion pricing.
- The addition of a double left turn lane on US 380 could improve access to the DNT during the morning peak period.

## **PRESIDENT GEORGE BUSH TURNPIKE**

The PGBT currently has several areas of severe congestion in both the morning and evening periods. The congestion is caused by a number of factors, and most of it occurs near the approaches to the interchanges with IH 35E, the DNT, and US 75. The following describes some of the problem areas and offers some suggestions for potential improvements:

### ***Problem Areas***

- There is heavy congestion between US 75 and IH 35E in the westbound direction in the morning peak period and the eastbound direction in the evening peak period.
- The direct connection from westbound PGBT to northbound IH 35E becomes congested in the evening peak period while the through lanes move freely, creating a potentially dangerous speed disparity.
- During congested periods, the run-by lane past the Josey exit in the eastbound direction allows for queue jumping.
- Heavy weaving and queue jumping occurs at MLP 8 due to the current configuration of the TollTag express lanes.
- Congestion on the DNT interchange extends onto the mainlanes during both the morning and evening peak periods.

- Congestion on the US 75 interchange extends onto the mainlanes during both the morning and evening peak periods.
- There is heavy weaving traffic near US 75 in both directions due to the free movements between Custer Road and Jupiter Road.

### ***Suggestions for Improvement***

- The currently planned addition of a fourth lane between IH 35E and the DNT should alleviate congestion in that area.
- Restriping at MLP 8 and MLP 6 so that all three approach lanes can access the TollTag lanes (similar to MLP 7) would eliminate much of the weaving and queue jumping that is currently occurring.
- The addition of tolls at Custer and Jupiter to eliminate the existing free movements would help reduce congestion near US 75.
- An in-depth analysis of the PGBT interchanges at US 75 and IH 35E could determine potential improvements to the performance of those facilities.
- Demand is extremely high during the peak periods and could be managed through the use of a congestion pricing toll system.

## **OTHER FACILITIES**

Both the Addison Airport Toll Tunnel and the Mountain Creek Lake Bridge operate below their respective capacities throughout the day and experience little or no congestion.

## **CONVERSION TO ALL-ETC**

In 2009, the NTTA will begin the process of converting its facilities from the current ETC/Cash toll collection system to an all-ETC system with video tolling. Under this system, all cash collection booths will be removed, and no vehicles will be required to stop or slow down to pay tolls. Gantries will replace the current mainlane and ramp plazas. When passing under a gantry, vehicles not equipped with a valid TollTag will have their license plates photographed. Using the license plate number, the vehicle owner will be billed for the transaction. Patrons utilizing the video toll system will pay the standard ETC toll rate plus an additional surcharge. This implementation of the ETC/Video is expected to improve traffic flow on all of NTTA's facilities by eliminating the delay associated with the current toll collection system.