

4. Transit Service Overview (FY 2015–FY 2019)

PVTA provides fixed route bus, ADA paratransit, and senior demand response van service to 24 member communities in the Pioneer Valley region, including Agawam, Amherst, Belchertown, Chicopee, Easthampton, East Longmeadow, Granby, Hadley, Hampden, Holyoke, Leverett, Longmeadow, Ludlow, Northampton, Palmer, Pelham, South Hadley, Springfield, Sunderland, Ware, West Springfield, Westfield, Wilbraham, and Williamsburg. While PVTA provides bus service to 24 areas, service covers 48 percent of the land area²¹ (coverage is defined as being within $\frac{3}{4}$ mile of a bus route), leaving over half of the area without access to general public transit.

The region PVTA service is developed around two urban areas. The largest, in the south of the region, has the cities of Springfield, Chicopee, and Holyoke as its urban core. In the north, the City of Northampton is a hub around which development is occurring in the surrounding towns of Hadley, Amherst, and Easthampton. As home to the flagship campus of the state university, Amherst is also a significant center of employment and activity.

The 24 communities that PVTA serves have a population of 575,550 and widely varying development patterns. These communities include highly urbanized centers and rural communities. While the City of Springfield is densely populated, having 4,798 residents per square mile, most of the communities PVTA serves have population densities of less than 1,000 residents per square mile. Nine of the 24 communities have fewer than 300 residents per square mile and 56.6 percent of PVTA's service area is considered rural (per the 2010 census classifications).²² Serving mixed population densities shapes the services that PVTA provides and how it functions.

In addition to the mixed population densities, PVTA serves a mixed socioeconomic area, providing lifeline connections for a large proportion of minority and low-income population in the region. According to the 2013-2017 5-year American Community Survey (ACS) data, of the 4979 census block groups in PVTA's service area, 30 percent of them have a population with poverty rate greater than 20 percent. The average poverty rate for the PVTA communities is 25.1 percent. Hampden County, and especially the principal cities of Springfield, Holyoke, Chicopee, and West Springfield, have a large proportion of low-income, transit-dependent households. For example, Springfield and Holyoke have an average poverty rate of 36 and 29 percent, respectively, including some areas with a poverty rate as high as 90 percent, and 22 percent of households in both cities have no personal vehicle access. To the north in Hampshire County, PVTA serves a large low-income area in Amherst and Northampton, which includes the student population in University of Massachusetts-Amherst and other Five College Consortium area schools.

4.1 Description of Transit Services

PVTA operates 45 scheduled bus routes (36 fixed route local services, 6 fixed route express routes, and 3 deviated fixed routes) and 3 demand response services, including ADA paratransit service, senior van services, and the Survival and Wilbraham Shuttle. PVTA's fixed route buses operate on scheduled timetables and travel along a preset route, while the deviated fixed routes may travel off the main route to pick up or drop off passengers upon request. Additionally PVTA operates express routes between certain points that do not stop at local stops along the way.

PVTA provides paratransit services to eligible individuals residing within the geographic boundaries of the member communities or within $\frac{3}{4}$ mile of a fixed route. The service provides a shared ride, door-to-door trip and is available all days and times when fixed route service is

²¹ This includes areas of water and mountains not just populated areas.

²² Rural is defined as an area that is not considered an urbanized area or urban cluster per the most recent census delineations.

operating. Additionally, PVTA provides shared ride, demand response senior van service, also known as "Senior Dial-a-Ride," to residents 60 years of age and older in all 24 member communities in the Pioneer Valley. Senior van service is offered on a space available basis with priority given to certified ADA passengers in accordance with federal law.

PVTA's fixed route system can be organized by the garages that operate them: SATCo operates 26 routes in the southern portion of Hampden County and carries 57 percent of bus riders; UMTS/UMass operates 10 routes in the Five Colleges area in eastern Hampshire County and carries 31 percent of bus riders; VATCo operates 6 routes in the central portion of PVTA's service area around Northampton and carries 9 percent of bus riders; and Hulmes operates 2 shuttles in Easthampton and Palmer/Ware, and carries about 0.3 percent of bus riders. PVTA's ADA paratransit, Senior Van Service, Wilbraham Shuttle, and Northampton Shuttle are operated by Next and/or COAs and carry about 2.7 percent of riders. An overview of PVTA transit services by operator is presented in Table 3.

PVTA bus routes are categorized into one of five service tiers based on their termini's typical weekday departure intervals (Table 2). Other services, including Wilbraham/Eastfield Mall, ADA paratransit service, the various Senior Van Services, Northampton, Agawam, and the Tri-Town Trolley are demand response services and operate only on-demand and are not classified into service tiers.

Table 2. PVTA Service Tiers–Bus Routes

Service Tier	Frequency	Number of Routes
1	Every 15 Minutes	7
2	Every 20 Minutes	5
3	Every 30 Minutes	15
4	Every Hour	14
5	More than Hourly	16

Source: PVTA

**Route sums may total greater than 45 due to the double counting of reduced service or seasonally operating routes that have different headways.*

Table 3. Transit Service Overview

Route	Operator	Service Tier	Description	Towns Served
G1 - Chicopee/ Sumner-Allen/Canon Circle	SATCo	2	Between Chicopee Big Y and Canon Circle via Union Station. Some trips serve Riverbend Medical Center and 5 Town Plaza before Canon Circle; others serve Stop & Shop and 5 Town Plaza after Canon Circle. Some trips turn back at Chicopee Center instead of continuing to Chicopee Big Y.	Chicopee Springfield East Longmeadow
G2 - East Springfield via Carew/Belmont- Dwight	SATCo	3	Between Memorial Industrial Park and either East Longmeadow Big Y or Dwight and Benton Streets via Union Station. Some trips serve Mercy Medical Center or Cottage Street. Some weekday trips serve East Longmeadow Industrial Park.	Chicopee Springfield East Longmeadow Longmeadow
G2E - East Springfield Express	SATCo	4	Express service between Memorial Industrial Park and Union Station.	Springfield
G3 - Springfield Plaza via Liberty/ King- Westford	SATCo	3	Between Springfield Plaza and Westford Circle via Union Station. Some trips serve the Springfield Registry of Motor Vehicles. Sunday service to Chicopee Falls.	Chicopee Springfield
B4 - Plainfield Street	SATCo	3	Between Union Station and the Baystate Medical Offices via Plainfield Street.	Springfield
G5 - Springfield/ Dickinson/ Jewish Home/ Longmeadow	SATCo	4	Between Union Station and the Jewish Home in Longmeadow with select trips serving MassMutual Center in Enfield.	Springfield East Longmeadow Longmeadow Enfield
B6 – Ludlow via Bay Street	SATCo	2	Between Union Station and the Ludlow Big Y via Bay Street, Berkshire Avenue, and Indian Orchard. Some trips operate via Pasco and Goodwin Streets. Sunday service to Eastfield Mall. Select trip service to Encompass Health (formerly HealthSouth).	Ludlow Springfield

Route	Operator	Service Tier	Description	Towns Served
B7 – Eastfield Mall via State Street/Boston Road	SATCo	1	Springfield Route connecting Eastfield Mall and Union Station via Walmart. Some trips serve Independence House or PriceRite. Select weekday trip service to MassMutual. Saturday express service operates via I-291, stopping at Walmart on outbound trips.	Springfield
B7S - State Street Shuttle*	SATCo	1	Shuttle between the Raymond Jordan Senior Center and Union Station.	Springfield
10S - Westfield Center/ Westfield State University**	SATCo	3	Shuttle during semesters only connecting Westfield Center and WSU via Stop & Shop (trips from WSU to Westfield Center do not serve Stop & Shop).	Westfield
R10 - Westfield State University / West Springfield	SATCo	4	Westfield Route connecting Union Station and Westfield Center via the Westfield Walmart with service to WSU when Route 10S is not running. Some trips operate via Union and Meadow Streets in Westfield. Select trip service to Western Mass Hospital in Westfield.	Westfield West Springfield Springfield
P11 - Holyoke Community College Express	SATCo	4	Service when school is in session only between HCC and Union Station.	Holyoke Springfield
B12 - Stonybrook Express	SATCo	5	Connects Union Station and the Hampden County Correctional Facility.	Springfield Ludlow
R14 - Feeding Hills/Springfield***	SATCo	4	Between Union Station and Feeding Hills Center, Agawam. Outbound trips operate via North Street and inbound trips operate via Springfield Street in the morning, vice versa in the afternoon. Select trip service to Heritage Nursing Home and Agawam Industrial Park via Agawam Center.	Springfield West Springfield Agawam

Route	Operator	Service Tier	Description	Towns Served
B17 - Eastfield Mall via Worthington-Wilbraham Road	SATCo	4	Between Union Station and Eastfield Mall via Worthington Street and Sixteen Acres.	Springfield
P20 - Holyoke/ Springfield via Riverdale Street	SATCo	2	Between Union Station and the HTC via Riverdale Street and the Holyoke Mall.	Holyoke West Springfield Springfield
P20E - Holyoke Mall/ Union Station I-91 Express	SATCo	3	Express bus between Union Station and the Holyoke Mall.	Holyoke Springfield
P21 - Holyoke/ Springfield via Chicopee	SATCo	3	Between Union Station and HTC via Chicopee Center. Some trips operate via Meetinghouse and Meadow Streets in Willimansett.	Holyoke Chicopee Springfield
P21E - Springfield/ Holyoke via 391 Express	SATCo	4	Express bus between Union Station and HTC. Some weekday trips and all weekend trips operate via Baystate Medical Center.	Holyoke Springfield
B23 - Holyoke/ Westfield via HCC	SATCo	4	Between Westfield Center and HTC via HCC. Additional helper services when Holyoke Public Schools are in session. One morning trip to WSU during the academic year (trip to WSU has since been eliminated).	Holyoke Westfield
R24 - Cabot-Pleasant Street-Holyoke Medical Center-Sargeant Street	SATCo	4	Circulator around Holyoke connecting HTC, Stop & Shop, Holyoke Hospital, Holyoke Mall, and the Amtrak Station.	Holyoke
R29 - Amherst/ Holyoke Mall via Route 116 & Holyoke Trans Center	SATCo	5	Between Holyoke Mall and UMass via HTC and Route 116.	Holyoke Granby South Hadley Amherst

Route	Operator	Service Tier	Description	Towns Served
X90 - Inner Crosstown	SATCo	3	Crosstown service connecting HTC and East Longmeadow via Springfield Plaza and Chicopee. Route splits into "A" and "B" segments with 60 minute frequencies to serve different parts of Chicopee Falls, Aldenville, and Fairview.	Holyoke South Hadley Chicopee Springfield East Longmeadow
X92 - Mid-City Crosstown	SATCo	4	Springfield Route. Additional helper service when Springfield Public Schools are in session.	Springfield
Loop - The Loop	SATCo	3	Springfield Route. The Loop Evening Extension service provides extended service to La Quinta Inn in the evenings. No service on Monday and Tuesday.	Springfield
OWL - Westfield State University Shuttle	SATCo	1	Shuttle service on the WSU campus connecting parking lots to academic centers; different timetables for Monday/Wednesday/Thursday and Tuesday/Thursday but same span and frequency.	Westfield
39E - Smith/ Mount Holyoke Express	VATCo	4	Express service between Smith College and Mount Holyoke via Route 47.	Northampton South Hadley Hadley Amherst
R41 - Northampton/ Easthampton/ HCC/ Holyoke Mall	VATCo	4	Between downtown Northampton and the Holyoke Mall via Easthampton and HCC.	Northampton Easthampton Holyoke
R42 - Northampton/ Williamsburg/VA Hospital	VATCo	4	Between downtown Northampton and Williamsburg via Route 9 and the VA Hospital.	Northampton Williamsburg
B43 - Northampton/ Hadley/Amherst	VATCo	2	Between Smith College and Amherst College via Route 9 and UMass (express service uses Route 116).	Northampton Hadley Amherst

Route	Operator	Service Tier	Description	Towns Served
R44 - Florence Heights via King Street and Bridge Road	VATCo	5	Between downtown Northampton and Florence Heights via Florence Center, service to the Hampshire County House of Corrections; some trips serve Florence Center via High Street; serves VA Medical Center on Sunday only.	Northampton
R44a - Florence Center via Hampshire Plaza and Northampton Center via Florence Heights	VATCo	5	Counter-clockwise loop between Salvo House and Florence Center. Florence-bound service operates via Big Y and Salvo House bound service via Hampshire County House of Corrections; some trips serve Florence Center via High Street.	Northampton
R44b - Florence Center via Florence Heights and Northampton Center via Hampshire Plaza	VATCo	5	Clockwise loop between Salvo House and Florence Center, operating the reverse route of Route 44a.	Northampton
B48 - Northampton/Holyoke via Route 5	VATCo	3	Between HTC and downtown Northampton via Route 5.	Holyoke Northampton
51 - UMass Helper Bus	UMTS	5	Shadow bus used on the Routes 30 and 31 to pick up passengers left behind during peak times.	Amherst
30 - North Amherst / Old Belchertown Road	UMTS	1	Between Puffton Village in North Amherst and Old Belchertown Road (east Amherst) via the UMass Campus and downtown Amherst.	Amherst
31 - Sunderland / South Amherst	UMTS	1	Between Sugarloaf Estates Apartments and the Boulders Apartments in South Amherst. South Amherst bound trips operate via Sunderland Center and Sugarloaf Estates trips operate via the UMass Campus and downtown Amherst.	Sunderland Amherst

Route	Operator	Service Tier	Description	Towns Served
33 - Puffers Pond/ Shopper Shuttle	UMTS	3	Between Stop & Shop and Amherst Survival Center via UMass.	Amherst
34 - Campus Shuttle Northbound	UMTS	1	Campus circulator connecting various residential and parking areas.	Amherst
35 - Campus Shuttle Southbound	UMTS	1	Campus circulator connecting various residential and parking areas.	Amherst
36 - Olympia Drive/ Atkins Farm	UMTS	4	Between Atkins Farm and Olympia Drive via UMass Campus and downtown Amherst.	Amherst
38 - Mount Holyoke/ Hampshire/ Amherst/ UMass	UMTS	3	Connects UMass and Amherst College, Hampshire College, and Mount Holyoke College via downtown Amherst.	Amherst South Hadley
39 - Smith/ Hampshire	UMTS	3	Smith College to/from Hampshire College via Bay Road and Northampton Center. Evening and weekend service between Hampshire College and Hampshire Mall. Winter session weekday service operates between Smith College and Mount Holyoke College via Hampshire College.	Northampton Hadley South Hadley Amherst
45 - Belchertown Center / UMass	UMTS	5	Between Belchertown Center and UMass via Route 9, Gatehouse Road, and Amherst Center.	Amherst Belchertown
46 - South Deerfield / UMass	UMTS	5	Between UMass and South Deerfield with service to the Whatley park and ride.	Whately Sunderland Amherst South Deerfield
WP - Ware Palmer Circular	Hulmes	5	Local circulator within Palmer and Ware with express service to/from Union Station.	Ware Palmer Springfield
NE - Nashawannuck Express	Hulmes	5	Local circulator within Easthampton with connections to Northampton and Southampton.	Easthampton Northampton Southampton

Route	Operator	Service Tier	Description	Towns Served
S - Northampton Survival Center Shuttle	Next	4	Service between downtown Northampton and the Survival Center during food distribution hours.	Northampton
W - Wilbraham Eastfield Mall	Next	N/A	Van shuttle riders must be within Wilbraham travelling to the Eastfield Mall or travelling from the Eastfield Mall to a destination in Wilbraham.	Wilbraham Springfield
ADA Paratransit Service	Next	N/A	Service provides a shared ride, door-to-door van transportation throughout the Pioneer Valley within ¾ mile of a city bus route. Available all days when city bus is in service. Service is provided outside of the ¾ mile limit for a premium fare.	Towns throughout PVTA service area
Senior Van Service – Regionwide	Next	N/A	Only available Monday through Friday to seniors in 24 member communities in Pioneer Valley on a space available basis with priority given to certified ADA passengers.	All 24 PVTA member communities
Northampton Senior Van	Northampton COA	N/A	On-demand rides and regularly scheduled trips to markets and shopping centers including Mountain Farms Mall, Hampshire Mapp, Big Y, and River Valley Market and Stop & Shop.	Northampton Hadley
Agawam Senior Van****	Agawam COA	N/A	On-demand rides include priority rides to medical appointments, senior activities, and employment or volunteer opportunities. Non-priority rides are for any other purpose including shopping centers and beauty salon within the Agawam boundaries.	Agawam

Route	Operator	Service Tier	Description	Towns Served
Tri-Town Trolley: East Longmeadow/Longmeadow/Hampden	East Longmeadow COA	N/A	On-demand transportation for residents of East Longmeadow, Longmeadow, and Hampden. Trips are provided for shopping, hair salons, groceries, medical, and recreation.	East Longmeadow Longmeadow Hampden Ludlow Springfield West Springfield

Source: PVTA Springfield Area Schedules, Northampton Area Schedules, and Amherst & Surrounding Areas Schedules, <http://pvta.com/schedules.php>; PVTA Mobility Impaired Information, <http://pvta.com/mobility.php>; PVTA Seniors, <http://pvta.com/seniors.php>

**Route has since been eliminated.*

***Route has since been eliminated; now operates Westfield Route connecting Union Station and Westfield Center via the Westfield Walmart with most trips servicing WSU. Some trips operate via Union and Meadow Streets in Westfield. Select trip service to Western Mass Hospital in Westfield.*

****Route had a service change in August 2020; route now operates between Union Station and Feeding Hills Center, Agawam via Springfield Street. Select trip service to Maple/Walnut Streets as well as Pheasant Hill Apartments.*

*****Service began June 2019.*

4.1.1 Service Characteristics

PVTA transit fixed route buses and shuttles operate with different spans of service on weekdays and weekends. Table 4 summarizes the span of service hours and days of operation for each route. Weekday span of service generally ranges from 5:00 AM to 11:30 PM in the Springfield (SATCo) area; 5:45 AM to 12:00 AM in the Northampton (VATCo) area; and 7:00 AM to 12:00 AM in the Amherst UMTS area, with some routes providing late night services until 3:00 AM on Thursdays and Fridays. As shown in the table, express services (Routes G2E, P11, B12, P20, P21E, and 39E) generally end their services by 8:00 PM since they primarily serve commuter traffic. Schedules are adjusted each quarter to account for seasonality in service demands and are denoted with an “R” for reduced or “ns” for no school in Table 4. Since most UMTS routes and some SATCo and VATCo routes are college oriented, their schedules are in part informed by the school calendar. UMTS Routes 30, 31, 33, 35, 38, 39, and 45, VATCo Route B43, and SATCo Route P11 and OWL operate reduced service schedules, or no service when the universities/colleges they serve are not in session. As shown in the table, 14 bus routes do not operate on Saturday and 24 bus routes do not operate on Sunday. On weekends, ADA paratransit operates on the same schedule as bus routes. Demand response senior van services (including Agawam and Tri-Town Trolley) and the Wilbraham/Eastfield Mall (Route W) do not operate on Saturdays or Sundays.

ADA paratransit service is operated the same days and hours as fixed route bus service, and as such, days and hours of service vary for each community. PVTA member communities that do not have fixed route services do not have complementary ADA paratransit service. Senior Van Service (60 years and older) is available within the entire PVTA service area between 8:00 AM and 4:30 PM Monday through Friday. Service is available on a space available basis with priority given to certified ADA passengers in accordance with federal law.

Accounting for day of week travel patterns and traffic volumes, PVTA fixed route and shuttle services operate different headways on the weekday and weekend. Table 5 summarizes the headways of each route for weekday and weekend services.

PVTA currently serves 24 communities, which range from densely populated urban areas to traditional New England villages. Generally these two areas are separated by relatively low-density rural areas. PVTA strives to provide services to those who need it the most; however, it can be challenging for any transit provider to balance the tradeoff between two key transportation planning principles—coverage and frequency. Coverage routes are those routes with longer headways, in part because they serve areas of lower population density. While these coverage routes tend to be less direct, reach farther, and have varying deviations from the main routing, coverage routes provide vital transportation services to much of PVTA’s service areas. In comparison, frequency routes serve smaller, typically high-density geographic areas with shorter headways along more direct paths. Some PVTA routes are considered hybrid, with moderate frequency and coverage.

Table 4. Span of Service Hours

Route	Service Tier	Weekday	Saturday	Sunday
G1 - Chicopee/Sumner-Allen/ Canon Circle	2	5:35 AM – 10:10 PM	6:00 AM – 9:30 PM	7:00 AM – 8:20 PM
G2 - East Springfield via Carew/Belmont-Dwight	3	5:00 AM – 10:15 PM	5:37 AM – 9:30 PM	9:00 AM – 7:00 PM
G2E - East Springfield Express	4	9:40 AM – 6:00 PM	No Service	No Service
G3 - Springfield Plaza via Liberty/King-Westford	3	5:50 AM – 7:45 PM	7:00 AM – 6:45 PM	9:00 AM – 5:58 PM
B4 - Plainfield Street	3	5:55 AM – 6:58 PM	6:00 AM – 5:58 PM	9:00 AM – 6:43 PM
G5 - Springfield/ Dickinson/ Jewish Home/Longmeadow	4	6:05 AM – 7:50 PM	7:30 AM – 5:58 PM	No Service
B6 - Ludlow via Bay Street	2	5:10 AM – 10:30 PM	7:00 AM – 9:18 PM	8:30 AM – 7:28 PM
B7 - Eastfield Mall via State Street/Boston Road	1	5:00 AM – 11:05 PM	5:00 AM – 9:58 PM	9:00 AM – 8:08 PM
B7S - State Street Shuttle	3	7:55 AM – 5:20 PM	No Service	No Service
10S - Westfield Center/ Westfield State University	3	6:17 AM – 5:35 PM	No Service	No Service
R10 - Westfield State University / West Springfield	4	5:00 AM – 11:13 PM	7:00 AM–9:48 PM	9:00 AM – 7:45 PM
P11 - Holyoke Community College Express	4	7:30 AM – 9:48 PM (Monday-Thursday) 7:30 AM–5:18 PM (Friday) (when class is in session only)	No Service	No Service
B12 - Stonybrook Express	5	1:55 PM – 6:58 PM	1:55 PM – 6:58 PM	No Service
R14 - Feeding Hills/Springfield	4	6:10 AM – 7:18 PM	7:10 AM – 6:28 PM	8:30 AM – 4:58 PM

Route	Service Tier	Weekday	Saturday	Sunday
B17 - Eastfield Mall via Worthington-Wilbraham Road	4	5:55 AM – 7:25 PM	7:00 AM – 6:58 PM	No Service
P20 - Holyoke/ Springfield via Riverdale Street	2	5:30 AM – 11:25 PM	6:00 AM – 10:38 PM	9:00 AM – 7:58 PM
P20E - Holyoke Mall/Union Station I-91 Express	3	7:10 AM – 6:35 PM	10:15 AM – 6:10 PM	No Service
P21 - Holyoke/Springfield via Chicopee	3	5:00 AM – 9:08 PM	8:00 AM – 9:08 PM	8:00 AM – 7:13 PM
P21E - Springfield/Holyoke via 391 Express	4	6:05 AM – 7:58 PM	8:00 AM – 6:58 PM	9:05 AM – 5:58 PM
B23 - Holyoke/Westfield via HCC	4	5:30 AM – 7:20 PM	No Service	No Service
R24 - Cabot-Pleasant Street-Holyoke Medical Center-Sargeant Street	4	8:00 AM – 4:55 PM	No Service	No Service
R29 - Amherst/Holyoke Mall via Route 116 & Holyoke Transportation Center	5	7:30 AM – 7:50 PM	7:30 AM – 10:20 AM 5:30 PM -7:50 PM	7:30 AM – 10:20 AM 5:30 PM – 7:50 PM
X90 - Inner Crosstown	3	6:10 AM – 9:25 PM	6:55 AM – 9:25 PM	9:00 AM – 5:10 PM
X92 - Mid-City Crosstown	4	6:00 AM – 6:43 PM	5:50 AM – 5:48 PM	No Service
Loop - The Loop	3	9:55 AM – 9:50 PM (No service on Monday and Tuesday)	9:55 AM – 9:50 PM	9:55 AM – 9:50 PM
OWL - Westfield State University Shuttle	1	7:58 AM – 3:00 PM	No Service	No Service
39E - Smith/Mount Holyoke Express	4	6:50 AM – 5:00 PM	No Service	No Service

Route	Service Tier	Weekday	Saturday	Sunday
R41 - Northampton/ Easthampton/ HCC/Holyoke Mall	4	6:15 AM – 7:40 PM	8:00 AM – 5:45 PM	No Service
R42 - Northampton/ Williamsburg/VA Hospital	4	5:45 AM – 8:55 PM	7:10 AM – 7:00 PM	No Service
B43 - Northampton/ Hadley/ Amherst	2	6:00 AM – 12:15 AM (Monday, Tuesday, Wednesday) 1:45 AM (Thursday) 3:00 AM (Friday)	6:00 AM – 3:00 AM	8:00 AM – 10:53 PM
B43ns - No School - Northampton/ Hadley/Amherst	3	6:30 AM – 12:00 AM	7:30 AM – 11:00 PM	8:00 AM – 11:00 PM
R44 - Florence Heights via King Street and Bridge Road	5	No Service	7:02 AM – 6:43 PM	10:55 PM – 4:58 PM
R44a - Florence Center via Hampshire Plaza and Northampton Center via Florence Heights	5	5:50 AM – 6:40 PM	No Service	No Service
R44b - Florence Center via Florence Heights and Northampton Center via Hampshire Plaza	5	6:20 AM – 7:10 PM	No Service	No Service
B48 - Northampton/ Holyoke via Route 5	3	7:00 AM – 8:00 PM	9:00 AM – 9:00 PM	9:00 AM – 7:00 PM
30 - North Amherst / Old Belchertown Road (full service schedule)	1	7:12 AM – 12:10 AM (Monday, Tuesday, Wednesday) 7:12 AM – 1:40 AM (Thursday, Friday)	7:45 AM – 1:40 AM	10:45 AM – 12:40 AM

Route	Service Tier	Weekday	Saturday	Sunday
30 R - North Amherst / Old Belchertown Road (reduced service schedule)	3	7:15 AM – 10:50 PM	7:45 AM – 10:40 PM	10:45 AM – 8:40 PM
31 - Sunderland / South Amherst (full service schedule)	1	7:00 AM – 12:11 AM (Monday, Tuesday, Wednesday) 7:00 AM – 1:21 AM (Thursday, Friday)	7:06 AM – 1:59 AM	10:51 AM – 12:49 AM
31 R- Sunderland / South Amherst (reduced service schedule)	3	6:47 AM – 11:16 PM	7:06 AM – 11:01 PM	10:51 AM – 8:41 PM
33 - Puffers Pond/Shopper Shuttle	3	7:06 AM – 9:12 PM	10:46 AM – 7:15 PM	10:46 AM – 7:15 PM
34 - Campus Shuttle Northbound	1	7:05 AM – 8:09 PM	No Service	No Service
35 - Campus Shuttle Southbound	1	7:22 AM – 12:35 AM	11:07 AM – 12:35 AM (and on holidays)	11:07 AM – 12:35 AM (and on holidays)
36 - Olympia Drive/Atkins Farm	4	8:00 AM – 8:05 PM	8:00 AM – 8:05 PM	No Service
38 - Mount Holyoke/Hampshire/Amherst/UMass (Fall and Spring semesters, no summer service)	3	6:45 AM – 1:20 AM (Monday, Tuesday, Wednesday) 2:35 AM (Thursday) 2:35 AM (Friday)	9:30 AM – 2:35 AM	9:00 AM – 12:35 AM
38 R - Mount Holyoke/Hampshire/Amherst/UMass (Winter Session)	3	6:30 AM – 9:25 PM	9:00 AM – 8:35 PM	No Service

Route	Service Tier	Weekday	Saturday	Sunday
39 - Smith/Hampshire (Fall and Spring semesters, no summer service) Smith College – Hampshire College – Smith College	3	7:30 AM – 7:05 PM (with two express trips Smith College - Mount Holyoke College in late afternoon)	9:50 AM – 2:05 AM	9:50 AM – 11:40 PM
39 - Smith/Hampshire/Hampshire Mall (Fall and Spring semesters, no summer service) Smith College – Hampshire College – Hampshire Mall - Hampshire College – Smith College	3	7:15 PM – 11:45 PM (Monday, Tuesday, Wednesday, Thursday) 1:30 AM (Friday)	9:50 AM – 2:05 AM	9:50 AM – 11:40 PM
39 R- Smith/Hampshire/Mount Holyoke (Winter semester)	3	7:15 AM – 9:20 PM	9:50 AM – 8:15 PM	No Service
45 - Belchertown Center / UMass	5	6:30 AM – 8:19 PM	No Service	No Service
46 - South Deerfield / UMass	5	7:00 AM – 7:45 AM 4:51 PM – 5:35 PM (semester) 5:41 PM – 6:26 PM (summer)	No Service	No Service
WP - Ware Palmer Circular	5	8:00 AM – 5:30 PM	No Service	No Service
NE - Nashawannuck Express	5	10:45 AM – 8:15 PM	10:45 AM – 8:15 PM	No Service
S - Northampton Survival Center Shuttle	4	11:10 AM – 1:40 PM (Monday, Wednesday, Friday) 4:10 PM – 6:40 PM (Tuesday, Thursday)	No Service	No Service

Route	Service Tier	Weekday	Saturday	Sunday
W - Wilbraham Eastfield Mall	N/A	6:40 AM – 6:25 PM	No Service	No Service
ADA Paratransit Service	N/A	Available when the city bus service operates	Available when the city bus service operates	Available when the city bus service operates
Senior Van Service Region-Wide	N/A	8:00 AM – 4:30 PM	No Service	No Service
Agawam Senior Van	N/A	8:45 AM – 2:45 PM	No Service	No Service
Tri-Town Trolley	N/A	9:00 AM – 3:00 PM	No Service	No Service
Northampton Senior Van	N/A	Hadley Shopping - Second Wednesday of the Month 9:00 AM – 2:30 PM Big Y and River Valley Market: Every Tuesday 9:00 AM – 1:00 PM Stop & Shop Every Thursday 8:30 AM – 3:30 PM All other times 8:30 AM – 3:30 PM	No Service	No Service

Source: PVTA Schedules <http://pvta.com/schedules.php>; PVTA Mobility Impaired Information, <http://pvta.com/mobility.php>; PVTA Seniors, <http://pvta.com/seniors.php>

Table 5. Service Headways

Route	Service Tier	Weekday	Saturday	Sunday
OWL - Westfield State University Shuttle	1	15 minutes	No Service	No Service
34 - Campus Shuttle Northbound	1	15 minutes	No Service	No Service
B7 - Eastfield Mall via State St/Boston Road	1	15 minutes (30 minutes late evening and night)	20 minutes	30 minutes
30 - North Amherst / Old Belchertown Road (full service schedule)	1	15 minutes (30 minutes late night)	60 minutes	60 minutes
31 - Sunderland / South Amherst (full service schedule)	1	15 minutes (35 minutes late night)	75 minutes	75 minutes
35 - Campus Shuttle Southbound	1	15 minutes (40 minutes late night)	45 minutes (40 minutes late night)	45 minutes (40 minutes late night)
G1 - Chicopee/Sumner-Allen/Canon Circle	2	20 minutes	30 minutes	45 minutes
B6 - Ludlow via Bay Street	2	20 minutes (30 minutes late evening and night)	30 minutes	60 minutes
B43 - Northampton/Hadley/Amherst	2	20 minutes (45 minutes late night)	30 minutes	30 minutes (60 minutes late night)
P20 - Holyoke/ Springfield via Riverdale Street	2	20 minutes (60 minutes late night)	20 minutes	30 minutes
P20E - Holyoke Mall/Union Station I-91 Express	3	20–40 minutes	40 minutes	No Service
P21 - Holyoke/Springfield via Chicopee	3	30 minutes	30 minutes	45 minutes
G2 - East Springfield via Carew/Belmont-Dwight	3	30 minutes	30 minutes	60 minutes
G3 - Springfield Plaza via Liberty/King-Westford	3	30 minutes	30 minutes	60 minutes
X90 - Inner Crosstown	3	30 minutes	30 minutes	60 minutes
B7S - State Street Shuttle	3	30 minutes	No Service	No Service
10S - Westfield Center/ Westfield State University	3	30 minutes	No Service	No Service

