



# FARE IMPACT STUDY



Prepared by the  
Pioneer Valley Planning Commission

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## 1. PURPOSE

The purpose of this study is to help create a better understanding what is likely to happen to PVTA's ridership and fare revenue if the prices of bus and van fares are raised.

In public transportation, it is generally accepted that if fares go up, so does revenue—but ridership goes down. But this is not always the case; when PVTA last raised fares in 2008, ridership went up 2%. External circumstances, such as the onset of the Great Recession in 2008, have significant influence on public transportation ridership patterns.

This study follows a commonly used method to estimate what will likely happen to PVTA's ridership and fare revenue if the prices of the fares and passes to ride buses and paratransit vans were to be increased by 20%, 25%, or 50% in the coming fiscal year (FY2019). This study also presents a possible schedule of fare prices and increase implementation dates for the coming seven years to what regular fare increases of 5% and 10% per year were to be approved as part of a one-time fare increase for FY2019.

It is important to remember that revenue from the fare box is a small part of the total cost of a trip on one of PVTA's buses or vans. An average bus trip costs about \$7.50 per customer; therefore, the current \$1.25 full adult fare is only 17-18% of the full cost of the trip. An average van trip costs about \$28.00, so the \$2.50 fare that PVTA now charges is about 9% of the trip cost. The remaining costs are paid from state contract assistance (SCA); the annual assessments paid by PVTA member communities based on mileage and ridership; and limited federal sources.

Therefore, the information in this study is intended to aid decision-makers in establishing an equitable and sustainable fare structure for PVTA's fixed route bus and paratransit services. The adoption of any fare increase requires that the Advisory Board select one or more fare change proposals that are presented to the public at a minimum of four public hearings that are held throughout the PVTA service area. Then a recommendation on the proposal(s) must be made by the PVTA Finance Subcommittee, and all public comments received on the proposal must be considered by the Advisory Board. At that point, the Board may vote to adopt the fare change proposal as presented, or with additional changes and mitigation measures that the Board deems are necessary to mitigate potentially discriminatory impacts on customers who have low incomes or are people of color.

Importantly to the last point above, this study does not evaluate the potentially discriminatory impacts that a fare increase could have. That topic will be addressed in a Title VI Fare Equity Analysis that will be produced for the fare proposals that are presented at public hearings.

## 2. STUDY CONTEXT

For FY2019 (which begins July 1, 2018), PVTA will likely face a budget shortfall in operating revenues. The amount of the shortfall is as yet unknown, and could be as much as 13% (\$3.1 million) of PVTA's total annual operating budget for bus and paratransit van services. For a summary of PVTA's service area, transit services, and rider characteristics, see Appendix 1.

In the current fiscal year (FY2018) which began July 1, 2017, PVTA has reduced fixed route service by approximately 4% (\$1.2 million) in response to increased operating costs and a lower than anticipated amount of State Contract Assistance (SCA) for operations appropriated by the legislature. During the public hearing process for the current service reductions, a significant number of participants commented that they would be willing to pay higher fares to maintain service.

In 2012, the PVTA Advisory Board voted against a proposal to raise fare and pass prices 20%.

## 3. PVTA'S CURRENT FARE PRICES AND POLICIES

PVTA's current fare prices and policies have been in effect since July 1, 2008.

**Fig. 3-1: PVTA Current Fares**

<b><u>Bus Fares</u></b>	<b><u>Price</u></b>	<b><u>Discounts</u></b>
Adult Basic Cash Fare	\$1.25	
Adult Cash Transfer	\$0.25	
31-day Pass	\$45.00	\$43.00
31-day E&D Pass	\$22.00	\$20.00
1-day Pass	\$3.00	
7-day Pass	\$12.50	
Child Fare (6-12)	\$0.75	
Child Transfer	\$0.25	
Child Under 5	<i>free</i>	
Elderly & Disabled Cash Fare	\$0.60	
Elderly & Disabled Cash Transfer	\$0.10	
1-ride ticket	\$1.25	\$1.15
<b><u>ADA and Senior Service Van Fares</u></b>		
Zone 1	\$2.50	
Zone 2	\$3.00	
Zone 3	\$3.50	
Outside ¾-mi required ADA service areas	<i>Same as above</i>	
Pack of 20 Tickets valued at \$2.50 ea.	\$47.50	<i>(1 ride free)</i>
Pack of 10 Tickets valued at \$0.50 ea.	\$4.75	<i>(25¢ off)</i>

Source: PVTA

## 4. HISTORY OF PVTA FARE INCREASES

Following is a summary of PVTA fares since 1988. See Appendix 2 for detailed information by fare type.

**Fig. 4-1: PVTA Fare Increase History**

Years	Adult Bus Cash Fare	Bus Transfer	Monthly Bus Pass	ADA and Senior Van
1988-1996	\$0.65	Free	\$33.00	\$0.50 or donation
1997-2003	\$0.75	Free	\$36.00	\$0.50
2003-2008	\$1.00	\$0.25	\$40.00	\$2.00
2008-present	\$1.25	\$0.25	\$45.00	\$2.50

Source: PVPC "PVTA Fare Analysis" 2008

## 5. FARES AT PEER TRANSIT AGENCIES

PVTA's current cash fare and pass prices are significantly lower than those of peer regional transit agencies. See Appendix 1 for regional comparison of all Massachusetts RTAs. Following are PVTA's geographically closest peers.

**Fig. 5-1: FY2018 Fares at Peer Transit Agencies**

Agency	Adult Cash	Adult Fare on Electronic Media	Transfer	Monthly Pass	Paratransit Van single trip*
<b>PVTA</b>	<b>\$1.25</b>	<b>n/a</b>	<b>\$0.25</b>	<b>\$45.00</b>	<b>\$2.50/\$3.50</b>
CDTA Albany NY	\$1.75	\$1.30	None	\$52.00	\$2.50/\$3.50
CTTransit Hartford CT	\$1.75	n/a	Free	\$63.00	\$3.50/\$4.50
WRTA Worcester MA	\$1.75	\$1.55	Free	\$57.00	\$2.75/\$3.00
BRTA Berkshire County	\$1.75/\$4.50	\$1.40/\$3.60	Free	\$52.00/\$140.00	\$2.50/\$7.50
MBTA**	\$2.00	\$1.70	Free	\$55.00	\$3.15/\$5.25

