LOUDOUN COUNTY TRANSIT
COMMUTERBUS FARE ANALYSIS

Completed for:
Loudoun County
Department of Transportation and Capital Infrastructure
Transit and Commuter Services Division

Completed by:

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ATTACHMENT 1

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1.0 Introduction

Loudoun County presently provides the following commuter transit services to county residents:

- Long Haul service from various park-and-ride lots in the county to major employment destinations such as downtown Washington, D.C., the Pentagon, Crystal City and Rosslyn
- Tysons Corner commuter service from the Leesburg and Broadlands South park-and-ride lots
- Service from the Potomac Falls area of the county to the West Falls Church Metrorail station
- Reverse commute service from the West Falls Church Metrorail station to major employers in the Loudoun County (e.g., AOL, Verizon)

WMATA is near completion of the Silver Line Metrorail project that will provide new rail service in the Dulles Corridor to Wiehle Avenue. An opening date for this new line is not yet set, but is anticipated to be in summer 2014. The County's Division of Transit and Commuter Services has prepared a transit service plan that will provide new "Metrorail Connector" services to the Silver Line.

Loudoun County Transit fares for its commuter bus services are currently set as follows:

- Long haul services - $7.00 SmarTrip / $8.00 cash
- Tysons Express - $3.00 SmarTrip / $2.50 cash
- West Falls Church and Reverse Commute - $2.00 SmarTrip/$2.50 Cash

Fares for Long Haul services were last raised in September 2008. The West Falls Church fare was last raised in 2010. Tysons Express fares were established by the Commonwealth's Megaprojects' office and was part of a congestion management relief program during construction of the Metrorail Silver Line through Tysons Corner.

The planned introduction of new Loudoun County Metro Connector service, combined with the time span since the last fare increase, has resulted in the need to complete a comprehensive review of the Loudoun County commuter bus fare structure. This study has been initiated to define and evaluate potential fare options and to establish a fare policy that can move the long haul commuter services towards being self-sustaining by 2019 when the Silver Line is anticipated to be extended to Loudoun County. A self-sustaining fare for the long haul service is a stated goal in the County's Countywide Transportation Plan.

Tasks completed during the course of this project are as follows:

- A comprehensive review of historical LC Transit ridership and farebox revenue trends;
- An assessment of factors that have the most influence on ridership trends (e.g., county population growth, gasoline prices, toll rates);
- Peer review of similar commuter type transit services and fare structures; and
- A proposed new fare structure that addresses LC Transit's cost increases since the last fare increase, encourages use of new Metrorail Connection transit service and steps Long Haul fares to a self-sustaining level by 2019, when Metrorail is to be extended.

2.0 LC Transit Ridership and Revenue Trends

In order to initiate a discussion of an appropriate policy to guide fare levels and to establish a fare level which is commensurate with the policies, it is important to understand ridership and the resulting revenue which supports the operation of the service. In this section ridership and revenue trends for the existing LC Transit services will be described which will provide the foundation for establishing analysis tools for a range of fare options.

2.1 Service Level Baseline

A baseline analysis of the LC Transit service was completed by reviewing the service levels as reported into the National Transit Database (NTD). This source is the national reporting which is required for all transit entities in the US and is compiled through the Federal Transit Administration of the US Department of Transportation (DOT).

Table 2-1 shows ridership and service trends from 2007 to 2012 in which ridership doubled from 652,347 passenger trips to over 1.3 million passenger trips during the six year time period. During that same time period the amount of service on the street in terms of peak buses and vehicle hours to accommodate the riders similarly increased.

Table 2-1
LC Transit Ridership and Service Trends

Fiscal Year	Annual Rev Bus-Hours	Annual Total Bus-Hours	Total/Rev. Ratio	Unlinked Pass Trips	Peak Buses	Riders/ Rev. Hour	Service Days
2007	26,678	46,155	1.7	652,347	27	24.45	255
2008	32,836	58,012	1.8	777,273	30	23.67	253
2009	40,427	71,359	1.8	890,011	37	22.02	253
2010	41,845	82,133	2.0	967,957	45	23.13	250
2011	46,467	99,409	2.1	1,210,542	50	26.05	254
2012	49,738	104,636	2.1	1,316,448	52	26.47	255

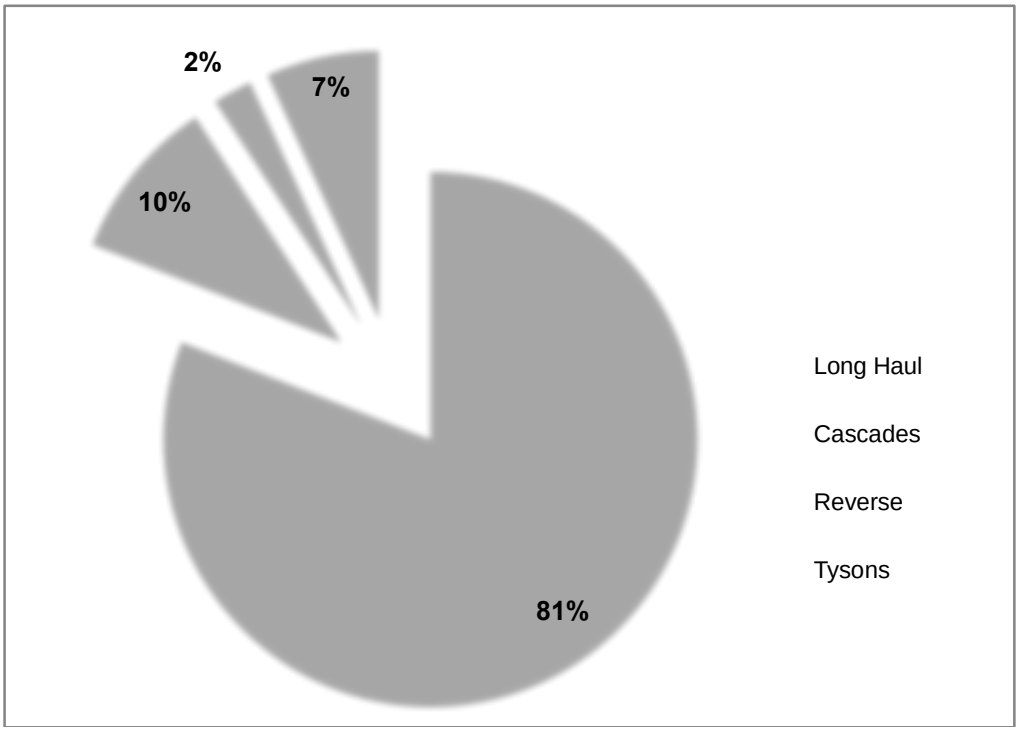
2.2 Ridership and Ridership Trends by Service Type

LC Transit operates a number of commuter routes between the County and the DC Metro area. The services include Long Haul bus services between Loudoun County and the District and Arlington, the Pentagon and Rosslyn, and services that connect West Falls Church to Cascades, and a relatively new service - the Tyson's Express. There is also reverse direction service which provides reserve commute connections using existing resources.

While ridership on LC Transit Commuter Services has increased dramatically over the past six years, performance on a service by service basis varies. Understanding the performance of the individual components of the service is important in establishing a firm foundation for fare and revenue considerations.

In 2013, ridership by type of service shows that the majority of ridership, over 80%, on LC Transit is associated with the Long Haul bus service, as shown in Figure 2-1.

Figure 2-1
FY 2013 Ridership by Service Type



This is a continuation of the trend established over the past seven years in which close to 80% of ridership on an annual basis is generated on the Long Haul service to the District, as shown in Figure 2-2.

From a long-term perspective, annual changes in ridership reflect a 13% increase in the Long Haul service, a 4.4% increase in Cascades/West Falls Church, and a 5.6% decline in ridership on the Reverse Commute. Service to Tyson's, which was started in FY 2011 has an average annual increase of 18.8% in ridership since its inception. Table 2-2 presents specific ridership figures and annual growth rates by type of service.

