Appendix A PVTA Service Changes (2014–2019)

Service Adjustments – Effective June 22, 2014

- Add 7 trips to G1 Sundays to extend evening hours.
- Add 6 trips to G2 Sunday to extend morning hours.
- Add 4 trips to G3 Saturday to extend morning hours and extend Sunday route to serve area from SBT to Westford Circle (Sunday previously ran northern portion of route only).
- Update B6 routing in Ludlow, add 8 weekday trips to/from Health South, extend Sunday service to Eastfield Mall.
- Add 3 trips to B7 Sunday to extend evening hours.

CSA I – Effective August 24, 2014

- Discontinue Routes G1E, G8, B13, and B15.
- Simplify routing/eliminate deviations on Routes G2, G3, G5, R14, B17, P20, P21, B23, and R24.
- Add new Routes R10s, R14E, R29, X90, and X92.
- Add new route X98 from Salvo House to River Valley Coop (VATCo).
- Eliminate Routes 32 and 37 (UMTS).
- Add new Routes 33 and 36 (UMTS).

CSA I Continued – Effective December 7, 2014

- Add trips and/or running time to portions of Routes G5, B6, R14, and P21E.
- Discontinue Routes G19, R22, and R25.
- Add Route C52 (Tiger Trolley) and expand Route X90 into Holyoke.
- Simplify P21 routing in Holyoke.

CSA II – Effective August 30, 2015

- Separate Routes P20E and P21E into their own schedules.
- Update routing on G1 (eliminate double loops in Canon Circle/5 Town Plaza area), B4 (service Wason Medical Offices), B7 (use State and Main), P21 (use Willimansett Bridge), and P11 and B23 (to use Doyle Drive).
- Decrease frequency of Route 10s from 20 minutes to 30 minutes. Increase frequency of Route P20 from 30 minutes to 20 minutes on weekdays and Saturdays. Increase frequency of Route P21 from 45 minutes to 30 minutes on weekdays and Saturdays.
- Add running time to Route R14 on Saturdays.
- Add running time to Route B4 weekdays, reducing frequency from 30 minutes to 40minutes (effective December 20, 2015).

Other Adjustments of Significance

- Run Route B7 weekday at consistent 15-minute frequency all day (effective March 20, 2016).
- Relocate central hub from SBT to Union Station (effective June 25, 2017).

- Modify Route 36 to serve North Pleasant Street stops at UMass on southbound trips.
- Modify Route X98 to terminate at Big Y instead of River Valley Coop.

Minor Service Reductions – Effective August 27, 2017

- Re-write Route G3 weekday and Route G5 weekday and Saturday schedules.
- Eliminate Route R14E, Route P20E weekday, Route B23 Saturday, Tiger Trolley, Route R27, and five weekend trips on Route R29. Eliminate Holyoke portion of Route X90 on Sundays. Eliminate early morning trips from Routes B4 and X90.
- Incorporate Agawam Industrial Park trips into Route R14 schedule. Incorporate one Wilbraham trip into Route B17 schedule.
- Update Route P21E routing to receive grant funding.
- Eliminate last trip on Route B12 (effective December 17, 2017).
- Eliminate Route M40, add express trips to Route B43.
- Reduce Route X98 to three round trips per day.
- Eliminate weekend service on Routes 45 and 46, reduce weekday trips on Route 46.
- Modify Route 39 due to detour on Bay Road (temporary).

Fare increase effective July 1, 2018

Minor Service Reductions – Effective August 26, 2018

- Eliminate service to Wilbraham.
- Reduce span of service by 3 hours on Route R24 and update routing; eliminate Route R24 Saturday service.
- Reduce frequency of Route X92 from 45 minutes to 60 minutes and add service to R.J. Senior Center.
- Reduce service level from Saturday service to Sunday service on Columbus Day and Veterans Day.
- New MGM Shuttle (The Loop) operates Wednesday through Sunday. Funded by MGM.
- Combine Ware and Palmer shuttles into new Ware-Palmer service.
- Reduce weekday trips on Route 46 (now interlined with Route 31).
- Add Hampshire Mall stop to Route 39 (limited trips).
- Add Wilbraham Shuttle.
- Replace Route X98 with Survival Shuttle.

Service Adjustments and New Garage opening on Cottage Street – Effective April 14, 2019

- New timetable and routing on The Loop
- G2 longer running times in the afternoon and decreased frequency from 20 minutes to 30 minutes.
- New Route G2E runs on weekdays

Service Improvements due to DOT Grant – Effective June 23, 2019

- New Route B7s runs on weekdays.

- Re-write Route G1 weekday schedule to allow longer running times.
- Add trips to weekday Route P20E.
- Modify Route R44 to operate as a loop route via Rocky Hill Cohousing (weekdays only).
- Temporary reduction in frequency for Routes 33, 34, and 35 due to UMTS driver shortage (September to December 2019).

Appendix B Illustrative FY 2015–FY 2019 Performance Results and Peer Review

Performance Evaluation

To provide historical context for PVTA performance since the PVTA 2014 CSA, this appendix provides information on PVTA systemwide performance for fixed route and demand response modes for FY 2015 through FY 2019. (FY 2020 and FY 2021 results are covered under the Bilateral PVTA/MassDOT MOU discussed in Chapter 6.) Although prior to FY 2020 PVTA did not have a bilateral MOU with MassDOT with mutually agreed upon key performance metrics, baselines, and targets, the FY 2015-FY 2019 data are presented here in comparison to the FY 2020-FY 2021 MOU baselines and targets for illustrative purposes. A brief performance comparison with peer transit systems is also included in this appendix.

This section evaluates the performance of the system and each route.[55] Five data sets were collected from FY 2019 records to analyze route diagnostics for service effectiveness and financial performance: ridership, revenue hours, revenue miles, operating cost, and revenues (Table 73). In FY 2019, PVTA had a systemwide ridership of 10,381,520, revenue hours of 556,042, revenue miles of 7,643,208, operating cost of $43,281,904, and revenue of $7,752,485.[56] Fixed route and paratransit revenue increased due to fare increases that went into effect on July 1, 2018 (as outlined in Table 15). Shuttle service income decreased due to the impact of service reductions.

Table 73. Operating Data by Route (FY 2019)

Route	Ridership	Revenue Hours	Revenue Miles	Operating Cost	Revenue Generated
G1	888,976	34,013	407,018	$3,194,779	$880,086
G2	745,671	25,252	279,559	$2,194,323	$738,215
G2E	3,017	342	5,550	$43,555	$2,987
G3	287,376	12,364	117,421	$921,664	$271,222
B4	130,504	4,698	47,759	$374,864	$123,717
G5	85,531	5,258	58,963	$462,822	$77,533
B6	390,373	18,080	247,613	$1,943,564	$391,979
B7	971,620	29,181	301,215	$2,364,314	$961,904
B7S	1,825	75	693	$5,440	$1,807
10S	17,368	1,583	19,563	$153,555	$17,194
R10	126,527	7,230	110,876	$870,377	$125,262
P11	38,747	1,764	38,815	$304,698	$38,360

[55] Routes that operate different service levels during regular and reduced/summer service are analyzed as separate routes. If it is a reduced service route, an R or ns has been placed after the number to denote it.
[56] Data may differ from previous tables as this is aggregated based on individual route data reported and does not include school helper routes.

Route	Ridership	Revenue Hours	Revenue Miles	Operating Cost	Revenue Generated
B12	5,662	780	19,401	$152,259	$98,178
R14	86,472	5,668	88,792	$696,949	$85,607
B17	130,056	6,700	84,966	$666,910	$128,755
P20	807,847	30,422	377,533	$2,963,352	$813,048
P20E	20,835	1,259	30,040	$235,791	$20,627
P21	448,059	14,945	187,191	$1,469,305	$449,060
P21E	105,677	3,545	76,914	$603,724	$104,620
B23	93,698	6,328	94,303	$740,198	$99,904
R24	31,572	2,246	36,661	$287,745	$25,746
R29	38,961	4,523	75,464	$592,334	$38,571
30	792,310	10,231	109,140	$428,920	$78,353
31	695,205	10,249	169,836	$667,455	$78,491
33	140,757	3,561	37,312	$146,247	$27,271
34	275,285	4,836	47,095	$185,083	$37,036
35	418,963	6,058	62,705	$246,431	$46,394
36	28,379	1,634	23,903	$93,939	$12,514
38	221,530	8,474	145,878	$573,301	$64,897
39	52,547	4,569	74,620	$293,257	$34,991
39E	10,327	1,218	27,271	$214,229	$11,582
R41	85,951	6,048	104,547	$820,606	$85,091
R42	62,777	4,755	87,615	$687,703	$62,149
B43	410,239	10,945	148,283	$1,164,022	$460,069
B43ns	129,608	5,281	69,089	$542,349	$128,312
R44	86,995	8,592	83,686	$656,871	$86,125
51	8,776	343	1,835	$7,215	$2,627
45	33,125	1,372	26,187	$72,937	$10,507
46	1,395	143	3,513	$17,237	$1,095
B48	122,192	5,841	124,213	$974,977	$120,970
X90	274,094	23,691	323,560	$2,539,697	$271,353

Route	Ridership	Revenue Hours	Revenue Miles	Operating Cost	Revenue Generated
X92	121,675	6,543	74,136	$581,911	$120,458
Loop	13,041	2,009	13,642	$107,071	$171,078
NE	11,997	2,953	45,921	$164,748	$10,218
OWL	34,637	738	11,070	$86,883	$127,184
S	1,216	552	1,833	$35,093	N/A
WP	12,581	2,834	66,778	$158,109	$9,321
R10 R	89,195	6,359	89,293	$700,950	$88,303
P11 R	1,511	141	2,953	$23,181	$1,495
31 R	201,895	4,167	71,303	$280,221	$32,081
30 R	203,977	4,128	48,639	$191,151	$31,781
45 R	15,487	947	18,559	$72,937	$7,291
46 R	1,831	178	4,386	$17,237	$1,370
38 R	14,435	686	11,947	$46,952	$6,871
39 R	3,612	475	8,455	$33,228	$5,904
33 R	86,159	3,237	33,805	$132,854	$24,921
ADA and Senior Van	251,101	179,973	2,710,566	$8,963,922	$794,068*
W	561	N/A	N/A	$12,083	N/A
Northampton Senior Van	3,571	1,687	16,512	$26,900	N/A
Agawam Senior Van**	299	109	1,323	$1,765	N/A
Tri-Town Trolley Senior Van	5,910	4,229	35,489	$69,710	N/A
Total System	**10,381,520**	**556,042**	**7,643,208**	**$43,281,904**	**$7,752,485**

Source: PVTA Financial FY 2019 Monthly Ridership, Hours, and Miles by Route

**Revenue generated includes all demand response senior vans (region-wide, Northampton, Agawam, and Tri-Town Trolley).*

*** Service was implemented at the end of FY 2019 (June) and is not inclusive of the entire fiscal year.*

On-Time Performance

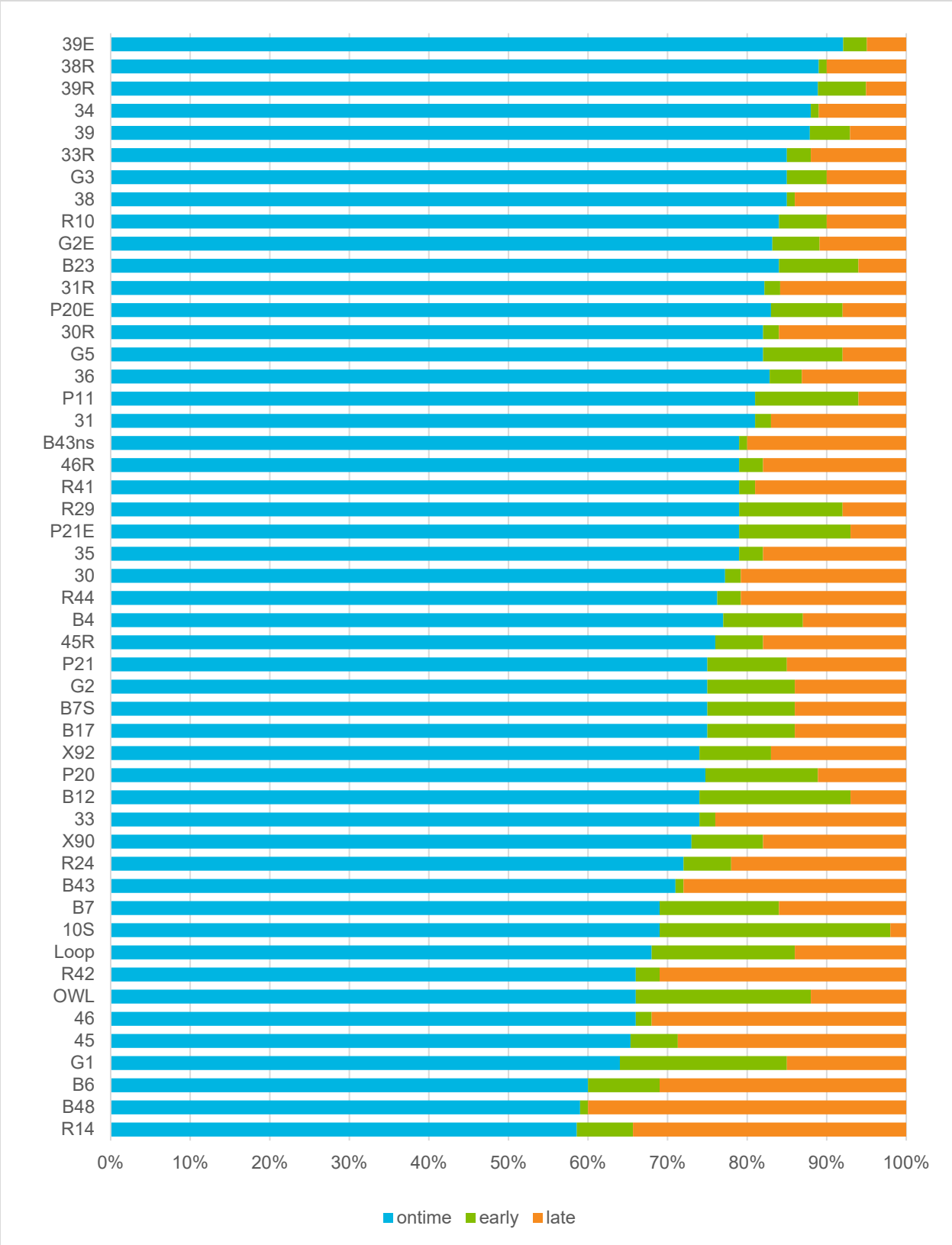
PVTA defines the OTP/schedule adherence metric for fixed routes as “on-time” if the bus departs within 5 minutes of scheduled departure time and not more than 1 minute early from scheduled timepoints (also known as time points) along a route. PVTA routes have at least two timepoints, the termini at either end[57] as well as to other major stops on the route. While some transit agencies calculate route OTP only at one location along the route, this can make performance look better than it is because it does not account for intermediate stops’ performance. It is frequently monitored at a termini where layover time is built into the schedule to account for traffic and allow drivers to take short breaks. By evaluating OTP at several timepoints along routes it allows PVTA to better monitor performance and adjust schedules. As a result it can show lower OTP as intermediate timepoints often lack layover built in.

Figure 98 through Figure 100 illustrate the OTP for each fixed route (including reduced service routes) on weekdays, Saturdays, and Sundays. OTP data are not available for Routes NE and WP as these routes operate with vehicles that are not equipped with the needed technology. On weekdays the average OTP is 73 percent (10 percent early, 17 percent late). Saturdays have a slightly higher OTP average of 75 percent, and Sundays at 78 percent. The average percent of early arrivals on weekdays is 10 percent, with three routes having over 20 percent early arrivals. Routes R14, B48, B6, 45, 46, R42, and B43 on weekdays have over 25 percent of trips as late arrivals. On weekends the percentage of late arrivals decrease by over 5 percent on Routes 35, B6, B48, P21, R14, and R42, causing an increase in OTP. Overall weekend OTP is better than on weekdays with the exception of Routes 30, 39, B43ns, and R10, which have over a 10 percent decrease in OTP.

PVTA defines the OTP/schedule adherence metric for demand response service (including both ADA paratransit and non-ADA demand response services) as “arrives within a 20-minute arrival window, defined as up to 20 minutes before and up to 20 minutes after a requested drop-off time.”

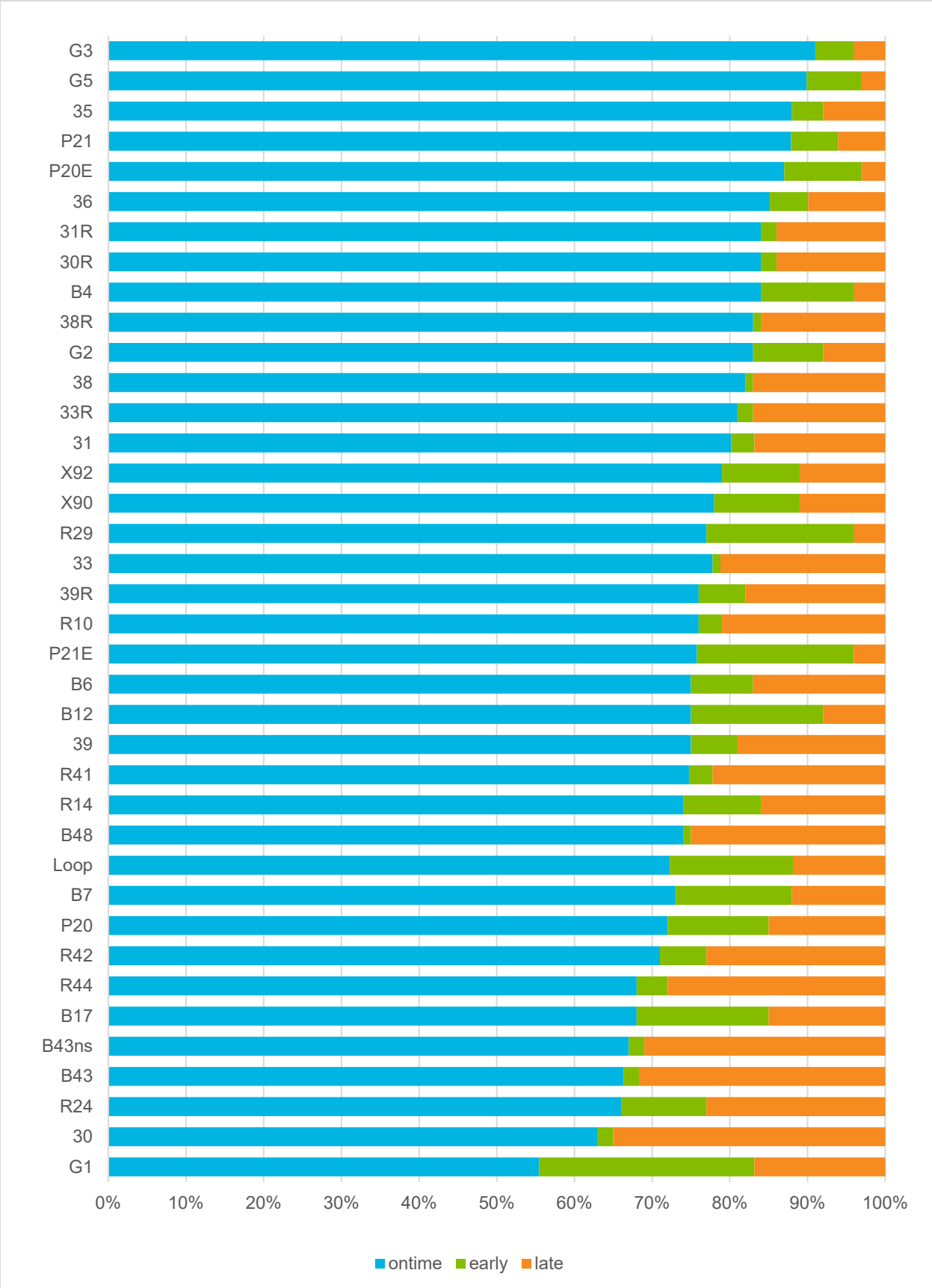
[57] For non-linear routes there are at least two timepoints evenly spaced.

Figure 98. Fixed Route Weekday On-Time Performance by Route (FY 2019)



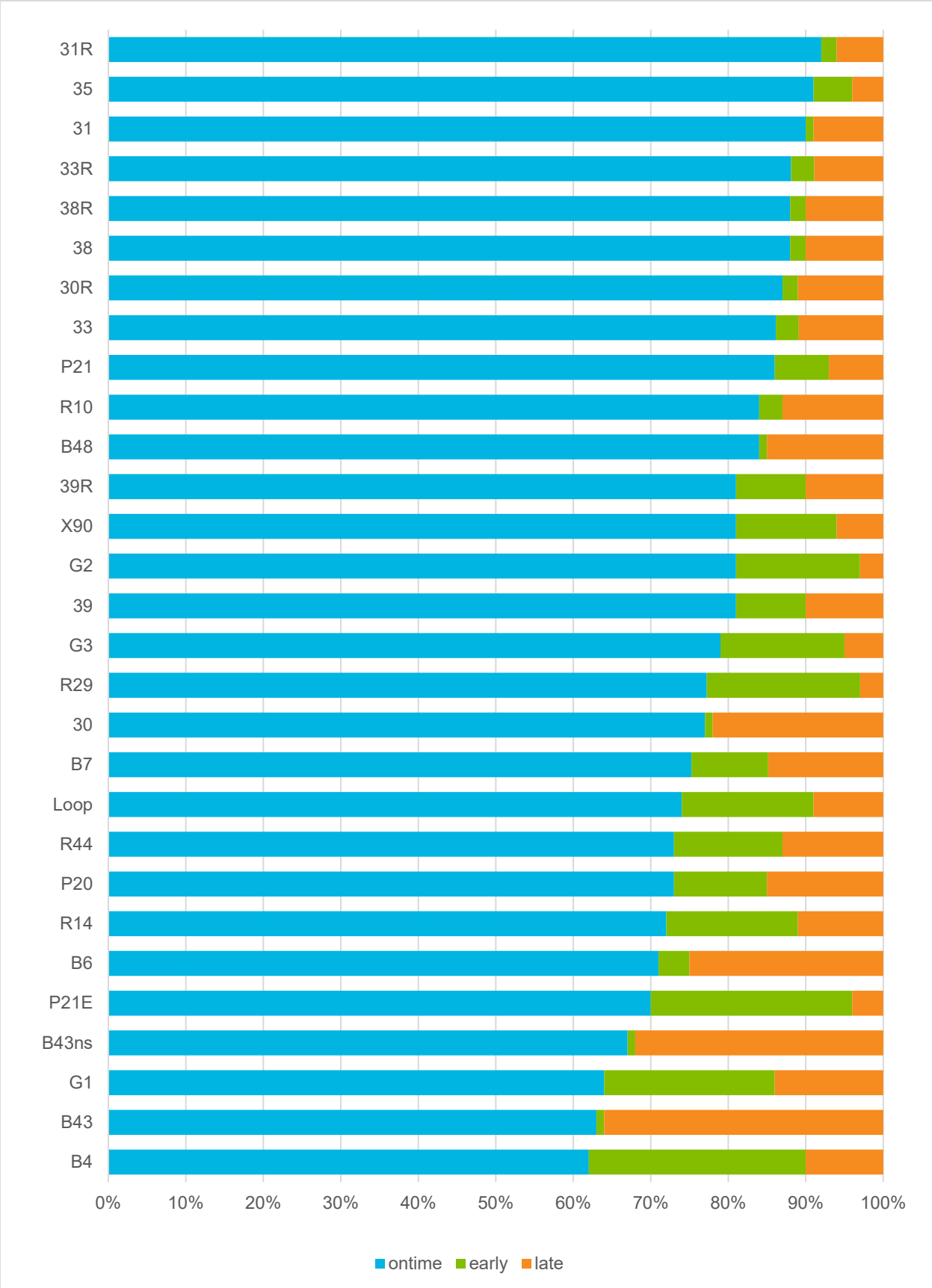
Source: PVTA OTP Data

Figure 99. Fixed Route Saturday On-Time Performance by Route (FY 2019)



Source: PVTA OTP Data

Figure 100. Fixed Route Sunday On-Time Performance by Route (FY 2019)



Source: PVTA OTP Data

In FY 2019, 83 percent of the ADA paratransit and non-ADA demand response services arrived on time (i.e., within a 20-minute arrival window), which is a slight improvement over FY 2018 (80 percent) (Table 74). Eight percent of the ADA paratransit and non-ADA demand response services arrived early in FY 2019 (i.e., before the 20-minute arrival window), which is better than FY 2018 (14 percent), and 9 percent arrived late in FY 2019 (i.e., after the 20-minute arrival time), which is slightly worse than FY 2018 (5 percent). OTP data are not available prior to 2018, nor separated out by demand response service.

Table 74. Demand Response On-Time Performance (2018–2019)

On-Time Performance	2018	2019
Early	14%	8%
On-time	80%	83%
Late	5%	9%

Source: PVTA On-time Performance Data

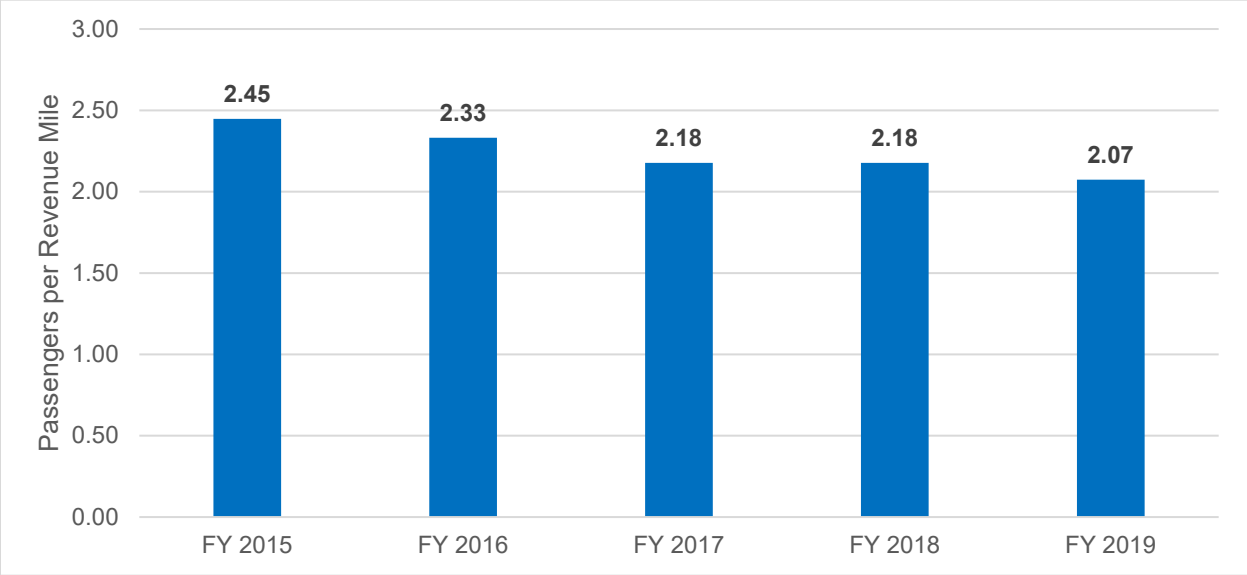
The percentage of scheduled trips operated for fixed route services was 99.97 percent in FY 2019. The scheduled trips operated for fixed route services was generally consistent from FY 2015 to FY 2019 at around 99.9 percent. The percentage of scheduled trips operated for ADA paratransit and non-ADA demand response services was 100 percent from FY 2015 to FY 2019.

Service Effectiveness

Fixed Route Service Effectiveness

Service effectiveness describes the amount of service utilized per unit of transit service provided. Service effectiveness is measured based on two indicators: passengers per mile and passengers per hour. From FY 2015 to FY 2019, the number of passengers per mile declined by 16 percent from 2.45 in FY 2015 to 2.07 in the most recent fiscal year (Figure 101).

Figure 101. Fixed Route Productivity: Passengers per Mile (FY 2015–FY 2019)



Source: NTD and PVTA

In FY 2019, PVTA's fixed route systemwide average passengers per revenue mile was 2.07 passengers, which was its lowest in the past five fiscal years. However, at 2.07 PVTA's passenger per revenue mile was 50 percent above the state average of 1.37 passengers per revenue mile and 9 percent below the national average of 2.26 passengers per revenue mile (Table 75).

Table 75. Fixed Route Productivity (FY 2019)

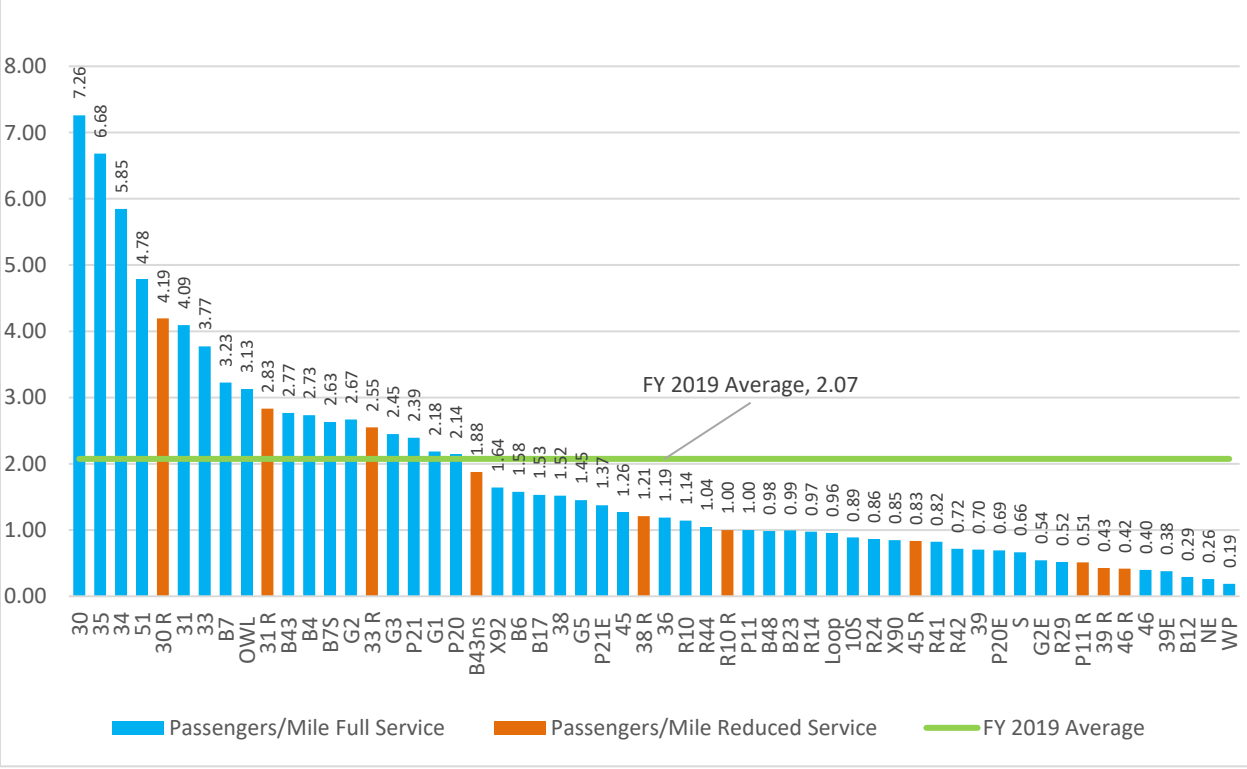
Route	Passengers/Mile
PVTA System Average	2.07
Massachusetts Average*	1.37
National Average	2.26

Source: NTD and PVTA

** Massachusetts average excludes MBTA service.*

As shown on Figure 102, 19 fixed routes performed well with passengers per revenue miles higher than the fixed route system average. The top performing routes are those serving a college or university. The lowest performing routes are Routes B12, 39E, NE, and WP; however, this is likely attributed to the operating conditions of these routes. For example, Route B12 runs express to Stonybrook and is paid for by the correctional department. Route 39E connects two colleges with very little ridership activity on intermediate stops and paid for by Five Colleges. Routes NE and WP are community circulator shuttles that typically carry lower passenger loads, and as such, smaller vehicles are utilized.

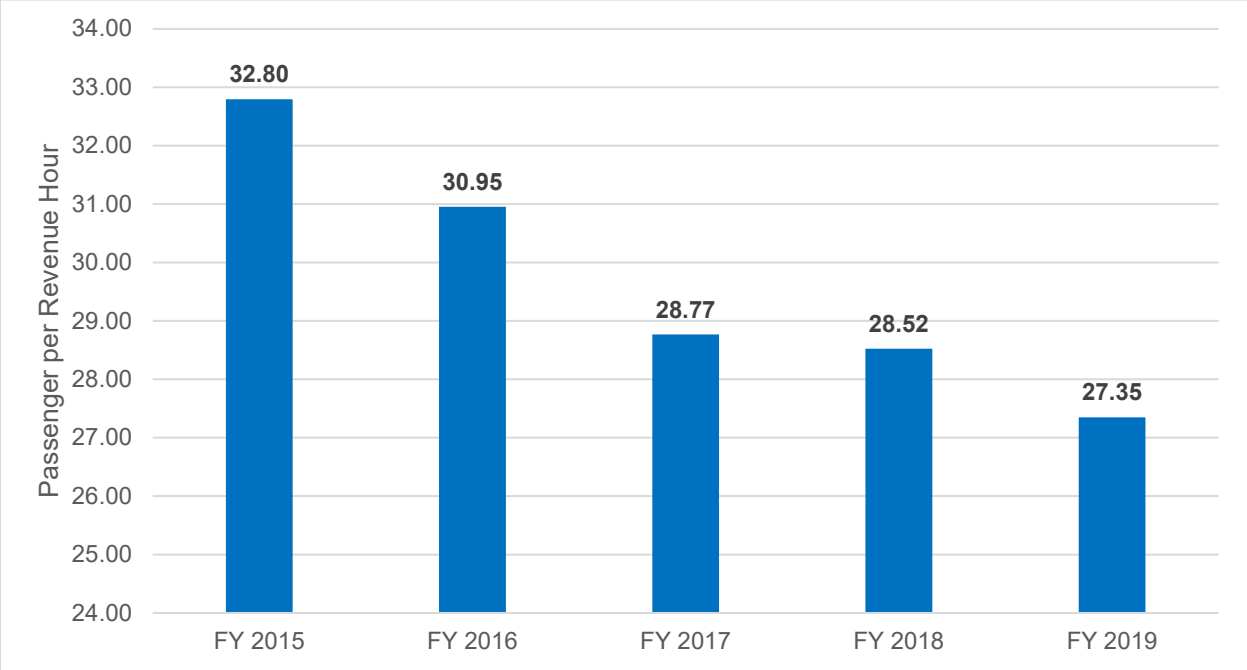
Figure 102. Fixed Route Passengers per Revenue Mile (FY 2019)



Source: PVTA FY 2019 Monthly Ridership, Hours, and Miles by Route

Passengers per hour is the second measure of service productivity. Passengers per revenue hour measures ridership as a function of the amount of service provided and varies based on the geographic spread of the area and average operating speed. Higher numbers indicate a more effective system. As shown in Figure 103, the number of passengers per revenue hour declined steadily since FY 2015 at 32.80 to its lowest at 27.35 in FY 2019.

Figure 103. Fixed Route Productivity: Passengers per Revenue Hour (FY 2015–FY 2019)



Source: NTD and PVTA

PVTA's fixed route systemwide average productivity was 27.35 passengers per revenue hour in FY 2019, which is just slightly higher than the national average of 27.21 passengers per revenue hour and is 47 percent greater than the state average of 18.39 (Table 76).

Table 76. Passengers per Hour (FY 2019)

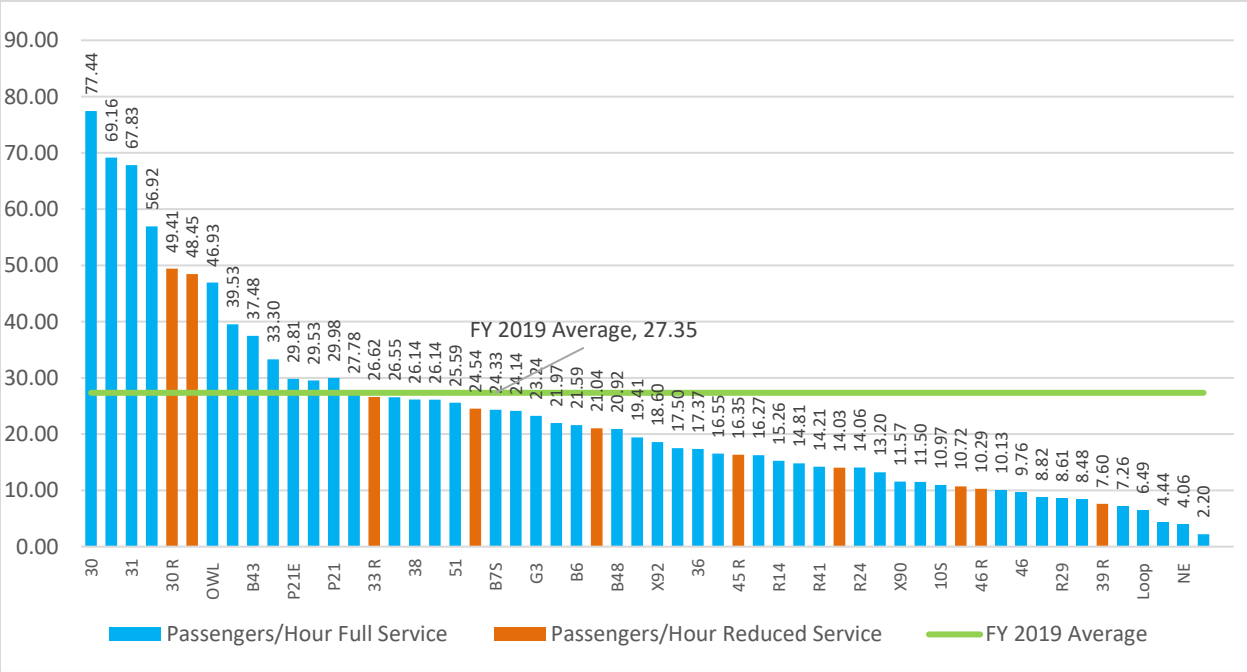
Route	Passengers/Hour
PVTA System Average	27.35
Massachusetts Average*	18.39
National Average	27.21

Source: NTD and PVTA

**Massachusetts average excludes MBTA service.*

As shown on Figure 104, 14 fixed routes were more productive than the passengers per revenue hour fixed route national average and 29 above the state average. The top performing routes are typically Tier 1 routes with service frequency every 15 minutes and located in college communities. Routes S, WP, NE, and Loop are the lowest performing routes with the lowest passengers per revenue hour. Excluding the Loop, these are all shuttle routes.

Figure 104. Fixed Route Passengers per Revenue Hour (FY 2019)



Source: PVTA FY 2019 Monthly Ridership, Hours, and Miles by Route

PVTA has classified all fixed routes into a tier system based on their frequency and set standards. All Tier 1 and tier 2 routes are meeting their standard. While 46 routes perform at or above the target PVTA plans to achieve in FY 2020, nine routes in Tiers 3, 4, and 5 perform below the target (Table 77). Notably, 34 of PVTA routes are exceeding the standards for the tier above or if a Tier 1 have a PPRH greater than 50. In the MOU with MassDOT tiers and standards were adjusted. Routes indicated in bold met their standard; however, routes denoted in italics did not exist under the FY 2019 standards.[58]

Table 77. PVTA Service Tier Standards Performance

Service Tier	Standard	Routes Meeting Target	Routes Not Meeting Target
1 (every 15 minutes)	30	**B7**, **30**, **31, 34, 35, OWL**	—
2 (every 20 minutes)	20	**G1**, **B6**, **P20**, **B43**	—
3 (every 30 minutes)	15	**G2**, **G3, B4,** *B7S*, P20E, **P21**, **33**, **38, B48, 31 R, 30 R, 33 R**	10S, 39, X90, Loop, S
4 (every hour)	10	*G2E*, G5, R10, **P11**, R14, B17, **P21E**, **B23**, R24, 36, R41, R42, **B43ns**, X92, R10R	39E, 39 R
5 (less than hourly)	5	B12, R29, R44, **45,** 46, P11R 45R, 46R, **38R**	NE, WP

[58] http://www.pvta.com/documents/performEff/Route%20by%20route%20PMs_FY19Q4.pdf

Demand Response Productivity

Table 78 outlines the service effectiveness for PVTA demand response routes/services. PVTA's demand response average productivity was 0.09 passengers per revenue mile (Figure 105) and 1.41 passengers per revenue hour in FY 2019 (Figure 106). Demand response productivity is below the national and state averages; on a service level only the ADA and senior van service is below the state and national averages for both measures. Productivity values tend to decline as service area size increases. The Agawam Senior Van and the Northampton Senior Van have the highest passengers per mile and passengers per hour. Data were not available for the Wilbraham Eastfield Mall demand response.

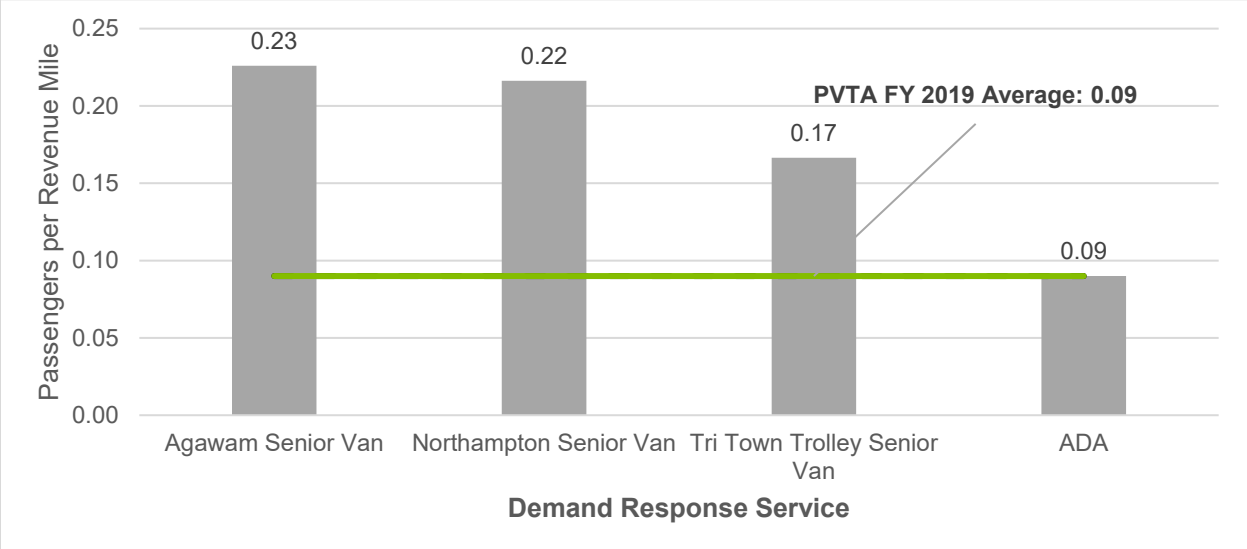
Table 78. Demand Response Productivity (FY 2019)

Route	Passengers/Mile	Passengers/Hour
ADA & Senior Van (*region wide)*	0.09	1.40
Wilbraham Eastfield Mall (Route W)	N/A	N/A
Northampton Senior Van	0.22	2.12
Agawam Senior Van	0.23	2.74
Tri-Town Trolley: East Longmeadow/Longmeadow/Hampden	0.17	1.40
PVTA Demand Response System Average	**0.09**	**1.41**
Massachusetts Average*	**0.15**	**2.30**
National Average	**0.13**	**1.97**

Source: NTD and PVTA

**Massachusetts average excludes MBTA, CCRTA, and MART. CCRTA and MART data are skewed as they report a portion of the HST trips operated to the NTD.*

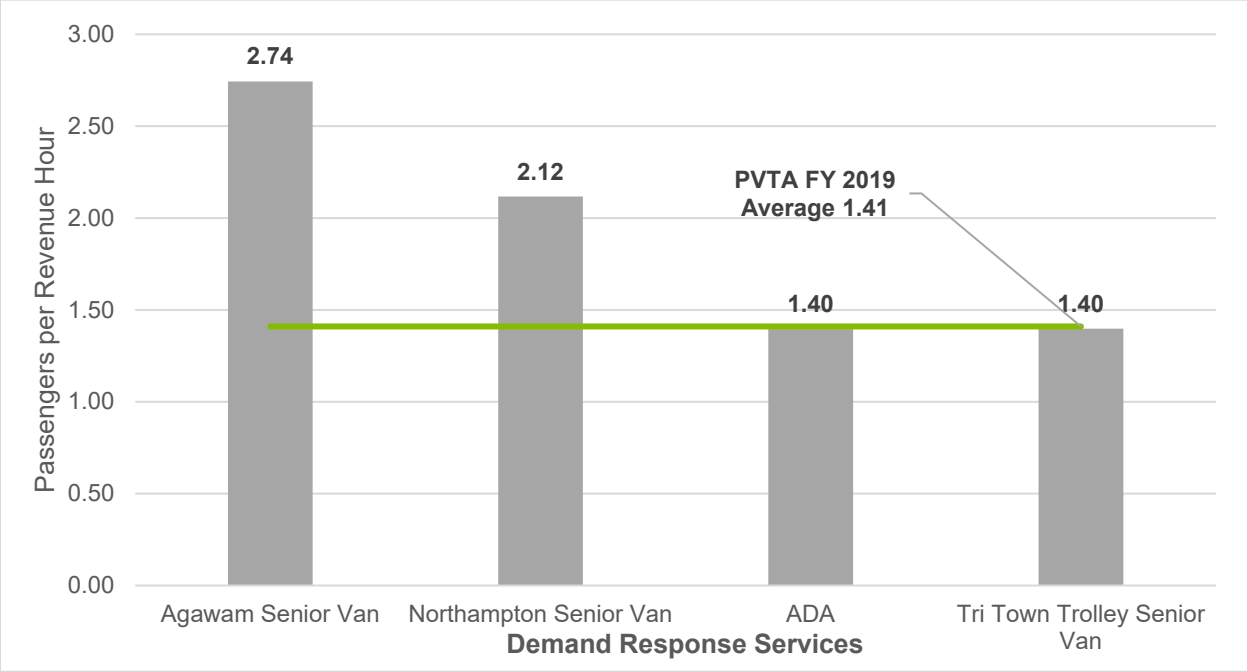
Figure 105. Demand Response Passengers per Revenue Mile by Route (FY 2019)



Source: PVTA

**Data were unavailable for the Wilbraham Eastfield Mall (Route W) shuttle.*

Figure 106. Demand Response Passengers per Revenue Hour by Route (FY 2019)



Source: PVTA

**Data were unavailable for the Wilbraham Eastfield Mall (Route W) shuttle.*

Financial Performance

Cost efficiency measures how much the dollars put into the system are being used to provide service or produce trips. The cost efficiency indicators are cost per revenue mile and cost per revenue hour.