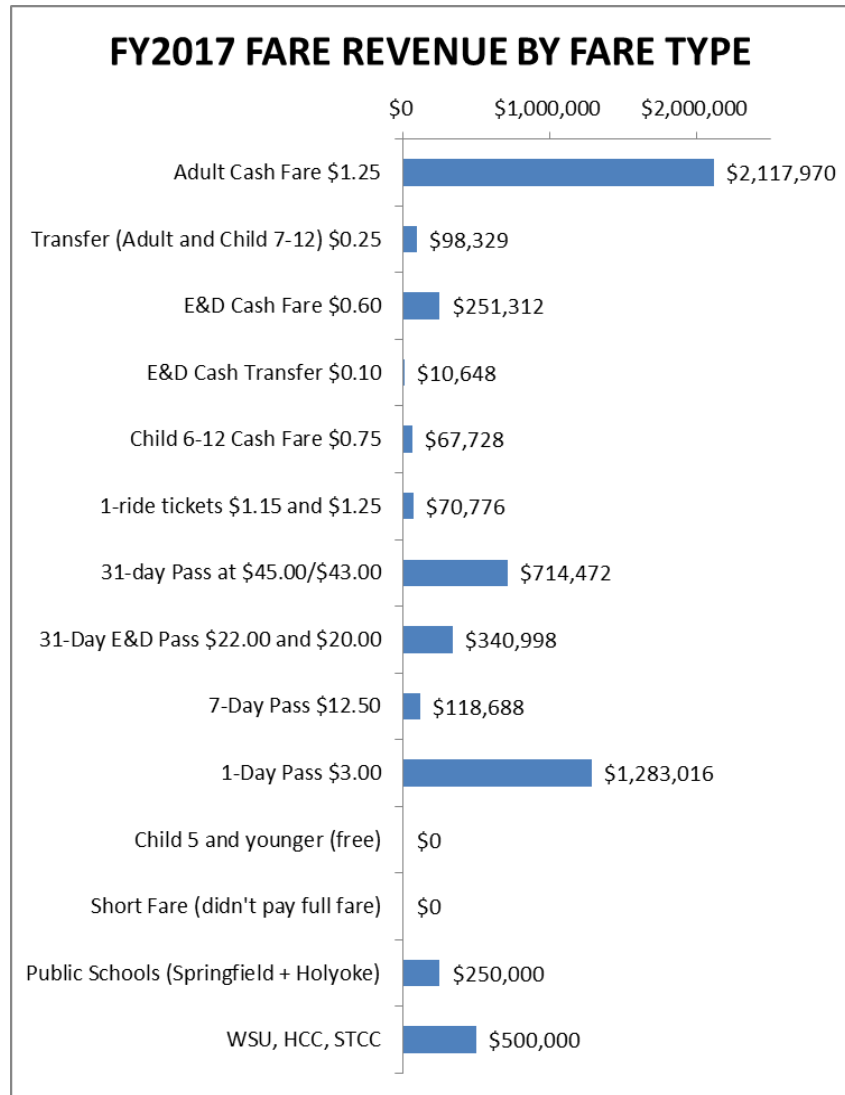
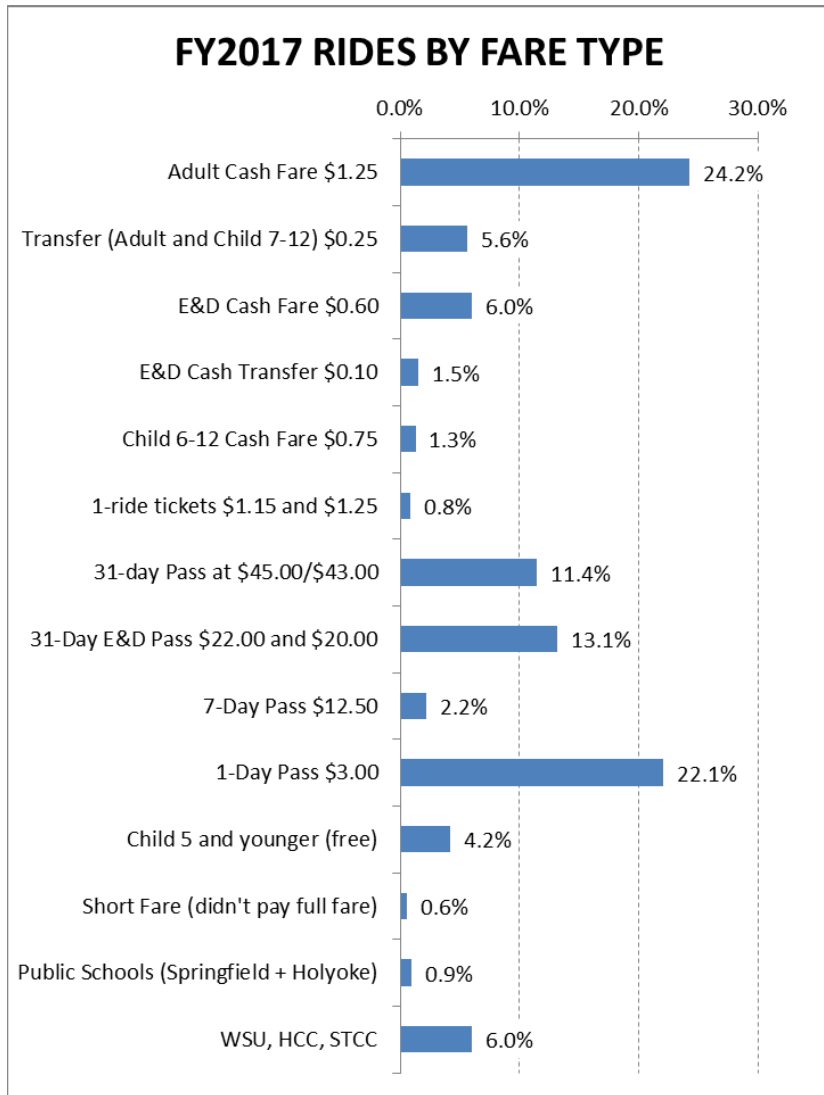
Source: Agency websites accessed 11/1/2017. \*Low/high ranges for shortest/longest trip distances by zone

## 6. FY2017 PVTA FIXED ROUTE RIDERSHIP AND REVENUE BY FARE TYPE

Ridership and associated revenue for PVTA fixed routes in FY2017 operated from the Springfield garage and the Northampton garage is shown below.

Ridership and revenue for Amherst-area routes operated by UMass Transit Services, which is approximately one-quarter of all PVTA's annual rides, is excluded from this study because buses on those routes are not equipped with fare boxes; fare revenue on Amherst area routes is instead collected under a proof of payment reimbursement agreement with academic institutions of that area. Also excluded is ridership and revenue from high school pass agreements for helper (extra) bus service with Holyoke and Springfield Public Schools that operate only on days that school is in session to assist the major bus lines in those municipalities.

**Fig. 6-1: FY2017 Ridership and Revenue by Fare Type**



Source: Farebox Report Data provided by Springfield Area Transit Company 9/27/2017

## 7. RIDERSHIP HISTORY AND REVENUE IMPACT ESTIMATION METHOD

The relationship between transit ridership and fare revenue is considered to be “inelastic.” This means that an increase in the price of the fare usually results in a decrease in ridership. When a bus fare is increased, some riders will choose to pay the higher fare and still make the same number of trips as they did before the increase. Other customers will choose to either ride less often or stop riding altogether, especially if other transportation alternatives are available to them.

It is difficult to predict with high confidence the relationship of fare increase to ridership loss in every circumstance. Every transit market and the transit systems that service it are different. Further, customer incomes and demographics are different in for every transit system. Existing levels of service also play a role in ridership after a fare change. In sum, there are countless individual decisions that influence transit customers’ changes in riding habits and fare payment in response to a fare change.

