OPTIONS PAPER

FRED FARE LEVELS AND STRUCTURE

FOR FY2014

Options Paper: Version 1/24/2013

FORWARD

April 8, 2013

This paper was forwarded to the Public Transit Advisory Board (PTAB) in February 2013. The PTAB comprises representatives of the four jurisdictions within which FREDericksburg Regional Transit (FRED) provides service, other major financial partners/donors, social service and planning agencies and citizens at large. At its April 3, 2013, meeting the PTAB discussed fare options at length and adopted the following recommendations:

- Increase the base fare for regular FRED service from $0.75 to $1.00 per boarding.
- Increase the monthly pass for regular FRED service from $30.00 to $35.00.

The PTAB's recommendation is Option 2 in the options paper.

Overall, the PTAB believes that the recommended adjustments to FRED's fares represent a prudent balance between the need to provide reasonably priced transit service while asking FRED's customers to cover with their fares an increasing, yet still moderate, share of the cost of providing that service. The PTAB's recommendation is consistent with the goal of having FRED cover 12 percent of its operating expenses with farebox revenue by FY2015. Based upon ridership estimated for FY2014, this increase is anticipated to achieve the 12 percent goal.

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Background

From its inception in December 1996 through July 2007, the basic fare for a ride on FREDericksburg Regional Transit (FRED) was $0.25; transfers were free. Upon the recommendation of the Public Transit Advisory Board (PTAB) and approval of City Council, beginning in July 2007 (the start of FY2008) FRED eliminated free transfers and all boardings cost $0.25. When FRED began providing special VRE feeder service in October 2007, the fare per boarding was set at $1.00 for that service.

FRED did not change its fares in FY2009. In March 2009, the PTAB reviewed FRED's fare structure again and recommended additional adjustments to City Council. That recommendation, subsequently accepted by City Council and implemented in July 2009 (the start of FY2010), included setting as a target for FY2015 a fare box recovery ratio of 12% (the ratio of fare box revenues to operating expenses).

As recommended by the PTAB and approved by City Council FRED's fares have been adjusted twice in the last five years. The following table summarizes fares during the last five fiscal years.

Fare	FY2009	FY2010	FY2011	FY2012	FY2013
Basic	$0.25	$0.50	$0.50	$0.75	$0.75
Monthly Pass	$15.00	$25.00	$25.00	$30.00	$30.00
Annual Pass		$200.00	$200.00	$200.00	$200.00
VRE Service	$1.00	$1.25	$1.25	$1.50	$1.50
VRE Monthly Pass	$35.00	$40.00	$40.00	$45.00	$45.00

FRED did not change its fares in fiscal years 2009, 2011 or 2013.

FRED'S Current Fare Level and Structure

As noted above for regular service FRED charges passengers $0.75 for each boarding anywhere on its system any time of the day. Passengers can purchase a monthly pass for $30.00 and an annual pass for $200.00.

Children under three (3) ride free.

There are no fare discounts for the elderly, the disabled, or low income riders.

The fare for an individual trip on a VRE feeder bus is $1.50; a monthly pass costs $45.00.

As a condition of their respective institutions making significant contributions/grants to FRED (either in cash or in kind), students and employees of the University of Mary Washington and employees of Medicorp Health Care System, Germanna Community College, the Star Radio Group, The Free Lance-Star and Spotsylvania Regional Medical Center may ride for free upon showing a valid ID.