Figure 2-2
LC Transit Annual Ridership Trends by Type of Service

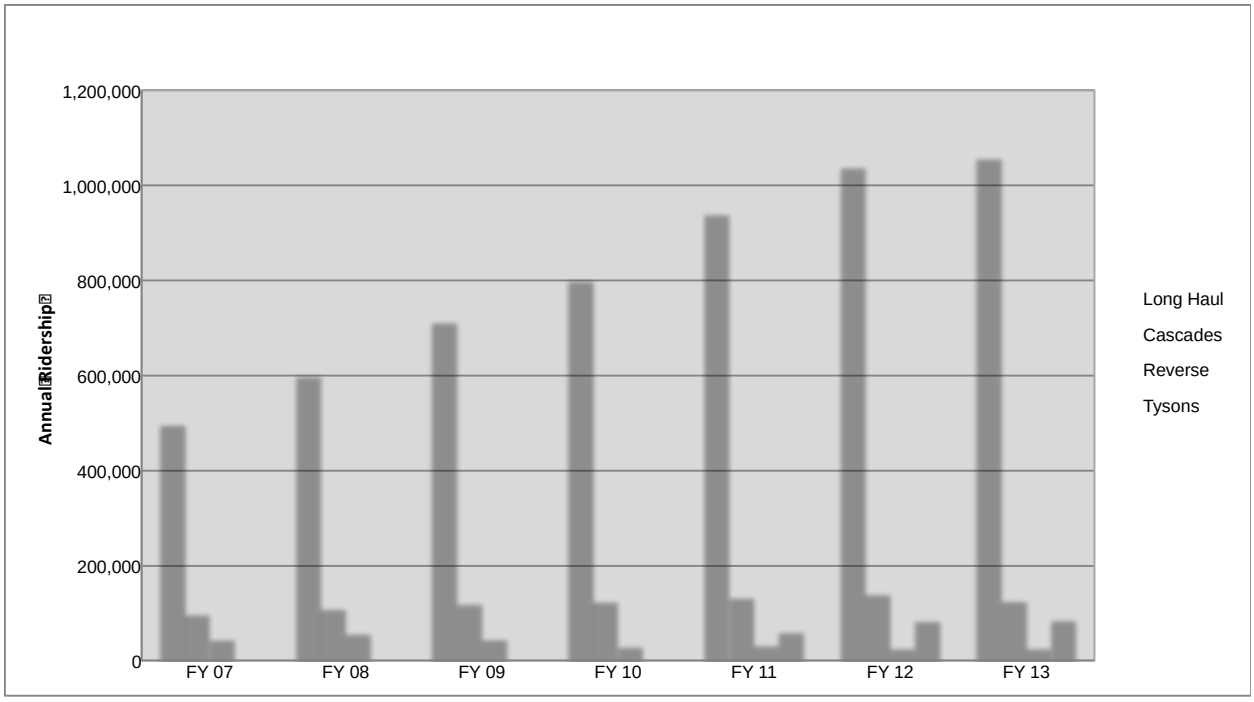


Table 2-2
LC Transit Annual Ridership and Growth Rates by Type of Service

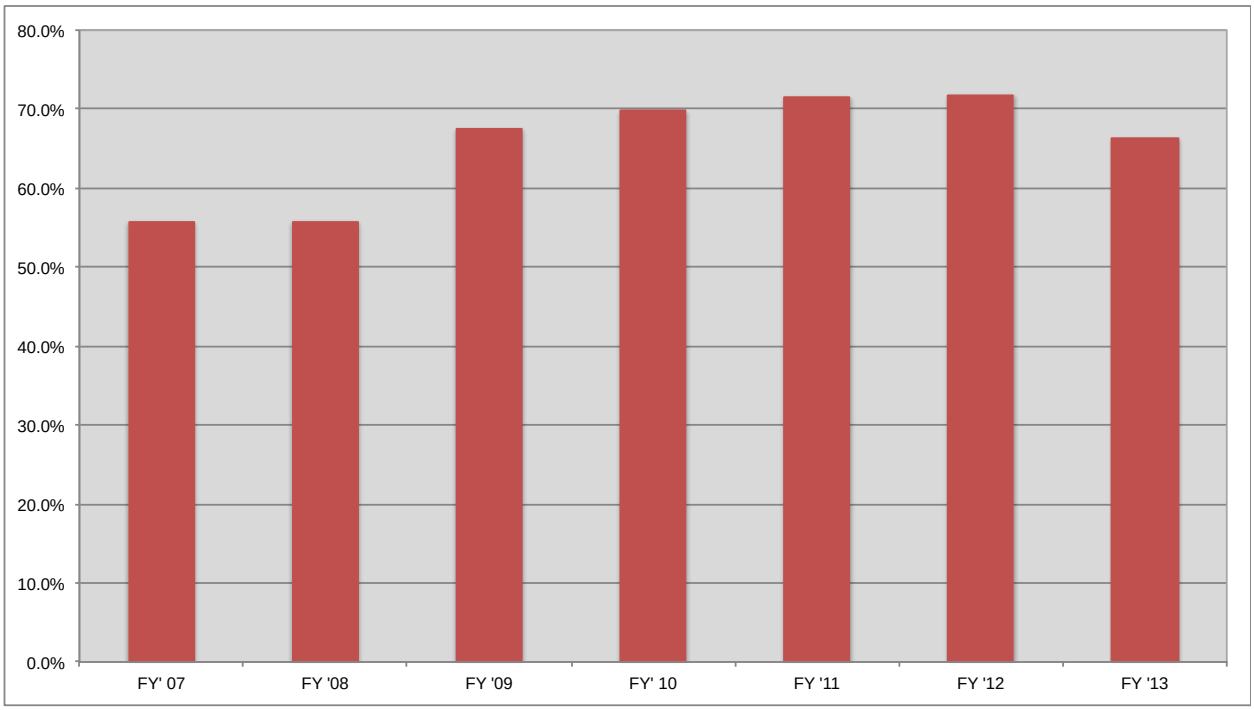
Fiscal Year	Long Haul	Annual % Change	Cascades-WFC	Annual % Change	WFC Reverse	Annual % Change	Tysons Express	Annual % Change	TOTAL RIDERS
FY 07	501,390		101,600		49,357		n/a		652,347
FY 08	602,781	20.2%	113,131	11.3%	61,361	24.3%	n/a	n/a	777,273
FY 09	716,689	18.9%	123,497	9.2%	49,825	-18.8%	n/a	n/a	890,011
FY 10	804,223	12.2%	128,258	3.9%	34,343	-31.1%	n/a	n/a	966,824
FY 11	944,684	17.5%	136,414	6.4%	37,319	8.7%	64,641	n/a	1,183,058
FY 12	1,042,368	10.3%	143,558	5.2%	31,087	-16.7%	87,844	35.9%	1,304,857
FY 13	1,061,200	1.8%	129,588	-9.7%	31,172	0.3%	89,348	1.7%	1,311,308
Average Annual Change		**13.5%**		**4.4%**		**-5.6%**		**18.8%**	**16.8%**

2.3 System Farebox Revenue

Revenues generated by the farebox are equally important, for these revenues help support the service. A solid understanding of these revenues is needed prior to establishing fare policy and fare levels.

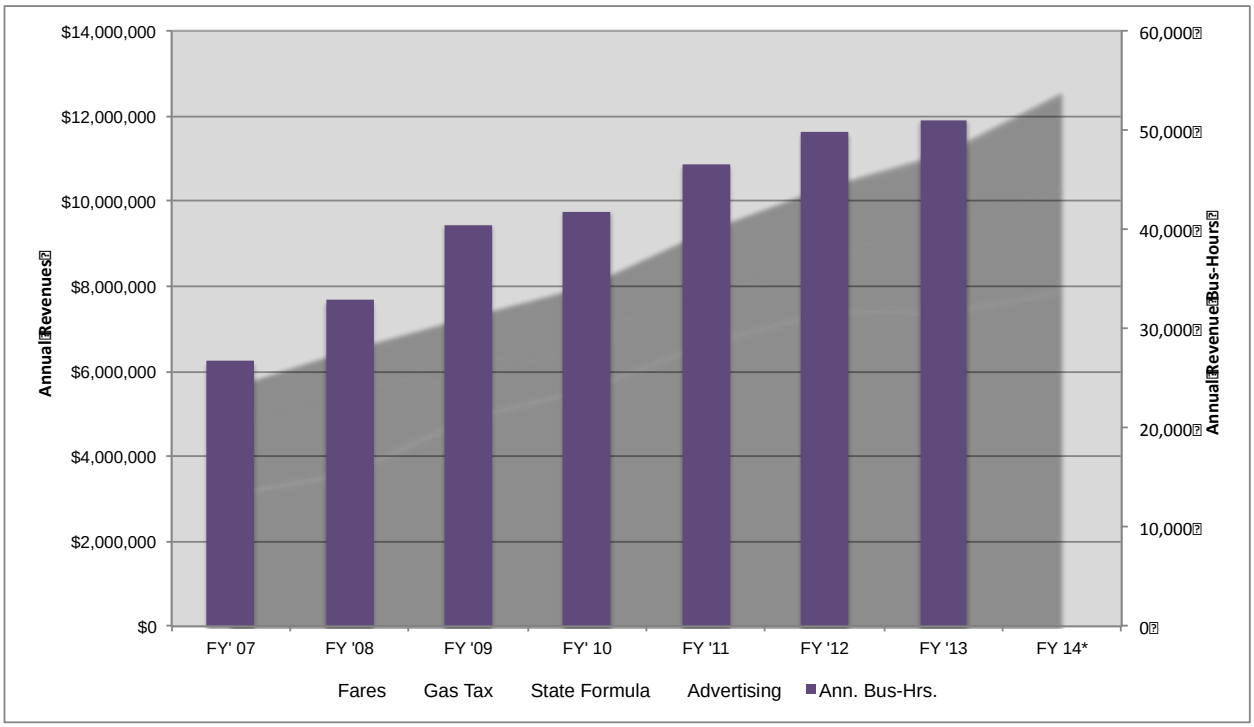
Over the past five years, LC Transit has generated between 66 and 72 percent of its operating revenue from the farebox to help fund its current operations, as shown in Figure 2-3. As the fare discussion develops in this process, maintaining and improving these revenue levels will continue to be an important consideration. From a policy perspective, one of the Loudoun County goals has been to move the Long Haul portion of LC Transit service towards a self-sustaining operation from a financial perspective (after consideration of state operating assistance).

Figure 2-3
Farebox Revenues, as a Percentage of Total Operating Costs



While it is important to note that the farebox recovery has generally been between 60 and 70% of the service revenue, state transit revenue has also been increasing. Estimated state funding levels in FY 2014 are 23 percent higher than in FY 2013. Gas tax funds from the County, as a percentage of funding LC Transit operations, have been decreasing from a high of 29 percent in 2007, to an anticipated 19 percent in 2014. Figure 2-4 illustrates LC Transit revenue source trends and overall LC Transit revenue bus-hours. LC Transit revenue bus-hours have tracked very closely with operating costs and revenue sources, thus reflecting a fairly stable operating cost for every bus-hour that a bus is in service.

Figure 2-4
LC Transit Revenues by Funding Source, Compared to Annual Revenue Bus-Hours



3.0 Characteristics that Influence Ridership

As noted in the prior section of this report, LC Transit has experienced tremendous ridership growth, particularly the Long Haul services. Before defining and evaluating potential new fare scenarios, it is necessary to understand the characteristics that most influence transit ridership. Specifically, various demographic, economic and service level characteristics have been reviewed to determine the characteristics that have impacted LC Transit ridership the past several years.

3.1 Consideration of Various Characteristics

Potential influencing factors that have been considered in this analysis are as follows:

- Population Growth
- Traffic Volumes
- Gasoline Prices
- Transit Service Levels
- External Factors
- Toll Road Costs

Following is a brief description of each factor and findings regarding that factor's correlation with LC Transit ridership.

Population Growth

Annual Loudoun County population estimates were obtained from the Loudoun County Planning Department for FY 2007 through FY 2013. This was compared to LC Transit ridership growth for the same period. Figure 3-1 provides a comparison of annual population growth (shown in red) to monthly LC Transit ridership (shown in blue). Loudoun County population has grown 13 percent from 2007 to 2013. However, LC transit ridership has grown by 101 percent over this same time period. Population is certainly a contributing factor to LC Transit ridership, but as Figure 3-1 illustrates, LC Transit ridership growth has significantly outpaced population growth, and thus does not exhibit a strong correlation.

Traffic Volumes

Average annual weekday traffic volumes for the Dulles Toll Road were collected from Virginia Department of Transportation publications for 2006 through 2012. This was compared to LC Transit ridership growth for the same period. Figure 3-2 provides a comparison of Dulles Toll Road traffic growth (shown in red) to monthly LC Transit ridership (shown in blue). Dulles Toll Road traffic has grown by 23%. However, LC transit ridership has grown by 100 percent over this same time period. As Figure 3-2 illustrates, LC Transit ridership growth has significantly outpaced Dulles Toll Road traffic growth, and thus does not exhibit a strong correlation.

Figure 3-1
Loudoun County Population vs. LC Transit Ridership

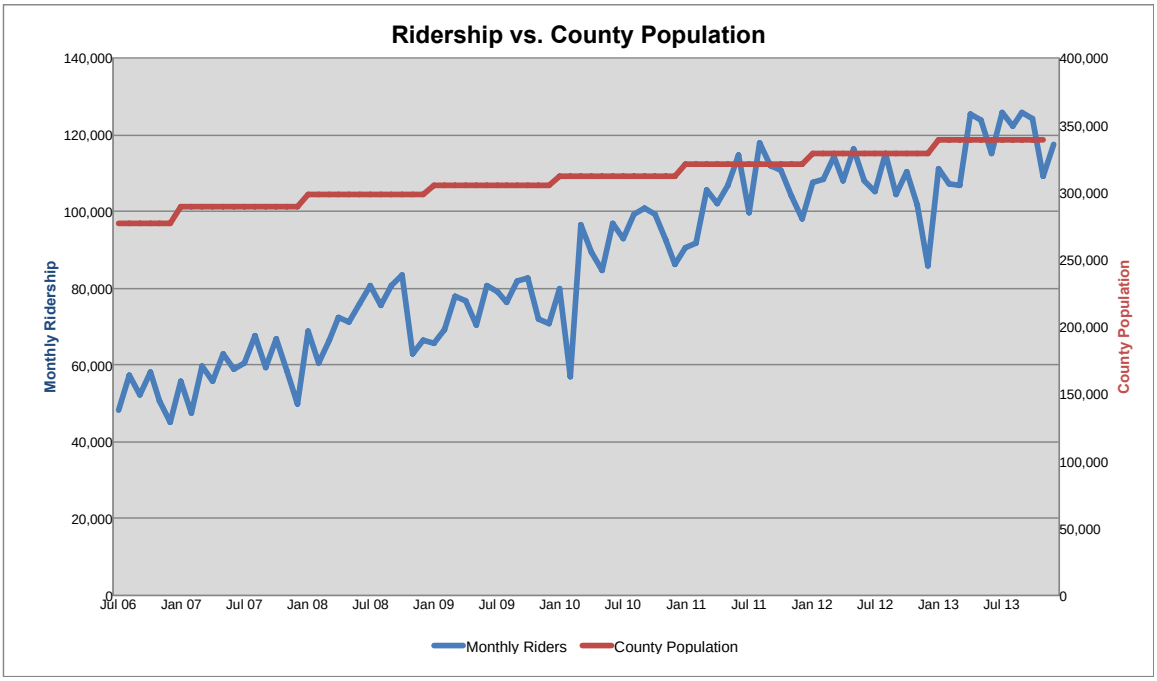
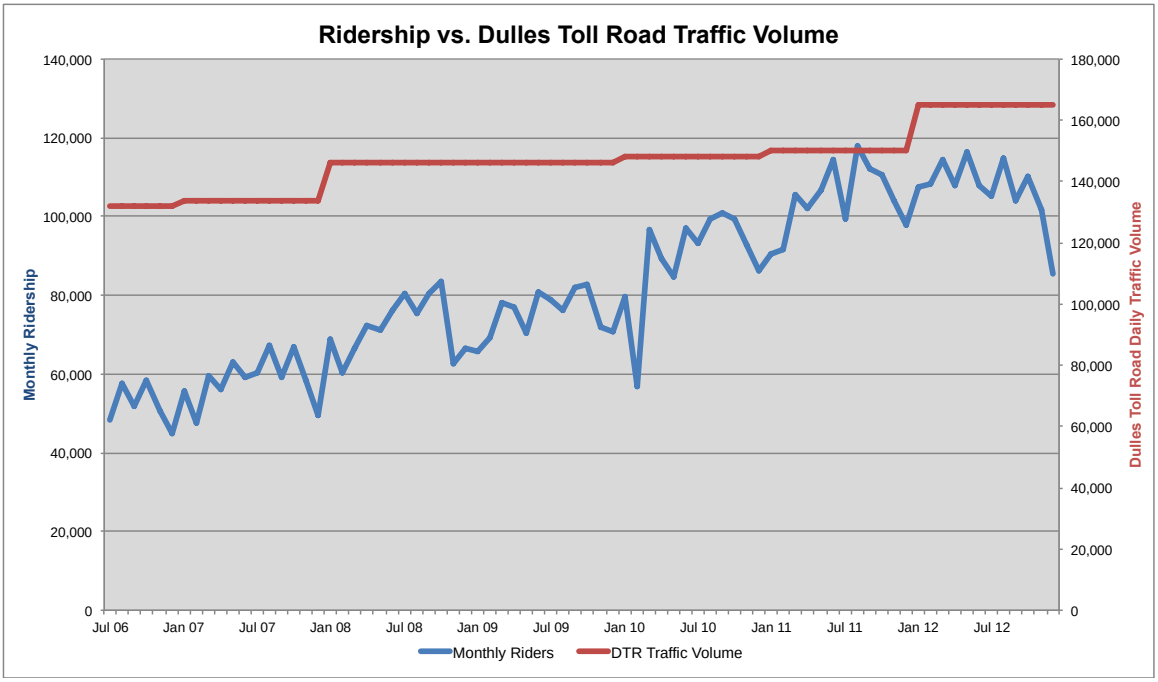