Three measures link cost efficiency and cost effectiveness, measuring how resources (dollars) are ultimately used to produce passenger trips, and how well the fares collected cover the cost per passenger. The three are cost per passenger, farebox recovery, and subsidy per passenger.

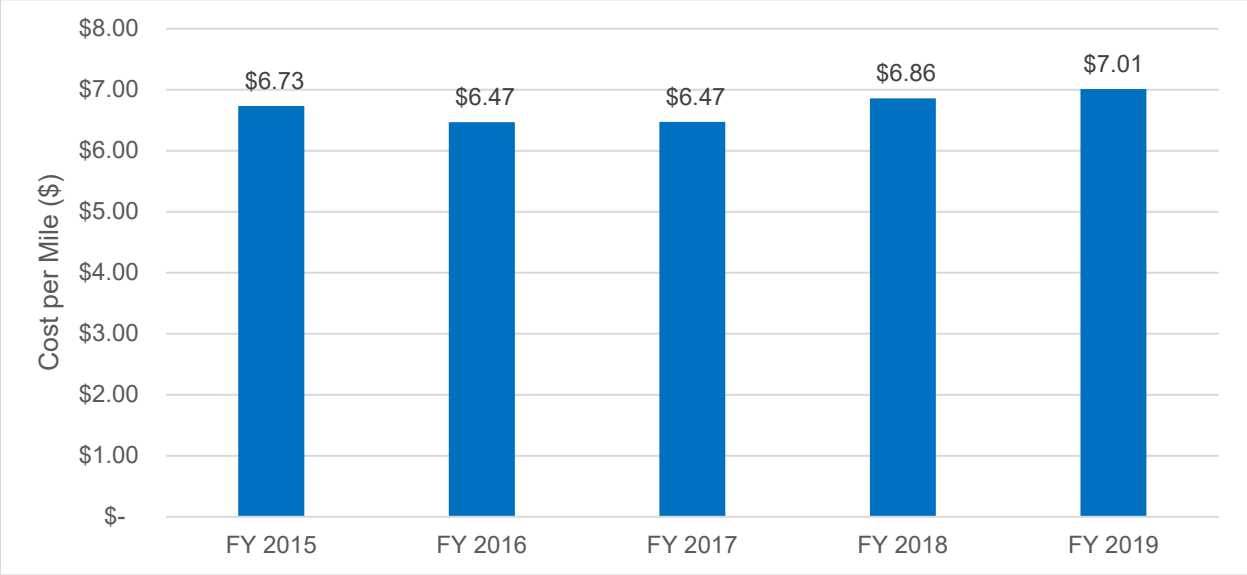
- **Cost per mile** measures how much it costs to provide a mile of service. A smaller number indicates more financially efficient routes. This metric is sensitive to fuel costs and operating speeds.
- **Cost per hour** measures how much it costs to provide an hour of service. A smaller cost per hour indicates more financial efficient routes and/or faster operating speeds. This metric is sensitive to labor costs.
- **Cost per passenger** is the overall cost to operate a route divided by the number of passengers and measures how well the resources are being used to produce trips.
- **Farebox recovery** measures the percent of operating cost covered by fares and is an outcome heavily influenced by the ridership productivity of a route against its total operating cost, as well as the fare policy of the system. It is calculated by dividing fare revenue by operating cost.
- **Subsidy per passenger** measures how much it costs to operate a route on a “per passenger” basis. It is calculated by subtracting passenger revenue from operating cost and dividing by the total number of passengers. It is the cost to operate after taking into account fare revenue and must be subsidized by other sources.

Fixed route metrics are examined first followed by demand response.

Fixed Route Financial Performance

Cost per revenue mile measures the financial efficiency of providing service based on how much it costs to provide a mile of service. A smaller number indicates a combination of more financially efficient routes, faster operating speeds, or lower fuel costs. From FY 2015 to FY 2019 cost per mile ranged from approximately $6.50 to $7.01 dollars. From FY 2016 to FY 2017 costs per mile remained steady; however, costs began to increase in FY 2018.

Figure 107. Fixed Route Cost per Mile (FY 2015–FY 2019)



Source: NTD and PVTA

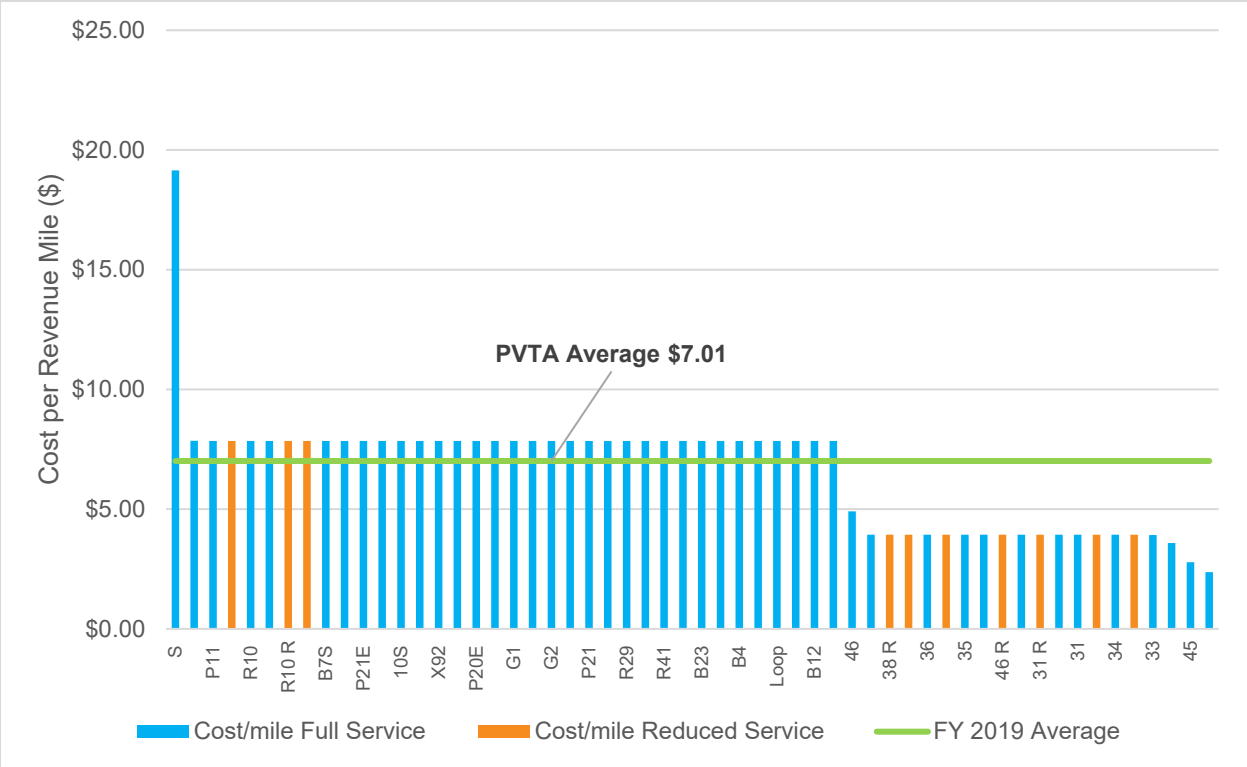
In FY 2019, the average fixed route operating cost per revenue mile in FY 2019 was $7.01, which is 3 percent lower than the state ($7.24) and 37 percent lower than the national ($11.15) average (Table 79). Cost data were calculated by PVTA based on revenue miles, and as such, the cost per revenue mile varies not by route but by the garage operating the route. Routes operated by UMTS had the lowest cost per revenue mile of $3.93, as they employ student drivers, whereas routes operated by VATCo and SATCo were $7.85. Routes NE and WP are operated by Hulmes, and costs were based on revenue hours operated, as such the cost per revenue mile for Route WP was $2.37, and Route NE was $3.59. Route S is operated by NEXT, and cost per revenue mile was $19.15 (Figure 108).

Table 79. Fixed Route Financial Efficiency (FY 2019)

Route	Cost/Mile
PVTA System Average	$7.01
Massachusetts Average *(*excludes MBTA*)*	$7.24
National Average	$11.15

Source: NTD; PVTA

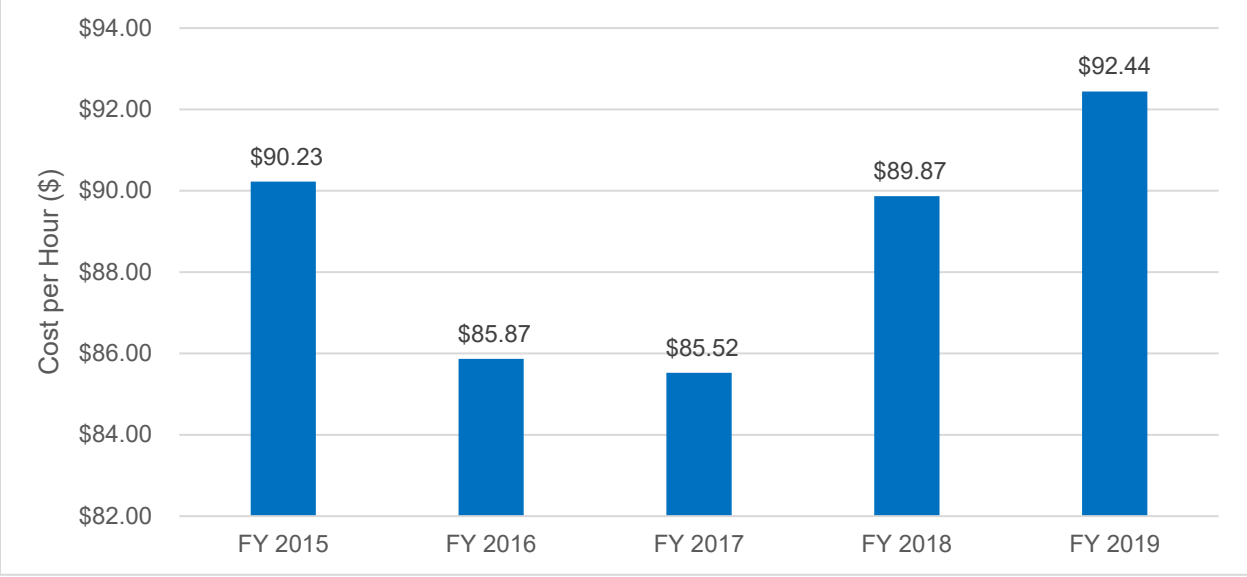
Figure 108. Fixed Route Cost per Revenue Mile (FY 2019)



Source: PVTA

Cost per revenue hour measures the financial efficiency of providing service based on how much it costs to provide an hour of service. A smaller cost per revenue hour indicates more financial efficient routes and/or slower operating speeds and/or lower labor costs. From FY 2015 to FY 2019, the cost per hour for PVTA fixed route service ranged from a low of $85.52 in FY 2017 to a high of $92.44 in FY 2019 (Figure 109). This equates to an increase of roughly 4 percent annually.

Figure 109. Fixed Route Cost per Hour (FY 2015–FY 2019)



Source: NTD and PVTA

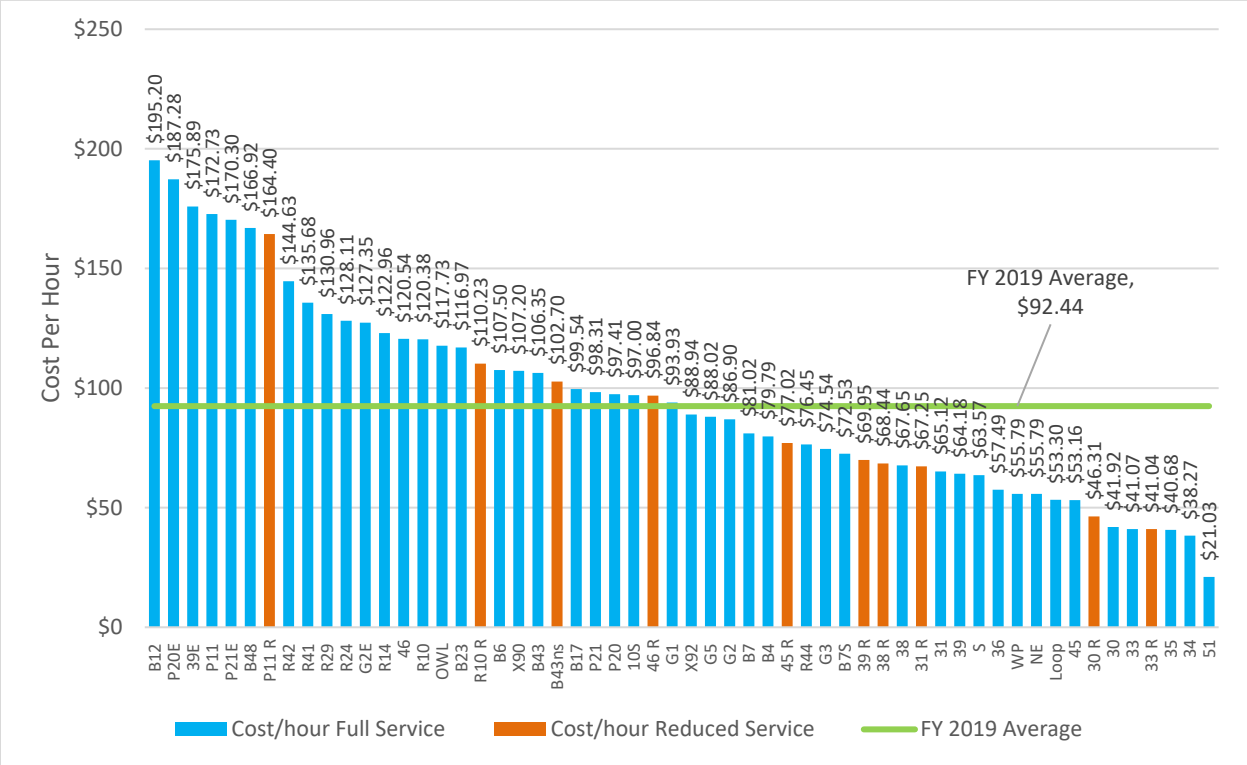
Despite PVTA's increased cost per hour, its average fixed route operating cost per revenue hour in FY 2019 was $92.44, 5 percent lower than the state ($97.20) average and 31 percent lower than the national ($133.99) average (Table 80). Thirty-one fixed routes had operating cost per revenue hour lower than the state average, indicating higher financially efficiency compared to the state (Figure 110). Nine of PVTA fixed routes are above the national average. In general the routes operated by UMTS tend to have lower costs per hour due to the lower labor costs of the student drivers they employ.

Table 80. Fixed Route Cost per Hour (FY 2019)

Route	Cost/Hour
PVTA System Average	$92.44
Massachusetts Average (excludes MBTA)	$97.20
National Average	$133.99

Source: NTD; PVTA

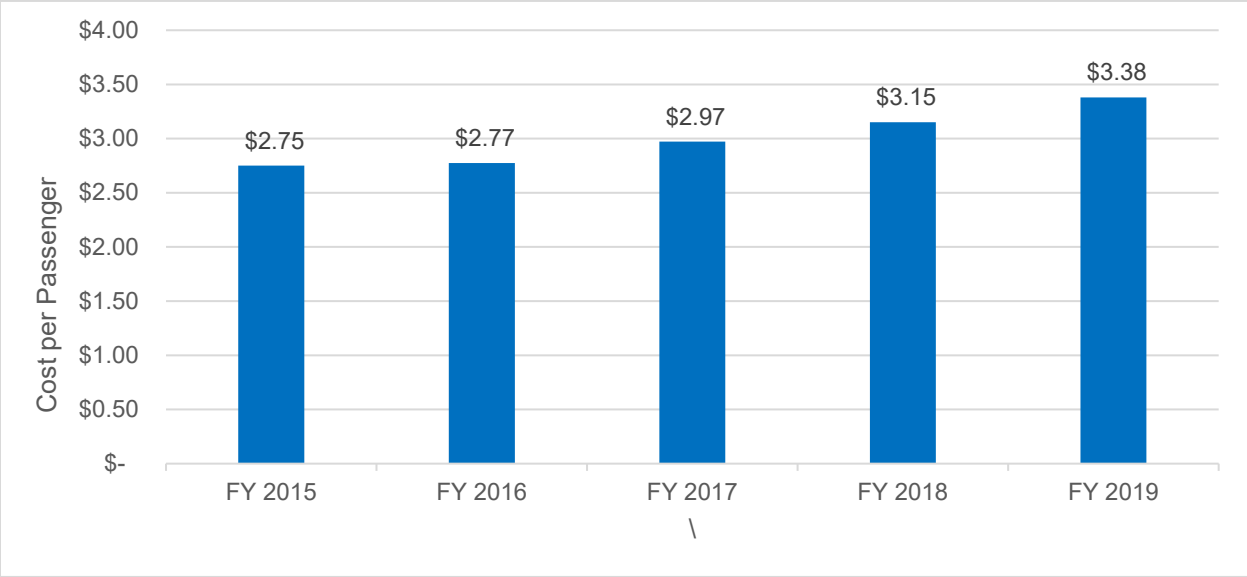
Figure 110. Fixed Route Cost per Revenue Hour by Route (FY 2019)



Source: PVTA

Cost per passenger is the overall cost to operate a route divided by the number of boarding passengers; a lower cost is desirable. The cost per passenger incrementally increased from $2.75 in FY 2015 to $3.38 in FY 2019 as the system also experienced declining passenger volumes (Figure 111).

Figure 111. Fixed Route Cost per Passenger (FY 2015–FY 2019)



Source: NTD; PVTA

Again despite PVTA's increased costs, its average fixed route system operating cost per passenger in FY 2019 was $3.38, which is 36 percent lower than the state ($5.29) average and 31 percent lower than the national ($4.92) average (Table 81). This puts PVTA among the top 10 percent of transit systems operating fixed route nationwide in terms of cost per passenger. Among all 15 RTAs and MBTA, PVTA has the lowest cost per passenger in the state, and fourth lowest in New England, for bus operations.

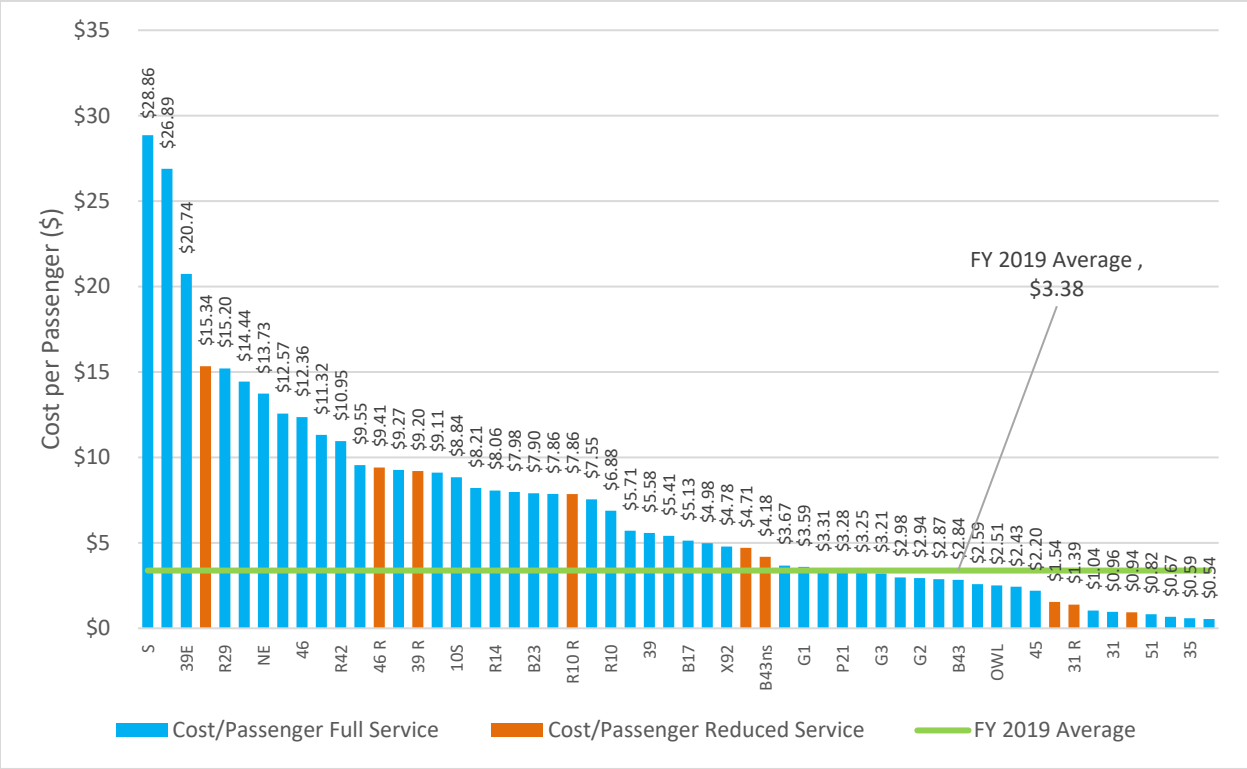
Table 81. Fixed Route Cost per Passenger (FY 2019)

Route	Cost/Passenger
PVTA System Average	$3.38
Massachusetts Average *(*excludes MBTA*)*	$5.29
National Average	$4.92

Source: NTD; PVTA

In FY 2019, 21 fixed routes performed better and had lower cost per passenger than the system average and 20 routes performed better than the state and national averages (Figure 112). Eight fixed routes (Routes 31R, 33, 31, 30R, 34, 35, 51, and 30) performed extremely well with cost per passenger lower than $1.50. Compared to national averages, only 2 percent of systems operating fixed routes have a system average less than $1.50; this is a good reflection of PVTA's financial performance for its fixed routes in terms of cost per passenger. However, 10 fixed routes, including Routes S, B12, 39E, P11 R, R29, G2E, NE, WP, 46, P20E, and R42, did not perform well, with operating costs per passenger greater than twice that of the national average.

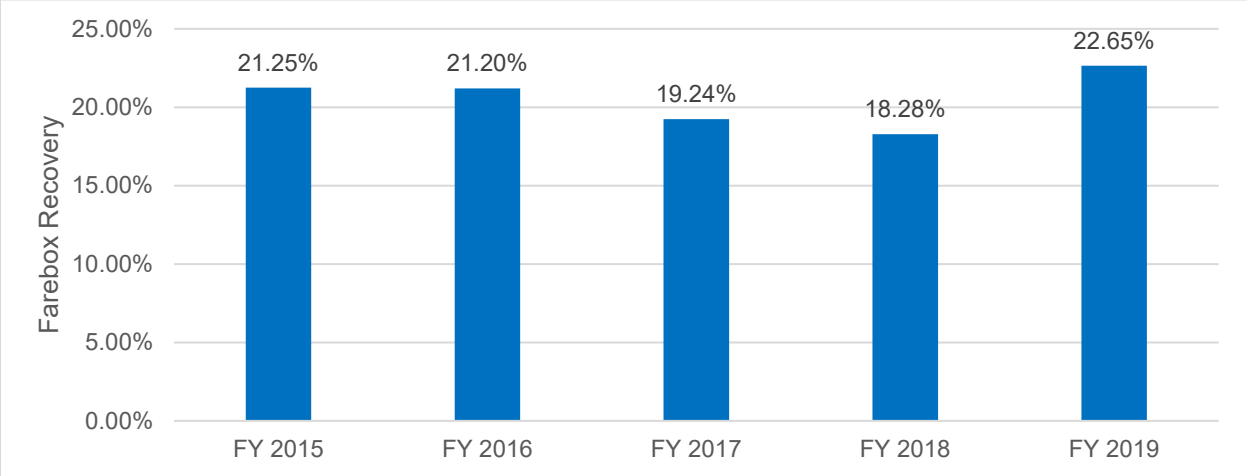
Figure 112. Fixed Route Cost per Passenger by Route (FY 2019)



Source: PVTA

Farebox recovery measures the percentage of operating cost covered by fare revenue and is an outcome heavily influenced by the ridership productivity of a route against its total operating cost, as well as the fare policy of the system. It is calculated by dividing fare revenue by operating cost. Fare revenue comes from the fareboxes, ticket and pass sales, and funding partnerships, which partially or completely covers the cost of service as depicted in Table 15. From FY 2015 to FY 2019 farebox recovery ranged from 18.28 to 22.65 percent with the highest farebox recovery, 22.65 percent, in the most recent fiscal year FY 2019 (Figure 113).[59]

Figure 113. Fixed Route Farebox Recovery (FY 2015–FY 2019)



Source: NTD; PVTA

[59] Farebox recovery for fixed routes is higher than the systemwide total of 15 percent due to the contract revenue for fixed routes.

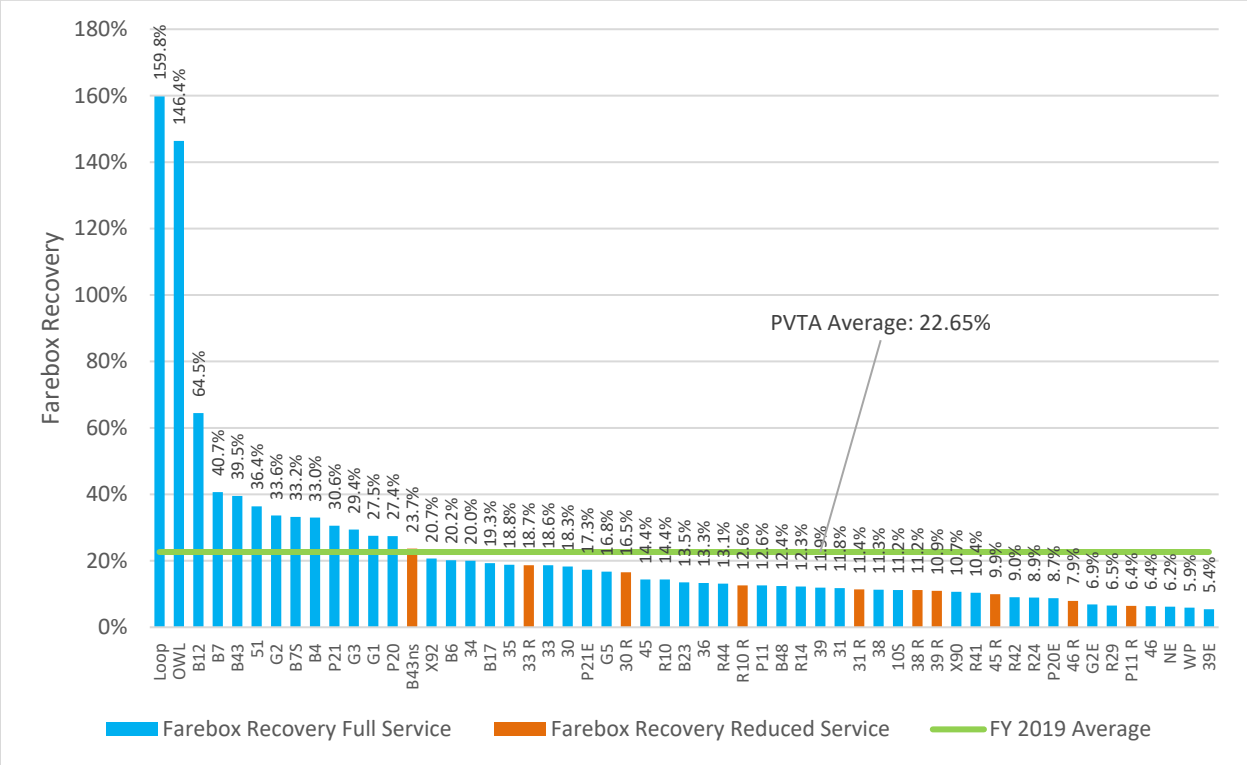
In FY 2019, the average fixed route system farebox recovery ratio was 22.65 percent, which exceeded both the state farebox recovery average of 15.4 percent and the national average (22.1 percent) (Table 82). At the route level, 13 fixed routes performed above the system average (Figure 114). Two routes, Loop and OWL, have farebox recovery higher than 100 percent because of contract partnerships with MGM and Westfield State. Twelve fixed routes (Routes R42, P20E, R24, 46 R, G2E, R29, P11 R, 46, NE, WP, and 39E) have a farebox recovery of less than 10 percent.

Table 82. Fixed Route Farebox Recovery (FY 2019)

Route	Farebox Recovery
PVTA System Average	22.65%
Massachusetts Average *(excludes MBTA)*	15.4%
National Average	22.1%

Source: NTD; PVTA

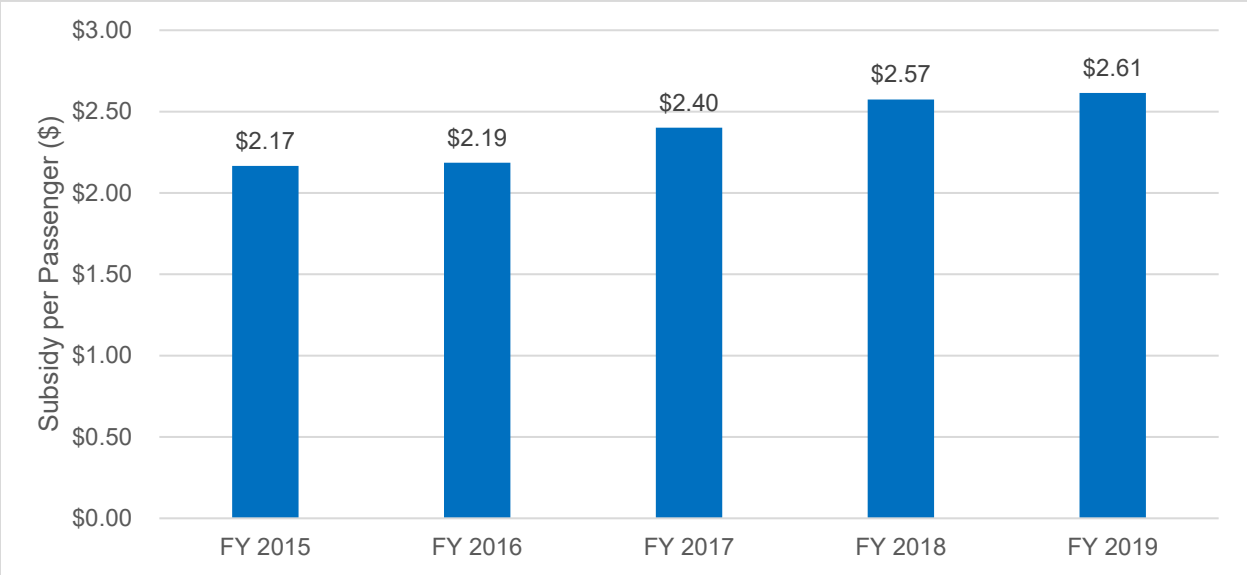
Figure 114. Fixed Route Farebox Recovery by Route (FY 2019)



Source: PVTA

Subsidy per passenger is calculated by subtracting passenger revenue (including contract revenue) from operating cost and dividing by the total number of passengers. It is the cost to operate after taking into account fare revenue and is subsidized by other sources such as state, local, and federal dollars. From FY 2015 to FY 2019 the subsidy per passenger incrementally increased from year to year starting at $2.17 in FY 2015 to $2.61 in the most recent fiscal year, FY 2019 (Figure 115).

Figure 115. Fixed Route Subsidy per Passenger (FY 2015–FY 2019)



Source: Calculations based upon NTD and PVTA data

In FY 2019, the average fixed route system subsidy per passenger was $2.61, which is about 60 percent of the state ($4.47) and national averages ($3.83) (Table 83).Within New England, PVTA has the fourth lowest subsidy per passenger among systems that collect a fare.

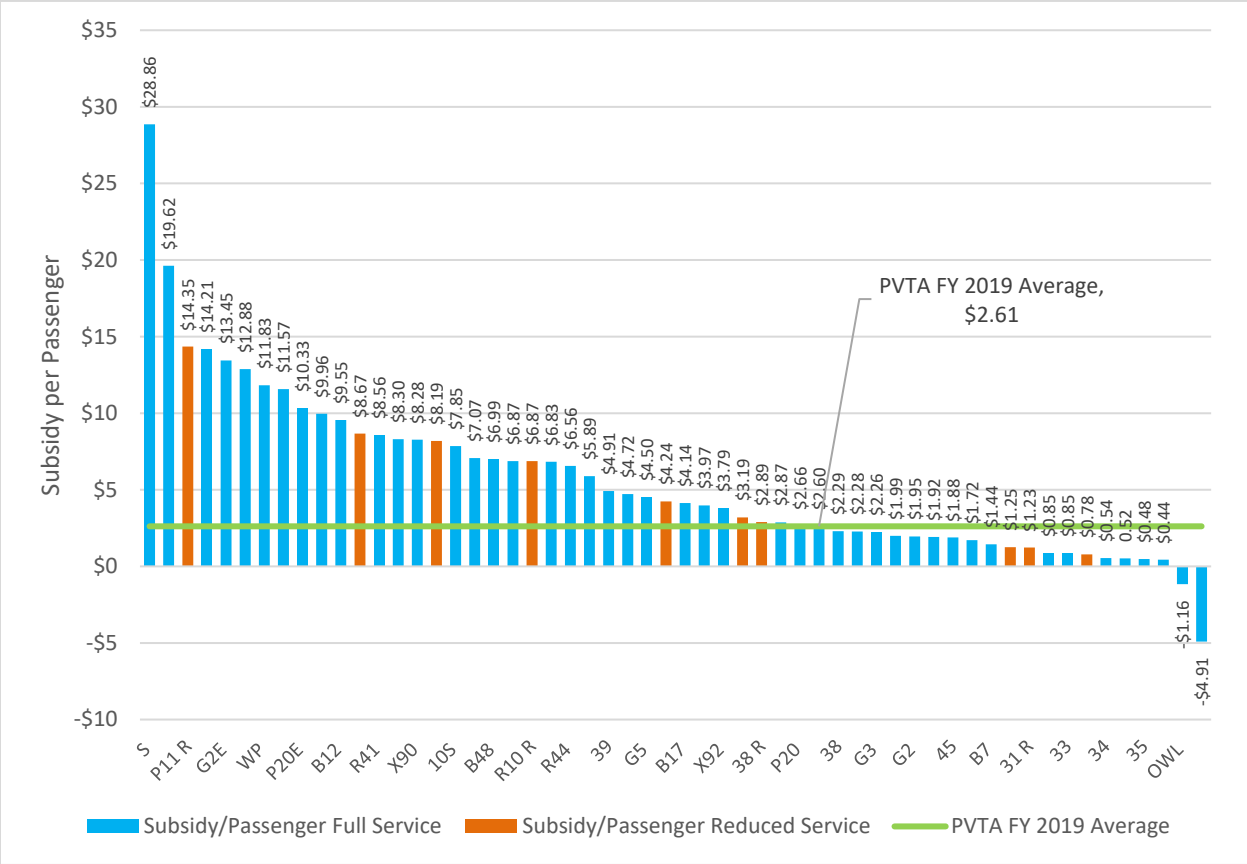
Table 83. Fixed Route Subsidy per Passenger (FY 2019)

Route	Subsidy/Passenger
PVTA System Average	$2.61
Massachusetts Average *(*excludes MBTA*)*	$4.47
National Average	$3.83

Source: NTD; PVTA

At the route level, the top performing routes with the lowest subsidies per passenger were Routes Loop, OWL, 30, and 35 (Figure 116). Routes OWL and Loop generated more revenue than the cost to operate the service, resulting in negative subsidies because of partnerships formed with agencies that cover the operating cost of the route. Thirty-six fixed routes were higher than the system average. Ten of these 35 routes, Routes S, 39E, P11 R, R29, G2E, NE, WP, 46, R24, and P20E, had very high subsidies per passenger at over $10.

Figure 116. Fixed Route Subsidy per Passenger by Route (FY 2019)



Source: PVTA

Demand Response Financial Performance

Table 84 outlines the financial performance for demand response services. Compared to state and national averages, PVTA performs more efficiently in terms of cost per mile, cost per hour, and farebox recovery, while it is performing slightly less effectively in cost per passenger and subsidy per passenger. Overall, the ADA and region-wide senior van service has the highest costs compared to other demand response services.

Table 84. Demand Response Financial Efficiency (FY 2019)*

Route	Cost/Mile	Cost/Hour	Cost/ Passenger	Subsidy/ Passenger	Farebox Recovery
Wilbraham Shuttle	N/A	N/A	$21.54	N/A	N/A
ADA & Senior Van *(region-wide)*	$3.31	$49.81	$35.70	$32.54**	9.0%**
Northampton Senior Van	$1.63	$15.95	$7.53	N/A	0.0%
Agawam Senior Van	$1.33	$16.19	$5.90	N/A	0.0%
Tri-Town Trolley: East Longmeadow/Longmeadow /Hampden	$1.96	$16.48	$11.80	N/A	0.0%
PVTA System Average	**$3.28**	**$48.79**	**$34.71**	**$31.67**	**8.8%**

Route	Cost/Mile	Cost/Hour	Cost/ Passenger	Subsidy/ Passenger	Farebox Recovery
Massachusetts Average* **	**$4.38**	**$59.86**	**$28.28**	**$25.95**	**8.3%**
National Average	**$4.33**	**$64.93**	**$32.92**	**$30.46**	**7.5%**

Source: NTD; PVTA

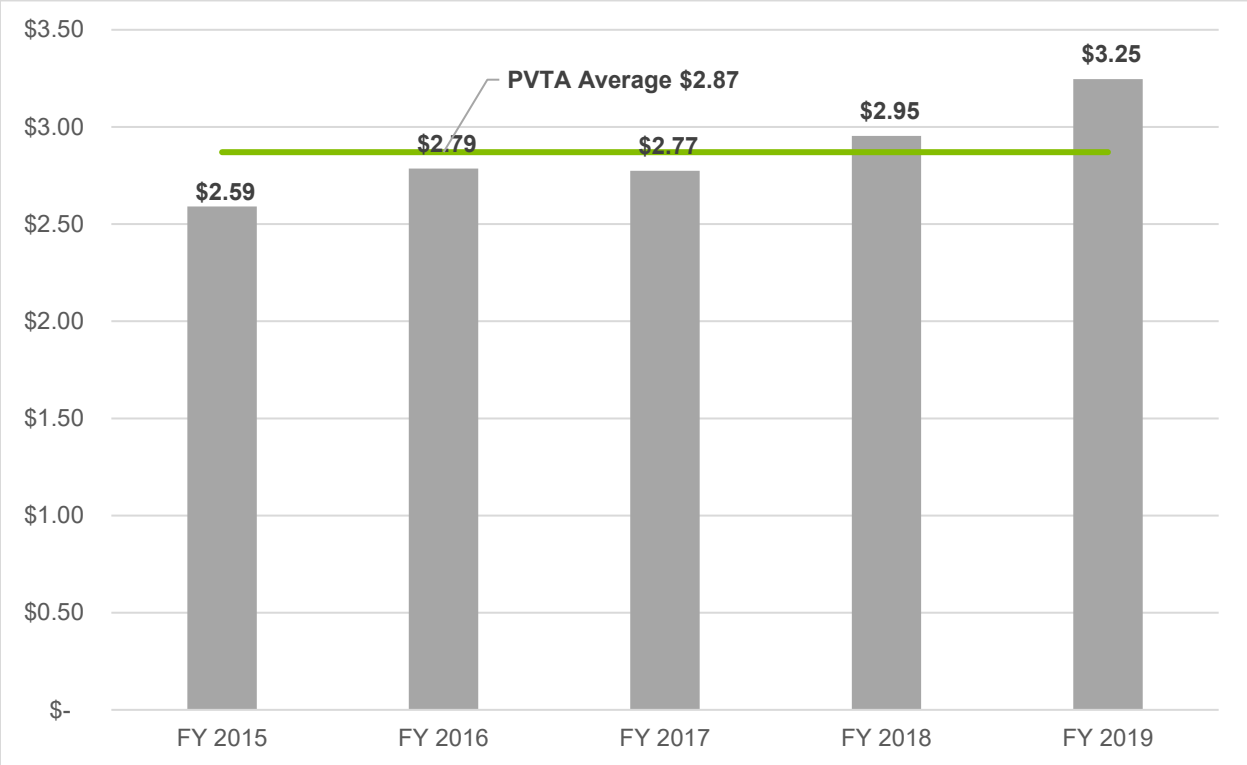
**Historical averages for FY 2015–FY 2019 are calculated using PVTA data as reported in the NTD. FY 2019 averages may differ slightly due to demand response service level calculations.*

***The revenue generated for all PVTA demand response is included in the ADA and Senior Van Service; therefore, data were not available for service level analysis for subsidy per passenger or farebox recovery.*

****Massachusetts average excludes MBTA, CCRTA, and MART.*

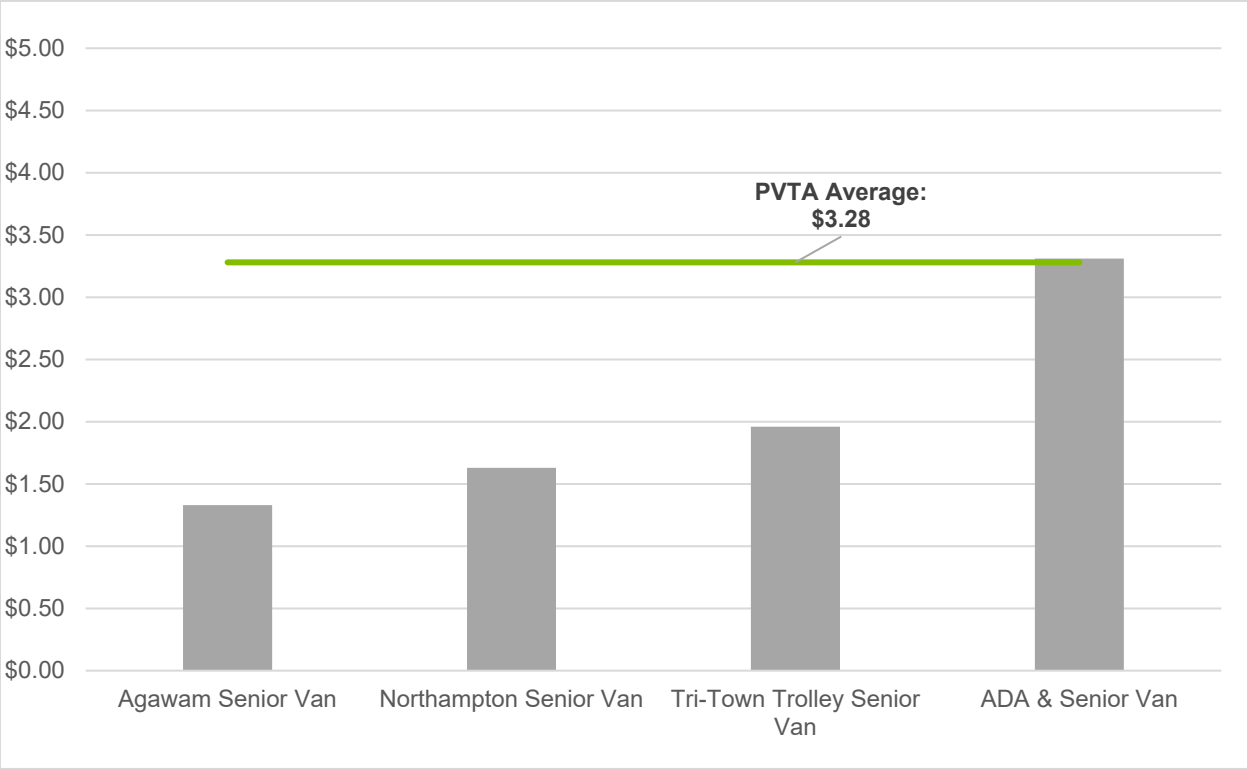
PVTA's demand response cost per revenue mile from FY 2015 to FY 2019 averaged $2.87 with its lowest cost per mile of $2.59 and its highest cost per mile of $3.25 occurring in the most recent fiscal year (Figure 117). While the revenue miles operated for demand response declined from year to year, the cost of operating the service increased. In FY 2019, the average cost per mile was $3.28 with the greatest cost per mile being generated by the ADA and Senior Van Service. Agawam Senior Van had the lowest cost per mile; however, this service was only operating for one month of FY 2019 (Figure 118).