Coverage of Operating Expenses

FRED's fare box revenues have steadily increased from $116,662 in FY2008, to $368,072 in FY2012, an increase of 315 percent. Correspondingly, FRED's fare box revenue coverage of operating expenses increased from 3.5% to 11.0%
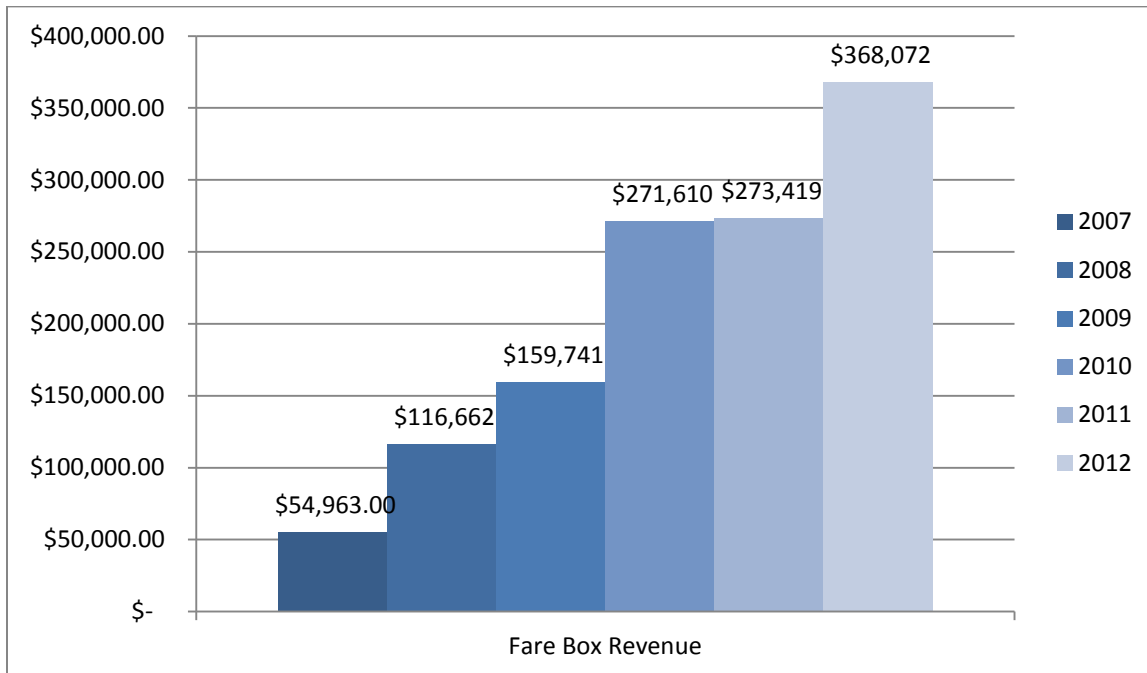

Figure 1 Fare Box Revenue FY 2007 to FY 2012

These numbers suggest that the adjustments made in July 2009 and July 2011 promoted the stated objectives, namely to:

- Retain a simplified fare structure;
- Recognize the economic challenges facing FRED's customers by keeping basic fares low; and
- Increase fare revenues and fare box coverage to ease the fiscal burdens on local governments.

When the PTAB made its recommendations about achieving a cost recovery ratio of 12 percent by FY2015, it considered only true fare box revenue and did not consider cash contributions made by four major non-government partners in lieu of fares. Accordingly the fare box revenues as presented above do not include cash contributions made by major non-government partners – the University of Mary Washington, Mary Washington Healthcare, Germanna Community College, and Spotsylvania Regional Medical Center. Those contributions, which totaled $127,750 in FY2012, entitle partner employees and UMW students to ride FRED free.

Rate Increases and Ridership

Ridership over the last six years indicates that our customers perceive service as a good value having increased 157 % over the period.
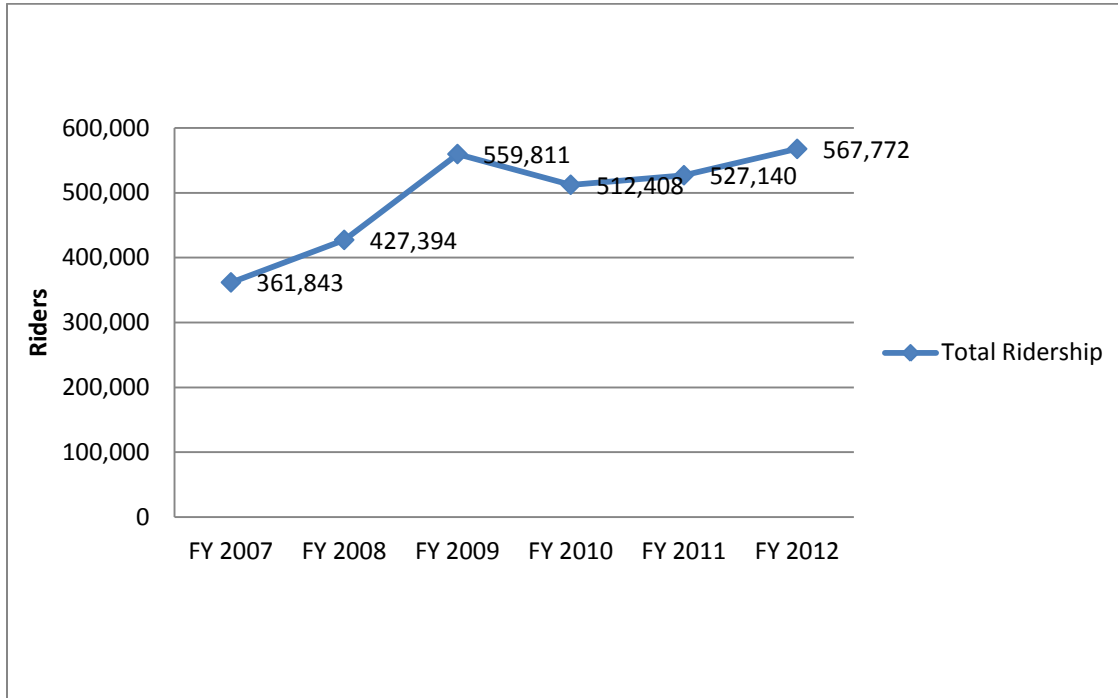