Figure 3-2
Dulles Toll Road Traffic Growth vs. LC Transit Ridership



External Events and Occurrences

Ridership can also be influenced by events that are not transportation or demographic related. LC Transit ridership trends from FY 2007 through FY 2013 was graphed and compared to the following specific events that occurred during this time period:

- September 2008 – Increase in Long Haul Fares from $6.00 to $7.00 (SmarTrip Fare)
- March 2009 – Commuter Tax Benefit Increased from $120 to $230/month
- February 2010 – "Snowmaggedon" (major snow storm)
- January 2012 – Commuter Tax Benefit temporarily cut
- October 2013 – Partial Government Shutdown

Figure 3-3 illustrates the time period of these events, compared to LC Transit monthly ridership. Findings were as follows:

- The September 2008 fare increase had no adverse impact on ridership. October ridership (after the fare increase) was 11 percent higher than August 2008 ridership (before the fare increase). October 2008 ridership was also 25 percent higher than October 2007 ridership.
- LC Transit ridership grew by 24 percent in the year following the March 2009 increase in the commuter tax benefit. However, annual ridership had increased 17 percent prior to the commuter tax benefit. Thus, ridership had been growing before the tax benefit increase, and that growth accelerated after the tax benefit change.
- Ridership did take a significant hit in February 2010 during Snowmaggedon (service was cancelled for several days). But, ridership rebounded significantly the following month.
- The temporary cut in the commuter tax benefit in 2012 had no adverse impact in LC Transit ridership. Ridership was still 19 percent higher than the prior year.
- The October 2013 partial government shutdown resulted in a slight drop in ridership from the prior month. However, October 2013 ridership was still 12 percent higher than October 2012.

Gasoline Prices

Average monthly gasoline prices (price per gallon) were collected from the US Energy Information Administration for FY 2007 through FY 2013. This was compared to LC Transit ridership growth for the same period. Figure 3-4 provides a comparison of gasoline prices (shown in red) to monthly LC Transit ridership (shown in blue). A comparison from 2007 to 2013 does not show a strong correlation (36% growth in gasoline prices vs. 101% growth in ridership. However, as shown in Figure 3-4, gasoline prices decreased significantly in 2008. There is a much stronger correlation when comparing from 2010 to 2013 (38% increase in gasoline prices vs. 35% increase in LC Transit ridership).

Figure 3-3
Dulles Toll Road Traffic Growth vs. LC Transit Ridership

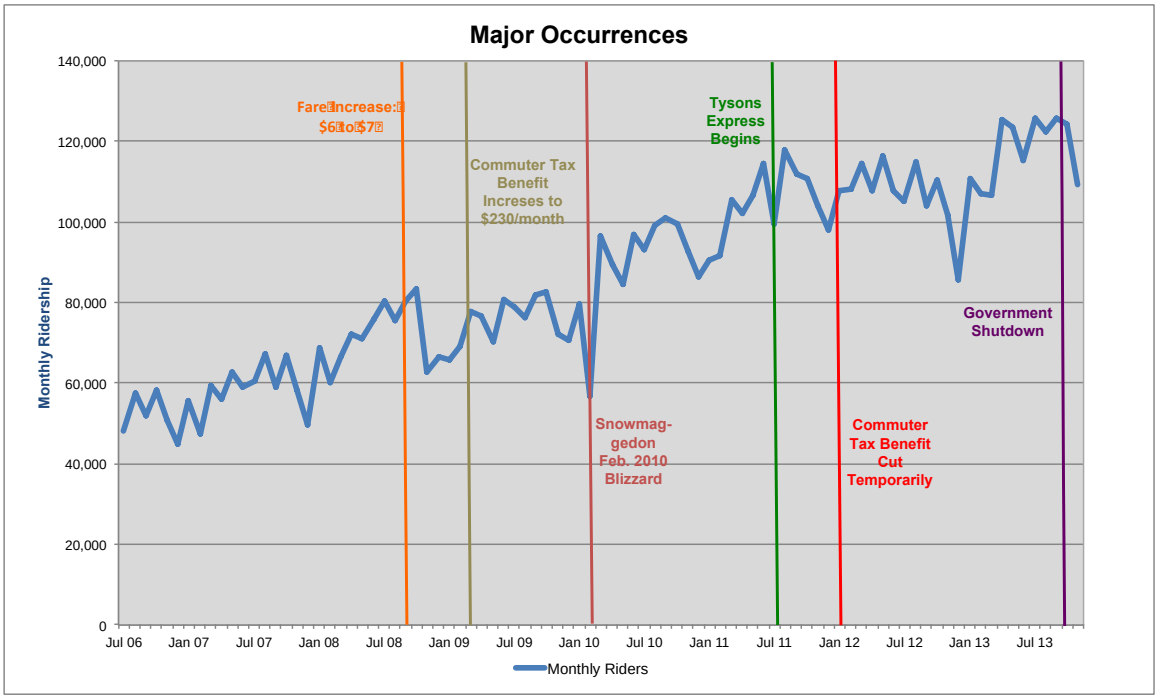
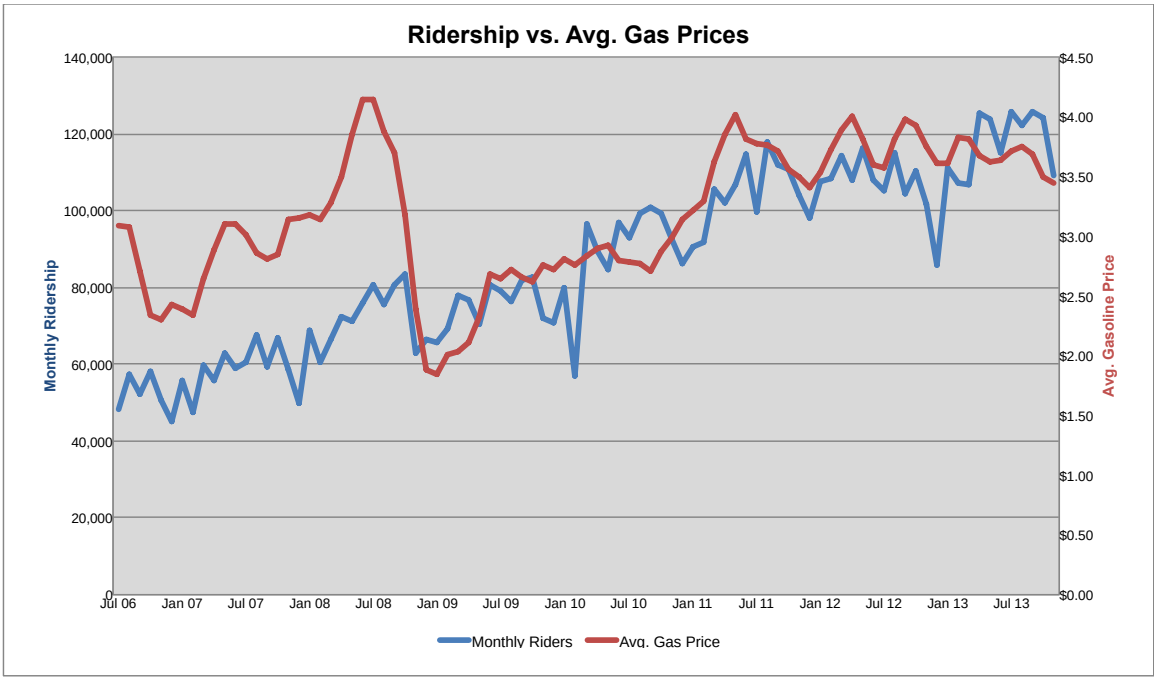


Figure 3-4
Monthly Average Gasoline Price vs. LC Transit Ridership



Tolls Road Costs

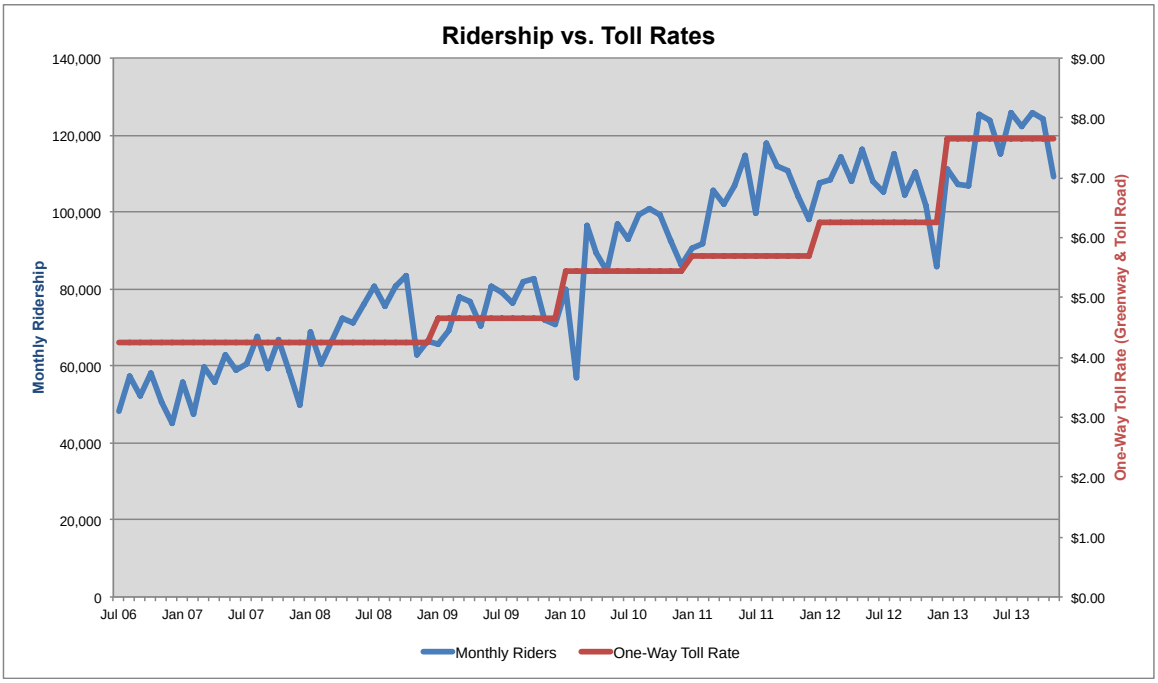
Loudoun County residents that commute to the central area of the Washington, D.C. metropolitan area incur tolls on the Dulles Toll Road and/or the Dulles Greenway. Residents in the Cascades area would incur tolls on just the Dulles Toll Road while residents in the Leesburg area incur tolls on both toll road facilities. Toll rates have increased significantly on both toll road facilities over the past several years. Table 3-1 shows total tolls a commuter from Leesburg (and Western Loudoun County) pay when using the Greenway and Toll Road.