Route	Service Tier	Weekday	Saturday	Sunday
38 - Mount Holyoke/Hampshire/ Amherst/ UMass	3	30 minutes (40 minutes late night)	45 minutes	90 minutes
B48 - Northampton/ Holyoke via Route 5	3	30 minutes peak / 60 minutes off-peak	60 minutes	60 minutes
39 - Smith/Hampshire (Fall and Spring semesters)	3	30 minutes (90 minutes late night)	90 minutes	90 minutes
B4 - Plainfield Street	3	40 minutes	30 minutes	60 minutes
Loop - The Loop	3	40 minutes	40 minutes	40 minutes
33 - Puffers Pond/Shopper Shuttle	3	40 minutes	80 minutes	80 minutes
B17 - Eastfield Mall via Worthington-Wilbraham Road	4	45 minutes	45 minutes	No Service
R10 - Westfield State University / West Springfield (No school)	4	45 minutes	60 minutes	60 minutes
G2E - East Springfield Express	4	50 minutes	No Service	No Service
R10 - Westfield State University / West Springfield (school in session)	4	60 minutes	60 minutes	60 minutes
P21E - Springfield/Holyoke via 391 Express	4	60 minutes	60 minutes	60 minutes
R14 - Feeding Hills/Springfield	4	60 minutes	60 minutes	60 minutes
X92 - Mid-City Crosstown	4	60 minutes	45 minutes	No Service
R42 - Northampton/Williamsburg/VA Hospital	4	60 minutes	60 minutes	No Service
36 - Olympia Drive/Atkins Farm	4	60 minutes	60 minutes	No Service
R41 - Northampton/Easthampton/ HCC/Holyoke Mall	4	60-65 minutes	60 minutes	No Service
G5 - Springfield/Dickinson/Jewish Home/Longmeadow	4	60 minutes	90 minutes	No Service

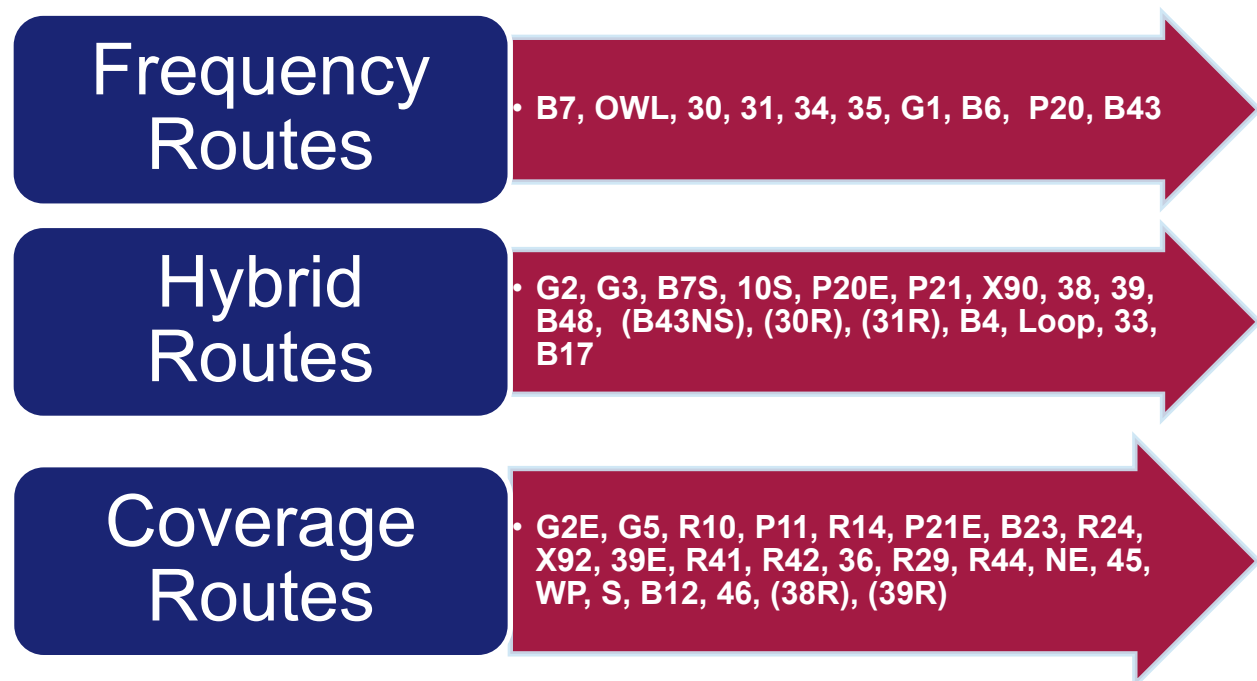
Route	Service Tier	Weekday	Saturday	Sunday
P11 - Holyoke Community College Express	4	60 minutes	No Service	No Service
B23 - Holyoke/Westfield via HCC	4	60 minutes	No Service	No Service
R24 - Cabot-Pleasant Street-Holyoke Medical Center-Sargeant Street	4	60 minutes	No Service	No Service
39E - Smith/Mount Holyoke Express	4	60-65 minutes	No Service	No Service
S - Northampton Survival Center Shuttle	4	3 trips (60 minutes)	No Service	No Service
R44a - Florence Center via Hampshire Plaza and Northampton Center via Florence Heights	5	70 minutes	No Service	No Service
R44b - Florence Center via Florence Heights and Northampton Center via Hampshire Plaza	5	70 minutes	No Service	No Service
NE - Nashawannuck Express	5	90 minutes	90 minutes	No Service
R29 - Amherst/Holyoke Mall via Route 116 and Holyoke Transportation Center	5	120 minutes	2 trips	2 trips
46 - South Deerfield / UMass	5	2 trips	No Service	No Service
B12 - Stonybrook Express	5	3 trips	3 trips	No Service
WP - Ware Palmer Circular	5	6 trips	No Service	No Service
45 - Belchertown Center / UMass	5	7 trips (6 trips during reduced service)	No Service	No Service
R44 - Florence Heights via King Street and Bridge Road	5	No Service	120 minutes	120 minutes
B43ns - No School - Northampton/Hadley/Amherst	3	30 minutes peak / 60 minutes off-peak	60 minutes	60 minutes
30 R - North Amherst / Old Belchertown Road (reduced service schedule)	3	30 minutes (60 minutes late night)	60 minutes	60 minutes
31 R- Sunderland / South Amherst (reduced service schedule)	3	35 minutes (70 minutes late night)	75 minutes	75 minutes

Route	Service Tier	Weekday	Saturday	Sunday
39 R- Smith/Hampshire (Winter semesters)	5	90 minutes	90 minutes	No Service
38 R – Mount Holyoke/Hampshire/ Amherst/UMass (Winter session)	5	90 minutes	90 minutes	No Service
W - Wilbraham Eastfield Mall	N/A	On-demand	No Service	No Service
ADA Paratransit Service	N/A	On-demand	On-demand	On-demand
Senior Van Service	N/A	On-demand	No Service	No Service
Northampton On-Demand	N/A	On-demand	No Service	No Service
Agawam On-Demand	N/A	On-demand	No Service	No Service
Tri-Town Trolley On-Demand	N/A	On-demand	No Service	No Service

Source: PVTA Springfield Area Schedules, <http://pvta.com/schedules.php>

Existing route headways were used in order to categorize PVTA routes as frequency, hybrid, or coverage. Routes with a headway of 20 minutes or less were classified as frequency, routes with headways between 20 and 45 minutes were classified as hybrid,²³ and those with a headway greater than 45 minutes were classified as coverage²⁴ (Figure 9). Based on these three categories, currently 41.8 percent of the service hours (fixed route, express bus, and deviated fixed route) operated by PVTA are frequency routes, 31.8 are hybrid routes, and 23.4 percent are coverage routes. However, other factors can impact how PVTA routes operate such as service demand, fluctuating funding levels, demographic data, and other local conditions. Overall, evaluating the tradeoff between coverage and frequency is an ongoing conversation in the transit community for all transit agencies, and all existing PVTA services should be evaluated according to performance.

Figure 9. Frequency versus Coverage Routes



Source: PVTA Schedules

4.1.1.1 Helper Service

PVTA holds contracts with local school districts to operate “Helper” trips (also referred to as “Tripper” services) on weekdays only when Springfield and Holyoke public schools are in session. The service schedules for these helper trips are determined in coordination with the local schools. Helper routes operate in the morning or afternoon peaks that coincide with the start and end of the school day. Table 6 lists the helper services and their service hours. Although different from the previously discussed scheduled helper service, UMass Transit also operates helper services or unscheduled overflow buses sent out to supplement service during high demand peak hours on weekdays. These services are also included in Table 6.

²³ These routes are neither frequent, nor are they “coverage” as they typically operate along more direct paths.

²⁴ 20 minutes is the maximum desirable time to wait if a bus is missed according to the TCRP Transit Capacity and Quality of Service Manual http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_webdoc_6-e.pdf. In TCRP Report 30 frequent is defined as 15 minutes or less, http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_30-a.pdf.

Table 6. Span of Service Hours - Helper Service

Route	Morning Trips	Afternoon Trips
G1 - Chicopee/Sumner-Allen/Canon Circle (Helper T1 Sumner Avenue – State Street)	6:28 AM – 7:13 AM	---
G1 - Chicopee/Sumner-Allen/Canon Circle (Helper T1 Main Street – State Street)	6:46 AM – 7:18 AM	--
G1 - Chicopee/Sumner-Allen/Canon Circle (Helper T1 State Street – Sumner Avenue – The X/Dickinson to Main Street)	---	2:30 PM – 3:24 PM
G2 - East Springfield via Carew/Belmont- Dwight (Helper T2 Carew – Roosevelt – State Street to Main Street)	6:46 AM – 7:15 AM	---
G2 - East Springfield via Carew/Belmont- Dwight (Helper T2 Dickinson to the X-Belmont to Main Street)	6:25 AM – 7:22 AM	---
G2 - East Springfield via Carew/Belmont- Dwight (Helper T2 Carew to Plainfield)	---	2:30 PM – 2:55 PM
G2 - East Springfield via Carew/Belmont- Dwight (Helper T2 State Street to Main Street – Belmont to the X-Sumner Avenue to Main Street)	---	2:30 PM – 3:37 PM
G3 - Springfield Plaza via Liberty/King-Westford (Helper T3 Liberty – Carew – Roosevelt - State Street)	6:36 AM – 7:18 AM	---
G3 - Springfield Plaza via Liberty/King-Westford (Helper T3 State Street – Liberty/ Carew)	---	2:30 PM – 2:55 PM
G3 - Springfield Plaza via Liberty/King-Westford (Helper T3 State Street – Armory - Carew)	---	2:30 PM – 3:03 PM
B4 - Plainfield Street (Helper T4 Plainfield – Carew – State Street)	6:36 AM – 7:15 AM	---
B4 - Plainfield Street (Helper T4 Plainfield – State Street via Main Street)	6:40 AM – 7:15 AM	---
B4 - Plainfield Street (Helper T4 State Street - Plainfield via Main Street)	---	2:30 PM – 3:10 PM
G5 - Springfield/Dickinson/Jewish Home/Longmeadow (Helper T1 State Street – Sumner Avenue to the X/Dickinson to Main Street)	---	2:30 PM – 3:24 PM
G5 - Springfield/Dickinson/Jewish Home/ Longmeadow (Helper T2 Dickinson to the X- Belmont to Main Street – State Street)	6:25 AM – 7:22 AM	---

Route	Morning Trips	Afternoon Trips
G5 - Springfield/Dickinson/Jewish Home/Longmeadow (<i>Helper T5 Belmont to the X-Dickinson to Main Street – State Street</i>)	6:33 AM – 7:15 AM	--
G5 - Springfield/Dickinson/Jewish Home/Longmeadow (<i>Helper T5 State Street – Dickinson/X-Belmont to Main Street</i>)	---	2:30 PM – 3:17 PM
B6 - Ludlow via Bay Street (<i>Helper T6 Downtown Springfield</i>)	---	2:30 PM – 2:50 PM
P20 - Holyoke/ Springfield via Riverdale Street (<i>Helper T20 Lower Westfield/Homestead – Beech</i>)	7:15 AM – 7:50 AM	3:00 PM – 3:25 PM (Monday, Tuesday, Thursday, Friday) 2:10 PM – 2:35 PM (Wednesday)
P21 - Holyoke/Springfield via Chicopee (<i>Helper T21 Glenwood Circle – Carew – State Street</i>)	6:41 AM – 7:15 AM	---
P21 - Holyoke/Springfield via Chicopee (<i>Helper T21 Glenwood Circle – Main Street – State Street</i>)	6:40 AM – 7:15 AM	---
P21 - Holyoke/Springfield via Chicopee (<i>Helper T21 State Street - Carew – Chestnut</i>)	---	2:30 PM – 3:07 PM
P21 - Holyoke/Springfield via Chicopee (<i>Helper T21 State Street – Chestnut - Carew – Plainfield</i>)	---	2:30 PM – 2:55 PM
P21 - Holyoke/Springfield via Chicopee (<i>Helper T21 State Street – Chestnut – Liberty – Carew to Glenwood Circle</i>)	---	2:30 PM – 3:00 PM
B23 - Holyoke/Westfield via HCC (<i>Helper T23 Highlands – Beech</i>)	7:15 AM – 7:50 AM	3:00 PM – 3:35 PM (Monday, Tuesday, Thursday, Friday) 2:10 PM – 2:45 PM (Wednesday)
R24 - Cabot-Pleasant Street-Holyoke Medical Center-Sargeant Street (<i>Helper 24 Flats-Beech</i>)	7:15 AM – 7:50 AM	---
R24 - Cabot-Pleasant Street-Holyoke Medical Center-Sargeant Street (<i>Helper 24 Dwight-Flats-Beech</i>)	7:20 AM – 7:50 AM	---
R24 - Cabot-Pleasant Street-Holyoke Medical Center-Sargeant Street (<i>Helper 24 Beech-Flats</i>)	---	3:00 PM – 3:35 PM (Monday, Tuesday, Thursday, Friday) 2:10 PM – 2:45 PM (Wednesday)

Route	Morning Trips	Afternoon Trips
X92 - Mid-City Crosstown (<i>Helper T92 Orange-White-Maple-State Street</i>)	6:25 AM – 7:11 AM	---
X92 - Mid-City Crosstown (<i>Helper T92 State Street-Sumner-White-Central to Maple</i>)	---	2:30 PM – 3:25 PM
51 - North Amherst/UMass/Main Street/Amherst Center/UMass	8:43 AM – 11:05 AM (Monday, Wednesday, Friday) 9:28 AM – 11:20 AM (Tuesday, Thursday)	---

Source: PVTA Schedules

4.1.2 Service Changes

PVTA has made several changes to its transit services in the past few years (Table 7) in response to several factors, including the 2014 CSA, budget constraints, new partnerships, workforce shortages, relocation to the new operations and maintenance (O&M) facility, and the availability of discretionary grants from MassDOT. Changes in FY 2015 are largely a response to recommendations in the 2014 CSA. Between FY 2015 and FY 2016, PVTA discontinued 7 routes, added 9 routes, and increased span or frequency of service on 18 routes. In FY 2018, due to level funding from the state and increasing operating costs, PVTA eliminated 5 routes, modified service hours or reduced frequency/trips on 21 routes, and adjusted alignments on 6 routes. Since 2017, PVTA has implemented four new routes from contracts and partnerships with local colleges and businesses, and two new routes from discretionary grant awards. Minor timing changes were also made across the system to improve OTP. A more thorough list of changes can be found in Appendix A.

Table 7. PVTA Service Changes (FY 2015–FY 2019)

Fiscal Year Implemented	Route	Service Change
FY 2015	G1E, G8, B13, B15, G19, R25, R22, 32, 37	Discontinued routes
FY 2015	R10s, R14E, R29, X90, X92, Tiger Trolley, 33, 36, X98	Created new routes
FY 2015	G2, G3, G5, B6, R14, B17, P20, P21, B23, R24, X90, R41	Adjusted alignment
FY 2015	R41	Added Saturday service
FY 2015	R42	Increased weekday span of service
FY 2015	R42, R41	Increased weekday frequency
FY 2015	G5, B6, R14, P21E	Added trips
FY 2015	G3, R44	Increased Saturday span of service
FY 2015	G2, B7	Increased Sunday span of service

Fiscal Year Implemented	Route	Service Change
FY 2015	G3, B6	Adjusted alignment on weekends
FY 2016	R14	Added running time
FY 2016	39E	Discontinued route
FY 2016	P20E, P21E	Separated into own schedules
FY 2016	45, 46	Eliminated evening trip on weekdays, added mid-day trips
FY 2016	G1, B4, B7, P21, P11, B23, X98, 36	Adjusted alignment
FY 2016	P20, P21, B43, B48, 33	Increased number of weekend trips
FY 2016	P20, P21, B48	Increased number of weekday trips
FY 2016	B4, 10S	Reduced weekday frequency
FY 2016	X98	Adjusted service span
FY 2016	Tiger Trolley	Adjusted alignment
FY 2016	B7	Created consistent frequency all day on weekdays
FY 2018	Springfield systemwide	Relocated hub from Springfield Bus Terminal (SBT) to Union Station
FY 2018	G3, G5	Revised weekday and Saturday schedules
FY 2018	Tiger Trolley	Eliminated route
FY 2018	R14E	Eliminated route
FY 2018	R27	Eliminated route
FY 2018	M40	Eliminated route
FY 2018	P20E, B23, 46, X98, G5 south of Longmeadow, X90, B4	Reduced number of trips daily on weekdays
FY 2018	45, 46	Eliminated weekend service
FY 2018	39	Temporarily adjusted alignment and frequency due to construction
FY 2018	B23	Eliminated Saturday service
FY 2018	R29, B48, B4	Reduced weekend frequency
FY 2018	X90	Adjusted alignment - eliminated Sunday service north of Memorial Drive

Fiscal Year Implemented	Route	Service Change
FY 2018	P21E	Altered route to serve Baystate Medical Center and Chestnut/Dwight Streets on alternate weekday trips as well as on all weekend trips
FY 2019	Loop, Survival Center Shuttle, Wilbraham Shuttle, 39E	Added new route
FY 2019	Systemwide	Reduced holiday service to Sunday service levels
FY 2019	R24	Adjusted alignment, eliminated Saturday service, reduced weekday span
FY 2019	NE	Shortened service span
FY 2019	30, 31	Reduced service during the summer
FY 2019	46, Palmer Shuttle, Ware Shuttle	Adjusted alignment - combined with another route
FY 2019	30,31,33	Reduced service frequency on weekdays 6:00 PM to 8:00 PM
FY 2019	45	Eliminated one mid-day trip
FY 2019	30,31,38,39	Reduced winter service frequency
FY 2019	34	Eliminated weekday evening service
FY 2019	39	Adjusted alignment at night and on weekends
FY 2019	X98	Eliminated and replaced with Survival Shuttle
Fall 2018 only	33, 34, 35	Reduced weekday frequency
FY 2019	R44	Reduced Sunday frequency
FY 2019	X92	Adjusted alignment, reduced frequency
FY 2019	B17	Adjusted alignment, eliminated route segment
FY 2019	Wilbraham Shuttle	Added service
FY 2019	B43	Reduced number of trips daily on weekdays
FY 2019	G2	Reduced weekday afternoon frequency
FY 2019	Loop	Adjusted alignment, added trips
FY 2019	G2E, B7s	Added new route
FY 2019	R44	Adjusted alignment, redesigned route
FY 2019	G1	Revised weekday schedule
FY 2019	P20E	Added weekday trips

Source: *PVTA Service Equity Analysis for 2019 Service Change Proposals; PVTA Equity Analysis for Service Changes Effective Fall 2017*

4.1.3 Financial

The total operating budget was \$49,373,444 in FY 2019, which is an increase of 6 percent from FY 2018, with the increase primarily due to contractual labor requirements, preventive maintenance on the buses, insurance claims payments, contractual paratransit vendor payments, fuel prices, and consumption, and an increase in rent at the Springfield Union Station. PVTA revenues come from federal, state, local, farebox revenue, partnerships/contracts, and other sources. Table 8 summarizes the funding amount by source from FY 2015 to FY 2019, and Figure 10 shows the funding sources by percentage of total revenue. In FY 2019, PVTA received its highest level of revenue, which had increased by 14 percent from FY 2015. As shown in Figure 10, in FY 2019 51 percent of revenue was received from the Commonwealth of Massachusetts,²⁵ followed by 18 percent from local member communities, 15 percent from farebox revenue, 13 percent from federal grants, and the remaining 3 percent from other sources such as advertisement revenues, service contracts, and interest income.

As shown in Figure 10, between FY 2015 and FY 2019 state funding remained relatively consistent, ranging between 53.4 percent and 49.4 percent, with a 2 percent funding reduction in FY 2018, followed by a 2 percent base funding increase in FY 2019.²⁶ The other two largest sources of financial assistance are local and farebox sources. Farebox revenue contributed 15.2 percent of the operating funding sources in FY 2019, up \$500,000 from FY 2018. Local funding also remained relatively consistent at 18 and 19 percent between FY 2015 and FY 2019. With the exception of FY 2016 each year the total dollar value from local sources increased by 2.5 percent in accordance with Proposition 2 ½, which does not allow the local assessment to increase by more than 2.5 percent unless new service is added.²⁷ Between FY 2015 and FY 2019 farebox revenue contributed 15.0 percent to 18.0 percent of the operating funding sources. In FY 2019, the farebox revenue increased by \$515,147 due to fare increases and accounted for 15 percent of revenues.

Table 8. Operating Revenue Sources (FY 2015–FY 2019)

Revenue Source	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Farebox	\$7,780,297	\$7,950,748	\$7,293,723	\$7,011,521	\$7,526,668
Federal	\$3,366,626	\$5,107,467	\$5,702,070	\$6,858,006	\$6,283,734
State	\$22,980,428	\$23,554,939	\$23,554,939	\$23,095,330	\$25,233,938
Local	\$7,827,620	\$8,309,002	\$8,516,727	\$8,729,645	\$8,947,886
Partnerships/ contracts	\$784,122	\$289,517	\$176,813	\$591,690	\$803,396
Other	\$398,314	\$439,577	\$390,420	\$475,544	\$577,822
TOTAL	\$43,137,407	\$45,651,250	\$45,634,692	\$46,761,736	\$49,373,444

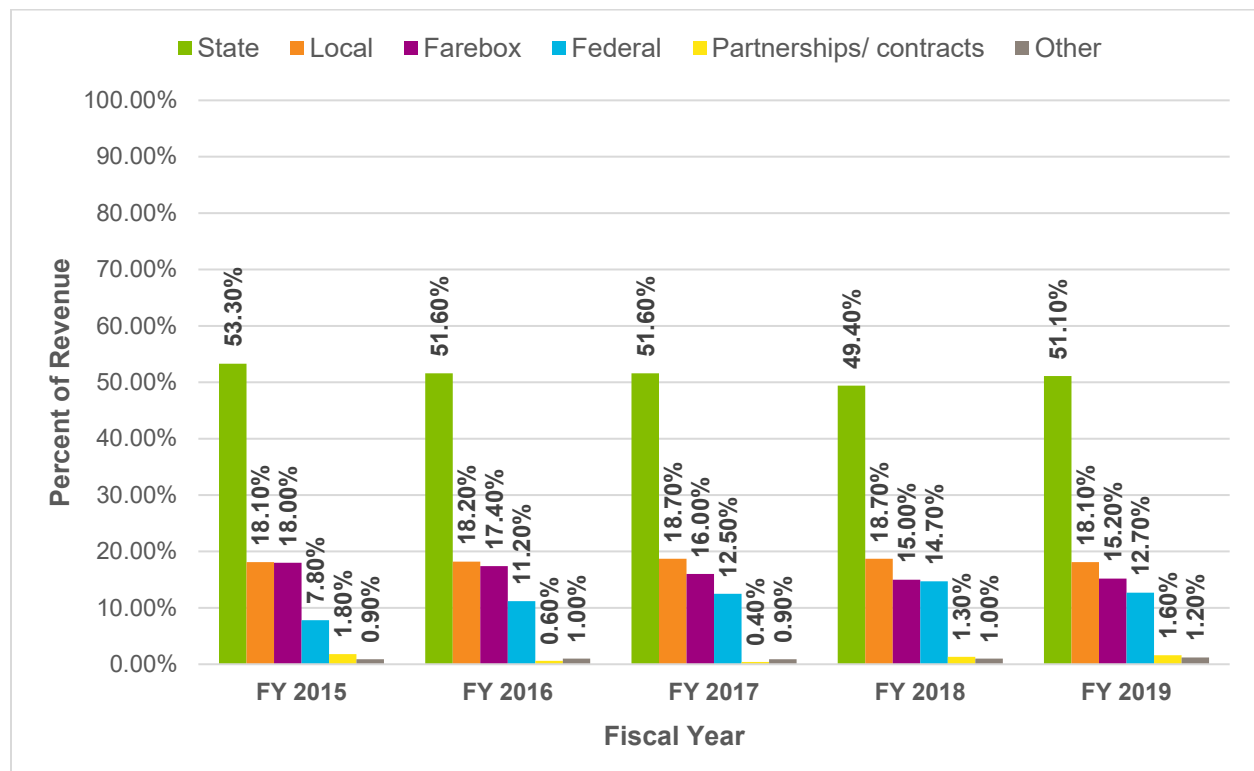
Source: *NTD, RTA Service Data FY 2015-FY 2019*

²⁵Across the 15 RTAs in the state, state funding makes up approximately 39 percent of their collective operating costs.

²⁶ This includes one-time discretionary grants beginning in FY 2019 for service improvements. Since the grants are not long-term sustainable sources the service improvements are often temporary. In FY 2019 state discretionary grants for PVTA amounted to \$600,241 (plus an additional 2.4% in state discretionary grants).

²⁷ In 2016, local funding increased by 6.2% because PVTA implemented substantial service changes in accordance with their CSA, adding 30,000 new revenue hours.

Figure 10. Operating Revenue Source Percentage by Fiscal Year (FY 2015–FY 2019)

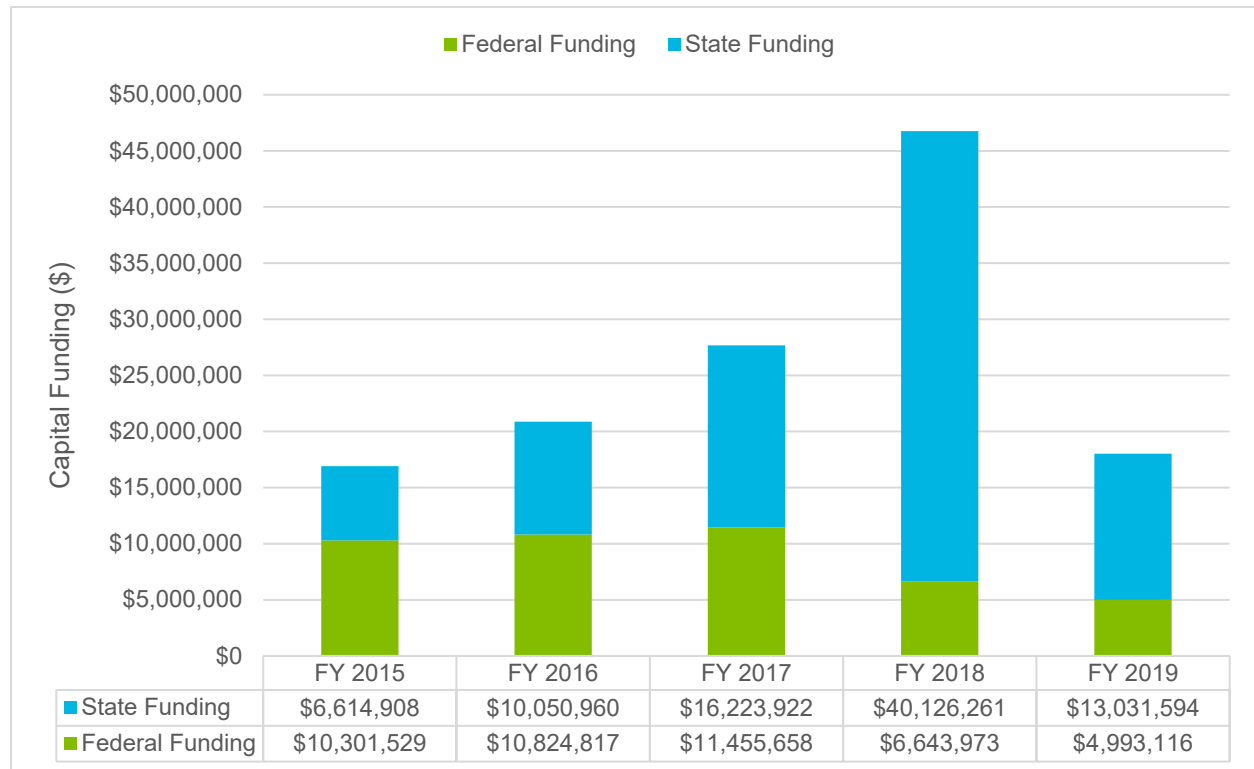


Source: RTA Service Data FY 2015-FY 2019

From FY 2015 to FY 2019 PVTA received between \$16.9 million and \$46.7 million in capital funding (Figure 11). Each year the federal government provides 14 and 61 percent of the capital revenue. Each year PVTA also receives between 39 and 86 percent of capital funds from the Commonwealth of Massachusetts. Together federal and state sources make up the entirety of PVTA’s capital revenue sources.

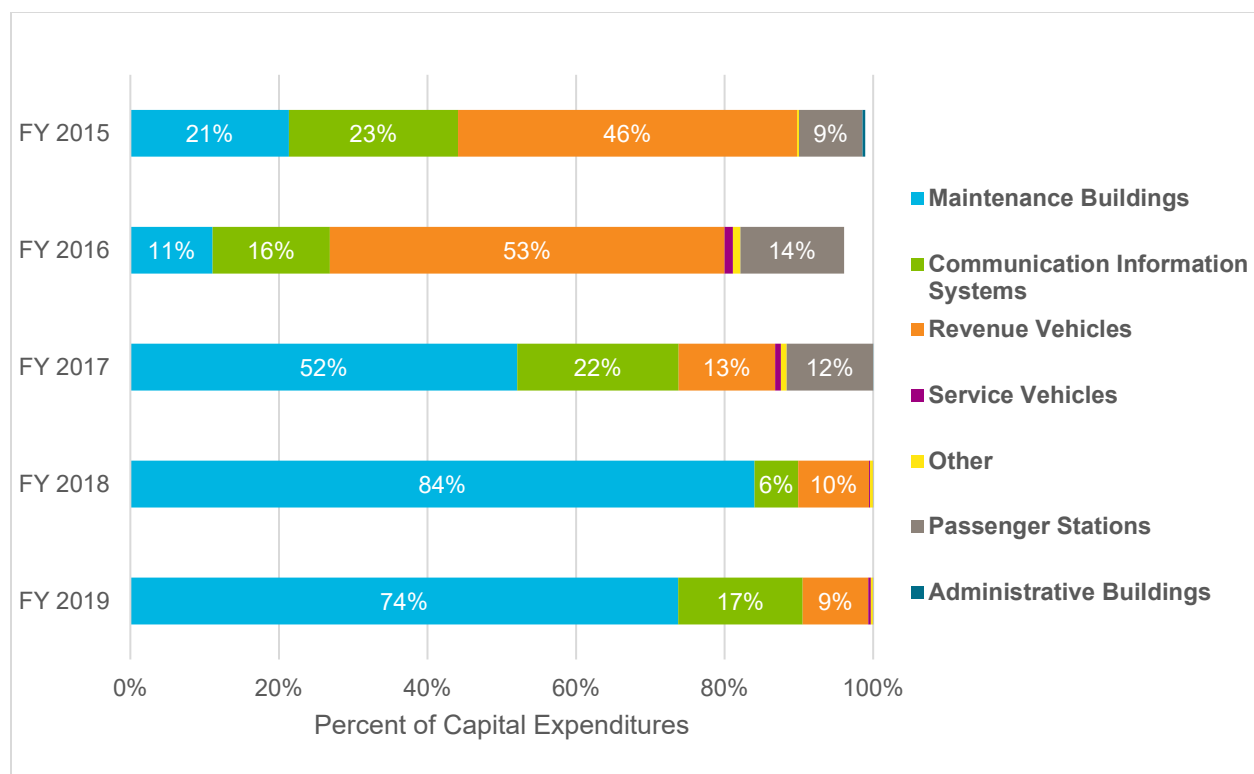
PVTA utilizes its capital funding received from the state and federal government for various capital expenditures. From FY 2015 to FY 2016, PVTA spent the largest portion of its capital funding on revenue vehicles (46 to 53 percent) (Figure 12). During this period PVTA also invested its capital funds in passenger stations and communication systems. In more recent fiscal years (FY 2018 to FY 2019), the greatest amounts of PVTA’s capital funding have been used to construct the new Cottage Street Bus Maintenance and Operations Facility in Springfield. The increase in capital funding in FY 2018 is associated with the construction of this facility. The remainder of the capital funding in FY 2018 and FY 2019 was used for communication information systems and revenue vehicles.