Figure 117. Demand Response Cost per Revenue Mile (FY 2015–FY 2019)



Source: MassDOT NTD Data (FY 2015-FY 2019)

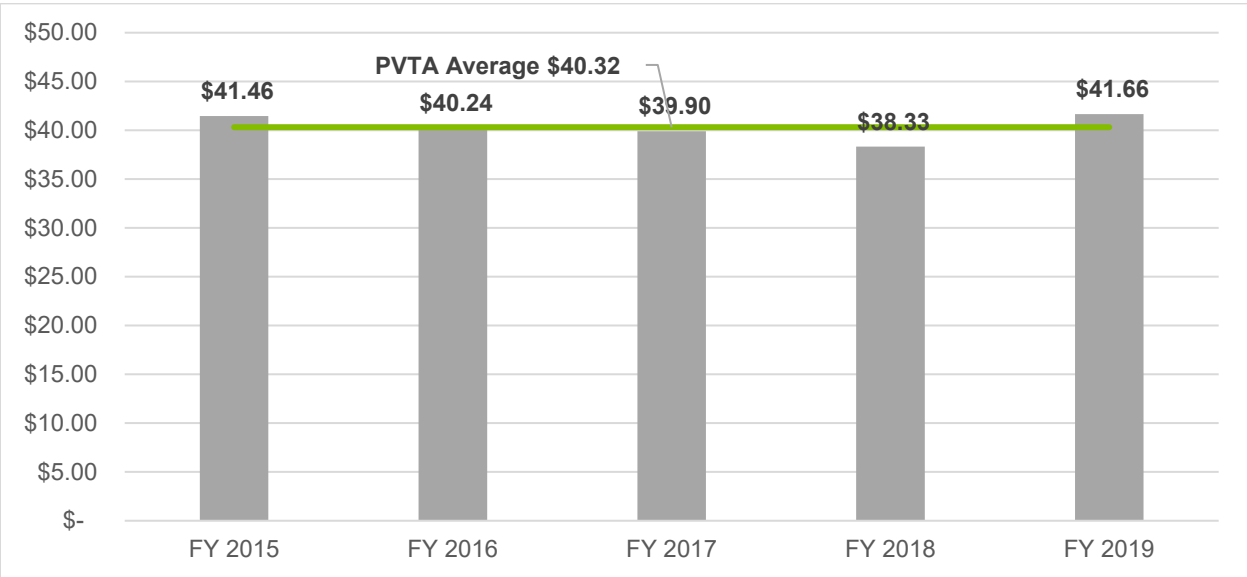
Figure 118. Demand Response Cost per Revenue Mile by Route (FY 2019)



Source: PVTA

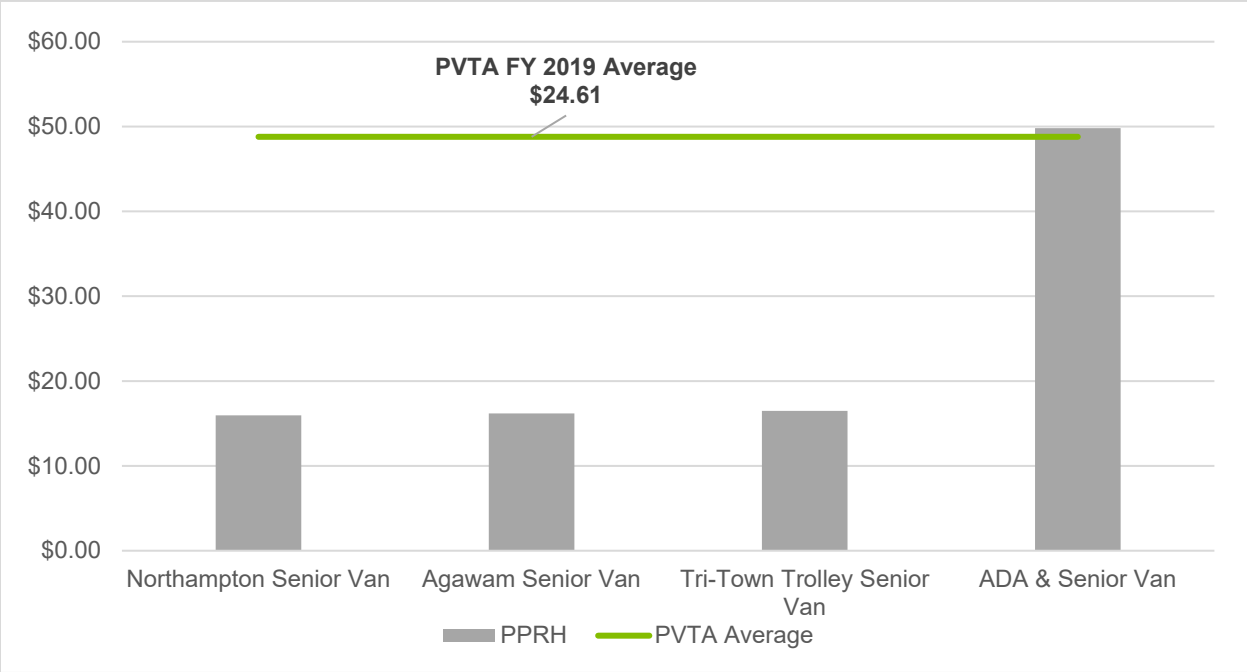
PVTA's demand response average cost per revenue hour ranged from $38 and $41 between FY 2015 and FY 2019, with an average value of was $40.32 per revenue hour (Figure 119). The highest cost per revenue hour was reported in FY 2019, a 0.5 percent increase from FY 2015. On a service level, in FY 2019, the average cost per revenue hour was $48.79, which is primarily driven by the cost of ADA and region-wide senior van service, at three times the costs of Northampton, Agawam, and Tri-Town Trolley senior van service (Figure 120).

Figure 119. Demand Response Cost per Revenue Hour (FY 2015–FY 2019)



Source: MassDOT BlackCat Data

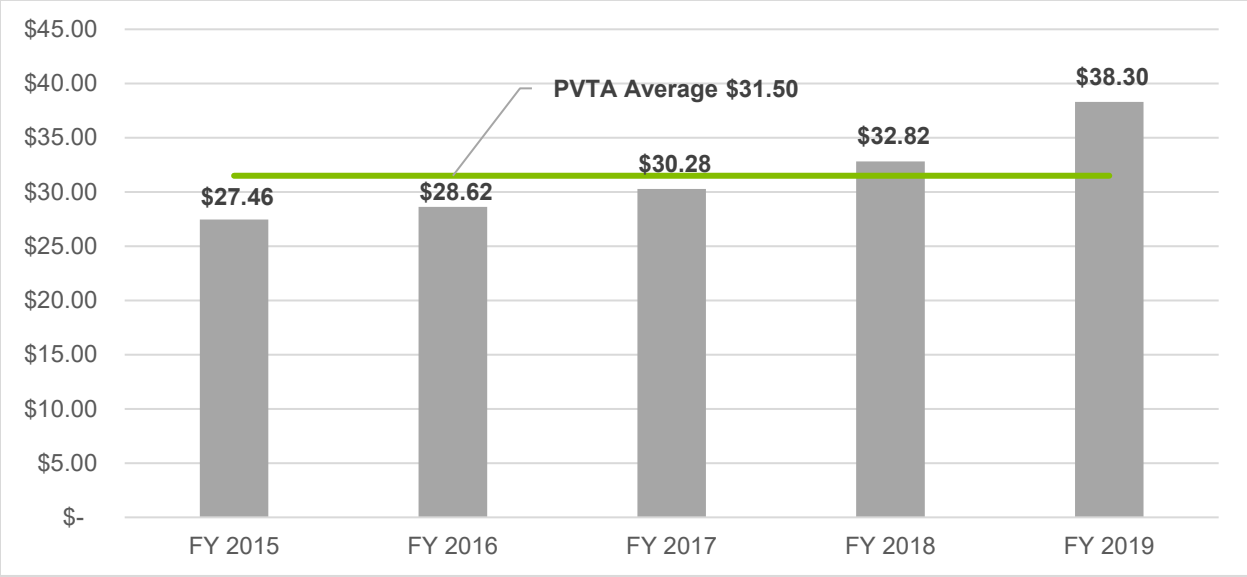
Figure 120. Demand Response Cost per Revenue Hour by Route (FY 2019)



Source: PVTA

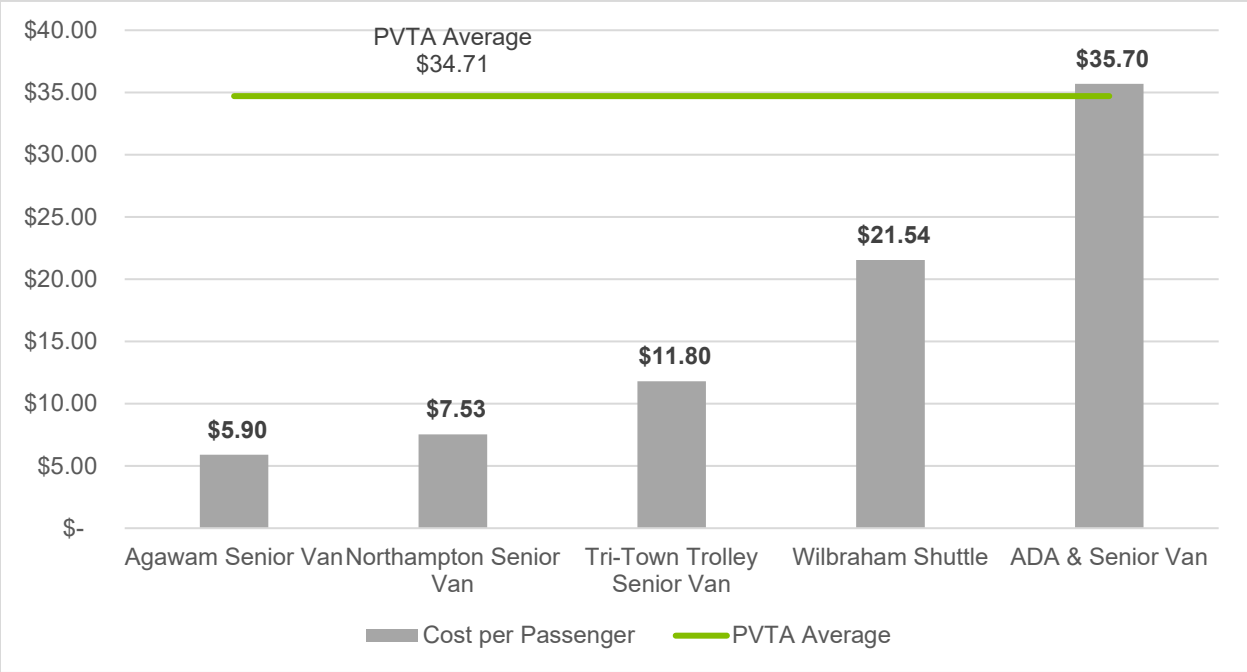
PVTA's demand response cost per passenger increased by 39.4 percent from $27.46 in FY 2015 to $38.30 in FY 2019 (Figure 121). This is a cost per passenger increase of 39.4 percent across five fiscal years. Over time the cost of service has increased while the number of demand response passengers has decreased, thus driving the cost per passenger upward. In FY 2019, the average cost per passenger was $38.30. The lowest cost per passenger was on Agawam Senior Van service; however, it also had the lowest overall cost and number of passenger as the service was recently introduced. The Wilbraham Shuttle had the second highest cost per passenger ($21.54) following behind the ADA and region-wide senior van service ($35.70) (Figure 122).

Figure 121. Demand Response Cost per Passenger (FY 2015–FY 2019)



Source: MassDOT BlackCat Data

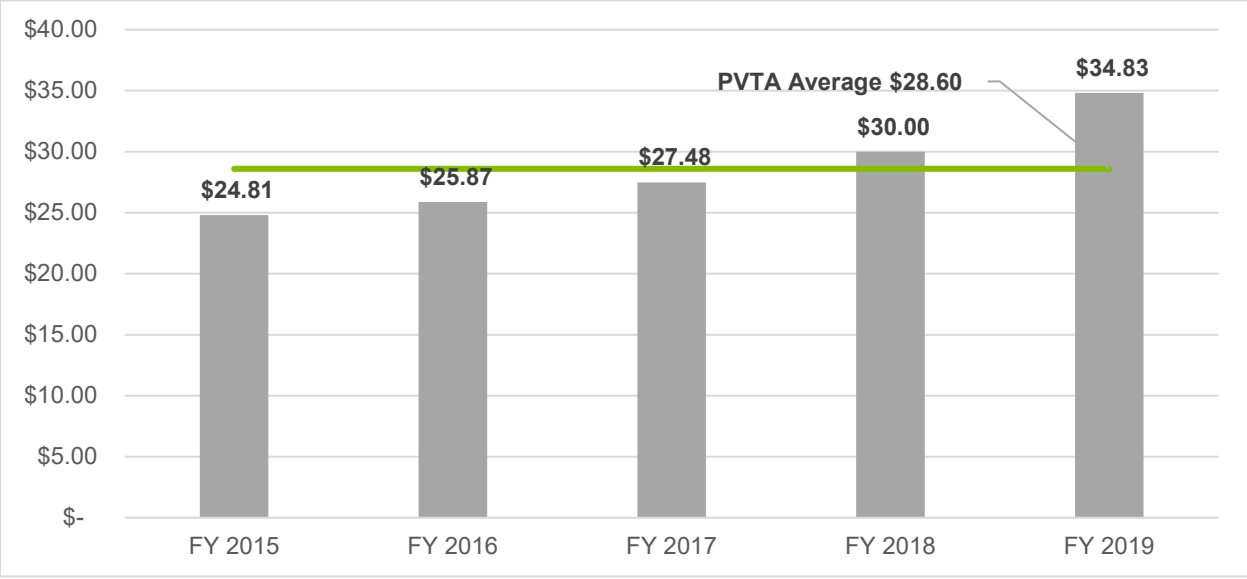
Figure 122. Demand Response Cost per Passenger by Route (FY 2019)



Source: PVTA

Between FY 2015 and FY 2019 the subsidy per passenger for PVTA demand response increased by $10.00 from $24.81 to $34.83 (Figure 123). Additionally, the farebox recovery decreased from FY 2015 to FY 2018, but began to increase slightly again in FY 2019 (Figure 124). On average, PVTA demand response services recover about 9.2 percent of farebox revenue. The average subsidy per passenger for FY 2019 was $31.67 and farebox recovery of 8.8 percent.[60]

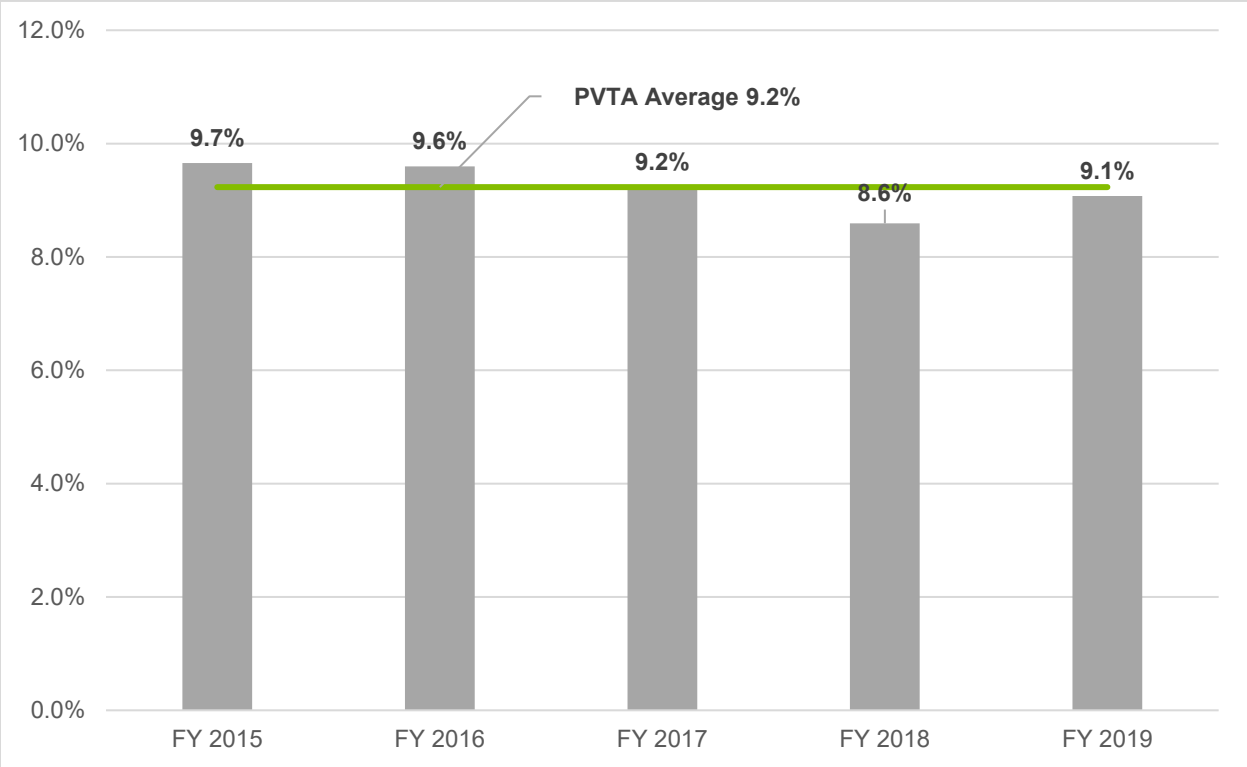
Figure 123. Demand Response-Subsidy per Passenger (FY 2015–FY 2019)



Source: MassDOT BlackCat Data

[60] Data were not available for a demand response route/service level analysis for subsidy per passenger or farebox recovery as the data for all services are incorporated into the ADA and region-wide senior van service for FY 2019.

Figure 124. Demand Response Farebox Recovery (FY 2015–FY 2019)



Source: MassDOT BlackCat Data

Capacity

Capacity examines the ability of a system to handle the passenger demand. When demand exceeds capacity customers can be denied trips or experience an unpleasant trip.

ADA Paratransit and Demand Response

Capacity constraints can be indicated through denied and missed trips, long telephone hold times, and OTP. High levels of cancellations and no-shows can create a strain on the system and lead to capacity issues as well. Table 85 and Table 86 summarize the ADA paratransit and non-demand response capacity analysis, respectively, from FY 2015 to FY 2019. As shown in Table 85, ADA paratransit trips per passenger increased from FY 2015 to FY 2018 then decreased in FY 2019 with 94.73 trips per passenger. Capacity analysis shows a declining trend in the trips per passenger for demand response non-ADA service. The demand response non-ADA trips per passenger increased from 22.77 trips per passenger in FY 2018 to 24.11 in FY 2019 (Table 86).

Table 85. ADA Paratransit Capacity Analysis (FY 2015–FY 2019)

ADA Paratransit	2015	2016	2017	2018	2019
Trips/Passenger	85.96	99.58	98.97	103.09	94.73
Unique Passengers	2,442	2,179	2,199	2,158	2,063
% Denied Trips	0.06%	0.08%	0.06%	0.07%	0.34%
% Missed Trips	N/A	N/A	0.06%	0.10%	0.21%

ADA Paratransit	2015	2016	2017	2018	2019
% No-show	2.33%	2.57%	2.57%	2.66%	2.89%
% Late Cancellation	2.39%	2.80%	3.05%	2.65%	2.45%
% Same Day Cancellation	12.66%	12.21%	12.32%	12.14%	12.89%

Source: PVTA

Table 86. Demand Response Non-ADA Capacity Analysis (FY 2015–FY 2019)

Demand Response Non-ADA	2015	2016	2017	2018	2019
Trips/Passenger	29.85	35.83	26.26	22.77	24.11
Unique Passengers	2,477	2,398	2,065	1,799	1,600
% Denied Trips	0.10%	0.10%	0.27%	0.21%	0.34%
% Missed Trips	N/A	N/A	0.11%	0.21%	0.30%
% No-show	3.90%	4.08%	3.89%	3.87%	3.99%
% Late Cancellation	2.43%	2.99%	3.21%	2.89%	2.27%
% Same Day Cancellation	34.03%	27.96%	29.74%	27.37%	24.75%

Source: PVTA

FTA defines a denial as a trip requested at least a day prior that the agency cannot provide or is outside of the 1-hour negotiation window. It also includes round-trip requests where the agency can only provide one leg of the trip; if one portion is taken then it equates to one denial and if the entire trip is not taken then two denials. This applies specifically to ADA complementary paratransit service, but PVTA applies the definition to all demand response trips. The percentage of denied trips increased over the past 5 years, averaging 0.34 percent in FY 2019 for both ADA paratransit and demand response non-ADA services.

Missed trips are defined as trips that do not take place at the fault of the agency but were requested, confirmed, and scheduled. This includes leaving before the beginning of the pick-up window, not waiting the required wait time, arriving after the pick-up window is over, and departing without the rider or not arriving at all. PVTA further clarifies that any trip that arrives outside the 20 minute pickup window is also a missed trip. In FY 2019, the percentage of missed trips was 0.21 percent and 0.30 percent for ADA paratransit and demand response non-ADA services, respectively.

No-shows are defined as incidents when passengers are not at the scheduled pick-up locations during the 20-minute window in order to board within 5 minutes of the vehicle arriving, and when passengers cancel at the door or wave away the driver who has arrived at the scheduled pick-up time and location. No-shows also include late cancels when a passenger cancels trips less than 1 hour prior to their scheduled 20-minute pick-up window. In FY 2019, PVTA averaged 21.7 no-shows per day, which represents 2.8 percent of overall ridership and 3.99 percent of demand response non-ADA ridership.

While it is anticipated that some level of cancelations will exist, high percentages of same-day cancellations can put strain on a system and lead to increased costs. Trip cancellations are required no later than 1 hour before the start of the pick-up window. Trip changes are also considered cancellations. Failure to cancel trips at least 1 hour before the scheduled 20-minute

pick-up window results in a late cancel. Same day cancels are defined as incidents when passengers cancel trips more than 60 minutes or more before the 20-minute pickup window on the day of service. The percentage of late cancellations for ADA paratransit increased in FY 2017 and decreased in FY 2018 and FY 2019, while the percentage of same day cancellation increased over 5 years (Table 85). The percentages of late cancellation and same day cancellations for demand response non-ADA service have been declining over the past 5 years.

Fixed Route

Capacity is measured based on overloads and the number of trips where crowding exists. UMTS reports overloads in their monthly reports to PVTA, but they are only instances of overloads, not the total number of passengers left behind. Even when a driver reports an overload, those passengers are typically captured by their helper buses each morning. PVTA also schedules the inbound Route 45 (Belchertown Center/UMass) and the inbound Route 33 buses so that they pick up overload passengers and act as “helpers” as well.

Table 87 summarizes the number of overload reports (but not the number of passengers impacted) for each year by route from FY 2015 to FY 2019. Over the past five fiscal years, the fixed route overload reports decreased by 50 percent from 839 overload reports in FY 2015 to only 417 overload reports in FY 2019. In general, routes that experienced a decline in ridership also had a decline in overloads and vice versa. The overload reports were lowest in FY 2017 with only 294 reports. As shown in the table, Route 30 accounts for almost half of the overloads each year.

Table 87. Fixed Route Overload Reports (FY 2015–FY 2019)

Route	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Route 30 - North Amherst/Old Belchertown Road	485	157	159	254	207
Route 31 - Sunderland/South Amherst	241	144	84	161	98
Route 33 - Shopper Shuttle/Puffers Pond	2	0	3	15	6
Route 34 - Orchard Hill	53	26	26	69	68
Route 35 - Mullins Center	16	7	8	32	30
Route 36 - Atkins Corner/Olympia Drive	0	0	0	1	0
Route 38 - Mount Holyoke College/UMass	5	1	2	5	1
Route 39 - Smith/Hampshire	4	0	1	0	0
Route 45 - Belchertown Center/UMass	1	10	4	7	2
Route 46 - South Deerfield Center/UMass	0	0	0	0	0
Route 51- Helpers	32	9	7	8	5
TOTAL	839	354	294	552	417

Source: PVTA

PVTA has established a vehicle load standard of 100 percent of seating capacity for the off-peak period and 120 percent for the peak period for the maximum number of individuals on average over1 hour, although individuals trips can exceed the average. This helps minimize standees,

providing a higher comfort level and increased safety for passengers. PVTA monitors the percentage of trips above the peak load on a monthly basis and flags any trip with more than 35 people onboard at any time as being overloaded. This method overestimates the percentage of trips exceeding the standard when 40 foot and articulated buses are on the route but does give a proxy for demand. The school helpers have the highest percentage of trips that reach a peak load. In the northern tier Routes 30 and 31 have the highest percentage of trips above the standard at 14.4 percent and 9.6 percent, respectively, when school is in session. In the southern tier, Routes B7 and P21 are the highest at 6.6 percent and 6.7 percent, respectively.

Customer Service

Table 88 shows the annual percentage of calls abandoned and percentage of calls answered within 2 minutes for ADA paratransit and demand response non-ADA services from FY 2015 to FY 2019. The percentage of calls abandoned represents the percentage of total calls to a telephone line at the reservation service or customer service center in which the customer hangs up prior to speaking with an agent. A high number of abandoned calls may indicate insufficient staffing. As shown in the table the percentage of calls abandoned was in the 0.02 to 0.03 percent range from FY 2015 to FY 2018 and increased significantly to 7.6 percent in FY 2019. The percentage of calls answered within 2 minutes has been declining in the past five fiscal years with the lowest at 92.4 percent in FY 2019.

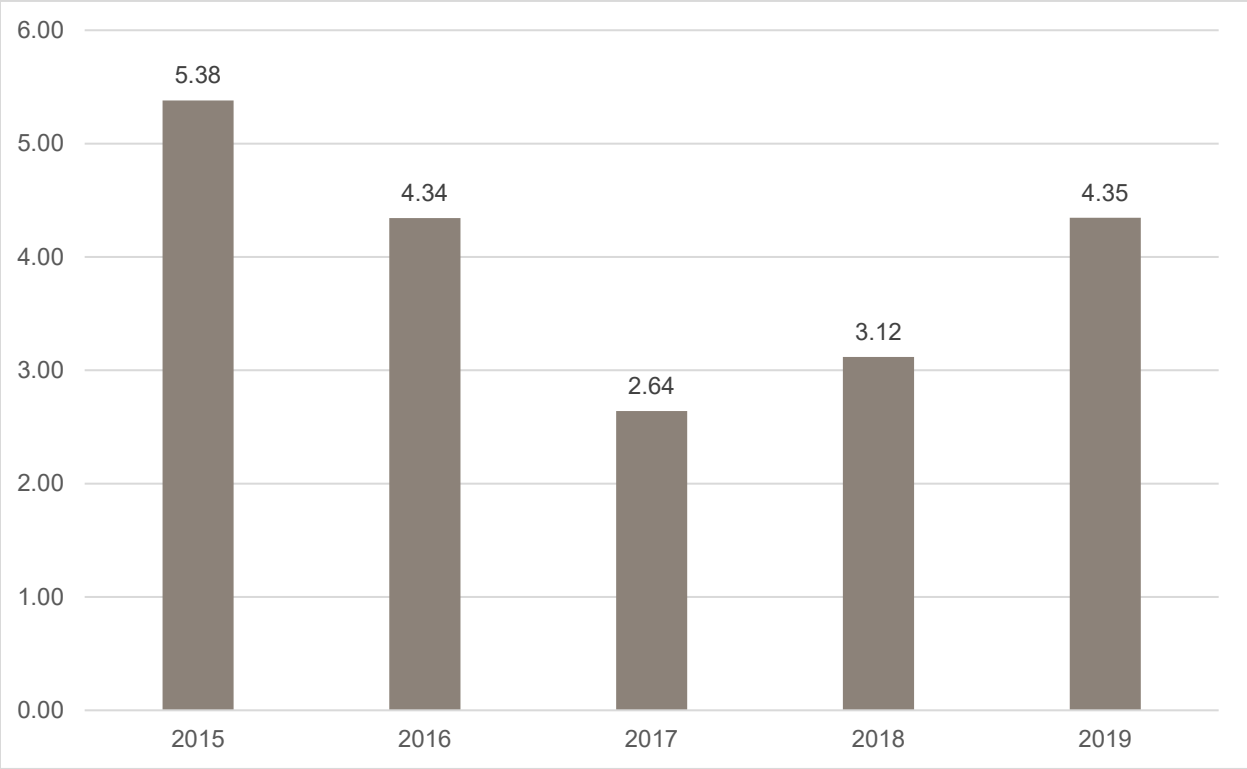
Table 88. FY 2015–FY 2019 Annual Percent of Calls Abandoned and Calls Answered (ADA Paratransit and Demand Response non-ADA)

Fiscal Year	% of Calls Abandoned	% of Calls Answered Within 2 Minutes
FY 2015	0.03%	99.7%
FY 2016	0.02%	98.5%
FY 2017	0.03%	99.4%
FY 2018	0.02%	97.9%
FY 2019	7.60%	92.4%

Source: PVTA

Valid complaints are used to assess the level of customer service provided. The number of complaints received is determined to be valid after a thorough investigation. Figure 125 shows the number of valid complaints per 100,000 passenger trips for PVTA fixed routes, ADA paratransit, and demand response non-ADA services from FY 2015 to FY 2019. As shown in the figure, FY 2015 had the highest valid complaints per 100,000 passenger trips with 5.38 valid complaints per 100,000 passenger trips. FY 2017 had the lowest with 2.64 complaints per 100,000 passenger trips. From FY 2015 to FY 2017, the valid complaints per 100,000 passenger trips decreased by 51 percent but has since increased by 39 percent. The valid complaints per 100,000 passenger trips increased by 32 percent between FY 2017 and FY 2019. In FY 2019, PVTA set an internal valid complaints per 100,000 passenger goal of 2.38, which they exceeded in FY 2019 by 1.97.

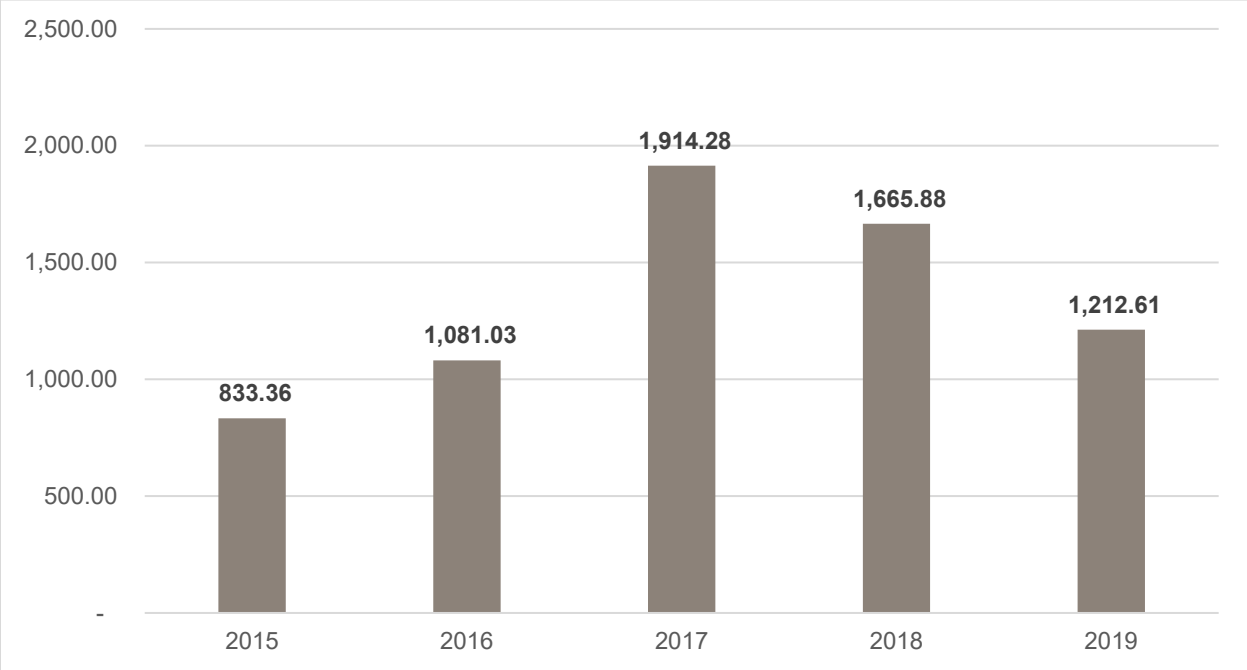
Figure 125. Valid Complaints per 100,000 Passenger Trips (2015–2019)



Source: PVTA

Figure 126 shows the number of valid complaints per vehicle service hour received for PVTA fixed routes, ADA paratransit, and demand response non-ADA services from FY 2015 to FY 2019.

Figure 126. Vehicle Service Hours per Valid Complaint (2015–2019)

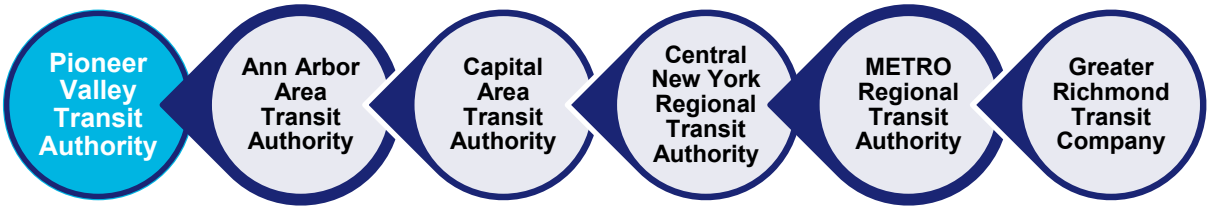


Source: PVTA

Peer Evaluation

As part of the comprehensive regional transit plan update a peer review was prepared to gain an understanding of how similar systems are operating transit service. This peer review explores five transit services that operate in similar conditions. Although each transit system and its routes are unique, the similarities and differences in these five peers provide useful insight into how transit service is provided and operated throughout the country. The list of peers was developed based on areas with similar demographics and service levels (Figure 127).

Figure 127. PVTA Peers



Data were gathered from the NTD and the U.S. Census, comparing 2018 agency profiles. Table 89 summarizes for each agency the census data, including town name, state, counties served, population, population density, population growth rate, and percent of individuals living at or below the poverty line. Population density helps in understanding whether the communities in the service area are densely or sparsely populated since denser communities can be served more efficiently by transit. Population growth rate indicates whether communities are growing rapidly, moderately, or slowly. Transit agencies serving communities with high population growth rate have different challenges than the agencies serving communities with moderate growth rates or communities that are decreasing in size. Percent of poverty level helps in understanding income level in the service area as people with lower income level are more likely to depend on public transportation.

Peer Systems Census Analysis

In 2018, as shown in the table, the PVTA service area had a population of 626,594 people, the second largest in the peer group, albeit spread across a larger area as indicated by the population density of 1,798 persons per square mile, the second lowest in the peer group. PVTA had a population growth rate of 8.47 percent and poverty rate of 16.5 percent, ranking in the 60th and 40th percentile in the peer group. While the table shows aggregate service area values, it is important to note that there is great variation in densities, growth rates, and poverty rates between each community in PVTA's service area, and likewise for the peers.

Table 89. Peer Systems Census Data (2018)

System	Town	State	Counties Served	Population	Population Density	Population Growth Rate	Percent Below Poverty
Pioneer Valley Transit Authority (PVTA)	**Springfield**	**MA**	**Hampshire and Hampden**	**626,594**	**1,798**	**8.47**	**16.5%**
Ann Arbor Area Transportation Authority (TheRide)	Ann Arbor	MI	Ann Arbor, Ypsilanti, & Washtenaw County Townships	320,990	2,012	10.25	16.5%
Capital Area Transportation Authority (CATA-MI)	Lansing	MI	Ingham, Eaton, and Clinton	322,236	2,037	7.76	20%
Central New York Regional Transportation Authority (Centro)	Syracuse	NY	Onondaga, Oswego, Cayuga, and Oneida	409,002	2,098	1.58	15.9%
METRO Regional Transit Authority	Akron	OH	Summit	568,131	1,746	1.57	14.9
Greater Richmond Transit Company (GRTC)	Richmond	VA	City of Richmond; Henrico, Hanover, and Chesterfield	1,010,680	2,053	12.54	13%

Source: 2018 NTD

Peer Systems Operating Analysis

An overview of the operating data of PVTA and the five peer transit agencies is provided in Table 90; statistics include all modes operated. PVTA has the highest ridership among the peer group and given it has the second largest service area also operated the second highest amount of service in terms of revenue miles and hours. In terms of operating budget, PVTA has a budget less than all but one in its peer group. Put together, PVTA operates the second largest service with an operating budget considerably lower than its peers. In FY 2018, PVTA generated $7,011,521, the second lowest revenue from passenger fares. However, PVTA's farebox revenue was 73 percent higher than METRO Regional Transit, which was the lowest in the peer group, and 6 percent and 8 percent lower than Ann Arbor Area Transportation Authority and Capital Area Transportation Authority, the next two highest among the peers, respectively.[61]

[61] Note that this revenue is based on what each agency reports to NTD as farebox revenue.

Table 90. Peer Systems Operating Data (2018)

System	Ridership	% miles Demand Response	Operating Budget	Revenue Miles Operated	Revenue Hours Operated	Farebox Revenue
Pioneer Valley Transit Authority	**11,223,169**	**44%**	**$46,531,050**	**7,947,598**	**586,575**	**$7,011,521**
Ann Arbor Area Transportation Authority	7,166,843	22%	$39,907,398	6,512,248	442,158	$7,649,229
Capital Area Transportation Authority	10,384,586	51%	$46,634,224	6,430,485	459,095	$7,458,477
Central New York Regional Transportation Authority	10,396,768	27%	$69,295,258	6,129,219	498,399	$14,967,833
METRO Regional Transit Authority	5,142,955	43%	$51,722,064	6,016,822	443,459	$4,052,602
Greater Richmond Transit Company	8,126,404	18%	$50,453,119	11,337,313	600,397	$10,003,819
Peer Average	**8,243,511**	**32%**	**$51,602,412**	**7,285,217**	**488,702**	**$8,826,392**

Source: 2018 Urban Integrated NTD; 2018 NTD Agency Profiles for PVTA, Ann Arbor Area Transportation Authority, Capital Area Transportation Authority, Central New York Regional Transportation Authority, Centre Area Transportation Authority, and Greater Richmond Transit Company.

Peer Systems Performance

Service Effectiveness

The peer system service effectiveness for passengers per mile and passengers per mile compared to PVTA is outlined in Table 91. PVTA exceeds the peer group average in terms of productivity for passengers per mile (Figure 128) and passengers per hour (Figure 129). Additionally, PVTA exceeds the peer group average for each measure. Only two peers are performing slightly more effectively than PVTA, the Capital Area Transportation Authority and Central New York Regional Transportation Authority. Overall, these measures are a function of the amount of service provided by each transit agency and vary based on the geographic spread of the area and average operating speed.

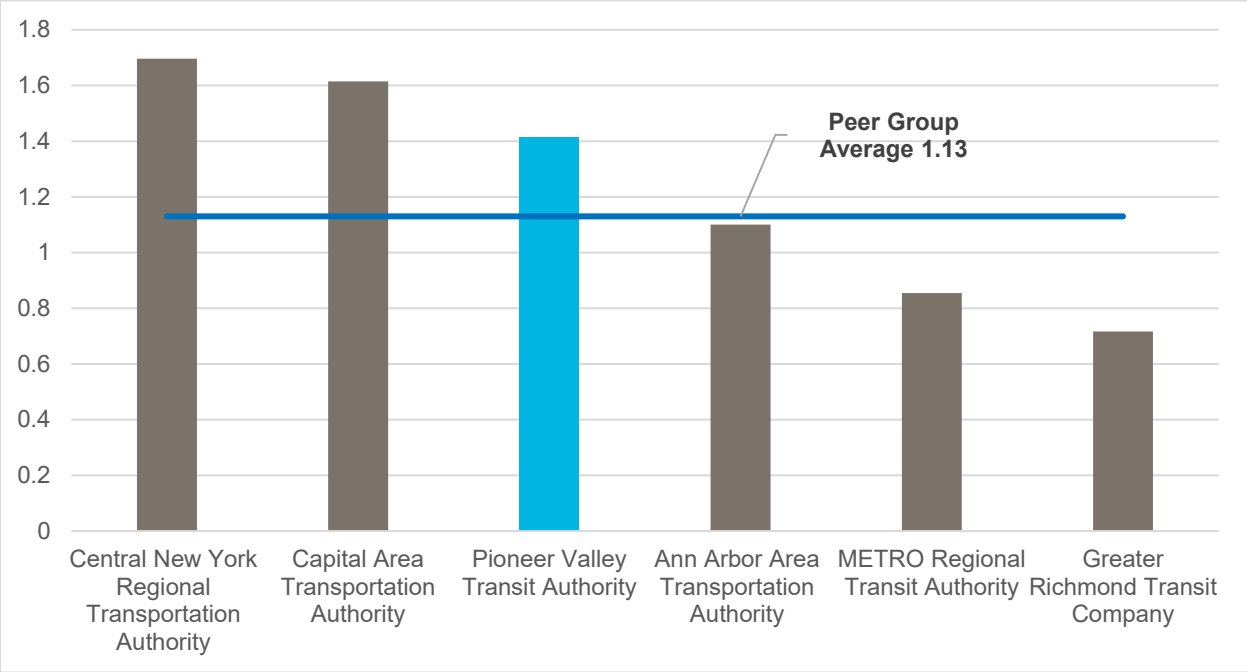
Table 91. Peer Systems Service Effectiveness

Peer	Passengers/ Mile	Passengers/ Hour
Pioneer Valley Transit Authority	**1.41**	**19.13**
Ann Arbor Area Transportation Authority	1.10	16.21

Peer	Passengers/ Mile	Passengers/ Hour
Capital Area Transportation Authority	1.61	22.62
Central New York Regional Transportation Authority	1.70	20.86
METRO Regional Transit Authority	0.85	11.60
Greater Richmond Transit Company	0.72	13.54
Peer Group Average	1.13	16.87

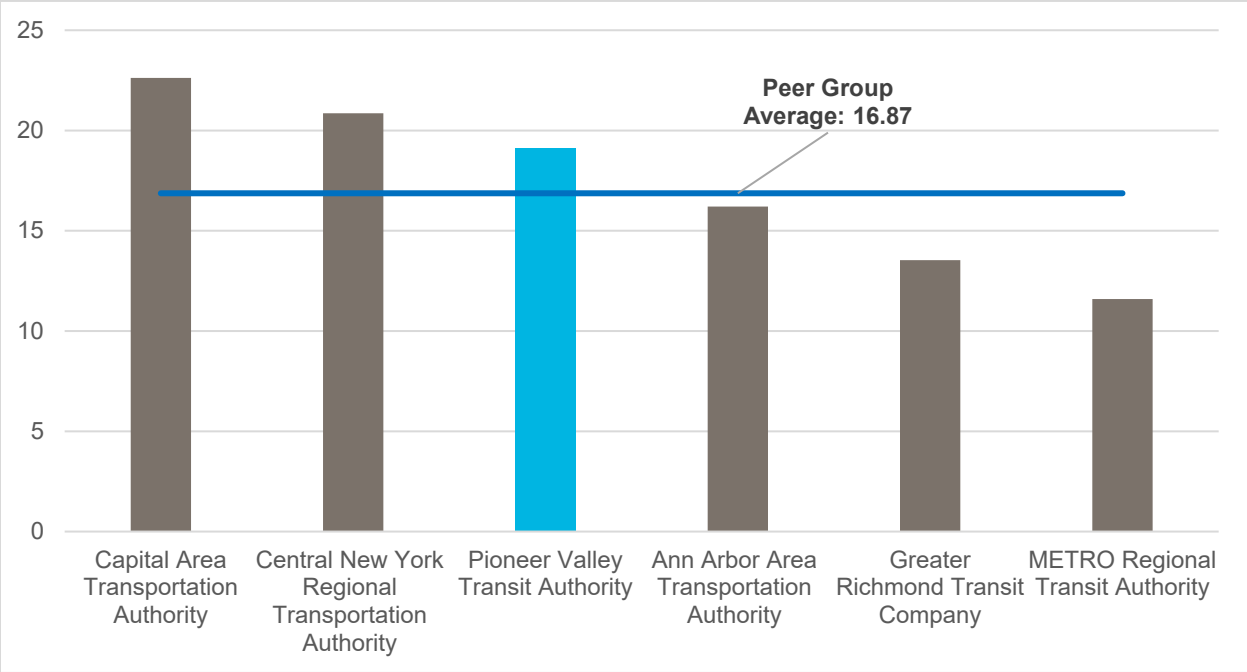
Source: 2018 NTD Agency Profiles

Figure 128. Peer Comparison: Passengers per Mile (2018)



Source: NTD

Figure 129. Peer Comparison: Passengers per Hour (2018)



Source: NTD

Peer Comparison per Capita Measures

A peer comparison of per capita measures is outlined in Table 92. Ridership per capita gives a representation for how many public transit trips the population in the area takes yearly. Among its peers, PVTA had a ridership per capita of 17.91, which was below the peer average of 19.16, but exceeded two of its peers, METRO Regional Transit Authority and Greater Richmond Transit Company. This is to be expected given the low density of the PVTA service area. Revenue miles per capita and revenue hours per capita are the total annual miles and hours of transit service, respectively, traveled per person in the population in a given area. PVTA had a revenue miles per capita value of 12.68, and a revenue hours per capita of 0.94, which were both slightly below the group average of 14.95 and 1.06, respectively. This suggests that PVTA operates less service per person living its area compared to its peers. Lastly, speed can be an indicator of the type of area served where higher speeds indicate the service operates in a less congested area and lower speeds indicate operations under congested conditions. PVTA had a speed of 13.55 miles per hour, which is second lowest speed amongst its peers; indicating that PVTA service operates in many congested urban areas.