Table 3-1
Dulles Greenway and Toll Road Costs

Year	Toll Road Plaza	Toll Road Ramps	Dulles Greenway	Total One-Way Tolls
2007	$0.75	$0.50	$3.00	$4.25
2008	$0.75	$0.50	$3.00	$4.25
2009	$0.75	$0.50	$3.40	$4.65
2010	$1.00	$0.75	$3.70	$5.45
2011	$1.25	$0.75	$3.70	$5.70
2012	$1.50	$0.75	$4.00	$6.25
2013	$1.75	$1.00	$4.90	$7.65
2014	$2.50	$1.00	$4.90	$8.40

Daily toll road costs for a one-way trip from FY 2007 through FY 2013 were compared to LC transit ridership growth for the same period. Figure 3-5 presents this comparison, with toll road costs shown in red and monthly LC Transit ridership shown in blue. There is a strong correlation between 2007 and 2013 (80% growth in toll road cots vs. 101% growth in ridership). The correlation is even stronger when comparing from 2009 to 2013 (65% growth in toll road costs vs. 57% growth in ridership).

Figure 3-5
One-Way Toll Road Costs vs. LC Transit Ridership



Transit Service Levels

Ridership can also be influenced by the level of transit service that is provided. Figure 3-6 presents a comparison of annual revenue bus-hours for LC Transit compared to monthly LC Transit ridership. From FY 2007 to FY 2012, revenue bus hours have grown 86% while ridership has grown 100%. Thus, the rate of growth is somewhat similar. As an additional check, passengers per revenue-hour were calculated and compared to monthly ridership. The average number of passenger trips per revenue hour has remained fairly constant, with an average of 24.5 passengers per hour in 2007, and 26.5 passengers per hour in 2012. This indicates that LC Transit has been growing service at a level that has kept up with demand, but has not exceeded demand.

Figure 3-6
Annual Revenue Bus-Hours vs. LC Transit Ridership

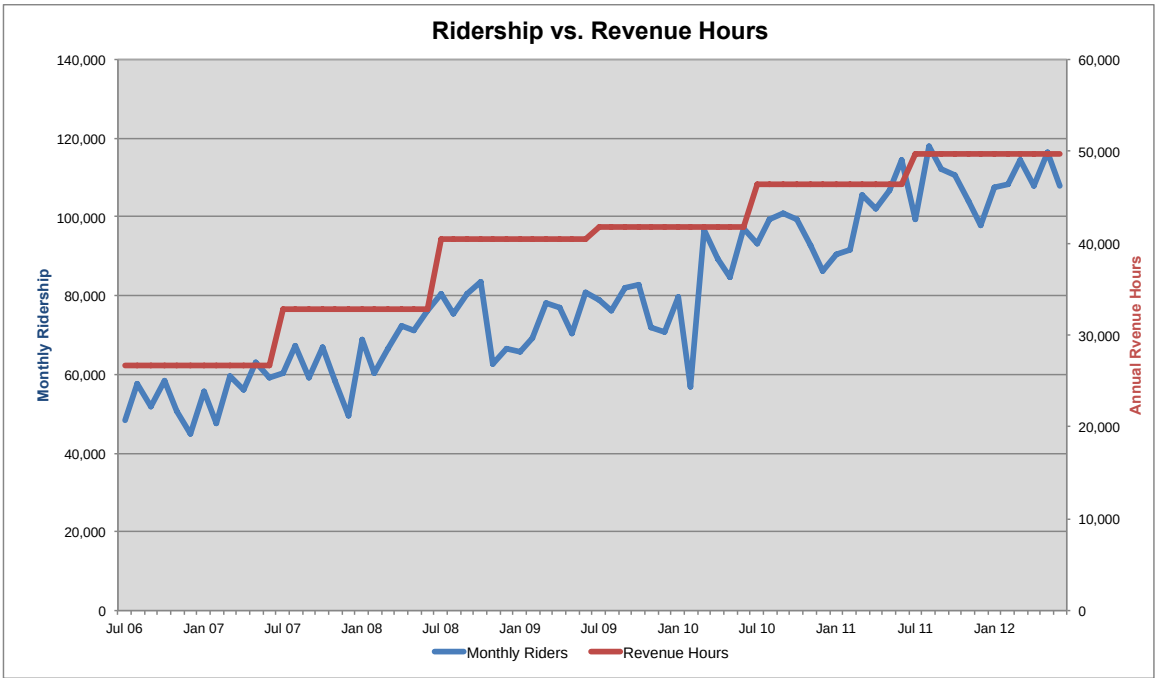
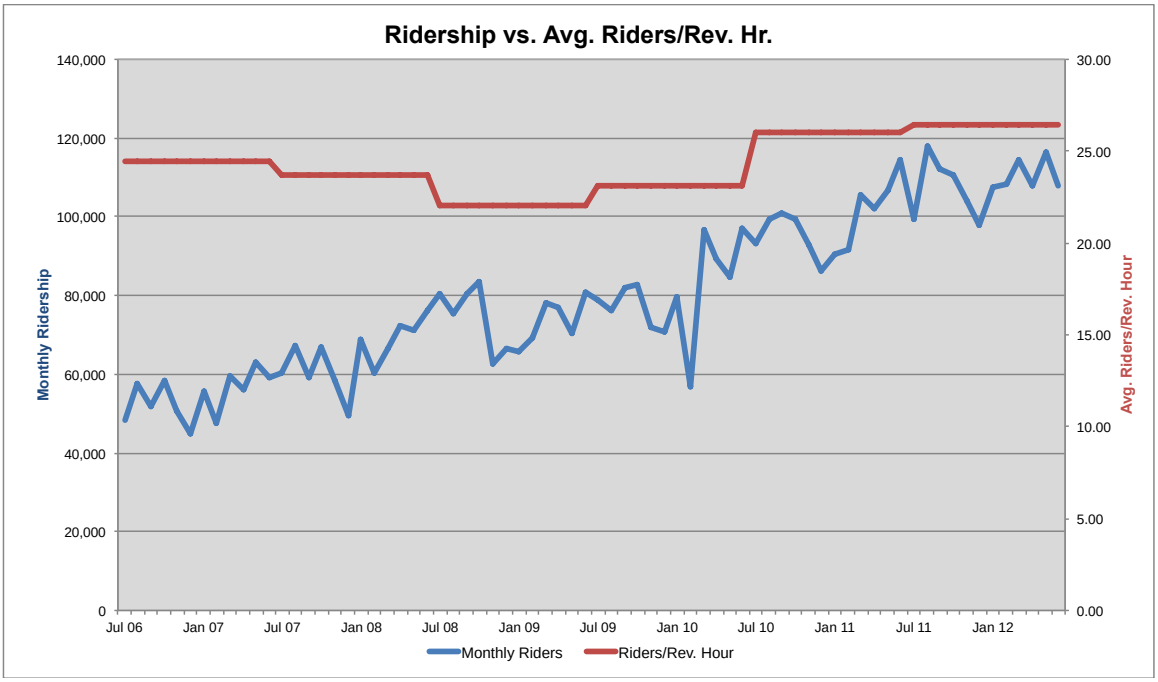


Figure 3-8
Average Riders per Revenue Bus-Hour vs. LC Transit Ridership



3.2 Influencing Characteristics

The analysis presented in this section indicates that LC Transit ridership correlates most closely with changes in gasoline costs and toll rates. As the cost of driving has increased (gasoline and tolls), LC Transit ridership has increased at a similar rate. Other factors, such as population growth and Dulles Toll Road traffic volume growth, undoubtedly contribute to transit ridership growth, but are not primary drivers. Other events, such as the September 2008 fare increase, changes in the federal tax benefit and the partial government shutdown have not adversely affected LC Transit ridership. A review of LC Transit trends in service hours indicates that service has kept pace, but has not exceeded ridership growth.

The idea that transit ridership is most significantly affected by the cost of driving was explored further by comparing historical commute costs for the three types of services offered by LC Transit – Long Haul, Cascades to West Falls Church, and reverse commute. Data and assumptions used in this analysis were as follows.

Long Haul Service to D.C.

Costs were compared for going from Leesburg to downtown Washington, D.C. The cost of transit is simply the Long Haul fare on LC Transit. The cost of driving consists of tolls, fuel and parking. Toll rates were determined from 2007 to 2013 and include tolls on the Greenway and the Dulles Toll Road. Fuel costs are based on the distance from Leesburg to downtown Washington, D.C., average gasoline prices for each year, and average automobile fuel consumption rates (miles per gallon), which was obtained from Automotive News. Downtown Washington, D.C. parking costs were assumed to be approximately $250 per month in 2013, and were deflated by 2.5% per year to 2007. It is important to note that the cost of driving includes auto insurance and auto maintenance costs. These cost items were not taken into account in this analysis, for these items are typically not specifically considered by the commuter when considering the use of transit.

Results from this analysis found that the cost of using transit from Leesburg ranges from 37.4% (2013) to 51.9% (2009 when fuel costs were at its lowest point for the past several years). Figure 3-9 compares the cost of transit as a percentage of driving costs, to LC Transit Long Haul ridership. As clearly shown in this figure, since 2009, LC Transit Long Haul ridership has increased as the cost of transit has decreased (when compared to the cost of driving). There is a strong inverse relationship.

Cascades to West Falls Church Service

Costs were compared for going from the Cascades area to downtown Rosslyn, since many riders of this service are going to places other than downtown Washington, D.C. The cost of transit is the LC Transit fare to travel to and from West Falls Church ($2.00 with SmarTrip), and the Metrorail fare from West Falls Church to the Rosslyn station. The cost of driving includes tolls, fuel and parking. Toll rates were determined from 2007 to 2013 and include tolls on only the Dulles Toll Road. Fuel costs were calculated in the same manner described for Long Haul service. Parking costs were assumed to be approximately $150 per month in the Rosslyn area, and were deflated by 2.5 percent per year to 2007.

Results from this analysis found that the cost of using transit from Cascades to Rosslyn ranges from 47.2% (2011) to 58.6% (2009). Figure 3-10 compares the cost of transit as a percentage

of driving costs, to LC Transit West Falls Church ridership. As shown in this figure, there is no where near the strong inverse relationship seen in Figure 3-9 for Long Haul services. Ridership increased slightly to 2011, and then has decreased, while the cost of transit when compared to driving has stayed in the 45 to 55% range.

Reverse Commute Service

Costs were compared for going from the Rosslyn Metrorail station to Verizon in Loudoun County. The cost of transit is the Metrorail fare from Rosslyn to West Falls Church station and the LC Transit reverse commute fare ($2.00 with SmarTrip). The cost of driving includes tolls (Dulles Toll Road only) and fuel.

Results from this analysis found that the cost of using transit from Rosslyn to Loudoun County ranges from 72.6% (2011) to over 100% (2009). This percentage is much higher than the percentage calculated for the other percentages because of the lack of parking costs. Figure 3-11 compares these results to LC Transit reverse commute ridership. As shown in this figure, there is no strong correlation. The cost of using transit, when compared to driving has decreased since 2009. However, ridership has also decreased.