Figure 11. PVTA Capital Funding (FY 2015–FY 2019)



Source: NTD (FY 2015 – FY 2019)

Figure 12. PVTA Capital Expenditures (FY 2015–FY 2019)



Source: NTD (FY 2015 – FY 2019)

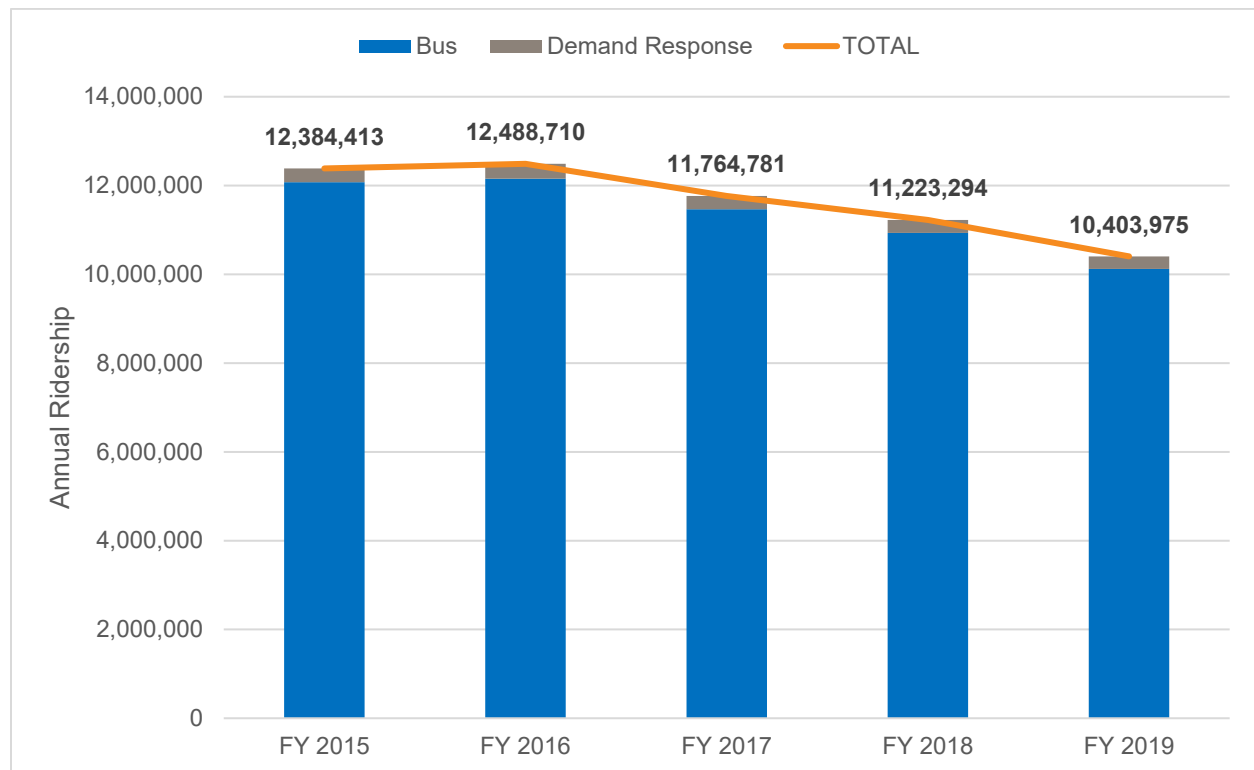
4.2 Ridership and Service Operations

This chapter provides an overview of ridership and the amount of service provided. Appendix B provides further information on performance metrics.

4.2.1 Ridership

PVTA experienced a decrease in ridership systemwide between FY 2015 and FY 2019, with an overall decline of 2,208,965, or 17.8 percent (Figure 13). While ridership increased slightly in FY 2016 by 100,000, a continued impact from the 2014 CSA recommended service additions, it then began to decrease annually at a rate of 5 to 8 percent, or approximately 700,000 per year. During this period of decline PVTA experienced reduced state funding, which led to service reductions and increased systemwide fares, which likely contributed to the decline in the number of riders, in conjunction with national trends of transit decline corresponding with the onset of TNCs such as Uber and Lyft. Beginning in 2015, transit ridership began decreasing nationally at 7.24 percent annually. During this national decline, over 56.0 percent of all US systems lost ridership. In Massachusetts, PVTA was not alone in its decline in ridership; other RTAs also saw ridership decline, between 0.9 and 22 percent.²⁸

Figure 13. Annual System Ridership Trends (2015–2019)

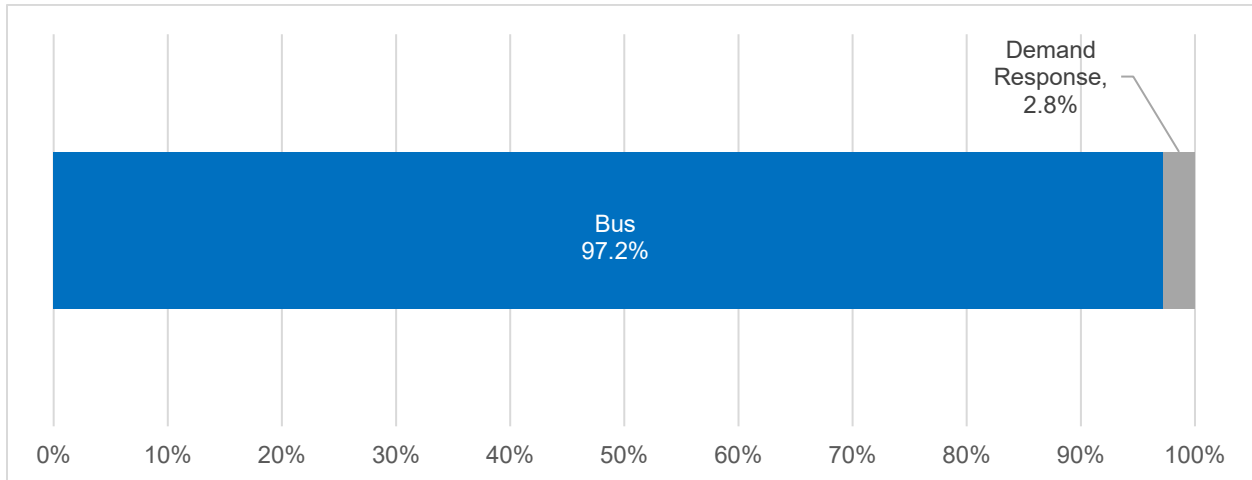


Source: NTD

Figure 14 shows a breakdown of the FY 2019 ridership by service type. As shown in the figure, in FY 2019 97.2 percent of the total passengers (9.9 million riders) used the fixed route bus system and 2.8 percent (283,897 riders) used demand response, which includes the ADA paratransit service, region-wide senior van service, and Wilbraham Shuttle.

²⁸ According to the FTA, Service Data and Operating Expenses Time Series by Mode, <https://www.transit.dot.gov/ntd/data-product/ts21-service-data-and-operating-expenses-time-series-mode-2>.

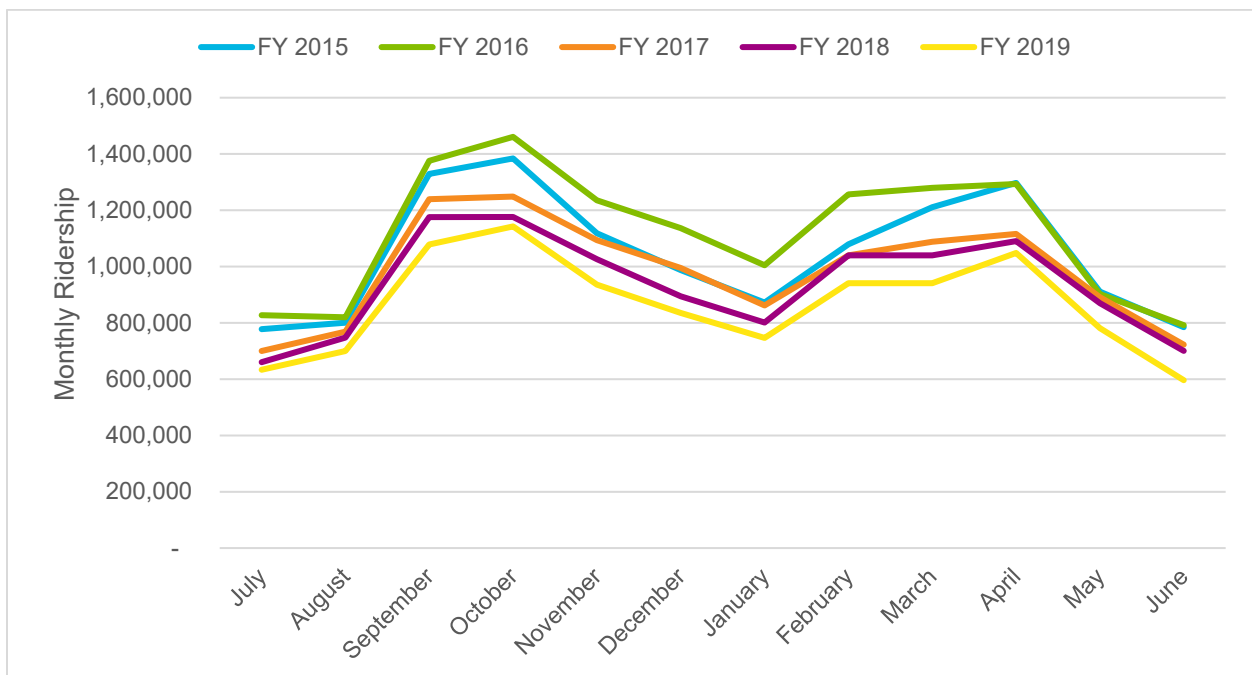
Figure 14. Ridership Breakdown by Service Type (2019)



Source: NTD

PVTA transported an average of 1,046,064 passengers each month during FY 2015 which decreased by 17 percent in FY 2019 to 865,077 passengers each month. The average monthly ridership trend over the last 5 years is shown on Figure 15. During the summer and winter months, when schools and colleges are closed and college student riders have returned home, ridership dips below the levels reported in the other months of the year. Conversely, ridership increases to peak levels during the fall and spring months predominantly driven by educational traffic. As a result, PVTA adjusts service on UMTS, VATCo, and SATCo routes to account for the seasonal trends in ridership.

Figure 15. Monthly Ridership Trends (2015–2019)

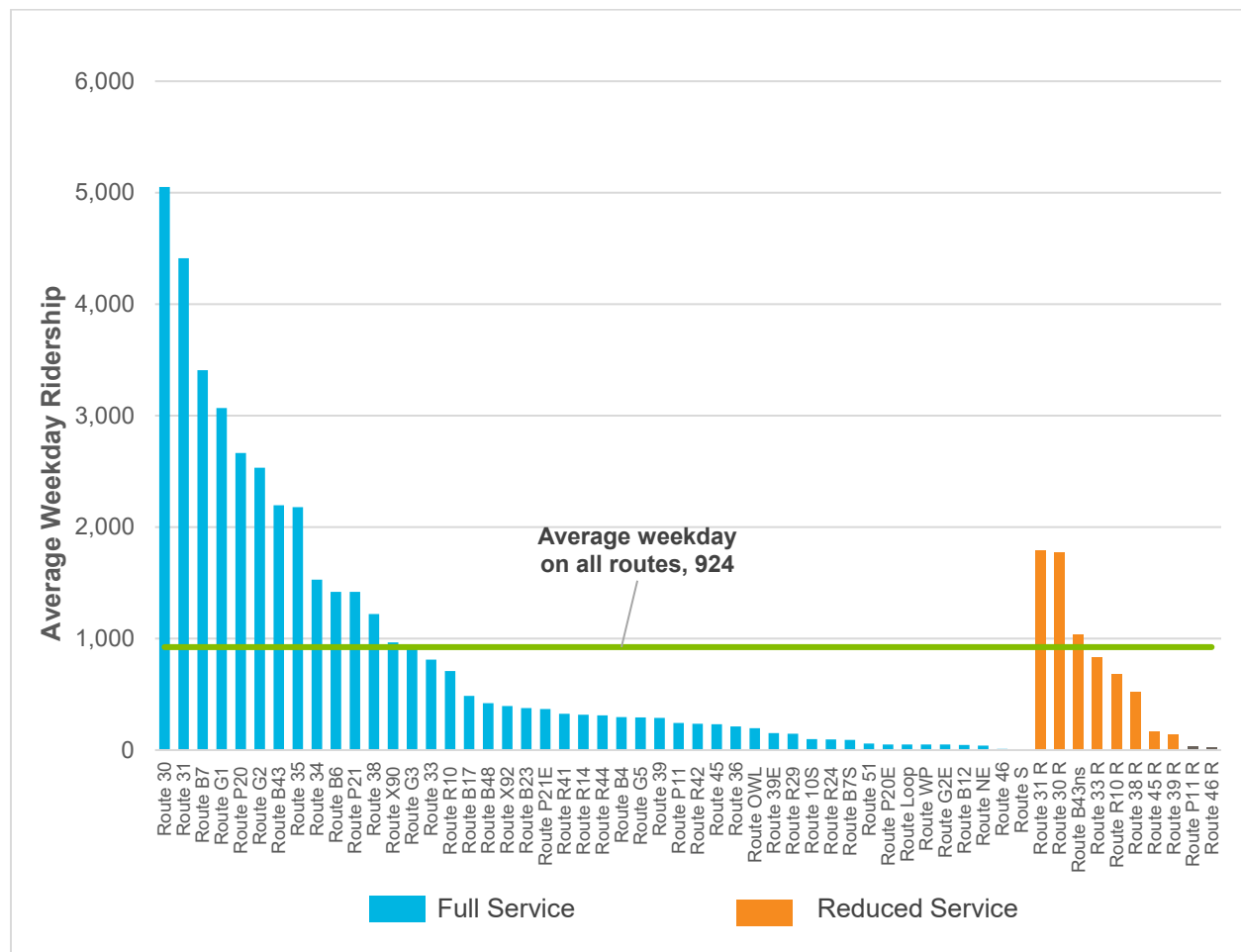


Source: NTD Time Series Data

4.2.1.1 Weekday Average Ridership by Route

During FY 2019, PVTA transported an average of 42,685 passengers per weekday on all fixed routes (local and express services, not including the reduced services) combined (Figure 16). The reduced service routes have modified schedules during periods when the service’s target populations, the colleges, are not in session; they often have shorter spans and longer headways. During full service, the average ridership per route was 924, with 13 of the 46 routes having greater than average ridership. Average daily ridership varied from as low as 4 on the Northampton Survival Center Shuttle to as high as 5,051 on Route 30. Routes 30, 31, B7, G1, P20, and G2 were the top six highest ridership routes and account for 46 percent of daily ridership.

Figure 16. Weekday Average Ridership by Route (FY 2019)



Source: PVTA

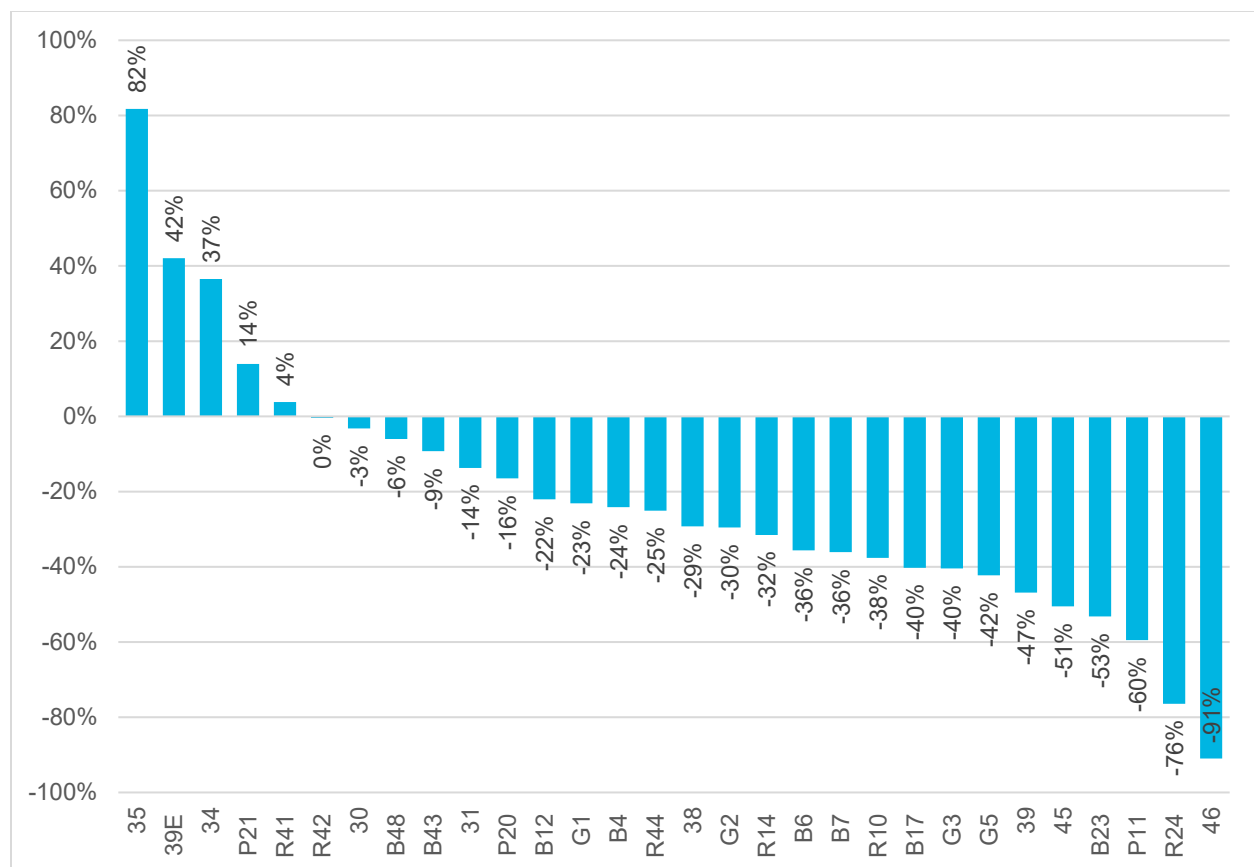
Routes G2E, B12, 46, NE, S, and WP had low ridership (50 passengers per day or fewer). The low ridership can be attributed to several factors. Route B12 services the county jail, and service is limited to visiting hours and primarily used for pre-release activities.²⁹ Route G2E operates in lieu of running out of service between the new operations and maintenance facility on Cottage Street and Union Station. Route 46 is interlined with Route 31 for the majority of the alignment, and as such, the unique ridership for the route only reflects a handful of stops. In 2019 the service was reduced, along with routing and timetables changes on Route WP by combining two routes, resulting in better performance metrics despite low ridership. The S is a new route

²⁹Route B12 also has a funding partnership where the county jail pays the cost of operating the route.

that replaced a poor performing route in FY 2019, and as a result the service increased in performance.

During FY 2012, 30 of the current PVTA routes operated during weekdays. Figure 17 illustrates the weekday average ridership change for those routes that operated during both FY 2012 and FY 2019.³⁰ Routes R29, 33, 36, X90, X92, Loop, NE, OWL, S, and WP did not operate during FY 2012, were not included in the 2014 CSA, or have undergone redesigns such that they are no longer comparable; therefore, ridership data for these routes were not available for analyzing trends.³¹ As the figure shows, weekday average ridership for most of the routes decreased over the past 7 years. This decline in ridership on several routes may be attributed to several service changes and fare increases that have been implemented since the last analysis; furthermore as a result of service changes, ridership may have shifted between routes.

Figure 17. Weekday Average Ridership Change (FY 2012–FY 2019)



Source: FY 2019 Ridership data from PVTA, FY 2012 ridership data from PVTA Comprehensive Service Analysis Final Report, June 2014

Of the 30 routes that operated during both FY 2012 and FY 2019, only Routes 35, 39E, 34, 41, and P21 recorded increased weekday daily ridership. Routes 34 and 35 had ridership growth despite service reductions. Route 35 had the highest weekday average ridership increase of 82 percent, from 1,199 riders in FY 2012 to 2,179 riders in FY 2019. The increases in ridership on Routes 34 and 35 is largely attributed to the new Olympia Oaks housing complex constructed on Olympia Drive. The increase on Route 39E is correlated to the decrease on Route 39. The timed transfer between Routes 38 and 39 was eliminated in order to maintain

³⁰ Route-level ridership data from FY 2012 were utilized in the PVTA Comprehensive Service Analysis Final Report (2014) and thus were used as the baseline comparison for FY 2019 ridership.

³¹ Routes 20 and 21 include express variants P20E and P21E ridership. Route 10 includes the 10S variant.

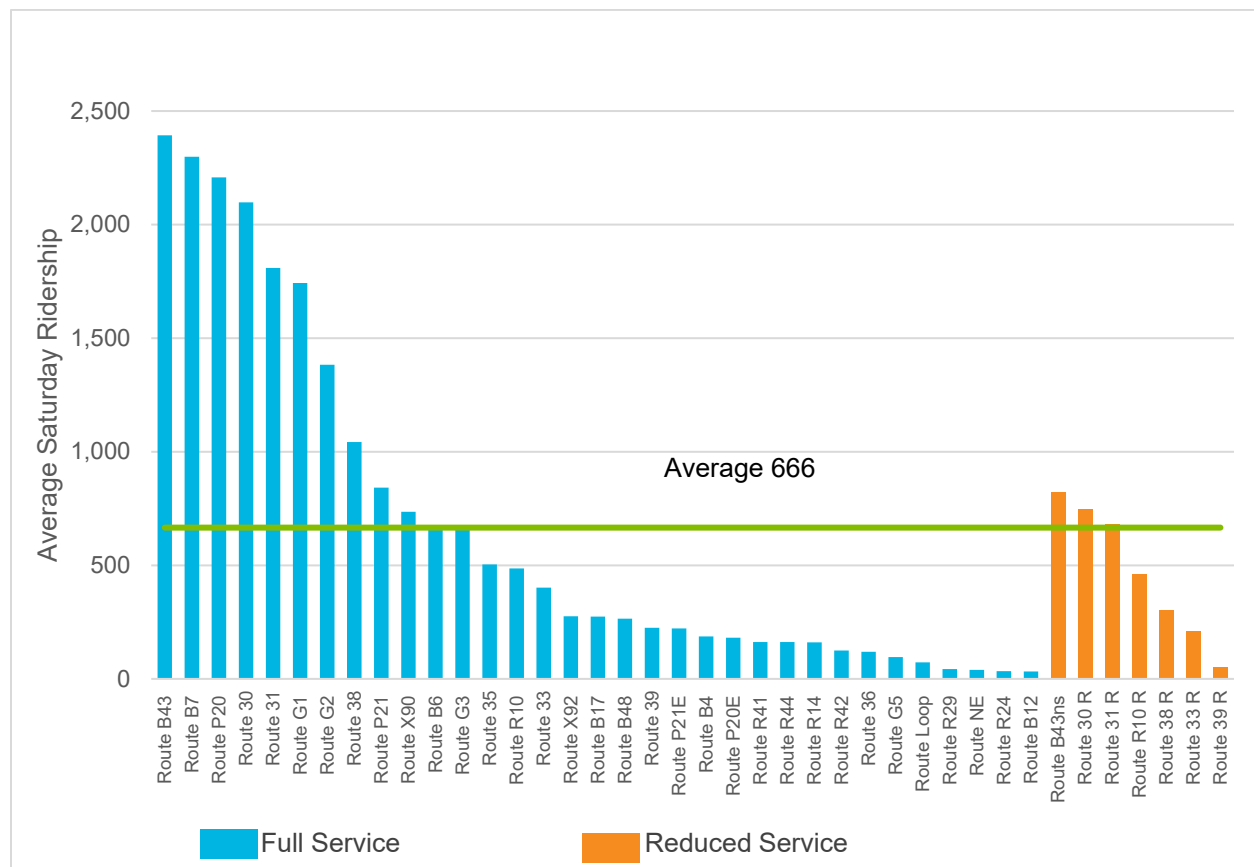
OTP, shifting ridership from Route 38 to Route 39 to Route 39E for those going between Smith College and Mount Holyoke College.

Ridership decreased by more than 50 percent on five routes: Routes 45, B23, P11, R24, and 46. Several of the routes (B17, G3, G5, and 39) that experienced over a 40 percent decrease in daily ridership had reductions in frequency, service spans reduced, or alignment changes between FY 2012 and FY 2019. Among them, Routes R24 and 46 had the greatest decrease in weekday average ridership. Route R24 ridership decreased by 76 percent, from 598 riders in FY 2012 to 96 riders in FY 2019. Route 46 ridership decreased by 91 percent, from 111 riders in FY 2012 to 10 riders in FY 2019.

4.2.1.2 Saturday Average Ridership by Route

In FY 2019, an average of 21,965 passengers used the fixed routes on Saturday, or an average of 666 passengers per route. This is 54 percent of weekday ridership and is in line with the service level supplied, as Saturday revenue hours are 63 percent of weekday (per NTD data). Saturday ridership by route is shown in Figure 18. Twelve routes do not operate on Saturday, and many routes operate at reduced frequencies and have shorter spans of service, also contributing to lower Saturday ridership. Routes B43, B7, P20, 30, 31, and G1 had the highest ridership, as seen in trends for weekday and Sunday average ridership. Route B43 ridership doesn't fluctuate because the route is for students. These six routes account for 12,550 riders, or 57 percent of ridership, on Saturday. Routes B12, R24 (Saturday service has since been discontinued), R29, and NE had the lowest ridership (fewer than 50 passengers).

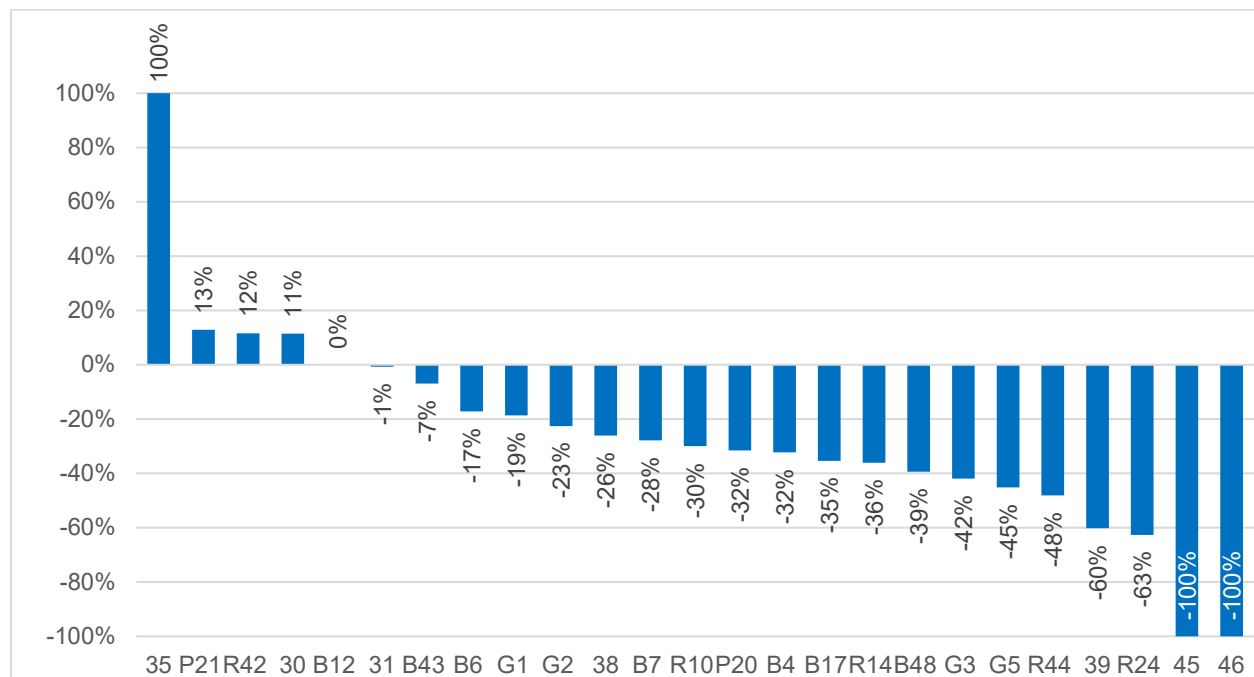
Figure 18. Saturday Average Ridership by Route (FY 2019)



Source: PVTA

Figure 19 illustrates the change in Saturday average ridership between FY 2012 and FY 2019. As shown in the figure, 25 routes that operated on Saturday in FY 2012 currently operate. Of the 25 routes, only 4 routes had an increase in daily Saturday ridership. Route 35 ridership increased by 100 percent, from 252 riders in FY 2012 to 504 riders in FY 2019; this coincides with service beginning 6 hours earlier on Saturdays. Routes P21, R42, and 30 experienced slight increases in ridership ranging from 11 to 13 percent between FY 2012 and FY 2019. Route P21 had an increase in the number of Saturday trips when the Route P21E schedule was separated out and the Route R42 frequency was improved in 2015. Route B12 experienced no change in ridership during this period (33 riders in both FY 2012 and FY 2019). The remaining 20 routes experienced decreases in ridership ranging from as little as 1 percent on Route 31 to as high as 63 percent on Route R24. Routes R24 and 39 experienced more than a 60 percent decrease in ridership. Route 39 ridership decreased by 340 riders (from 565 riders in FY 2012 to 225 riders in FY 2019); this is not surprising as weekday ridership also experienced a decline most likely attributed to the decline in enrollment at Hampshire College. Route R24 ridership decreased by 57 riders (from 91 riders in FY 2012 to 34 riders in FY 2019). Saturday service has since been eliminated on Route R24.