Figure 2: Ridership Fiscal Years 2007-2012

In FY 2010, when the basic fare increased from $0.25 to $0.50 ridership declined by about 8.4 percent. Despite the decline in ridership, the FY2010 fare rate increase offset the temporary decline in ridership and increased fare-box revenue, by 70 percent over the prior fiscal year to $271,610.

Unlike the ridership decline experienced in FY 2010, ridership increased 7.7% when fares were increased in FY2012. This increase combined with higher fares increased fare box revenues to $367,072, a gain of 35% over FY2011.

Options for Future Fare Levels

Options for how FRED might structure its fares in the future include:

- Option 1: No change in current fare level or structure.

- Option 2: Increase the fare for each boarding of regular services to $1.00. Increase the fare for monthly pass to $35.00.

- Option 3: Increase the base fare to $1.25. Increase the fare for monthly pass to $35.00.

The 2009 analyses of fare options presented to the Board included consideration of a zone-based fee structure. Due to the complexity of administering such a structure the Board did not support this option and therefore it was not considered as an option in this analysis.

Additionally, some jurisdictions have suggested that FRED (and the City) consider permitting them to set their own fare levels. This variation, FRED believes, should be considered only if the four jurisdictions cannot come to an agreement on a general adjustment to FRED fares.

Ridership and Revenue of Options

Estimates of the ridership and revenue effects of options considered for implementation in FY 2014 are calculated in Appendix 2 and are summarized in Table 1 below.

One can make several observations based on the information presented in Table 1.

First, all of the options result in lower ridership than in the baseline option. This is to be expected as they all entail increases in fares, and ridership (the amount of transit service demanded) is elastic with respect to fare levels, other things being equal (i.e., with service levels and the costs of other travel options held constant, higher fares will cause price sensitive riders to take fewer trips). In the calculations for the scenarios that follow, we have used elasticities of 0.1 (meaning that a 100 percent increase in fares will result in a 10 percent decrease in ridership) and 0.3 (meaning that a 100 percent increase in fares will result in a 30 percent decrease in ridership) to represent a range of rider sensitivities to fare levels.

Based on the revenue and ridership effects of the adjustments made to FRED fares in FY2010 and FY2012, we estimate that FRED's fare elasticity is closer to 0.10 and tends to be more inelastic given that ridership increased in FY 2012 when fares increased Of course, other factors could likely have affected ridership during these periods; for example, reductions in service in King George and Stafford counties; gas prices; the weak economy; unemployment; poor weather that closed operations for a significant number of days. Accordingly, our analysis presents estimates of revenue for a fare increase to $1.00 under the scenarios of no decrease in ridership (Scenario 2.0) and elasticities of 0.1 (Scenario 2.1) and 0.3 (Scenario 2.2). The expenses used in these calculations are projected expenses for the FY 2014 budget.

Second, all of the options result in higher revenues than in the baseline option. This, too, is to be expected in light of the elasticities used to link fare levels and ridership. Given the relatively low elasticity as revenues increase, so too do the cost recovery ratios, ranging from 10.2% to 15.0%.