Studies of fare increases in transit systems in North America and Europe over many years in many markets and economic circumstances have found a generally reliable and consistent relationship between ridership and revenue after a fare change for cities and regions of 500,000 or fewer residents:

**For every 10% increase in the price of transit fares, ridership decreases 3.5%**

This relationship is called “price elasticity” and is defined as the percentage decrease in ridership in response to an increase in the price (fares) of a single percent. Because an increase in fares typically causes a decrease in ridership, the price elasticity factor is a negative number of -0.35. (Source: Transportation Cooperative Research Board Report #95: Transit Pricing and Fares Chapter 12 Traveler Response to Transportation System Changes. Washington DC. 2004.)

Following are the steps in the method that this study uses:

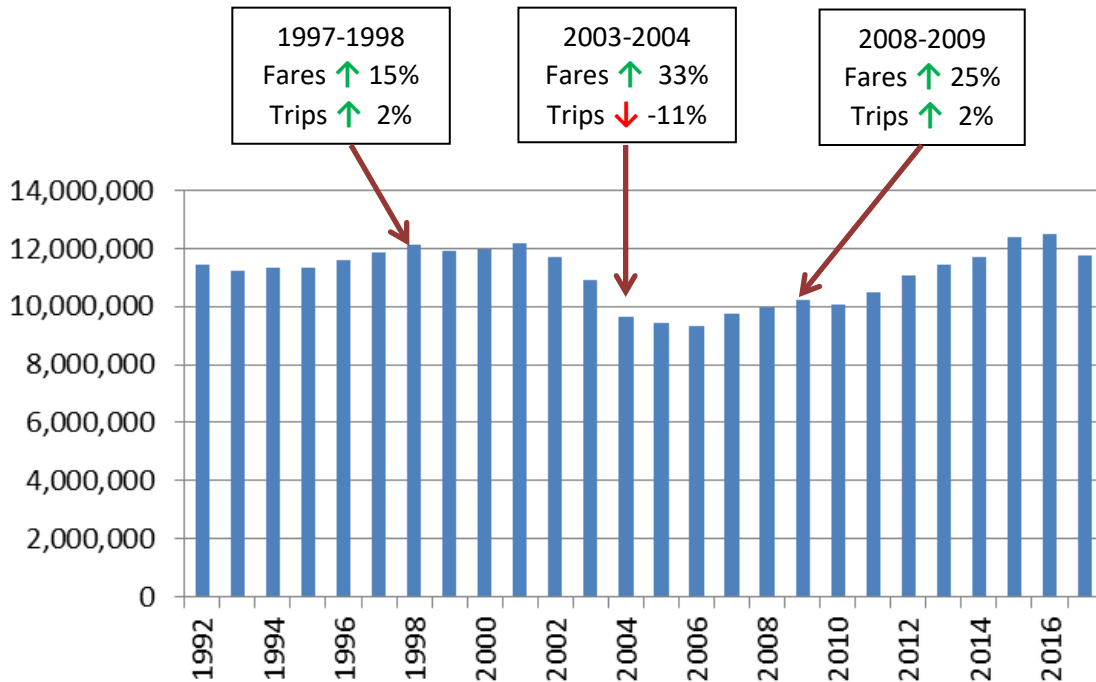
- Establish base year ridership for each fare product sold (excludes riders who use proof of payment system. Data was obtained from PVTA’s contract bus operators Springfield Area Transit, Valley Area Transit, and Hulmes Transportation.
- Establish base year fare revenue by fare media type. The base year for this study is FY2017, which is July 1, 2016 through June 30, 2017.
- Adjust base year ridership and revenue by fare media to estimate ridership change from non-fare price demand factors (i.e., service changes implemented in the fall of 2017 and anticipated in the summer of 2018) in fiscal year when new fares would be implemented.
- For multi-year estimates, readjust the baseline year for each year in which a fare change would be scheduled to take effect.



## 7.1 Fixed Route Fares

Two of the past three fare increases implemented by PVTA have not resulted in ridership losses at the rate predicted by the -0.35 elasticity factor. When PVTA raised fares 15% in 1997, ridership went up 12% in the following year. When PVTA raised fares by 33% in 2003 (from 75 cents to \$1.00), ridership fell 11.5% the next year, which is exactly what the standard elasticity model predicted. But in 2008, when PVTA raised fares by 25% (from \$1.00 to \$1.25), ridership actually went up 2.2%.

**Fig 7-1: PVTA Fixed Route Fare Increase and Ridership History**



Source: PVTA ridership and PVPC "PVTA Fare Analysis" 2008

There are many possible reasons why PVTA has defied the elasticity rule in the past:

- High unemployment in the region in the years that these fare increases were implemented.
- Onset of the Great Recession in 2008-2009.
- High proportion of transit dependency among PVTA riders, who have no other choice than the bus or van for making their trips.
- Unusually long intervals between fare increases, resulting in fare prices that are below those in other comparable transit markets.
- Rider sensitivity to fare changes tends to decrease with decreasing service area. While cities and regions of 1 million or more exhibit elasticity factors of -2.4% or less, regions of 500,000 and fewer residents typically show a -3.5% elasticity). PVTA is the largest regional transit authority in Massachusetts, with approximately 580,000 residents in its service area.



- Ridership is less sensitive to fare changes where auto travel is dominant. In the PVTA service area, more than 80% of all trips are made by private auto, with just 2-3% of trips by transit.
- Off-peak transit ridership is roughly twice the sensitivity to fare changes during peak periods. But many PVTA buses do not run during off-peak times (after 7PM weekdays or on weekends).

Further, ridership drops are most pronounced in the year immediately after the fare change. Over time, riders come back to the system. However, federal guidance for fare impact studies recommends use of the industry standard elasticity factor. This study does so, but with the understanding that the estimates produced by this method are widely variable, as PVTA's own fare increase history shows.