Tysons Express Service

Finally, a similar comparison was made for Tysons Express service. There is only three years of data, but as shown in Figure 3-12, the cost of using transit was calculated to range from 281% (2013) to 36.8% (2011). The three years of data suggests a similar inverse relationship that was seen with Long Haul service. As the cost of using transit has decreased (compared to driving), ridership has increased.

Figure 3-9
Long Haul Ridership vs. Cost of Using Transit (as % of Auto Cost)

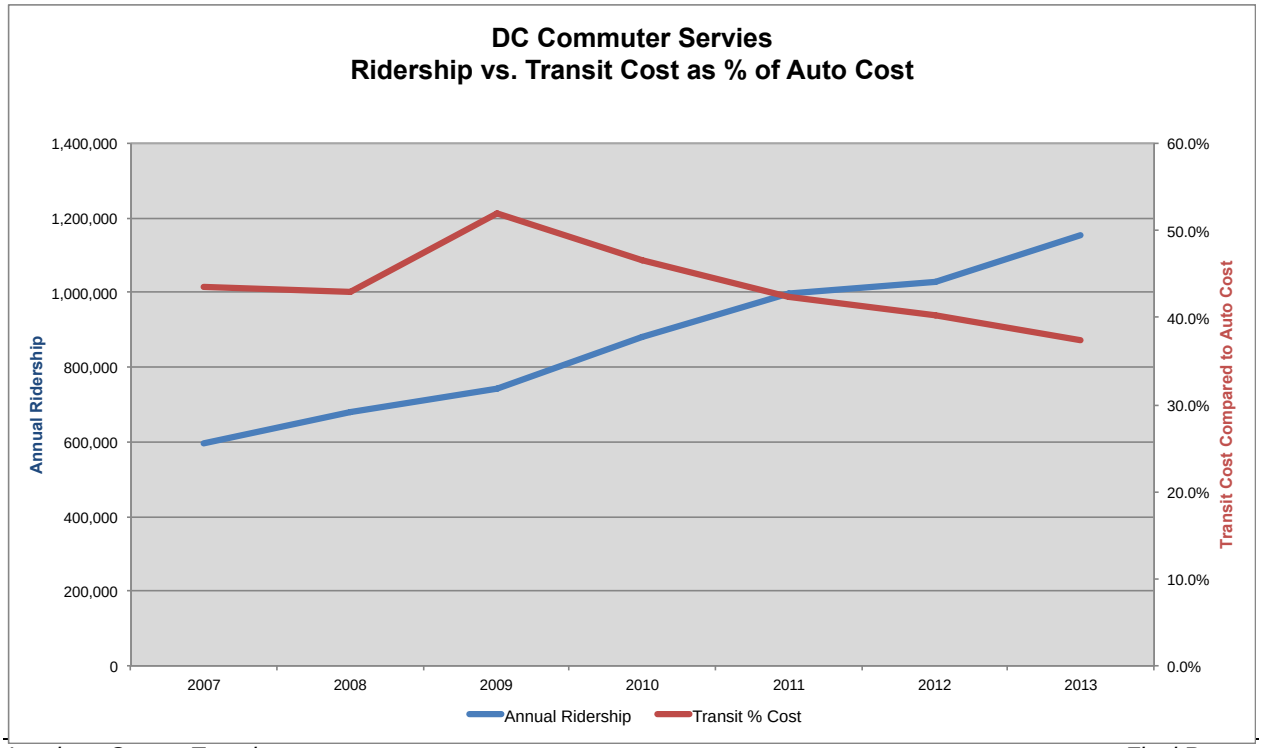


Figure 3-10
Cascades-WFC Ridership vs. Cost of Using Transit (as % of Auto Cost)

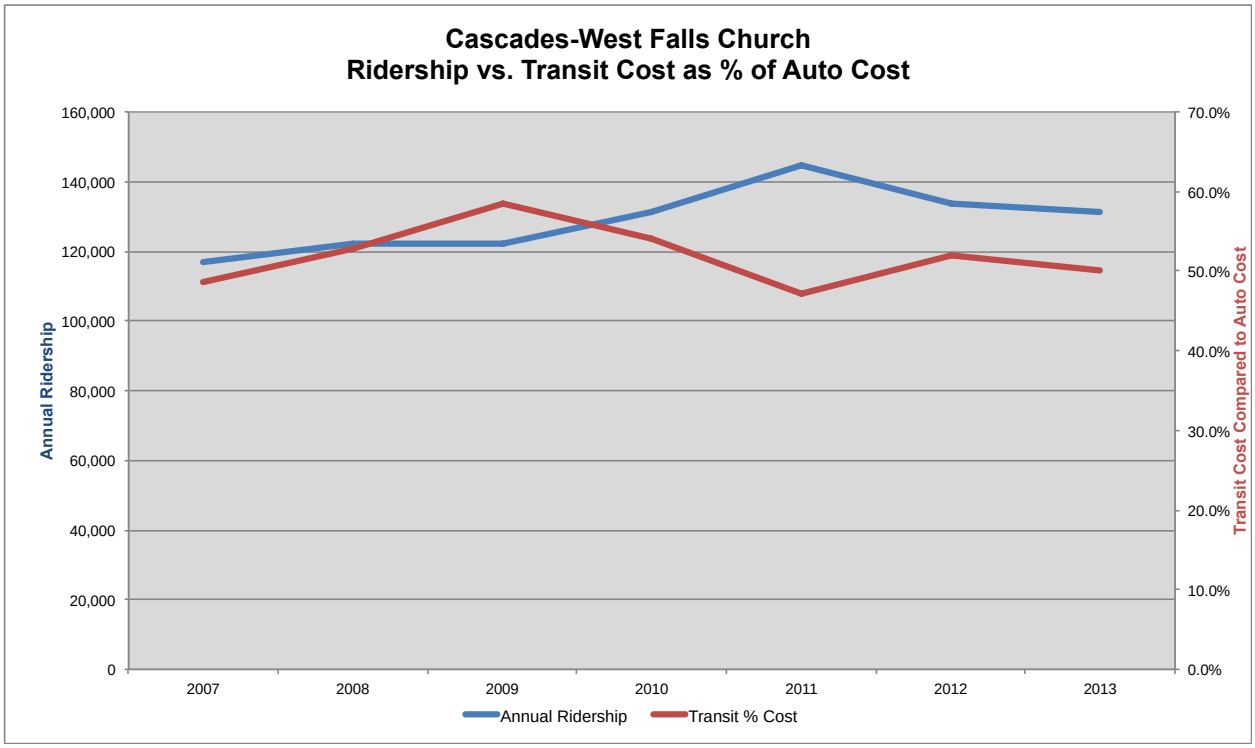


Figure 3-11
Reverse Commute Ridership vs. Cost of Using Transit (as % of Auto Cost)

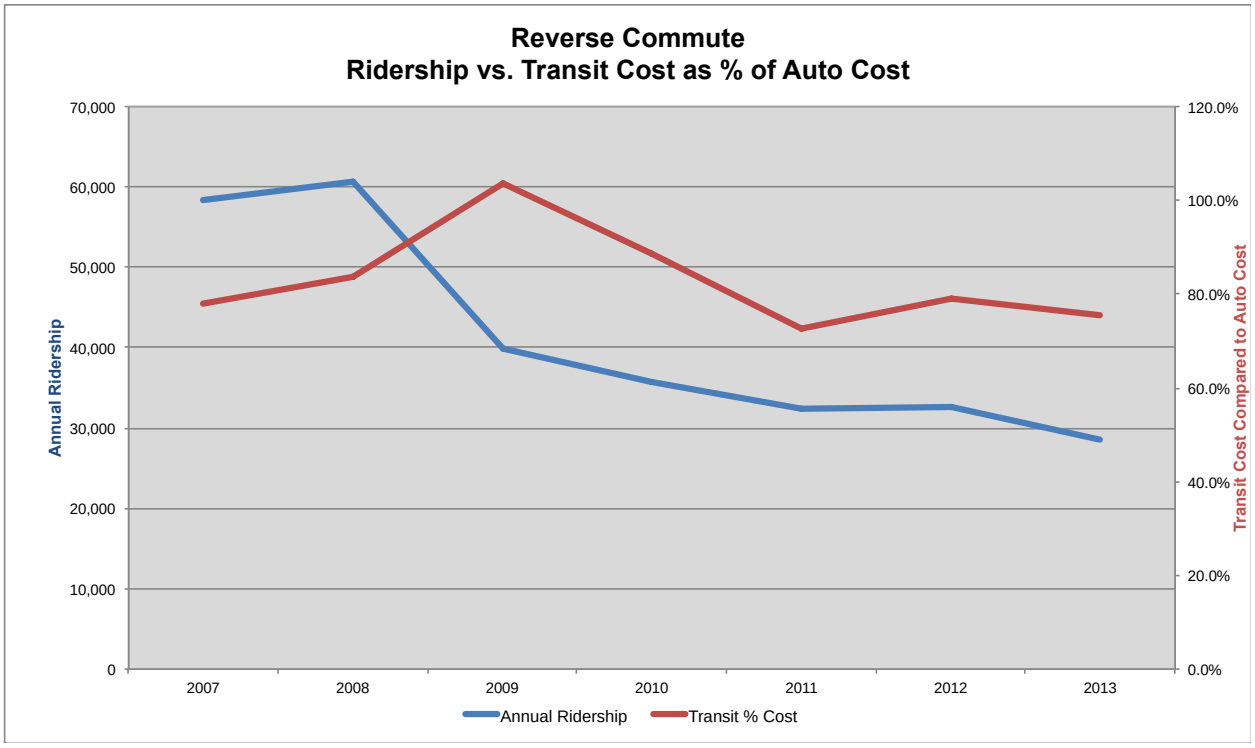
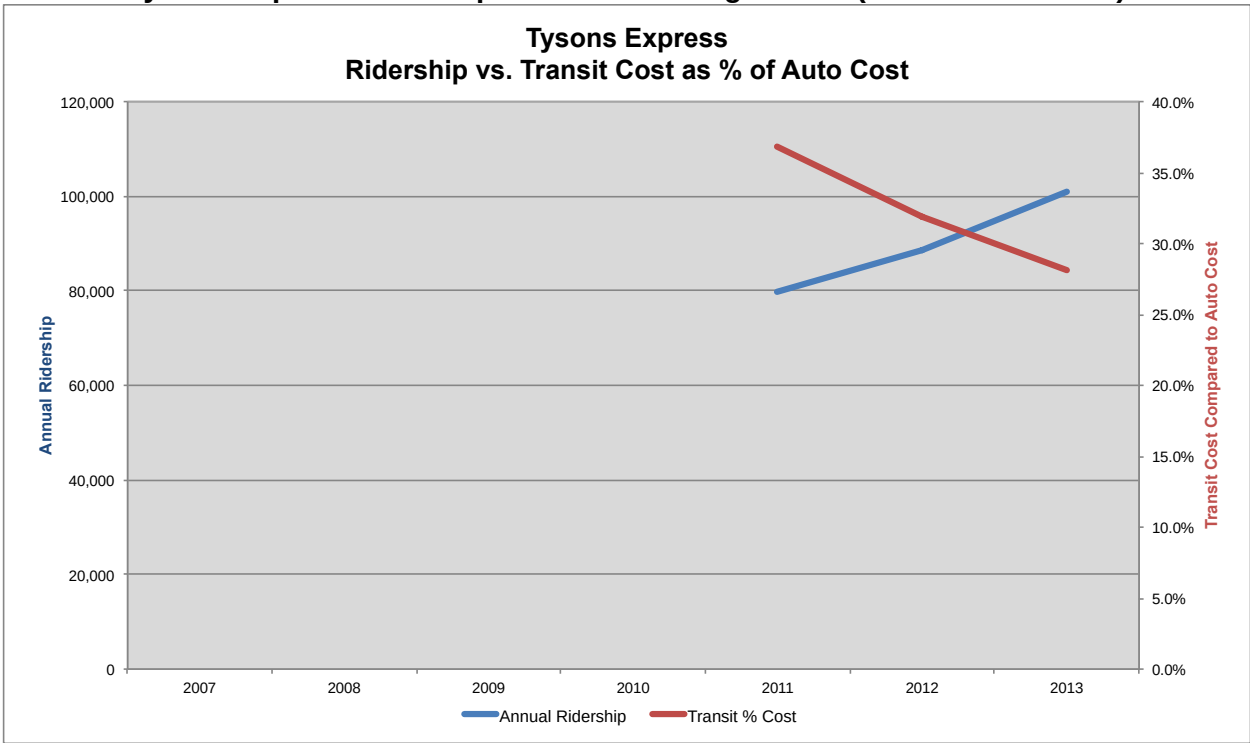


Figure 3-12
Tysons Express Ridership vs. Cost of Using Transit (as % of Auto Cost)



4.0 Fare Policy Framework and Proposed Fare Scenario

From a policy perspective, agencies establish fares to achieve specific goals such as to increase ridership, to garner revenue to support the operation of the service or to influence in some way rider behavior or use of the system. In reviewing commuter bus service trends nationally in the NTD, it is noted that the average farebox recovery is 55.5% with average passengers per revenue hour at approximately 20.