Table 1: Estimated Ridership and Revenue Effects of Fare Options

Option / Service	Ridership	Estimated Revenue	% Cost Recovery Farebox	% Cost Recovery Farebox + Partner Contribution
Option 1 : $0.75 Basic; $30 Monthly				
Regular Service	516,500	$ 382,650		
VRE Service	40,000	$ 46,200		
Total	556,500	$ 428,850	10.2%	13.3%
Option 2.0: $1.00 Basic; $35 Monthly Elasticity = 0				
Regular Service	516,500	$ 508,200		
VRE Service	40,000	$ 46,200		
Total	556,500	$ 554,400	13.2%	16.2%
Option 2.1 : $1.00 Basic; $35 Monthly Elasticity = 0.1				
Regular Service	497,467	$ 489,167		
VRE Service	40,000	$ 46,200		
Total	537,467	$ 35,367	12.8%	15.8%
Option 2.2 : $1.00 Basic; $35 Monthly Elasticity = 0.3				
Regular Service	460,400	$ 452,100		
VRE Service	40,000	$ 46,200		
Total	500,400	$ 498,300	11.9%	14.9%
Option 3.1 : $1.25 Basic; $35 Monthly Elasticity = 0.1				
Regular Service	478,933	$ 584,992		
VRE Service	40,000	$ 46,200		
Total	518,933	$ 631,192	15.0%	18.1%
Option 3.2 : $1.25 Basic; $35 Monthly Elasticity = 0.3				
Regular Service	404,800	$ 492,325		
VRE Service	40,000	$ 46,200		
Total	444,800	$ 538,525	12.8%	15.9%

Other Dimensions: Equity, Simplicity and Ease of Collection

Ridership and revenue, however, are not the only aspects to be considered when assessing the effects of potential changes in fare levels and structure. Other important dimensions are discussed below.

Equity

First, a fare structure that charges riders in proportion to the costs they impose on the system generally may be said to be more equitable than one that does not. FRED and other transit systems incur costs based largely on the number of hours they operate, which in turn generally relates to the number of miles operated; thus, riders whose trips take longer to make than

others' tend to impose higher costs on the system (although this may not be the case when considering rush hour versus non-rush hour trips). From this perspective, a flat fare can be said to be less equitable than one that is based on distance or zones traveled. In effect, under a flat fare structure, short distance riders "subsidize" long distance riders.

Second, the way in which a transit system's network and operations are structured may introduce certain inequities. FRED operates a "pulse" system with buses running to and from transfer points where roughly one-third of all fare-paying customers transfer between buses. The system forces large numbers of passengers to transfer to reach their destinations. Since FRED charges for transfers by having a separate fare for each boarding, passengers who were not lucky enough to be traveling between two points on a single route are assessed an additional charge even though the length of their trips might be shorter than those who are fortunate enough to be able to complete their trips on a single route. This possible source of inequity is an unavoidable feature of "pulse" systems that charge a new full fare for each boarding.

Simplicity for purposes of this assessment refers to how easy the fare structure is for passengers (and drivers) to understand.

A flat fare is the easiest for passengers to grasp and a fare that is in multiples of a single coin denomination are the simplest within this group. So, for example, a flat fare of $0.50 or $0.75 would be simpler than a fare of $0.65 or $0.90. Adding a transfer fee that is different than the full fare complicates matters somewhat, but still is relatively easily understood.

A distance- or zone-based fare can be fairly complicated for passengers (and drivers) to understand, requiring the passenger to consult a distance-fare table or a zone-fare table to be able to be certain to have the correct change when boarding the bus. A fare system that differentiates among a variety of classes of riders, time of day, level of service and perceived willingness of riders to pay would be the most complex of all for passengers to understand and for FRED to administer.

Ease of collection for purposes of this assessment refers to the complexity of collecting fares from the driver's perspective.

Currently, all boardings cost $0.75 (exact fare required), a system that is easy to administer. While simple to administer this fare requires the handling of a large amount of quarters and other change. If FRED were to raise base fares to $1.00, the handling of fares would be easier.

Distance or zone-based fares are difficult to administer. The driver has to know where zones start and stop or what the fares are for particular trips. To be certain of having correct change, passengers would have to have this knowledge as well. Additionally, this type of fare could lend itself to cheating, with passengers indicating a single-zone or short trip upon boarding, but actually making a longer trip; drivers would have the responsibility of policing this type of fare, which could give rise to conflicts with passengers.

The equity, simplicity and ease of collection are qualitatively summarized below for each of the fare options. A + (plus sign) indicates that any particular feature is a relatively positive aspect of an option; a – (negative sign) indicates that any particular feature is a relatively negative aspect.