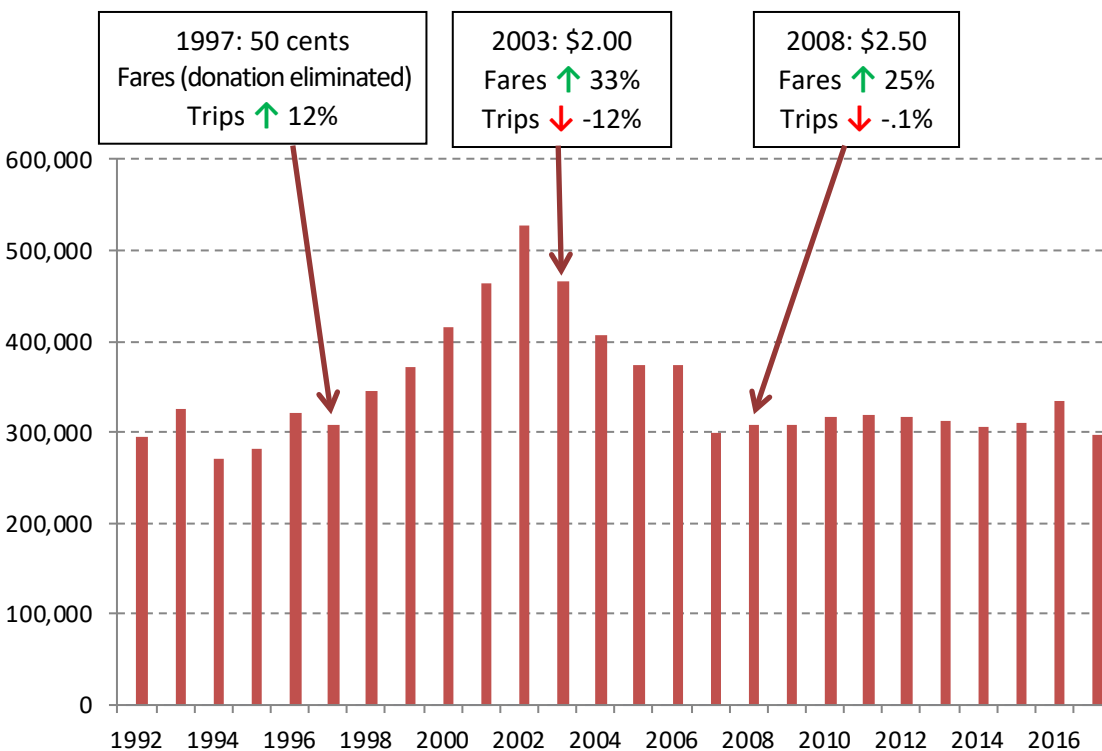
## 7.2 Paratransit Fares

Paratransit ridership is approximately 3% of all PVTA trips. Paratransit revenue is also a comparable proportion of all fares collected, at about 3% (approximately \$715,000 in FY2017).

Best available literature indicates that a similar inelasticity factor of  $-0.35$  (as was used to estimate fixed route impacts from a fare increase) is an appropriate approach to estimating impacts to paratransit ridership and revenue.

As with PVTA's fixed route services, past fare increases to paratransit fare prices have not always produced the results predicted by the inelasticity model. In 1997, PVTA did not increase the paratransit fare, but instead eliminated the option to pay a "donation"; ridership went up 12% the next year. In 2003, fares went up 33%, and ridership fell 12.0%, which is very close to the 11.6% drop that the model would predict. But in 2008, when the paratransit fare went up 25%, ridership stayed virtually level, even though the model said it should have fallen about  $-8.5\%$ .

**Fig. 11-1: PVTA Paratransit Fare Increase and Ridership History**



Source: PVTA ridership and PVPC "PVTA Fare Analysis" 2008

## 8. BASEYEAR RIDERSHIP AND REVENUE

The following table presents PVRTA fare box data for FY2017. Individual cash fares and passes are both counted by unit sold; however, rides are unlimited if a pass is used, which is why the total number of rides (6,178,893) and the total units sold (3,232,452) are different.

**Fig 8-1: Baseline Fixed Route Ridership and Fare Revenue**

FY2017 Actual				
Fixed Route				
CASH FARES	Value	Rides	Units Sold	Revenue
Adult basic	\$1.25	1,694,376	1,694,376	\$2,117,970
Transfer	\$0.25	393,316	393,316	\$98,329
E&D	\$0.60	418,853	418,853	\$251,312
E&D transfer	\$0.10	106,484	106,484	\$10,648
Child 7-12	\$0.75	90,304	90,304	\$67,728
<sup>1</sup> 1-ride tickets	\$1.19	59,478	59,478	\$70,776
<b>PASSES</b>				
<sup>2</sup> 31-day Regular	\$44.00	797,461	16,238	\$714,472
<sup>3</sup> 31-day E&D	\$21.00	918,649	16,238	\$340,998
7-day	\$12.50	155,015	9,495	\$118,688
1-day	\$3.00	1,544,959	427,672	\$1,283,016
<b>SUBTOTALS</b>		<b>6,178,895</b>	<b>3,232,454</b>	<b>\$5,073,937</b>
Paratransit (ADA and DAR)				
Fares	Value	Rides	Units Sold	Revenue
Zone 1	\$2.50	207,320	207,320	\$518,300
Zone 2	\$3.00	39,553	39,553	\$118,659
Zone 3	\$3.50	22,503	22,503	\$78,761
Beyond 3/4 mi*	n/a	n/a	n/a	n/a
<b>SUBTOTALS</b>		<b>269,376</b>	<b>269,376</b>	<b>\$715,720</b>
<b>2017 ACTUALS SUMMARY</b>				
		RIDES	UNITS	REVENUE
<b>TOTALS</b>		<b>6,448,271</b>	<b>3,501,830</b>	<b>\$5,789,657</b>
<sup>1</sup> Ave based on proportion of sales at \$1.15 and \$1.25				
<sup>2</sup> 31-day pass prices are midpoint of \$45 full price and \$43 discount				
<sup>3</sup> 31-day E&D pass prices ave. between \$22 full price and \$20 discount				

Source: Farebox Report Data provided by Springfield Area Transit Company 9/27/2017 and Fare Sales by Media provided by PVRTA 10/3/17

## 9. ADJUSTMENTS TO BASE YEAR RIDERSHIP AND REVENUE

The base year fare box data from FY2017 must be adjusted to reflect the ridership to the level at which is expected on the date that new fares begin to be charged (May, June or July 2018). To accomplish this, two basic adjustments have been made to the FY2017 base year ridership and revenue above:

1. **IN FY2018:** Ridership has been falling for the past 18 months at transit agencies throughout Massachusetts and the U.S. PVTA's ridership fell -6.6% from FY2016 to FY2017, and September 2016 to September 2017 year-over-year ridership shows that ridership is down another -8.8%. Also, PVTA implemented 15 major fixed route service reductions on August 27 and September 4, 2017 to make up a shortfall of about 5% (\$1.2 million) in the FY2018 operating budget due to a smaller than anticipated appropriation of state contract assistance (SCA) for operations. Because of variability in September ridership and ongoing work to mitigate the loss of service from the major service changes, it is being estimated that by the time FY2018 concludes on June 30, 2018, these two factors will reduce PVTA's fixed route ridership another 6.0%.
2. **FOR FY2019:** In addition, PVTA is anticipating an even larger operating budget shortfall for FY2019 that could be as much as \$3.1 million (13%) of the operating budget. Therefore, PVTA is now developing further and more significant service reduction options, many of which will need to be implemented by the time FY2019 begins on July 1, 2018. These reductions are still unknown; however, historically for PVTA each 1% point reduction in the operating budget has resulting is a roughly corresponding drop of 1% in ridership. However, in this case a ridership discount of 10% (rather than 13%) was applied to the FY2017 ridership baseline to produce the adjusted estimate below, as the actual amount of the FY2019 deficit and corresponding service reductions are not yet known.