Table 92. Peer Comparison per Capita Measures (2018)

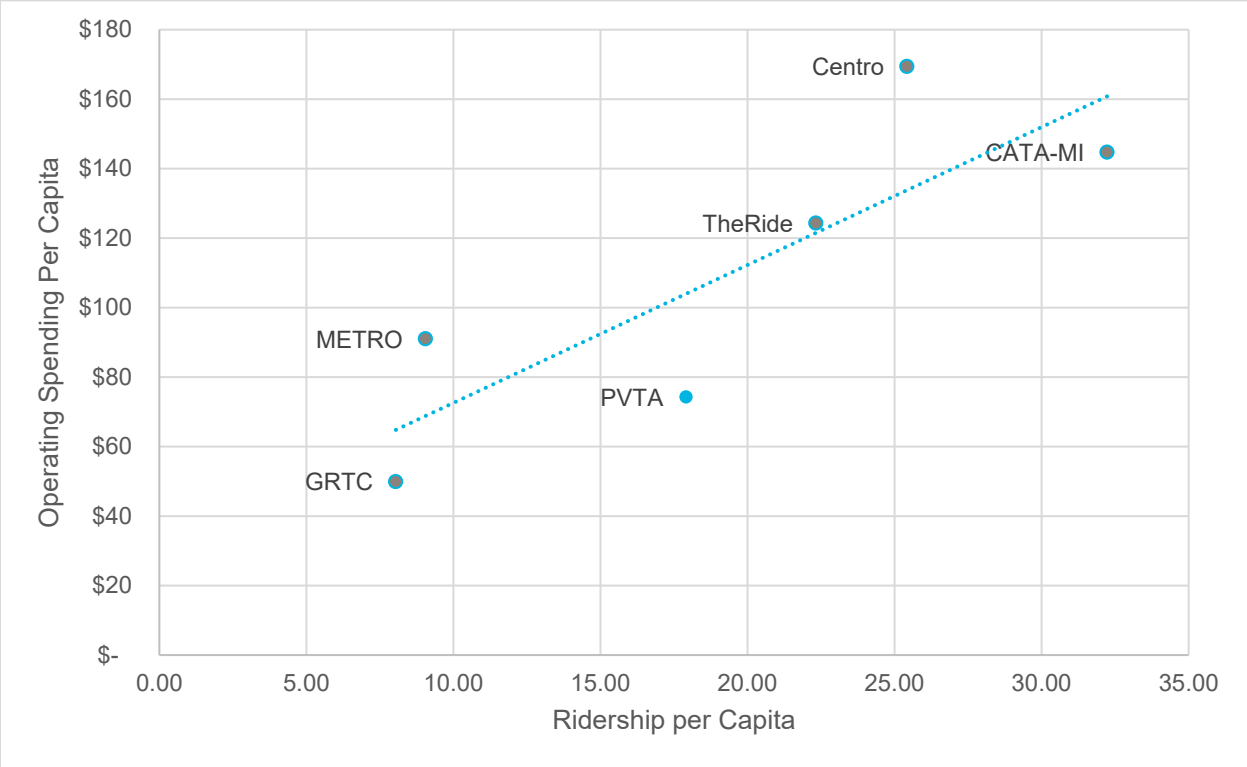
Peer	Ridership per Capita	Revenue Miles/ Capita	Revenue Hours/ Capita	Speed (miles/ hour)
Pioneer Valley Transit Authority	**17.91**	**12.68**	**0.94**	**13.55**
Ann Arbor Area Transportation Authority	22.33	20.29	1.38	14.73
Capital Area Transportation Authority	32.23	19.96	1.42	14.01
Central New York Regional Transportation Authority	25.42	14.99	1.22	12.30

Peer	Ridership per Capita	Revenue Miles/ Capita	Revenue Hours/ Capita	Speed (miles/ hour)
METRO Regional Transit Authority	9.05	10.59	0.78	13.57
Greater Richmond Transit Company	8.04	11.22	0.59	18.88
Peer Group Average	19.16	14.95	1.06	14.51

Source: 2018 NTD Agency Profiles

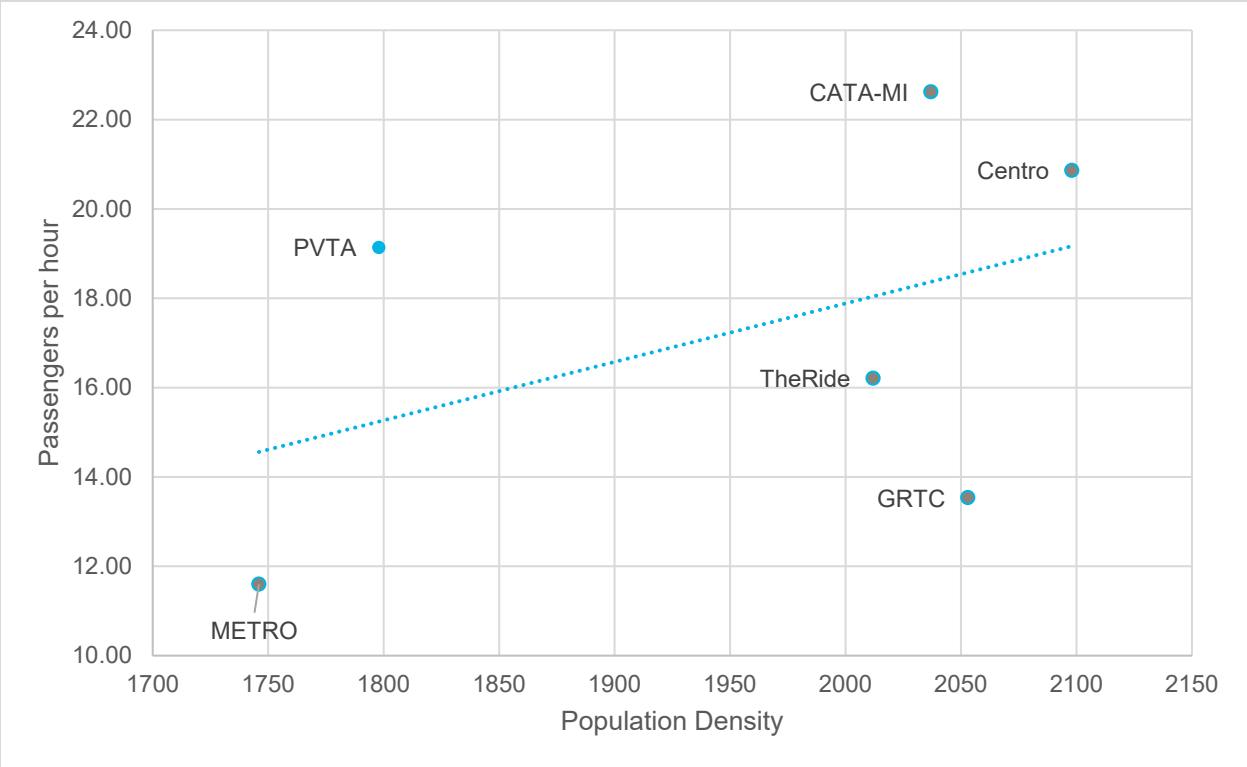
Among peer regions, there is a connection between transit spending, level of service, and ridership. CATA-MI, Centro, and TheRide spend the most in transit and in turn have the highest level of service (Figure 130). PVTA has the second lowest transit spending per capita, after GRTC. Additionally, passengers per hour and population density were compared. Different levels of service can affect total revenue hours per capita. In comparison to its peers, in 2018, PVTA had a higher number of passengers per hour despite operating in a region with a lower population density (Figure 131).

Figure 130. Peer Analysis Operating Spending per Capita versus Ridership per Capita (2018)



Source: 2018 Urban Integrated NTD

Figure 131. Peer Analysis: Passengers per Hour versus Density (2018)



Source: 2018 Urban Integrated NTD

Financial Performance

Financial performance measures include cost per hour, cost per passenger, subsidy per passenger, farebox recovery, and spending per capita (Table 93). Financial measures show that PVTA is outperforming most of its peers and has the lowest cost per hour, cost per passenger, and subsidy per passenger. PVTA's farebox recovery seems low among the peers because, while PVTA operates one of the most cost effective services, they collect fewer fares per passenger from the farebox because of contracts with various organizations that cover the cost of fares for either the organization's members or the general public depending on the route. Additionally, in FY 2019 PVTA had a farebox recovery that exceeded the state (15.4 percent) and national averages (22.1 percent). However, farebox recovery is reduced systemwide because of ADA demand response service. Lastly, PVTA spends less money per capita than most of its peers and is below the peer group average of $109. This combined with the higher passenger per hour is an indication of PVTA's strong financial performance.

Table 93. Peer Systems Financial Performance

Peer	Cost/ Hour	Cost/ Passenger	Subsidy/ Passenger	Farebox Recovery	Spending per Capita
Pioneer Valley Transit Authority	**$79.33**	**$4.15**	**$3.52**	**15.1%**	**$74**
Ann Arbor Area Transportation Authority	$90.26	$5.57	$4.50	19.2%	$124
Capital Area Transportation Authority	$101.58	$4.49	$3.77	16.0%	$145

Peer	Cost/ Hour	Cost/ Passenger	Subsidy/ Passenger	Farebox Recovery	Spending per Capita
Central New York Regional Transportation Authority	$139.04	$6.67	$5.23	21.6%	$169
METRO Regional Transit Authority	$116.63	$10.06	$9.27	7.8%	$91
Greater Richmond Transit Company	$84.03	$6.21	$4.98	19.8%	$50
Peer Group Average	**$105.59**	**6.26**	**5.19**	**17%**	**$109**

Source: 2018 NTD Agency Profiles for PVTA, Ann Arbor Area Transportation Authority, Capital Area Transportation Authority, Central New York Regional Transportation Authority, Centre Area Transportation Authority, and Greater Richmond Transit Company.

Peer Systems Technology Deployment

Technology today serves a variety of functions in many aspects of everyday life, including transit. A review of the peer systems' technology provides an understanding of trends within the industry for similar size agencies. This section explores three primary sectors of technology: schedule information, fare payment, and ability to stay connected. Table 94 provides a description of technology deployment in each of the peer services.

Table 94. Technology Deployment in the Peer Systems

Peer	AVL/ Real Time Info	Google Transit	Smart Card	Mobile Payment	Wi-fi On Board	Microtransit
Pioneer Valley Transit Authority	Yes	Yes	Yes	Yes	No	Yes
Ann Arbor Area Transportation Authority	Yes	Yes	No	No	No	No
Capital Area Transportation Authority	Yes	Yes	No	No	No	No
Central New York Regional Transportation Authority	Yes	Yes	No	No	Yes	No
METRO Regional Transit Authority	Yes	Yes	No	Yes	No	No
Greater Richmond Transit Company	Yes	Yes	No	Yes	No	No

PVTA is one of three transit agencies, in addition to the Greater Richmond Transit Company and METRO Regional Transit Authority, to have deployed mobile payments. PVTA recently deployed MassDOT BusPlus, allowing passengers to buy tickets on their smart phone. Only one peer, the Central New York Regional Transportation Authority offers wi-fi onboard their buses. Microtransit is a variant of demand response where users are able to request, and often pay for their trips, using a mobile app. While there are varying models the service typically provides curb-to-curb service that is on-demand. None of the peers have piloted a microtransit project.

Appendix C Outreach Backup Materials

A public survey, driver survey, and interviews were conducted to engage the community and operators in a discussion of transportation needs and how PVTA can best serve the community into the future. The results of each are presented in the following sections.

Public Survey

As a result of the COVID-19 pandemic and the associated social distancing requirements, in-person public outreach was cancelled and an online, mobile-friendly survey was created to reach as many people as possible who travel in and around the 24 communities they serve within the Pioneer Valley area. The goal of this survey was to engage the community in a discussion of transportation needs and how it can best serve the community into the future. The survey went live to the public on June 15, 2020, and remained open until August 3, 2020. The following section contains an analysis of the survey results for the duration of the survey.

Methodology

Through a series of conference calls and meetings with the AECOM team and PVTA staff, a series of survey questions were prepared to target both riders of the PVTA system, both fixed bus and demand response, and those who do not use the service. The development of the questions began in February 2020 and include questions about residency, frequency of travel with PVTA, primary mode of transportation, preference of service extensions, possible improvements, and included a set of optional demographic questions.

PVTA helped the AECOM team spread the word about the survey through stakeholder email blasts that included a QR code, short link, and advertising graphic for use on websites and social media accounts. All the survey promotional content included a brief description of the purpose of the survey, a link to the survey, and a QR code, which when scanned by a smart phone, provided a direct link to the survey. In addition, PVTA posted links to the survey on their social media accounts, Twitter, and Facebook to reach a larger audience. Flyers and signs were posted at PVTA transportation hubs and on vehicles for passengers to read while riding. The AECOM team prepared and PVTA distributed a press release to local media outlets and local towns, colleges, and universities for additional coverage. Using the automated phone system, PVTA set up pre-recorded calls to registered demand response riders to fill out the public survey online, provide feedback through the email address, or call the phone number and leave a voicemail.

To gather additional feedback from respondents who do not have access to a computer, smart phone, or other technology to complete the online survey, a Google Voicemail phone number was created. Those who called the phone number were greeted with a recording thanking them for their participation and asking for feedback about PVTA as a transportation resource to the region and their experiences as a rider, if applicable. A total of 41 voicemails were collected and are summarized in the report below. A Google email address was also created for those who preferred to submit their feedback in a typed format. No feedback was submitted via email. The Google Voicemail number and Gmail email address were included on each promotional material shared with the public and stakeholders, in both English and Spanish.

The AECOM team made a brief presentation to the PVTA Paratransit Council to introduce the purpose for the plan, the public survey, and the creation of the Google Voicemail phone number and Gmail email address. Phone interviews were set up for one-on-one interviews with council members by the AECOM team if desired and two interviews were held. The PVTA Paratransit Council members helped spread the word about the survey and encourage the public to submit feedback to the AECOM team for inclusion in the plan.

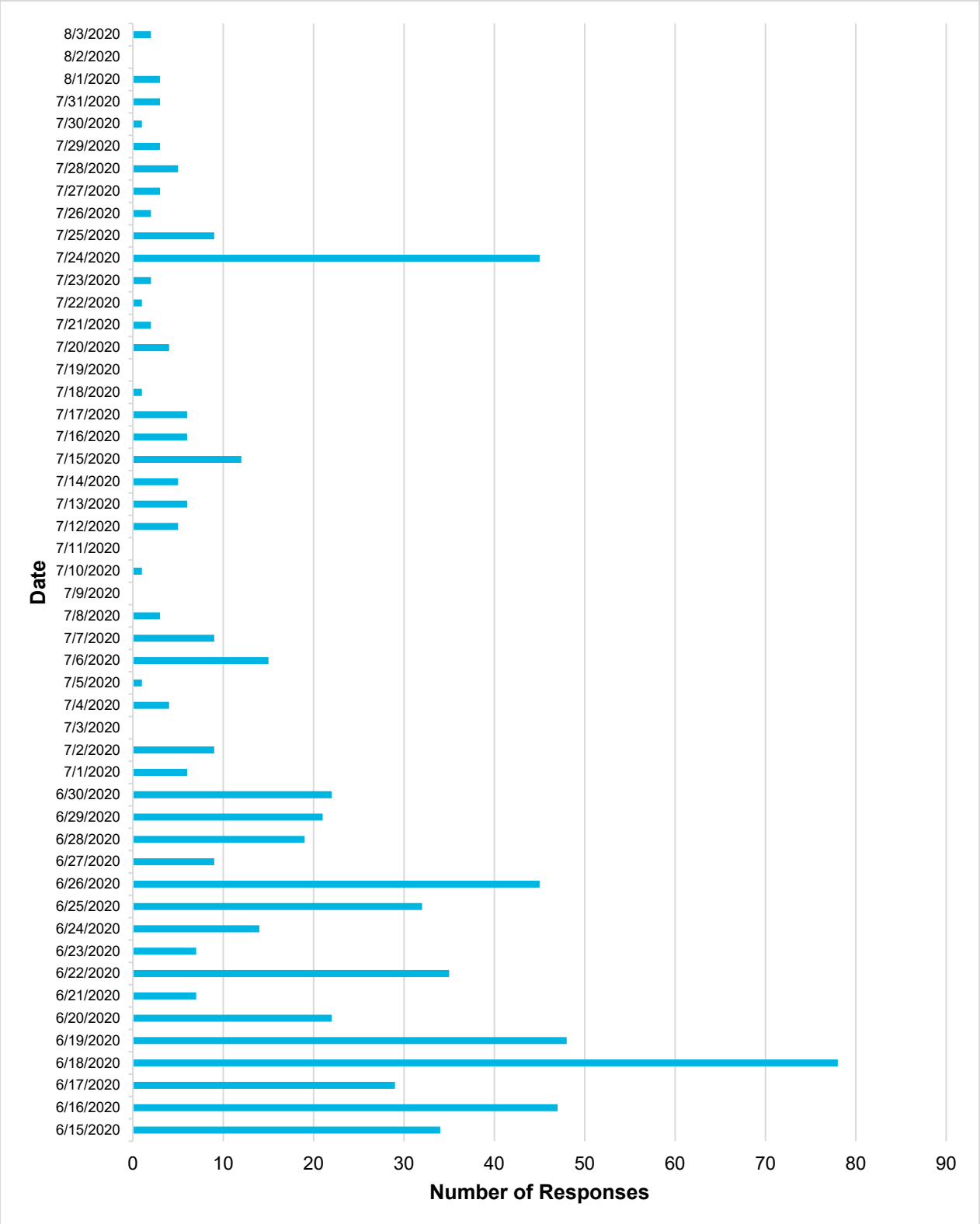
Online Survey

As previously stated, the online survey opened on June 15, 2020, and was available through August 3, 2020. The survey was open to all individuals who live, work, or visit the area and was open to both riders and non-riders of the PVTA system. The survey was made available in both English and Spanish and included an initial question to determine whether the respondent is a current rider of PVTA or not.

Responses

The survey received 643 responses, 452 completed surveys and 191 partially completed surveys. The peaks in responses shown in the following graph correlate with email blasts to stakeholder groups. A total of 544 respondents use PVTA services and 99 respondents do not ride with PVTA. Not all respondents answered all the survey questions. As such, the percentages in all figures are based on the number of responses received for that question rather than on the total number of responses.

Figure 132. Survey Responses by Date



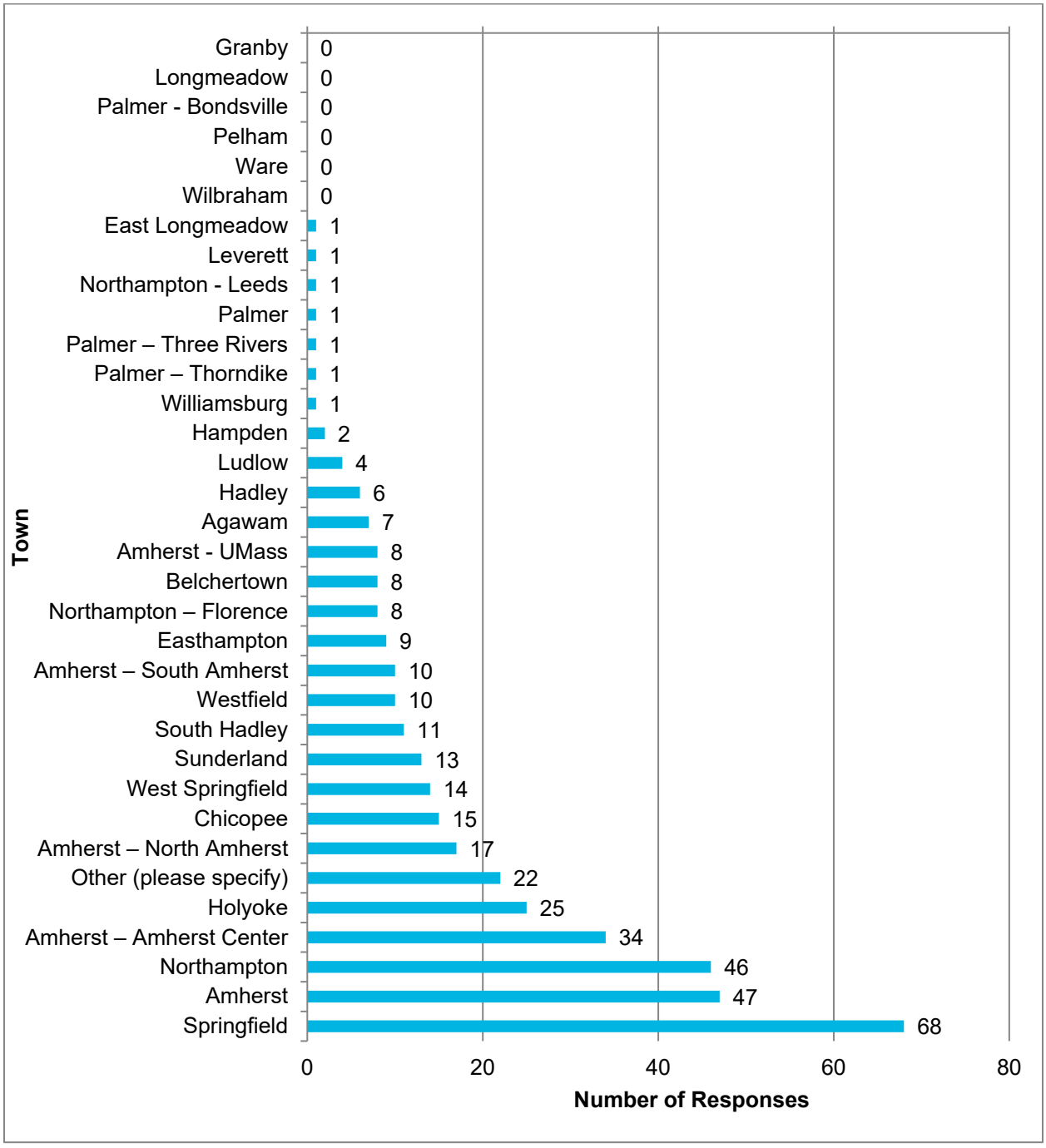
Fixed Route Riders

A total of 417 respondents use the PVTA fixed route bus service. Their survey responses are summarized below:

1. Where do you live? (n = 369)

The majority of respondents who use the PVTA fixed route bus services live in Amherst (116 total). Of the neighborhoods within Amherst, 34 respondents live in Amherst Center, 17 live in North Amherst, 10 live in South Amherst, and 8 live at UMass. The remaining 47 respondents live in Amherst, not a specific neighborhood. Similarly, Northampton consists of various neighborhoods and a total of 55 respondents live in the town. Of the 55 total respondents, eight live in the Florence neighborhood, one lives in Leeds, and the remaining 46 live in Northampton, not a specific neighborhood. A total of 68 respondents live in Springfield. No respondents live in Granby, Longmeadow, Palmer (Bondsville), Pelham, Ware, or Wilbraham.

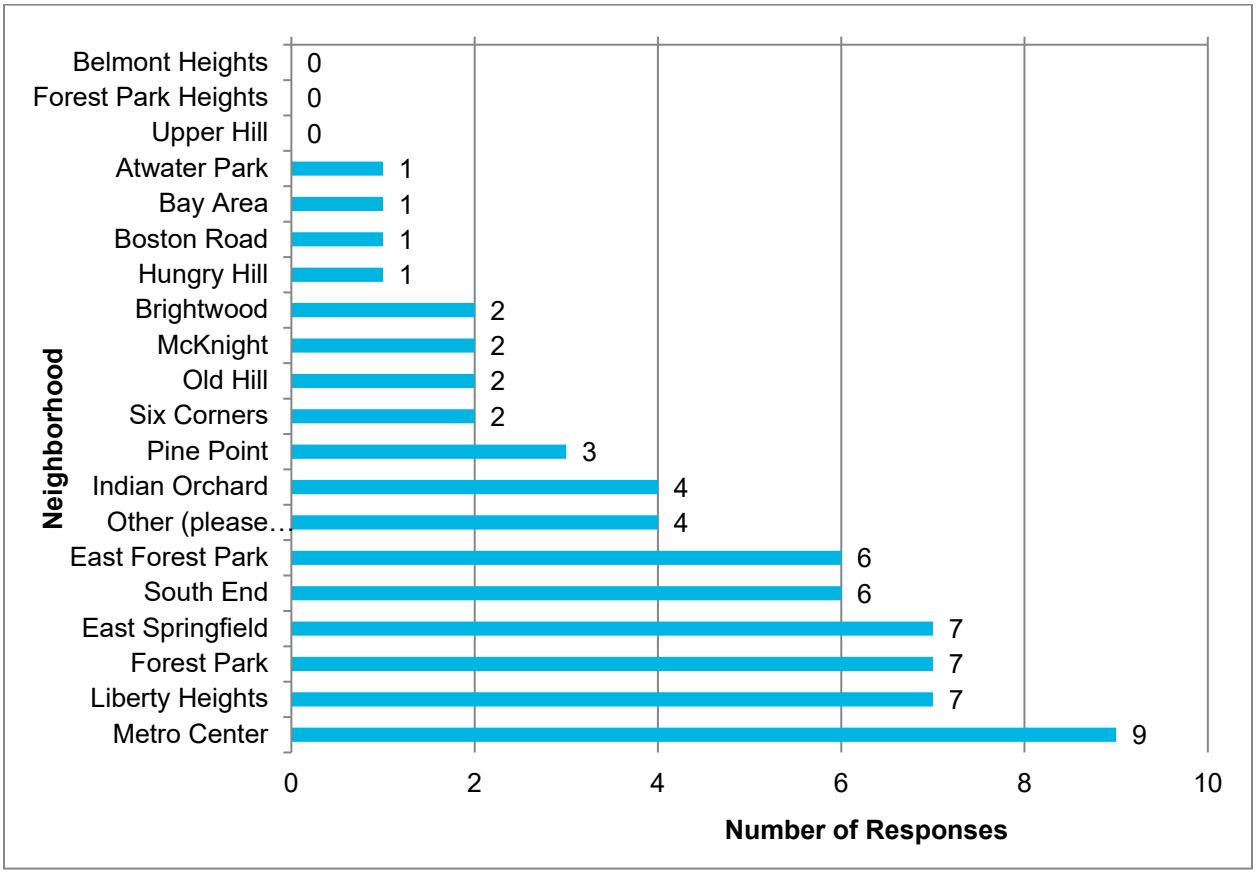
Figure 133. Towns Where Respondents Live



2. What Springfield Neighborhood do you live in? (n = 61)

Sixty-one of the respondents who live in Springfield provided additional information about the neighborhood in Springfield they live. Nine respondents live in the Metro Center neighborhood, seven respondents live in Liberty Heights, seven live in Forest Park, and seven live in East Springfield.

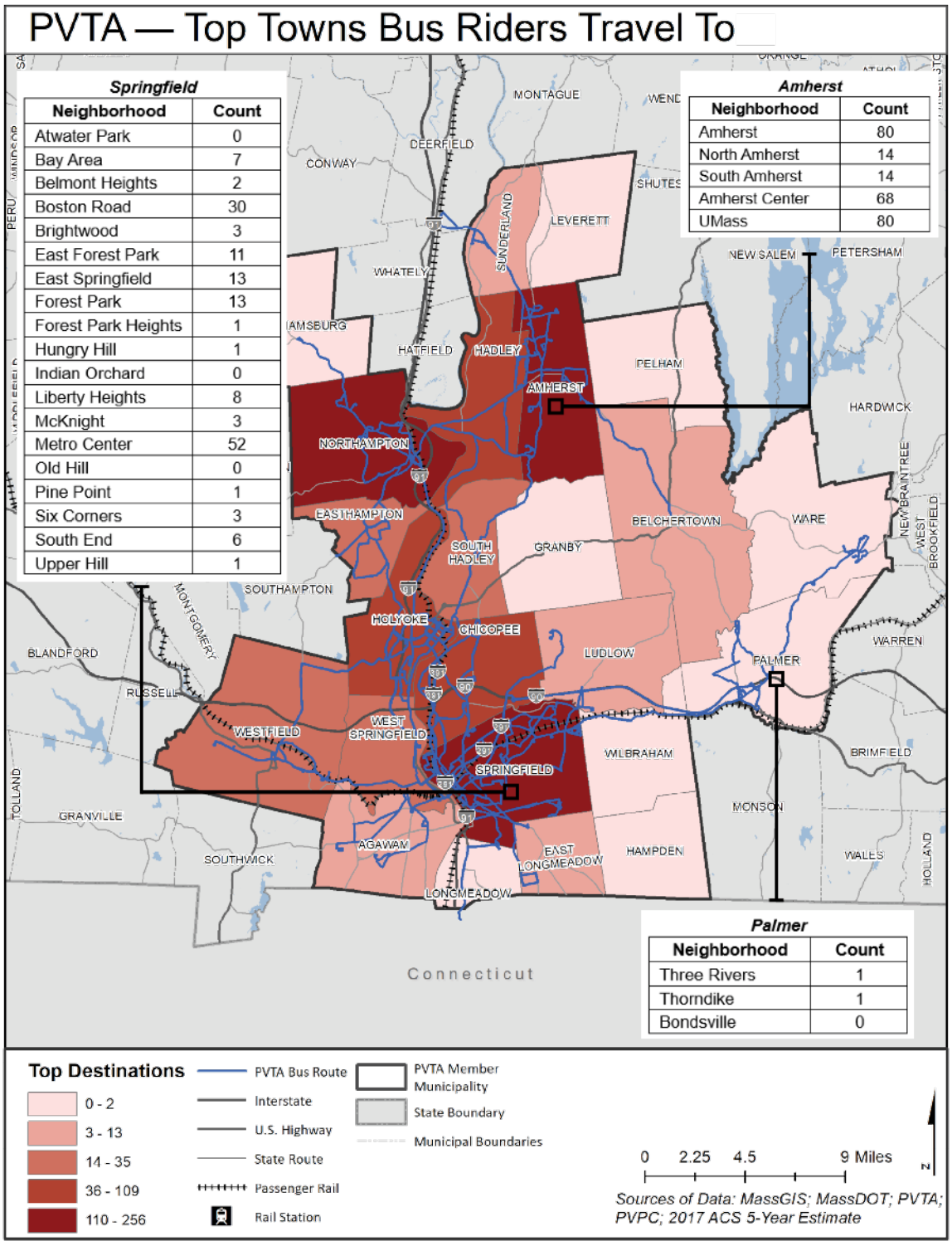
Figure 134. Neighborhoods in Springfield in which Respondents Live



3. What are the top three places you travel to most often? (n = 339)

The top three places respondents (339 total) travel to most often are Northampton (154), Holyoke (109), and Hadley (75).

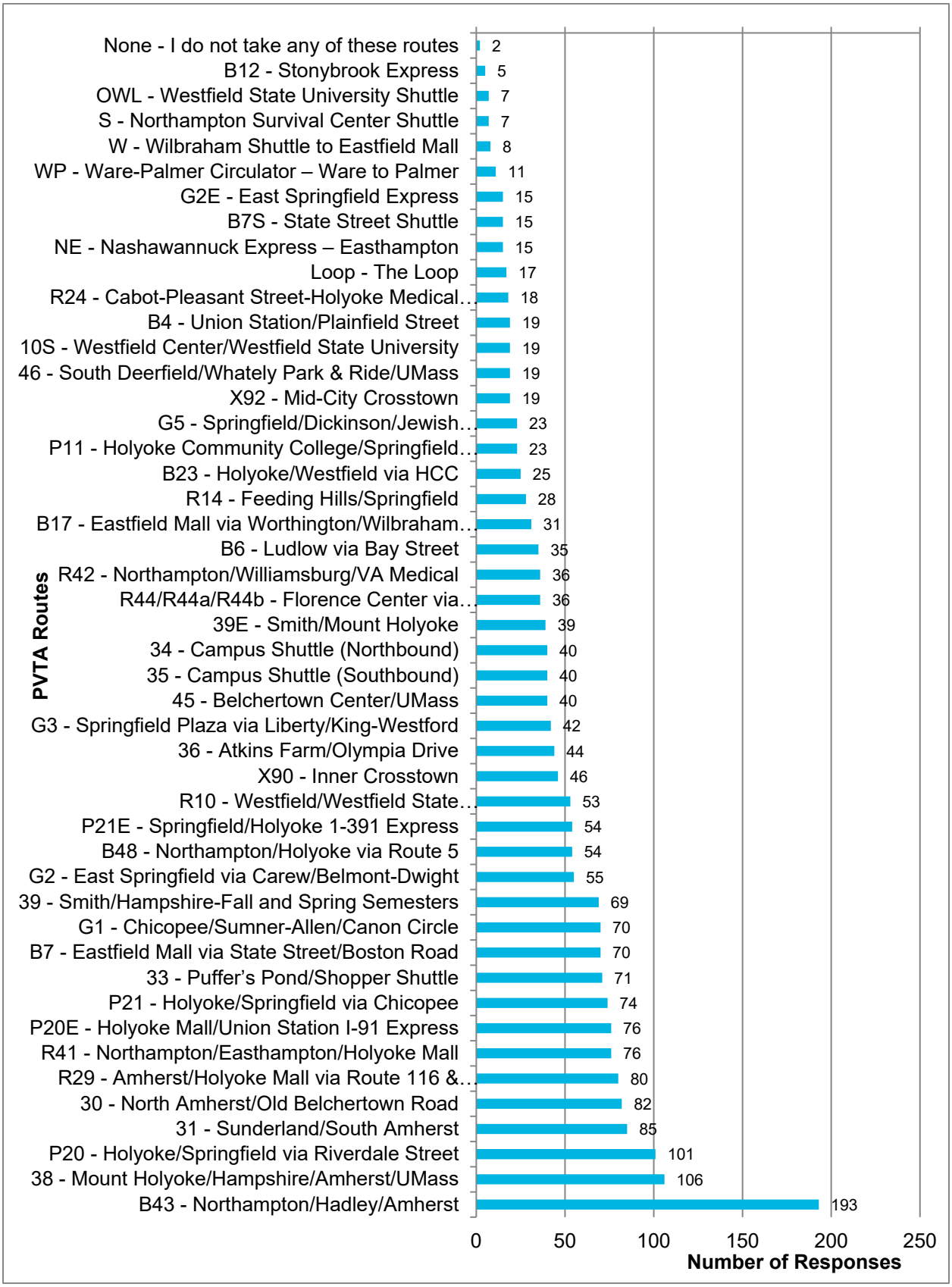
Figure 135. Top 3 Destinations by Fixed Route Riders



4. Which PVTA routes do you use? (n = 366)

The three routes used most often by respondents are Route B43 Northampton/Hadley/Amherst (193), Route 38 Mount Holyoke/Hampshire/Amherst/UMass (106), and P20 Holyoke/Springfield via Riverdale Street (101). The routes used least often by respondents are B12 Stonybrook Express, OWL Westfield State University Shuttle (5), and Route S Northampton Survival Center Shuttle (7).

Figure 136. Routes Respondents Use



5. Which improvements would you like to see on the PVTA routes you use? (n = 302)

Summarized in Table 95 are the improvements most wanted by respondents for the top five routes used most often:

Table 95. Desired Improvements on Routes Used

Improvement	Top 5 Routes per Improvement	Percent Respondents (#) Per Route
Bus came more often	G2E WP OWL B12 R44/R44a/R44b	100.00% (9) 100.00% (8) 100.00% (4) 100.00% (2) 96.00% (24)
Earlier weekday service	S OWL B6 X92 W	75.00% (3) 75.00% (3) 55.00% (11) 54.55% (6) 50.00% (2)
Bus ran later on weekdays	B6 S W OWL G3	80.00% (16) 75.00% (3) 75.00% (3) 75.00% (3) 68.42% (13)
Earlier Saturday service	S OWL X90 B6 W	75.00% (3) 75.00% (3) 50.00% (15) 50.00% (10) 50.00% (2)
Bus ran later on Saturday	S W B6 G3 Loop	75.00% (3) 75.00% (3) 70.00% (14) 63.16% (12) 57.14% (4)
Saturday service	S B23 R24 39E 46	75.00% (3) 64.29% (9) 53.85% (7) 52.17% (12) 50.00% (6)
Earlier Sunday service	S B6 X90 W OWL	75.00% (3) 55.00% (11) 50.00% (15) 50.00% (2) 50.00% (2)
Bus ran later on Sunday	S W B6 X90 Loop	75.00% (3) 75.00% (3) 65.00% (13) 60.00% (18) 57.14% (4)
Sunday service	S W X92 WP 10S	75.00% (3) 75.00% (3) 63.64% (7) 62.50% (5) 55.56% (5)

6. Are there any locations you would like the bus to go that it currently does not go? (n = 111)

A total of 111 respondents responded to this question and the responses have been separated into the following categories: Route Change(s), Business, Town/City/Neighborhood, Additional Stop(s), State, Schedule Change(s), Other, and N/A. A total of 15 respondents replied “no” or expressed satisfaction with current locations served by PVTA and are filed under N/A.

Figure 137. Other locations respondents would like to go on the bus

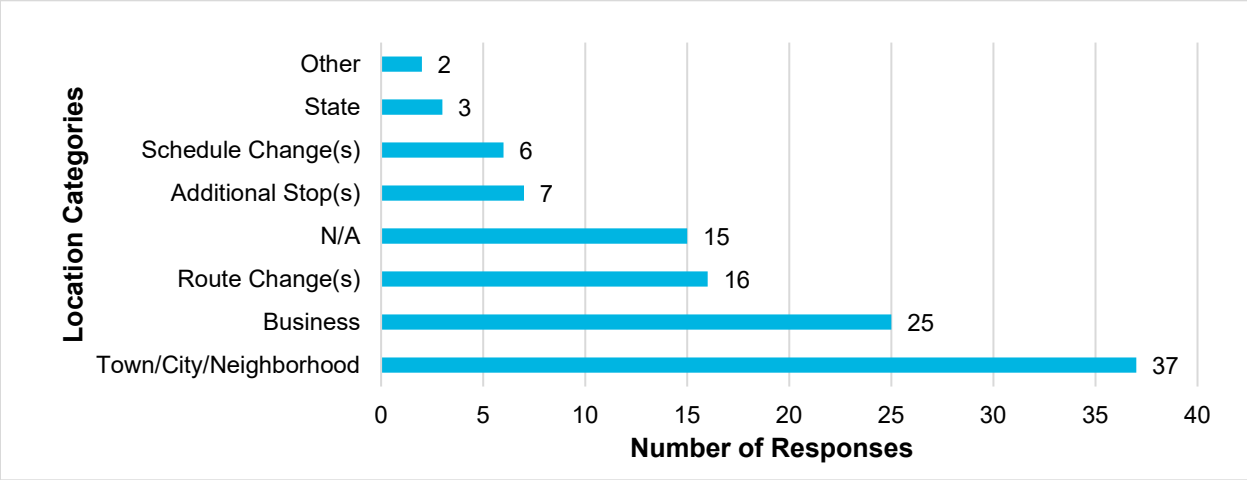
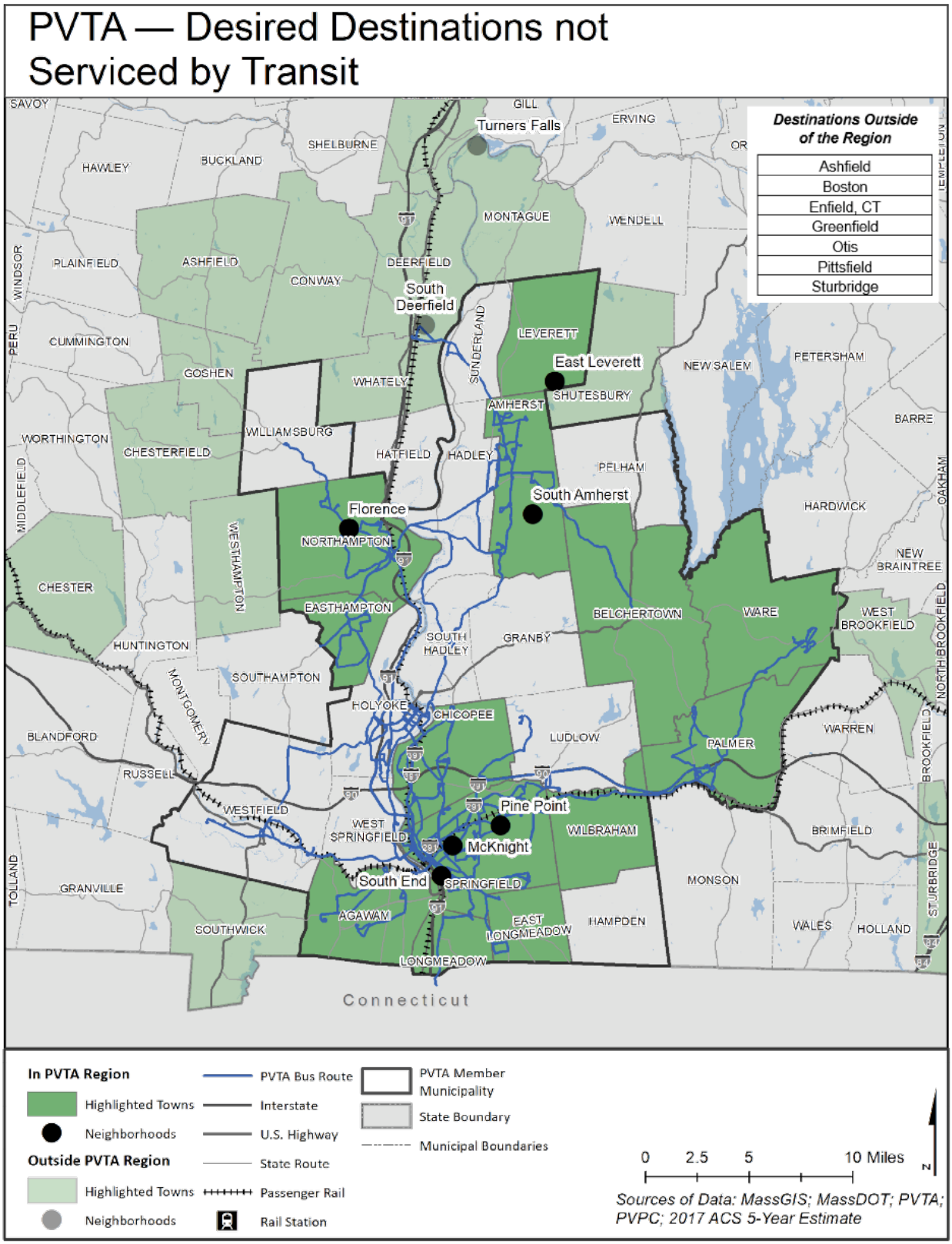


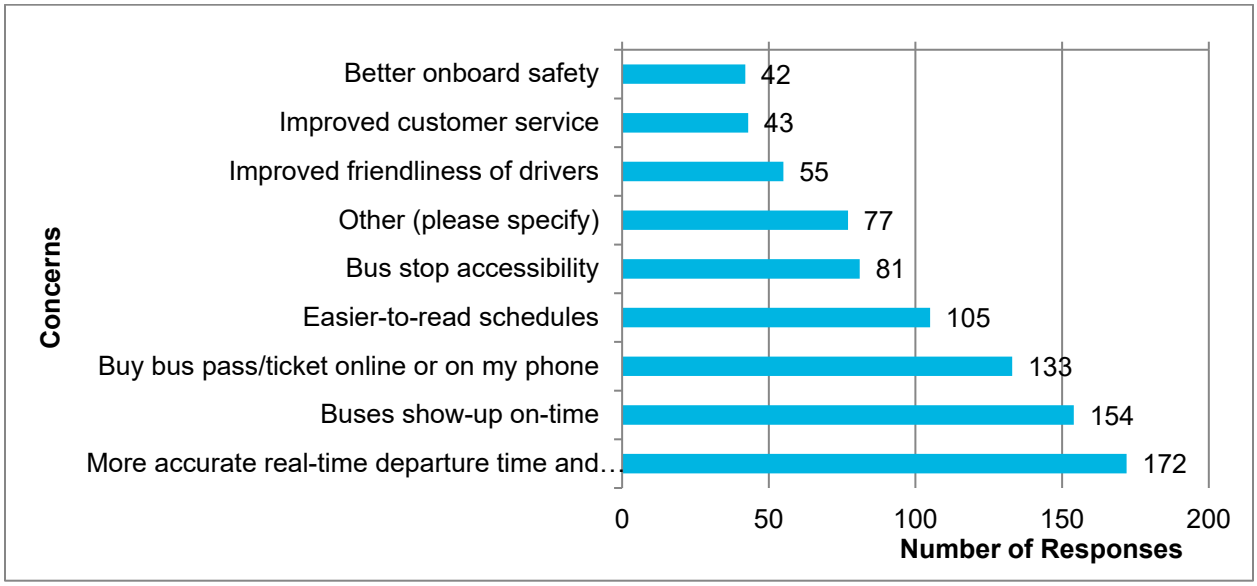
Figure 138. Locations you would like to go using PVTA that you currently cannot



7. What other concerns do you have regarding PVTA service that you would like to see improved? (n = 287)

More than half of respondents (179 total) would like to see more accurate real-time departure and delay information for the routes they are using and about 53 percent of respondents (154) would like to see the buses show on time more often. A total of 133 respondents would like the ability to buy bus passes or tickets online or through their mobile device/smartphone. Only 42 respondents would like to see onboard safety improvement and 43 would like to see customer service improved. A total of 77 respondents selected “other” and provided concerns that include weekend service, shorter wait on return trips, COVID-19 precautions, bus stop accessibility (crosswalks, enclosures, benches), discounted fares for essential workers, additional locations to purchase weekly passes, express buses between Northampton and Amherst, service in summer months, and efficient transfers.

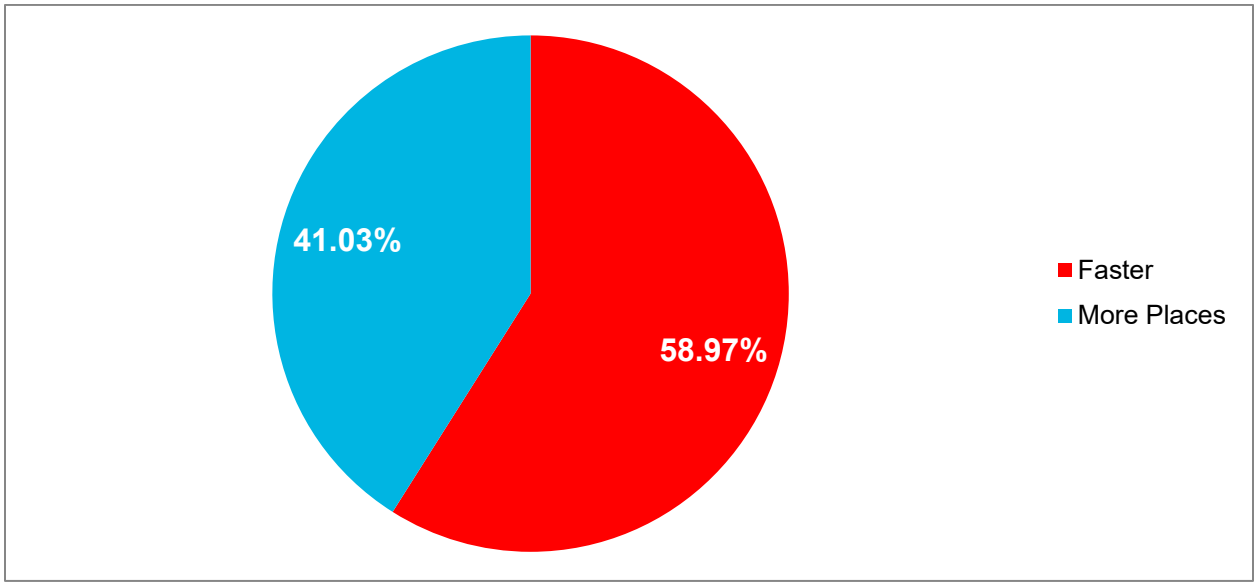
Figure 139. Concerns Regarding PVTA Service that Respondents would like Improved



8. Would you prefer the bus goes to more places (slower/more stops) or the bus makes less stops (faster)? (n = 290)

Given the option between the bus going to more places or the bus making fewer stops and running faster, 171 respondents (58.97%) would prefer the bus ran faster and 119 (41.03%) would prefer more stops.

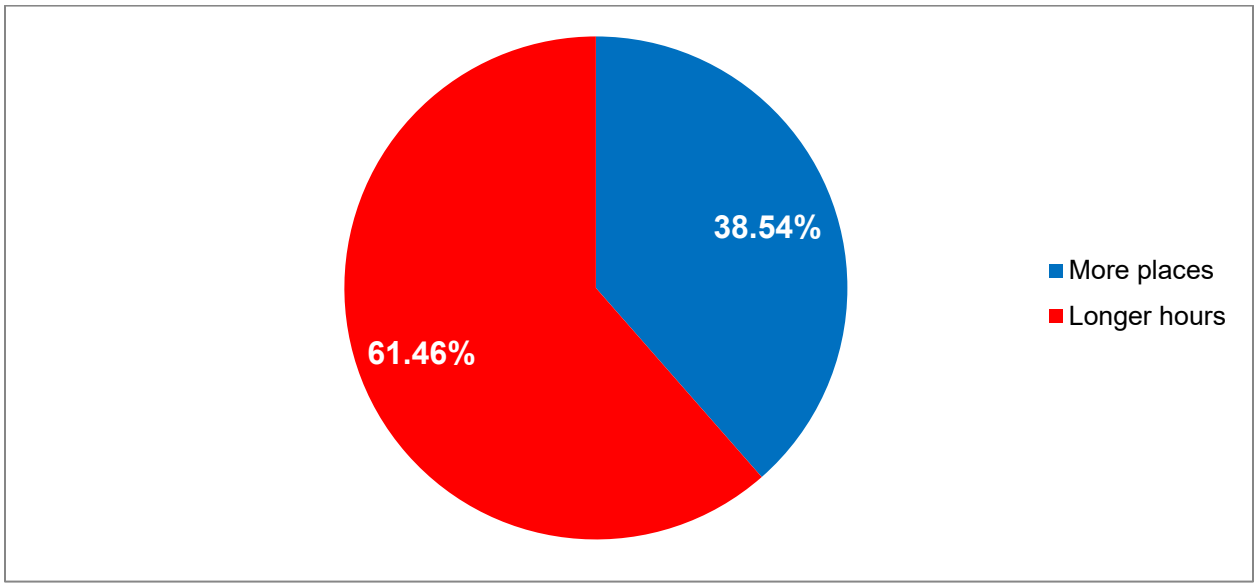
Figure 140 . Respondent Preference for Bus to go More Places or have Fewer Stops



9. Would you prefer the more bus destinations, or the bus runs earlier/later per day? (n = 288)

More than half of respondents (177 total; 61.46%) would prefer the buses run earlier/later per day (longer hours) and 111 (38.54%) would prefer the bus traveled to more places.