Figure 19. Saturday Average Ridership Change (FY 2012–FY 2019)



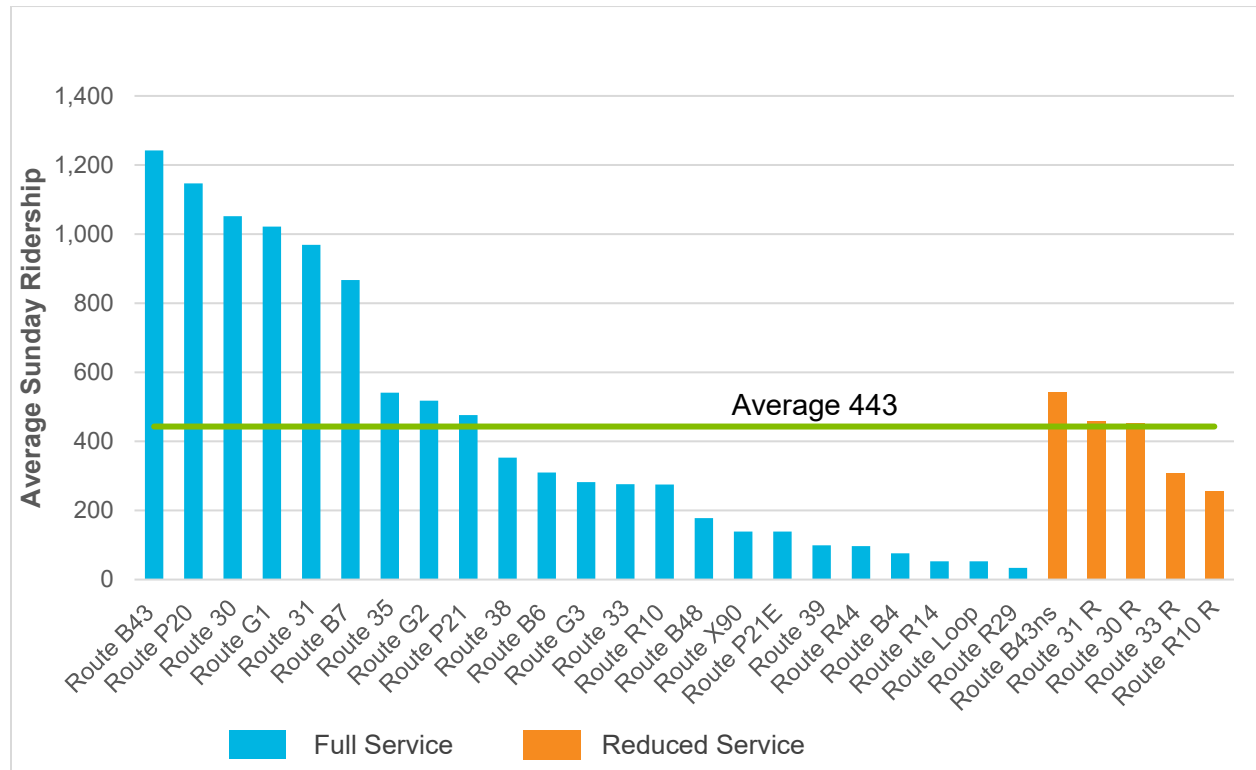
Source: FY 2019 Ridership data from PVTA, FY 2012 ridership data from PVTA Comprehensive Service Analysis Final Report, June 2014

4.2.1.3 Sunday Average Ridership by Route

In FY 2019, Sunday ridership totaled 10,198 passengers, or an average of 443 passengers per route, which is 25 percent of weekday ridership and 46 percent of Saturday ridership (Figure 20). This is in line with the service level supplied, as Sunday revenue hours are 47 percent of Saturdays and 30 percent of weekday (per NTD data). Additionally, 22 routes do not operate on Sundays and many routes operate at reduced frequencies and have shorter spans of service, contributing to even lower Sunday than Saturday ridership. Similar to Saturday ridership, Routes B43, B7, P20, 30, 31, and G1 had the highest Sunday ridership. These six routes account for 6,299 riders, or 62.0 percent of ridership, on Sunday. Only Route R29 had fewer than 50 passengers.

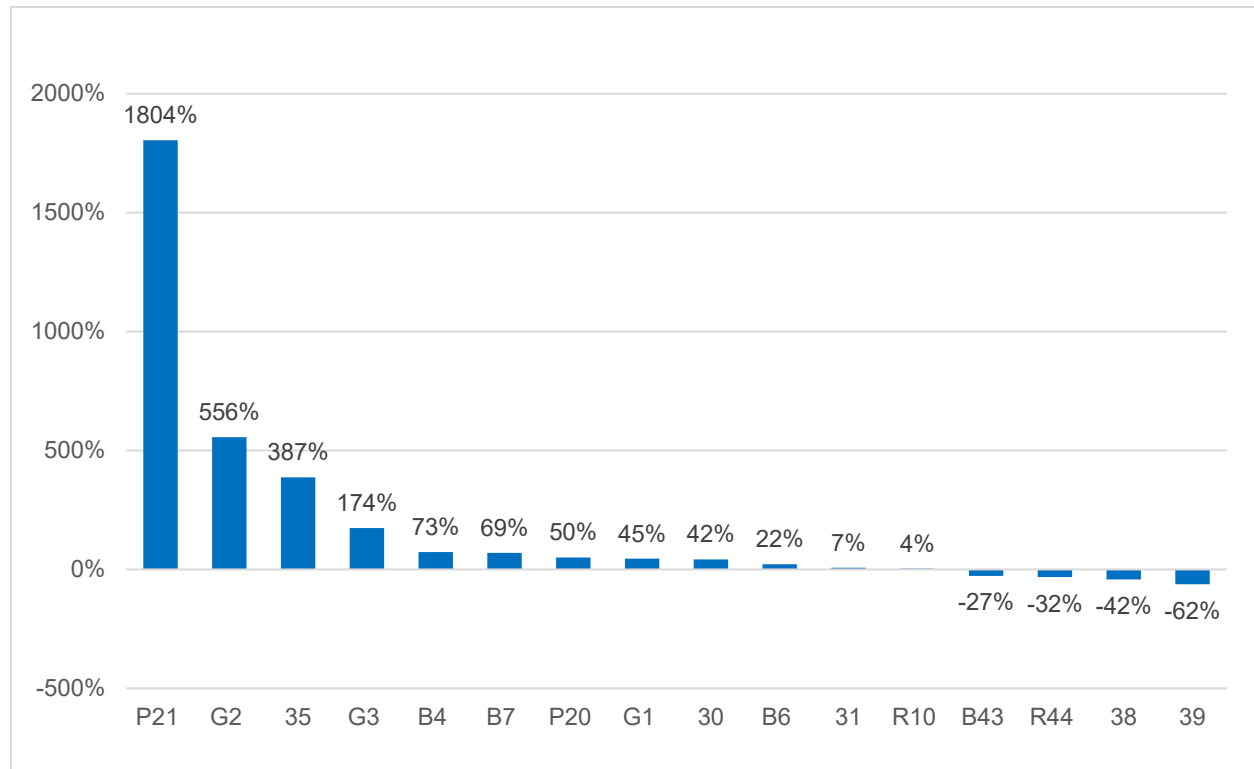
Figure 21 illustrates the Sunday average ridership change between FY 2012 and FY 2019. As shown in the figure, 18 routes operated on Sunday in both FY 2012 and FY 2019. Sunday average ridership increased on two-thirds of the routes over the past 7 years. Of the 18 routes, ridership increased on 12 routes. Routes P21, G2, 35, and G3 recorded more than 100 percent increase in ridership; all four of these routes had an increase in service span and all but Route 35 had an increase in frequency. Routes P21, G2, and 35 had an increase in ridership by 430 to 451 riders between FY 2012 and FY 2019.

Figure 20. Sunday Average Ridership by Route (FY 2019)



Source: PVTA

Figure 21. Sunday Average Ridership Change (FY 2012–FY 2019)



Source: FY 2019 Ridership data from PVTA, FY 2012 ridership data from PVTA Comprehensive Service Analysis Final Report, June 2014

4.2.1.4 Stop Level Ridership

Ridership is concentrated in several corridors and at several nodes within the northern tier and southern tier service areas as shown on Figure 22 and Figure 23, respectively. In the northern tier, ridership is concentrated in downtown Northampton, and in Amherst on North Pleasant Street from North Amherst through the UMass Campus to the intersection of Route 9. In the southern tier, ridership is concentrated in Holyoke along Maple Street and High Street, in the vicinity of the Holyoke Mall, and in Springfield in the downtown core spreading outwards along State Street and Main Street. Of the 1,531 stops with ridership data, 12.8 percent have less than one person per day get on or off (Figure 24).³² Those corridors where ridership activity is low include Route R10 in West Springfield, Route 45 in Belchertown, Route G5 south of the Jewish Home stop, Route R14 along State Route 47, and Route B17 along Parker Street.

³² This does not account for the number of times a day a stop is serviced or the number of routes. PVTA has many stops where the bus is not required to stop except when there is a passenger to pick up or drop off. Based on October 2019 stop level ridership for weekdays only.

Figure 22. Northern Tier Ridership Heatmap

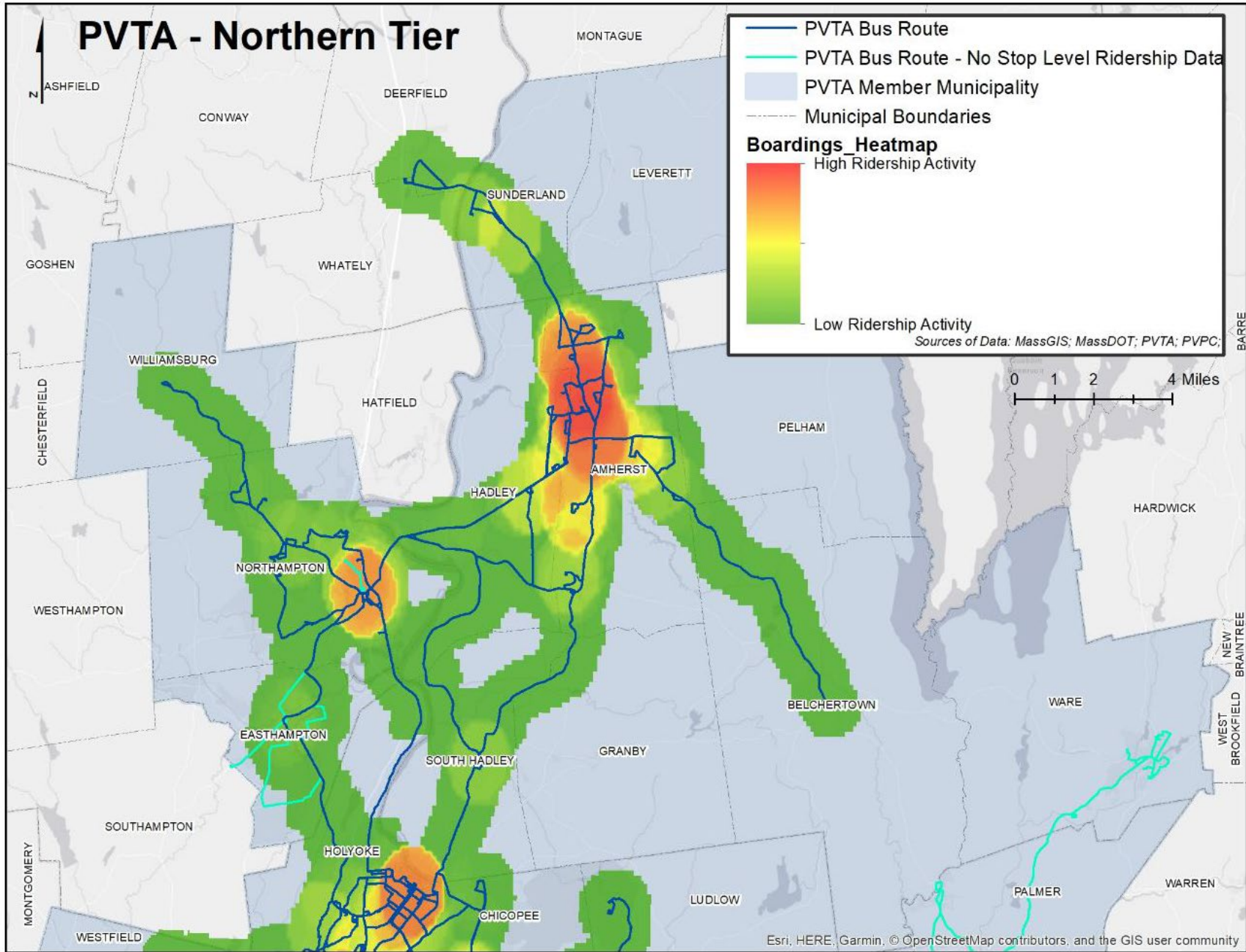


Figure 23. Southern Tier Ridership Heatmap

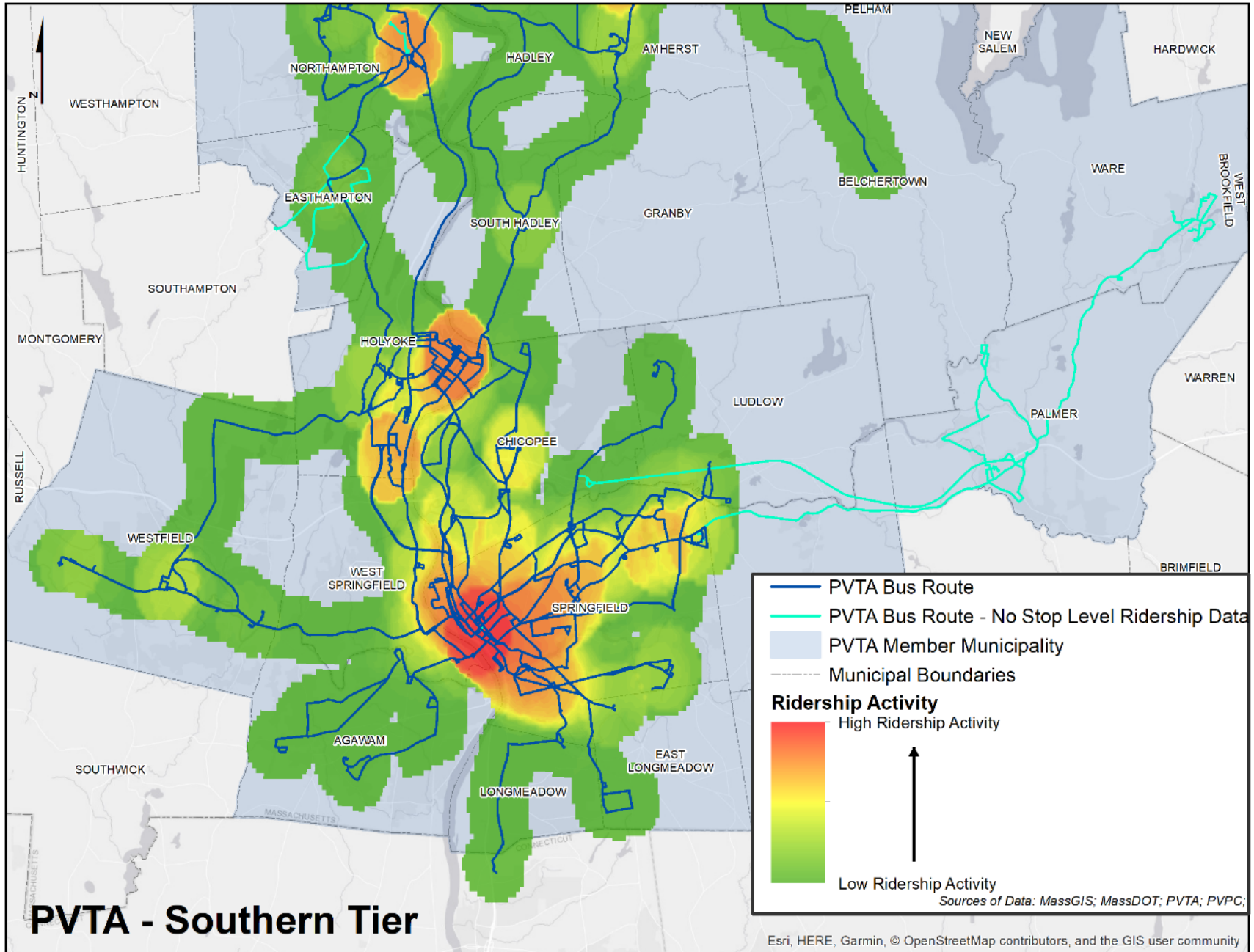


Figure 24. Stops With Less Than One On or Off per Day

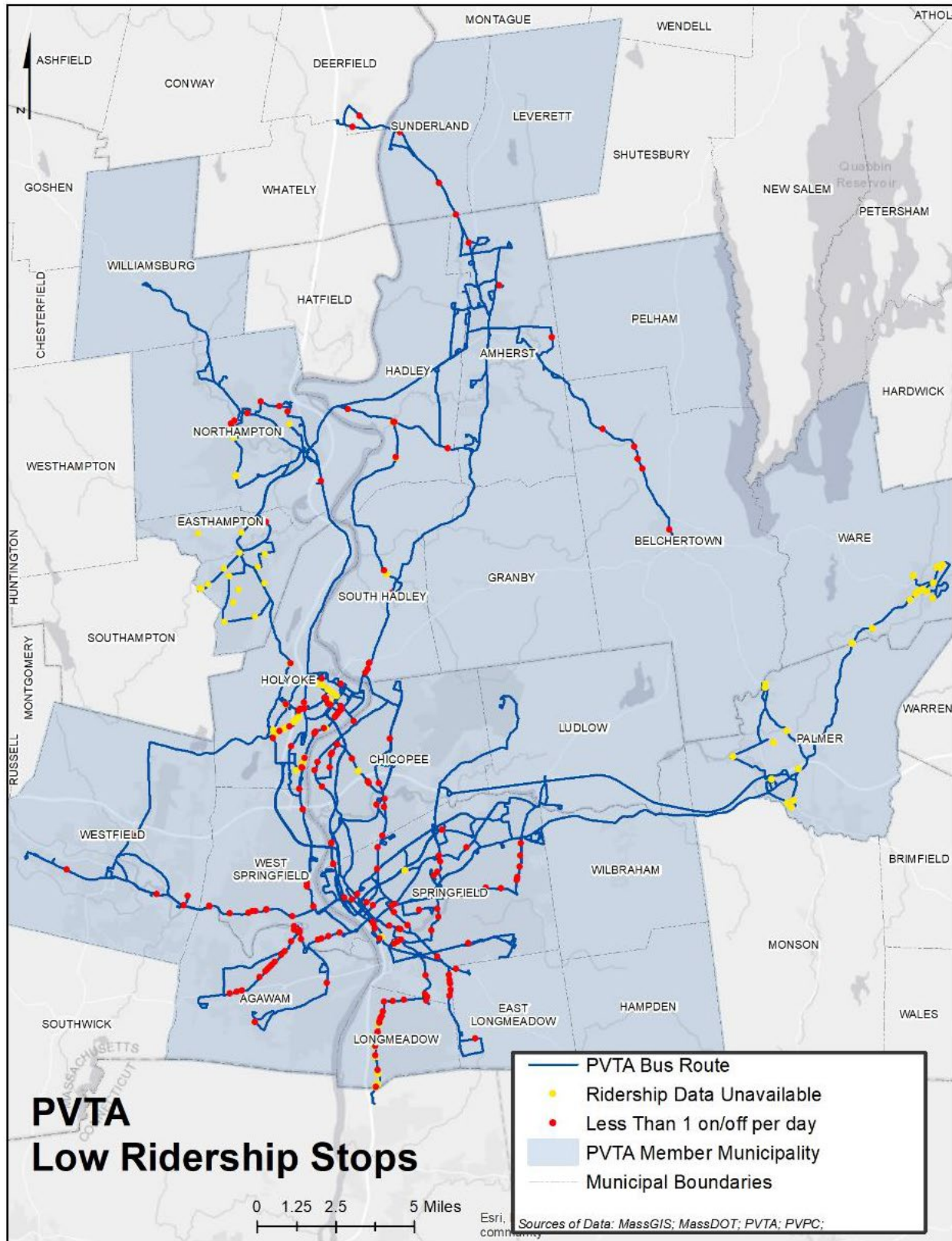


Figure 25 illustrates the average daily corridor boardings along the 1.35 mile Main Street corridor in Springfield from Union Station to Locust Street. The Main Street corridor has an average daily boarding of 4,500 passengers; 82 percent of them are at Union Station, which is the hub for transferring passengers. The 0.35 mile long segment between Union Station and Harrison Avenue is the busiest corridor segment along Main Street in both the northbound and southbound directions, with 20 buses per peak hour heading northbound and 17 heading southbound. Fifty-six percent of routes depart Union Station at even increments (though not all routes depart during each increment) at 0:00, 0:15, 0:30, and 0:45 past the hour, creating bunching along the corridor. Forty-four percent of routes depart at other times, which results in at least one bus every 5 minutes between 0:00 and 0:30 and 0:45 and 0:00 past the hour. There is, however, a 15-minute period between 0:30 and 0:45 where there are no departing buses, except G1, P20, and B4.

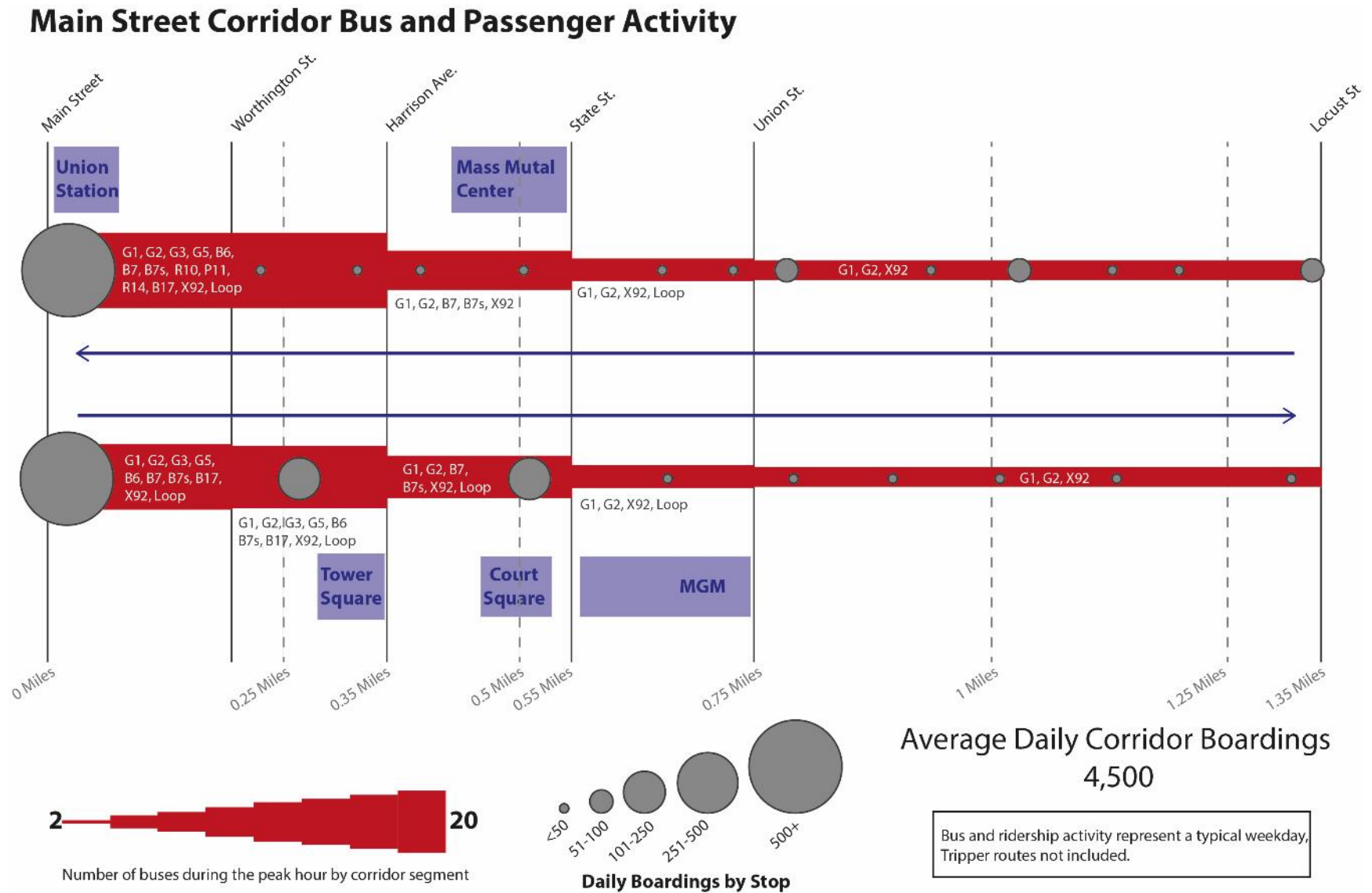
Routes have staggered arrivals at Union Station, creating more evenly spaced service along the corridor, with the largest gap being no more than 8 minutes. Nine stops in the northbound direction have average daily boardings of fewer than 50 passengers, and three stops have boardings between 51 and 100 passengers. In the southbound direction, Bridge Street and Court Street stops have the second highest number of boardings with 101 to 250 passengers getting on at each stop. The remaining stops between State Street and Locust Street in the southbound direction have average daily boardings of fewer than 50 passengers. This analysis indicates that passengers in the corridor are primarily boarding and heading toward Union Station, a major transfer hub with deboarding occurring in the opposite direction.

Figure 26 illustrates the average daily corridor boardings along the 2.65 mile Pleasant Street corridor in Amherst from the intersection of Meadow Street and Pine Street to Route 9. The Pleasant Street corridor has an average daily boarding of 7,500 passengers. The 0.35 mile long segment between Massachusetts Avenue and East Pleasant Street is the busiest corridor segment along Pleasant Street in both northbound and southbound directions, with 20 buses during the peak hour in each direction. Along North Pleasant Street on the UMass campus the routes are staggered to provide a bus every 5 minutes, with some instances of two buses with even shorter headways. The other corridor segments with high ridership in both directions include the segments between Governors Drive/Eastman Lane and Massachusetts Avenue, and between East Pleasant Street and Amity Street/Main Street.

In downtown Amherst service tends to be concentrated around four 5-minute intervals, resulting in 10 minute gaps in service. For both the northbound and southbound directions, the stops with the highest ridership are clustered between Governors Drive/Eastman Lane and Massachusetts Avenue. This 0.7 mile long segment with three stops in each direction experiences just over 5,000 daily boardings during the semester (including weekends in the average). The Amherst Post Office stop between East Pleasant Street and Amity Street/Main Street in the northbound direction also has high ridership along the corridor with more than 500 passengers boarding at the stop. The boardings are higher at these stops due to use by UMass Campus students and downtown Amherst businesses along the corridor segment. Stops along the northbound corridor between Meadow Governors Drive/Eastman Lane and Lane Street/Pine Street have the lowest boardings with fewer than 50 passengers at each stop, as these are primarily deboarding stops.

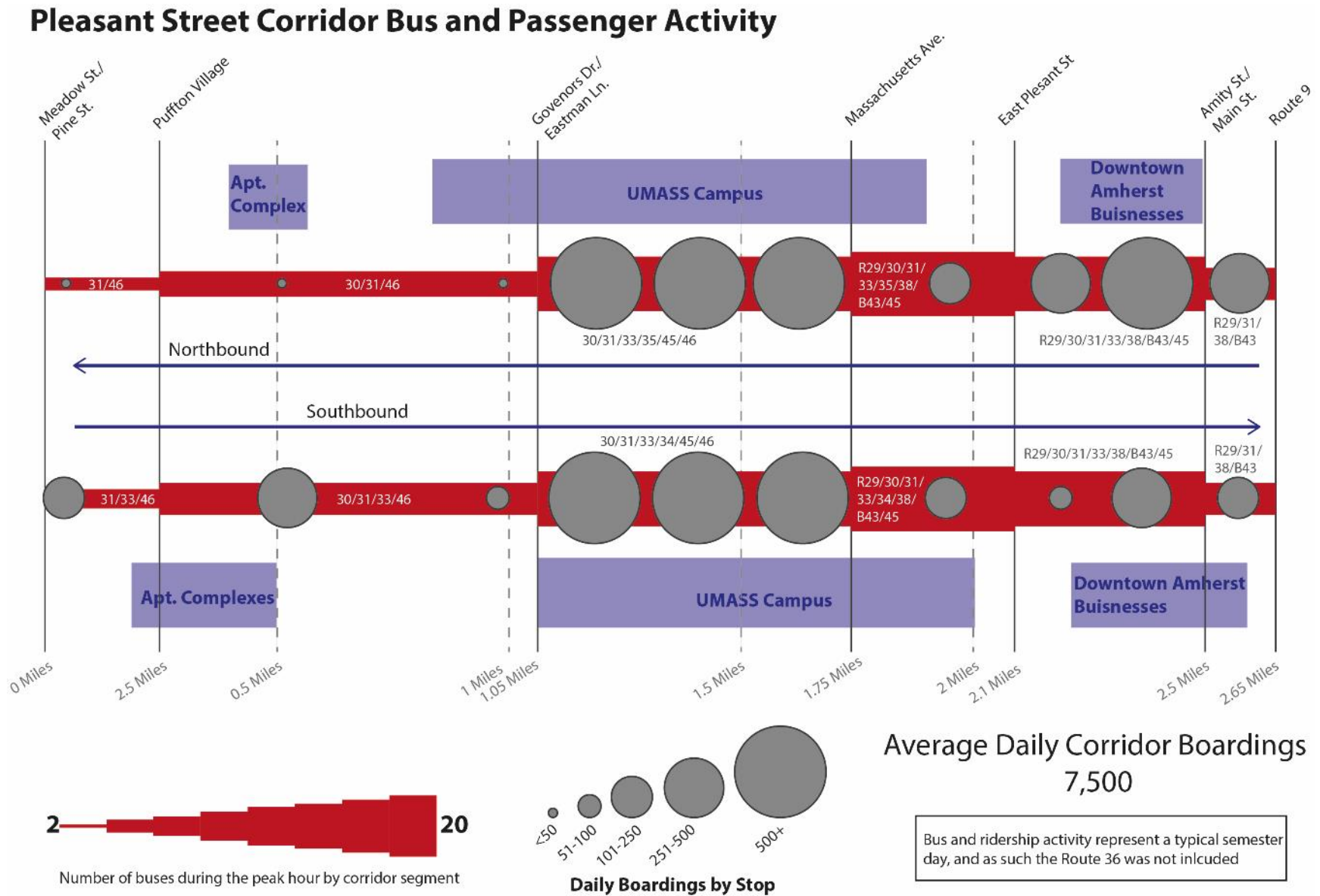
Figure 27 illustrates the average daily boardings along the 2.45 mile State Street corridor in Springfield from Main Street to Blunt Park Road. The State Street corridor has an average daily boarding of 1,300 passengers. Each direction has 17 to 18 stops, with a spacing of roughly 0.13 mile. Ridership is not concentrated at any single stop or section of the corridor but spread out. The State and Walnut bus stop has the highest daily ridership at 97 boardings. The peak number of buses on the corridor is between Chestnut Street/Dwight Street and Saint James with 11 buses. The timing of these 11 vehicles is spaced so that no two routes are scheduled to be at the same stop at the same time. Time spacing varies based on the hour and can be every 2 minutes.

Figure 25. Average Daily Boardings - Main Street Corridor



Source: PVTA FY 2019 Ridership by Stop Data

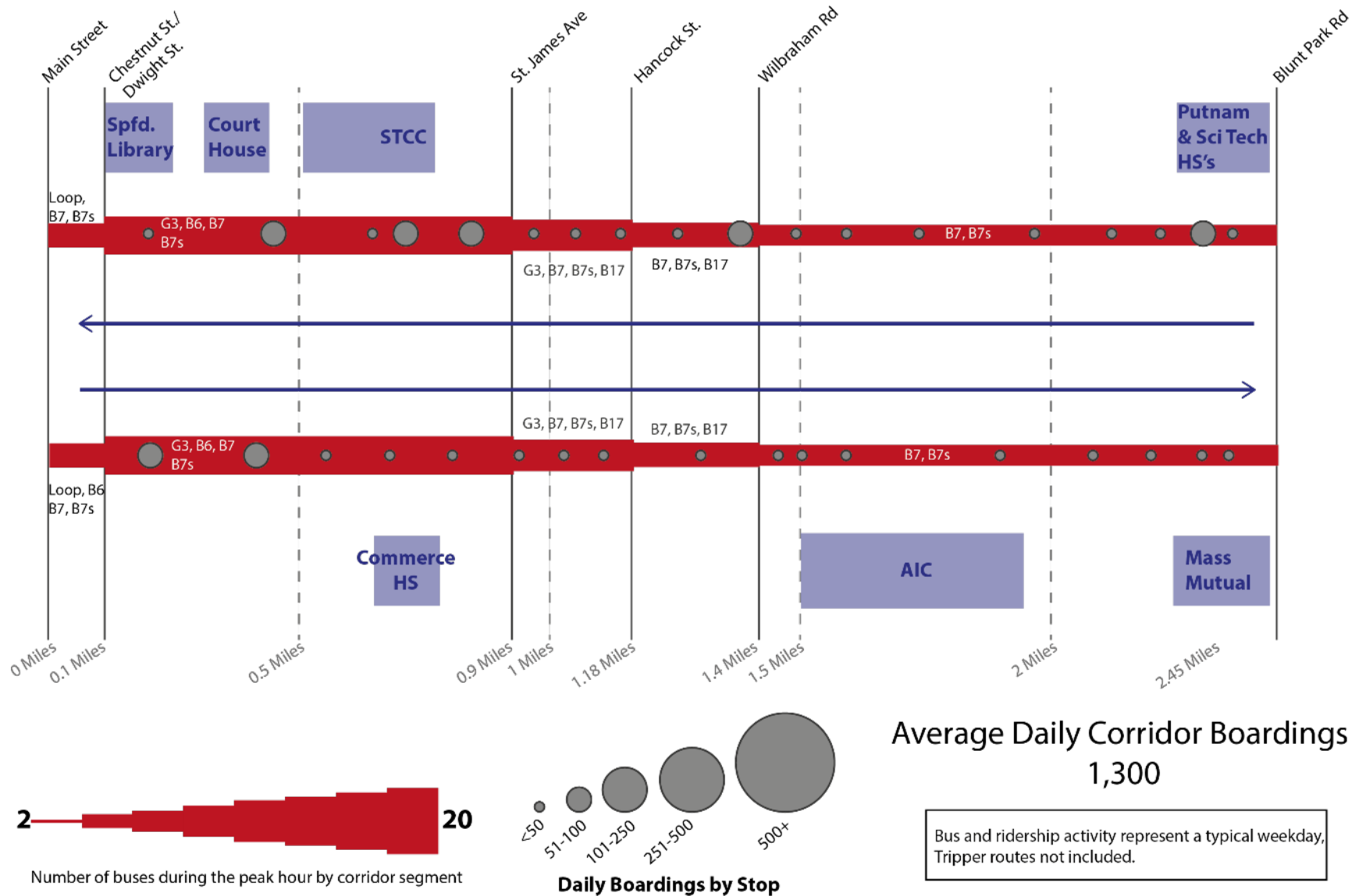
Figure 26. Average Daily Boardings - Pleasant Street Corridor



Source: PVTA FY 2019 Ridership by Stop Data

Figure 27. Average Daily Boardings - State Street Corridor

State Street Corridor Bus and Passenger Activity



Source: PVRTA FY 2019 Ridership by Stop Data

Along the Maple Street/High Street corridor, the roads are one-way with Maple Street running east to west and High Street running west to east. The average daily corridor boardings along the Maple Street/High Street corridor in Holyoke from Lyman Street to Davis Street is 1,100 (Figure 28). The 1.15 mile long corridor has eight stops along each street with the number of buses during the peak being 13 at Holyoke Transportation Center (HTC) and 10 between Dwight Street and Cabot Street. Routes do not depart HTC in a manner that creates consistent headways along Maple Street but rather periods where there is a bus every 5 minutes followed by 10 to 15 minute gaps. Of the 16 stops along the corridor four have over 50 boardings, and all are on Maple Street. Forty percent of departures are at 0:00 or 0:30, and the remaining 36 percent are at 0:15 or 0:45. The busiest stop is HTC, which has 725 daily boardings; approximately 76 percent of departures from HTC are at 0:00, 0:15, 0:30, or 0:45, while 24 percent are at other intervals past the hour.