**Fig 9-1: Adjusted Fixed Route Baseline Ridership and Revenue**

<b>FY2017 Adjusted Baseline (16% ridership loss expected 7/1/18)</b>					
Fixed Route					
	<b>CASH FARES</b>	<b>Value</b>	<b>Rides</b>	<b>Units Sold</b>	<b>Revenue</b>
	Adult basic	\$1.25	1,423,276	1,423,276	\$1,779,095
	Transfer	\$0.25	330,385	330,385	\$82,596
	E&D	\$0.60	351,837	351,837	\$211,102
	E&D transfer	\$0.10	89,447	89,447	\$8,945
	Child 7-12	\$0.75	75,855	75,855	\$56,892
<sup>1</sup>	1-ride tickets	\$1.19	49,960	49,960	\$59,452
<b>PASSES</b>					
<sup>2</sup>	31-day Regular	\$44.00	669,867	13,640	\$600,156
<sup>3</sup>	31-day E&D	\$21.00	771,665	13,640	\$286,438
	7-day	\$12.50	130,213	7,976	\$99,698
	1-day	\$3.00	1,297,766	359,244	\$1,077,733
	<b>SUBTOTALS</b>		<b>5,190,270</b>	<b>2,715,260</b>	<b>\$4,262,107</b>
Paratransit (ADA and DAR)					
	<b>Fares</b>	<b>Value</b>	<b>Rides</b>	<b>Units Sold</b>	<b>Revenue</b>
	Zone 1	\$2.50	174,149	174,149	\$435,372
	Zone 2	\$3.00	33,225	33,225	\$99,674
	Zone 3	\$3.50	17,013	17,013	\$59,543
	Beyond 3/4 mi*	\$3.50	1,890	1,890	\$6,616
	<b>SUBTOTALS</b>		<b>226,277</b>	<b>226,277</b>	<b>\$601,205</b>
<b>2017 BASELINE ADJUSTED TO EXPECTED FY2018</b>					
			<b>RIDES</b>	<b>UNITS</b>	<b>REVENUE</b>
	<b>TOTALS</b>		<b>5,416,547</b>	<b>2,941,537</b>	<b>\$4,863,312</b>
<sup>1</sup> Ave based on proportion of sales at \$1.15 and \$1.25					
<sup>2</sup> 31-day pass prices are midpoint of \$45 full price and \$43 discount					
<sup>3</sup> 31-day E&D pass prices ave. between \$22 full price and \$20 discount					

## 10. FARE CHANGE SCENARIOS FOR FY2019

Fare change options for FY2019 were developed to be comparable with the size of PVRTA's fare increases in the past (15% in 1997; 33% in 2003; and 25% in 2008). For this study, fare increase scenarios of 20%, 25%, and 50% are modeled. Following are summaries of the FY2019 fixed route scenarios shown in Figures 10-1, 10-2, and 10-3 on the following pages.

2017 ACTUALS SUMMARY				
		RIDES	UNITS	REVENUE
<b>TOTALS</b>		<b>6,448,271</b>	<b>3,501,830</b>	<b>\$5,789,657</b>

2017 BASELINE ADJUSTED TO EXPECTED FY2018				
		RIDES	UNITS	REVENUE
<b>TOTALS</b>		<b>5,416,547</b>	<b>2,941,537</b>	<b>\$4,863,312</b>

20% INCREASE PROPOSAL SUMMARY				
	RIDES	UNITS		REVENUE
	<b>5,031,962</b>	<b>2,728,720</b>		<b>\$5,413,690</b>
	<i>Δ Revenue from FY2017 Adjusted:</i>		<b>\$550,378</b>	<b>↑ 10.2%</b>
	<i>Δ Ridership From FY2017 Adjusted:</i>		<b>-384,585</b>	<b>↓ -7.6%</b>

25% INCREASE PROPOSAL SUMMARY				
	RIDES	UNITS		REVENUE
	<b>4,914,751</b>	<b>2,667,063</b>		<b>\$5,554,269</b>
	<i>Δ Revenue from FY2017 Adjusted:</i>		<b>\$690,957</b>	<b>↑ 12.4%</b>
	<i>Δ Ridership From FY2017 Adjusted:</i>		<b>-501,796</b>	<b>↓ -10.2%</b>

50% INCREASE PROPOSAL SUMMARY				
	RIDES	UNITS		REVENUE
	<b>4,447,855</b>	<b>2,414,899</b>		<b>\$5,986,780</b>
	<i>Δ Revenue from FY2017 Adjusted:</i>		<b>\$1,123,468</b>	<b>↑ 18.8%</b>
	<i>Δ Ridership From FY2017 Adjusted:</i>		<b>-968,692</b>	<b>↓ -21.8%</b>

The following three figures present ridership and revenue estimates for these three scenarios by fare type.

**Fig. 10-1: Average 20% Increase to All Fare in FY2019**

<b>20% Increase</b>						
Fixed Route						
Fare New	% increase	Δ Rides	Δ Units	Units New	Revenue New	
\$1.50	20%	-99,629	-99,629	1,323,647	\$1,985,470	
\$0.25	0%	-23,127	-23,127	307,258	\$76,815	
\$0.75	25%	-30,786	-30,786	321,051	\$240,788	
\$0.10	0%	-7,827	-7,827	81,620	\$8,162	
\$0.90	20%	-5,310	-5,310	70,545	\$63,491	
<sup>1</sup> \$1.40	18%	-3,086	-3,086	46,874	\$65,624	
<b>PASSES</b>						
<sup>2</sup> \$53.00	20%	-47,956	-977	12,664	\$671,166	
<sup>3</sup> \$25.00	19%	-51,444	-909	12,731	\$318,267	
\$15.00	20%	-9,115	-558	7,418	\$111,265	
\$3.60	20%	-90,844	-25,147	334,097	\$1,202,749	
		<b>-369,123</b>	<b>-197,355</b>	<b>2,517,905</b>	<b>\$4,743,796</b>	
					<i>Δ Revenue from FY2017 Adjusted:</i>	
					<b>\$481,689</b>	
					<i>Δ Ridership From FY2017 Adjusted:</i>	
					<b>-369,123</b>	
Paratransit						
Fare New	% increase	Δ Rides	Δ Units	Units New	Revenue New	
\$3.00	20%	-12,190	-12,190	161,959	\$485,876	
\$3.50	17%	-2,326	-2,326	30,899	\$108,147	
\$4.00	14%	-851	-851	16,162	\$64,649	
\$6.25	79%	-95	-95	1,796	\$11,222	
		<b>-15,461</b>	<b>-15,461</b>	<b>210,816</b>	<b>\$669,894</b>	
					<i>Δ Revenue from FY2017 Adjusted:</i>	
					<b>\$68,689</b>	
					<i>Δ Ridership From FY2017 Adjusted:</i>	
					<b>-15,461</b>	
<b>20% INCREASE PROPOSAL SUMMARY</b>						
		RIDES	UNITS	REVENUE		
		<b>5,031,962</b>	<b>2,728,720</b>	<b>\$5,413,690</b>		
				<i>Δ Revenue from FY2017 Adjusted:</i>	<b>\$550,378</b>	<b>↑ 10.2%</b>
				<i>Δ Ridership From FY2017 Adjusted:</i>	<b>-384,585</b>	<b>↓ -7.6%</b>
<sup>1</sup> Ave based on split of full and discount prices						
<sup>2</sup> 31-day pass prices are midpoint between full and discount prices						
<sup>3</sup> 31-day E&D pass prices are midpoint between full and discount prices						