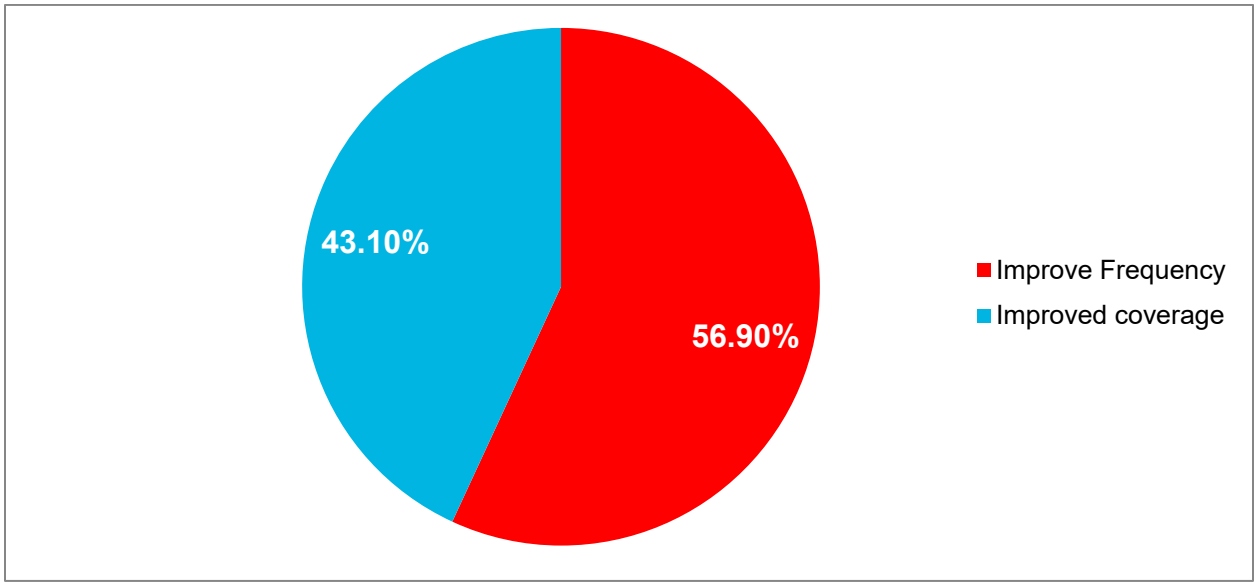
Figure 141. Respondent preference for more bus destinations or longer hours



10. Would you prefer the bus comes more often (increased frequency) or the bus goes to more places (increased coverage)? (n = 290)

Approximately 56 percent of respondents (165) would prefer the bus frequency was improved and 44 percent of respondents (125) would prefer the bus went to more places that currently offered.

Figure 142. Respondent preferences for improved frequency or improved coverage



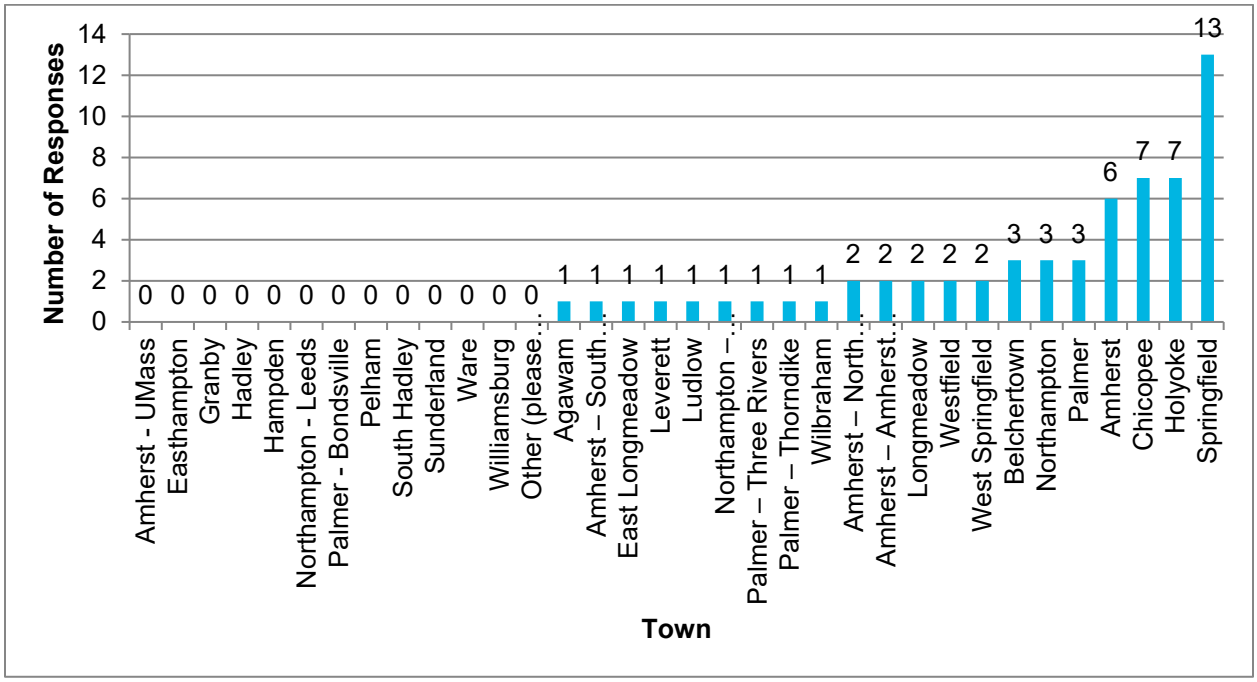
Demand Responses Riders

A total of 87 respondents use the PVTA paratransit van service (demand response). Their survey responses are summarized below:

1. Where do you live? (n = 61)

The top three towns respondents who use PVTA demand response services live in are Springfield (13), Holyoke (7), and Chicopee (7). Other respondents currently live in Amherst (6), Palmer (3), Northampton (3), and Belchertown (3).

Figure 143. Where Demand Response Riders live

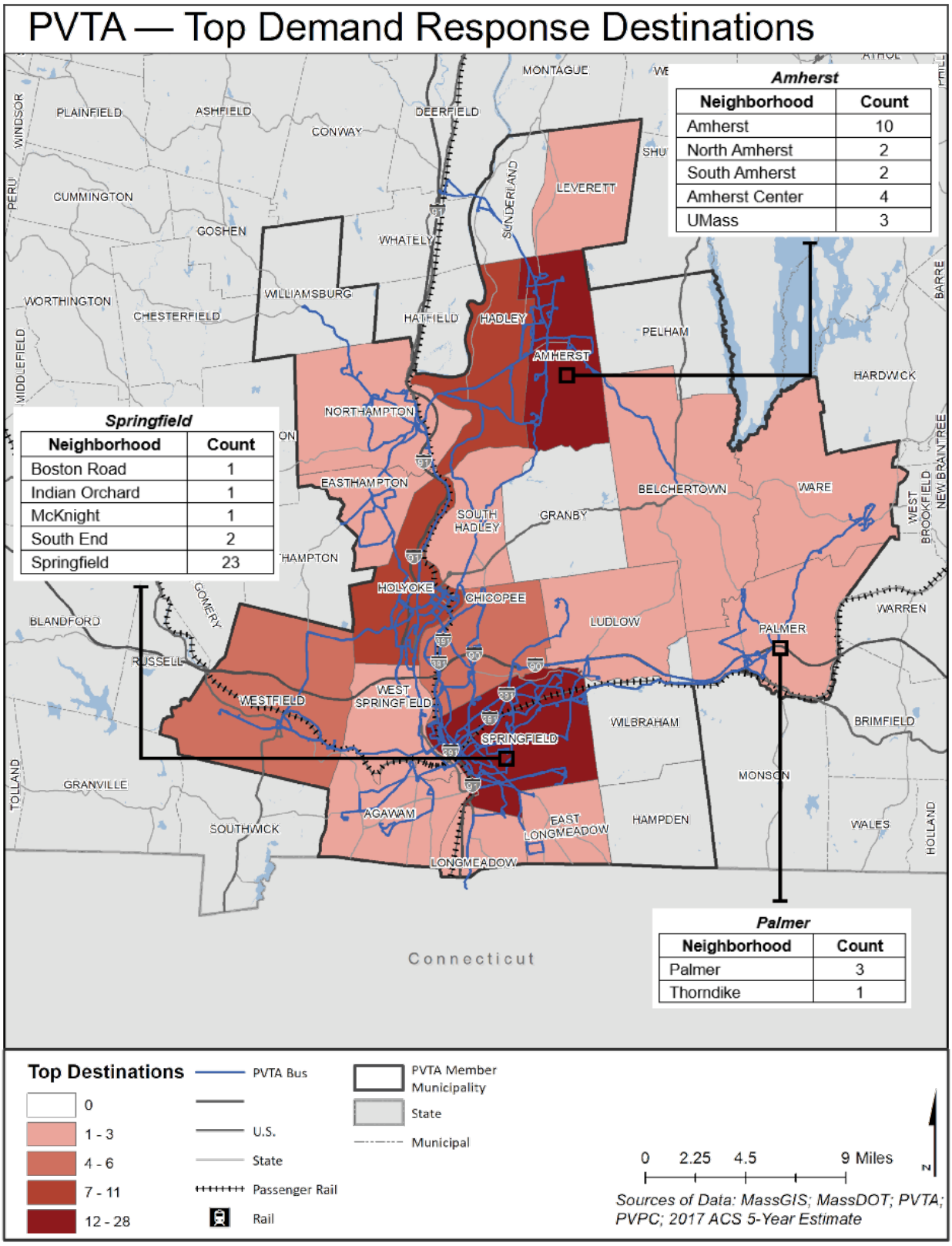


2. What are the top three places you travel to most often? (n = 62)

The top three places respondents travel to most often are Springfield (23), Amherst (21), and Holyoke (11). The town of Amherst was broken down into neighborhoods and respondents were

given the option to select the section(s) of town they travel to most often. Of the 21 respondents who travel to Amherst, four travel to Amherst Center three travel to UMass, two travel to North Amherst, and two travel to South Amherst. The remaining 10 respondents travel to Amherst, not a specific neighborhood or section of town.

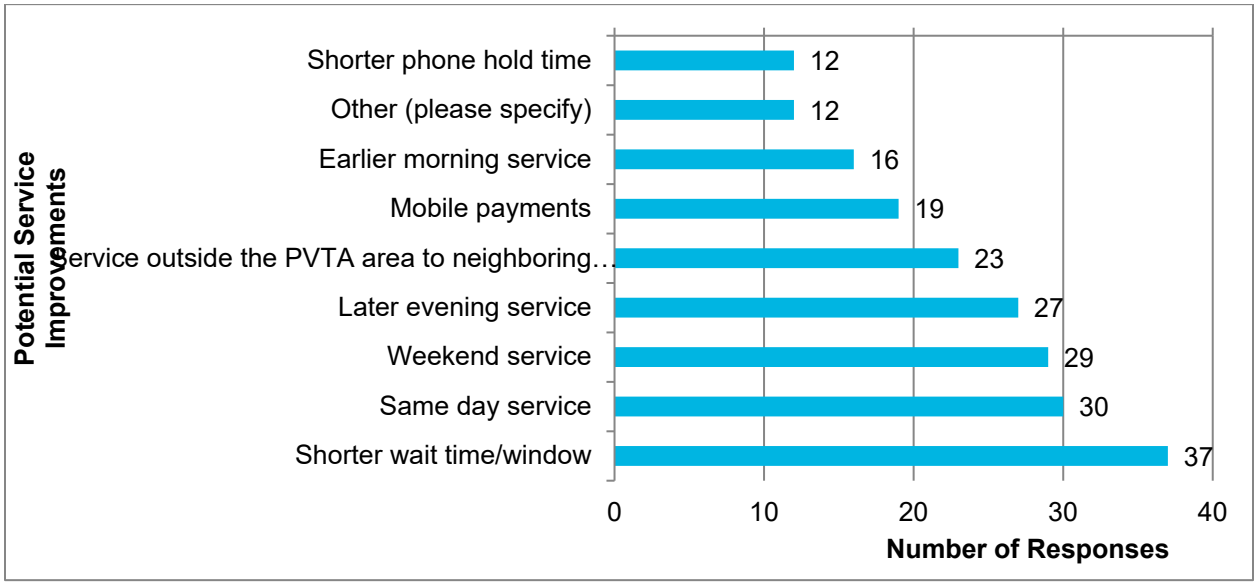
Figure 144. Top 3 Places Demand Response Riders Travel to Most Often



3. Which of the following service improvements would most improve service for you to use? (n = 62)

More than 50 percent of respondents (37 total) would like shorter wait times or windows and 30 would like to be able to schedule rides for same day service. An additional 29 respondents would like PVTA to offer weekend service and 27 would like PVTA to offer demand response service later into the evening. A total of 23 respondents would like PVTA to provide service to communities outside of the PVTA service area, 19 would like to PVTA offer mobile payment options, 16 want earlier morning service, 12 would prefer a shorter hold time when calling PVTA on the phone, and a total of 12 respondents selected "other". The "other" service improvements provided by respondents include shorter wait times before and after appointments, the option to book a trip online, text message alerts, reduced fare for service within county, collaborations with employers to provide fare discounts, on-time arrivals, and driver training for working with riders in bad weather and riders with disabilities.

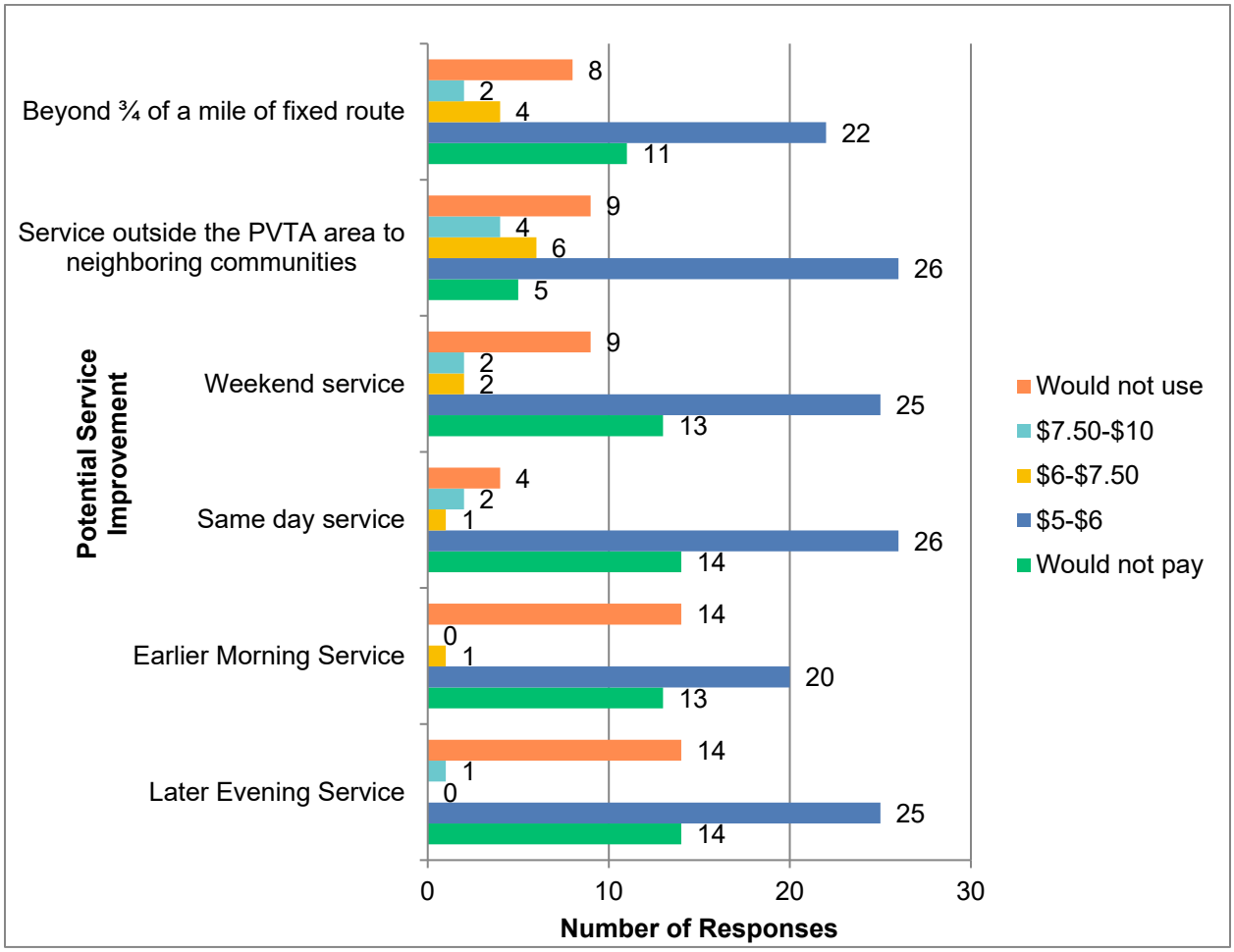
Figure 145. Service improvements which would improve service for Demand Response users.



4. What is the maximum you would be willing to pay for each service? (n = 56)

The maximum most respondents would be willing to pay for each service improvement is between $5 and $6. Only four respondents would not take advantage of same day service if offered and 14 would not pay for this service.

Figure 146. Maximum Amount Respondents are willing to pay for Service Improvements



5. How would you rate your current experience riding the PVTA paratransit service on a scale of 1 to 10? (n = 50)

The average rating from 50 respondents based on current experiences riding with PVTA using a scale from 1 to 10 (10 = best) is 7.4 out of 10.

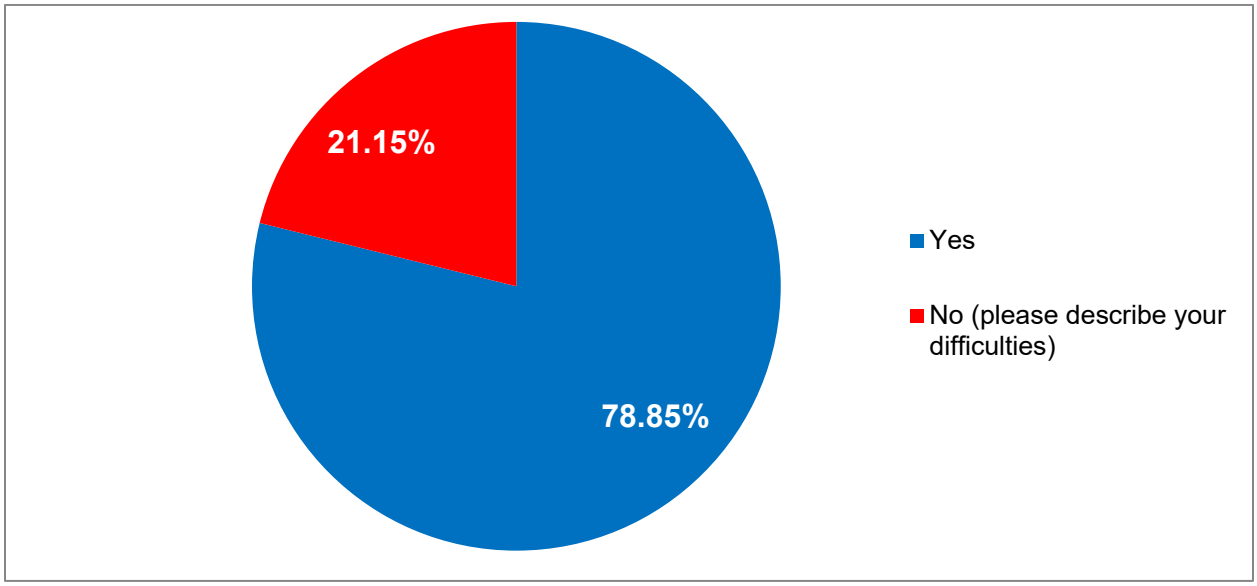
6. How would you rate your current experience when booking a ride on the PVTA paratransit service on a scale of 1 to 10? (n = 51)

The average rating from 51 respondents based on current experiences booking a ride with PVTA paratransit service using a scale from 1 to 10 (10 = best) is 7.5 out of 10.

7. Are you able to schedule rides at the times and days needed? (n = 52)

Approximately 80 percent of respondents (41) are able to schedule rides with PVTA paratransit service on the days and times they need. Only 11 respondents have difficulty with scheduling.

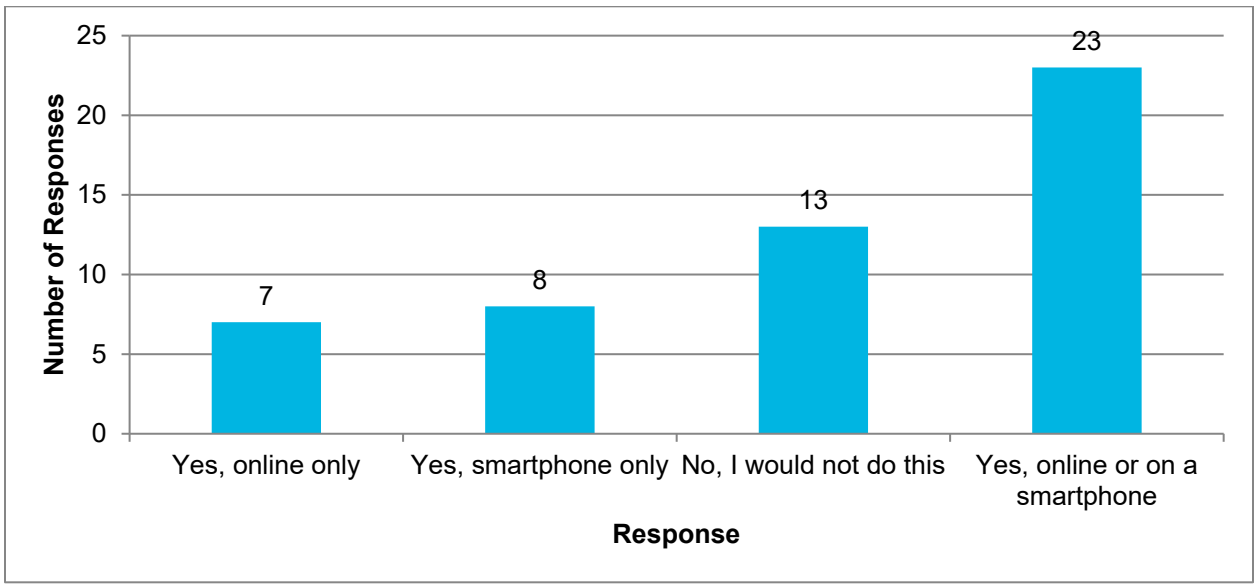
Figure 147. Ability to schedule rides at the times and days needed



8. If you could book your trip online through a smartphone, would you? (n = 51)

If the option to book trips with PVTA using a smartphone were available, a total of 43 respondents would do so; 23 either online or on a smartphone, eight would use just a smartphone, and seven would just book trips online using another device. Only 13 respondents would not take advantage of online or mobile booking.

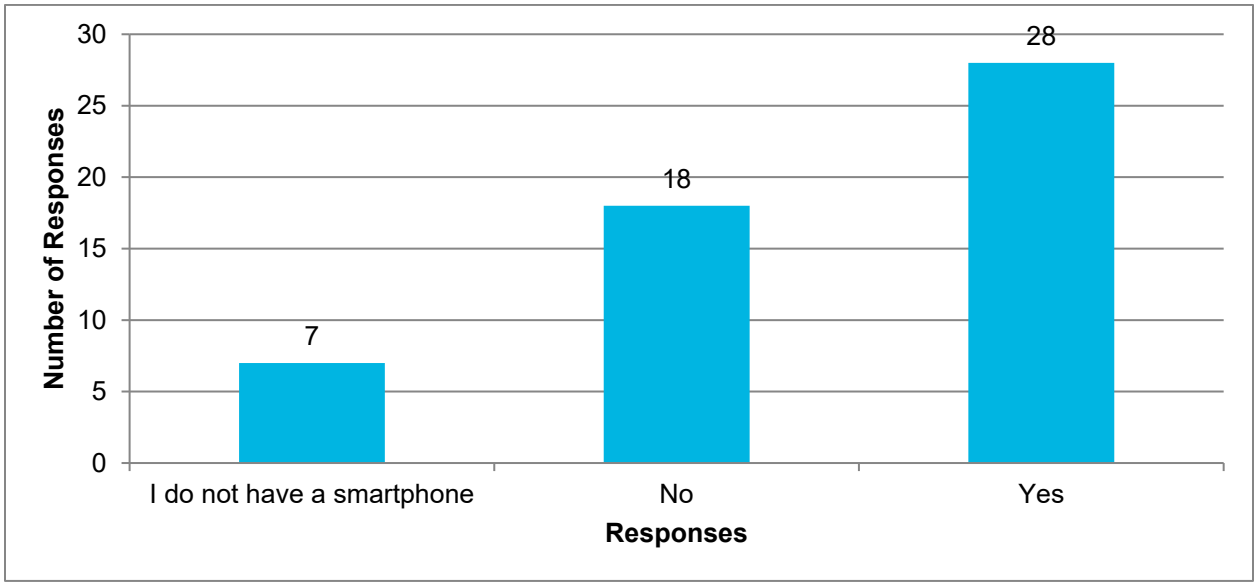
Figure 148. Respondents preferences for booking trips online through a smartphone.



9. If you could pay your fare on your smartphone, would you? (n = 53)

The majority of respondents (28 total) would pay for their transportation fare on their smartphone if the option were available and only 18 would not. A total of seven respondents do not have access to a smartphone to pay for their fare.

Figure 149. Respondents preferences for paying fare on smartphones.



10. What percent of the time do you share your PVTA trip with another person (not including a companion, friend, family member or personal care attendant)? (n = 48)

Using a scale from 0 to 100 percent, respondents were asked to estimate the amount of time they share their paratransit trip with another passenger. The average amount of time respondents report sharing a paratransit ride with other passengers is 42.4%, based on 48 respondents.

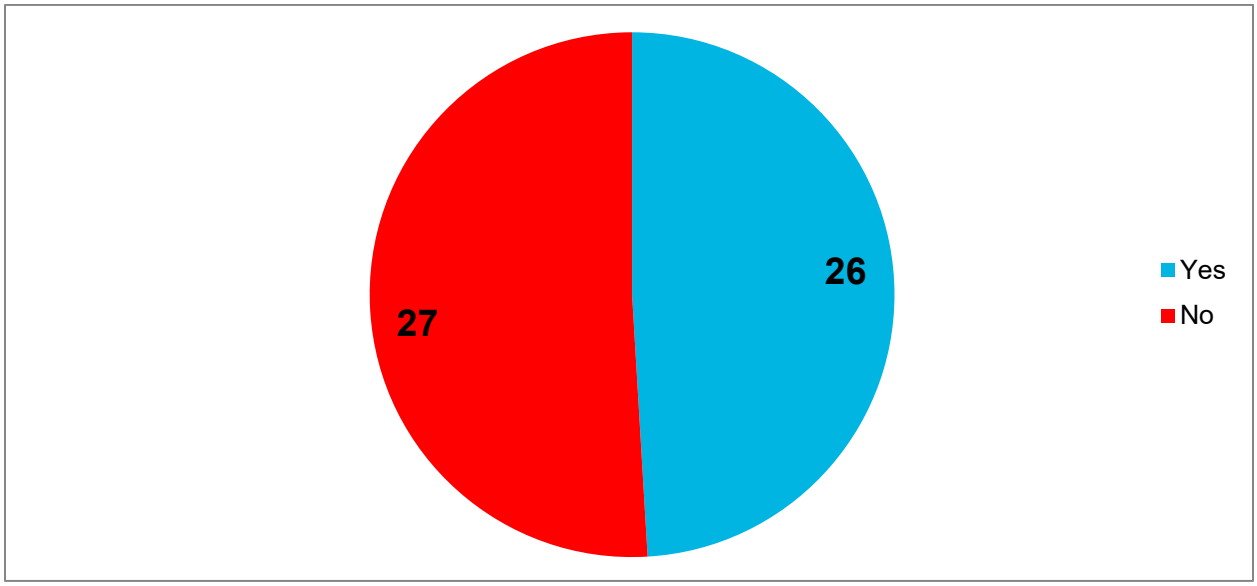
11. Do you have other concerns regarding the PVTA paratransit service? (n = 31)

Respondents were asked to explain any additional concerns they may have about using the PVTA paratransit service and 31 respondents provided feedback. A total of eight respondents do not have additional concerns. The remaining respondents submitted concerns that include enough time to board/sit down, running late, van arrival times, no same-day service, no access to Hatfield, connections with FRTA, staff training, flexible pick-up/drop-off times, payment options, long wait time for return trips, high fares, use of texts instead of calling, efficient booking and scheduling, limited service area/destinations, and mobile tickets and payment options.

12. Do you use the PVTA fixed route bus service? (n = 53)

PVTA paratransit riders who responded to the survey were asked if they also ride the PVTA fixed bus route service. Out of a total of 53 respondents, almost 50 percent (27 respondents) do not use the fixed bus service and 26 do.

Figure 150. Demand Response respondents usage of PVTA fixed route bus service



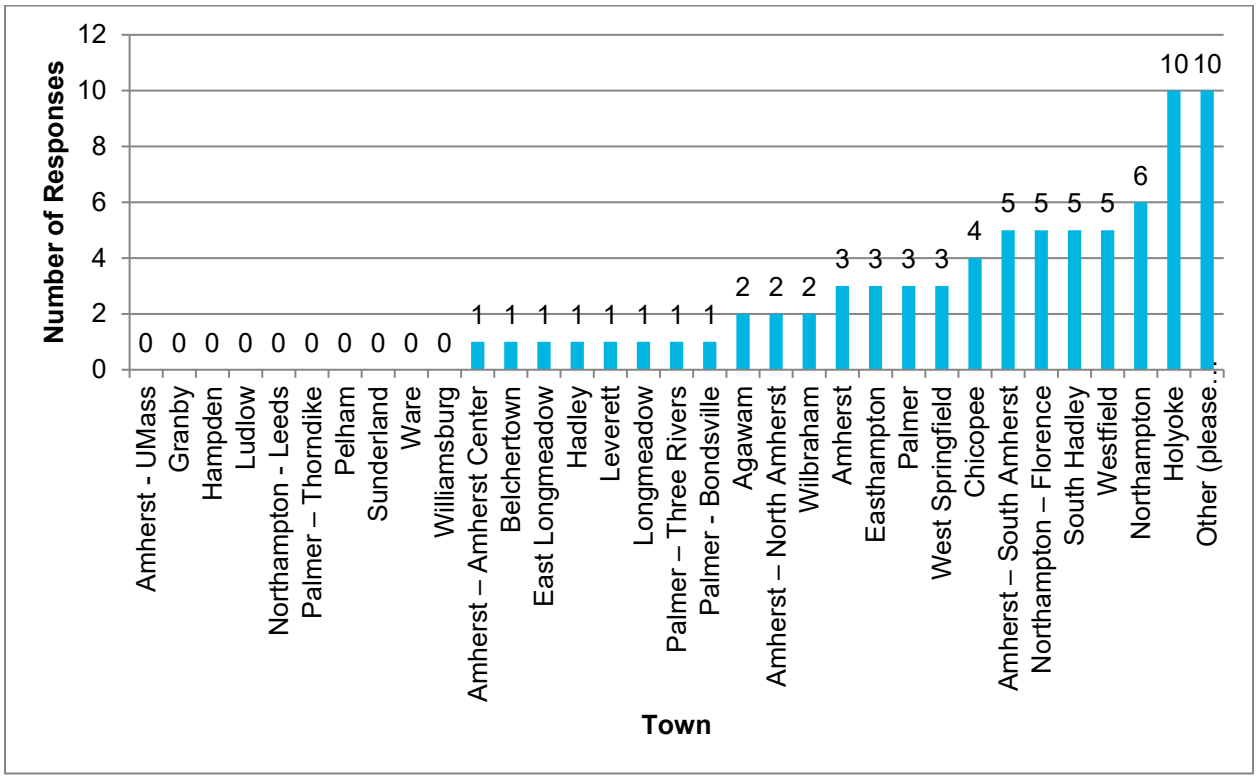
Non-Riders

A total of 99 respondents do not currently use PVTA transportation services. Their survey responses are summarized below:

1. Where do you live? (n = 77)

Respondents who do not currently use PVTA services live in Holyoke (10), Northampton (6), Westfield (5), South Hadley (5), Florence neighborhood of Northampton (5), and South Amherst (5). A total of ten respondents selected “other” and live in Westhampton, Shutesbury, Southwick, Feeding Hills, American Samoa, and New Britain, CT.

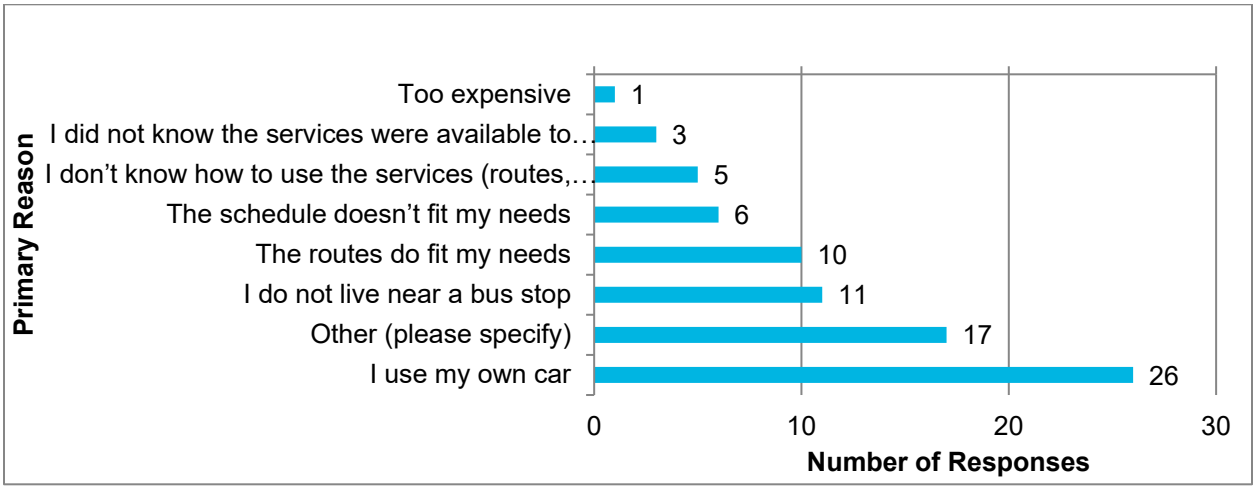
Figure 151. Where Non-Riders Live



2. What is the primary reason you do not use PVTA transit services? (n = 79)

The majority of respondents do not use PVTA transit services because they use their own car (26). Seventeen respondents selected “other” and do not use PVTA transit services because they do not live in the area, rides take too long, no longer a student in the area, have not needed public transit, safety concerns, COVID-19 pandemic related, rides have been late, and the schedule changes do not fit their needs.

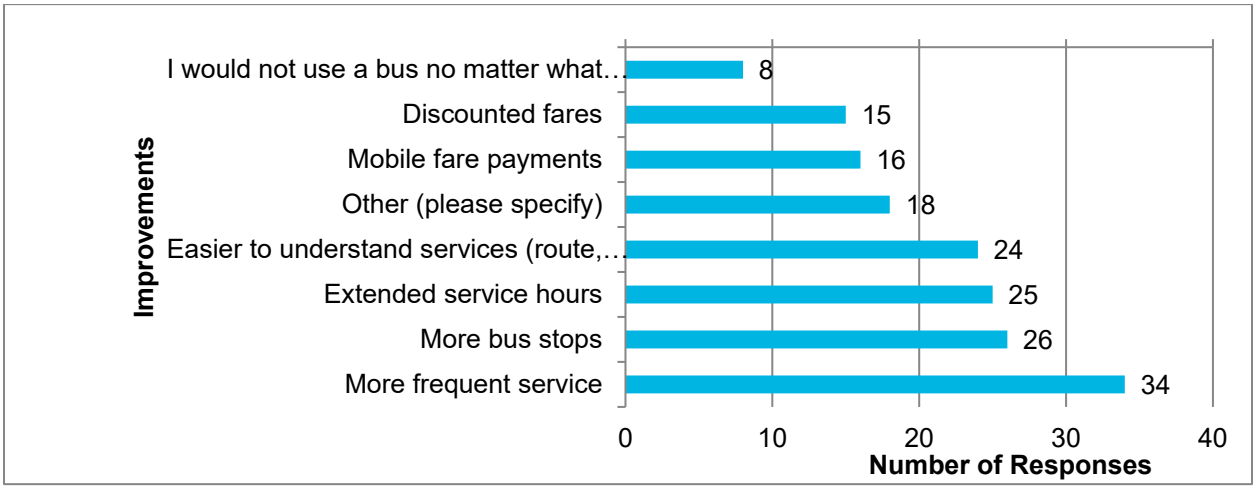
Figure 152. Primary reason non-riders do not use PVTA transit services



3. What improvements would get you to use PVTA transit services? (n = 81)

Respondents were asked to think of potential improvements the PVTA could make that would encourage them to ride and a total 81 respondents provided feedback. Thirty-four respondents would ride with PVTA if there were more frequent service and 26 would ride if there were more bus stops. A total of 25 respondents would ride with PVTA if service hours were extended and 24 would ride if they knew more about the services offered, including routes and schedules. Only eight respondents would not use PVTA services no matter the improvement.

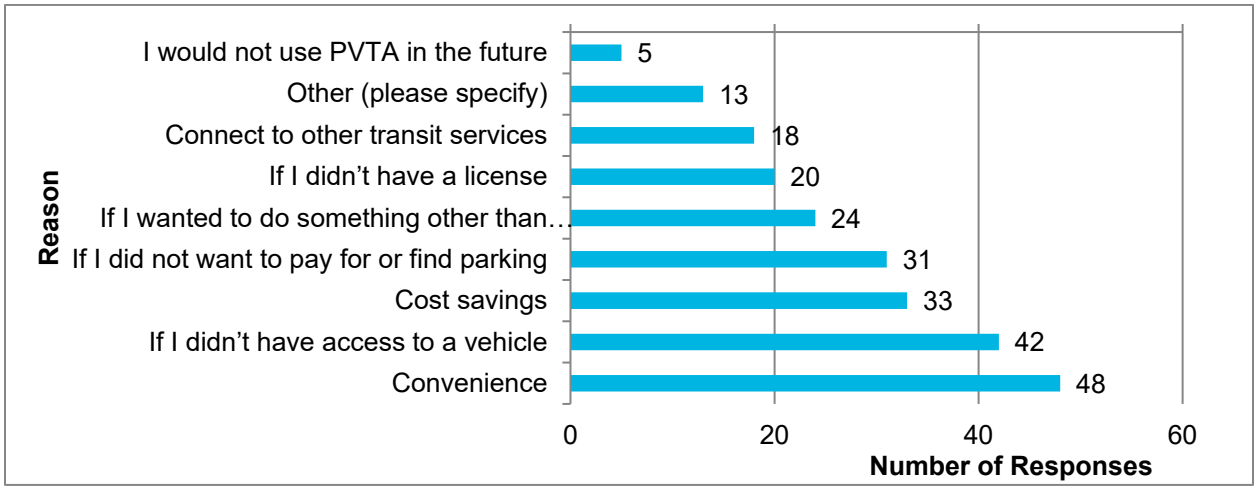
Figure 153. Improvements to Encourage Non-Rides to Use PVTA transit services



4. What are the primary reasons you would use PVTA in the future? (n = 82)

A total of 48 respondents would use PVTA services in the future if it were convenient to them and 42 would ride if they did not have access to a vehicle. Only five respondents would not use PVTA in the future and 13 respondents selected “other”. The responses provided by those who selected “other” include public transit is better for the environment or if they were no longer able to drive themselves.

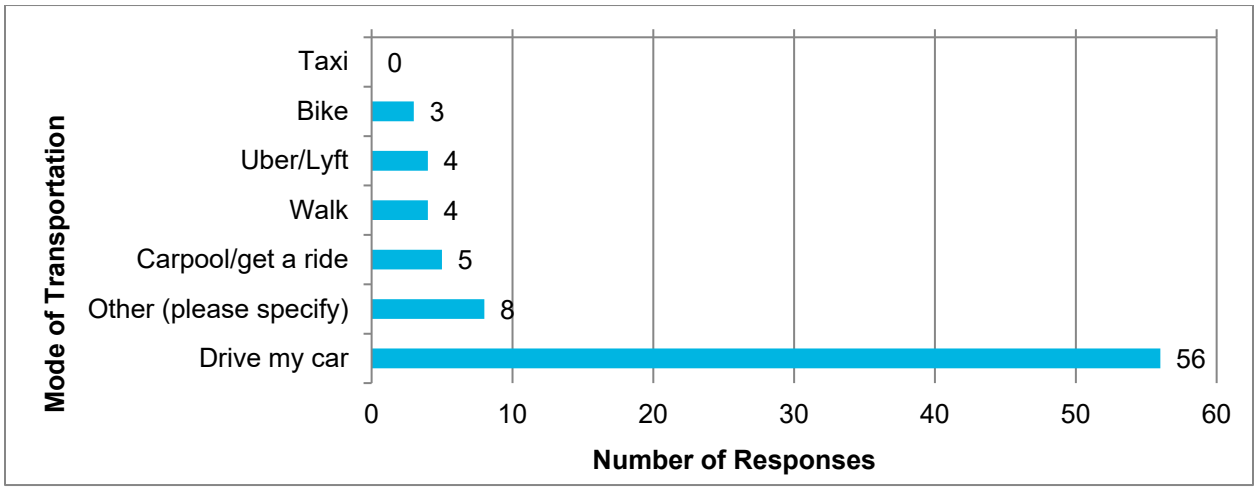
Figure 154. Primary reasons non-riders would use the PVTA in the future



5. What is your primary mode of transportation? (n = 80)

Seventy percent of respondents (56) drive their own vehicle as their primary mode of transportation. The remaining respondents carpool or get a ride with others (5), walk (4), use a rideshare service like Uber or Lyft (4), or use a bicycle (3). No respondents use a taxi service as their primary mode of transportation. A total of eight respondents selected "other" and use the PVTA bus or medical transportation to get around.

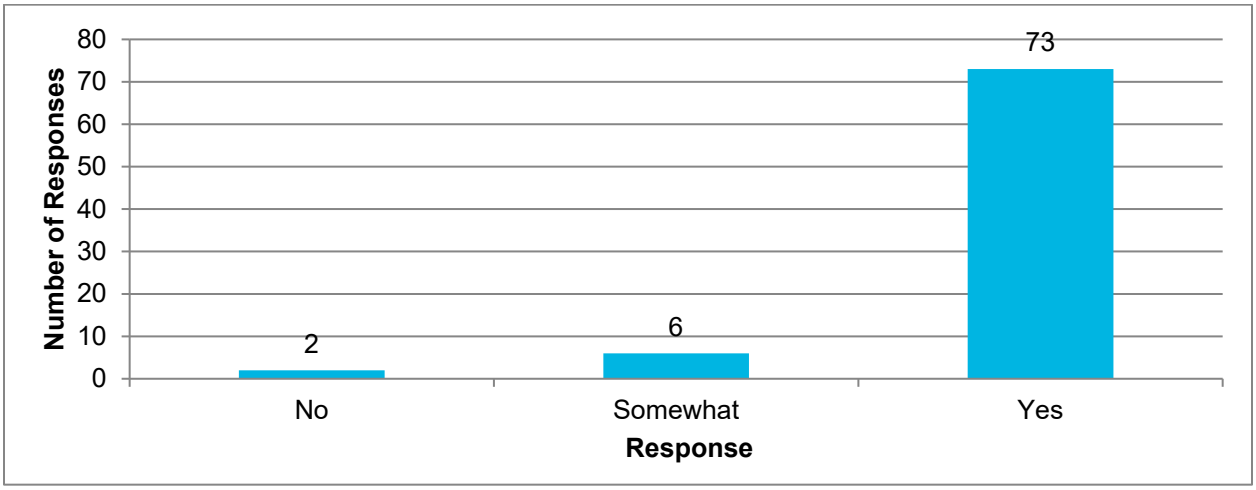
Figure 155. Primary mode of transportation for non-riders



6. Do you feel that PVTA is a valuable public transportation resource in the region? (n = 81)

The overwhelming majority of respondents feel PVTA is a valuable public transportation resource in the region (73 total). Only six respondents feel it is somewhat valuable and two respondents do not feel it is valuable.