Figure 29 and Figure 30 show stop level boardings as they relate to the structure of the route (main route, route branch, route deviation) and show where ridership activity is located. The majority of PVRTA's routing can be classified as main routing where the route consistently serves this area and does not deviate from the primary roadway to do so.

A **route deviation** is when the bus either only occasionally serves an area or must leave the primary road to serve a location such as a shopping plaza. The 2014 CSA recommends minimizing the use of route deviations and following the thresholds listed below for implementing route deviations:

- The deviation will increase in overall route productivity.
- The number of new passengers that would be served is equal to or greater than 25 percent of the number of passengers who would be inconvenienced by the additional travel time on any particular deviated trip.
- The deviation would not interfere with the provision of regular service frequencies and/or the provision of coordinated service with other routes operating in the same corridor.

Route branching is when a route might take alternating paths along a section of the route in order to serve two areas with the same route. Branches are generally at the ends of the routes or along low-density sections where there is less demand and therefore the frequency can be split between the branches.

PVRTA has 57 unique deviations across 28 different routes, with some deviations being served by more than one route, equating to 69 route deviations (Table 9). Using the recommendations outlined for deviations in the 2014 CSA, 33 of the deviations meet the recommendation, 26 do not meet any of the indicators, and 10 may possibly meet one of the indicators, but either data segregation by route was not available or productivity was just slightly lower than the overall route productivity. While some deviations are not meeting the requirement, they may still be warranted if they serve vulnerable population groups or would result in increased pressures on the demand response system.

Branching is found on Routes G1, G2, B6, R14, P21, and X90 (Table 10). While PVRTA does not have a standard for branching, ridership was examined to determine the productivity of each branch. Findings include higher ridership on the Route G2 Big Y Plaza branch than the Benton via Dwight and on Route P21 higher on the Meadow Street than Chicopee Street. Branch ridership was similar for Routes B6 and X90.

Figure 28. Average Daily Boardings - Maple/High Street Corridor

Maple/High Street Corridor Bus and Passenger Activity

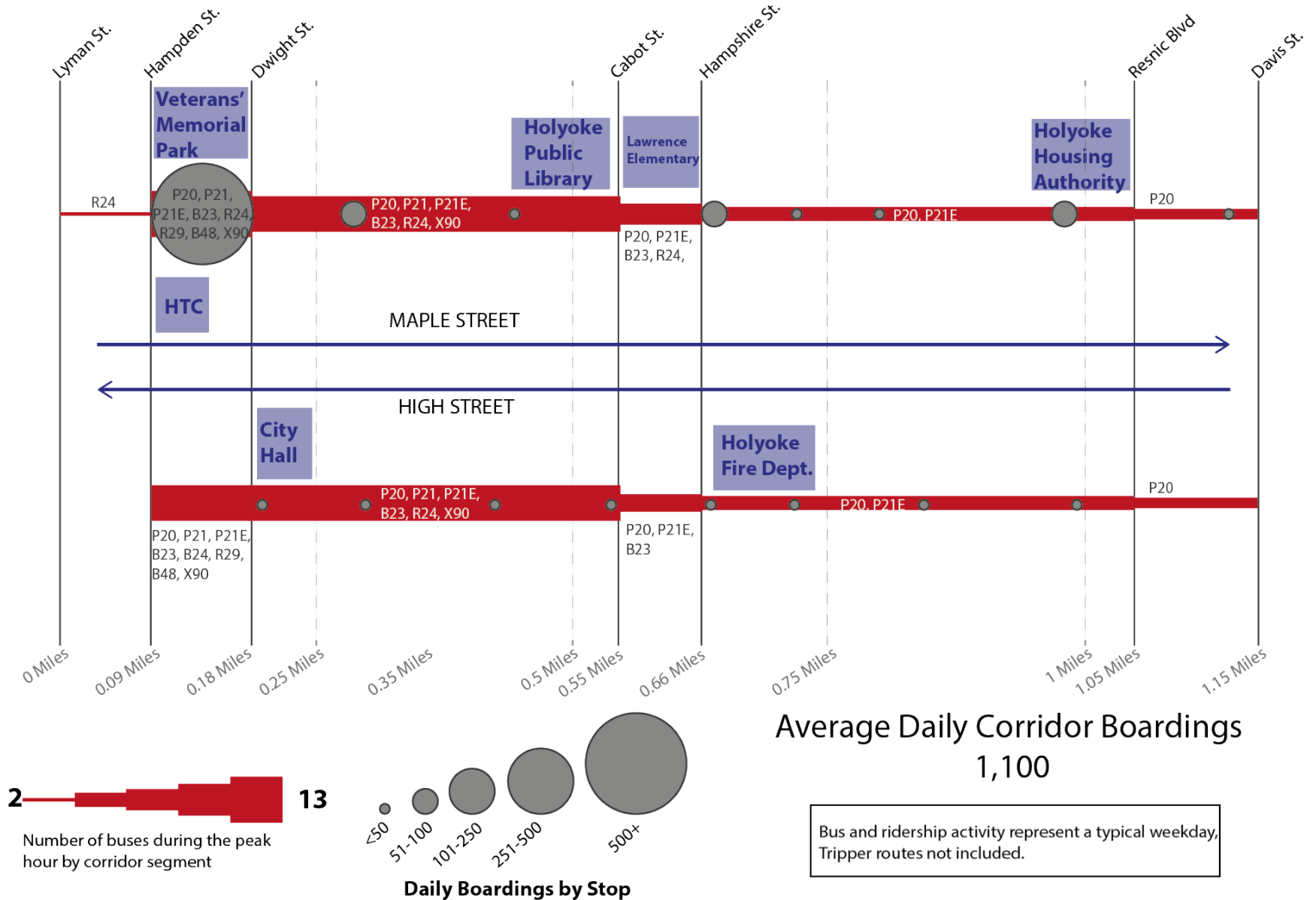


Figure 29. Southern Tier Branch Deviations, Main Routing

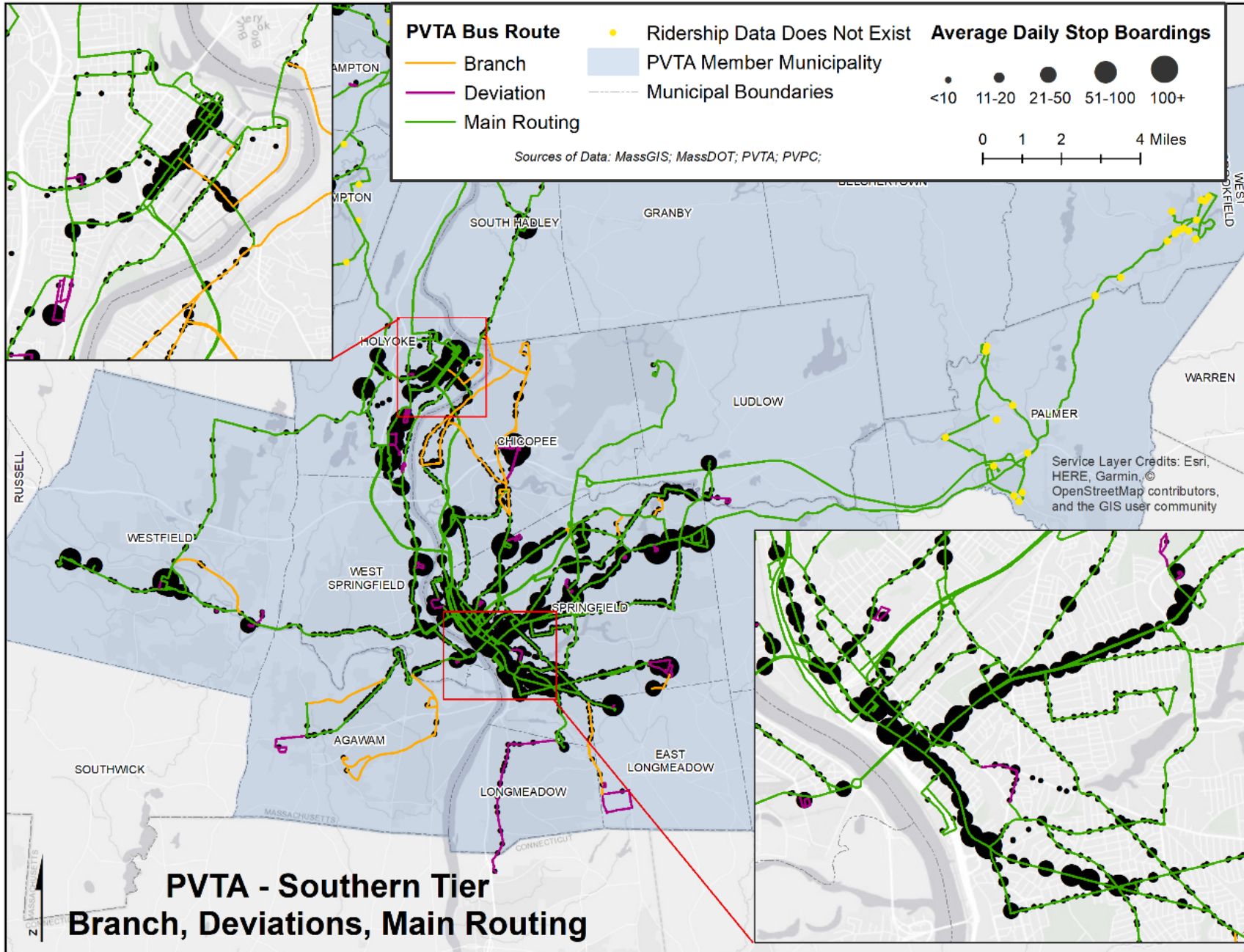


Figure 30. Northern Tier Branch Deviations, Main Routing

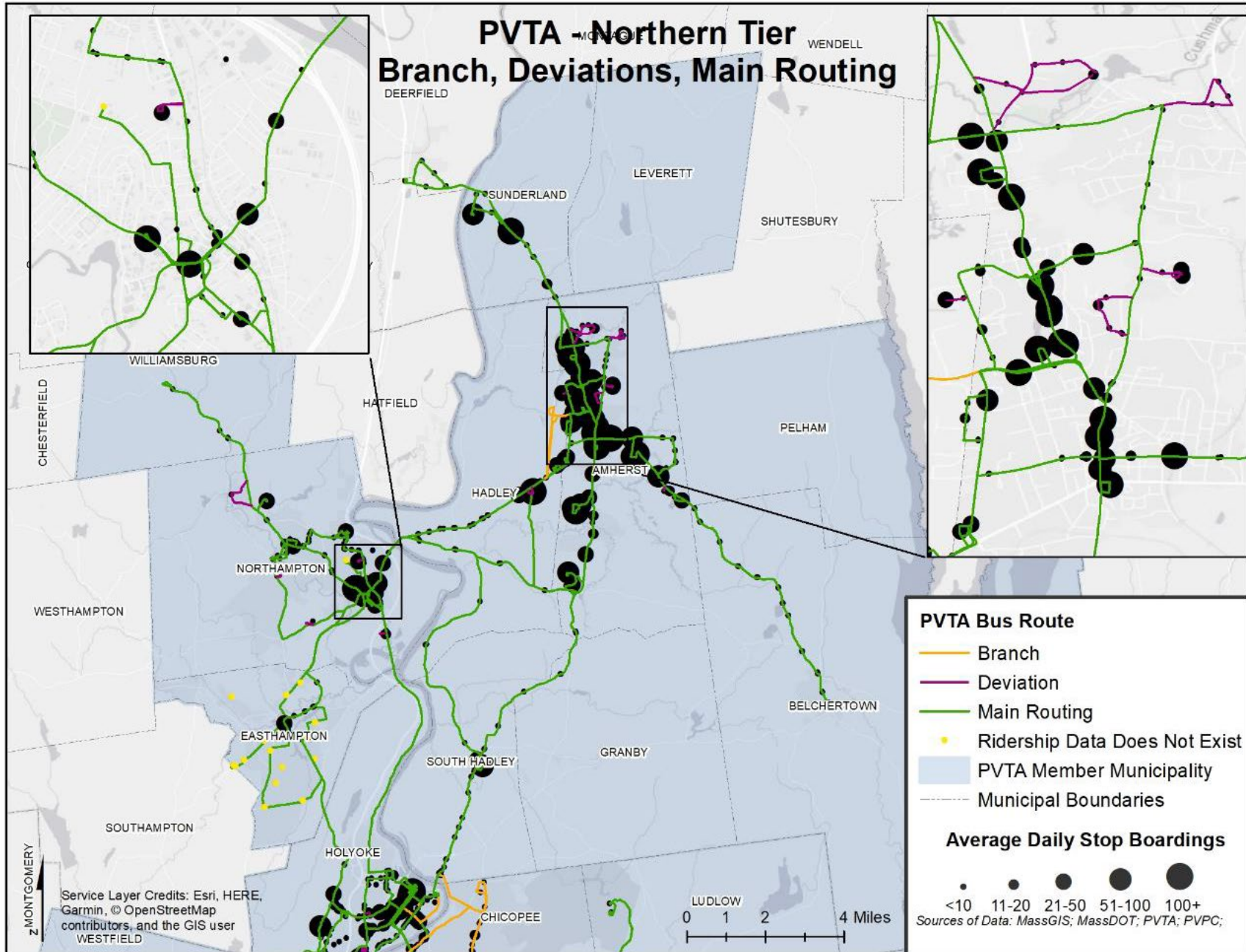


Table 9. Route Productivity for Deviations

Route	Deviation	Deviation Productivity (Passengers/Revenue Hour)*	New Passengers Served Greater than 25% of Passengers On-board**	Increases Route Productivity	Meets PVTA Deviation Standard
G1/X90	Walmart Plaza Chicopee	21.35	Possibly X90, Yes G1	Yes X90, Possibly G1	Yes (both)
	Fairview Shopping Plaza	39.37	Yes	Yes	Yes
G1	Five Town Plaza	65.71	Yes	Yes	Yes
	Stop and Shop	4.09	No	No	No
G2	Mercy Hospital	22.67	Possibly	Possibly	Possibly
	East Longmeadow Industrial Park	0.08	No	No	No
	Cottage Street	6.46	No	No	No
G2/X90	Stop and shop Plaza	3.00	No	No	No
G3	Registry of Motor Vehicles	8.44	No	No	No
	Saab Court	12.95	No	No	No
B4	Clyde Street	68.18	Yes	Yes	Yes
G5	Six Corners	19.71	No	Yes	Yes
	Enfield	4.20	No	No	No
B6	Health South	6.86	Possibly	No	Possibly
B7/X92	Independence House	9.87	No B7, Possibly X92	No B7, Possibly X92	No B7, Possibly X92
B7	Walmart	24.00	Yes	Possibly	Yes
	Mass Mutual	15.00	No	No	No
	Price Rite	17.00	No	No	No

Route	Deviation	Deviation Productivity (Passengers/Revenue Hour)*	New Passengers Served Greater than 25% of Passengers On-board**	Increases Route Productivity	Meets PVTA Deviation Standard
R10	Westfield Shops	12.00	No	Possibly	Possibly
	East Mt View Apartments	1.11	No	No	No
	Union Street	6.36	Possibly	No	Possibly
	Western Mass Hospital	3.75	No	No	No
	Walmart	30.00	Yes	Yes	Yes
R14	West Side Big Y	19.69	No	Yes	Yes
	Walnut Street/Maple Street	4.80	Yes	No	Yes
	Heritage Nursing Home	2.14	No	No	No
	Pheasant Hill	7.50	No	No	No
P20	Riverdale Shops	21.65	Possibly	Possibly	Possibly
	Holy Family Road	15.23	Possibly	No	Possibly
P20/R24	Holyoke Shopping Center	19.88	No	Possibly P20, Yes R24	Possibly P20, Yes R24
B23/R24	Holyoke Hospital	13.71	No	Possibly B23, Yes R24	Possibly B23, Yes R24
	Soldiers Home	4.62	No	No	No
R24	Mont Marie	-	No	No	No
R29	Providence Hospital	7.27	No	Possibly	Possibly
30	Valley Medical	2.17	No	No	No
	Colonial Village	43.97	Yes	No	Yes
33	Cushman Center	7.14	No	No	No

Route	Deviation	Deviation Productivity (Passengers/Revenue Hour)*	New Passengers Served Greater than 25% of Passengers On-board**	Increases Route Productivity	Meets PVTA Deviation Standard
	Pulpit Hill	14.29	Yes	No	Yes
34	Orchard Hill	14.90	Yes	No	Yes
35	Orchard Hill	13.33	Yes	No	Yes
34/35	Olympia Drive	26.94	Yes	No	Yes
	Lot 12	27.45	Yes	No	Yes
38/B43	Amherst College	33.89	Yes B43, Possibly 38	Yes (both)	Yes
38/39/R29	Hampshire College	18.12	Yes 39, Yes 38, Possibly R29	Yes 39 & R29, Possibly 38	Yes (all)
R42	Veteran Medical Center	16.50	Yes	Yes	Yes
	Leeds	15.00	Yes	Yes	Yes
B43	Mountain Farms	42.00	Possibly	Yes	Yes
	Hampshire Mall	66.86	Possibly	Yes	Yes
R44	Stop & Shop Northampton	31.36	No	Yes	Yes
	High Street	-	No	No	No
	Hampshire County House of Corrections	6.82	No	No	No
	Florence Heights	12.27	Possibly	Yes	Yes
	Hampshire Plaza	41.82	Yes	Yes	Yes
45	Gatehouse Road	5.71	No	No	No
B48	Atwood Drive	4.50	No	No	No
X90	Montcalm Heights Apartments	6.43	No	No	No

Route	Deviation	Deviation Productivity (Passengers/Revenue Hour)*	New Passengers Served Greater than 25% of Passengers On-board**	Increases Route Productivity	Meets PVTA Deviation Standard
x92	Senior Center	5.45	No	No	No

Source: PVTA GTFS Feed and Stop level Ridership

*Deviation productivity was calculated by dividing the total amount of time daily devoted to performing the deviation by the daily ridership. To calculate the total deviation time, schedule data were used to determine the number of times a day the deviation occurs and the amount of time it takes to perform the deviation.

** Determination was based on daily ridership data provided, where the stop fell along the route, and ridership activity at the preceding stops.

Table 10. Branch Ridership (FY 2019)

Route	Branch	Riders per Trip
B6	Berkshire Avenue	0.7
B6	Pasco Road	1.1
G2	Big Y Plaza	4.7
G2	Benton via Dwight Road	1.0
R14	Route 147	3.7
R14	Industrial Park	1.5
R14	North Street	0.3
P21	Meadow Street	4.6
P21	Chicopee Street	1.9
X90	A trip	2.8
X90	B trip	2.7

Source: PVRTA GTFS Feed and Stop level Ridership

4.2.2 Annual Revenue Hours

PVRTA had 554,350 revenue hours during FY 2019 (Table 11). The majority of the hours were for fixed route bus service (67 percent, producing 98 percent of ridership) and 33 percent was generated by demand response services, producing the remaining 2 percent of ridership. Overall, PVRTA revenue hours increased between FY 2015 and FY 2017 and then decreased in FY 2018 and FY 2019 (several service reductions occurred during this period due to level funding and increased operating costs). In FY 2019, the total revenue hours decreased by 5 percent compared to FY 2018. Some service changes made during this time period had an impact on hours; as one example, the Ware and Palmer shuttles were merged, and their hours drastically cut in September 2018 also as a result of level funding and increased operating costs. Overall, the revenue hours decreased by approximately 0.3 percent between FY 2015 and FY 2019; this is less than the decline in ridership during the same period, which was 16.2 percent.

Table 11. Annual Revenue Hours (FY 2015–FY 2019)

Service Type	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Bus	368,158 (66.2%)	392,667 (67%)	398,593 (67.1%)	383,227 (65.3%)	367,241 (66.2%)
Demand Response	188,026 (33.8%)	193,711 (33%)	195,340 (32.9%)	203,348 (34.7%)	187,109 (33.8%)
TOTAL	556,184 (100%)	586,378 (100%)	593,933 (100%)	586,575 (100%)	554,350 (100%)

Source: NTD

4.2.3 Annual Revenue Miles

In FY 2019 PVTA had a total of 7,671,513 revenue miles. Revenue miles operated increased from FY 2015 to FY 2018 and then began to decrease by 4.2 percent between FY 2018 and FY 2019. Demand response has declined by 4.0 percent since FY 2015. Table 12 shows the annual trends in revenue miles over the past five fiscal years.

Table 12. Annual Revenue Miles (FY 2015–FY 2019)

Service Type	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Bus	4,932,766 (62.1%)	5,213,063 (62.6%)	5,266,583 (64.0%)	5,020,685 (63.2%)	4,856,166 (63.8%)
Demand Response	3,008,563 (37.9%)	3,112,275 (37.4%)	2,967,455 (36%)	2,926,913 (36.8%)	2,761,347 (36.2%)
TOTAL	7,941,329 (100%)	8,325,338 (100%)	8,234,038 (100%)	7,947,598 (100%)	7,617,513 (100%)

Sources: NTD, RTA Service Data FY 2015 to FY 2019

4.2.4 Annual Operating Cost

In FY 2019, the total annual operating cost was \$54,083,176, an increase of approximately \$8 million from FY 2015. This represents an annual average increase in cost of 4.8 percent from FY 2015 to FY 2019. Although revenue hours and revenue miles have been decreasing in recent years, the operating cost did not decrease for either bus or demand response services. The largest increase was seen between FY 2018 and FY 2019. Additionally, including in PVTA annual operating costs are administrative salaries, taxes, and fringe benefits. Between FY 2015 and FY 2018 administrative costs ranged between \$4.1 million and \$4.8 million; however, in FY 2019 administrative costs increased by approximately \$900,000 from FY 2018 levels.

According to PVTA financial statements, the FY 2019 actual costs exceeded its FY 2019 budget by approximately \$4.2 million in bus service and \$900,000 in administration costs in order to account for PVTA's adjustment to its net pension and other postemployment benefit liabilities.³³ Table 13 shows the annual trends in operating costs over the past five fiscal years. Overall, between FY 2015 and FY 2019 the cost to operate bus service increased by 20.2 percent and demand response by 15 percent.³⁴

Table 13. Annual Operating Cost (FY 2015–FY 2019)

Service Type	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Bus	\$33,217,259 (74%)	\$33,717,165 (71%)	\$34,089,216 (72%)	\$34,439,278 (73%)	\$39,934,939 (74%)
Demand Response	\$7,794,846 (17.3%)	\$8,669,159 (18.3%)	\$8,231,868 (17.5%)	\$8,646,729 (18.3%)	\$8,963,922 (16.6%)
Administration	\$4,128,474 (9.1%)	\$4,872,550 (10.3%)	\$4,700,613 (10%)	\$4,287,638 (9.1%)	\$5,184,315 (9.6%)
TOTAL	\$45,140,579 (100%)	\$47,258,874 (100%)	\$47,021,697 (100%)	\$47,373,645 (100%)	\$54,083,176 (100%)

Sources: PVTA Audited Financial Statements FY 2015-FY 2019

³³ Liabilities are determined through actuarial valuations performed by financial advisors.

³⁴ Note that Massachusetts minimum wage increased significantly (by more than 50%) in this time period. At the start of FY 2015 minimum was \$8.00/hour, while today it is \$12.75. This has a particularly large impact on the cost of providing service.

Annual expenditures by PVTA operators, SATCo and VATCo, UMTS, and Hulmes are outlined in Table 14. From FY 2015 and FY 2019 expenditures by SATCo and VATCo were between 86 and 88 percent of the total expenditures by all operators. For SATCo, VATCo, and UMTS expenditures generally increased from year to year, whereas Hulmes expenditures decreased by 12 percent in the last five fiscal years (largely due to a reduction in service on routes they operate). Overall, operator expenditures increased by 14 percent, while annual revenue hours and annual revenue miles experienced an inverse effect.

Table 14. Annual Expenditures by Fixed Route Operator (FY 2015–FY 2019)

Bus Operators	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
SATCo/ VATCo	\$26,861,601 (87%)	\$28,563,356 (88%)	\$28,304,458 (87%)	\$29,219,542 (86%)	\$30,838,186 (87%)
UMTS	\$3,788,745 (12.3%)	\$3,792,665 (11.6%)	\$3,866,851 (11.9%)	\$4,453,714 (13.1%)	\$4,412,986 (12.4%)
Hulmes (shuttles)	\$262,026 (0.8%)	\$244,921 (0.8%)	\$232,737 (0.7%)	\$242,244 (0.7%)	\$230,291 (0.6%)
TOTAL	\$30,912,372 (100%)	\$32,600,942 (100%)	\$32,404,046 (100%)	\$33,915,500 (100%)	\$35,481,463 (100%)

Source: PVTA Budget FY 2015-FY 2019

4.2.5 Annual Revenue

Each year PVTA earns between \$7.0 and \$7.9 million in farebox revenue across its bus and demand response service.³⁵ Between FY 2015 and FY 2019 fare revenue decreased by 3 percent. However, in FY 2019, PVTA increased the fares for fixed route, monthly bus pass, and paratransit service by approximately 20 percent starting July 1, 2018. As a result of this fare change, PVTA fare revenue increased by 7 percent from FY 2018. Fare revenue between FY 2015 and FY 2019 is presented in Table 15.

Table 15. Fare Revenue (FY 2015–FY 2019)

Service Type	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Motor Bus	\$7,057,617 (90.7%)	\$7,146,956 (89.9%)	\$6,559,719 (89.9%)	\$6,294,861 (89.8%)	\$6,732,600 (89.4%)
Demand Response	\$722,680 (9.3%)	\$803,792 (10.1%)	\$734,004 (10.1%)	\$716,660 (10.2%)	\$794,068 (10.6%)
TOTAL	\$7,780,297 (100%)	\$7,950,748 (100%)	\$7,293,723 (100%)	\$7,011,521 (100%)	\$7,526,668 (100%)

Sources: PVTA Audited Financial Statements FY 2015-FY 2019

PVTA has contracts with partner organizations including Springfield Technical Community College, Westfield State College, Holyoke Community College (HCC), Five Colleges, Springfield Public Schools, Hampden County Sherriff, UMass Amherst, and MGM Springfield (Table 16). These contracts cover the cost of fares for either the organization's members or the general public depending upon the route. In all contracts except the UMass Amherst contract, the contracting organization covers the cost of operating the route by paying PVTA. UMass Amherst holds an operating contract with PVTA and absorbs a certain value of the cost for operations, in lieu of reimbursement for service from PVTA. Table 16 shows the organizations contracted with in order of increasing contract revenue.

³⁵ Does not include contract revenue generated.

Table 16. Operating Contract Revenue (FY 2019)

Organization Contracted With	Annual Contract Revenue	Contract Purpose
Westfield State College	\$67,893.00	R10
Holyoke Community College (HCC)	\$86,346.50	UPass for students
Five Colleges	\$91,323.00	Routes B43, 39, 38, 39E
Hampden County Sheriff	\$92,573.04	Route B12
Westfield State College Owl Shuttle	\$92,893.00	OWL
Springfield Technical Community College	\$97,019.20	UPass for students
MGM Springfield	\$171,078.00	The Loop route
UMass Amherst	\$500,000.00	Covers portion of UMass Transit operating costs
Springfield Public Schools	\$576,073.00	Student passes good for Springfield routes during select times when school is in session

Source: Email correspondence with PVTA

4.3 Safety and Security

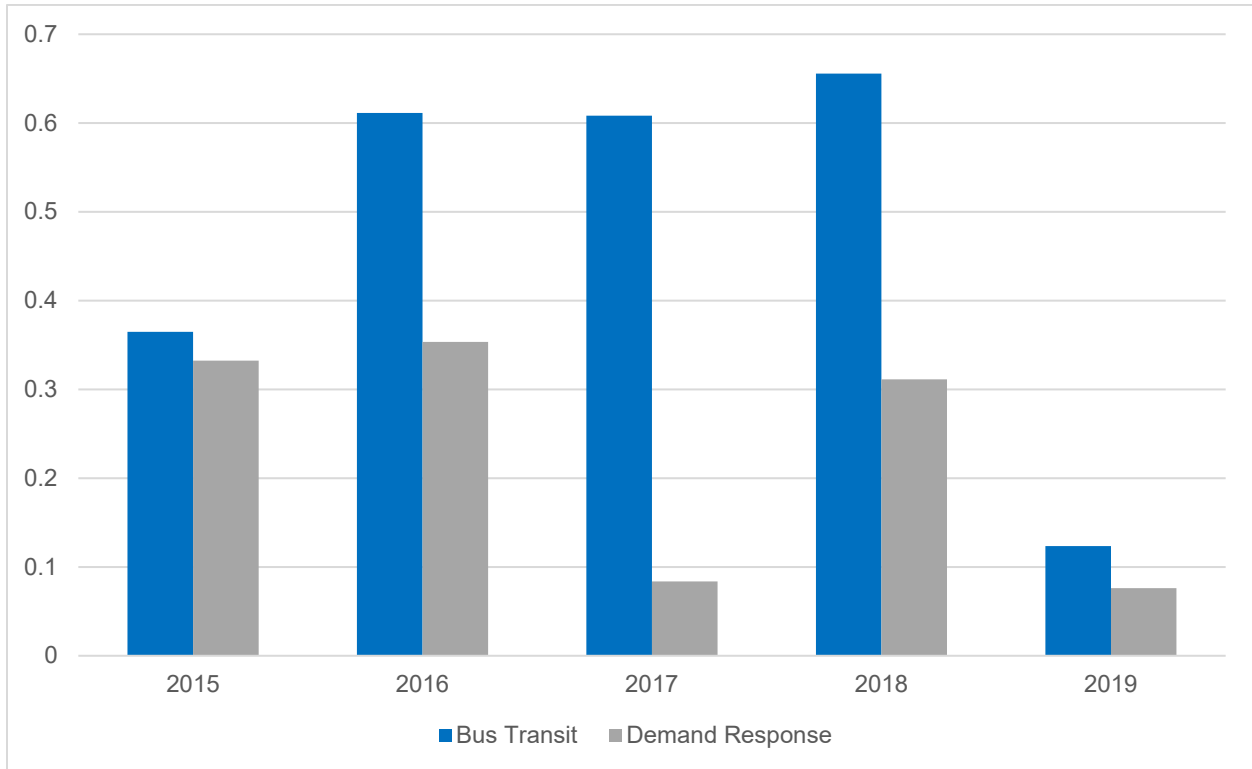
FTA rule 49 CFR 673 requires transit operators who are recipients or sub-recipients of Section 5307 funding to develop Public Transportation Agency Safety Plans (PTASP) that include the processes and procedures to implement safety management systems by December 31, 2020. PVTA established a Safety Committee that reflected the intent of the CFR 673 in August 2019. This committee included representatives from across the organization at all levels and began work on the development of the Agency Safety Plan. The final plan was approved by the Advisory Board in March 2020.