**Fig 10-2: Average 25% Increase to All Fares in FY2019**

<b>25% Increase (Sent to Public Hearings Jan 24)</b>						
Fixed Route						
Fare New	% increase	Δ Rides	Δ Units	Units New	Revenue New	
\$1.60	28%	-139,481	-139,481	1,283,795	\$2,054,072	
\$0.25	0%	-32,378	-32,378	298,007	\$74,502	
\$0.75	25%	-30,786	-30,786	321,051	\$240,788	
\$0.10	0%	-7,827	-7,827	81,620	\$8,162	
\$0.90	20%	-5,310	-5,310	70,545	\$63,491	
<sup>1</sup> \$1.45	22%	-3,820	-3,820	46,140	\$66,902	
<b>PASSES</b>						
<sup>2</sup> \$55.00	25%	-58,613	-1,194	12,447	\$684,558	
<sup>3</sup> \$27.00	29%	-77,167	-1,364	12,276	\$331,452	
\$16.00	28%	-12,761	-782	7,194	\$115,110	
\$3.75	25%	-113,554	-31,434	327,810	\$1,229,288	
		<b>-481,697</b>	<b>-254,374</b>	<b>2,460,886</b>	<b>\$4,868,324</b>	
					<i>Δ Revenue from FY2017 Adjusted:</i>	
					<b>\$606,217</b>	
					<i>Δ Ridership From FY2017 Adjusted:</i>	
					<b>-481,697</b>	
Paratransit						
Fare New	% increase	Δ Rides	Δ Units	Units New	Revenue New	
\$3.15	26%	-15,848	-15,848	158,301	\$498,650	
\$3.65	22%	-3,023	-3,023	30,202	\$110,236	
\$4.15	19%	-1,106	-1,106	15,907	\$66,015	
\$6.25	79%	-123	-123	1,767	\$11,045	
		<b>-20,100</b>	<b>-20,100</b>	<b>206,177</b>	<b>\$685,944</b>	
					<i>Δ Revenue from FY2017 Adjusted:</i>	
					<b>\$84,739</b>	
					<i>Δ Ridership From FY2017 Adjusted:</i>	
					<b>-20,100</b>	
<b>25% INCREASE PROPOSAL SUMMARY</b>						
		RIDES	UNITS	REVENUE		
		<b>4,914,751</b>	<b>2,667,063</b>	<b>\$5,554,269</b>		
				<i>Δ Revenue from FY2017 Adjusted:</i>	<b>\$690,957</b>	<b>↑ 12.4%</b>
				<i>Δ Ridership From FY2017 Adjusted:</i>	<b>-501,796</b>	<b>↓ -10.2%</b>
<sup>1</sup> Ave based on split of full and discount prices						
<sup>2</sup> 31-day pass prices are midpoint between full and discount prices						
<sup>3</sup> 31-day E&D pass prices are midpoint between full and discount prices						

**Fig 10-3: Average 50% Increase to All Fares in FY2019**

<b>50% Increase</b>						
Fixed Route						
	<b>Fare New</b>	<b>% increase</b>	<b>Δ Rides</b>	<b>Δ Units</b>	<b>Units New</b>	<b>Revenue New</b>
	\$1.90	52%	-259,036	-259,036	1,164,240	\$2,212,056
	\$0.25	0%	-60,130	-60,130	270,255	\$67,564
	\$0.90	50%	-61,571	-61,571	290,266	\$261,239
	\$0.10	0%	-15,653	-15,653	73,794	\$7,379
	\$1.15	53%	-14,160	-14,160	61,695	\$70,950
<sup>1</sup>	\$1.75	47%	-8,229	-8,229	41,731	\$73,030
<b>PASSES</b>						
<sup>2</sup>	\$66.50	51%	-119,891	-2,441	11,199	\$744,717
<sup>3</sup>	\$32.00	52%	-141,472	-2,501	11,139	\$356,459
	\$18.75	50%	-22,787	-1,396	6,580	\$123,379
	\$4.50	50%	-227,109	-62,868	296,376	\$1,333,693
			<b>-930,038</b>	<b>-487,985</b>	<b>2,227,275</b>	<b>\$5,250,465</b>
						<i>Δ Revenue from FY2017 Adjusted:</i> <b>\$988,358</b>
						<i>Δ Ridership From FY2017 Adjusted:</i> <b>-930,038</b>
Paratransit						
	<b>Fare New</b>	<b>% increase</b>	<b>Δ Rides</b>	<b>Δ Units</b>	<b>Units New</b>	<b>Revenue New</b>
	\$3.75	50%	-30,476	-30,476	143,673	\$538,773
	\$4.25	42%	-5,814	-5,814	27,411	\$116,495
	\$4.75	36%	-2,127	-2,127	14,886	\$70,710
	\$6.25	79%	-236	-236	1,654	\$10,336
			<b>-38,653</b>	<b>-38,653</b>	<b>187,624</b>	<b>\$736,315</b>
						<i>Δ Revenue from FY2017 Adjusted:</i> <b>\$135,110</b>
						<i>Δ Ridership From FY2017 Adjusted:</i> <b>-38,653</b>
<b>50% INCREASE PROPOSAL SUMMARY</b>						
		<b>RIDES</b>	<b>UNITS</b>		<b>REVENUE</b>	
		<b>4,447,855</b>	<b>2,414,899</b>		<b>\$5,986,780</b>	
					<i>Δ Revenue from FY2017 Adjusted:</i> <b>\$1,123,468</b>	<b>↑ 18.8%</b>
					<i>Δ Ridership From FY2017 Adjusted:</i> <b>-968,692</b>	<b>↓ -21.8%</b>
<sup>1</sup> Ave based on split of full and discount prices						
<sup>2</sup> 31-day pass prices are midpoint between full and discount prices						
<sup>3</sup> 31-day E&D pass prices are midpoint between full and discount prices						

### 11. MULTI-YEAR FARE INCREASE SCENARIOS

In addition to increasing the fare for FY2019, the PVTA Advisory Board has the option of increasing fares in future years on a regular and predictable basis as part of a single fare increase action.

Two multi-year fare increase scenarios are presented below: one with an annual escalation of approximately 5%, and a second with an annual increase of 10%. The prices for cash at fare box products are rounded to the nearest 25-cent increment where feasible. However, because it is not possible to forecast with reliability PVTA’s ridership and revenue three years hence, estimates of the impacts in the years that future fare increases would take place are not possible. Instead, that analysis would be performed prior to the effective dates, which would be (assuming implementation every 3 years):

Fare increases would be effective on:

- July 1, 2021 for FY2022
- July 1, 2024 for FY2025

Any discounts that may be offered for use of electronic fare media or mitigation for low-income customers are not included, as they are currently unknown.