Table 2: Relative Equity, Simplicity and Ease of Collection

Option	Equity	Simplicity	Ease of Collection
Option 1	-	+	+
Option 2	-	+	++
Option 3	-	+	+

++ indicates strongly positive   + indicates somewhat positive
- - indicates strongly negative   - indicates somewhat negative

FUTURE FARE-RELATED TECHNOLOGY OPTIONS

FRED currently uses simple mechanisms to collect fares. Each bus is equipped with a manually operated farebox. Passengers deposit fares through a slot in the top of the box. The driver views and verifies the fare through the glass sides of the box. Once the fare has been verified, the driver depresses a lever to drop the fare into a lock box. The driver marks a trip sheet noting the type of fare paid by each passenger. At the end of each shift, the lock box is removed and fares are brought into FRED Central, counted, reconciled with the trip sheets and secured for later deposit. This is a low cost, labor intensive and error prone method of collecting fares that has been in use for over 100 years.

New technologies have emerged over the last decade that automate and computerize fare collections on buses. They accept not only coins and cash, but also a variety of electronic fare media. Many of these modern systems are linked to GPS hardware and software to permit every passenger's boarding and alighting location to be recorded. These fareboxes can be programmed for a wide range of fare options that can be changed to reflect things like the time of day, the nature of the service (e.g., express vs. local), and rider characteristics (e.g., age, disability, student status). Retrieval of fares can also be automated.

One of the main benefits of automated fareboxes is that they make it easier for transit agencies to use more sophisticated and complicated fare structures which can be used to increase revenue and make the fare structure more equitable. They also offer accurate passenger counts and fare accounting. The driver is basically taken out of the equation. Passengers may still be befuddled by the fare structure, but generally take comfort from the fact that a computer is at work calculating their fares.

FRED has done some preliminary analysis of automated fareboxes. Our conclusion is that, while they offer certain benefits, their high initial cost and significant upkeep make them unsuitable for FRED's relatively small operation.

Farebox Revenue Coverage in Peer Transit Agencies

Appendix 1 compares FRED's revenue performance compared to 18 other transit agencies. These are the same 18 were used for comparison purposes in past analyses of FRED fare adjustments in 2009. While FRED's FY2012 data are available, only FY2011 data are available for the other transit properties and the nation as a whole. A comparison of the 2009 data against the 2011 data for these agencies shows that FRED's fare increases are comparable to our peers with regard to Cost Coverage Ratio (CCR) and Average Revenue per Unlinked Trip. FRED's ranking among peer agencies remains virtually unchanged. For FY 2009 data FRED ranked 16th,and 15th, respectively, and following the fare increase in FY2010, 17th and 15th in FY 2011.

The cost coverage ratios for the 19 transit properties ranged from 7.4 percent (Charles County, MD) to 79.6 percent (Loudoun County). The average revenue per unlinked trip, or yield, ranged from $0.36 (Charlottesville) to $5.69 (Loudoun County). Although FRED's cost coverage ratio and average revenue per unlinked trip increased significantly from FY2009, FRED still ranks at the lower end ,17th and 15th , respectively, in these two measures. The foregoing suggests that an increase in FRED fares in FY2014 would keep FRED well within the range of revenue performance measures attained by its peers.

It should also be noted that FRED needs to consider value to both customers and to agencies that provide funding. Exceptionally low fares would benefit customers however, would at the same time exert pressures on partners with budget challenges. Additionally, FRED needs to maintain fares within a reasonable range of peers in order to maintain itself as a "good value" to state and federal funding agencies. Senate Joint Resolution (SJ 297) recommends a funding model that includes a both a formula component and a performance-based component that is applied within peer groups of similar systems. It is important that FRED compete successfully for limited funds. SJ297 outcomes have not yet been finalized.

CONCLUSIONS

FRED's fare box revenues have increased as a result of fare increase in 2009 and 2011, but remain relatively low by any standard. Compared to other transit agencies sampled for this analysis, in FY2011 FRED had the fourth lowest average fare box revenue per unlinked trip ($0.52) as well as the third lowest fare box coverage ratio (8.3%).

Estimating the effect of raising fares on ridership with any certainty is challenging. The FY 2008 elimination of free transfers had the effect of raising fares. Fares were also raised in FY 2010 and FY 2012. Given these three increases the only decrease in ridership occurred in 2010.

Option 1 – leaving the current fare level unchanged, is most favorable to riders but does not achieve the goal of increasing fare box recovery of operating expenditures.