As part of the PTASP, performance targets based on safety performance measures (fatalities, injuries, safety events, system reliability) must be established in a National Public Transportation Safety Plan. PVTA adopted the following safety targets for FY 2021:

- **Fatality Rate:** 0.0058 per million vehicle miles traveled
- Rate of incapacitating injuries: 0.0437 per million vehicle miles traveled
- Target fatalities: 0
- Target for incapacitating injuries: 0

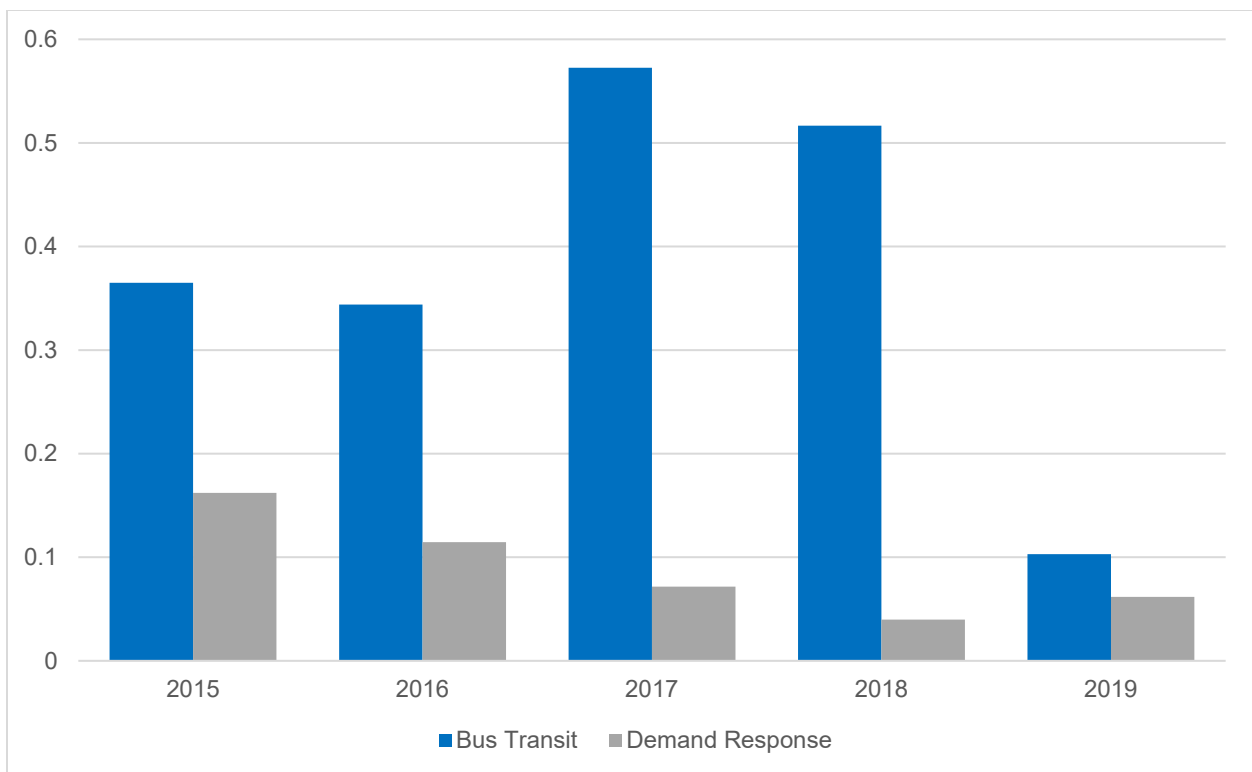
PVTA and the Safety Committee will continue to review and refine safety targets to address shortcoming and goals identified by the committee and front line employees on an annual basis. PVTA recorded zero fatalities in both bus and demand response services between 2015 and 2019. During the same time period, the number of injuries and safety events per 100,000 revenue miles for fixed route was the highest between FY 2016 and FY 2018. The number of injuries (Figure 31) and safety events (Figure 32) per revenue miles declined in 2019. PVTA is still in the process of establishing targets per PTASP.

Figure 31. PVTA Injuries by Mode (FY 2015–FY 2019)



Source: 2019 NTD Safety and Security Time Series data for PVTA.

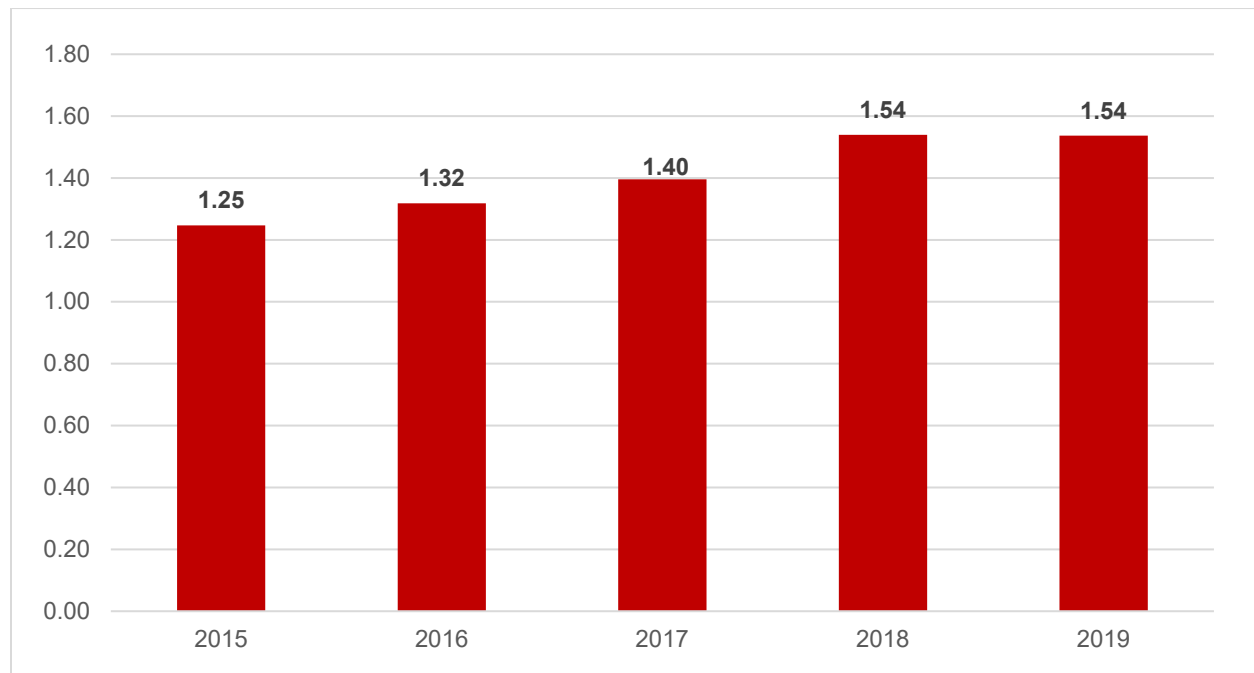
Figure 32. PVTA Safety Events by Mode (FY 2015–2019)



Source: 2019 NTD Safety and Security Time Series data for PVTA.

Preventable accidents are used to measure safety. An accident is considered preventable when the operator has failed to do everything reasonable to prevent the accident. Preventable accidents per 100,000 miles are calculated by dividing the number of miles by the number of preventable accidents in a given time period. Preventable accidents per 100,000 miles for PVTA increased from 1.25 in FY 2015 to 1.54 in FY 2018 and FY 2019 (Figure 33). PVTA has an internal FY 2019 goal of 1.75 preventable accidents per 100,000 miles, which PVTA was below in FY 2019.

Figure 33. Preventable Accidents per 100,000 Miles (FY 2015–FY 2019)



Source: PVTA

4.4 Asset Management

PVTA is required by FTA to develop a plan to inventory and maintain the agency's assets. Pursuant to this requirement, PVTA developed a TAM Plan in 2018. As a Tier 1 agency, PVTA's TAM Plan provides a detailed description of the current capital assets and the needs for the transit agency.

The TAM Plan also identifies PVTA's Capital Improvement Program for FY 2019 to FY 2023. The Capital Improvement Plans also aligns with the regional Metropolitan Planning Organization's Transportation Improvement Plan. The capital program specifies the type of capital investment by category: vehicles, facilities, equipment (including non-revenue vehicles), and systems. Throughout the year, PVTA may also perform additional informal prioritization processes, and re-allocate funds to address any asset needs that arise during routine quarterly facility inspections and monthly vehicle inspections. Specific capital improvements are outlined in Table 17.

Table 17. Programmed List of Capital Investments (FY 2019–FY 2023)

Fiscal Year	Vehicles	Facilities	Equipment	Systems	Total Planned Capital Cost
FY 2019	Replace: <ul style="list-style-type: none"> • 8 Buses • 27 Minivans 	<ul style="list-style-type: none"> • Cottage Street Bus O&M Facility • PVTA Main Street Maintenance Garage (SATCo) • UMass Bus O&M Facility/University Transit Services 	Replace: <ul style="list-style-type: none"> • 6 Nonrevenue vehicles • Bus shelters • Other equipment* 	Information systems (security infrastructure, communications, monitoring, and revenue collection)	\$23,757,731
FY 2020	Replace: <ul style="list-style-type: none"> • 25 Buses 	<ul style="list-style-type: none"> • PVTA Main Street Maintenance Garage (SATCo) • Northampton Bus Maintenance Facility (VATCo) 	Replace: <ul style="list-style-type: none"> • 4 Nonrevenue vehicles • Bus shelters • Other equipment* 	Information systems (security infrastructure, communications, monitoring, and revenue collection)	\$18,898,435
FY 2021	Replace: <ul style="list-style-type: none"> • 32 Buses 	–	Replace: <ul style="list-style-type: none"> • 2 Nonrevenue vehicles • Bus shelters • Other equipment* 	Information systems (security infrastructure, communications, monitoring, and revenue collection)	\$22,605,645
FY 2022	Replace: <ul style="list-style-type: none"> • 25 Buses • 24 Minivans 	–	Replace: <ul style="list-style-type: none"> • 7 Nonrevenue vehicles • Bus shelters • Other equipment* 	Information systems (security infrastructure, communications, monitoring, and revenue collection)	\$20,384,119
FY 2023	Replace: <ul style="list-style-type: none"> • 25 Buses • 9 Minivans 	<ul style="list-style-type: none"> • Northampton Bus Maintenance Facility (VATCo) • HTC 	Replace: <ul style="list-style-type: none"> • Bus shelters • Other equipment* 	Information systems (security infrastructure, communications, monitoring, and revenue collection)	\$20,075,943

Source: PVTA TAM Plan, 2018

*Equipment includes special tools for bus and van repairs including tires; replacing worn or damaged tools and enhancements for the paratransit maintenance shop equipment.

4.4.1 Facilities

PVTA has direct capital responsibility for four O&M facilities, two transit centers, and one administration building. The new, state-of-the-art, 224,000 square-foot fixed route bus O&M facility on Cottage Street used by SATCO has been in operation since May 2019, replacing PVTA's 2840 Main Street facility, which was undersized and inadequate to serve the needs of the fixed route bus system. The new facility provides light- and heavy-duty maintenance, fueling, and indoor storage to PVTA's fleet of 189 diesel-fueled and electric-powered fixed route buses. The administration office at 2808 Main Street is over 100 years old and a former fire station. The facility adjacent to the former SATCO O&M facility at 2840 Main Street in Springfield is a satellite maintenance facility currently used for maintaining gas-powered vehicles and select functions not available at the Cottage Street facility. PVTA received a grant in 2018 to upgrade the 2840 Main Street maintenance facility to a facility that would be used for both maintenance and paratransit operations.³⁶ This upgrade was substantially complete in April 2020 and NEXT began operating out of 2840 Main Street in April.

In the northern tier PVTA owns a facility in Northampton and on the UMass campus in Amherst. The Northampton facility, located at 54 Industrial Park Drive, houses O&M for VATCO operations. The O&M facility in Amherst consists of two buildings and is in the northwest corner of campus.

PVTA operates three passenger facilities: HTC at 206 Maple Street in Holyoke, Union Station at 55 Frank B Murray Street in Springfield, and Westfield Olver Transit Pavilion at 10 Arnold Street in Westfield. HTC has seven loading bays and a public waiting/customer service area. The Westfield Olver Transit Pavilion has four loading bays and a 2,800 square foot building with a public waiting/customer service area. PVTA leases 18 bus berths; 2,300 square feet of office space, and 1,800 square feet of waiting area at the Union Station.

Table 18 summarizes the facilities, type, location, direct capital responsibility, operator, and Transit Economic Requirements Model (TERM) rating. Targets are required to be set by PVTA for each applicable asset class for the coming year. For facilities, the performance measure is the percentage of facilities rated below condition 3 on the TERM scale. The table includes the condition ratings for all facilities that PVTA has direct capital responsibility for. PVTA is required to inventory all the passenger facilities in the TAM Plan and report to NTD regardless of direct capital responsibility; however, condition assessments and targets are not required for the facilities that PVTA does not have direct capital responsibility for. PVTA does not have direct capital responsibility for facilities such as HTC Info Center, NEXT, Springfield Information Center, and Union Station Bays; therefore, PVTA is not required to provide the condition ratings for them.

As shown in the table, the two buildings at 2840 Main Street are the only facilities with a TERM rating below 3. The lower rating means the facility is in marginal condition and the asset has met its useful life, although it performs its designed function. The two new facilities, Olver Transit Pavilion and Cottage Street, have the top rating of 5.

Table 18. Facility Inventory Summary

Facility Name	Type	Location	Direct Capital Responsibility	Operator	TERM Rating
Administration Building	Administration office / sales office	2808 Main Street, Springfield	Yes	PVTA	3

³⁶ *Daily Hampshire Gazette*, "PVTA gets \$2.4M to upgrade garage," 10/10/2018, [https://www.gazettenet.com/PVTA-awarded-\\$2-4-million-for-improving-bus-maintenance-garage-in-Springfield-20765486](https://www.gazettenet.com/PVTA-awarded-$2-4-million-for-improving-bus-maintenance-garage-in-Springfield-20765486).

Facility Name	Type	Location	Direct Capital Responsibility	Operator	TERM Rating
HTC Bays	Passenger - bus transfer center	206 Maple Street, Holyoke	Yes	Springfield Area Transit Company	4
HTC Info Center	Administration office / sales office	206 Maple Street, Holyoke	No	PVTA	N/A
National Express Transit	General purpose maintenance facility/depot	Springfield	No	NEXT	N/A
Northampton Bus Maintenance Facility (VATCo)	Maintenance facility (service and inspection)	54 Industrial Drive, Northampton	Yes	Valley Area Transit Company	4
PVTA Main Street Maintenance Garage (SATCo)	Maintenance facility (service and inspection)	2840 Main Street, Springfield	Yes	Springfield Area Transit Company	2
PVTA Main Street Maintenance Garage (SATCo) Barn	Maintenance facility (service and inspection)	2840 Main Street, Springfield	Yes	Springfield Area Transit Company	2
Springfield Information Center	Administration office / sales office	665 Cottage Street, Springfield	No	PVTA	N/A
UMass Bus O&M Facility/University Transit Services	Maintenance facility (service and inspection)	185 Holdsworth Way, Amherst	Yes	UMTS	3
UMass Bus O&M Facility/University Transit Service - RTIC	Maintenance facility (service and inspection)	185 Holdsworth Way, Amherst	Yes	UMTS	4
Union Station Bays	Administration office / sales office	55 Frank B Murray Street, Springfield	No	SATCo	N/A
Westfield Olver Transit Pavilion	Passenger - bus transfer center	10 Arnold Street, Westfield	Yes	PVTA	5
Cottage Street Fixed Route Bus O&M Facility	Maintenance facility (service and inspection)	649 Cottage Street, Springfield	Yes	PVTA	5

Source: PVTA 2018 TAM Plan

4.4.2 Vehicles

Table 19 provides a summary of the revenue vehicles (rolling stock) and non-revenue vehicles (service vehicles) asset inventory. PVTA has 362 active revenue vehicles and 54 non-revenue in its inventory. Revenue vehicles fall into six primary categories: 4 articulated buses, 175 buses (including both 40 foot and 35 foot vehicles [heavy duty]), 8 minibuses (non-cutaway less than 35 feet), 7 cutaway buses, 166 minivans, and 2 trolley buses. The average age of the revenue vehicle fleet is 6.6 years. PVTA has 54 non-revenue service vehicles that fall into two categories: 25 trucks or other non-revenue vehicles and 29 automobiles. The average age of the non-revenue vehicles is 6.1 years.

Table 19 also summarizes PVTA's vehicles' ULB and the percentage of vehicles that are at or past the ULB. The condition of each revenue vehicle is based on each vehicle's age relative to its ULB. It is important to look at the age and condition of the overall fleet as vehicles approaching their ULB are often more costly to maintain and have higher instances of road calls. Calculations for average age and ULB are based on the fiscal year of the in-service date for each vehicle. In total, PVTA currently has 67 revenue vehicles (18.5 percent of the fleet) that are at or past their ULB, including 34 buses, 8 minibuses, 1 cutaway bus, 22 minivans, and 2 trolley buses. Additionally, PVTA has 9 trucks and other non-revenue vehicles and 9 automobiles that are at or past their ULB.

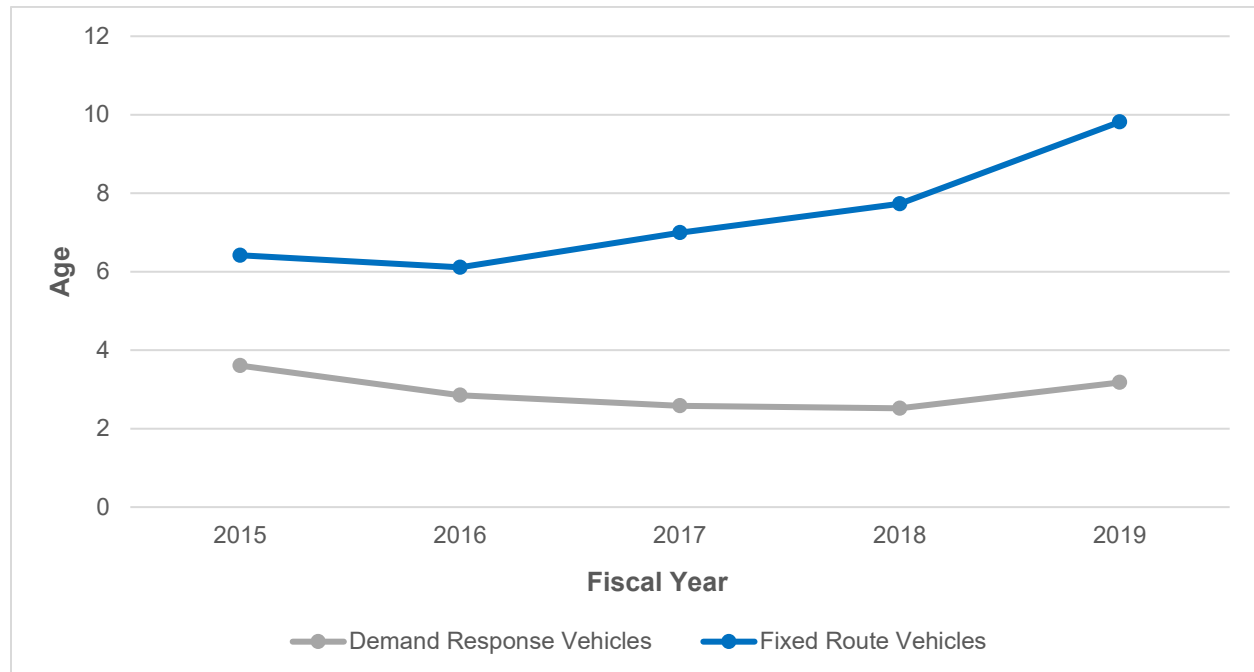
Table 19. Equipment Inventory Summary

Vehicle Type	Total Number	Average Age	ULB	Count at Past ULB	% at or Past ULB
Articulated bus	4	7.0	12	0	0%
Bus	175	7.2	12	34	19%
Cutaway bus	7	4.7	7	1	14%
Minibus	8	14	10	8	100%
Minivan	166	3.2	4	22	13%
Rubber-tired vintage trolley	2	19	13	2	100%
Trucks and other non-revenue	25	8.48	10	9	36%
Automobile (non-revenue)	29	4	8	9	31%
Revenue vehicles	362	6.6	—	67	—
Non-revenue vehicles	54	6.1	—	18	—

Sources: PVTA Vehicle and Facility Inventory Audit 2019, PVTA 2018 TAM Plan

The age of PVTA's fleet of fixed route and demand response vehicles is shown in Figure 34. Between FY 2015 and FY 2019 the age of fixed route vehicles increased, while the age of demand response vehicles declined. On average, demand response vehicles are 2.9 years, while fixed route vehicles are 7.4 years. However, vehicle age is only one component of maintaining a fleet of vehicles relative to its ULB.

Figure 34. Fleet Age (FY 2015–FY 2019)



Source: NTD Vehicle Inventory (FY 2015-FY 2018); FY 2019 PVTA Vehicle Audit

4.4.2.1 Spare Ratio

Spare ratio, expressed as a percentage, is defined as the number of spare vehicles divided by the vehicles required for annual maximum service. FTA sets a guideline that the number of spare buses in the active fleet for grantees operating 50 or more revenue vehicles should not exceed 20 percent of the number of vehicles operated in maximum service. Vehicles operated in maximum service includes the number of revenue vehicles operated to meet the annual maximum service requirement and includes the revenue vehicle count during the peak season of the year, on the week and day that maximum service is provided. The spare ratio for both fixed route and demand response is twice that of the recommended guideline (Table 20).

Table 20. Spare Ratio for Revenue Vehicles (FY 2019)

Vehicle Type	Total	Active	Contingent	Inactive	Maximum in Service	Spare Ratio
Fixed Route	198	196	0	2	140	40%
Demand Response	186	166	0	20	111	49.5%
Total	384	362	0	22	251	44.2%

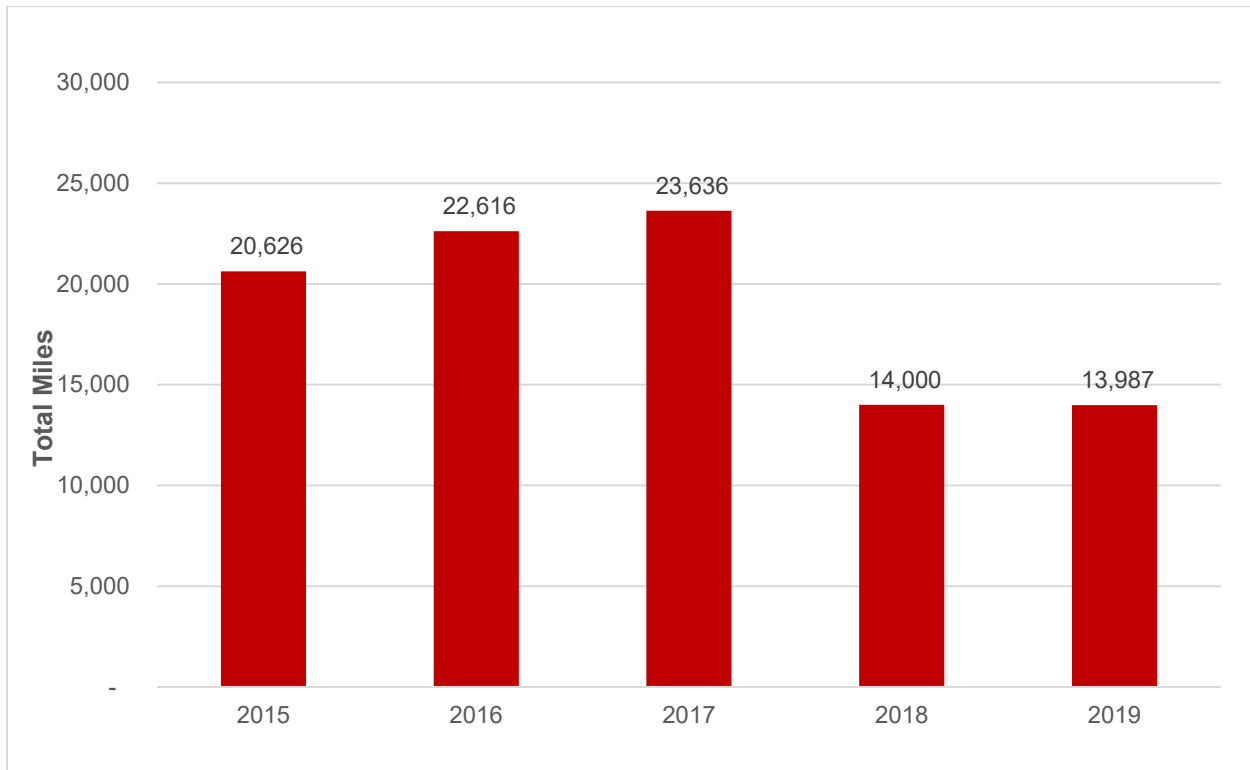
Source: PVTA 2018 TAM Plan, NTD Time Series Data

4.4.2.2 Road Calls

A road call is a mechanical failure of a bus in revenue service that necessitates removing the bus from service until repairs are made. Frequency of road calls is monitored to measure maintenance performance but is also an indicator of an aging fleet. Each road call disrupts service and creates an inconvenience to customers. Average miles operated between failures or road calls provide PVTA an overview of the effectiveness of their preventive maintenance programs and repair maintenance programs. The average miles between road calls show an increasing trend from FY 2015 to FY 2017. In FY 2018, miles between road calls decreased to

14,000 from 23,636 in FY 2017 and remained steady between FY 2018 and FY 2019 (Figure 35). However, road calls declined starting in FY 2018. The miles between road calls internal goal for PVTA systemwide is 20,759, which PVTA was below in both FY 2019 and FY 2018.

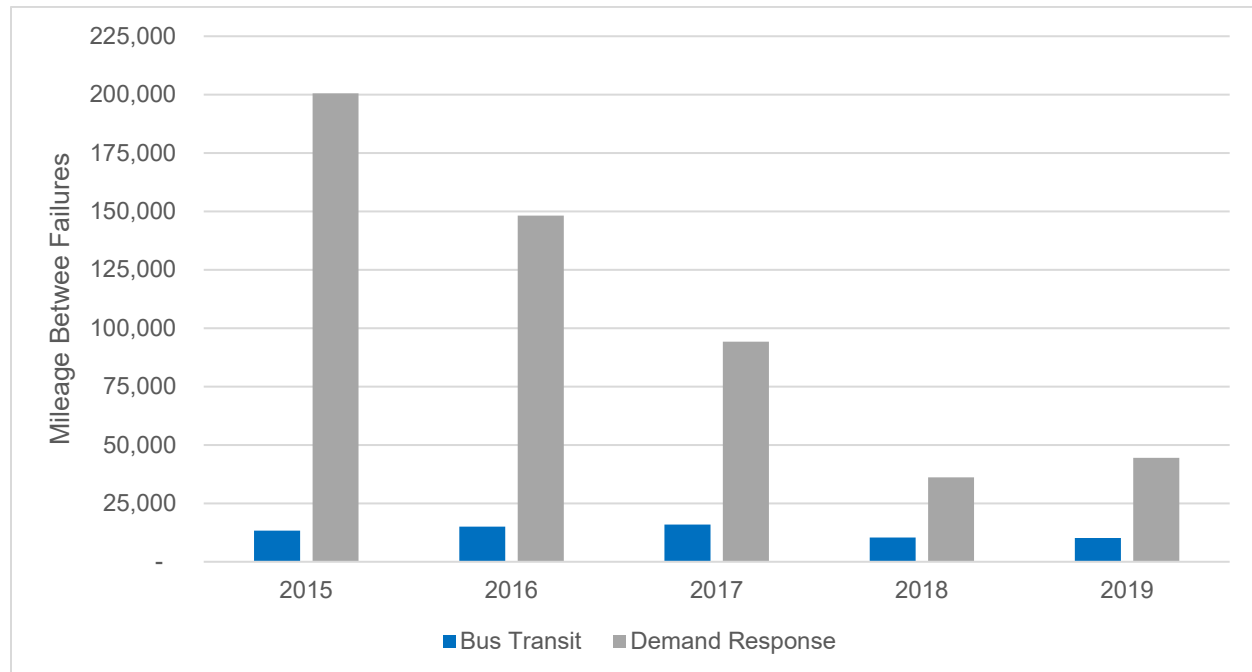
Figure 35. Miles Between Road Calls (2015–2019)



Source: MassDOT BlackCat

4.4.2.3 Mechanical Failures

A mechanical failure of a revenue vehicle prevents the vehicle from completing a scheduled revenue trip or from starting the next scheduled revenue trip because actual movement is limited or because of safety concerns. Mechanical failures can result in missed trips, are often tied to road call levels, and can necessitate higher spare ratios in order to maintain service. System reliability, which measures mechanical failures per vehicle revenue miles, is higher for demand response vehicles than fixed route buses for each fiscal year. In FY 2019, demand response service had one mechanical failure per 44,519 miles and fixed route buses had one mechanical failure per 10,202 miles (Figure 36). The systemwide average for fixed route bus and demand response services is 13,987 miles.

Figure 36. Major Mechanical Failures (2015–2019)

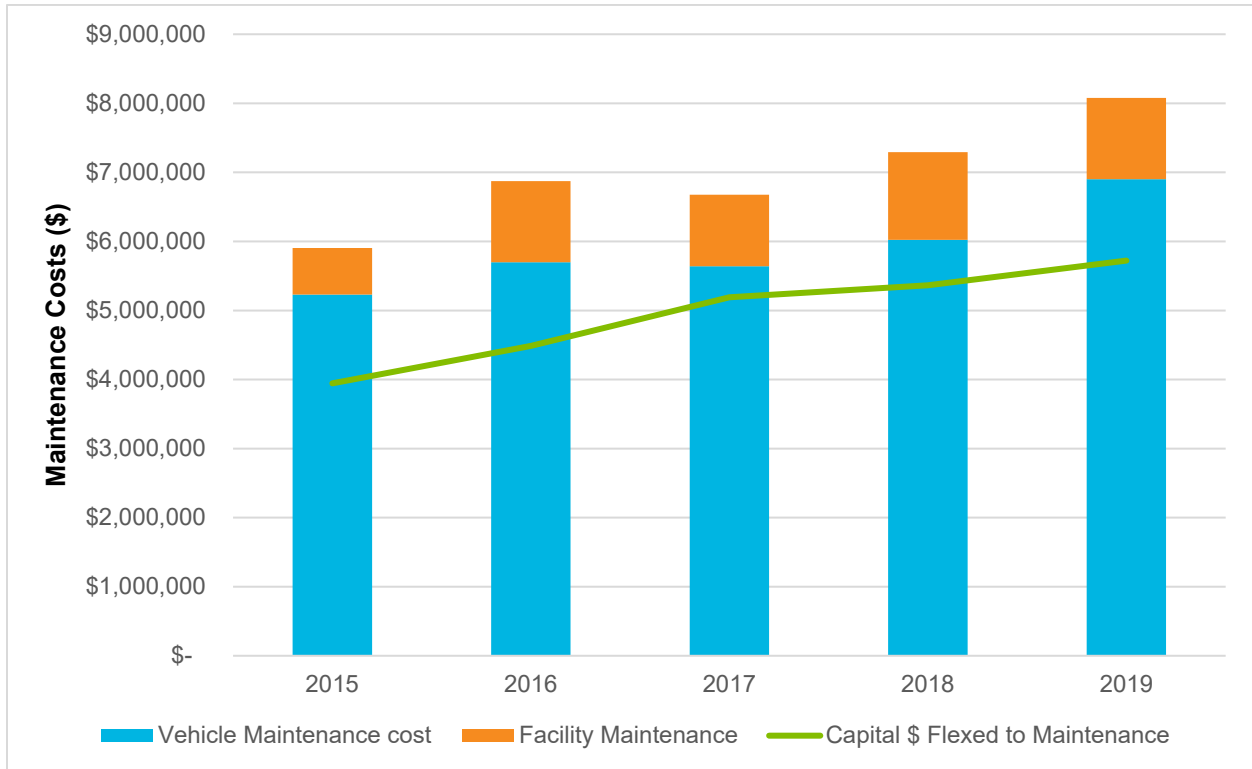
Source: MassDOT BlackCat and PVTA

4.4.2.4 Maintenance Costs

The cost of maintenance for PVTA in FY 2019 was just over \$8 million, with 85 percent for vehicle maintenance and the remaining 15 percent for facility maintenance (Figure 37). Of the overall \$8 million maintenance budget, 71 percent of it is flexed over from capital, an increase of 45 percent in FY 2019 from FY 2015. The maintenance cost per revenue vehicle in FY 2019 was \$19,065, up 18 percent from FY 2015. It is anticipated that maintenance costs would rise for PVTA; the average age of the fleet has increased over time when vehicles were not replaced as they met their useful life, resulting in an older fleet.