Fig. 12-1 below shows a scenario that assumes a 20% increase starting in FY2019 and then annual increases of 5% in all fares, implemented every 3 years. This is approximately the rate at which the Massachusetts legislature allows the Massachusetts Bay Transportation Authority to increase its fares (implemented every two years).

**Fig. 12-1: Multi-year Scenario 1: 20% Fare Increase in FY2019 and 5% Annually Thereafter**

	2018	2019	2020	2021	2022	2023	2024	2025
<b>Buses</b>								
Adult Cash	\$1.25	\$1.50	\$1.50	\$1.50	\$1.75	\$1.75	\$1.75	\$2.00
Transfer	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25
E&D Cash	\$0.60	\$0.75	\$0.75	\$0.75	\$0.85	\$0.85	\$0.85	\$1.00
E&D Transfer	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10
Child	\$0.75	\$0.90	\$0.90	\$0.90	\$1.00	\$1.00	\$1.00	\$1.25
1-Ride Ticket	\$1.15	\$1.25	\$1.25	\$1.25	\$1.50	\$1.50	\$1.50	\$1.50
31-day Regular	\$44.00	\$54.00	\$54.00	\$54.00	\$63.00	\$63.00	\$63.00	\$72.00
31-day E&D	\$21.00	\$26.00	\$26.00	\$26.00	\$30.00	\$30.00	\$30.00	\$34.00
7-Day	\$12.50	\$15.00	\$15.00	\$15.00	\$17.50	\$17.50	\$17.50	\$20.00
1-Day	\$3.00	\$4.00	\$4.00	\$4.00	\$4.50	\$4.50	\$4.50	\$5.00
<b>ADA and Senior Service Vans</b>								
Zone 1	\$2.50	\$3.00	\$3.00	\$3.00	\$3.50	\$3.50	\$3.50	\$4.00
Zone 2	\$3.00	\$3.50	\$3.50	\$3.50	\$4.00	\$4.00	\$4.00	\$4.50
Zone 3	\$3.50	\$4.00	\$4.00	\$4.00	\$4.50	\$4.50	\$4.50	\$5.00
<i>% Increase over prior year</i>		20%	0%	0%	17%	0%	0%	14%

Fig. 12-2 presents a scenario in which fares are raised 10% per year, implemented every three years.

**Fig. 12-2: Multi-year Scenario 2: 20% Fare Increase in FY2019 and 10% Annually Thereafter**

	2018	2019	2020	2021	2022	2023	2024	2025
<b>Buses Lines</b>								
Adult Cash	\$1.25	\$1.50	\$1.50	\$1.50	\$2.25	\$2.25	\$2.25	\$3.00
Transfer	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25	\$0.25
E&D Cash	\$0.60	\$0.75	\$0.75	\$0.75	\$1.00	\$1.00	\$1.00	\$1.25
E&D Transfer	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10	\$0.10
Child	\$0.75	\$0.90	\$0.90	\$0.90	\$1.20	\$1.20	\$1.20	\$1.50
1-Ride Ticket	\$1.15	\$1.25	\$1.25	\$1.25	\$1.65	\$1.65	\$1.65	\$2.00
31-day Regular	\$44.00	\$54.00	\$54.00	\$54.00	\$70.00	\$70.00	\$70.00	\$91.00
31-day E&D	\$21.00	\$26.00	\$26.00	\$26.00	\$33.00	\$33.00	\$33.00	\$43.00
7-Day	\$12.50	\$15.00	\$15.00	\$15.00	\$19.50	\$19.50	\$19.50	\$25.00
1-Day	\$3.00	\$4.00	\$4.00	\$4.00	\$5.00	\$5.00	\$5.00	\$6.75
<b>ADA and Senior Service Vans</b>								
Zone 1	\$2.50	\$3.00	\$3.00	\$3.00	\$4.50	\$4.50	\$4.50	\$6.00
Zone 2	\$3.00	\$3.50	\$3.50	\$3.50	\$5.00	\$5.00	\$5.00	\$6.50
Zone 3	\$3.50	\$4.00	\$4.00	\$4.00	\$5.50	\$5.50	\$5.50	\$7.00
<i>% Increase over prior year</i>		20%	0%	0%	30%	0%	0%	30%

The PVTA Advisory Board could modify any aspect of this multi-year scenario, such as annual rate of increase, years between implementation, staggered implementation of fare types, extension of the period covered (i.e., 10 years versus 7), exemptions or discounts for low-income customers, or triggers based on the appropriation of anticipated state contract assistance.

## REFERENCES

American Public Transportation Association. Fare Elasticity and Its Application to Forecasting Transit Demand. Washington DC. 1991 <[www.apta.com/resources/Documents/Pham\\_Linsalata\\_Fare\\_Elasticity\\_1991.pdf](http://www.apta.com/resources/Documents/Pham_Linsalata_Fare_Elasticity_1991.pdf)>

Federal Transit Administration. Guidance Circular 4702.1B: title VI Requirements and Guidelines for Federal Transit Administration Recipients. October 1, 2012. <[http://www.fta.dot.gov/documents/Title\\_VI\\_Circular\\_4702.1B.pdf](http://www.fta.dot.gov/documents/Title_VI_Circular_4702.1B.pdf)>

Litmann, Todd. "Transit Price Elasticities and Cross-Elasticities," *Journal of Public Transportation*. Vol. 7, No. 2, 2004, pp. 37-58. <[www.nctr.usf.edu/jpt/pdf/JPT\\_7-2\\_Litman.pdf](http://www.nctr.usf.edu/jpt/pdf/JPT_7-2_Litman.pdf)>

Massachusetts Bay Transportation Authority. Title VI Report. October 2017. <[www.ctps.org/data/pdf/programs/equity/2017\\_MPO\\_Title\\_VI/2017\\_MPO\\_Title\\_VI\\_Report.pdf](http://www.ctps.org/data/pdf/programs/equity/2017_MPO_Title_VI/2017_MPO_Title_VI_Report.pdf)>

Pioneer Valley Planning Commission. "PVTA Fare Impact Analysis." Technical Memo. March 10, 2008.

Pioneer Valley Transit Authority. Title VI Fare Equity Analysis. April 12, 2012. <[www.pvta.com/media/pdfs/planning/PVTA%20Fare%20Equity%20Analysis%2004-12-12.pdf](http://www.pvta.com/media/pdfs/planning/PVTA%20Fare%20Equity%20Analysis%2004-12-12.pdf)>

Transportation Cooperative Research Board. TRCB Report 95: Traveler Response to Transportation System Changes. Chapter 12—Transit Pricing and Fares. Washington DC. 2004. [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_95c12.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c12.pdf)

Transportation Planning Capacity Building (TPCB) Peer Program. "Effective Practices in Title VI Transit Equity Analysis for Major Transit Service and Fare Changes." May 24, 2011. <[http://www.planning.dot.gov/Peer/Tennessee/APTA\\_Equity\\_Roundtable\\_05-11.pdf](http://www.planning.dot.gov/Peer/Tennessee/APTA_Equity_Roundtable_05-11.pdf)>

## APPENDIX 1: PVTA CUSTOMER INFORMATION

PVTA customers are highly dependent on public transit. “Transit dependent” is generally defined as having no means other than public transit to make a typical trip. A total 68% of PVTA riders surveyed said they have “No other way to make my trip” (PVTA 2015-2016 onboard rider surveys, n=2,798).