Figure 156. Respondents thoughts on if or if not PVTA is a valuable public transportation resource in the region



Demographics

Table 96. Respondent Demographics

Respondents by Tier (Northern versus. Southern)	Northern Region Respondents: 57.5% riders; 55.6% non-riders Southern Region Respondents: 42.5% riders; 44.4% non-riders
Age: (N = 364)	Average = 40 years Median = 36 years

Figure 157. Respondents Gender

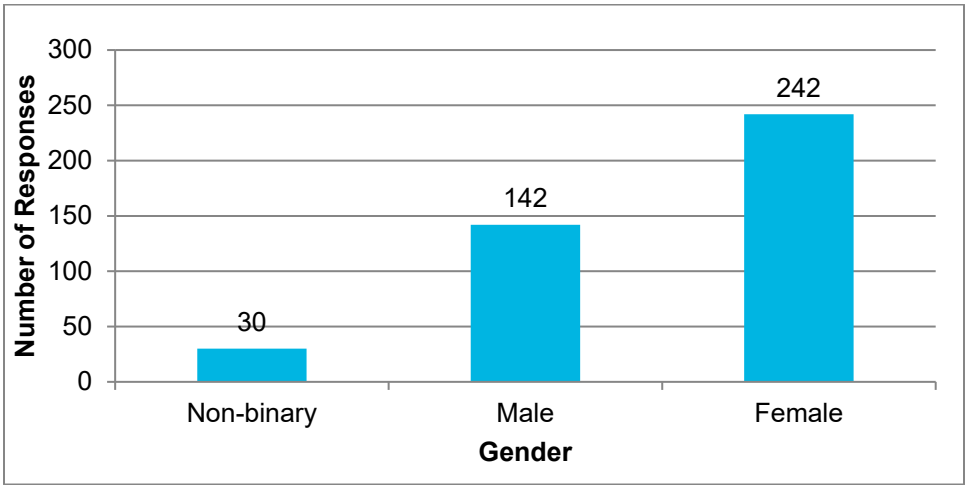


Figure 158. Respondents Total Annual Household Income

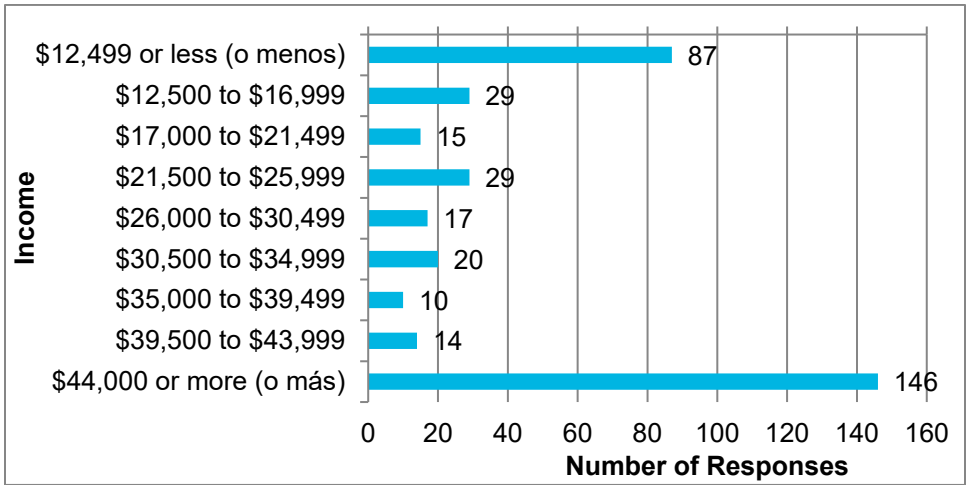


Figure 159. Respondents Race/Ethnicity

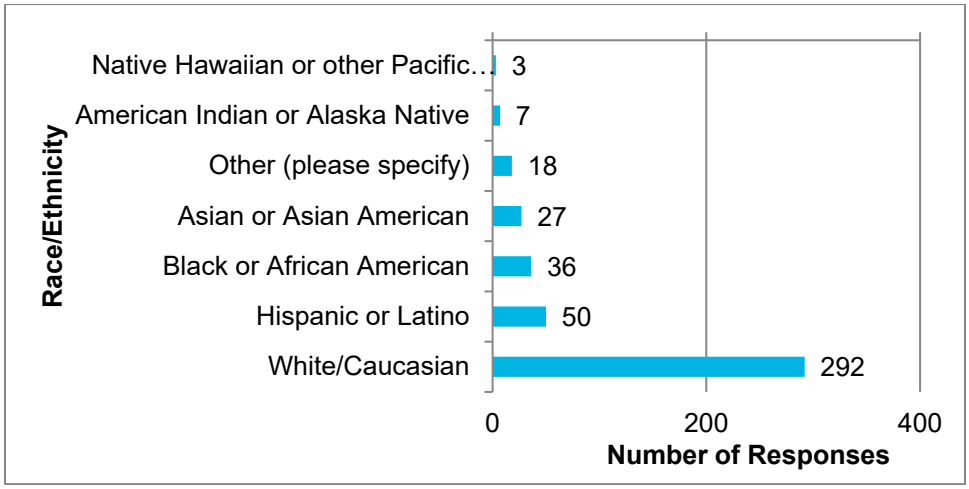


Figure 160. Respondents highest level of educational attainment

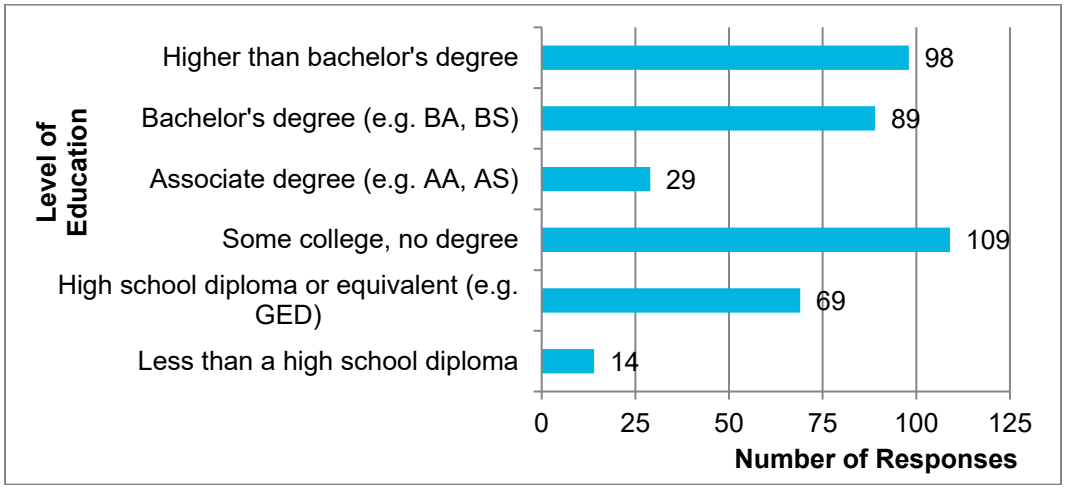


Figure 161. Respondents primary language spoken at home

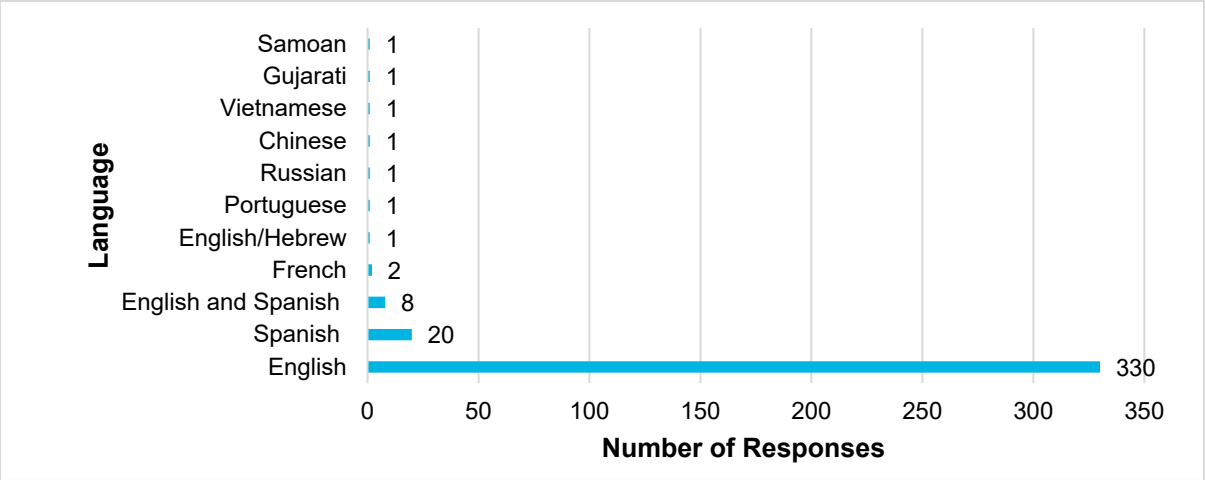


Figure 162. Number of People in Household

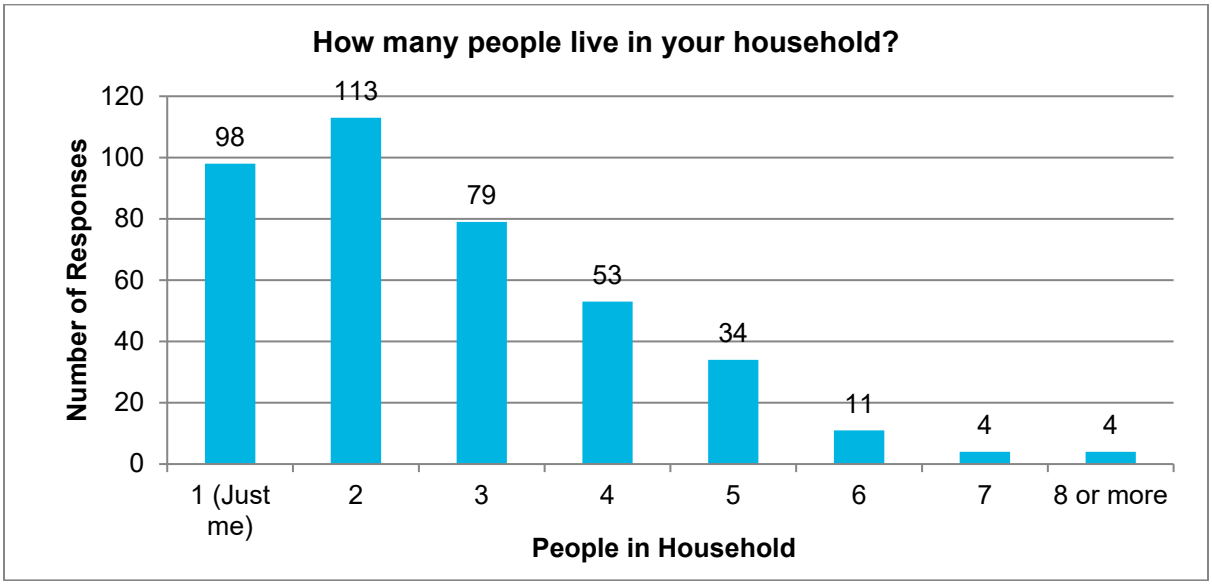
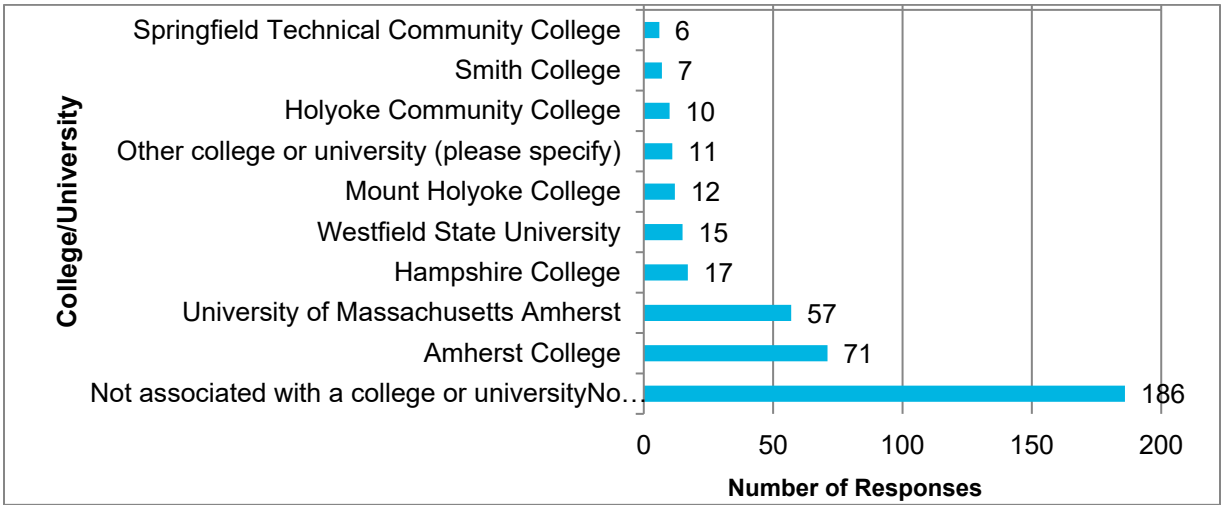


Figure 163. Respondents College/University Affiliation



Additional Comments and Feedback: Voicemails and Emails

No additional feedback was submitted to the project team via email.

Summarized below is the feedback collected through a total of 41 voicemails left for the project team at the Google Voicemail number in the following categories: Bus stops (1); Overall Satisfaction (21); Booking and Scheduling (16); COVID-19 (2); Comfort (2); Fares (1); Bags (2); and Wait Times (5).

Table 97. Additional Feedback from the Public at Google Voicemail

Bus Stops	Wave down the bus as clearly marked, designated bus stops like on Cape Cod with a safe pull-off area for the bus
Overall Satisfaction	Happy with the service; No improvements; Excellent Service
Booking and Scheduling	Cannot book return times when needed; confusion/miscommunication when scheduling rides for appointments; later evening bookings
COVID-19	Overcrowding; cannot ride during pandemic
Comfort	Turn on air conditioning; loud vehicles
Fares	Too expensive for short/local trips; many on fixed income
Bags	Allow more bags for passengers on shopping trips
Wait Times	Long wait times for return trips; shorter wait times for shopping trips;

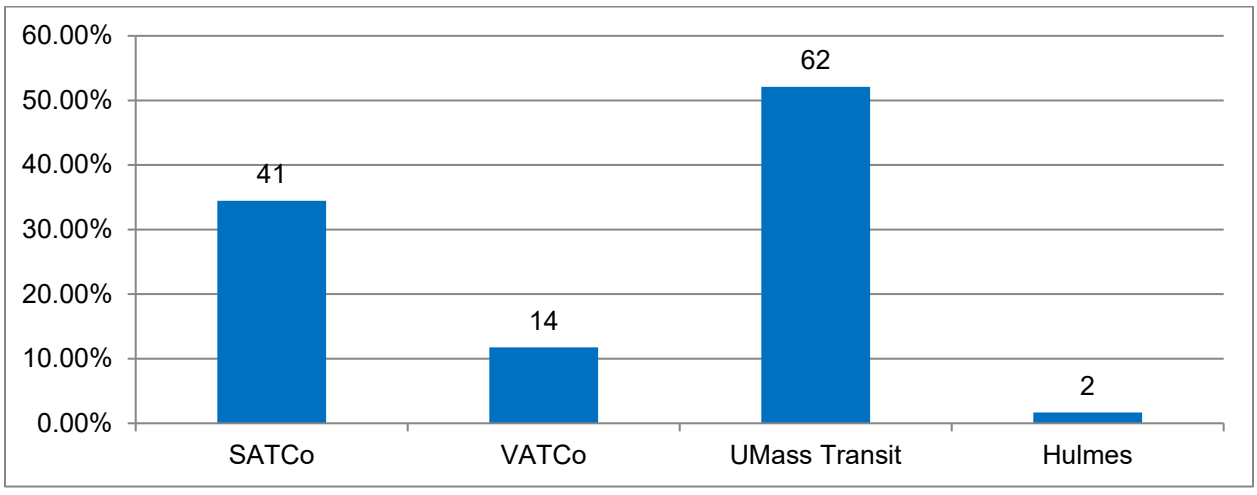
Operator Survey

A survey was sent out to all PVTA fixed route and demand response operators. Responses were received from 119 fixed route and 14 demand response operators. The survey had separate questions for fixed route and demand response operators that asked about needed improvements/ changes, operational challenges and recommendations to improve service. A review of responses by question and mode operated is presented below.

Fixed Route

Responses were heard from 119 bus operators, with the greatest number coming from UMTS (Figure 164).

Figure 164. Response by Bus Operator



Q1. What is the best part about the PVTA service?

Respondents were able to select more than one response. The top cumulative response, at slightly over 75 percent, was that it served a vital need for the community (Figure 165). This was also the top response for each operator.

Figure 165. Best Part About the PVTA Service by Fixed Route Operator

Q2. What are the top three service changes that you would like to see that would improve service for the customers?

This question was open-ended, responses were then categorized into 10 themes. The most mentioned theme was general service changes such as more weekend service, increased frequency, later hours, and improved transfers (Figure 80). A breakdown of the comments within each theme is shown in Table 98 with the number of responses in parenthesis. Table 99 shows the breakdown of specific comments by route. Additionally, there were a number of operational comments beyond the extent of the RTP such as the need for more drivers, increased pay, better benefits, more training, management issues, or how shifts are designed. The top five comments heard in order were for cleaner buses, changes to the Route 31, increasing the fleet size, changes to the Route 30, and better enforcement of the code of conduct policy. The comments for cleaner busses, fleet expansions, and better enforcement of the PVTA code of conduct was stated by all operators except Hulmes.

Figure 166. Top Service Changes Identified by Operators

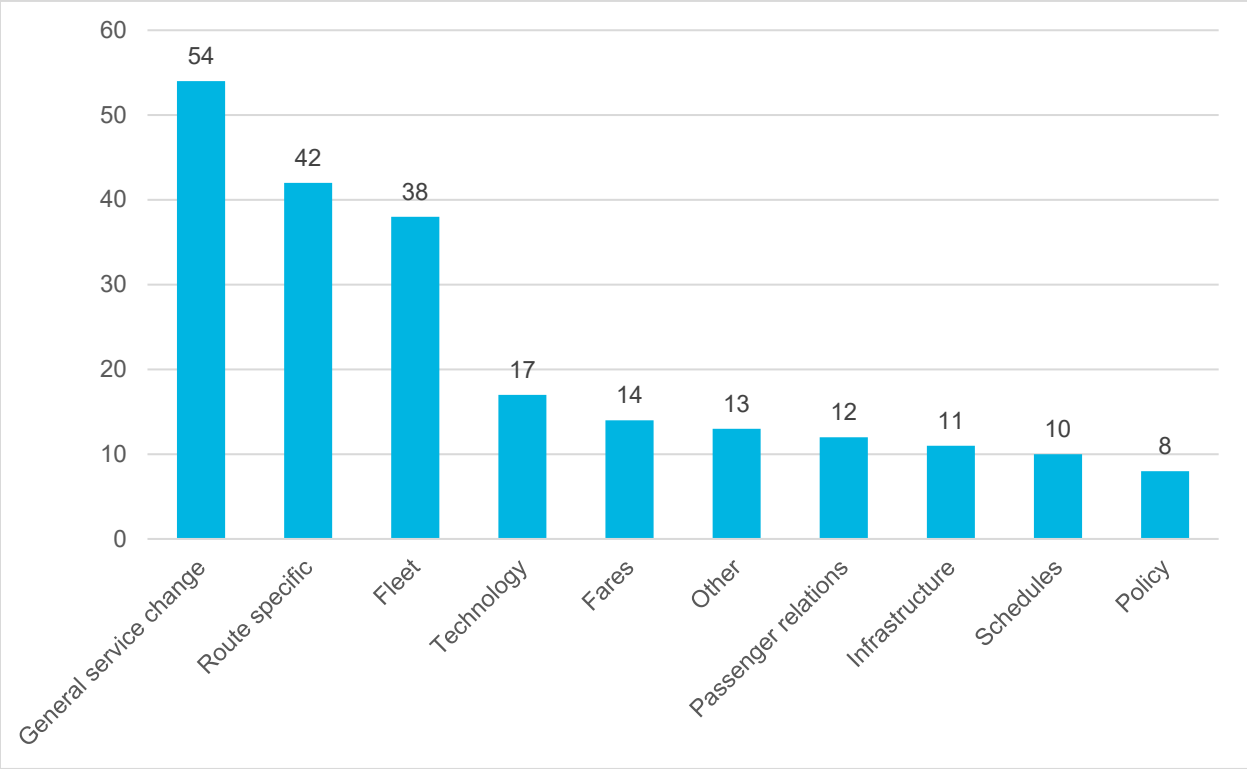


Table 98. Breakdown of Comments by Theme

Fleet	Schedules	Technology	Policy	Infrastructure
• Cleaner Fleet (10) • Larger fleet (8) • More Artics' (6) • Newer buses (6) • Better Maintenance (4) • Electric buses (3) • Plastic bus seats (1)	• Create easier to read schedules (4) • Re-establish paper schedules (3) • Include all service variants in the public schedule (3)	• Improve real time app (7) • Improve bus automatic announcements (4) • Transit signal priority (3) • Better radio system (1) • Improved web interface (1) • Improved real time at stations (1)	• Enforcement of Code of Conduct (8) • Enforcement (1)	• Improved lighting at stops (4) • Install bus lanes (4) • Improve bus Capacity at Cowles Lane and Academy of Music by removing parking (1) • Repave University Drive (1) • Improve bus safety (1)

Other	Fares	General Service Change	Route Specific	Passenger Relations
• COVID related (3) • Consolidate bus stops (2) • Security (1) • Replace flag stop with signed stops (2) • Improve snow removal at stops (1) • Police on bus routes (3) • Better way to handle routes that run late (1)	• Fix the Smartcard system (3) • Eliminate fares (3) • Make B43 Free for 5 College year round (2) • Decrease fares (2) • Allow transfers to be used on same route (1) • Improve E&D pictures on cards (1) • Upgrade fareboxes (1) • Sell passes at more locations (1)	• Improve frequency (7) • Adjust route timing (6) • Add later evening service (6) • Better coordinate transfers (6) • More weekend service (6) • Extend Sunday service hours (4) • Service more areas (3) •Six Flags (2) Bradley airport (1) Hadley (1) Montague (1) • More express trips (2) • Eliminate poor performing routes (2) • Eliminate holiday service and run regular service (1) • Operate all routes 7 days a week (1) • Increase Sunday service (1) • Expand reduce service routes (1) • Simplify routes and variants (1) • Eliminate mid-day service on unpopular routes (1) • Increase Friday and Saturday night service in the	• 31 (9) • 30 (8) • 33 (7) • 34 (5) • 35 (3) • 46 (3) • R41 (3) • B7 (2) • P20 (1) • 14 (1) • G1 (1) • 21E (1) • B4 (1) • R10 (1) • 90B (1) • G2 (1) • B17 (1) • B48 (1) • 38 (1) • 39 (1) • 45 (1) • M40 (1)	• Provide public with more information(4) • Educate passengers on rules and how to use service (4) • Expand Customer service booth hours (1) • Create educational videos about passenger rules (1) • Engage the public more in service and stop changes (1) • Display schedules on interior bus screens (1)

Table 99. Route-Specific Changes for Recommended Service Changes

Route-Specific Changes
Increase B7 (1)
Provide more time on the P20 on weekends (1)
Increase R14 (1)
Eliminate Price Rite on the B7 (1)
Increase G1 (1)
Increase P21E (1)
Use 40 minute cycle times all the time on the B4 (1)
Create North End to South End Shuttle (1)
Create more stops on the R10 (1)

Route-Specific Changes

Provide more time on the 90B between Db and East Longmeadow (1)
Increase G2 (1)
Adjust B17 timepoints (1)
Add additional evening trip on the B48 weekdays and Sunday (1)
Add additional evening service on the R41 in Easthampton (1)
Operate the R41 on Sundays (1)
Add more time to the 412 run (1)
Increase service during the peak on the 31 (8)
Increase service during the peak on the 30 (6)
Bring back the M40 (1)
Eliminate the Amherst College timecheck on the 38 for the last eve trip (1)
Convert Valley Med to on request only (2)
Increase the 35 during the peak (1)
Improve both campus shuttle routes (1)
Bring back the 34 Eve (2)
Increase service on the 45 (1)
Increase service on the 34 (2)
Increase service on the 33 (7)
Reduce the 38 on Friday and Saturday nights (2)
Increase AM trippers (1)
Less 34 (1)
Less 35 (1)
Eliminate the 39 (1)
Add more 46 trips (3)
Increase time allotted to get to Sunderland from Campus on the 31 (1)

Q3. Where else or when do you think transit service should be provided that is currently not?

This question was open-ended, 75 individuals responded with comments. All comments were categorized into five themes (Table 100). The top comment was from SATCo operators for service to Six Flag. Overall UMass Transit provided primarily related to route specific changes, SATCo's were geared to creating new connections between areas and citing towns/areas that

would benefit from new or additional service, and VATCo had a mix of general as well as route specific.[62]

Table 100. Comments by Theme for Additional Service

Other (2)	Service More Areas (34)	General Service Change (9)	Route Specific (21)	Create Connections (9)
• COVID-19 related (1) • Park and Rides for UMass (1)	• Six Flags (4) • Southwick (3) • Bradley airport (1) • Hadley (1) • Pittsfield (1) • Montague (1) • Palmer (1) • Ware (1) • Belchertown (1) • Franklin county (1) • Berkshires (1) • Longmeadow (1) • East Longmeadow (1) • Carew Street Springfield (1) • Westfield Industrial Park (1) • James Street Springfield (1) • Greenfield (1) • Southeast Amherst (1) • General more areas (1)	• More weekend service (3) • Better coordinate transfers (2) • Sunday service on all routes (1) • Extend Sunday service hours (1) • Earlier morning service in the Amherst Area (1) • Add later evening service (1) • Improve frequency (1)	• 31 (4) • 34 (2) • 35 (2) • 46 (2) • 30 (2) • B43 (1) • 33 (1) • 45 (1) • B7 (1) • P20 (1) • B6 (1) • G1 (1) • X90 (1) • G2 (1)	• UMass to Venture way via Hadley Farm (2) • Connect 5 town Plaza and Eastfield Mall (1) • Holyoke to Northampton express service (1) • Union Station to Northampton Express bus (1) • Route 5 Express bus to Enfield (1) • Springfield to Easthampton bus (1) • Chicopee Falls to East Springfield connection (1) • Indian Orchard to Five Town (1)

Q4. What times/trips on specific routes do you think should be evaluated and/or possibly eliminated due to extremely low ridership?

This question was open-ended, 66 individuals responded with 76 comments. While the overwhelming majority (90 percent) were route specific, additionally there were five that were for a town (Westfield, Ludlow, Palmer, Belchertown, and West Springfield) and two general comments pertaining to adjusting the timing on routes. The route with the most comments was the 39, it had 26 comments, of which the largest were to eliminate the 39.

Table 101. Route-Specific Recommendations to Evaluate for Low Ridership

Recommended Service to Evaluate for Low Ridership
Eliminate the R10 trips to the hospital and apartments (1)
Eliminate X90B to South Hadley (2)
Eliminate R29 (3)
Reduce service on the X90 after 7 PM (1)
P11 Helper (2)

[62] Hulmes did not provide any comments.

Recommended Service to Evaluate for Low Ridership

B7 Express (2)
G5 service to Mass Mutual (1)
The Loop (1)
Combine the B23 and R24 (1)
B7s (1)
B12 (1)
G5 (1)
B7 (1)
P20 (1)
Reduce the 38 at night (1)
Reduce service on the 38 (1)
Eliminate service past Rolling Green on the 30 (1)
Eliminate the 39 (15)
Reduce service on the 39 (4)
Eliminate late night service on the 39 (6)
Convert Valley Med to on request only on the 31 (1)
Evaluate the 39 mid-day (1)
Eliminate the mdi day trip on the 45 (1)
Reduce service on the 46 (2)
Reduce service on the 45 (3)
Increase service on the 34 (2)
Reduce the 33 in the morning (1)
Reduce the 38 on Saturday nights (3)
Reduce the 38 on Friday nights (4)
Eliminate the trips to the mall on the 39 (1)
Reduce AM service on the 35 (1)
Reduce service on the B48, low ridership (1)
Reduce early morning service on the R44 (1)
Eliminate the last B43 trip on Saturdays and Sundays (1)

Q5. Do you face any operational challenges?

Respondents were able to select more than one response, over all 118 individuals provided 343 responses. The overwhelming majority identified at least one challenge, with only 14.4 percent stating they do not have any operational challenges (Figure 167). The top challenge reported was passenger challenges followed by the timing between bus stops. A breakdown of challenges by operator shows that the top challenge for VATCo are passenger related, for SATCo it is tied at both too many stops and passenger challenges, and for UMass Transit it is tight turns (Figure 168). Both Hulmes operators stated they do not have any challenges.

Figure 167. Operational Challenges Faced

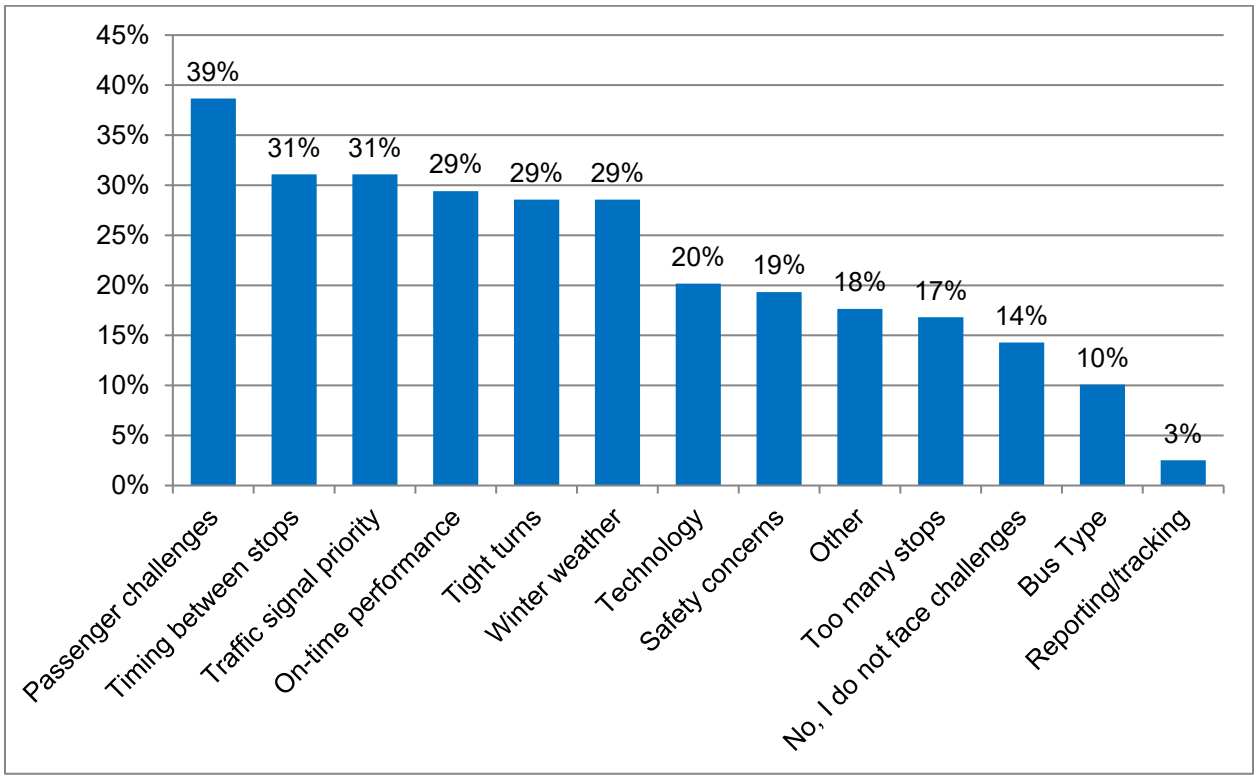
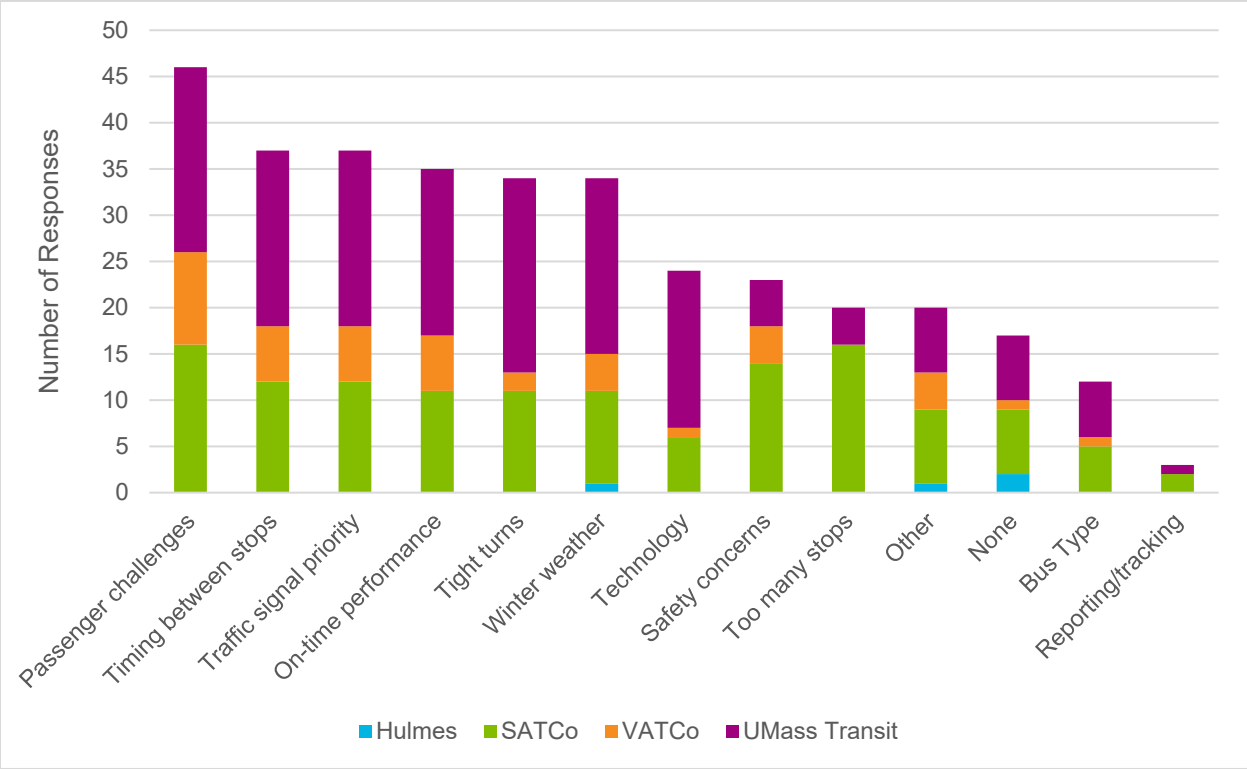


Figure 168. Operational Challenges by Operator



For each challenge selected follow up questions were provided for the operator to describe the challenge (Table 102). The majority of the passenger challenges are related to disrespectful or disruptive passengers. The UMass Transit Comments related to traffic signal priority were primarily with issues at existing signals and difficulties taking left turns when the signal was not protected or short signal cycles which cause delay in the route. Comments regarding winter weather were split between identifying specific areas (generally hills and sloped areas) that are difficult and fleet issues. Overall New Flyers were identified as having poorer handling in the snow.

Table 102. Description of Challenges by Theme

Challenge	Responses
Passenger challenges	• Disrespectful passengers (11) • Disruptive passengers (11) • “Joy” riding (3) • Crowding (2) • More training is needed for drivers on passenger relations (2) • COVID related (2) • Substance abuse onboard (2) • Crossing in front of bus (1) • Harassing other passengers (1) • Route specific (1) • Talk too much to drivers (1) • Do not let supervisors transport (1) • Passenger hygiene (1) • Communicating events that might impact routing or schedules to passengers (1)
Timing between stops	• General difficulties in making timepoints (9) • UMass to Cliffside on the 31 (2) • Fine Arts Center to Cowles Lane (2) • B43 (2) • G1 outbound from Union Station (1) • HTC to Union Station 1) • The X (1) • Mason Square (1) • X92 has too many mid time points (1) • Saturdays P20 Kmart to Riverdale Shops has too much time (1) • Eliminate mid timepoints (1) • Fine Arts Center to the Stadium on the 35 (1) • Library to Big Y on the 33 (1) • Olympia Drive to Studio Arts Building (1) • Colonial Village to Old Belchertown Road on the 30 (1) • Route 45 in the afternoon – all time points (1) • Studio Arts Puffton on the 30 (1) • The entire 30 during reduced service (1) • The 45 in the evening too much time for Rolling Green timecheck (1) • Too much time at Amherst College outbound on the 38 (1) • Transfer issues (1) • B43 Saturday mornings 6 AM – 8 AM (1) • R42 (1)

Challenge	Responses
Traffic signal priority	• Transit signal priority is desired (5) • Route 9 TSP does not appear to work correctly (4) • Issues taking left turns due to lack of protected signal: • Mass Ave to Commonwealth (2) • Route 9 onto University Drive (2) • N. Pleasant onto Main (2) • Southeast St onto Main (1) • TSP in Springfield is not working (3) • All of Northampton signals are difficult (2) • Remove no right on red policy (2) • Signal at Liberty and Main (2) • Signals and traffic cause lateness (2) • B7 midtown (1) • P21 (1) • State St. in Wilbraham (1) • Signal timing to short (1) • Exiting the Cowles Lane Bus stop (1) • Right from Main Street to Southeast Street (1)
On-time performance	• Traffic results in running late (8) • UMass North Pleasant Street during class change (5) • R42 timing is to tight (3) • R10 (3) • UMass Campus to town (2) • 35 (2) • 30 (2) • G1 (1) • 34 (1) • B43 mid-day trips 1:40 is insufficient for a loop and 1:20 early morning is overly ambitious (1) • Construction results in running late (1) • B6 (1) • G3 (1) • X90B (1) • P20 (1) • B7 (1) • P20 weekends (1) • Bus terminals (1)

Challenge	Responses
Tight turns	• Route 30 Main Street to Southeast Street (11) • Route 31 Meadow Street on to North Pleasant St (7) • Route 31 Route 116 to Meadow (2) • Right from Main to Carew St (2) • Montcalm Heights (2) • Route 33 Right into the Big Y Plaza (1) • Navigating through Orchard Hill (1) • The Smith College turn around (1) • Route 33 Right onto Amity Street (1) • During detours (1) • Hancock St dues to parked cars (1) • Parking lots (1) • Walmart in Springfield (1) • Dwight St. (1) • Magazine to Lincoln (1) • General (1) • Central and Pine Streets (1)
Winter weather	• Lack of timely plowing of roads (5) • Snowed in bus stops (4) • New Flyers don't handle well in the snow (3) • Going up and over the Notch (3) • Belmont Street (2) • Artics don't handle well in the snow (1) • Causes poor on-time performance (1) • Springfield St in Chicopee (1) • Hills – general (1) • Vehicles – general (1) • Harrison (1) • Heating of buses (1) • Walmart parking lot Springfield (1) • State Street (1) • Orchard Hill (1) • Amity Street (1)
Technology	• Avail (15) • Vectors (3) • Announcement system (3) • Radio (3) • Cameras (1)

Challenge	Responses
Safety concerns	• Passengers situations (7) • Vehicle concerns (4) • Pedestrians crossing in front of bus (3) • Staff supervision/assistance (2) • COVID (1) • Crowding on buses (1) • Passenger information (1) • The X (1) • Bicyclists (1) • Lack of security (1) • Navigating the Big Y Century Plaza (1)
Other	• B43 timing issues (2) • Crowding at bus stops (1) • Reduce flag stops and convert to signed stop (1)
Too many stops	• Bus stop consolidation is needed (5) • G1 (3) • B7 (2) • High & Maple Streets Holyoke (2) • Olympia Drive the stops are very close (2) • Sanders Stop on the Hampshire College campus (1) • G1 North end to Union Station (1) • B6 on Berkshire Ave (1) • G2 (1) • P20 (1) • White St Springfield (1) • Orange St X 92 (1)
Bus Type	• Mechanical failures (3) • Inability to open passenger windows (2) • Desire electric (2) • New Flyers don’t handle as well (1) • Glare from passenger lights (1) • Need new buses (1) • Gillig (1)
Reporting/tracking	• Phone App for passenger accuracy (1) • Vector (1) • Need more time (1)

Q6. What other recommendations/thoughts do you have which would improve the service?

This question was open-ended, 46 individuals responded with 57 comments. Comments made by UMTS operators were largely route specific, SATCo comments were management concerns, and VATCo general suggestions to improve the service (Table 103).[63]

Table 103. Other Recommendations

Customer	Training (3)	Management (7)	Infrastructure
• Bring back paper schedules (2) • Better method for public feedback (1)	• More driver passenger relations training (2) • Longer CDL training program (1)	• Needs to be more approachable (2) • Driver support (2) • Better relations (2) • Drivers have say in routing (1)	• Install bus lanes (3) • More park and rides (1) • Bigger bus stops (1)

Capital/Maintenance (8)	Technology (7	Route Specific (11)	Other (11)
• More Artics (2) • COVID-19 disinfectant leaves film (2) • More mechanics (1) • New driver seats (1) • TVM in northern tier (1) • Signs on rear of vehicle "This bus does not turn on red" and "Bus makes frequent stops" (1)	• Improve real time app (2) • Improve bus automatic announcements (1) • Avail (1) • Transit signal priority (1) • More monitors on board (1) • Real time detour updates (1)	• More Route 30 service (3) • More Route 31 service (3) • Less route 39 (1) • Less Route 38 at night (1) • Improve B43 schedule (1) • End B43 on UMass Campus (1) • Service the Trade Joes Cut out on Route 9 B43 Express trips (1)	• More time added to routes (4) • Towns remove pedestrian crosswalk sandwich boards (1) • More cops on evening service (1) • Enforce rea door exit, front door enter policy (1) • Stop consolidation (1) • Better parking lot circulation (1) • Better benefits (1) • Mirror at Union Station to help with visibility turning (1)

[63] Hulmes operators provided no additional recommendations/thoughts.

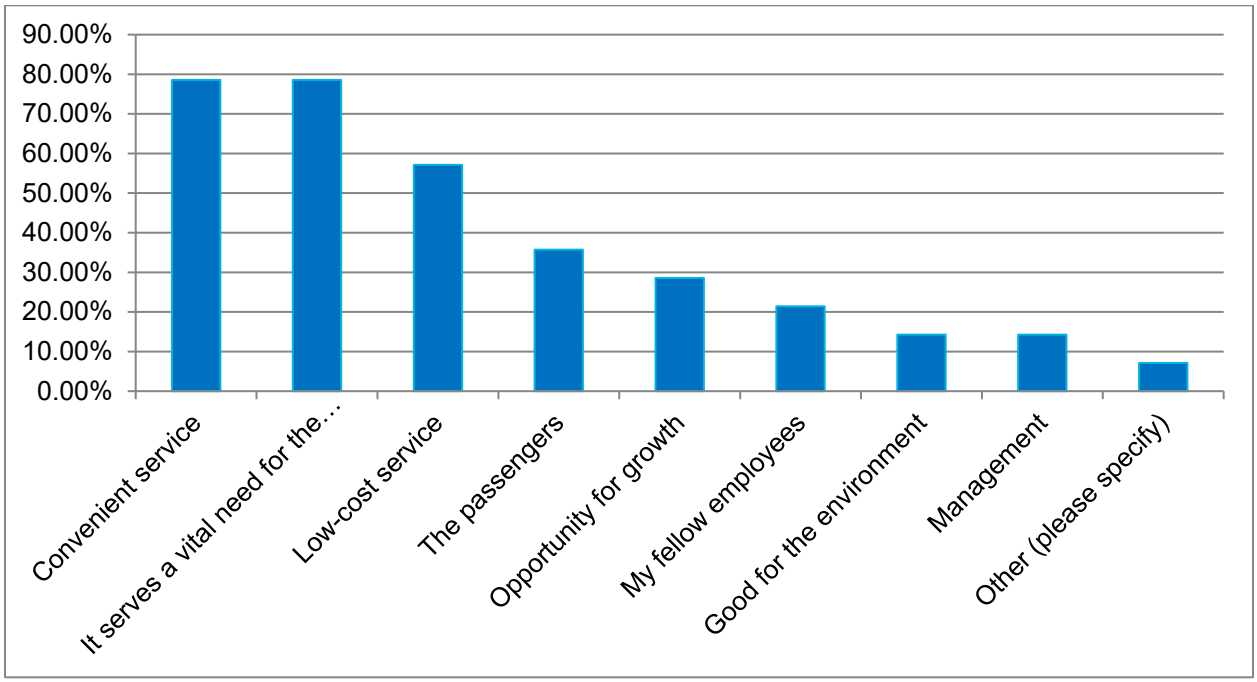
Demand Response

Responses were heard from 14 demand operators

Q1. What is the best part about the PVTA service?

Respondents were able to select more than one response. The top cumulative responses, at 78.6 percent each were convenient service and is serves a vital need for the community Figure 169.

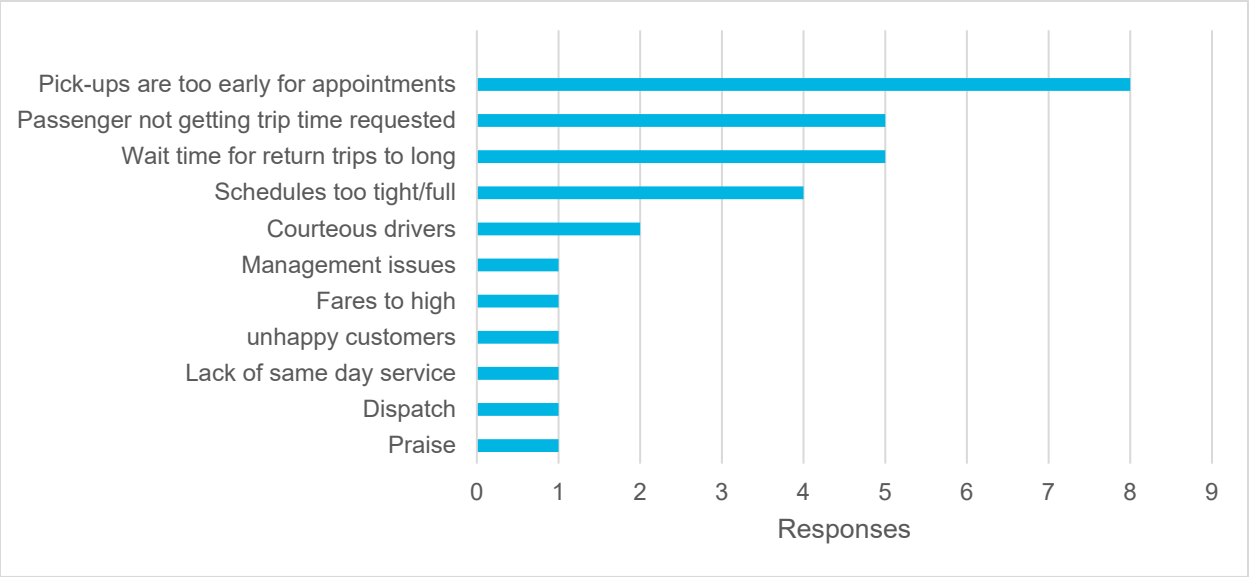
Figure 169. What is the Best Part About the PVTA Service – Demand Response



Q2 What are the top three service changes that you would like to see that would improve service for the customers?

This question was open-ended. Thirteen individuals responded providing 30 responses that were categorized into 11 themes. The most mentioned theme had to do passengers having pick-up times that were too early for their appointment (Figure 170).

Figure 170. Top Service Changes – Demand Response



Q3. What do you hear from customers about with regard to unmet needs – places they'd like to go or times/days they'd like to travel?

This question was open-ended, four responses were received. A summary of responses is below:

- Weekend senior service
- Weekends (general)
- Long Wait times
- Weekends in Belchertown

Q5. Do you face any operational challenges?

Respondents were able to select more than one response, over all 13 individuals provided 34 responses. The majority identified at least one challenge, only 23.1 percent stated they do not have any operational challenges (Figure 171). The top challenge reported was schedules followed by technology. For each challenge selected follow up questions were provided for the operator to describe the challenge (Table 104). The majority of the challenges are related to the schedules or to issues with the radio/GPS system.