Option 2 – increasing fares from $0.75 to $1.00, impacts riders but also simplifies fare collection and would achieve the desired 12% coverage of expenses by fare box revenues.

Option 3 – increasing fares from $0.75 to $1.25, impacts riders, has the largest potential for revenue generation and potentially could exceed the 12% coverage of expenses.

If one's objective is to maximize FRED ridership, then Option 1 – leaving the current fare level and structure unchanged – would rank highest. However, given ridership gain when fares increased in FY 2012, an increase in fares for FY 2014 would not necessarily produce a decrease ridership. Additionally, if maximizing ridership were the sole objective, then one would consider eliminating fares altogether.

If one's objective is to maximize farebox revenues, then Option 3 – boosting the per-boarding fare to $1.25 would appear to rank highest.

For most transit agencies, their objective falls somewhere in between these two poles – minimizing the loss of ridership in the short term while significantly increasing farebox revenue and coverage ratios. The information presented in Table 1 and Appendix 2 gives decision makers a sense of the ridership and revenue effects of the options; they are highly sensitive to assumptions about passenger behavior, especially their potential reactions to fare increases.

The qualitative features of fares – equity, simplicity and ease of collection – are important as well, but their effects on ridership and revenue are difficult if not impossible to gauge. For example, a too complicated fare structure could frustrate passengers, ultimately driving them away; a fare structure that provides deep discounts for different categories of citizens could lead to intense political pressure on decision makers to expand the universe of those to whom discounts are offered, ultimately eroding revenues.

Once an option is selected (assuming there is a change of some type), FRED should:

        1) brief all partners on the prospective change;
        2) give the public an opportunity to review and comment on the prospective change;
        3) heavily advertise the prospective change on all buses, at FRED Central, on the FRED website and in local media;
        4) give ample notice of when the prospective change is to take place; and
        5) make certain that all drivers and other FRED staff who deal with the public are fully trained on the prospective changes and on how to handle inquiries regarding same.

Prepared by: FRED Staff
                    January 2013

Forward added: April 8, 2013

APPENDICES

		FARE COMPARISONS -- FY2011 Data					Rank	
							Appendix 1 Comparison of Peer Agencies	
TRANSIT AGENCY	# of Buses	Farebox Revenue	Operating Expenses	Unlinked Trips	Cost Cover-age Ratio	Avg Revenue per Unlinked Trip	CCR	AR/UT
Loudoun County (VA)	56	$6,893,451	$ 8,659,266	1,210,542	79.6%	$ 5.69	1	1
PRTC (VA)	139	$10,961,497	$ 25,931,402	3,326,699	42.3%	$ 3.30	2	2
Hampton Roads (VA)	325	$14,212,376	$ 51,664,098	15,724,596	27.5%	$ 0.90	3	4
Richmond Transit (VA)	170	$10,035,166	$ 37,588,748	12,169,867	26.7%	$ 0.82	4	6
Roanoke Transit (VA)	47	$1,856,995	$ 7,183,875	2,291,101	25.8%	$ 0.81	5	7
Danville Transit (VA)	10	$203,763	$ 865,234	240,031	23.6%	$ 0.85	6	5
Washington County (MD)	15	$290,458	$1,521,000	394,975	19.1%	$ 0.74	7	10
Kanawha Valley (WV)	55	$1,926,133	$10,785,260	2,530,383	17.9%	$ 0.76	8	8
Annapolis (MD)	19	$646,657	$ 3,685,699	1,047,822	17.5%	$ 0.62	9	14
Lynchburg Transit (VA)	40	$987,781	$6,343,067	2,704,381	15.6%	$ 0.37	10	18
Petersburg Transit (VA)	16	$375,195	$2,548,526	585,641	14.7%	$ 0.64	11	13
Charlottesville (VA)	36	$837,778	$6,175,458	2,312,126	13.6%	$ 0.36	12	19
Ohio Valley Transit (OH)	22	$394,554	$ 3,267,684	400,453	12.1%	$ 0.99	13	3
Harford Transit (MD)	29	$199,971	$1,813,124	283,190	11.0%	$ 0.71	14	11
Howard Transit (MD)	37	$620,117	$5,948,866	884,331	10.4%	$ 0.70	15	12
Tri-State Transit (WV)	34	$604,834	$5,579,969	813,876	10.8%	$ 0.74	16	9
Williamsburg Transit (VA)	43	$434,085	$5,815,918	1,056,158	7.5%	$ 0.41	18	17
Charles County (MD)	29	$302,225	$4,090,063	697,812	7.4%	$ 0.43	19	16
FRED (2011 Data)	**30**	$273,419	**$3,300,354**	**527,147**	**8.3%**	**$ 0.52**	17	15
FRED (Option 2.0)		$554,400	$4,198,485	556,500	13.2%	$ 0.99	13	3
Median of Sample Agencies					**16.5%**	**$ 0.74**		