LC Transit is essentially established to serve the commuter market between the County and the DC Metropolitan region, from downtown to the suburban areas that are the primary work destinations for residents of Loudoun County. Loudoun County compares favorably with national trends for commuter services both in ridership (LC Transit passengers per revenue bus-hour is at 24), and in farebox recovery (LC Transit farebox recovery ratio in recent years has fluctuated between 66 and 72%). Thus, policies that are established for fares should be in support of the current practices.

4.1 National Perspectives

A significant amount of research has been conducted nationally regarding fares and passenger response to fare system changes. A number of these research studies have been reviewed in order to obtain a range of estimates of fare elasticities to measure potential ridership response to proposed fare system changes. Elasticity is defined as the measurement of the riders' willingness to ride more if fares are lowered, or less if fares are increased.

An early effort at estimating elasticities was the Simpson-Curtin rule, which suggested an elasticity of -0.30, meaning that every 10 percent increase in fares would result in a 3 percent decrease in ridership.

Report 95 of the Transit Cooperative Research Program (TCRP) includes an extensive discussion of fare elasticities in Chapter 12, "Transit Pricing and Fares." The report compared measured elasticities across a variety of cities, modes, and operating hours. That report noted that bus riders are generally found to be more sensitive to price than rail riders. Peak or commuter riders are less price sensitive than non peak riders. The report also noted that in large metropolitan areas with growing populations, where ridership increases are consistent with the population increases, the elasticities are typically lower. In addition, where there are multiple alternatives for commuting purposes to the single occupant vehicle, e.g. both bus and commuter rail, the trend is that these alternatives have higher elasticities.

"*Transit Price Elasticities and Cross-Elasticities*", a research report completed for the Victoria Transport Policy Institute in May of 2012 by Todd Litman reviewed a number of recent analyses of fare elasticities. These include experiences of agencies both in the US and in other countries. The report noted that elasticity values tend to be lower in larger metro areas, and during peak hours, and in other situations that reduce the number of alternatives to single occupant auto travel.

Recent work through APTA indicates a national average elasticity range of -0.18 in large metropolitan /urban areas to -0.26 in small urban areas related to fare increases.

Other factors that significantly impact transit ridership are things outside the control of transit agencies. These include toll road fees, fuel prices, traffic congestion, and the availability of parking, each of which are tracking with the research and findings in Loudoun County as noted in the previous chapter of this report.

Because every transit agency serves a unique market, its' ridership will respond differently to pricing changes. Elasticities vary according to a variety of factors, such as rider income, transit dependency, time of day (peak vs. off-peak), system routing, spread and span of service, as well as many factors which are also not in the control of transit agencies, such as local and regional economic conditions.

Other factors seem to have a more significant impact on ridership changes for Loudoun County such as the availability of parking at specified park and ride locations as well as the availability of appropriate capacity (matching demand with supply) for the transit services.

Measuring elasticity can be a complex process requiring extensive rider surveys. Furthermore, because many other factors besides fare pricing impact transit ridership, it can be difficult to directly measure the impact of a fare increase. For these reasons, general estimates of elasticity can be derived and used with some predictability from available research on the experiences of other U.S. transit agencies.

Estimates generally considered for purposes of this analysis will be generally lower for the long haul services at -0.10%, with higher elasticities -0.20 assigned for the Wiehle and West Falls Church metro connection services and -0.3 for the reverse commute service.

4.2 Peer Review

A number of peer commuter services were reviewed as part of this research. In identifying peers, research included looking at other services in the DC metro area as well as a number of commuter bus services in California.

In the DC area other commuter services include the PRTC, and the Maryland MTA. While the fare policy for Loudoun County should be established to meet goals set by the County, it is relevant to have familiarity with peer services and fare levels for comparison purposes. As an example, the following table shows one way fares for services to Tysons Corner for both PRTC and for LC Transit.

Table 4-1
Comparison of LC Transit and PRTC Fares to Tysons Corner

Fare Category	LC Transit Tysons	PRTC Tysons
One-Way SmarTrip Fare	$3.00	$2.90
One-Way Cash Fare	$3.50	$3.60

Both PRTC and the Maryland MTA provide a number of commuter-oriented services to the DC Metro area, both commuter services and services that connect to Metrorail. MTA commuter service fares vary depending on the zone of the trip origination. MTA also offers discounted ten trip and monthly passes. PRTC OmniRide fares are similar to LC Transit in that there is a cash fare and a SmarTrip fare.

MTA fares to Metrorail stations vary from $3.50 to $5.00 depending on the zone. Ride-On (Montgomery County Transit) also provides service to Metrorail stations with a SmarTrip fare that ranges from $3.15 to $3.65 (depending on if there is a transfer). PRTC "MetroDirect" fares are $2.90. Tables 4-2 and 4-3 present a comparison of fares for D.C. Commuter services and Metrorail connection services for area transit service providers.

Table 4-2
Comparison of Fares for Commuter Services

Fare Category	LC Transit D.C. Service	PRTC OmniRide	MTA Zone 3	MTA Zone 5
SmarTrip	$7.00	$5.75	n/a	n/a
Cash	$8.00	$7.70	$4.25	$5.75

Table 4-3
Comparison of Fares for Metrorail Connection Services

Fare Category	LC Transit WFC	PRTC Metro Direct	Ride-On to #70-Bethesda	MTA Zone 2	MTA Zone 3
One-Way SmarTrip Fare	$2.00	$2.90	$3.15-$3.65	n/a	n/a
One-Way Cash Fare	$2.50	$3.60	$4.00	$3.50	$5.00

What can be learned is that there are ranges of fare options established with discounts for connecting to Metrorail when these services are made available.

From the California commuter services that were reviewed, several factors were gleaned. These included the fact that long haul commuter bus services continued to maintain their market share, even with the addition of commuter rail alternatives. Many commuters enjoy the one seat ride that can take them more proximate to their destination with the flexibility of the bus service rather than switching to a rail service that may require more than one mode transfer. This seemed to be consistent with many commuter services operated in the Los Angeles area particularly from Santa Clarita and the Antelope Valley north of Los Angeles.

In the San Francisco bay area, services that were reviewed included VTA in San Jose and San Joaquin RTD in Stockton. Both systems operate commuter buses into the San Francisco metro area, including operating commuter bus services that connect with the BART services which, similar to WMATA is establishing new extended rail lines. In both instances the agencies viewed their market as particularly transit dependent and not specifically peak hour commute only service. While the BART commuter rail fares are distance based, the bus services operated by VTA and by SJRTD are flat fare, not distance based, similar to LC Transit

VTA in San Jose has been operating their metro connection bus to rail service with a free afternoon transfer from the rail to the bus in order to encourage ridership on that service. They are currently studying the sustainability of that no cost transfer for future consideration on revenue and ridership.

4.3 Fare Policy and Recommended Fare Structure

Policy considerations for establishing fare levels now and to serve as a foundation to meet future County expectations include the following:

- The long haul commuter bus service should be self-sustaining, including state contributions, by the time of the Silver Line extension into Loudoun County in 2019. This is a stated objective of the County's Countywide Transportation Plan.
- Riders should be encouraged to use metro connection services in support of the rail line extension through the established fare structure.

Considering as a basis the combination of operating cost for the service as well as inflation, it is recommended to have in place a policy which gradually increases fares for the long haul services between now and 2019, and to establish fares for the metro connection services which take into consideration the total fare paid including the rail portion of the trip. The goal is to incentivize commuters to transition to the Metrorail service where convenient and to attract new riders to the system.

The last fare increase for LC Transit Long Haul services occurred in September 2008. A review of LC Transit's costs and Bureau of Census Consumer Price Index data suggests that the $7.00 SmarTrip fare enacted in 2008 is equivalent to $7.50 to $8.50 in FY 2015 dollars. Therefore, it is recommended that Long Haul fares increase to $8.00 for FY 2015. As noted above, a desired objective is to achieve a self-sustaining fare for Long Haul service once the Silver Line is extended into Loudoun County in 2019 (after consideration of state operating assistance). A 2019 fare of $10.00 is estimated to be necessary to achieve this objective. Therefore, it is also recommended that the Long Haul fare is increased to $9.00 in FY 2017 and $10.00 in FY 2019. A fare increase every other year is proposed as opposed to having riders incur a fare increase every year.

For Metro Connection services, an initial fare of $1.00 is recommended for services that connect to the Wiehle-Reston East Metrorail Station. This low fare is proposed to incentivize use of Metro Connection service. A fare of $3.50 is recommended for Metro Connection service to West Falls Church (to account for the difference in distance between Wiehle and West Falls Church Metrorail stations from Cascades). The proposed Tysons fare remains unchanged from the current fare of $3.00.

It is desirable to encourage riders from Leesburg to utilize the proposed Tysons Corner Metro Connection service to and from the Spring Hill Metrorail station. An incentivized fare for this particular service requires a discount for afternoon riders from Spring Hill. Therefore, it is recommended that afternoon riders boarding at Spring Hill Station (the last stop for Tysons Corner commuter buses) pay a half fare of $1.50. Riders at other stops in Tysons Corner would continue to pay $3.00.

A 50 cent fare increase is proposed every other year for all Metro Connection services. This fare increase is proposed to bring Metro Connection services up to a more acceptable farebox recovery ratio after the initial introductory fare of $1.00, while still maintaining an incentive for riders to use these services (i.e., Long Haul fares would be increasing by $1.00 while Metro Connection fares would be increasing by $0.50).

Table 4-4 presents the proposed fare structure (SmarTrip fares), along with the total fare incurred for riders travelling to/from downtown Washington, D.C. (the Metro Center Metrorail station was used as a destination location). Metrorail fares used in the following table reflect WMATA's proposed fare increase. It is important to note that the fare structure shown below is for SmarTrip fares. Cash fares should continue to be an additional $1.00 for Long Haul service and $0.50 for Metro Connection service.

As noted, fare increases are proposed every other year. Prior to any future fare increase, a through review of LC Transit expenditures, ridership and farebox revenues should be completed to validate the justification for the fare increase.

Table 4-4
Proposed Loudoun County Fares through FY 2019

	Existing Fares	Proposed Annual SmarTrip Fares				
		FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
LC Transit Fares						
Long-Haul	$7.00	$8.00	$8.00	$9.00	$9.00	$10.00
Annual % Fare Increase		*2.0%*	*0.0%*	*12.5%*	*0.0%*	*11.1%*
Metro Connection						
Wiehle (from Cascades and Loudoun Station)	n/a	$1.00	$1.00	$1.50	$1.50	$2.00
West Falls Church (from Cascades)	$2.00	$3.50	$3.50	$4.00	$4.00	$4.50
Tysons Corner stops (except Spring Hill)	$3.00	$3.00	$3.00	$3.50	$3.50	$4.00
Spring Hill Metrorail Station (am/pm fare)	n/a	$3.00/$1.50	$3.00/$1.50	$3.50/$1.75	$3.50/$1.75	$4.00/$2.00
Total Fare to Metro Center						
Long Haul: from Leesburg	$7.00	$8.00	$8.00	$9.00	$9.00	$10.00
Metro Connection to WFC: from Cascades	$7.10	$7.60	$7.60	$8.10	$8.10	$8.60
Metro Connection to Wiehle: from Cascades	n/a	$7.00	$7.00	$7.50	$7.50	$8.00
Metro Connection to Wiehle: from Loudoun Stat.	n/a	$7.00	$7.00	$7.50	$7.50	$8.00
Metro Connection to Spring Hill: from Leesburg	n/a	$7.40	$7.40	$7.78	$7.78	$8.15

Note: Metro Connection to Spring Hill: From Leesburg fares reflect an average one-way daily fare, for 1/2 fare is proposed in the p.m.