Figure 171. Demand Response Operational Challenges

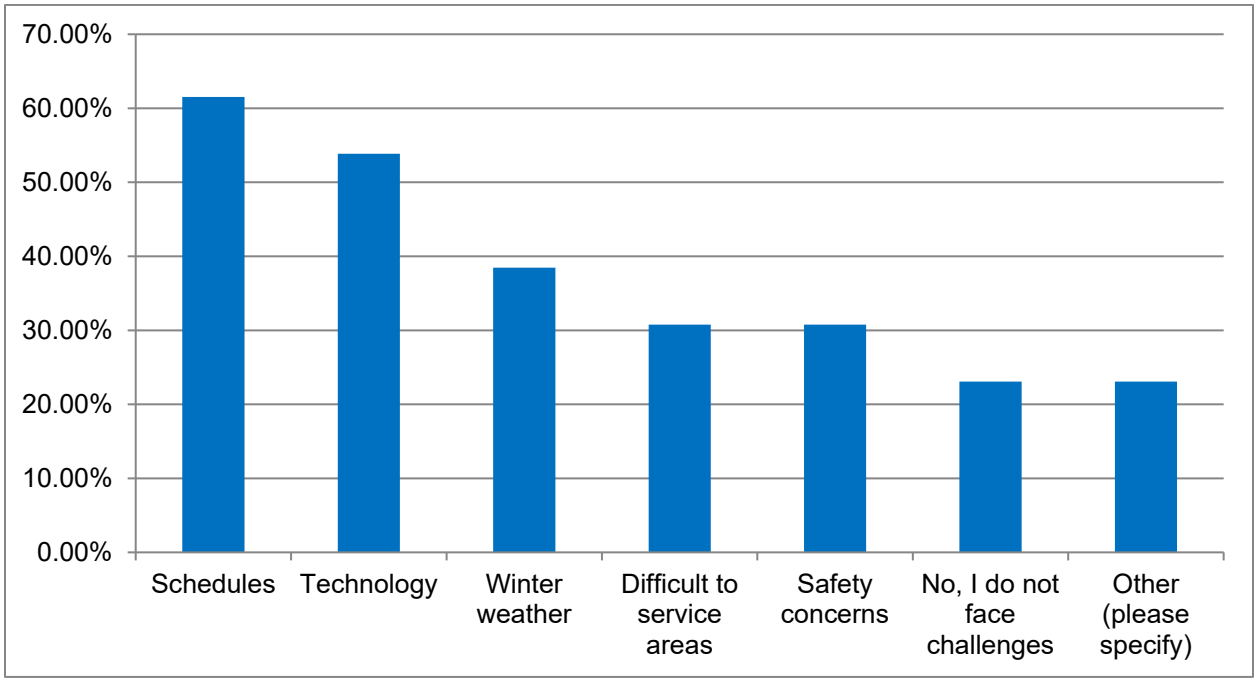


Table 104. Demand Response Challenges by Theme

Challenge	Responses
Schedules	• Schedules are too tight (4) • Passenger wait times (2) • Schedules change too much throughout the day • Last trip goes beyond end of shift • Passengers on-board for too long • Pick-ups are too early for appointments
Technology	• GPS issues (2) • Timecard punch in/out • Hard to hear dispatch • Zonar/Victon not working • Computers break • Adept
Winter weather	• Safety should be prioritized over schedules • Essential trips only during storms • Vehicles handle poorly • Streets are not plowed
Difficult to reach service areas	• Radio dead zone areas (2) • Small side streets and one-ways • Steep driveways
Safety concerns	• Breaks need to be built in • COVID • Pick up locations that require a U-turn or are on a dead end

Challenge	Responses
Other	• Radio dead zone areas • Management issues • Schedules are too packed

Q6. What other recommendations/thoughts do you have which would improve the service?

This question was open-ended, eight individuals responded. A summary of responses is as follows:

- Higher pay is needed (2)
- Keep dual wheel vans
- Home pick-ups need to be inspected before approved to ensure accessible for the vehicle
- People/drivers who smoke make vans smell bad, even if they smoke out of the van
- Better communications
- Driver committee
- Allow early pick-ups if passenger is ready

Interviews

Interviews were held with members of the PVTA paratransit council who elected to do so after presenting to the council. As representatives of the paratransit community each was asked the following four questions. Two individuals were interviewed, both live in the northern service tier.

- What do you hear from other passengers about the PVTA paratransit service?
- Are there places you wish you could go on the PVTA paratransit service that you cannot now or times?
- What barriers or concerns do you have about the PVTA paratransit service?
- What are some of the improvements that you and fellow passengers would like to see and would benefit greatly from?

What do you hear from other passengers about the PVTA paratransit service?

- The changes in schedules because of the colleges impacts the ADA users as the hours are shortened and in some cases service does not operate when school is not in session. This makes the service unreliable to use year-round
- There appears to be a disconnect between dispatch and scheduling
- There is no verification process that ensures people are dropped at the correct location, this is dangerous for those with cognitive disabilities as they might not be aware they are at the wrong location
- Vehicles do not always show up on time and those with cognitive disabilities may not have the wherewithal to know and call about the status of the ride.
- On-vehicle times sometimes seam longer than necessary
- There is a need to connect to the rural areas in the hilltowns

Are there places you wish you could go on the PVTA paratransit service that you cannot now or times?

- Later service hours in all towns
- Access to the hilltowns (Westhampton)

What barriers or concerns do you have about the PVTA paratransit service?

- There appears to be high turnover in drivers. Newer drivers tend to require more training in human services and safety
- Reduction in hours during the summer because of the colleges
- Long trip times
- Bad weather has caused some riders to not be picked up at all

What are some of the improvements that you and fellow passengers would like to see and would benefit greatly from?

- Ability to schedule trip online
- Ability to pay fare with a smartcard that had an online component to add funds to
- Being able to track to location of the vehicle in real-time so did not have to call and ask the status
- Two different phone lines; one for scheduling and the other for everything else
- Service to Westhampton along Route 66
- Improved educational material on how public transit benefits the environment

Appendix D PVTA Needs

Existing Fixed Routes Needs

Need	Rationale	Source(s)
Route 30		
Route 30: Reduce service to Valley Medical	Very little ridership (5 daily); does not meet requirement for deviation; difficult to maneuver bus through; would help improve OTP	• Existing Conditions Analysis • Driver Survey
Route 30: Earlier morning weekday service	The first trips in the morning to campus from either direction have high loads and average standing space only. 27% of survey respondents wanted earlier morning service on this route.	• Existing Conditions Analysis • Driver Survey • Previous RTP • Public Outreach
Route 30: Increased frequency mid-day weekdays during the semester	Ridership from 8:00 AM to 5:00 PM averages over 70 PPRH with over 650 instances where more than 30 individuals board the same stop at the same time	• Existing Conditions Analysis • Driver Survey
Route 30: Increase frequency during the early evening	Ridership from 6:00 PM to 8:00 PM average 60 passengers per revenue hour.	• Existing Conditions Analysis • Driver Survey
Route 30: Add service on Thursday and Friday night between 8 :00 PM and 11:00 PM	Ridership spikes from 8:00 PM to 11:00 PM with over 80 PPRH	• Existing Conditions Analysis • Driver Survey
Route 30: Earlier morning Sunday service	Service on the first full trip has the highest ridership of all trips. 50% of survey respondents wanted earlier morning Sunday service on this route.	• Existing Conditions Analysis • Driver Survey • Public Outreach
Route 30: Adjust service level to meet demand	Ridership levels are low in the late evening with less than 10 people per trip	• Existing Conditions Analysis • Driver Survey
Route 30: Additional Sunday service 11:00 AM to 10:00 PM	Ridership from 11:00 AM-10:00 PM averages 77 PPRH	• Existing Conditions Analysis • Driver Survey
Route 30: Additional Saturday service	Ridership from 10:00 AM to the end of service averages 117 Passengers per hour from a low of 71 to a high of 188	• Existing Conditions Analysis • Driver Survey

Need	Rationale	Source(s)
Route 31		
Route 31: Additional Sunday service	Ridership from 11:00 AM to 10:00 PM averages 66 Passengers per hour with trips heading to Sunderland having greater loads	• Existing Conditions Analysis • Driver Survey
Route 31: Additional Saturday service	Ridership from 10:00 AM to 11:00 PM averages 108 Passengers per hour with some having over 125 Passengers	• Existing Conditions Analysis • Driver Survey
Route 31: Earlier morning weekday service	The first trips in the morning to campus from either direction have high loads and average standing space only. 33% of survey respondents wanted earlier morning service on this route.	• Existing Conditions Analysis • Driver Survey • Public Outreach
Route 31: Earlier morning Sunday service	Service on the first full trip has the highest ridership of all trips. 37% of survey respondents wanted earlier morning Sunday service on this route.	• Existing Conditions Analysis • Driver Survey • Public Outreach • Previous RTP
Route 31: Increased frequency mid-day weekdays during the semester	Ridership from 9:00 AM to 3:00 PM averages over 60 passengers per revenue hour with several instances where more than 30 individuals board the same stop at the same time	• Existing Conditions Analysis • Driver Survey
Route 31: Additional evening service on Thursday and Friday nights	Ridership spikes from 8:00 PM to 10:00 PM, resulting in some of the highest productivities	• Existing Conditions Analysis • Driver Survey
Route 31: Connect Route 31 with shopping centers on Route 9	These locations are less than 2 miles apart, but passengers must travel to the center of town and then transfer	• Public Outreach HST Plan
Route 31: Additional travel time to go from Sunderland to UMass	During full service the schedule allocates 15 minutes to go between Sunderland and the UMass Campus a distance of 6.2 miles. This is tight in particular because of the high ridership activity in North Amherst and development occurring along Route 116.	• Driver Survey

Need	Rationale	Source(s)
Route 33		
Route 33: Remove unused deviations, shorten layover at Stop & Shop and create 30 minute headways	More weekday service is needed, by eliminating the Cushman center deviation (low ridership), and reducing the Stop & Shop time check could create 30 minute service on weekdays. The deviation takes four minutes to complete. Layover at Stop & Shop averages 23 minutes	• Existing Conditions Analysis • Driver Survey • Public Outreach • Regional Transportation Plan
Route 33: Additional mid-day service on Saturdays	There is only one bus on Saturdays but mid-day between 11:00 AM and 5:00 PM it averages 45 passengers per hour, many with shopping bags	• Existing Conditions Analysis • Driver Survey
Route 34		
Route 34: Weekday evening service	This route ends at 8:00 PM service is provided in the opposite direction on route 35. In the last hour of service on the 34 the route carries 20 PPH. 38% of survey respondents wanted later weekday hours	• Existing Conditions Analysis • Public Outreach • Driver Survey
Route 34: Increase frequency weekdays	The 34 had 242 overloads reported. Activity peaks between 9:00 AM and 10:00 AM on trips coming from the stadium going to North Pleasant Street carries upwards of 40 people per trip on average. 62% of route survey respondents wanted increased frequency	• Existing Conditions Analysis • Public Outreach • Driver Survey
Route 34:Saturday service	This route does not operate on Saturdays, 43% of route users desired Saturday service. The 35 operates it averages 40 PPRH between noon and 10:00 PM	• Existing Conditions Analysis • Public Outreach • Driver Survey
Route 35		
Route 35: Increase frequency weekdays	Between 9:00 AM and 6:00 PM the PPRH is greater than 40. 61% of route survey respondents wanted increased frequency	• Existing Conditions Analysis • Public Outreach • Driver Survey

Need	Rationale	Source(s)
Route 38		
Route 38: Adjust service level to meet demand	Ridership drops to 4.7 passengers per revenue hour after 11:00 PM. At 8:00 PM productivity drops to 10.6. The one anomaly is Halloween	• Existing Conditions Analysis • Driver Survey
Route 38: Adjust service level to meet demand	Ridership drops after 10:00 PM	• Existing Conditions Analysis • Driver Survey
Route 38: Adjust service level to meet demand	Ridership on the last trip averages much lower productivities (7.3)	• Existing Conditions Analysis • Driver Survey
Route 38: Reduce service on Saturday nights	Drivers report low ridership	• Driver Survey
Route 39		
Route 39: Adjust service level to meet demand	Route has very little ridership, is not meeting the target and enrollment has been dropping at HC	• Existing Conditions Analysis • Driver Survey
Route 39: Adjust service hours to meet demand - weekdays	Ridership drops to single digits each hour starting at 6:00 PM. All classes end by 8:50 PM	• Existing Conditions Analysis • Driver Survey
Route 39 Adjust routing to meet demand	The trips to Smith College have twice the ridership than those going to the mall during the same time periods	• Existing Conditions Analysis • Driver Survey
Route 39: Adjust service hours to meet demand - Saturday	Ridership after 8:00 PM begins to drop. Particularly after the first month of return to school, ridership is single digits per trip	• Existing Conditions Analysis • Driver Survey
Route 45		
Route 45: Increased peak hour service	Ridership is highest on this route between 7:00 AM and 9:00 AM and 4:00 PM to 6:00 PM. While the productivity is over 20 PPRH half of the activity along this route are passengers who are traveling between campus and downtown Amherst/Main Street. Increased frequency was desired by 87% of route users	• Driver Survey • Public Outreach • Previous RTP

Need	Rationale	Source(s)
Route 46		
Route 46: Additional trips	Service is very limited with only 2 trips a day. 92% of route users in the survey wanted more service on this route	• Driver Survey • Public Outreach
R41		
R41: Additional Saturday evening service	The last northbound trip has the highest ridership of all northbound trips. 55% of passengers desired later evening service	• Driver Survey • Public Outreach
R41: Sunday service	Easthampton has no Sunday bus service. 55% of survey respondents desired Sunday service on the route. This route was noted the most by VATCo drivers for needing improvements including Sunday service	• Driver Survey • Public Outreach
R41: Additional weekday evening service	Ridership in the southbound direction has a consistent passengers per trip from the second trip in the morning to the last with 17 -11 passengers, ridership does not peak and taper off. 59% of passengers desired later evening service. This was one of the few routes to have an increase in weekday ridership between 2012 (CSA data) and 2019	• Driver Survey • Public Outreach • Existing Conditions Analysis
R42		
R42: Discontinue service to Nash Hill	Service to Nash Hill is on request three times a day. No ridership was recorded at this location, turning the bus around at this location is difficult	• Existing Conditions Analysis
R42: Sunday service	Williamsburg has no Sunday bus service beyond the VA. 45% of survey respondents desired Sunday service on the route.	• Driver Survey • Public Outreach • Existing Conditions Analysis

Need	Rationale	Source(s)
R44		
R44: Increased frequency	96% of survey respondents desired this. The current frequency is 70 minutes but with buses circulating in the opposite direction departs the Salvo house every 35 minutes	• Public Outreach • Existing Conditions Analysis
R44: Increased Sunday service	Sunday hours are limited and there are only three trips daily with service patterns inconsistent because of service to the VA.	• Existing Conditions Analysis • Driver Survey
R44: Streamline the routing	The R44 deviates to High Street outbound on weekends and 44A on weekdays. This deviation does not meet the productivity standard and averages 1 boarding per week	• Existing Conditions Analysis
B43		
B43: Increased Weekend frequency	Ridership on this route is above 50 PPRH between 2:00 PM and 9:00 PM with trips averaging over 57 passengers per directional trip. The majority of ridership activity is between town and the Mall	• Existing Conditions Analysis • Public Outreach • Driver Survey
B43: Adjust service hours to meet demand -Friday	The last trip on Friday nights carries 7 PPRH compared to the trip before which is 29 PPRH. This trip only operates Friday nights	• Existing Conditions Analysis • Driver Survey
B48		
B48: Express service from Northampton to HTC	The B48 operates service via Route 5 between these two locations, the majority of ridership is in downtown Northampton and HTC. 64% of survey respondents who use this route desired faster service compared to 59% overall. While the scheduled travel time is 30 minutes this route often runs behind schedule, travel via I-91 is faster.	• Public Outreach • Previous RTP • Driver Survey

Need	Rationale	Source(s)
B48: Increased Weekday frequency	In the morning peak service is only hourly, during this time the PPRH averages 26 compared to 21 the rest of the day. 61% of survey respondents wanted higher frequency on this route	• Existing Conditions Analysis • Public Outreach
B48: Later evening service	This route operates to 9:00 PM on Saturdays by 8:00 PM on weekdays. 58% of survey respondents for this route desired longer hours	• Existing Conditions Analysis • Public Outreach • Driver Survey
B48: Earlier weekday service	In the first hour of service this route carries 25 PPRH. All other Northampton based routes begin weekday service at 6:00 AM this route begins at 7:00 AM.	• Existing Conditions Analysis • Driver Survey
B48: Earlier Saturday morning service	The first NB trip in the morning has the greatest ridership amongst all Saturday trips and has a PPRH of 33. All other Northampton based routes begin weekday service at 8:00 AM this route begins at 9:00 AM.	• Existing Conditions Analysis • Previous RTP
B48: Increased Saturday frequency	Saturday service averages 12.7 passengers per trip which is greater than on weekdays. Between 9:00 AM and 5:00 PM the PPRH is greater than 24	• Existing Conditions Analysis • Driver Survey
WP		
WP: Increased service	100% of users wanted increased frequency in the public survey. Ridership is low at 4.44 PPRH	• Public Outreach • Palmer Ware Outreach • Intercity Bus Study
WP: Service to Springfield	Springfield is one of the top destinations desired for WP residents.	• Public Outreach • Palmer Ware Outreach • Intercity Bus Study
WP: Dedicated Routes	Previously this service had two routes but was combined into one and service reduced	• Public Outreach • Palmer Ware Outreach
WP: Saturday service	In the Palmer-Ware on-board survey 25% desired Saturday service and 50% said this for route riders in the public survey	• Public Outreach • Palmer Ware Outreach • Intercity Bus Study

Need	Rationale	Source(s)
WP: Sunday service	In the Palmer-Ware on-board survey 16% desired Sunday service and 63% said this for route riders in the public survey	• Public Outreach • Palmer Ware Outreach • Intercity Bus Study
Miscellaneous Routes		
M40: Express service between Northampton and Amherst	The M40 was discontinued but provided 9 trips daily. The B43 schedule absorbed some of these trips with an express variant	• Public Outreach • Existing Conditions Analysis
NE: Improved service	90% of route users desired an increase in frequency. The current frequency is 90 minutes with multiple trip variants. Ridership activity by stop is unknown as are travel patterns.	• Existing Conditions Analysis • Public Outreach
G1		
G1: Later weekday evening service	Service ends at 10:00 PM but the last trips leaving Union Station is at 9:10 in both directions. From 9:00 to 10:00 PM the route carries ~25 people per day. 42% wanted later weekday evening service.	• Existing Conditions • Public Outreach
G1: Adjust weekday frequency to meet demand	The frequency throughout the day maintains steady at 20-25 minutes though ridership is lower in the mornings and evening than mid-day which carries over 200 people per hour. In the evening the route carries ~50 people per hour. Increased frequency was the top desired improvement on this route (57%).	• Existing Conditions • Public Outreach • Driver Survey
G1: Consistent service to the Chicopee Big Y	Approximately 1/3 of the trips do not extend to the Chicopee Big Y plaza but terminate in Chicopee center. This creates confusion for passengers as there are over 25 stops between the center and Big Y including the Chicopee Marketplace Plaza. On an average weekday there are over 225 boardings at these stops	• Existing Conditions

Need	Rationale	Source(s)
G1: Additional Saturday Service	On Saturdays the PPRH is ~29, greater than on weekdays. The route has a 30 minute headway but is performing closer to a Tier 1 route, though it is a Tier 3 on Saturdays.	• Existing Conditions
G1: Additional Sunday Service	On Sundays the PPRH is ~27, greater than on weekdays. Ridership has increased by 556% since the last CSA due to increased frequency. The route has a 45 minute headway but is performing closer to a Tier 1 route, though it is a Tier 3 on Sundays. Of the Southern Tier routes, it has the second highest Sunday ridership.	• Existing Conditions • Public Outreach
G1: Later evening Sunday Service	The last trip departing Union Station SB averages 12 people. Later Sunday service was desired by 47%.	• Existing Conditions • Public Outreach • Previous RTP
G2		
G2: Increased service to Big Y	The Big Y variation has four times the ridership than Dwight Road.	• Existing Conditions
G2: Eliminate unused deviation	The Industrial Park deviation has a productivity of 0.08 PPRH.	• Existing Conditions • Previous RTP
G2: Adjust weekday frequency to meet demand	Of the Tier 3 routes this route has the highest ridership and a productivity closer to a Tier 1 Route. Improved headway was the top desired improvement in the public survey for this route (70%). In the evening though ridership begins to drop starting at 6:00 PM from 100 passengers per hour to 60, then to 40 at 8:00 PM and 24 at 9:00 PM despite headway remaining every 30 minutes.	• Existing Conditions • Public Outreach • Driver Survey
G2: Additional Saturday Service	Between 10:00 AM and 5 PM this route carries 100 people per hour. The PPRH on Saturdays is ~27	• Existing Conditions
G2: Additional Sunday Service	Between 9:00 AM and 6:00 PM this route carries 51 people per hour. The Sunday average PPRH is 26.	• Existing Conditions

Need	Rationale	Source(s)
G2: Later weekday evening service	Service ends at 10:00 PM but the last trips leaving Union Station is ~9:30 PM. 48% wanted later weekday evening service.	• Existing Conditions • Public Outreach
G2: Longer Sunday Hours	Service begins at 9:00 AM and ends at 7:00 PM. It does not follow a traditional bell curve but begins and ends with high ridership. 33% of the public wanted earlier morning service and 55% later on Sundays.	• Existing Conditions • Public Outreach
G3		
G3: Saturday evening service	Later evening on Saturdays was identified as a need by 63%, service ends at 6:30 PM though most other Tier 3 routes on Saturday end later.	• Existing Conditions • Public Outreach
G3: Adjust weekday frequency to meet demand	Service currently ends at 7:45 PM with irregular frequencies after 2:45 PM (20-40 minutes) through the end even though ridership begins to drop at 6:00 PM. Even though ridership drops later evening service was the top desired improvement in the public survey for this route (68%) .	• Existing Conditions • Public Outreach
G3: Adjust weekday morning service to meet demand	Ridership is lower before 9:00 AM but Frequency is 30 minutes.	• Existing Conditions
G3: Increased service to State Street	Service east of Hancock Street only accounts for 7% of the ridership and all stops are within 1/4 mile of State Street. This route would be better served as a loop with service on Wilbraham Road	• Existing Conditions
G3: Consistent Routing	The Sunday Chicopee Falls deviation has very little ridership and creates confusion for Passengers.	• Existing Conditions
B4		
B4: Cleaner Schedule	The schedules imply that on Saturdays the bus does not service this area, but it does.	• Existing Conditions
G5		

Need	Rationale	Source(s)
G5: Eliminate unused service	The Campus has closed, there is very little ridership on this section. Demand was identified instead to connect to CT Transit.	• Existing Conditions • Public Outreach • Previous RTP • Driver Survey
G5: Sunday Service	This route does not have Sunday service. A need was identified by 46% of survey respondents using the route.	• Existing Conditions • Public Outreach • Driver Survey
G5: Additional Saturday evening service	Service ends at 6:00 PM put the PPRH is increasing from 4 to 5 from 5 to 15. 46% of the survey respondents using the route wanted later Saturday Service.	• Existing Conditions • Public Outreach
B6		
B6: Longer Saturday Hours	Service on Saturdays ends at 8:40 PM, the earliest of the Tier 2 routes. The last EB trip carries an average of 16 passengers. 70% wanted later Saturday service.	• Existing Conditions • Public Outreach
B6: Consistent routing and improved Sunday frequency	On Sundays the route serves the Eastfield Mall. This variation has very little ridership by eliminating it.	• Existing Conditions
B6: Expanded Sunday service	On Sunday service ends at 7:15 PM. The westbound trip with the greatest ridership is the first (26 passengers) and the eastbound with the greatest is the last trip (20 passengers). 65% want later Sunday service and 55% earlier.	• Existing Conditions • Public Outreach
B6: Remove unused deviations	The B6 Health South Deviation is sporadic and has little activity compared to the Main routing and averages about 7 passenger per day.	• Existing Conditions
B6: Adjust Frequency to Match Demand	The B6 has the lowest productivity and highest subsidy per passenger of the Tier 2 routes. Annual ridership is half of that of the P20 or G1. From 8:00 AM to 5:00 PM per hour it carries 100 passengers similar to that of many Tier 3 routes. Additionally, the B6 has one of the poorest OTP on weekdays .	• Existing Conditions

Need	Rationale	Source(s)
B7		
B7: Express and local variant	The route has multiple deviations, many which do not meet the requirements. With the loss of many businesses at the Mall, ridership east of Walmart has dropped.	• Existing Conditions • Previous RTP
B7: Match frequency to demand on weekdays	The B7 operates a 15 minute frequency until 6:00 PM and then reduces to 30 minutes. At 5:00 PM ridership drops from 250 passenger per hour to 200 and then to less than 100 at 7:00 PM and less than 50 after 9:00 PM.	• Existing Conditions
B7: Match frequency to demand on Saturday	On Saturdays the headway is 20 minutes all day, despite ridership having a bell curve and peaking 1 PM. Before 8:00 AM the route carries less than 10 PPRH. In the evening ridership begins declining steadily at 4:00 PM.	• Existing Conditions • Previous RTP
B7: Consistent Saturday Routing	On Saturdays the B7 has express trips via I-91 to the Eastfield Mall. These trips carry less than 10 passengers each and create a confusing schedule.	• Existing Conditions • Previous RTP
B7: Improve Sunday Service Span	Sunday Service is limited to 9:00 AM to 7:00 PM. Ridership on the first trip outbound carries on average 26 passengers. The last outbound trip is at 6:00 PM and averages 29 passengers. Additional morning service was desired by 45% of users and evening by 43% on Sundays.	• Existing Conditions • Public Outreach • Previous RTP
R10		
R10: Remove unused deviations	The Hospital and East Mt. View Apartments deviations have very little ridership and do not meet the deviation requirement.	• Existing Conditions • Previous RTP • Driver Survey
R10: Remove unused deviations	This Union Street branch has little ridership and creates a sporadic schedule. Eliminating it could streamline the schedule.	• Existing Conditions • Previous RTP

Need	Rationale	Source(s)
R10: Additional morning service to Walmart	The first trip into Walmart on weekdays is 8:30 AM but the store opens at 7:00 AM.	• Existing Conditions
R10: Consistent routing	When WSU is in session during weekdays the R10 ends at the Olver Transit Pavilion but when it is not continues onto WSU. The different schedule times and destinations can be confusing to individuals not associated with the university.	• Existing Condition • Driver Survey
R10: Improved weekday frequency	The frequency on this route is inconsistent, mainly because of the multiple deviations that could occur. 86% of the route users desired improved frequencies.	• Existing Conditions • Public Outreach • Previous RTP • Driver Survey
R10: Improved Sunday morning service	The first inbound trip from Westfield in the morning on Sundays averages over 20 people.	• Existing Conditions • Public Outreach • Previous RTP • Driver Survey
P11		
P11: Additional morning service	The first trip in the morning carries the greatest number of people (~ 25 passengers). 43% desired more morning service.	• Existing Conditions • Public Outreach
B12		
B12: Reduce unproductive routes	The B12 has one of the highest cost per passenger but because the Department of Corrections subsidizes it the farebox recovery is one of the highest. This route carries 3.5 passenger per round trip on weekdays and 2 on Saturday.	• Existing Conditions • Driver Survey
R14		
R14: Streamline the routing	Route has multiple deviations and branches and at different times of the day circulate in different directions. Simplifying the route could improve constancy and create consistent headways.	• Existing Conditions • Regional Transportation Plan • Previous RTP • Driver Survey

Need	Rationale	Source(s)
B17		
B17: Sunday Service	This route does not have Sunday service. A need was identified by 40% of survey respondents using the route. On Saturdays this route carries ~ 19 PPRH.	• Existing Conditions • Public Outreach • Driver Survey
B17: Adjust weekday frequency to meet demand	This route carries an average of 19.4 PPRH, almost twice the tier 1 goal of 10 PPRH. Increased frequency was the top desired improvement on this route (64%).	• Existing Conditions • Public Outreach
P20		
P20: Improve Weekday frequency	This route carries over 800,000 annually and has an average PPRH of 26.55 and ranks fifth in average daily weekday ridership. Ridership forms a bell curve, peaking in the afternoon. 48% of route users desired improved frequency.	• Existing Conditions • Public Outreach
P20: Later evening Saturday service	The last trip leaving the Mall SB is at 10:05 and NB 9:15 PM. Each trip averages 10 people. Later evening service was desired by 44% of the route users.	• Existing Conditions • Public Outreach
P20: Increase Sunday span of service	Service begins at 9:00 AM and the first NB and SB trip carry 25 passengers each. 33% of riders wanted earlier morning service and 47% later evening.	• Existing Conditions • Public Outreach
P20E		
P20E: Additional Saturday service	On Saturdays the service averages a PPRH of 30. The first trip to the Mall in the morning carries 10 passengers and the last trip back 12. 44% wanted earlier morning service and 51% later.	• Existing Conditions • Public Outreach
P20E: Sunday service	This route has no service on Sundays but was desired by 46% or route users.	• Existing Conditions • Public Outreach
P21		

Need	Rationale	Source(s)
P21: Increase Saturday span of service	Service begins at 8:00 AM and the first trip has 13-16 passengers, in the evening service ends at 9 PM but there is a desire for it to end later (44%).	• Existing Conditions • Public Outreach
P21: Increase Sunday span of service	Service begins at 8:00 AM and the first SB trip carries 20 passengers. Service ends at 7:00 PM 36% of riders wanted earlier morning service and 42% later evening.	• Existing Conditions • Public Outreach
P21: Improve weekday frequency	This route has a PPRH of 28.58, almost twice that of the target of 15 PPRH. It is one of the few routes which experienced an increase in weekday ridership between 2012 and 2019. 45% of route users want improved frequency and later evening service.	• Existing Conditions • Public Outreach
B23		
B23: Weekend Service	This route does not operate on weekends. 64% of route users in the survey desired Saturday service and 50% Sunday Service.	• Existing Conditions • Public Outreach • Driver Survey
B23: Remove unused deviations	The deviation to the Solider Home is also served by the R24 and it does not meet the deviation requirement	• Existing Conditions
B23: Service to the Silver Street Big Y	The Big Y on Silver Street is not serviced by the PVTA but is considered a major generator as it would benefit both patrons and employees.	• Existing Conditions
R24		
R24: Weekend Service	This route does not operate on weekends. 54% of route users in the survey desired Saturday service and 39% Sunday Service.	• Existing Conditions • Public Outreach • Driver Survey
R29		
R29: Mid-Day weekend service	Weekend service is limited to one-trip in each direction.	• Existing Conditions
X90		•

Need	Rationale	Source(s)
X90: Increased Sunday Service	Sunday service ends in Chicopee and does not connect to a transit center. Ridership in the last hour is the greatest amongst all hours. Later Sunday service was identified as a need by 60% of route users.	• Existing Conditions • Public Outreach
X90: Reduce Unproductive Deviations	The X90B deviates to Montcalm Heights but this deviation does not meet the requirement. Both the A and B serve South Hadley Center, but this area has very little ridership.	• Existing Conditions • Driver Survey
X92		
X92: Sunday service	This route does not have Sunday service. A need was identified by 64% of survey respondents using the route.	• Existing Conditions • Public Outreach • Driver Survey
X92: Adjust weekday frequency to meet demand	The X92 has a morning and afternoon peak in ridership, as opposed to many other routes which peak mid-day. During these peaks' trips can be carrying upwards of 25 passengers. Increased service was the top desired improvement (73%).	• Existing Conditions • Public Outreach
LOOP		
LOOP: Funding Partnership	This route has low ridership and is not meeting the PPRH target of 10. It is subsidized by MGM.	• Existing Conditions • Driver Survey
LOOP: Adjust weekday span to meet demand	Ridership after 8:00 PM drops to less than 3 PPRH on weekdays with most activity at stops which are serviced by other routes.	• Existing Conditions • Driver Survey
LOOP: Adjust Sunday span to meet demand	Sunday ridership is low averaging just 4.4 PPRH and is highest from 11:00 AM to 3:00 PM. After 3:00 PM the PPRH ranges from 0.8 to 4.	• Existing Conditions • Driver Survey
R10s/OWL		

Need	Rationale	Source(s)
R10s/OWL: Consistent schedules and increased connections	The OWL operates different schedules on MWF and Tu/Th because of class schedules. This route is very short. The 10S connects WSU to downtown Westfield. These two routes provide duplicative service in places.	• Existing Conditions
W		
W: Weekend service	This service only operates on weekdays, but weekend service is desired. The demand response service overall carries less people on weekends.	• Existing Conditions • Public Outreach

Demand Response Needs

Need	Rationale	Source(s)
Demand response connections to FRTA	Currently the FRTA and PVTA area for non-ADA demand response do not overlap. Many of the rural FRTA communities' main destinations are PVTA communities.	• Public Outreach
Connect Sunderland to the South County Senior Center	Sunderland residents have a tri-town senior center located in South Deerfield, but seniors cannot access it via dial-a-ride because South Deerfield is a FRTA town.	• Public Outreach
Online trip scheduling for Demand Response	Improve the passenger experience and lower the number of calls and call wait time.	• Public Outreach • PVTA Paratransit Study • COVID Exercise
Demand Response: Coordination with Quaboag Connector	The Quaboag connector provides demand response service to several towns in the Quaboag region including desired connections to WRTA and PVTA routes in Belchertown	• Existing Conditions Analysis • Public Outreach

New Service Needs

Need	Rationale	Source(s)
First-mile/last-mile service	While most of the high population areas have access to transit there is still a proportion of the population that does not.	• Existing Conditions • Regional Transportation Plan
Late night service	There are varying needs for service throughout the service area to accommodate 2nd and 3rd shift workers	• Public Outreach • Regional Transportation Plan
Same day demand response service	Demand response users must book their trip in advance. This limits mobility. Same day service was desired by almost 50% of users.	• Public Outreach • HST Plan
Service to Six Flags	During the summer months there is demand for access to Six Flags for both recreation and for jobs.	• Existing Conditions • Public Outreach • Driver Survey
Connection to CTtransit	The G5 provides limited connections to CT Transit at Mass Mutual.	• Existing Conditions • Public Outreach
Out of service area medical trips	There is a need to access medical service in Worcester and Boston	• Existing Conditions • Public Outreach • HST Plan
Service to Venture Way	More and more UMass departments are moving here	• Driver Survey
Express service between Northampton and Springfield	Innovative methods to increase transit ridership which could serve park and rides, provide fast direct service and entice commuters. Convenient service was identified as the top reason no riders would begin riding	• Public Outreach • HST Plan • Regional Transportation Plan • Previous RTP • Intercity Bus Study
Express service between Amherst and Springfield	The Route 29 provides service between Amherst and Holyoke providing connections to Springfield, but it can take 2 hours to complete this trip. Convenient service was identified as the top reason no riders would begin riding	• Public Outreach • HST Plan • Previous RTP • Driver Survey • Intercity Bus Study

Need	Rationale	Source(s)
Service deeper into East Longmeadow	There is no service to the center of East Longmeadow which was identified as a need.	• Public Outreach
Transit service in South Hadley Falls	Service to most of South Hadley outside the 116 corridor was discontinued with the elimination of the Tiger Trolley but there has been a need identified.	• Public Outreach
Connection between Westfield Neighborhoods and Industrial area	There are several neighborhoods in Westfield which have no service but exhibit a high demand. Additionally the streamlining of the R10 will eliminate service from certain areas.	• Previous RTP
Additional Agawam Service	The deviation to the industrial park is recommended for elimination. Service is limited and the industrial park businesses has varying needs for hours and shift times.	• Public Outreach
Additional service in Palmer and Ware	These communities use to be serviced by 2 routes. There are several destinations and neighborhoods which need to be connected.	• Palmer Ware Outreach

Systemwide Needs

Need	Rationale	Source(s)
Faster service	Faster service was preferred over serving more places in the public outreach.	• Public Outreach • HST Plan • Intercity Bus Study
Improved weekend service	Weekend service drops on many routes and some do not operate at all.	• HST Plan • Intercity Bus Study
Expand evening service	Later evening service is needed to accommodate 2nd and 3rd shift workers.	• HST Plan
Increased frequency	Increased frequency would improve mobility for the region. Frequency was desired over coverage in the public survey for riders. 42% of non-riders stated they would use the PVTA if service was more frequent and 56% said they would use it if it was convenient	• Public OutreachHST Plan • PVTA Northern Tier • PVTA Southern Tier • COVID Exercise

Need	Rationale	Source(s)
Additional weekend service for fixed route and demand response	Increased frequency would improve mobility for the region. Frequency was desired over coverage in the public survey	• Public Outreach • HST Plan
Improved weekend service	Weekend service drops on many routes and some do not operate at all.	• Intercity Bus Study
Systemwide: First-mile/last-mile and after hours service	There is a need to provide service to all in the region, and during later evening and early morning hours in order to increase mobility, economic activity and livability. In many cases Fixed Route is not financially feasible nor is there enough demand to warrant a micro transit program	• Existing Conditions Analysis

Bus Stop Needs

Needs	Rationale	Source(s)
Improved lighting at bus stops	Difficult to see waiting customers and would improve safety. It was found that 374 stops do not have adequate lighting	• Existing Conditions Analysis • Driver Survey
Accommodate additional vehicles at Cowles Lane and Academy of Music	These stops are serviced by multiple routes. Cowles Lane can only hold 1 bus at a time. Academy of Music can only hold three buses, but up to 5 buses can be there at once.	• Driver Survey
Safer crossings at heavily used crosswalks by bus stops	This is a main crosswalk on campus, and it is difficult to pull out of the bus stop and then get through the crosswalk, especially during class change. This causes vehicles to run behind	• Driver Survey
Bus stop consolidation	In some areas stops are placed closer than the recommended standard, slowing down the routes	• Existing Conditions Analysis • Driver Survey • PVTA Northern Tier • PVTA Southern Tier
Improved bus stop amenities	This includes benches, shelters and improved accessibility	• Existing Conditions Analysis • HST Plan • PVTA Northern Tier • PVTA Southern Tier

Needs	Rationale	Source(s)
Bus stop shelters at high ridership stops	PVTA has at least 19 stops that meet the requirement for installing a shelter but do not have one	• Existing Conditions Analysis • PVTA Northern Tier • PVTA Southern Tier • COVID Exercise
Policy for bench placement at bus stops	This will help PVTA prioritize where to put benches	• Existing Conditions
Improved safety at crosswalks at bus stops	In areas with high pedestrian activity and numerous crosswalks passengers often cross in front of the bus making it difficult to pull out of stops and creating a safety hazard.	• Driver Survey
Longer bus stops	Many stops with pullouts are not designed to accommodate more than one vehicle or longer articulated vehicles.	• Driver Survey
Bus stop snow and trash removal	When snow is not removed from bus stops, they become difficult to service, in some cases snow is removed in a manner limiting accessibility and ramp deployment or shelter access. Trash can build up if not removed. While each garage has a crew to maintain and clean shelters this is time consuming and costly.	• Driver Survey

Fleet Needs

Needs	Rationale	Source(s)
Increased vehicle capacity	Increase capacity on the 30 and 31, these two routes have the greatest number of overloads.	• Existing Conditions Analysis • Driver Survey
Buses with windows that open	This would help with air circulation, which is recommended in enclosed spaces during the pandemic, reduce odors, and reduce dependency on AC.	• Driver Survey • COVID Exercise
Electric bus	To reduce the carbon footprint in the Pioneer Valley	• Driver Survey

Needs	Rationale	Source(s)
Newer buses	18.5% of revenue vehicles are past their ULB. These older vehicles have high mileage are become more costly to maintain and components begin to break. The automatic announcement system was noted as a concern on older buses	• Existing Conditions Analysis • Driver Survey
Inform other drivers that PVTA buses do not turn on red and stop frequently	A way is needed to let drivers behind the bus know that the bus does not turn on red and that it stops frequently.	• Driver Survey

Infrastructure Needs

Need	Rationale	Source(s)
BRT Infrastructure on Route 9	Route 9 is the primary corridor connecting Northampton and Amherst. The DOT is working on improvements to the roadway which would benefit PVTA including TSP, and new bus pull outs.	• Route 9 BRT Study • Driver Survey • Previous RTP
BRT Infrastructure on State Street	The B7, one of the busiest routes, operates along the State Street corridor. Additionally, several other routes serve sections of this corridor. The existing conditions analysis identified this as a high ridership corridor. Treatments are needed to shorten travel time given the numerous traffic signals and would help with OTP.	• State Street BRT Study
Protected left turns in order to increase OTP	Without the protected lefts, vehicles can wait a substantial time to turn causing the routes to fall behind schedule	• Driver Survey
Improved curb radii in order to reduce the need to use the oncoming lane or rubbing the tire on the curb	Turn is difficult in a bus when cars are waiting at the stop bar. Off track's often occur	• Driver Survey

Need	Rationale	Source(s)
Elimination of regular car traffic on North Pleasant Street on Campus. Allow buses, emergency and university plated vehicles only on weekdays during the day.	Would help improve OTP for the 30, 31, 33, 34, 35 which use this corridor. Getting in and out of the bus stops with car and pedestrian traffic is difficult. xx buses an hour during the peak are traveling this corridor	• Existing Conditions Analysis • Driver Survey
Expansion of the UMass and VATCo Maintenance Facilities	The current facilities do not accommodate safe and proper maintenance of articulated buses. This is needed to expand the use of articulated buses	• Existing Conditions Analysis • Regional Transportation Plan • COVID Exercise
Additional park and rides throughout the region.	Additional Park & Rides are needed in areas surrounding the UMass campus in order to reduce vehicles on campus. They should be serviced by PVTA with appropriate amenities.	• Driver Survey
Reduced number of crosswalks on North Pleasant Street, UMass Campus.	Route often run behind schedule along this segment and travel time can vary from 2 mins to 10 min depending on the time of day. From the Roundabout to intersection with Mass Ave there are 14 crosswalks over the .7 mile long roadway segment, with some just 100 feet apart.	• Existing Conditions Analysis • Driver Survey

Fare Needs

Need	Rationale	Source(s)
Cash less fare options in addition to magnetic stripe cards	This would speed up boarding times and OTP and improve passenger satisfaction. This could be a mobile payment or smart card option	• Existing Conditions Analysis • PVTA Northern Tier • COVID Exercise
Additional locations to obtain a PVTA E&D card	Currently there are no locations in the northern tier to obtain a card	• Driver Survey
New fare collection system	The current system is becoming outdated and there were several issues with the Fast Break card deployment and TVMs. The current system does not have a functional Smart Card system.	• Driver Survey

Need	Rationale	Source(s)
Cashless fare option for demand response	The mobile payment app recently deployed is for fixed route. Over 50% of demand response users would pay via phone.	• Existing Conditions • Public Outreach

Policy Needs

Need	Rationale	Source(s)
Minimum span of service guidelines that reflect new route classification structure	The 2014 CSA outlines the minimum span of service for each route type and day type. These should be adjusted to reflect the new route type structure	• Existing Conditions Analysis
Identification of flag stop corridors	While the majority of stops have signs or are identified in the GTFS and app there are several corridors where the entire corridor is flag stop. By identifying these it is clear to passengers and drivers where the bus will stop if waved down verse where someone must be at a prescribed stop	• Existing Conditions Analysis
Electric scooter policy	As micro mobility increases, and more individuals are utilizing electric scooters PVTA should establish a policy regarding if and when they are allowed on buses.	• Existing Conditions Analysis
Data driven framework for determining service levels	Enhanced performance management system to support an enterprise-wide data-driven and performance focused management and decision-making framework	• RTA Task Force • MassDOT

Operational Needs

Needs	Rationale	Source(s)
UMTS: Improved timing on route segments	Drivers reported insufficient timing on several routes.	• Driver Survey
Additional road supervisors	Drivers had concerns about the response time for incidents that occur on-board buses	• Driver Survey

Needs	Rationale	Source(s)
Improved communication between drivers and drivers/Management and PVTA	TBD	• Driver Survey
Improved transfer communication	Communication between vehicles is not quick and sometimes transfers are missed.	• Driver Survey
Continually monitoring OTP	Reliable service is imperative to maintaining ridership, most routes have segments where OTP is not meeting the performance metric	• Existing Conditions Analysis • PVTA Northern Tier • PVTA Southern Tier
Improved cleanliness of vehicles	This was a top concern in on-board passenger surveys and was heard from drivers.	• Driver Survey • PVTA Northern Tier • PVTA Southern Tier • COVID Exercise
Coordinated service along State Street	With the proposed changes there will be an increase in service along State Street, a busy corridor with high ridership. The timing of the routes should be coordinated to reduce buses running back to back.	• Existing Conditions • Previous RTP • State Street BRT Study
Adjusted timing on routes	Drivers identified route segments where timing needs to be improved because routes are running hot or behind	• Driver Survey
30/31/45/ Additional time from UMass Graduate Research Center (GRC) to Cowles Lane	4 minutes are allotted in the schedule, but drivers report often running behind because of the high ridership activity in this corridor, and numerous crosswalks.	• Existing Conditions Analysis • Driver Survey
Improved travel time and OTP through the center of Amherst	To help move the buses through town quicker. The Cowles Lane stop is just before the signal and getting out of the stop and through the signal can be very difficult and time consuming.	• Driver Survey

Technology Needs

Need	Rationale	Source(s)
New AVL Software	Avail not working properly was a common complaint across garages. In particular, voice fallback, silent alarms trigger automatically and randomly, poor radio quality, intermittent automatic announcements	• Driver Survey
Improved real-time information at stations	Screens at Union Station and HTC do not always work properly	• Public Outreach • Driver Survey
AVL and APC data for the community shuttles	The WP route and NE do not have AVL and the APC technology is not turned on. This hinders the ability to monitor the routes performance. These routes do not show up on the Transit App	• Existing Conditions Analysis
Transit signal priority	PVTA currently has TSP deployed along at a select few locations. In some instances it was reported that it was not working by drivers	• Driver Survey
New Demand Response scheduling and CAD software	PVTA currently uses Adept	• Technology Survey
New Fixed Route scheduling software	PVTA utilizes Hastus	• Technology Survey
Route planning software	PVTA currently uses Remix to aid in planning but this software is limited and requires the developer to upload new files each time there is a route/schedule change. Additionally, it does not function well for routes that operate different schedules on different days of the week	• Technology Survey
Upgraded parts management and Maintenance work order software	PVTA has just upgrade the software	• Technology Survey
Integrated service alert system with social media	A service alert system would better inform passengers of change	• Technology Survey • Public Outreach • Driver Survey

Need	Rationale	Source(s)
Vehicle-mounted collision warning and tracking systems	Zonar technology is currently deployed on the paratransit fleet but there is no such technology on the bus fleet	Technology Survey Existing Conditions Analysis