Appendix 2: Trips and Revenue						
Option 1						
	Option Level			Estimated Trips	Estimated Passes	Estimated Revenue
Basic Fare	$ 0.75			495,000		$ 371,250
Monthly Pass	$ 30.00			20,000	30	$ 10,800
Yearly Pass	$200.00			1,500	3	$ 600
Estimated Sub-total				516,500		$ 382,650
VRE Fare	$ 1.50			20,000		$ 30,000
VRE Monthly Pass	$ 45.00			20,000	30	$ 16,200
Estimated Sub-total				40,000		$ 46,200
		0 elasticity	Total Ridership	556,500		
Estimated Total Revenue						$ 428,850
Option 2.0						
	Option Level			Estimated Trips	Estimated Passes	Estimated Revenue
Basic Fare	$ 1.00			495,000		$ 495,000
Monthly Pass	$ 35.00			20,000	30	$ 12,600
Yearly Pass	$200.00			1,500	3	$ 600
Estimated Sub-total				516,500		$ 508,200
VRE Fare	$ 1.50			20,000		$ 30,000
VRE Monthly Pass	$ 45.00			20,000	30	$ 16,200
Estimated Sub-total				40,000		$ 46,200
		0 elasticity	Total Ridership	556,500		
Estimated Total Revenue						$ 554,400

Appendix 2: Trips and Revenue						
Option 2.1						
	Option Level			Estimated Trips	Estimated Passes	Estimated Revenue
Basic Fare	$ 1.00			475,967		$ 475,967
Monthly Pass	$ 35.00			20,000	30	$ 12,600
Yearly Pass	$ 200.00			1,500	3	$ 600
Estimated Sub-total				497,467		$ 489,167
VRE Fare	$ 1.50			20,000		$ 30,000
VRE Monthly Pass	$ 45.00			20,000	30	$ 16,200
Estimated Sub-total				40,000		$ 46,200
		0.1 elasticity	Total Ridership	537,467		
Estimated Total Revenue						$ 535,367
Option 2.2						
	Option Level			Estimated Trips	Estimated Passes	Estimated Revenue
Basic Fare	$ 1.00			438,900		$ 438,900
Monthly Pass	$ 35.00			20,000	30	$ 12,600
Yearly Pass	$200.00			1,500	3	$ 600
Estimated Sub-total				460,400		$ 452,100
VRE Fare	$ 1.50			20,000		$ 30,000
VRE Monthly Pass	$ 45.00			20,000	30	$ 16,200
Estimated Sub-total				40,000		$ 46,200
		0.3 elasticity	Total Ridership	500,400		
Estimated Total Revenue						$ 498,300

Appendix 2: Trips and Revenue						
Option 3.1						
	Option Level			Estimated Trips	Estimated Passes	Estimated Revenue
Basic Fare	$ 1.25			457,433		$ 571,792
Monthly Pass	$ 35.00			20,000	30	$ 12,600
Yearly Pass	$200.00			1,500	3	$ 600
Estimated Sub-total				478,933		$ 584,992
VRE Fare	$ 1.50			20,000		$ 30,000
VRE Monthly Pass	$ 45.00			20,000	30	$ 16,200
Estimated Sub-total				40,000		$ 46,200
		0.1 elasticity	Total Ridership	518,933		
Estimated Total Revenue						$ 631,192
Option 3.2						
	Option Level			Estimated Trips	Estimated Passes	Estimated Revenue
Basic Fare	$ 1.25			383,300		$ 479,125
Monthly Pass	$ 35.00			20,000	30	$ 12,600
Yearly Pass	$ 200.00			1,500	3	$ 600
Estimated Sub-total				404,800		$ 492,325
VRE Fare	$ 1.50			20,000		$ 30,000
VRE Monthly Pass	$ 45.00			20,000	30	$ 16,200
Estimated Sub-total				40,000		$ 46,200
		0.3 elasticity	Total Ridership	444,800		
Estimated Total Revenue						$ 538,525