FTA defines transit dependency as: 1) people without private transportation or private car; 2) elderly age 65 and older; 3) youths under age 18; and 4) persons below poverty or median income. With respect to these characteristics, PVTA’s most recent customer surveys found:

- 52% of PVTA customers do not own or have access to a private auto.
- 3.7 % are age 65 or older.
- Approximately one-fifth are 18 or younger.
- More than half (55.2%) of PVTA riders have incomes at or below the federal poverty level.

Therefore, it is reasonable to conclude that the majority of PVTA riders are transit dependent. Based on ridership, fare payment data, and customer trip frequencies reported on rider surveys, there are an estimated 15,000 to 20,000 people in the region who use PVTA on a regular basis (at least once a week).

### Fixed Route Customer Demographics

Demographic information presented in this section was compiled from surveys of 2,799 riders performed in 2015 (Hampden County PVTA routes) and 2016 (Hampshire and Franklin County routes). Additional information is presented from 2014 American Community Survey five year estimates.

#### Income

PVTA customers on average have personal incomes that are significantly less than the regional average. In fact, the majority of PVTA customers report personal income that is at or below the federal poverty level, which is shown below for 2015.

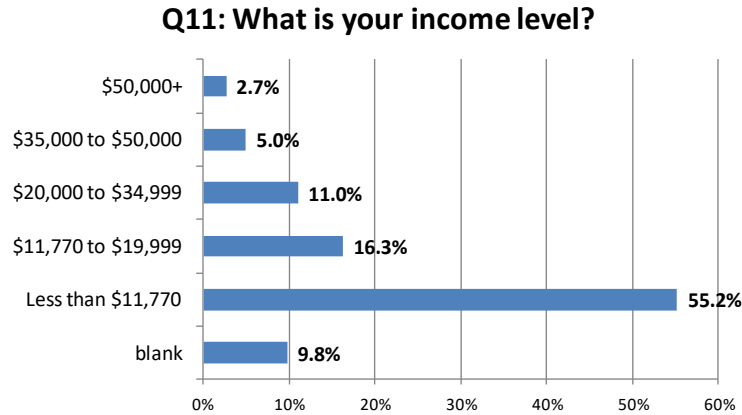
**Fig A2-1: Federal Poverty Thresholds 2015**

Household Size	Annual Income
1 person	\$11,770
2 people	\$15,930
3 people	\$20,090
4 people	\$24,250
5 people	\$28,410
6 people	\$32,730

*Source: U.S. Department of Health and Human Services*

Results from the 2015 and 2016 PVTA Customer Survey presented below show that more than 55% of PVTA customers are at or below the federal poverty level.

**Fig. A2-2: PVTA Customers' Annual Income**



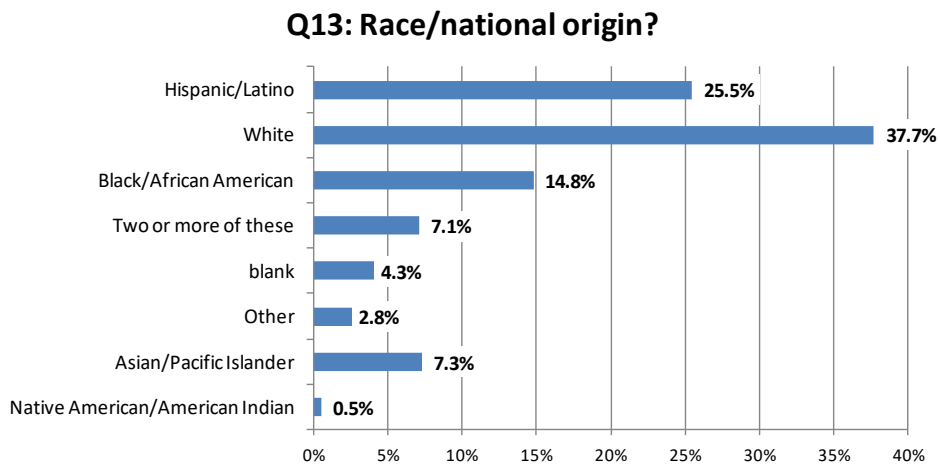
*PVTA On Board Customer Surveys 2015 and 2016. N=2,798*

This finding is generally consistent with U.S. Census American Community Survey 2014 five-year estimates for income, which report that 55% of commuters who take transit to work make less than \$10,000/year. Another 29% earn between \$10,000-14,999, of which approximately 6% can reasonably be estimated to be below the \$11,700 federal poverty threshold shown below. Therefore, the estimated proportion of transit commuters only in the region below the poverty level is at least **61%**.

### Race and Ethnicity

People of color are the majority of PVTA riders, constituting at least 62% of customers surveyed in 2015 and 2016.

**Fig A2--3: Racial Characteristics of PVTA Customers**



*PVTA On Board Customer Surveys 2015 and 2016. N=2,798*



The proportion of transit commuters in the PVTA service region who are people of color is approximately four times greater than the proportion of persons of color in the region as a whole.

**Fig A2-4: Regional Commuting by Public Transportation by Race**

Race	Proportion of Commuters Who Take Public Transportation to Commute to Work		
	Hampden County	Hampshire County	PVTA Riders Who Use Bus to Commute to Work (25% of riders surveyed)
American Indian/Alaska Native	0.4%	0.0%	0.6%
Asian	1.4%	24.4%	3.1%
Black/African American	27.5%	3.1%	19.8%
Hawaiian/Pacific Islander	0.0%	0.0%	0.0%
Hispanic/Latino	41.8%	9.5%	33.8%
White	45.5%	70.1%	29.8%
Another Race	20.2%	0.6%	3.3
Two or more races	5.1%	1.7%	9.7%

Source: American Community Survey 2014 five-year estimates; PVTA Customer Surveys 2015 and 2016

### Language and English Proficiency

For languages spoken, the proportion of PVTA customers surveyed in 2015-2016 who said they speak only Spanish was 1.1%. This is much lower than the regional average of 6.3%. However, 6% of PVTA riders who took the survey chose the Spanish language form, which suggests the actual proportion of PVTA customers who speak only Spanish is greater than 1.1% and probably closer to the regional average of 6.3%.

Also, in Hampden County (where two-thirds of PVTA riders live) the proportion of PVTA customers who speak both Spanish and English is nearly double (31.5%) the countywide average (16.8%). While the PVTA survey was not able to ask how well bilingual customers speak English, the ACS 2014 five-year estimates for Hampden County suggests that approximately one-third of Spanish/English bilingual persons “Do Not Speak English Well or At All.” Therefore, it is likely that at least one-third of PVTA customers in Hampden County (approximately 10%) also do not speak English well or at all. It is for this critical reason that PVTA provides all rider information in Spanish, as well as English.