Other Needs

Need	Rationale	Source(s)
How to ride guide	Information is needed that walks passengers through how to use the bus system including reading a schedule, boarding the bus, and paying the fare.	• Public Outreach • Driver Survey
Improved customer communication	Customers need a way to communicate with PVTA and provide feedback about the service. While PVTA does have a customer complaint form it is geared toward this and not necessarily feedback that would help improve the system. Pre-pandemic PVTA did hold rider meetings but had mixed results on attendance.	• Driver Survey
Reestablish printed schedules	Not all customers have access to a smart phone with data plan that allows them to see schedules as a result they are having to ask the drivers for schedule information.	• Driver Survey
Better enforcement of code of conduct	Passenger challenges were the top challenge identified by fixed route operators. In particular those who are disruptive and disrespectful and make the driver and other passengers uncomfortable.	• Driver Survey
Improved schedule format	Schedules with multiple variants can be difficult to read, especially in the Amherst area, they lack info on ending early, reduced etc. 36% of survey respondents stated the need for easier to read schedules	• Public Outreach • Driver Survey
Method for public to provide feedback	Drivers noted that there needs to be a method for passengers to provide feedback to PVTA with suggestions on how to improve the service. While PVTA does have a Contact form under Customer Service making this more prominent and highlighting that you are look for feedback on a main page would help.	• Driver Survey

Need	Rationale	Source(s)
Connections to Franklin County	Bus drivers and passengers identified this need. FRTA operates two routes which connect to PVTA service	• Driver Survey • Public Outreach

Appendix E PVTA Recommendations

Existing Fixed Routes Recommendations

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
Route 30									
Route 30: Reduce Service to Valley Medical	Convert to on-request only					Implemented			
Route 30: Earlier morning weekday service	Begin weekday service earlier by adding an additional trip in each direction				X	**Low**	**Low**	**Low**	**3**
Route 30: Increased frequency mid-day weekdays during the semester	Add service mid-day to create 12 minute headway from 8:00 AM to 5:00 PM				X	**High**	**Low**	**High**	**3**
Route 30: Increase frequency during the early evening	Additional Service from 6:00 PM to 8:00 PM, improve headway to 15 minutes			X		**Medium**	**Low**	**Low**	**4**
Route 30: Add service on Thursday and Friday night between 8:00 PM and 11:00 PM	Add service on Thursday and Friday night between 8:00 PM and 11:00 PM to create 20 minute headways				X	**Low**	**Medium**	**Medium**	**2**
Route 30: Earlier morning Sunday service	Begin Sunday service an hour earlier	X				**Low**	**Low**	**Medium**	**2**
Route 30: Adjust service level to meet demand	End Sunday service an hour earlier					Implemented			
Route 30: Additional Sunday service 11:00 AM to 10:00 PM	Additional Sunday service 11:00 AM to 10:00 PM by adding another bus and increasing frequency to 30 minutes					Implemented			

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Route 30: Additional Saturday service	Additional Saturday service 10 AM to end of service by adding another bus and increasing frequency to 30 minutes					Implemented			
Route 31									
Route 31: Additional Sunday service	Additional Sunday service 11 AM to 10 PM by adding another bus and increasing frequency to 35 minutes					Implemented			
Route 31: Additional Saturday service	Additional Saturday service 10 AM to 11 PM by adding another bus and increasing frequency to 35 minutes					Implemented			
Route 31: Earlier morning weekday service	Begin weekday service earlier by adding an additional trip in each direction				X	**Low**	**Low**	**Low**	**3**
Route 31: Earlier morning Sunday service	Begin Sunday service an hour earlier	X				**Low**	**Low**	**Low**	**3**
Route 31: Increased frequency mid-day weekdays during the semester	Add service mid-day to create shorter 12 minute headways from 9:00 AM to 3:00 PM				X	**High**	**Medium**	**High**	**3**
Route 31: Additional evening service on Thursday and Friday nights	Add service on Thursday and Friday night between 8:00 PM and 10:00 PM to create 20 minute headways				X	**Low**	**Medium**	**Medium**	**3**
Route 31: Connect Route 31 with shopping centers on Route 9	Further research would be needed to implement any service to determine potential ridership levels.				X	**High**	**Low**	**Low**	**5**
Route 31: Additional travel time to go from Sunderland to UMass	Increase traveling time and reduce layover time at the Boulders					Implemented			

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
Route 33									
Route 33: Remove unused deviations, shorten layover at Stop & Shop and create 30 minute headways	Remove unused deviations, shorten layover at Stop & Shop and create 30 minute headways using two buses. Without eliminating the deviation it is likely the route will fall behind at times given the varying traffic levels and pedestrian activity on Campus and in town.	X				**Low**	**Low**	**Medium**	**2**
Route 33: Additional mid-day service on Saturdays	Add a second bus between 11:00 AM and 5:00 PM creating 45 minute frequencies and extending to the Hampshire Mall	Implemented							
Route 34									
Route 34: Weekday evening service	Extend service to 10:00 PM				X	**Medium**	**Low**	**Low**	**4**
Route 34: Increase frequency weekdays	Capacity issues appear to be at discrete times. Establish a tripper for this time.				X	**Medium**	**Low**	**Medium**	**3**
Route 34:Saturday service	Provide service from noon to 10:00 PM				X	**Low**	**Low**	**Medium**	**2**
Route 35									
Route 35: Increase frequency weekdays	Improve headway to 12 minutes on weekdays from 9:00 AM-6:00 PM				X	**High**	**Medium**	**High**	**3**
Route 38									

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
Route 38: Adjust service level to meet demand	Monday - Thursday end service by 11:00 PM and reduce frequency after 8:00 PM to 90 Minutes	X				**Low**	**Low**	**Negative**	**3**
Route 38: Adjust service level to meet demand	Friday - reduce frequency after 10:00 PM	X				**Low**	**Medium**	**Negative**	**3**
Route 38: Adjust service level to meet demand	Sunday - eliminate the last trip	X				**Low**	**Low**	**Negative**	**3**
Route 38: Reduce service on Saturday nights	A review of ridership per revenue hour shows while ridership does drop in the evening the route still carries just under 20 PPRH. Continue providing service but monitor future evening ridership	X				**Low**	**Low**	**Low**	**3**
Route 39									
Route 39: Adjust service level to meet demand	Reduce to 60 minute headways on weekdays	X				**Low**	**Low**	**Negative**	**3**
Route 39: Adjust service hours to meet demand - weekdays	End service earlier in the evening on weekdays with the last trip departing for Smith College around 9:00 PM	X				**Low**	**Low**	**Negative**	**3**
Route 39 Adjust routing to meet demand	Eliminate trips to the Hampshire Mall	X				**Low**	**Low**	**Negative**	**3**
Route 39: Adjust service hours to meet demand - Saturday	End Saturday service at 8:00 PM	X				**Low**	**Medium**	**Negative**	**3**
Route 45									

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
Route 45: Increased peak hour service	Add a trip during the morning peak that arrives on campus in time for the 10:00 and 10:10 AM class schedule block				X	**Low**	**Low**	**Low**	**3**
Route 46									
Route 46: Additional trips	Add back in the morning and evening trips eliminated as part of the FY2019 service reductions				X	**High**	**Low**	**Medium**	4
R41									
R41: Additional weekday evening service	Add an additional evening trip on weekdays				X	**Low**	**Low**	**High**	**1**
R41: Additional Saturday evening service	Add an additional evening trip		X			**Low**	**Low**	**Low**	**3**
R41: Sunday service	Implement service with one hour headways with a minimum span of 10:00 AM-5:00 PM	X				**Low**	**Low**	**High**	**1**
R42									
R42: Discontinue service to Nash Hill	Eliminate Nash Hill	X				**Low**	**Medium**	**Low**	**2**
R42: Sunday service	Implement service with one hour headways with a minimum span of 10:00 AM-5:00 PM	X				**Low**	**Medium**	**High**	**1**
R44									

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
R44: Increased frequency	Eliminate circular routing and on weekdays use Saturday routing, reduce headway to hourly and extend service span to 8 PM. Serve Rocky Hill Co-housing on-request using the NE		X			**Low**	**Medium**	**High**	**1**
R44: Increased Sunday service	Expand service hours by adding an additional morning and afternoon trip using Saturday routing. VA to be serviced with establishment of Sunday service on the R42	X				**Low**	**Low**	**Medium**	**2**
R44: Streamline the routing	Convert to on-request only.	X				**Low**	**Medium**	**Low**	**2**
B43									
B43: Increased Weekend frequency	On Saturdays extend the Route 33 to the Mall, creating 45 minute headways and reducing the Big Y layover				X	**Low**	**Medium**	**High**	**1**
B43: Adjust service hours to meet demand -Friday	Eliminate last trip on Friday nights				X	**Low**	**Low**	**Low**	**3**
B48									
B48: Express service from Northampton to HTC	The current routing serves a small number of passengers along Route 5 and Lincoln Street for which there is no other service. Therefore it is recommended to alternate trips between an express variant (I-91) and the current routing and market appropriately.				X	**Low**	**Low**	**Medium**	**2**
B48: Increased Weekday frequency	Create consistent 30 minute headways on this route from 7:00 AM to 6:00 PM				X	**Low**	**Low**	**Medium**	**2**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
B48: Later evening service	Expand service to 9:00 PM on weekdays				X	**Low**	**Low**	**High**	**1**
B48: Earlier weekday service	Add a 6:00 AM trip		X			**Low**	**Low**	**Low**	**3**
B48: Earlier Saturday morning service	Add an 8:00 AM trip		X			**Low**	**Low**	**Low**	**3**
B48: Increased Saturday frequency	Increase Saturday frequency between 9:00 AM and 5:00 PM				X	**Low**	**Low**	**High**	**1**
WP									
WP: Increased service	Coordinate with the Quaboag Connector to provide Microtransit and connection to neighboring communities			X		**Medium**	**Low**	**High**	**2**
WP: Service to Springfield	Increase the number of trips to Springfield and serve the Ware Big Y, Walmart, Palmer Big Y and ending at either Union Station or the Eastfield Mall. Trips can alternate between going to Union Station and the Mall			X		**Low**	**Low**	**Medium**	**1**
WP: Dedicated Routes	Work with Quaboag connector to reestablish two routes that connect at the Ware Walmart. The Quaboag Connector can operate one route and PVTA the other			X		**Low**	**Medium**	**High**	**1**
WP: Saturday service	Establish a micro transit that operates on Saturdays from 8:00 AM to 5:00 PM. Include access to the Eastfield Mall for transfer opportunities to Springfield	X				**High**	**Medium**	**High**	**3**

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
WP: Sunday service	Establish a micro transit that operates on Sundays from 8:00 AM to 5:00 PM. Include access to the Eastfield Mall for transfer opportunities to Springfield	X				**High**	**Medium**	**High**	**3**
Miscellaneous Routes									
M40: Express service between Northampton and Amherst	Convert the B43 express trips back to non-express trips and reestablish the M40 with morning trips heading toward UMass and afternoon toward Northampton. Vehicle schedules can be interwoven with the B43 to reduce deadhead and increase efficiency				X	**High**	**Low**	**High**	**3**
NE: Improved service	Conduct an on/off study to better understand ridership activity and adjust the route converting deviations with little ridership to by request, adjusting routing where needed and create one hour headways that depart Northampton on an opposite schedule than the 41	X				**Low**	**Low**	**High**	**1**
G1									
G1: Later weekday evening service	Add 1 additional evening trip departing Union Station in each direction.		X			**Low**	**Low**	**Medium**	**2**
G1: Adjust weekday frequency to meet demand	Improve frequency to 15 minutes from 8:00 AM to 4:00 PM, from 6:00 PM to 8:30 PM reduce to 30-40 min and after 8:30 PM reduce to 60 minutes.				X	**High**	**Low**	**High**	**3**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
G1: Consistent service to the Chicopee Big Y	Extend Route to the Chicopee Plaza on all trips	X				**High**	**Low**	**High**	**3**
G1: Additional Saturday Service	Between 10:00 AM and 4:00 PM improve headway to 20 minutes.			X		**Low**	**Low**	**High**	**1**
G1: Additional Sunday Service	Between 8:00 AM and 5:00 PM improve headway to 20 minutes.			X		**Medium**	**Low**	**High**	**2**
G1: Later evening Sunday Service	Add an additional evening trip departing Union Station SB.		X			**Low**	**Low**	**Medium**	**2**
G2									
G2: Increased service to Big Y	Eliminate the Dwight Road variant and replace with microtransit or Taxi/TNC on-demand feeder service, all trips to service Big Y.	X				**Medium**	**High**	**Low**	**3**
G2: Eliminate unused deviation	Replace service to the Industrial Park with microtransit	X				**Medium**	**High**	**Low**	**3**
G2: Adjust weekday frequency to meet demand	Improve frequency to 20 minutes from 7:00 AM to 6:00 PM, from 6:00 PM to 8:00 PM reduce to 30 min and after 8:00 PM 60 minutes.				X	**High**	**Low**	**High**	**3**
G2: Additional Saturday Service	Improve frequency to 20 minutes from 10:00 AM to 5:00 PM			X		**Low**	**Low**	**High**	**1**
G2: Additional Sunday Service	Improve frequency to 45 minutes from 9:00 AM to 6:00 PM.			X		**Low**	**Low**	**High**	**1**
G2: Later weekday evening service	Add 1 additional evening trip departing Union Station in each direction.				X	**Low**	**Low**	**Medium**	**2**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
G2: Longer Sunday Hours	Begin Service at 8:00 AM and end at 8:00 PM.				X	**Low**	**Low**	**Medium**	**2**
G3									
G3: Saturday evening service	Extend service to 9:00 PM.				X	**Low**	**Low**	**High**	**1**
G3: Adjust weekday frequency to meet demand	Consistent 30 minute frequency to 5:00 PM. Begin tapering service off at 5:00 PM with 60 minute headways but extend service to 9:00 PM.				X	**Low**	**Low**	**High**	**1**
G3: Adjust weekday morning service to meet demand	Reduce frequency in the morning			X		**Low**	**Low**	**Negative**	**3**
G3: Increased service to State Street	On the eastern section of the route convert to a loop using Wilbraham road instead of an out and back. This will still provide access to the Old Hill/Upper Hill neighborhoods but serve the busier Wilbraham Rd corridor.	X				**Low**	**Low**	**Low**	**3**
G3: Consistent Routing	Remove the Sunday Chicopee Falls Deviation.					Implemented			
B4									
B4: Cleaner Schedule	Clean up Saturday Schedule to include Plainfield and Wason Timepoints.	X				**Low**	**Low**	**Medium**	**2**
G5									
G5: Eliminate unused service	Eliminate Service to MassMutual in Enfield and create a new route from Union Station to the Enfield Mall that is express via I-91.	X				**Low**	**Medium**	**Low**	**2**

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
G5: Sunday Service	Implement hourly Sunday service from 9:00 AM to 5:00 PM.	X				**Low**	**Low**	**High**	**1**
G5: Additional Saturday evening service	Add 2 additional evening trips .				X	**Low**	**Low**	**Medium**	**2**
B6									
B6: Longer Saturday Hours	Add a 9:30 PM trip	X				**Low**	**Low**	**High**	**1**
B6: Consistent routing and improved Sunday frequency	Eliminate the deviation and create 45 minute frequencies.	Implemented							
B6: Expanded Sunday service	Add an 8:30 AM westbound trip from Big Y. Add one additional full evening trip ending service at 9:15 PM at Big Y.		X			**Low**	**Low**	**High**	**1**
B6: Remove unused deviations	Convert to on request only.	X				**Low**	**Medium**	**Low**	**2**
B6: Adjust Frequency to Match Demand	Reduce frequency to 30 minutes with 45 minute frequency from 5:00 PM to 7:00 PM and hourly after 7:00 PM. This should allow for increased cycle time which will help with OTP.				X	**Low**	**Medium**	**Negative**	**3**
B7									

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
B7: Express and local variant	Create a limited stop variation that stops at the proposed locations in the BRT study but ends at Walmart, weekdays from 7:00 AM to 5:00 PM. The local variant will service Independence House and Shop Rite on each trip in each direction as well as Mass Mutual when needed. Each should operate at 30 minute headways creating 15 minute headways on the route. Limited stop = 2 buses 60 minute cycle, Local = 4 buses 120 minute cycle. The express variant would need to be branded differently with stops clearly defined in order to not confuse passengers.				X	**High**	**Medium**	**High**	**3**
B7: Match frequency to demand on weekdays	Reduce to 30 minutes after 5:00 PM and 45-60 minutes after 7:00 PM.				X	**Low**	**Low**	**Negative**	**3**
B7: Match frequency to demand on Saturday	Before 8:00 AM reduce headway to 30 minutes. Reduce headway to 30 minutes starting at 6:00 PM.				X	**Low**	**Low**	**Negative**	**3**
B7: Consistent Saturday Routing	Discontinue the Eastfield Mall express variant on weekends.					Implemented			
B7: Improve Sunday Service Span	Begin service at 8:00 AM on Sundays and end at 9:30 PM (2 additional evening trips).		X			**Low**	**Low**	**Medium**	**2**
R10									
R10: Remove unused deviations	Eliminate scheduled service to the Hospital and East Mt. View Apts. Serve via microtransit					**Medium**	**Medium**	**Low**	**3**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
R10: Remove unused deviations	Eliminate Union Street and replace with microtransit service					**Medium**	**Medium**	**Low**	**3**
R10: Additional morning service to Walmart	Service Walmart on all trips in all directions when store is open.					**Low**	**Low**	**Medium**	**2**
R10: Consistent routing	Service WSU on all trips, eliminate different schedules for in school and not in school.	Implemented							
R10: Improved weekday frequency	Create consistent 30 minute headways on this route from 5:30 AM to 6:00 PM, then decrease to 60 minutes. Serve the Westfield shops in both directions on each trip.				×	**High**	**Medium**	**High**	**3**
R10: Improved Sunday morning service	Add an additional morning trip.					**Low**	**Low**	**Medium**	**2**
P11									
P11: Additional morning service	Add an additional morning trip that gets to campus for 7:30 AM.				×	**Low**	**Low**	**Medium**	**2**
B12									
B12: Reduce unproductive routes	Eliminate the route and serve using an on-demand service.	×				**Medium**	**Low**	**Low**	**4**
R14									
R14: Streamline the routing	Convert the Industrial Park variant and North Street to a microtransit zone. Service Big Y and Pheasant Hill on all trips. Creating a consistent routing should improve frequency.	×				**Medium**	**Medium**	**Low**	**3**
B17									

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
B17: Sunday Service	Implement Sunday service from 9:00 AM to 5:00 PM using 1 bus.	X				**Medium**	**Low**	**High**	**2**
B17: Adjust weekday frequency to meet demand	Improve mid-day weekday frequency from 9:00 AM to 5:00 PM to 30 minutes.			X		**High**	**Low**	**High**	**3**
P20									
P20: Improve Weekday frequency	Improve weekday Frequency from 9:00 AM to 5:00 PM to 15 minutes and then decrease to 30 minutes from 5:00 PM to 8:00 PM and hourly after 8:00 PM.			X		**High**	**Low**	**High**	**3**
P20: Later evening Saturday service	Add one additional round trip on Saturday evenings.				X	**Low**	**Low**	**Medium**	**2**
P20: Increase Sunday span of service	Add an 8:00 AM trip from HTC and two additional evening trips to increase the span to ~9:30 PM.	X				**Low**	**Low**	**Medium**	**2**
P20E									
P20E: Additional Saturday service	Add additional morning and evening trip.		X			**Low**	**Low**	**Medium**	**2**
P20E: Sunday service	Implement hourly service on Sundays from 10:00 AM to 5:00 PM.		X			**Low**	**Low**	**Medium**	**2**
P21									
P21: Increase Saturday span of service	Add a 7:00 AM trip and one additional evening trip to end service at 10:00 PM HTC.		X			**Low**	**Low**	**Medium**	**2**
P21: Increase Sunday span of service	Add one additional AM and 2 evening trips to expand service hours		X			**Low**	**Low**	**Medium**	**2**

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
P21: Improve weekday frequency	Improve weekday Frequency from 9-4 to 20 minutes and then decrease to 30 minutes from 4:00 PM to 7:00 PM and hourly after 7:00 PM. Add in additional evening trip to end service at 10:30 PM			X		**High**	**Low**	**High**	**3**
B23									
B23: Weekend Service	Implement Saturday service from 10:00 AM to 5:00 PM using 1 bus.	X				**Low**	**Low**	**High**	**1**
B23: Remove unused deviations	Remove deviation to Solider Home and serve via the R24 as a schedule stop and not via request.	X				**Medium**	**Low**	**Low**	**4**
B23: Service to the Silver Street Big Y	Extend the B23 to the Silver Street Big Y.	X				**Low**	**Low**	**Medium**	**2**
B24									
R24: Weekend Service	Implement hourly Saturday service from 10:00 AM to 5:00 PM.	X				**Low**	**Low**	**High**	**1**
R29									
R29: Mid-Day weekend service	Add an additional mid-day trip on weekends to connect the college areas to HTC and the mall.		X			**Low**	**Low**	**High**	**1**
X90									
X90: Increased Sunday Service	Extend route to HTC on weekends with 1 hour frequency from 9:00 AM to 7:00 PM.	X				**Low**	**Low**	**High**	**1**

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
X90: Reduce Unproductive Deviations	Eliminate Montcalm deviation and South Hadley Falls, both A and B to access Holyoke via the Willimansett Bridge. Area eliminate to be served via microtransit.	X				**Medium**	**Low**	**Low**	**4**
X92									
X92: Sunday service	Implement hourly Sunday service from 9:00 AM to 5:00 PM.	X				**Low**	**Low**	**High**	**1**
X92: Adjust weekday frequency to meet demand	Implement 20 minute service during the peaks (7:00 AM to 9:00 AM and 3:00 PM to 5:00 PM).				X	**High**	**Low**	**High**	**3**
LOOP									
LOOP: Funding Partnership	Discontinue route if funding partnership with MGM is no longer available.	X				**Low**	**Low**	**Low**	**3**
LOOP: Adjust weekday span to meet demand	End weekday service at 8:30.	X				**Low**	**Low**	**Negative**	**3**
LOOP: Adjust Sunday span to meet demand	Operate service from 11:18 to 3:53 only on Sundays.	X				**Low**	**Low**	**Negative**	**3**
R10s/OWL									
R10s/OWL: Consistent schedules and increased connections	Combine the OWL and R10s into one route that connects the school parking lots, main campus, Horace Mann Center and downtown Westfield. Work with WSU to determine the routing and timing that works best		X			**Medium**	**Low**	**High**	**2**
W									

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
W: Weekend service	Add weekend service.	X				**Low**	**Low**	**High**	**1**

Demand Response Recommendations

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
Connect Sunderland to the South County Senior Center	Allow for demand response trips to and from the senior center as long as the other end is within a PVTA member community. This location can also be used to transfer passengers wishing to access other FRTA communities via FRTA demand response.	X				**Low**	**Low**	**Low**	**3**
Online trip scheduling for Demand Response	Online trip scheduling for Demand Response.	X				**High**	**Medium**	**High**	**3**
Demand response connections to FRTA	Work with FRTA to identify locations to transfer passengers	X				**Medium**	**Low**	**Low**	**4**
Demand Response: Coordination with Quaboag Connector	Work with Quaboag Connector to better promote services on the PVTA website and include information on the WP schedule	X				**Low**	**Medium**	**Medium**	**2**

New Service Recommendations

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Transit service in South Hadley Falls	Establish a microtransit zone that extends from South Hadley falls to Granby which connect to the South Hadley Big Y.	X				**High**	**High**	**Medium**	**3**
Connect Westfield Neighborhoods and Industrial area	Establish a microtransit zone	X				**High**	**High**	**Medium**	**3**
Additional Agawam Service	Establish a microtransit zone.	X				**High**	**High**	**Medium**	**3**
Service deeper into East Longmeadow	Create an East Longmeadow/Longmeadow microtransit zone.	X				**High**	**High**	**Medium**	**3**
First-mile/last-mile service	Develop a TNC/Taxi feeder program for first-mil/last-mile service to connect people to bus stops.				X	**High**	**High**	**High**	**3**
Service to Six Flags	When Six flags is open operate a route that is direct from Union Station to Six Flags. Five trips daily, 7 days a week.				X	**High**	**Low**	**Medium**	**4**
Connection to CTtransit	Create an express route from Union Station to the Enfield Park and Ride Route which will create connections to CTtransit and the local Enfield Magic Carpet Route. Trips should align to make connection with CT Transit. 4 trips daily.	X				**High**	**Low**	**Medium**	**4**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Out of service area medical trips	Establish a volunteer driver program in conjunction with FRTA to serve Hampshire and Hampden county				X	**High**	**Negative**	**Low**	**5**
Service to Venture Way	Coordinate with UMass to determine what departments are moving and if there would be a demand for people to travel between here and campus				X	**Low**	**Low**	**Low**	**3**
Express service between Northampton and Springfield	Create an express route from Northampton to Union Station via I-91.				X	**Low**	**Low**	**High**	**1**
Express service between Amherst and Springfield	Create an express route from Amherst to Union Station via Route 116 and HTC. Two hour headways that departs Amherst at half past on the even hours to create 1 hour headways between Amherst and HTC between the new route and the 29. Depart HTC on the hour staggering service to Union Station with the P21E				X	**High**	**Low**	**Medium**	**3**
Additional service in Palmer and Ware	Establish a microtransit zone in Palmer and Ware in conjunction with the Quaboag Connector			X		**High**	**High**	**Medium**	**3**

Systemwide Recommendations

Need	Recommendation
Faster service	See individual existing fixed route and new service recommendations.
Improved weekend service	See individual existing fixed route recommendations.
Expand evening service	See individual existing fixed route recommendations.
Increased frequency	See individual existing fixed route and new service recommendations.
Additional weekend service for fixed route and demand response	See individual existing fixed route, demand response recommendations.
Improved weekend service	See individual existing fixed route recommendations.
Systemwide: First-mile/last-mile and after hours service	See new service recommendations.

Bus Stop Recommendations

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership impact	Priority
Improved lighting at bus stops	Solar powered lights at stops with poor lighting. In particular Aspen Chase inbound, North Amherst Center Inbound	X				**Low**	**Low**	**Low**	**3**
Accommodate additional vehicles at Cowles Lane and Academy of Music	Remove parking at Cowles Lane and Academy of Music to increase the number of buses	X				**Medium**	**Medium**	**High**	**2**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership impact	Priority
Safer crossings at heavily used crosswalks by bus stops	Crossing guard at ILC Crossing like at Southwest				X	**High**	**Medium**	**High**	**3**
Bus stop consolidation	Work with the municipalities that have not undergone a bus stop consolidation study to conduct one where stop spacing is closer then recommended in PVTA guidelines	X				**Medium**	**Medium**	**Negative**	**4**
Improved bus stop amenities	Prioritize list of capital improvements based on bus stop guidelines developed.	X				**Low**	**Low**	**Medium**	**4**
Bus stop shelters at high ridership stops	Create a list of priority stops to add shelters and work with landowners to install shelters	X				**Low**	**Low**	**Medium**	**2**
Policy for bench placement at bus stops	Establish a policy for bench placement at stops	X				**Low**	**Low**	**Medium**	**2**
Improved safety at crosswalks at bus stops	Create exterior announcements drivers can play reminding people to cross behind the bus	X				**Low**	**Medium**	**High**	**1**
Longer bus stops	Identify stops where length should be increased and work with municipalities to expand	X				**High**	**Medium**	**Low**	**4**

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership impact	
Bus stop snow and trash removal	Create an adopt a stop program where individuals and organizations can adopt a stop to empty trash bins on a weekly basis and remove snow in the winter. Offer a set amount of free one trip tickets in exchange.	X				**Medium**	**Medium**	**High**	**2**

Fleet Recommendations

Need	Recommendation	Scenarios				Scoring			
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Increased Vehicle Capacity	Procure articulated buses.				X	**High**	**Medium**	**High**	**4**
Buses with windows that open	Future bus procurements to allow windows to open	X				**Low**	**Medium**	**High**	**1**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Electric Bus	Conduct a facility audit at the VATCo and UMTS garages to better understand the upgrades needed to accommodate electrical vehicles. Perform an analysis on the schedules in Hastus to determine which vehicle schedules are candidates to deploy electric vehicles on	X				**High**	**Medium**	**Low**	**4**
Newer Buses	Replace vehicles at their ULB	X				**Low**	**High**	**Low**	**2**
Inform other drivers that PVTA buses do not turn on red and stop frequently	Stickers/signs on the back of the bus that state this	X				**Low**	**Medium**	**Low**	**2**

Infrastructure Recommendations

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
BRT Infrastructure on Route 9	Serve new bus pullouts with the re-established M40 express route. Install TSP technology on the B43 and M40 vehicles				X	**High**	**Low**	**High**	**3**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
BRT Infrastructure on State St	Work with the city to implement BRT measures along State street as proposed in the BRT state St study. This should include Queue jumps, TSP and Branding	X				**High**	**Medium**	**High**	**3**
Protected left turns in order to increase OTP	Work with Amherst to determine signal warrants for protected left turns: N Pleasant St to Main St, Southeast St to Main St, Russell St to University Drive, Elm St/ West St	X				**Low**	**Medium**	**Low**	**2**
Improve curb radii in order to reduce the need to use the oncoming lane or rubbing the tire on the curb	Work with municipalities to improve curb radii: Meadow Street. - N. Pleasant St; Main Street to S. East Street; Route 116 to Meadow St, Right into Big Y plaza Route 33; Smith College turn around; right onto Amity Street	X				**Low**	**Medium**	**Low**	**2**
Eliminate regular car traffic on North Pleasant Street on Campus. Allow buses, emergency and university plated vehicles only on weekdays during the day.	Eliminate regular car traffic on North Pleasant Street on Campus and create a bus only roadway. Allow buses, emergency and university plated vehicles only on weekdays during the day.	X				**High**	**Medium**	**High**	**3**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Expansion of the UMass and VATCo Maintenance Facilities	Conduct a feasibility study to determine the cost for upgrading maintenance at each.	X				**Medium**	**High**	**Medium**	**3**
Additional Park & Rides	Work with municipalities and MassDOT to identify future locations and incorporate bus service. Increase bus service to the Whately Park & Ride				X	**High**	**Low**	**Low**	**5**
North Pleasant Street UMass Campus reduced number of crosswalks	Work with UMass to reduce the number of crosswalks and funnel pedestrians	X				**Medium**	**Medium**	**High**	**2**

Fare Recommendations

		Scenarios				Scoring			
Need	**Recommendation**	**Core Need**	**Low Ridership**	**Medium Ridership**	**High Ridership**	**Complexity**	**Operational Impact**	**Ridership Impact**	**Priority**
Deploy cash less fare options in addition to magnetic stripe cards	PVTA has already deployed a mobile payment option	Implemented							
Additional locations to obtain a PVTA E&D card	Establish a regular schedule where a customer service representative is available at a central location such as senior center or town hall to process applications and take pictures. The IDs can then be mailed to the individual once printed.	X				**High**	**Negative**	**Low**	**3**
New fare collection system	The RTAs should do a joint procurement for a new fare system that includes a mobile payment option, items such as fare capping and multiple outlets to procure smartcards.	X				**High**	**Low**	**High**	**3**
Cashless fare option for demand response	Expand the mobile fare payment to include demand response.		X			**Low**	**Medium**	**High**	**1**

Policy Recommendations

		Scenarios				Scoring			
Need	**Recommendation**	**Core Need**	**Low Ridership**	**Medium Ridership**	**High Ridership**	**Complexity**	**Operational Impact**	**Ridership Impact**	**Priority**
Minimum span of service guidelines that reflect new route classification structure	Adjustment of minimum span of service guidelines to match new route classification structure	X				**Low**	**Medium**	**Low**	**2**
Identification of flag stop corridors	Indicate flag stop corridors on route maps	X				**Low**	**Medium**	**Medium**	**2**
Electric scooter policy	Establish an electric scooter policy	X				**Low**	**Medium**	**Medium**	**2**
Data-driven framework for determining service levels	Identify technology-driven data tools and key performance metrics, particularly in the service and financial performance areas. Utilize these tools to establish an improved enterprise-wide data-driven performance focused management and decision-making framework; implement a public-facing and transparent performance reporting mechanism.	X				**Medium**	**Medium**	**High**	**2**

Operational Recommendations

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
UMTS: Improved timing on route segments	Examine timing and OTP on the 35 from FAC to the stadium, 33 Library to Big Y, 30 Colonial Village to Old Belchertown Road, 30 Studio Arts Building to Puffton, 45 evening Rolling Green	X				**Low**	**Medium**	**High**	**1**
Additional road supervisors	Hire additional road supervisors	X				**Medium**	**High**	**Low**	**3**
Improved communication between drivers and drivers/Management and PVTA	Establish a locked drivers comment box in the driver breakroom. Create an online form that individuals can anonymously (or by name) report issues to.	X				**Low**	**Medium**	**Low**	**2**
Improve transfer communication	This would require upgrading the radio/communication equipment.	X				**High**	**Medium**	**Medium**	**4**
Continually monitor OTP	Continually monitor OTP	X				**Low**	**High**	**High**	**1**
Improve cleanliness of vehicles	Increased cleaning (interior and exterior) of the buses daily and automatic announcements reminding passengers to remove their belongings	X				**Low**	**Medium**	**High**	**1**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Coordinate service along State Street	Adjust route departure/arrival times to Union Station that serve State Street in order to spread out service and reduce bus bunching.	X				**Low**	**Medium**	**High**	**1**
Adjust timing on routes	Adjust timing on: G1 outbound from Union Station; Union Station to Mason Square; HTC to union Station on the P21E; Union Station to the X; Saturday P20 Kmart to Riverdale Shops	X				**Low**	**Medium**	**Medium**	**2**
Improve travel time and OTP through the center of Amherst	Transit Signal Priority in Amherst and Northampton Center, in particular Cowles Lane.				X	**High**	**Medium**	**Low**	**4**

Technology Recommendations

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
New AVL Software	Consider a joint procurement with other RTAs looking to upgrade their AVL system	Implemented							
Improved real-time information at stations	Continue working with Union Station to diagnose and fix problems as they arise. Each hour a customer service rep can walk around the bus bays to identify any screens that are out. At HTC develop a way quickly identify screens with errors using internal controls.	X				**Low**	**Medium**	**High**	**1**
AVL and APC data for the community shuttles	Procure AVL technology for the community shuttle. Turn on and test the APC technology.	X				**Medium**	**Low**	**High**	**2**
Transit signal priority	Work with municipalities to correct any issues with existing TSP systems. As new roadway projects are developed with the state DOT and local municipality to determine if TSP can be deployed.				X	**High**	**Medium**	**Low**	**4**
New Demand Response scheduling and CAD software	Upgrade software and add the Passenger app that allows them to request, manage and track trips	X				**Low**	**Medium**	**High**	**1**

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
New Fixed Route scheduling software	Upgrade software as releases are made	Implemented							
Route planning software	Explore upgrading Hastus to add in the planning platform that will provide the same function but be linked to existing route files	Implemented							
Upgrade parts management and Maintenance work order software	Roll out and test the software	X				**Low**	**Medium**	**Low**	**2**
Integrated service alert system	The alert feature should be a centralized location that supervisors can post ongoing and in the moment, service updates that posts to the PVTA Twitter account, Facebook account, Banner of PVTA webpage and Transit App	X				**Medium**	**Medium**	**High**	**2**
Vehicle mounted collision warning and tracking systems	Procure technology. Consider a joint procurement with MART, FRTA, VTA, CCRTA and MVRTA who are also looking to add this technology to their fixed route and demand response fleets.	X				**High**	**Low**	**Low**	**5**

Other Recommendations

Need	Recommendation	Scenarios				Scoring			Priority
		Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	
How to Ride Guide	Create a how to ride guide or promotional video that shows passengers that teaches peoples how to use the service. These videos could play at transit stations and on board the buses. MVRTA has a series of well-produced how to ride videos on how to pay your fare, etiquette, reading schedules and using their apps. Videos are in four languages.	X				**Low**	**Medium**	**High**	**1**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Improved customer communication	Update the contact form intro with language that lets people know you are looking for any and all feedback. Update where they select why they are contacting to encourage them to select. Monitor Social media for PVTA related hashtags and provide responses where warranted.	X				**Low**	**Negative**	**High**	**1**
Reestablish printed schedules	Print a limited number of schedules and redesign to use minimal space.	X				**Low**	**Medium**	**High**	**1**
Better enforce code of conduct	Have drivers go through annual passenger relations refresher trainings. Create education videos on PVTA etiquette and code of conduct that can play on board the buses. Work with operators so that they report these incidents and PVTA can investigate and properly handle problem passengers	X				**Low**	**Medium**	**Medium**	**2**

		Scenarios				Scoring			
Need	Recommendation	Core Need	Low Ridership	Medium Ridership	High Ridership	Complexity	Operational Impact	Ridership Impact	Priority
Improved schedule format	On schedules indicate the days that service will end early and the approximate time.	X				**Low**	**Medium**	**Medium**	**2**
Connections to Franklin County	Increase service on the 46 with timed connections. Work with FRTA when updating connecting schedules to facilitate transfers. Include FRTA schedule information on the Academy of Music schedule screen.		X			**Medium**	**Low**	**Low**	**4**

Appendix F Fixed Route Productivity and Financial Efficiency (FY 2019)

Fixed Route Productivity (FY 2019)

Route	Passengers/Mile	Passengers/Hour
G1	2.17	26.03
G2	2.62	28.96
G2E	0.54	8.82
G3	2.36	22.28
B4	2.33	22.75
G5	1.34	15.11
B6	1.57	21.52
B7	3.23	33.30
B7S	2.63	24.33
10S	0.89	10.97
R10	1.14	17.50
P11	1.00	21.97
B12	0.29	7.26
R14	0.97	15.26
B17	1.53	19.41
P20	2.14	26.55
P20E	0.69	16.55
P21	2.29	28.58
P21E	1.37	29.81
B23	0.98	14.78
R24	0.69	12.14
R29	0.52	8.61
30	7.26	77.44
31	4.09	67.83
33	3.77	39.53
34	5.85	56.92
35	6.68	69.16
36	1.19	17.37

Route	Passengers/Mile	Passengers/Hour
38	1.52	26.14
39	0.70	11.50
39E	0.38	8.48
R41	0.82	14.21
R42	0.72	13.20
B43	2.77	37.48
B43ns	1.88	24.54
R44	1.04	10.13
45	1.26	24.14
46	0.40	9.76
B48	0.98	20.92
X90	0.85	11.57
X92	1.55	17.56
Loop	0.96	6.49
NE	0.26	4.06
OWL	3.13	46.93
S	0.66	2.20
WP	0.19	4.44
R10 R	1.00	14.03
P11 R	0.51	10.72
31 R	2.83	48.45
30 R	4.19	49.41
45 R	0.83	16.35
46 R	0.42	10.29
38 R	1.21	21.04
39 R	0.43	7.60
33R	2.55	26.62
PVTA System Average	2.05	27.15
Massachusetts Average *(excludes MBTA)*	1.37	18.39
National Average	2.26	27.21

Source: NTD and PVTA

Fixed Route Financial Efficiency (FY 2019)

Route	Cost/Mile	Cost/Hour	Cost/ Passenger	Subsidy/ Passenger	Farebox Recovery
G1	$7.85	$94.07	$3.61	$2.62	27.4%
G2	$7.85	$86.80	$3.00	$2.01	33.0%
G2E	$7.85	$127.35	$14.44	$13.45	6.9%
G3	$7.85	$74.13	$3.33	$2.34	29.8%
B4	$7.85	$76.48	$3.36	$2.37	29.5%
G5	$7.85	$88.24	$5.84	$4.85	17.0%
B6	$7.85	$107.44	$4.99	$4.00	19.8%
B7	$7.85	$81.02	$2.43	$1.44	40.7%
B7S	$7.85	$72.53	$2.98	$1.99	33.2%
10S	$7.85	$97.00	$8.84	$7.85	11.2%
R10	$7.85	$120.38	$6.88	$5.89	14.4%
P11	$7.85	$172.73	$7.86	$6.87	12.6%
B12	$7.85	$195.20	$26.89	$9.55	64.5%
R14	$7.85	$122.96	$8.06	$7.07	12.3%
B17	$7.85	$99.54	$5.13	$4.14	19.3%
P20	$7.85	$97.59	$3.68	$2.69	26.9%
P20E	$7.85	$187.28	$11.32	$10.33	8.7%
P21	$7.85	$98.04	$3.43	$2.44	28.9%
P21E	$7.85	$170.30	$5.71	$4.72	17.3%
B23	$7.85	$118.20	$8.00	$7.01	12.4%
R24	$7.85	$138.29	$11.39	$10.40	8.7%
R29	$7.85	$130.96	$15.20	$14.21	6.5%
30	$3.93	$41.92	$0.54	$0.44	18.4%
31	$3.93	$65.12	$0.96	$0.85	11.8%
33	$3.92	$41.07	$1.04	$0.84	18.7%
34	$3.93	$38.27	$0.67	$0.54	20.1%
35	$3.93	$40.68	$0.59	$0.48	18.9%
36	$3.93	$57.49	$3.31	$2.87	13.4%
38	$3.93	$67.65	$2.59	$2.16	16.5%
39	$3.93	$64.18	$5.58	$4.78	14.4%

Route	Cost/Mile	Cost/Hour	Cost/ Passenger	Subsidy/ Passenger	Farebox Recovery
39E	$7.86	$175.89	$20.74	$19.62	5.4%
R41	$7.85	$135.68	$9.55	$8.56	10.4%
R42	$7.85	$144.63	$10.95	$9.96	9.0%
B43	$7.85	$106.35	$2.84	$1.72	39.5%
B43ns	$7.85	$102.70	$4.18	$3.19	23.7%
R44	$7.85	$76.45	$7.55	$6.56	13.1%
45	$2.79	$53.16	$2.20	$1.88	14.5%
46	$4.91	$120.54	$12.36	$11.57	6.4%
B48	$7.85	$166.92	$7.98	$6.99	12.4%
X90	$7.85	$107.20	$9.27	$8.28	10.7%
X92	$7.85	$88.67	$5.05	$4.06	19.6%
Loop	$7.85	$53.30	$8.21	-$4.91	159.8%
NE	$3.59	$55.79	$13.73	$12.88	6.2%
OWL	$7.85	$117.73	$2.51	-$1.16	146.4%
S	$0.00	$0.00	$0.00	$0.00	0.0%
WP	$2.37	$55.79	$12.57	$11.83	5.9%
R10 R	$7.85	$110.23	$7.86	$6.87	12.6%
P11 R	$7.85	$164.40	$15.34	$14.35	6.4%
31 R	$3.93	$67.25	$1.39	$1.23	11.4%
30 R	$3.93	$46.31	$0.94	$0.78	16.6%
45 R	$3.93	$77.02	$4.71	$4.24	10.0%
46 R	$3.93	$96.84	$9.41	$8.67	8.0%
38 R	$3.93	$68.44	$3.25	$2.78	14.6%
39 R	$3.93	$69.95	$9.20	$7.56	17.8%
33 R	$3.93	$41.04	$1.54	$1.25	18.8%
PVTA System Average	$7.00	$92.56	$3.41	$2.64	22.5%
Massachusetts Average (excludes MBTA)	$7.24	$97.20	$5.29	$4.47	15.4%
National Average	$11.15	$133.99	$4.92	$3.83	22.1%

Source: PVTA; NTD

Appendix G Commonwealth Environmental Policies

Transportation is a leading producer of greenhouse gas emissions (GHG) in the Commonwealth, and the only sector identified through the Global Warming Solutions Act of 2006 (GWSA) with a volumetric increase in GHG emissions; meaning that any effort to reduce emissions must significantly target the transportation system. In 2008, through the passage of the GWSA, Massachusetts committed to reduce its GHG emissions by 80 percent below 1990 baseline levels by 2050. Commonwealth policies and action on environmental sustainability in the transportation sector can be summarized by a series of executive orders, regulations, and recommendations to achieve the Commonwealth's goal of reducing transportation-related emissions by 40 percent over the next 20 years,[64] helping to meet the emissions reduction goals of the GWSA.

Massachusetts is establishing an integrated climate change strategy for the Commonwealth through the implementation of Executive Order 569, which was issued in 2017 and had major elements codified in 2018.[65] It aims to develop a roadmap for climate mitigation and adaptation for the Commonwealth.

Sustainability requirements for transportation are summarized in 310 CMR 60.05,[66] where the Climate Protection and Green Economy Advisory Committee advises the Executive Office of Energy and Environmental Affairs on measures to reduce GHG emissions in accordance with the GWSA. The purpose of 310 CMR 60.05 is to assist the Commonwealth in achieving the GHG emissions reduction goals, and to establish an annually declining aggregate GHG emissions limit for MassDOT, as well as general requirements for determining aggregate transportation GHG emissions in the transportation planning process.

To be in line with this regulation, RTAs in particular must conduct comprehensive service reviews; identify service enhancements to increase passenger ridership; identify vehicle technology and operational improvements that can reduce aggregate transportation GHG emissions; and work within the MPO process to prioritize and fund GHG reduction projects and investments.

In Executive Order 579: Establishing the Commission on the Future of Transportation in the Commonwealth, the goal is to determine "how to ensure that transportation planning, forecasting, operations, and investments for the period from 2020 through 2040 can best account for likely demographic, technological, climate, and other changes in future mobility and transportation behaviors, needs and options."[67] This will be accomplished by further investigating topics such as climate and resiliency, transportation electrification, autonomous and connected vehicles, transit and mobility services, and land use and demographics.[68] In 2019, the Commission on the Future of Transportation released their report, *Choices for Stewardship: Recommendations to Meet the Transportation Future*.[69]

The report provides five recommendations with a planning horizon of year 2040. The recommendations include (1) modernizing existing transportation assets; (2) creating a 21st Century "mobility infrastructure" to prepare the Commonwealth for emerging changes in transportation technology and behavior; (3) substantially reducing GHG emissions from the transportation sector; (4) coordinating and modernizing land use, economic development, housing, and transportation policies and investment in order to support resilient and dynamic regions and communities throughout the Commonwealth; and (5) changing current

[64] https://www.mass.gov/doc/a-vision-for-the-future-of-massachusetts-regional-transit-authorities/download.
[65] https://www.mass.gov/executive-orders/no-569-establishing-an-integrated-climate-change-strategy-for-the-commonwealth.
[66] https://www.mass.gov/doc/final-regulation-4/download.
[67] https://www.mass.gov/executive-orders/no-579-establishing-the-commission-on-the-future-of-transportation-in-the.
[68] https://www.mass.gov/executive-orders/no-579-establishing-the-commission-on-the-future-of-transportation-in-the.
[69] https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download.

transportation governance and financial structures in order to better position Massachusetts for the transportation system that it needs in the next years and decades.

Current RTA-specific sustainable practices are described in Section 4.7 and recommendations for future sustainable practices are described in Chapter 8.