5.0 Ridership and Revenue Projections

The proposed fare structure identified in the prior section of this report was applied to a spreadsheet model that was developed specifically to estimate ridership and farebox revenues by type of service. This section of the report presents methodology and results for these projections.

5.1 Methodology

The methodology used to develop ridership and revenue projections is based on a step-by-step process of adjusting "base" ridership and revenue tables that assume the current fare structure. Adjustments to ridership are based on "elasticity" factors that reflect the anticipated percent change in ridership based on the percent change in fare. Steps taken to estimate ridership and revenue are as follows:

Step 1: Develop 2014 Ridership Table by Service Type

FY 2014 ridership figures for the full year are not yet available since FY 2014 does not end until June 30, 2014. Therefore, full year FY 2014 ridership was estimated based on FY 2013. For the first five months of FY 2014, Long Haul service ridership has increased by 15%, Tysons Express ridership has increased by 20.3%, Cascades-WFC ridership has increased by 1.4% and reverse commute ridership has decreased by 15.6%. However, these figures were prior to the reduction in the commuter tax benefit on January 1, 2014. Therefore, only 75% of these growth rates were applied to FY 2013 to obtain estimates of FY 2014 ridership by service type.

Step 2: Develop Estimates of 2015 Ridership Assuming Current Fares

Application of elasticity factors must pivot off of a "base" trip table. A 2015 trip table was developed by first conservatively assuming a 7% growth in Long Haul ridership from FY 2014 (a reduced growth rate has been assumed to account for likely shifts to Metro Connection transit services). For other services, the 2015 service plan is significantly different than 2014, because of the introduction of Metro Connection transit service. Therefore, a base trip table for those services was developed by estimating average riders per bus trip, using current passenger per trip data for Tysons Express and Cascades-WFC transit services.

Step 3: Estimate Farebox Revenues Using Current Fares

The average fare per passenger trip was calculated with FY 2013 data, and applied to the FY 2015 "Base" trip table that was developed in Step 2.

Step 4: Determine the Percent Change in Fares and Apply Elasticity Factors to Estimate New 2015 Ridership

The proposed new fare structure was compared to the current fare structure to determine the percent change by service type. Elasticity factors were then applied to these percentages. As noted in earlier sections of this report, analyses of the Long Haul services indicate that it is very inelastic. An elasticity factor of -0.1 was still applied to this service to conservatively estimate potential adverse impacts. An elasticity factor of -.1 means that for every 10% increase in fares, ridership is anticipated to drop by 1 percent. An elasticity factor of -0.2 was applied for the

Metro Connection services and a factor of -0.3 was applied for reverse commute services. These factors are more in-line with published fare elasticity data for peak period commuter services. Application of these elasticity factors results in a revised estimate of 2015 ridership.

Step 5: Generate a Revenue Forecast

In this step, a revised average net fare per passenger trip is applied to the new 2015 ridership forecast to estimate total farebox revenues.

Step 6: Forecast FY 2015 through FY 2020 Ridership and Revenues

In this final step, ridership forecasts from the prior year are grown to reflect typical annual ridership growth (based on prior ridership growth rates, but moderated to be conservative). Since the proposed fare structure reflects an increase every other year, the process of applying elasticity factors and revised average net fares per passenger trip is applied for each year a fare increase is assumed. A higher elasticity rate of -0.15 was used for Long Haul service for fares that exceeded $9.00 (i.e., fares that exceeded potential inflation fare adjustments).

5.2 Ridership and Revenue Projections

Table 5-1 presents estimated ridership and fare revenues by type of service for FY 2015 through FY 2019. As noted in this table, annual ridership for all LC Transit services is anticipated to grow from an estimated 1.4 million in FY 2014 to 1.8 million in FY 2019. Farebox revenues are anticipated to grow to $14.7 million by FY 2019. The anticipated average fare collected for every LC Transit passenger trip boarding (Long Haul and Metro Connection service) is as follows:

- FY 2014 - $5.66
- FY 2015 - $6.13
- FY 2016 - $6.15
- FY 2017 - $7.10
- FY 2018 - $7.11
- FY 2019 - $8.04

Figure 5-1 illustrates anticipated ridership growth for each fiscal year. Figure 5-2 illustrates anticipated farebox revenue growth for each fiscal year.

Table 5-1
Ridership and Farebox Revenue Projections
By Fiscal Year and Service Type

Fiscal Year	Service	Ridership	Revenues
FY 2015	D.C. Commute	1,171,702	$8,904,935
	Tysons Corner	114,300	$308,610
	Metrorail Connect	256,794	$363,703
	Reverse Commute	27,940	$50,292
	TOTAL	**1,570,736**	**$9,627,540**
FY 2016	D.C. Commute	1,259,840	$9,574,784
	Tysons Corner	122,936	$331,927
	Metrorail Connect	269,240	$380,848
	Reverse Commute	28,702	$51,664
	TOTAL	**1,680,718**	**$10,339,222**
FY 2017	D.C. Commute	1,310,386	$11,203,800
	Tysons Corner	125,984	$396,850
	Metrorail Connect	254,254	$515,607
	Reverse Commute	24,892	$67,208
	TOTAL	**1,715,516**	**$12,183,466**
FY 2018	D.C. Commute	1,373,378	$11,742,382
	Tysons Corner	132,080	$416,052
	Metrorail Connect	262,890	$533,667
	Reverse Commute	25,400	$68,580
	TOTAL	**1,793,748**	**$12,760,681**
FY 2019	D.C. Commute	1,414,780	$13,440,410
	Tysons Corner	134,112	$482,803
	Metrorail Connect	254,508	$671,170
	Reverse Commute	23,368	$84,125
	TOTAL	**1,826,768**	**$14,678,508**

Figure 5-1
Ridership Projections

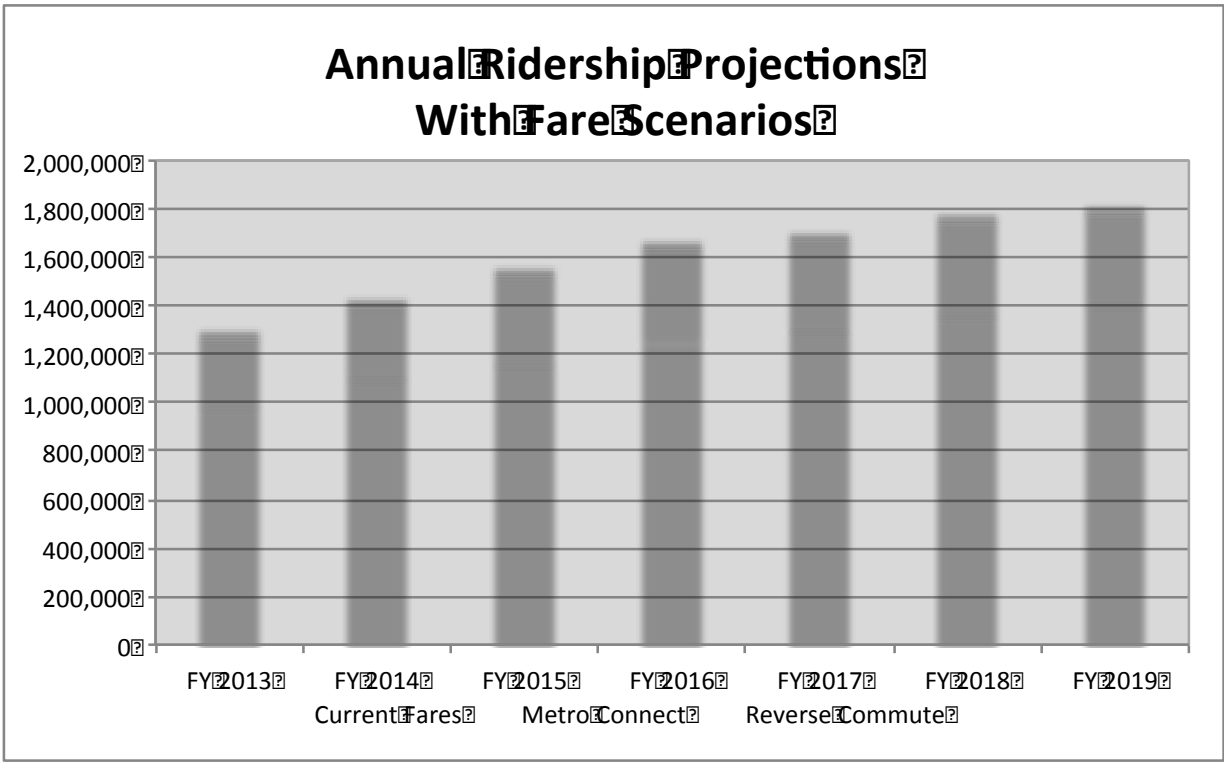
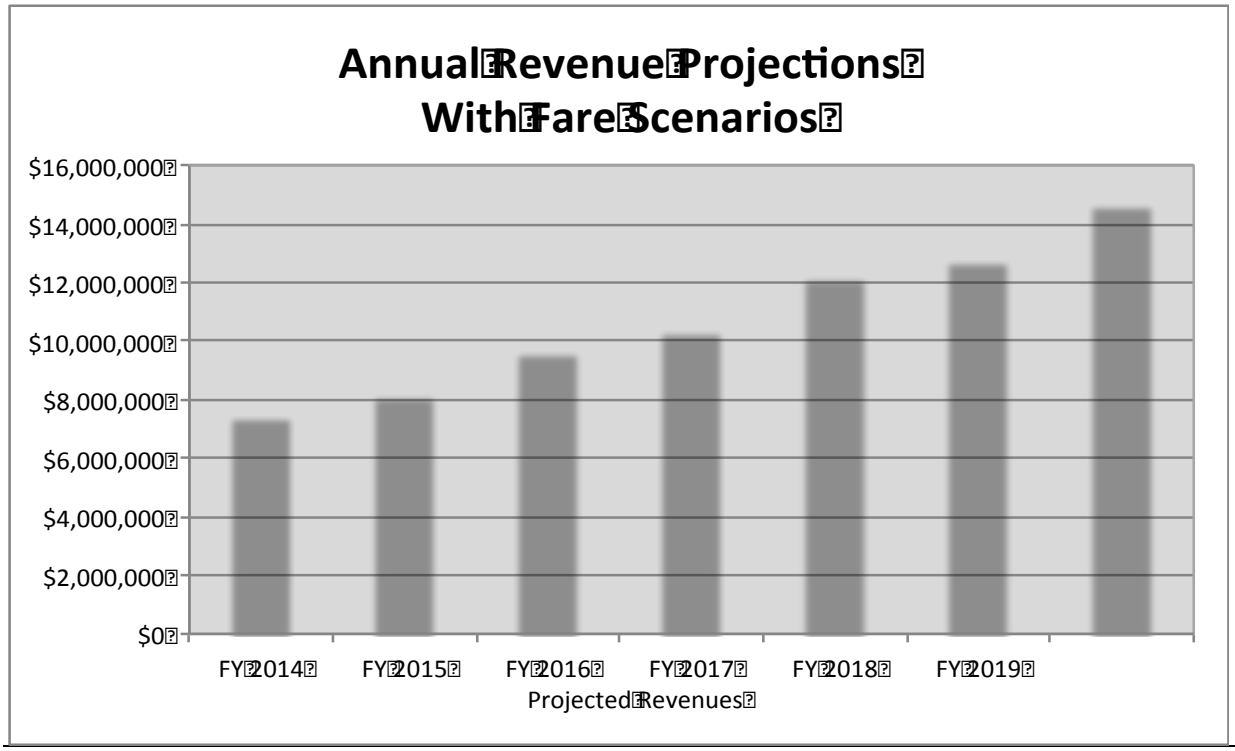


Figure 5-2
Revenue Projections



6.0 Conclusions

The planned introduction of new Loudoun County Metro Connector service, combined with the time span since the last fare increase, has resulted in the need to complete a comprehensive review of the Loudoun County commuter bus fare structure. This study has been initiated to define and evaluate potential fare options and to establish a fare policy that can move the long haul commuter services towards being self-sustaining by 2019 when the Silver Line is anticipated to be extended to Loudoun County

Historical LC Transit ridership characteristics have been reviewed and analyzed. Ridership trends were compared to various demographic and transportation-related characteristics to determine factors that are most responsible for LC Transit ridership growth. This analysis has determined that the LC Transit ridership trends correlate well with cost of driving trends. As the cost of driving increases and transit becomes more attractive to use from a cost perspective, transit usage increases. This is particularly true for Long Haul transit services. Past fare increases have had negligible impact on ridership, since the cost of using transit is still quite a bit less than the cost of driving.