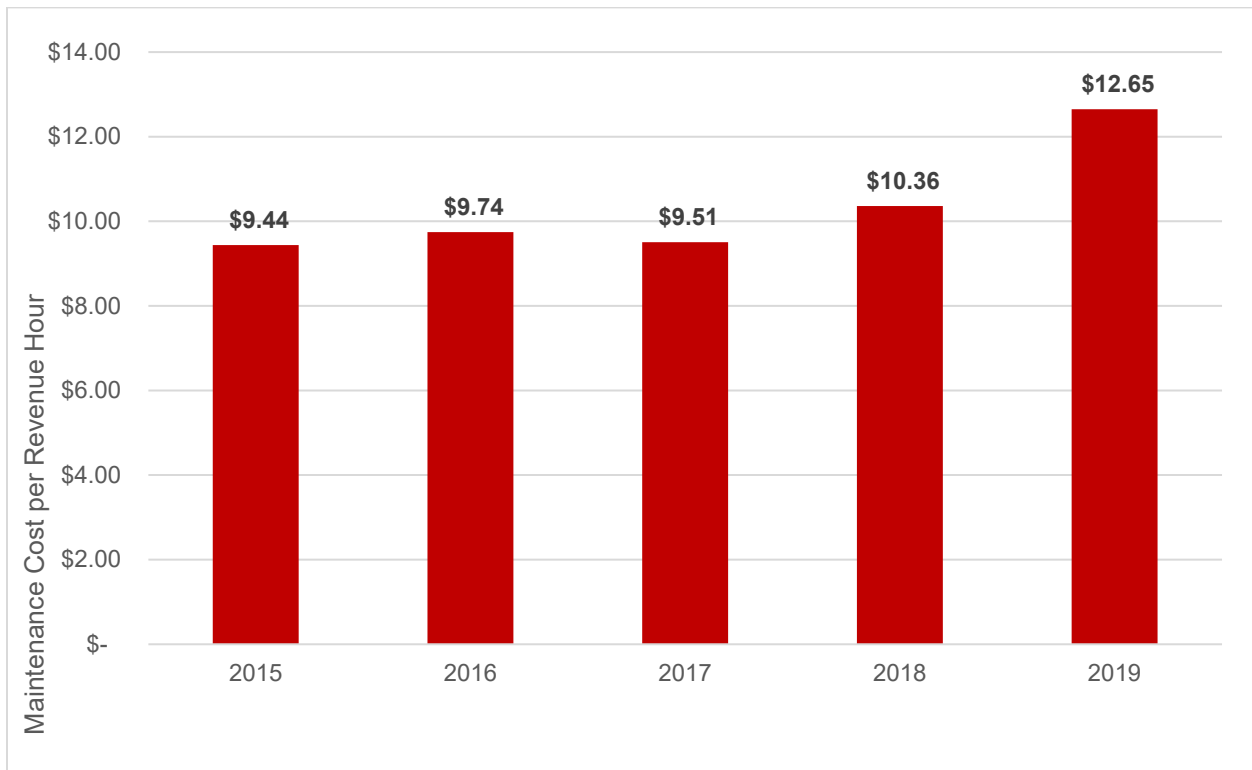
Maintenance cost per revenue hour is used to measure cost efficiency of maintaining vehicles and the effectiveness of a maintenance program. A lower cost per revenue hour generally indicates a more effective preventive maintenance program but can also be an indicator of fleet age as newer vehicles require less maintenance. The maintenance cost per revenue hour for PVTA has been increasing in recent fiscal years, which is in line with the overall cost trends (Figure 38). In FY 2019, the maintenance cost per revenue hour was \$12.65, which is an increase of 22 percent compared to FY 2018. Overall, the maintenance cost per revenue hour increased by 34 percent from FY 2015 to FY 2019. This trend is likely correlated with the aging PVTA fleet, especially for fixed route vehicles, which have increased in age from approximately 6 years in FY 2015 to 10 years in FY 2019. With 362 revenue vehicles in its inventory it is to be expected that aging vehicles would require more maintenance and thus generate higher maintenance costs.

Figure 37. Maintenance Costs (2015–2019)



Source: PVTA

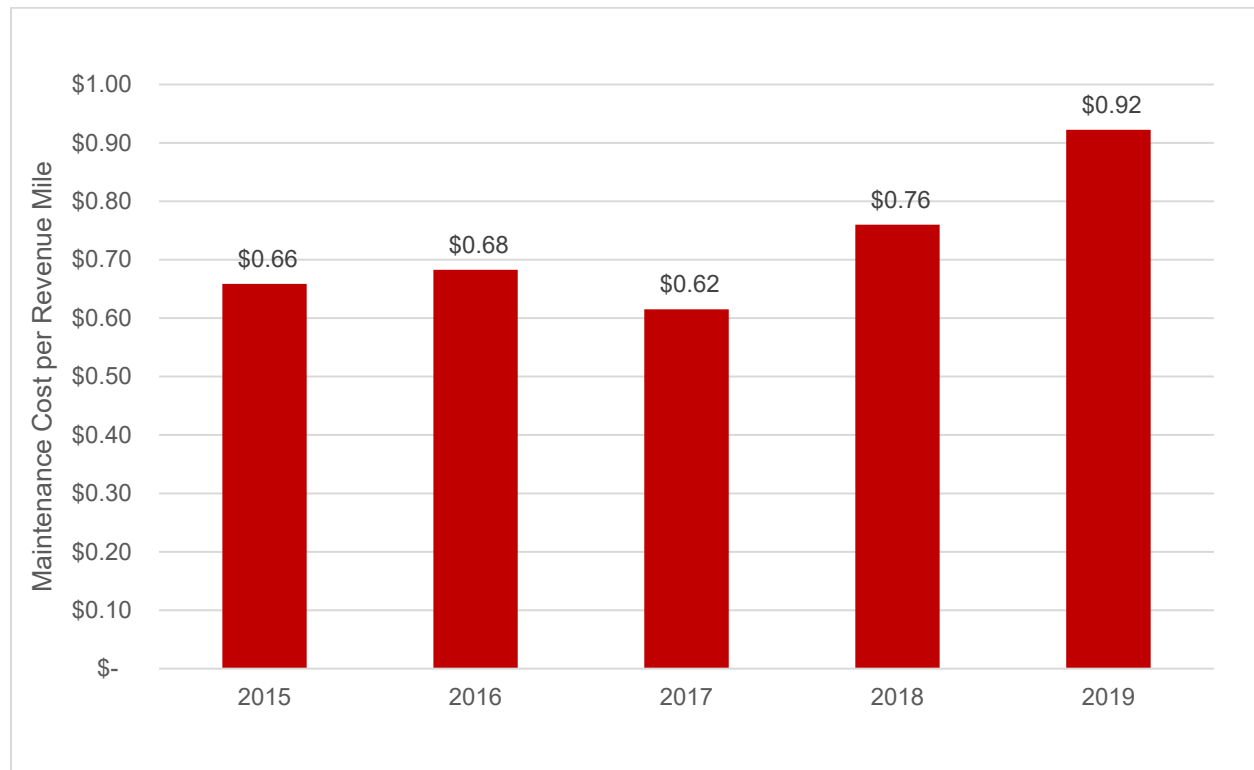
Figure 38. Vehicle Maintenance Cost per Revenue Hour (2015–2019)



Source: MassDOT BlackCat; PVTA

Maintenance cost per revenue mile is another cost efficiency measure used to examine the effectiveness of a maintenance program. The lower the cost per revenue mile, the more effective the preventive maintenance program. Additionally, maintenance costs correlate with increasing vehicle age. The maintenance cost per revenue mile analysis for PVTA shows an increasing trend for the past 5 years, although there was a small drop in cost during FY 2017 (Figure 39). In FY 2019, the maintenance cost per revenue mile was \$0.92, which is an increase of 21 percent compared to FY 2018. Overall, the maintenance cost per revenue mile increased by 40 percent from FY 2015 to FY 2019.

Figure 39. Vehicle Maintenance Cost per Revenue Mile (2015–2019)



Source: MassDOT BlackCat; PVTA

4.4.3 Technology

PVTA uses the following information technology, which are divided into six categories: (1) Communications, (2) Revenue Collection Systems, (3) Safety and Security Infrastructure, (4) Operations, (5) Asset and Financial Management, and (6) Information Services.

4.4.3.1 Communications

Communications technology includes radio equipment, communication towers, antennas, and related equipment, along with supporting software, hardware, and any transit signal priority (TSP) technology. Due to changes in available technology PVTA converted to cellular data communications (AT&T FirstNet) from land mobile radio. Each vehicle is equipped with a 1100IVR Cradlepoint, which acts as an onboard communication router to wirelessly transfer data to and from the vehicles. PVTA utilizes Opticom TSP system, which provides a green light when transit vehicles need to stay on time and move efficiently through traffic.

4.4.3.2 Revenue Collection

Revenue collection systems include fareboxes, money counters, and point-of-service software. PVTA utilizes the Genfare (GFI) fare collection system on fixed route buses for automatic fare collection launched on July 19, 2020. PVTA has partnered with MassDOT and Brockton Area Transit (BAT) to capitalize on a contract MassDOT has with Bytemark to provide mobile payment. The Bytemark solution is a visual validation fare system that will allow a user to set up an account and purchase a PVTA fare. When activated the fare will display on their cell phone for validation by the bus driver.

4.4.3.3 Safety and Security

Security infrastructure includes cameras, access control hardware, network video recorders, and systems. Systems include fixed route video, paratransit video, and facility video. PVTA replaced the fixed route video system in FY 2018. The new system, Safefleet MobileView, is a fully IP, high-resolution video system. Additionally, PVTA will explore the possibility of emergency live “look-in” functionality using Cradlepoint, which was installed on all fixed route vehicles as part of the project to support wireless video offload. PVTA continues to deploy the Samsung NVR, Cradlepoint, and camera solution in paratransit vehicles. All new vehicles are being equipped with the NVR and IP cameras.

4.4.3.4 Operations

PVTA uses Adept, Avail, Hastus, Trapeze, and an in-house reporting system to manage O&M. The Adept software is utilized for paratransit operations and dispatch, including client registration, client eligibility and certification tracking, scheduling, dispatch, and reporting. The software includes interactive voice response that integrates with Adept paratransit software to make night before reminders, arrival notifications, and customer information calls to PVTA paratransit clients. Currently, PVTA is using version 6.2.42. A maintenance/support agreement is in place.

The Avail ITS provides PVTA with real-time automatic vehicle locator (AVL) and operations data to facilitate the operations of daily fixed route and paratransit service. Avail tracks operations statistics, captures odometer readings, and has GPS, computer assisted dispatch (CAD), and automated passenger counter (APC) functions. PVTA utilizes Infodev Electronic Designers International Inc. APC system and has automatic audible and visual announcement systems that provide automated and next-stop announcements. PVTA uses version 6.3.6 but is planning to upgrade the software, which will allow for improved data mining and reporting through the business intelligence module, tighten data exchange integration between Hastus and Avail, and improve trigger box design. A maintenance/support agreement is in place.

Hastus is a fixed route software system used for planning, scheduling, operations, passenger information, and analysis. It is a database and software used for modeling and managing the delivery of fixed route service and used by operators for managing contractor staff leave. PVTA currently operates Hastus 2015 and anticipates upgrading to Hastus 2019 or Hastus 2020 in FY 2021. Possible feature enhancement includes self-serve, NTD reporting, and additional integration with Avail, including sending driver and vehicle assignment back to Avail. A maintenance/support agreement is in place.

Trapeze is a software system used for managing maintenance, including recordkeeping, vehicle usage, tracking and scheduling preventive maintenance, managing parts inventory, and procuring parts. PVTA is using version 14.o.x but is upgrading to a newer version soon. The latest version of Trapeze EPM will be installed into the SATCo/VATCo production environment in

FY 2020 for fleet maintenance system.³⁷ The Trapeze facility maintenance system will be deployed in FY 2020/2021.

PVTA has deployed an in-house incident reporting system that monitors and collects accident/incident data. The operator enters the report directly into a database. The supervisor adds and approves information as entered by the operator. This system eliminates the possibility of data entry error when recording a paper report into an online database. Future enhancements include pulling incident data directly into the PVTA claims database and eliminating the need for double data entry of incidents.

4.4.3.5 Asset and Financial Management

The Abila MIP Fund Accounting system is utilized to manage budgets, maximize grants, produce reports, and record van mileage. PVTA is currently using version 18.1.1.0, which is the latest version. A maintenance/support agreement is included in the subscription.

TransAM is an open-source asset management platform used to maintain an asset inventory, including condition assessment, forecasts, and NTD report generation. PVTA is currently using Build 2.2.1 powered by TransAM Ver 2.2.9, with quarterly maintenance releases being deployed per the hosting/maintenance agreement.

4.4.3.6 Information Services

PVTA utilizes a website trip planner powered by Google Maps (not in real time) for planning trips. The Avail ITS also provides customer information and a data feed to support third party application development. PVTA has mobile apps such as Transit app, MyStop mobile by Avail, and a custom UMass BusTrack app for tracking buses in real time. Transit app provides the following information for Android and iOS users: step-by-step navigation instructions, service disruption notification, departure and stop reminders, and shortcut to Uber and Lyft ride sharing services.

Real-time customer information signage is available at nine locations. PVTA is working to identify additional locations and obtain the necessary electrical infrastructure to support electronic signage. Solar-powered customer information signs are possible at locations that receive sufficient sun, but many candidate locations with high ridership are in urban areas where building shadows prevent sufficient sunlight from being captured on the panels.

4.5 Policies and Procedures

This section provides an overview of PVTA's customer and service policies, including bag policy, code of conduct, wheelchair securement, service animals, bus shelter, etiquette and safety, flag stop usage, and bus stop placement.

4.5.1 Customer Policies

Customer policies and procedures are outlined in Table 21.

³⁷ Trapeze EAM Version 19 has since been deployed into production.

Table 21. Policies and Procedures

PVTA Policy	Description of Policy
Animals	Properly trained service animals are allowed on board, but pets are not permitted unless they are secured in fully enclosed carriers. Passengers are expected to comply with PVTA's service animals' policies and must be able to confirm that the animals are service animals if asked. Service animals must be leashed or harnessed and must not block the vehicle aisle or path of travel.
Bag Policy	<p>On fixed route buses, bags may be brought on board; however, no more than three standard grocery bags per passenger are permitted. For safety reasons all grocery bags and carry-on items must be under the passenger's control. Items brought on board such as backpacks, bags, suitcases, etc., must be stored in the passenger's lap or underneath the seat. Items must be kept out of the aisle, and these items are not allowed to be stored on other seats on the bus.</p> <p>For Senior Van Service, riders who require assistance with their bags or parcels must call only once to notify the Reservation Office that they are requesting the assistance, which will be added to the client file. Drivers are only required to assist with up to three standard size carry-on bags with a combined weight not to exceed 25 pounds. Driveways and sidewalks must be cleared of snow and/or ice if driver is required to provide door to door assistance or shopping bag assistance.</p>
Bicycle	All buses are equipped with bike racks that can hold two or three bikes. Customers must load and unload their own bike; bus drivers cannot assist. Electric and gas-powered bikes are not allowed on the bike racks due to weight restrictions. Folding bikes are allowed on PVTA buses and must be kept out of the aisle.
Code of conduct	<p>PVTA's Passenger Code of Conduct includes three tables. Table 1 (Behaviors Punishable by Suspension) lists activities and descriptions of behaviors that are either expressly prohibited or allowed on PVTA property (PVTA transit vehicles and transit centers). Unless otherwise deemed a "Major Infraction" in Table 1, behavior will be considered a "Minor Infraction. Table 2 (Disciplinary Actions) lists disciplinary actions and processes for each type of infraction. Table 3 (Suspension Return Table) lists the duration of suspension or type of infraction and the requirement for notifying PVTA and the person to be notified at PVTA. The detailed Passenger Code of Conduct is available at the PVTA official website at http://www.pvta.com/documents/customerService/codeConduct2019.pdf.</p>

PVTA Policy	Description of Policy
Etiquette and safety	<p>To create a safe and comfortable ride, PVTA has set the following etiquette and safety rules when riding the bus:</p> <ul style="list-style-type: none"> • Rude, hateful, discriminatory, or derogatory language is prohibited. • Threatening or harassing a passenger or PVTA employee is prohibited. • Physical or violent behavior toward passengers or PVTA employees is prohibited. • Vandalism or destruction of PVTA or another passenger's property is prohibited. • Any actions that result in delaying a vehicle for more than 5 minutes will be considered a serious disruption of service and are prohibited. Please stay seated to avoid falling when the bus starts or stops. • Any actions that result in requiring a bus to be removed from service for cleaning are prohibited.
Lost & Found	<p>PVTA is not responsible for items left behind on any fixed route or paratransit bus; however, PVTA staff will make reasonable efforts to locate an item but is not responsible for finding or securing lost items. Customers should contact Customer Service to locate lost items.</p>
Strollers/Carts	<p>Strollers and grocery carts must be folded and kept out of the aisle.</p>
Scooters (electric razor type)	<p>PVTA does not have a policy for scooters.</p>
Wheelchair securement	<p>All wheelchairs must have four point securement if the passenger is in it.</p>

Source: PVTA

4.5.2 Service Policies

PVTA requires bus shelter placement at stops with ridership of at least 60 boardings per day in urban locations, ridership of at least 40 boardings per day in suburban locations, and ridership of at least 15 boardings per day in rural locations. Shelter placement at stops with lower ridership may be considered if the location experiences a particularly large number of transfers, development proposed for the area will likely increase ridership, or elderly or mobility challenged passengers in the area would benefit from the addition of a shelter. Bus shelter policy requires input from appropriate stakeholders (i.e., community planners, abutters, residents, and business owners), which should be solicited before final placement decisions are made. PVTA has 285 stops (15.6 percent of stops) with shelters, 66 of these have over 60 boardings per day (Figure 40 and Figure 41). Nineteen stops do not have shelters but have over 60 boardings per day, thus meeting the requirement. These stops include Main/Bridge; North Village Apartments; Cowles Lane; Amherst Glass (In); Sci Tech High School; Rolling Green Apts (In); Mill Valley Apartments (In); Maple/Suffolk; Maple/Hampshire; Commerce High School (opposite); Belmont/Beaumont; Main/Acushnet; Putnam High School (Blunt Park Road); Amherst Common (N); Springfield Library; Memorial/(Park Inn 628); Sylvan Residential (In); Walmart Chicopee; North Amherst Center (In); and Boston/Lucerne (1).

Figure 40. Southern Tier Stops Ridership by Shelter Status

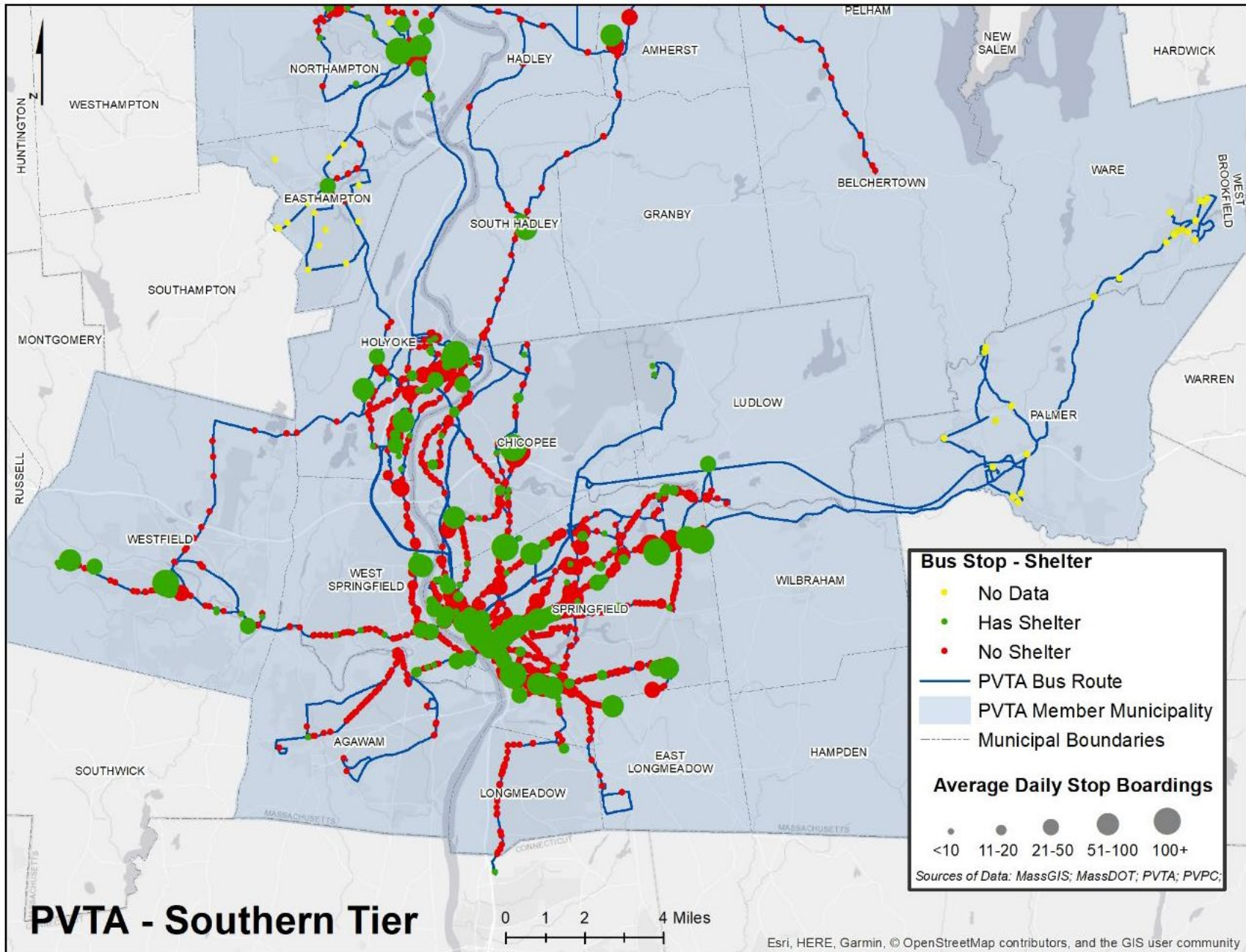
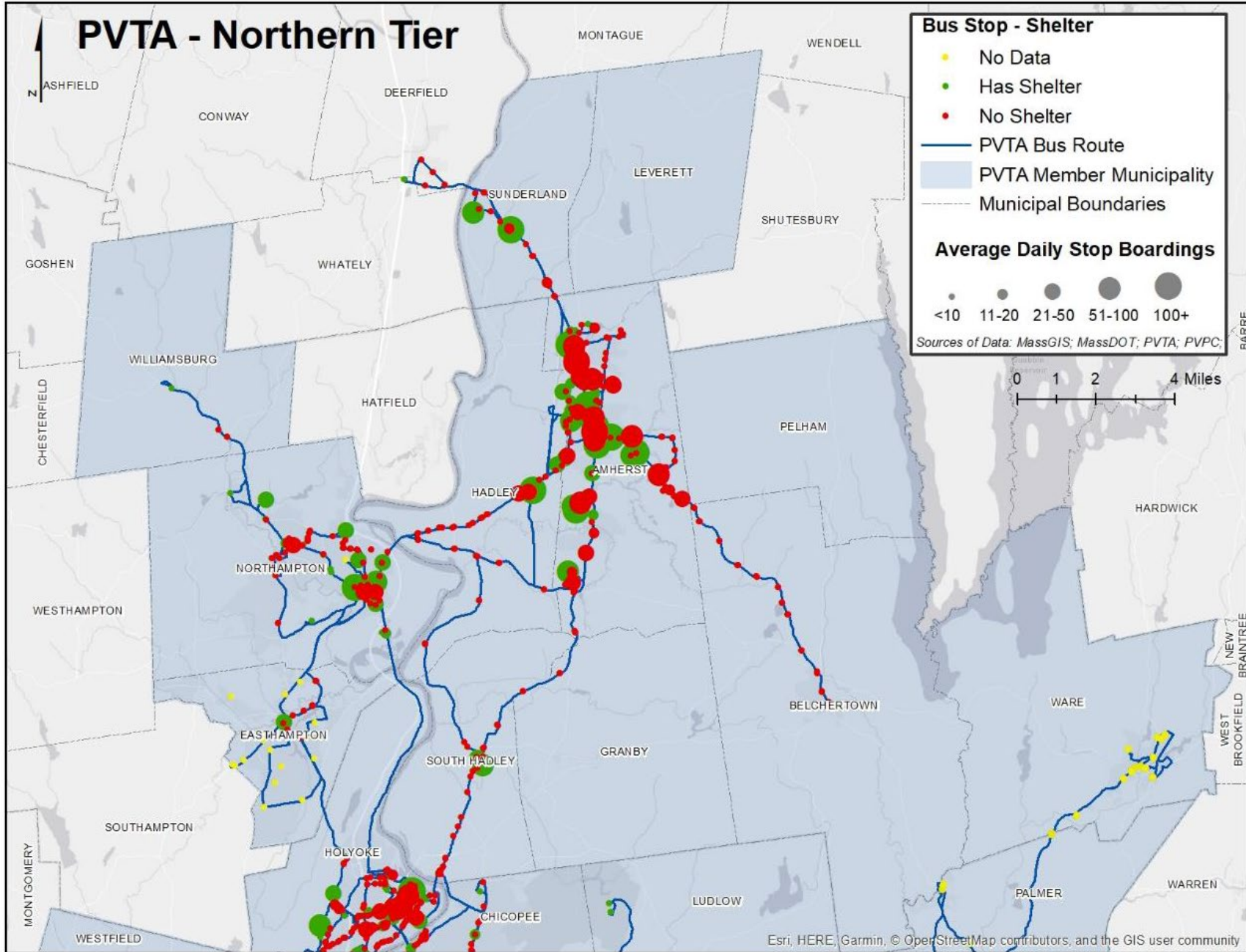


Figure 41. Northern Tier Stops Ridership by Shelter Status



PVTA does not have a policy for benches at stops. Currently, 1,549 stops do not have benches (Figure 42 and Figure 43), including 117 stops that do have shelters but no bench. While PVTA does not have a standard for shelter placement, a review of other system policies shows that in general the guideline for installing a bench is half of the standard used for shelter placement. Using this guideline and the PVTA standard for urban areas, 72 stops with over 30 passengers per day do not have seating.

PVTA does not have a policy for lighting at stops. Currently, 374 stops do not have adequate lighting (Figure 44 and Figure 45). Lighting at stops is an important factor as it improves the safety and security of the bus stops, as well as allows bus drivers to see waiting passengers and drivers of other vehicles to see passengers boarding and deboarding the bus.

Most of the bus stops are marked with PVTA bus stop signs; however, unmarked stops or flag stops are used in some areas (Figure 46). Passengers need to arrive at the stop 5 minutes or more before the expected arrival of the bus, be ready to board (with fare and any ID cards), and signal the driver as the bus approaches.

PVTA provides different types of transit services, including local and express services. Generally, services that provide more accessibility have more frequent stops that are closely spaced, and services that provide more mobility such as express or commuter services have fewer stops. PVTA follows the minimum stop spacing (or maximum stops per mile) guidelines shown in Table 22. Where multiple routes operate in the same corridor, the standard for the higher service type applies.

PVTA has changed their service tiers since the development of the 2014 CSA. There are now five tiers based on average weekday headway. The update occurred in FY 2020 in order to hold more frequent service to higher productivity standards.

Table 22. Bus Stop Spacing Guidelines

	BRT/Key Regional Tier I	Key Regional Tier II	Urban Radial	Campus Shuttles	Five Colleges	Village Connector	Community/ Flex	Express
Minimum Stop Spacing (feet)								
Moderate to high density areas	900	900	900	660	900	660	660	900
Low density areas	1,100*	1,300	1,300	1,100	1,100	1,100	1,100	1,100
Maximum Stops per Mile								
Moderate to high density areas	6	6	6	8	6	8	6	6
Low density areas	4	4	4	5	5	5	5	5

Source: 2014 CVA

Note: Moderate to high density = greater than or equal to 4,000 per square mile, low density = less than 4,000 persons per square mile.

*BRT stops vary by type and the surrounding environment.