The following fare structure (Table 6-1) has been proposed for FY 2015 through FY 2019, when the Silver Line is anticipated to be extended into Loudoun County. Total fares shown in this table to the Metro Center Metrorail Station include anticipated Metrorail fares once WMATA's proposed fare increase is in place this summer.

Table 6-1
Proposed Loudoun County Fares through FY 2019

	Existing Fares	Proposed Annual SmarTrip Fares				
		FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
LC Transit Fares						
Long-Haul	$7.00	$8.00	$8.00	$9.00	$9.00	$10.00
Annual % Fare Increase		*2.0%*	*0.0%*	*12.5%*	*0.0%*	*11.1%*
Metro Connection						
Wiehle (from Cascades and Loudoun Station)	n/a	$1.00	$1.00	$1.50	$1.50	$2.00
West Falls Church (from Cascades)	$2.00	$3.50	$3.50	$4.00	$4.00	$4.50
Tysons Corner stops (except Spring Hill)	$3.00	$3.00	$3.00	$3.50	$3.50	$4.00
Spring Hill Metrorail Station (am/pm fare)	n/a	$3.00/$1.50	$3.00/$1.50	$3.50/$1.75	$3.50/$1.75	$4.00/$2.00
Total Fare to Metro Center						
Long Haul: from Leesburg	$7.00	$8.00	$8.00	$9.00	$9.00	$10.00
Metro Connection to WFC: from Cascades	$7.10	$7.60	$7.60	$8.10	$8.10	$8.60
Metro Connection to Wiehle: from Cascades	n/a	$7.00	$7.00	$7.50	$7.50	$8.00
Metro Connection to Wiehle: from Loudoun Stat.	n/a	$7.00	$7.00	$7.50	$7.50	$8.00
Metro Connection to Spring Hill: from Leesburg	n/a	$7.40	$7.40	$7.78	$7.78	$8.15

Note: Metro Connection to Spring Hill: From Leesburg fares reflect an average one-way daily fare, for 1/2 fare is proposed in the p.m.

The fare increase program shown in Table 6-1 is designed to incentivize use of Metro Connection services in the initial years, and increase Long Haul Fares to a level that is estimated to be required for this service to be self-sustaining by FY 2019 (after consideration of State operating subsidies), when the Silver Line is extended into Loudoun County. It is also important to note that Metro Connection service can be incentivized through the level of service

provided (e.g., add service to Metro Connection routes while maintaining Long Haul service levels).

Fare increases shown in Table 6-1 represent proposed time periods for fare increases. Prior to any fare increase, a thorough review of expenditures, ridership and farebox revenues should be completed to validate the justification for the fare increase.

Table 6-2 presents a comparison of estimated existing and projected transit travel times to Metro Center Metrorail Station in downtown Washington, D.C., using the various LC Transit service options. As shown in this table, the Metro Connection to Wiehle from Cascades is anticipated to add 3-minutes to a rider's travel time from Cascades (70 minutes vs. 67 minutes). Use of Metro Connection from Leesburg (connecting to the Silver Line at Spring Hill) is anticipated to add 4-minutes to a rider's travel time (78 minutes vs. 74 minutes).

Table 6-2
Comparison of Transit Travel Times to Metro Center Metrorail Station
(Travel Times shown as Minutes)

Transit Travel Option	Existing Times	New Times
Long Haul: from Leesburg	74	74
Metro Connection to WFC: from Cascades	67	67
Metro Connection to Wiehle: from Cascades	n/a	70
Metro Connection to Wiehle: from Loudoun Stat.	n/a	64
Metro Connection to Spring Hill: from Leesburg	n/a	78

Note: Travel Times using Metro Connection Assume an Average 5-Minute Walk and Wait Time from Bus to Rail

As noted earlier, LC Transit ridership has been determined to be very sensitive to the cost of driving. The cost of using transit to downtown Washington, D.C., from Leesburg has generally ranged from 40 to 50 percent of the cost of driving in recent years. This percentage is anticipated to decrease to 35 percent without a fare increase. With the proposed $8.00 fare in FY 2015, the cost of using transit from Leesburg is anticipated to be approximately 40 percent of the cost of driving. Thus, the $8.00 fare brings the cost of using transit back in-line with recent trends. The proposed FY 2015 cost of using transit from Cascades to downtown D.C. is approximately 53 percent when compared to the cost of driving. This percentage is higher because a commuter from Cascades pays less tolls than a commuter from Leesburg. Thus, the proposed fare structure in FY 2015 keeps the cost of using transit in-line with recent trends and is not anticipated to have a significant impact on ridership. Since toll rates are not known beyond this year, it is not possible to see how the cost of using transit will compare to the cost of driving in future years.

Ridership and revenues have been projected for each LC Transit service type through FY 2019. Table 6-3 presents those projections.

Table 6-3
Projected Ridership and Farebox Revenues

Fiscal Year	Service	Ridership	Revenues
FY 2015	D.C. Commute	1,171,702	$8,904,935
	Tysons Corner	114,300	$308,610
	Metrorail Connect	256,794	$363,703
	Reverse Commute	27,940	$50,292
	TOTAL	**1,570,736**	**$9,627,540**
FY 2016	D.C. Commute	1,259,840	$9,574,784
	Tysons Corner	122,936	$331,927
	Metrorail Connect	269,240	$380,848
	Reverse Commute	28,702	$51,664
	TOTAL	**1,680,718**	**$10,339,222**
FY 2017	D.C. Commute	1,310,386	$11,203,800
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	Metrorail Connect	254,254	$515,607
	Reverse Commute	24,892	$67,208
	TOTAL	**1,715,516**	**$12,183,466**
FY 2018	D.C. Commute	1,373,378	$11,742,382
	Tysons Corner	132,080	$416,052
	Metrorail Connect	262,890	$533,667
	Reverse Commute	25,400	$68,580
	TOTAL	**1,793,748**	**$12,760,681**
FY 2019	D.C. Commute	1,414,780	$13,440,410
	Tysons Corner	134,112	$482,803
	Metrorail Connect	254,508	$671,170
	Reverse Commute	23,368	$84,125
	TOTAL	**1,826,768**	**$14,678,508**

Revenue projections presented in the table above were compared to anticipated annual costs for Long Haul and Metro Connection services. Long Haul costs are estimated to be approximately 80% of LC Transit's current service hours, and thus operating costs. Annual costs were assumed to increase at rates similar to estimated ridership increases, with costs inflated 4% per year. State operating assistance has been assumed at 18 percent. Table 6-4 presents estimates of farebox recovery ratios with and without state operating assistance. As shown in this table, Long Haul service is estimated to be essentially self-sustaining by 2019 (i.e., fares achieve a level that covers local funding requirements after consideration of state operating assistance). Metro Connection and reverse commute services reach a farebox recovery ratio of 39 percent after consideration of state operating assistance.

Table 6-4
Farebox Recovery Calculations

Long-Haul Calculations

Fiscal Year	Est. Long-Haul Cost	State Contribution	Net Cost to County	Annual Pass. Trips	Fares Collected	Sefl-Sustaining Fare Req'd.	Proposed Fare	Farebox Recovery Ratios w/o State	w/ State
FY 2015	$11,280,000	$2,030,400	$9,249,600	1,171,700	$8,904,900	$8.29	$8.00	79%	96%
FY 2016	$12,611,000	$2,270,000	$10,341,000	1,259,800	$9,574,800	$8.62	$8.00	76%	93%
FY 2017	$13,902,400	$2,502,400	$11,400,000	1,310,400	$11,203,800	$9.13	$9.00	81%	98%
FY 2018	$15,152,500	$2,727,500	$12,425,000	1,373,400	$11,742,400	$9.50	$9.00	77%	95%
FY 2019	$16,515,000	$2,972,700	$13,542,300	1,414,800	$13,440,400	$10.05	$10.00	81%	99%

Metro Connection & Reverse Commute Calculations

Fiscal Year	Est. Metro Connect. Cost	State Contribution	Net Cost to County	Annual Pass. Trips	Fares Collected	Sefl-Sustaining Fare Req'd.	Avg. Proposed Fare	Farebox Recovery Ratios w/o State	w/ State
FY 2015	$2,820,000	$507,600	$2,312,400	399,000	$722,605	$6.38	$2.02	26%	31%
FY 2016	$3,079,400	$554,300	$2,525,100	420,900	$764,438	$6.60	$2.02	25%	30%
FY 2017	$3,330,700	$599,500	$2,731,200	405,100	$979,665	$7.42	$2.69	29%	36%
FY 2018	$3,574,800	$643,500	$2,931,300	420,400	$1,018,299	$7.67	$2.69	28%	35%
FY 2019	$3,836,800	$690,600	$3,146,200	412,000	$1,238,098	$8.40	$3.34	32%	39%

ALL LCT TRANSIT SERVICES

Fiscal Year	Est. Metro Connect. Cost	State Contribution	Net Cost to County	Annual Pass. Trips	Fares Collected	Sefl-Sustaining Fare Req'd.	Avg. Proposed Fare	Farebox Recovery Ratios w/o State	w/ State
FY 2015	$14,100,000	$2,538,000	$11,562,000	1,570,700	$9,627,505	n/a	n/a	68%	83%
FY 2016	$15,690,400	$2,824,300	$12,866,100	1,680,700	$10,339,238	n/a	n/a	66%	80%
FY 2017	$17,233,100	$3,102,000	$14,131,100	1,715,500	$12,183,465	n/a	n/a	71%	86%
FY 2018	$18,727,300	$3,370,900	$15,356,400	1,793,800	$12,760,699	n/a	n/a	68%	83%
FY 2019	$20,351,800	$3,663,300	$16,688,500	1,826,800	$14,678,498	n/a	n/a	72%	88%

1. Long-Haul Cost Assumptions
   FY 2014 budget = $12.617 million. Long-haul estimated to be remain at 80% of all services.
   FY 2015 budget = $14.1 million. Assumes long-haul continues to be 80% of total costs.
   FY 2016 assume 7.5% service increase + 4% inflation
   FY 2017 assume 6% service increase + 4% inflation
   FY 2018 assume 4.8% service increase + 4% inflation
   FY 2019 assume 4.8% service increase + 4% inflation
2. State Contribution assumed to be 18% of total costs
3. Pass. Trip forecasts estimated through application of elasticity factors.
4. Self-sustaining fare is Net Cost / Pass Trips, multiplied by ratio to account for Net Fare collected.
5. Proposed fare for Metro Conenction is an average of the estimated fare collected for all Metro Connection and Reverse Commute services, factored up to reflect fares collected are "net" fares, not fares charged to passengers.