Figure 42. Northern Tier Stops Ridership by Bench Status

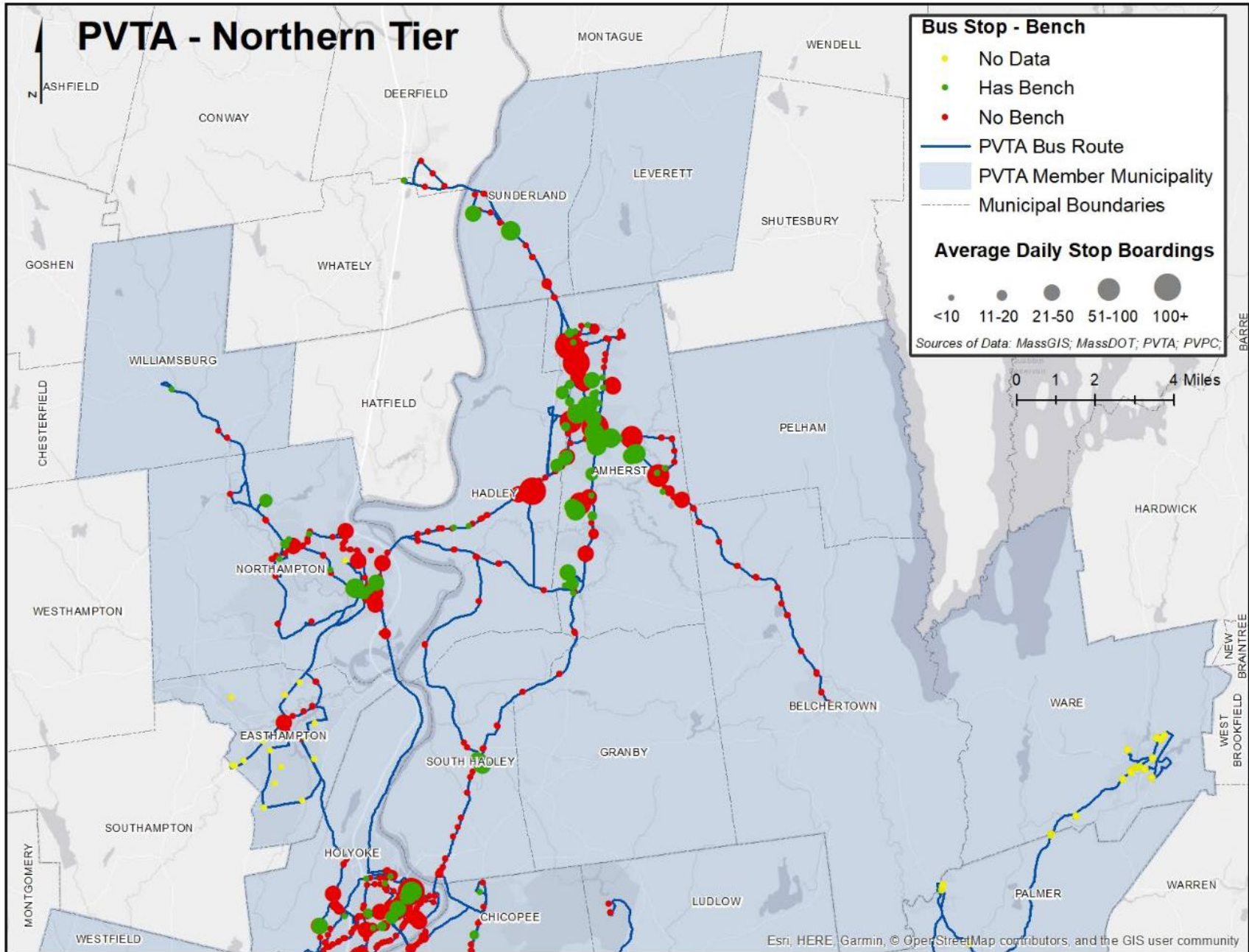


Figure 43. Southern Tier Stops Ridership by Bench Status

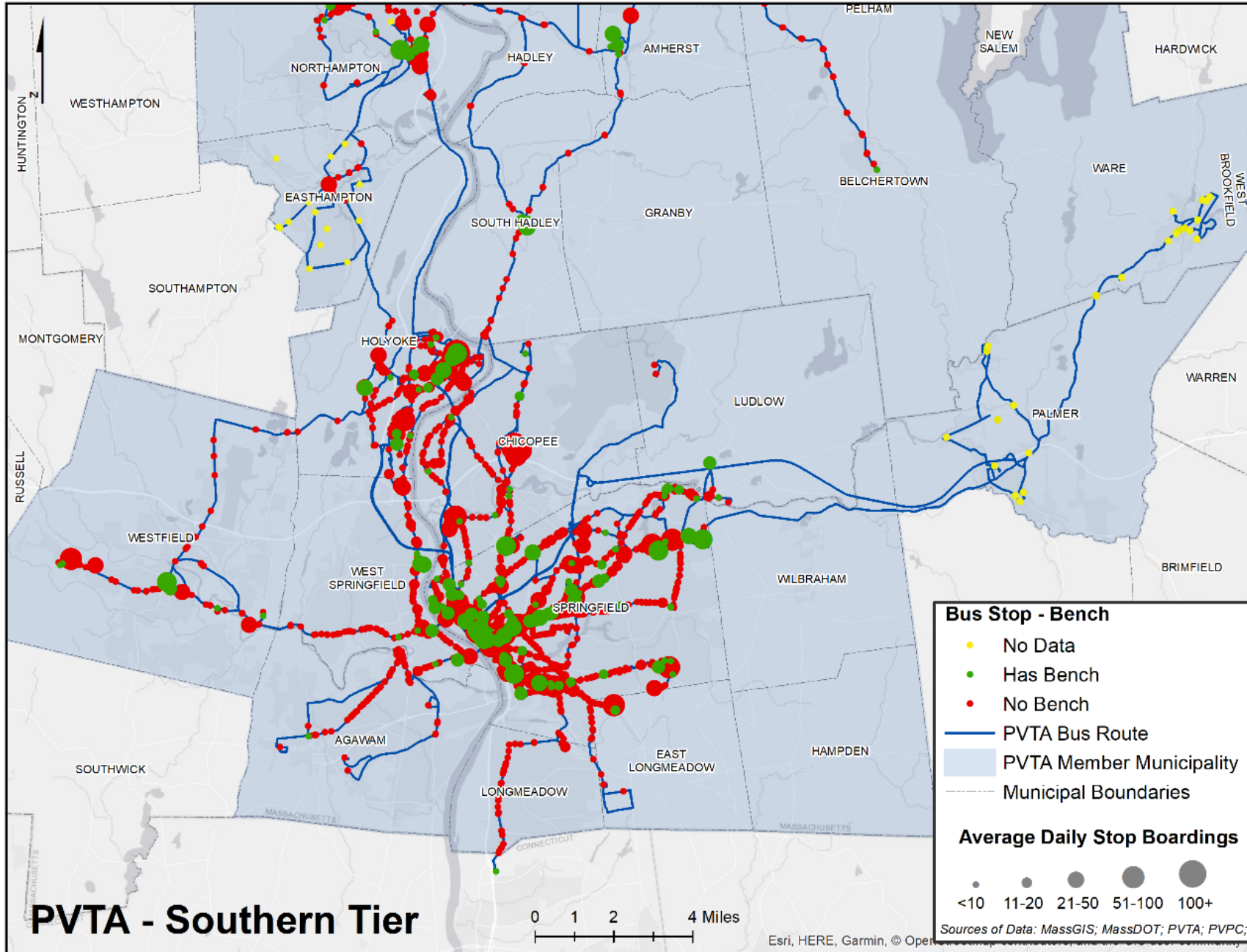
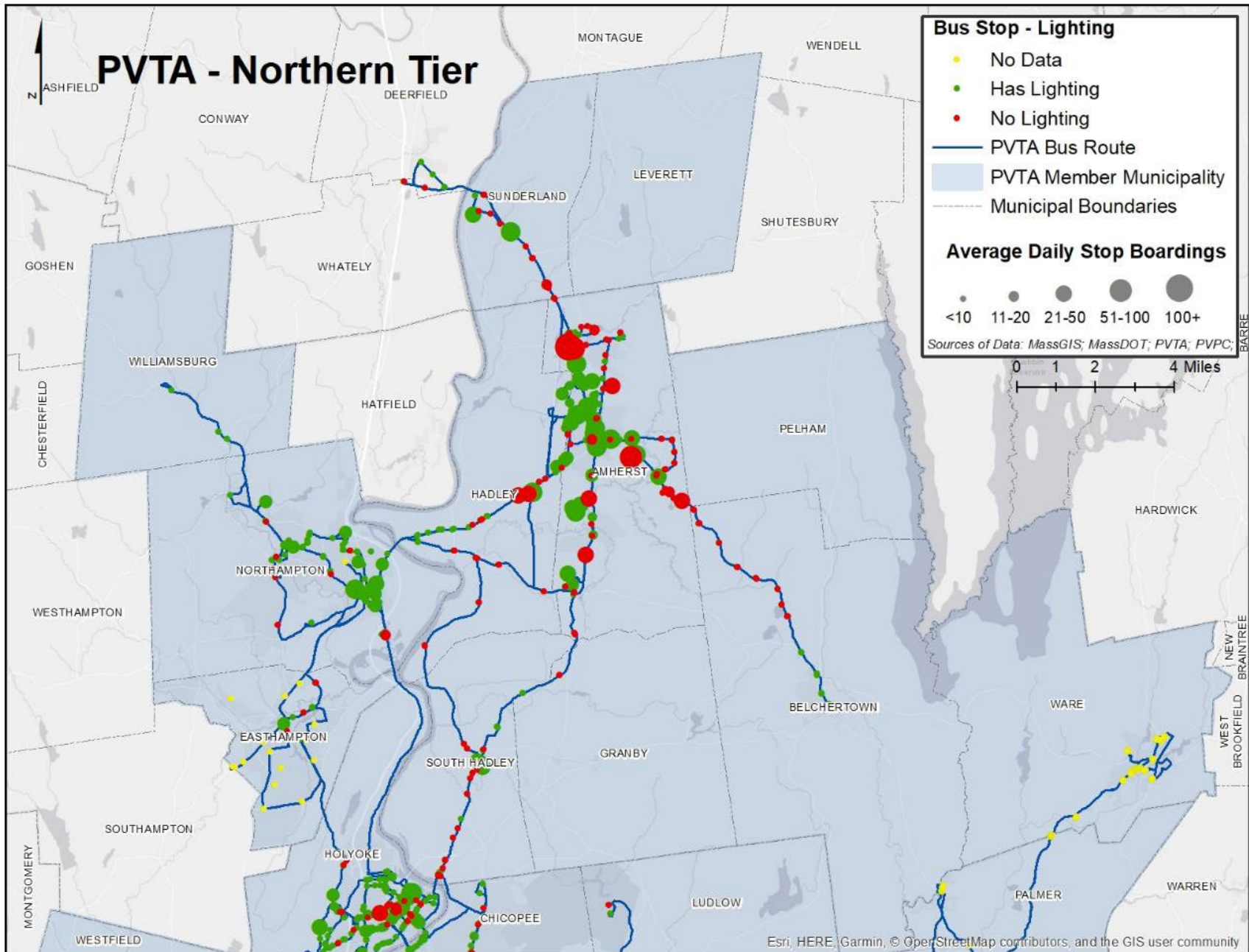


Figure 45. Northern Tier Stops Ridership by Lighting Availability



4.6 Regional Connections and Other Transportation Providers

PVTA routes connect to a number of other bus and rail services in and adjacent to the Pioneer Valley. Franklin Regional Transit Authority (FRTA) operates two routes in the PVTA area, providing connection to the FRTA hub in Greenfield. FRTA Route 31 (Northampton/Greenfield) provides seven round trips per weekday every 2 hours between PVTA's transfer hub at the Academy of Music in downtown Northampton and the John W. Olver Transit Center in Greenfield. Route 23 (Sunderland/Greenfield) provides six round trips per weekday between Sugarloaf Estates in Sunderland and the John W. Olver Transit Center.

One PVTA route (G5) extends outside the formal PVTA area to Enfield, Connecticut, serving a large MassMutual employment center and connecting with CTtransit's Enfield Express, which operates express to downtown Hartford. Route G5 has four trips (two in the morning and two in the afternoon) per weekday to MassMutual Bright Meadow Campus in Enfield where transfers can be made to CTtransit Routes 905 and 915.

Intercity bus connections are available at several locations served by PVTA and Peter Pan Bus Lines: Union Station, HTC, Holyoke Mall, Amherst Center, UMass, Northampton, Chicopee, Deerfield, and South Hadley. Connections can be made to Boston, Bradley International Airport in Connecticut, and New York destinations. Additionally, Greyhound provides intercity bus connections from Springfield Union Station to New York and Boston.

Five intercity rail routes serve Springfield's Union Station. Northeast Regional service provides one daily round trip from Springfield to New York City via Hartford and New Haven, Connecticut; the Vermonter provides one daily round trip from New York City to St. Albans, Vermont; the Lake Shore Limited service provides one daily round trip from Chicago to Albany with service to either New York City or Boston (via Springfield); the Valley Flyer provides two daily round trips from Springfield to Greenfield; and CT**rail** Hartford Line provides seven trips per weekday between Springfield and New Haven, Connecticut.

Since 2017, rideshare companies or TNCs, commonly Uber and Lyft, have been increasingly providing on-demand transportation throughout Massachusetts and the nation. Massachusetts state law requires TNCs to share data with the Commonwealth. Ridesharing companies have grown in popularity because passengers are quickly and easily matched with drivers who use their private vehicles to take them to and from any destination. Operating similarly to taxi services, people with their own vehicles give passengers rides to specific destinations as requested, which allows passengers to have quick and easy access to an on-demand ride at any time of day.

In 2019, TNCs provided 91.1 million rides in Massachusetts, which was a 12.8 percent increase from 2018 and 40.6 percent increase from 2017. In 2019 there were 2,104,849 TNC rides originating in the PVTA service area, which represents approximately 2 percent of all TNC rides in Massachusetts (Table 23). The majority of TNC trips originated in Springfield, Amherst, Chicopee, Holyoke, and West Springfield (more than 100,000 trips) (Figure 47). Between 2017 and 2019, East Longmeadow, Springfield, Chicopee, Palmer, and West Springfield had the greatest increase in TNC trip originations with an increase between 130 and 150 percent; however, all of PVTA's member communities have had an increase in TNC ridership since 2017 (Figure 48).

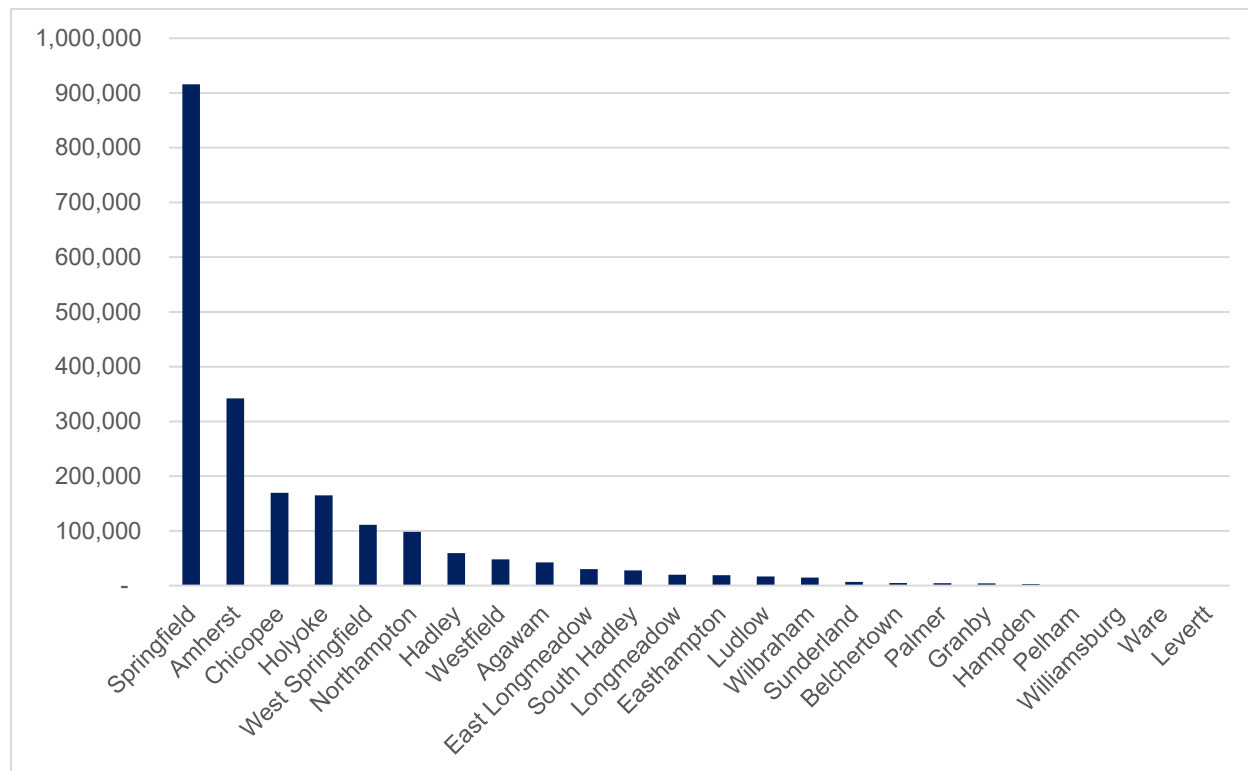
Table 23. TNC Ridership in PVTA Member Communities (2017–2019)

PVTA Member Communities*	TNC Rides Started (2017)	TNC Rides Started (2018)	TNC Rides Started (2019)
Agawam	20,918	31,993	42,411
Chicopee	70,278	127,167	169,518
Easthampton	11,762	15,479	19,111
East Longmeadow	11,974	23,207	29,990
Holyoke	74,232	122,924	164,750
Northampton	61,570	83,128	98,354
Springfield	378,381	682,690	915,724
Westfield	28,502	41,549	48,056
West Springfield	48,288	82,955	111,231
Amherst	284,506	338,842	342,082
Belchertown	2,754	4,062	4,628
Granby	2,490	3,371	4,092
Hadley	40,317	55,563	59,412
Hampden	1,501	2,897	2,857
Leverett	294	405	486
Longmeadow	11,785	15,606	19,945
Ludlow	7,748	12,432	16,613
Palmer	1,876	3,762	4,409
Pelham	655	852	880
South Hadley	16,742	24,713	27,754
Sunderland	5,285	6,768	6,653
Ware	258	490	559
Wilbraham	6,751	9,658	14,530
Williamsburg	552	747	804
South Hadley	20,918	31,993	42,411
Sunderland	70,278	127,167	169,518
Total:	1,089,419	1,691,260	2,104,849

Source: 2017-2019 Data Report Rideshare in Massachusetts, Mass.gov
<https://tnc.sites.digital.mass.gov/> .

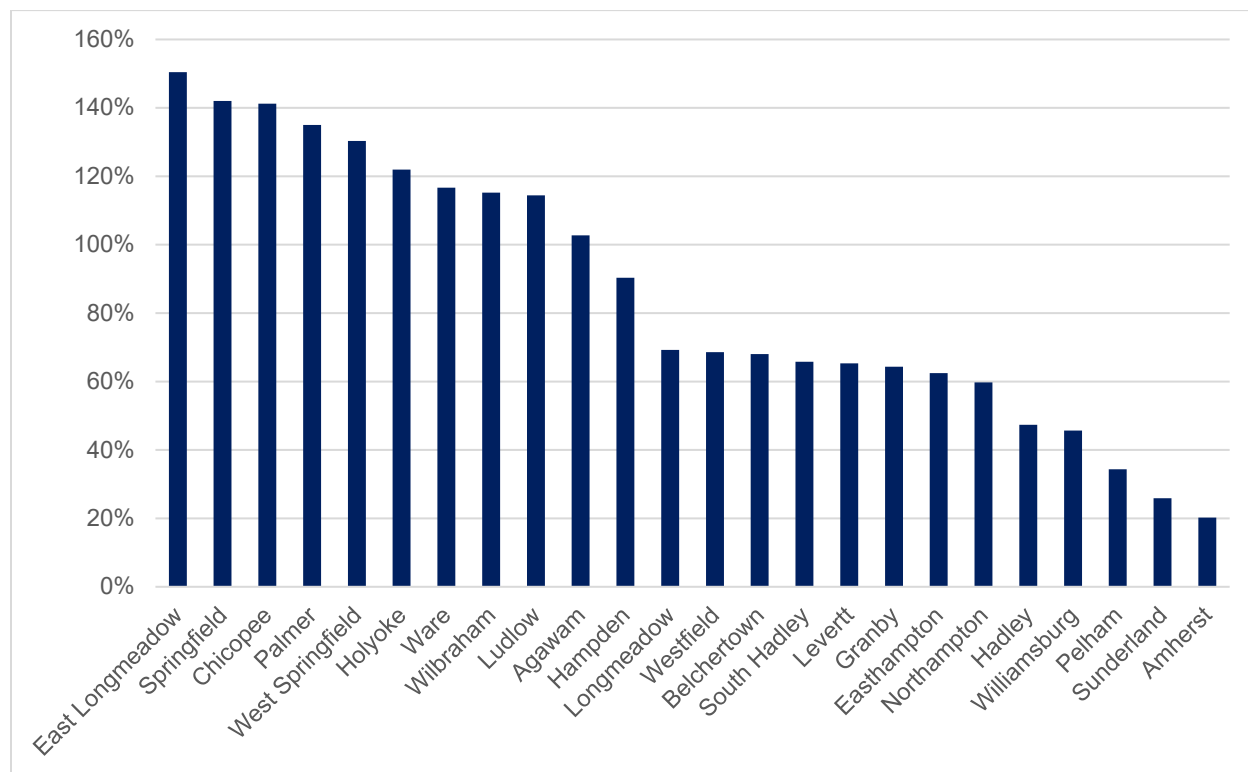
* PVTA serves a small section of Southampton, and Deerfield and Enfield, two non-member communities, which were not included in this analysis.

Figure 47. TNC Riders Started in PVTA Member Communities in 2019



Source: 2019 Data Report Rideshare in Massachusetts, Mass.gov
<https://tnc.sites.digital.mass.gov/> .

Figure 48. Percent Change in TNC Ridership in PVTA Communities (2017–2019)



Source: 2019 Data Report Rideshare in Massachusetts, Mass.gov
<https://tnc.sites.digital.mass.gov/> .

4.7 Sustainability Initiatives

Climate change is a real and present threat and working toward a more sustainable system means addressing the role of our transportation systems in contributing toward climate change or working to combat it. Transit plays a critical role in reducing the climate impacts from transportation systems while also improving the mobility of vulnerable user groups. Under this context the study team reviewed PVTA's progress toward five key sustainability indicators: Clean Vehicles, Education, Multimodal Integration, Efficient Facilities, and Recycling. These indicators address the sustainable aspects of RTA infrastructure (clean vehicles, efficient facilities, etc.) and how their system accommodates vulnerable and multimodal users (education, multimodal integration, etc.). The following section outlines PVTA's progress toward meeting these indicators.

PVTA has a strong commitment to sustainability across all of their facilities, through their operations, and within their fleet. PVTA operates out of four facilities across its region: SATCo – Cottage Street, NEXT – 2840 Main Street, VATCo – 54 Industrial Drive, and UMTS –185 Holdsworth Way in addition to the administration offices at 2808 Main Street. Operationally the system currently uses a combination of traditional diesel as well as hybrid and electric buses and is expecting delivery of an additional four all-electric buses in December 2020. To help with the integration across modes PVTA provides bike racks on buses and bike parking at major stops or transfer points. Additionally, the Valley Bike share program is operated through much of the region, and kiosks are often coordinated with stops.

Figure 50 describes PVTA's progress toward the Efficient Facilities and Recycle categories by each of the four facilities listed above. Overall PVTA is working to integrate sustainable practices across all of these facilities to reduce their energy demands. This includes LED lighting, skylights, and either on-site solar or feasibility studies for the construction of on-site solar. Recycled products are used across all facilities where possible and single stream recycling is employed to limit contribution to landfills.

Figure 49. Top left: New Cottage Street Facility; Top Right: Bike Part Vending Machine at the Olver Pavilion; Bottom left: PVTA Electric Bus; Bottom Right: Solar Powered Bus Stop Departure Sign



Figure 50. PVTA Ongoing Sustainability Initiatives

Efficient Facilities

- Cottage Street: Best practices stormwater management including vegetative swales/cleaning of runoff, infiltration/retention basins, etc.
- All operations facilities: LED interior/exterior lights with sensor/timer shut-offs. Natural light provided to most employee spaces and to maintenance areas. Skylights in bus maintenance for natural light and vertical windowing under roof eaves for additional natural light in bus storage.
- All operations facilities: White roof specified to reduce heat island effect.
- 54 Industrial Drive and 185 Holdsworth Way: 1 MWatt Rooftop PV Solar Array with battery storage in design by third party through PPA; planned for 2020-21 construction.
- Cottage Street: Irrigation using onsite water sources/well is being studied now.
- Cottage Street: Stormwater quality control – onsite retention.
- Olver Pavillion: Building envelope/building systems specified - exceeds building energy performance standards (LEED levels). Building managemnet system installed to optimize energy use.
- All operations facilities: Operable window for employee comfort
- 54 Industrial Drive, 2840 Main Street, and Cottage Street: Recycled and regionally produced wood and materials. Low volatile organic compounds emitting materials specified.
- Cottage Street: Building opened in 2019. Bus stop and bike racks provided. Six electric bus charging stations to be installed in 2020.

Recycle

- Purchase recycle material products where possible
- Green/recycled materials purchased whenever possible.
- Bus wash uses reclaimed water in each lane.
- Engine oil and antifreeze are recycled using Safety-Kleen.
- Metal and plastic components from buses are recycled through Kane Scrap Iron & Metal.
- Reclaimed materials are used whenever possible (i.e., rebuilt parts).
- Single stream recycling through Mcnamara Waste.
- Paper shredded and recycled via ProShred.

Clean Vehicles

- LED exterior and interior lightng is used on all PVTA vehicles.
- PVTA expects to receive delivery of four 40-foot electric buses from Proterra in December 2020. PVTA will be placing an order for additional electric vehicles, possibly 12 funded through VW credits, for delivery in 2021.
- Construction is currently ongoing for the installation of EV chargers at Cottage Street. A needs study is being conducted at the facilities in Northampton and Amherst to determine the steps needed to install EV chargers at those locations.

Education

- Transit themed coloring book for children.
- Special wrapping on all-electric buses to identify them as zero emission buses.

Multimodal Integration

- Valley Bikes (bike share program) is operated through much of the region and is often coordinated bus stops and transit hubs.
- Bike racks at major bus stops and transfer locations throughout the region.
- Union Station, Westfield Olver Pavillion, and Holyoke Transit were redevelopment projects with a transit oriented development component.
- PVTA coordinates services with CTrail (Hartford Line) and FRTA.
- Provides bike racks on all buses and participates in annual Bike to Work campaigns and events.

4.8 Fare Rates and Structure

4.8.1 Collection Methods and Media

PVTA uses four different methods for fare collection. For the routes operated by SATCo and VATCo the on-board GFI Genfare farebox system and recently launched Bytemark mobile ticketing system are used for fare collection and visual validation. Fareboxes are probed daily and vaults emptied. Farebox cash collection is reconciled with the probe data and tabulated daily, monthly, and annually. The routes operated by UMTS do not have fareboxes, allowing for all-door boarding. Routes operated by Hulmes have diamond dropboxes for fareboxes. Van drivers use fare envelopes to collect fares and tickets. These envelopes are given to the accounting clerks and audited daily against the paper manifests for accuracy.

Fares can be paid using cash, transfer tickets, tokens, magnetic stripe cards, tickets (van only), and the Fast Break smart card and online through the mobile ticketing system. PVTA requires exact change when using cash for paying fares, and the fareboxes only accept US coins, \$1, \$5, \$10 and PVTA tokens. The fareboxes do not accept pennies, and change cards are not distributed. Riders can also purchase day passes (magnetic stripe cards) and transfer tickets (magnetic stripe cards) on the bus by informing the operator that they want to purchase a day pass or transfer. PVTA is phasing out the use of tokens and no longer sells them except to the Springfield Public School system for distribution to students using the bus for after school programs.

Magnetic stripe bus passes, 1-ride tickets, and ADA and Senior Van Service tickets can be purchased at the Customer Service Center located at Union Station or HTC between 9:00 AM and 4:45 PM from Monday through Friday. ADA and Senior Van Service tickets can also be purchased at most local senior centers. Van tickets do not have an expiration date. PVTA has partnered with Big Y who sells PVTA 31 Regular and Reduced Day Passes (magnetic stripe) at all stores in the service area. Magnetic stripe cards, both those purchased from customer service and Big Y, expire in 3 years if unused.

Regular 31-day bus passes and van tickets (book of twenty \$3 tickets and book of ten \$0.50 tickets) are also available for online purchase via PayPal. Tickets and passes are mailed to confirmed addresses within the United States and the customer must pay the shipping cost. Van tickets can also be purchased by filling out the Paratransit Van Ticket Order Form and sending it to the PVTA Customer Service Center with the payment (check only); there is no cost for shipping.

In FY 2016, PVTA launched a pilot program for the Fast Break smart card technology project with the Springfield Technical Community College to test the hardware. All students not driving to campus were issued a new Fast Break Card loaded with monthly passes. Several issues were discovered during testing, which led to a soft roll out to the public for use of the Fast Break Card with 31-day passes only (magnetic stripe and Fast Break cards). Ticket vending machines (TVM) are located at Union Station, Westfield Transportation Center, and HTC, but are currently not functional. During the roll-out process functionality limitations and complexity of transactions for the farebox, such as using the card for purchasing day passes or stored value, were discovered and the project was halted. PVTA continues to work with GFI to make the TVMs operational by supporting magnetic day pass and the 31-day full and half fare smart card.

PVTA has partnered with MassDOT and BAT to capitalize on a mobile payment contract MassDOT maintains with Bytemark (from the legacy Bus Plus service). The mobile payment system uses visual validation, and when activated the fare displays on a cell phone for validation by the bus driver. PVTA and BAT have both received MassDOT discretionary grant funding in 2020 to customize the Bytemark app for their systems.

4.8.2 Fare Structure

4.8.2.1 Fixed Route Bus Service

The regular fixed route fare for patrons ages 13 and older is \$1.50 or \$1.40 if a 1-ride ticket is purchased at the Customer Service Center; transfers are available for \$0.25. Fixed route fare for children 5 years old and under is free if accompanied by an adult and for children 6 to 12 years old is \$0.90. Transfers for children are available for \$0.25. Reduced fixed route fares are available for senior citizens (60 years and older) and mobility impaired customers at \$0.75, which is half of the full-fare; transfers are \$0.10. A valid PVTA Photo ID or Statewide Transportation Access Pass is required for senior and mobility impaired discounted fares. PVTA Photo ID and Statewide Transportation Access Pass can be obtained by presenting the required documents (listed on the PVTA website) at the customer service centers at Union Station or HTC from Monday through Friday between 9:30 AM and 4:30 PM. One transfer is available per ride and must be purchased at the time of boarding for both regular and reduced fare paying customers. Transfers are valid for 90 minutes and cannot be used on the same route.

PVTA introduced a new program called "Senior Fare Free Tuesdays" in July 2019. This 2-year program will run through June 2021. Seniors aged 60 years and older can ride fixed route buses and shuttles for free every Tuesday. This program applies to PVTA buses and shuttles. It does not apply to PVTA van service. Seniors must show a valid PVTA Senior ID and Senior Pass when boarding the bus.

4.8.2.2 Bus Pass

PVTA offers regular 31-day and senior and mobility impaired 31-day passes, as well as regular 7- and 1-day passes. The regular 31-day pass costs \$54 and the senior and mobility impaired 31-day pass costs \$26. The regular 7-day and 1-day passes cost \$15 and \$3.50, respectively. The 31-day passes are good for 31 consecutive days from the initial use date. Regular 1-day passes are sold on the bus and must be used on the date of purchase. Day passes bought on the bus can only be purchased with cash. Day passes are also sold at the PVTA customer service centers and can be used on any single day of choice. Regular 31-day bus passes are also available for online purchase via PayPal by paying the shipping cost.

4.8.2.3 ADA and Senior Van Service

ADA and Senior Van Service fares range from \$3 to \$4 based on the number of transfers required if a comparable trip was made via bus. All ADA trips with an origin or destination beyond 3/4 mile of a fixed route are \$5. The Senior Van Service is not subject to federal ADA regulation, not subject to the 3/4 mile rule and thus all fares are based on the number of transfers if done on a bus. ADA and Senior Van Service tickets can be purchased at most local senior centers or at PVTA Customer Service Centers. Tickets are available in \$0.50 or \$3 denominations. Van tickets are also available for online purchase via PayPal by paying the shipping cost.

4.8.2.4 Fare Increase

In 2018, PVTA conducted a PVTA Fare Impact Study to better understand what would happen to PVTA's ridership and fare revenue if the prices of bus and van fares increased. The study looked at several fare increase scenarios. As a result of the study, PVTA increased the fares for fixed route, monthly bus pass, and paratransit service by approximately 20 percent starting July 1, 2018. The fixed route base fare increased from \$1.25 to \$1.50, monthly pass base fare increased from \$45 to \$54, and paratransit base fare increased from \$2.50 to \$3.00. A \$5.00 premium fare for ADA van trips that travel outside of the federally required 3/4 mile distance from a bus route was also implemented. The transfer fares remained the same.

Prior to this the last fare increase was in 2008. Additionally, a policy was approved to examine fare increases in 3-year intervals with possible increases every third year ranging from a 5 percent to 25 percent increase. Table 24 shows the current fare structure.

Table 24. Fare Structure

Fare Type	Fare (One-way)
Fixed Route	
Adult 13 and older	\$1.50 (\$1.40 if purchased at the Customer Service Center)
Adult Transfer	\$0.25
Senior 60 and older	\$0.75
Senior Transfer	\$0.10
Mobility Impaired	\$0.75
Mobility Impaired Transfer	\$0.10
Children 6 to 12 years old	\$0.90
Children Transfer	\$0.25
Children 5 years old and under	Free
Bus Pass	
Regular 31-Day Pass	\$54 (\$2 discounts with a Big Y card at local Big Y)
Senior and Mobility Impaired 31 Day Pass	\$26 (\$2 discounts with a Big Y card at local Big Y)
Regular 7-Day Pass	\$15
Regular 1-Day Pass	\$3.50
ADA and Senior Van Service	
Trip within town	\$3
Trip to a surrounding town	\$3.50
Trip beyond a surrounding town and within PVTA's service area	\$4
Paratransit van ticket beyond 3/4 mile	\$5
20 Pack of ride tickets (within town)	\$57 (one free ticket)
10 Pack of 50 cent ride tickets	\$4.75
Buying online with PayPal	
Regular 31-Day Bus Pass	\$54 + \$1.50 shipping
Van Ticket booklet of 20 (within town)	\$57 + \$0.50 shipping
Van Ticket booklet of 10 (\$0.50)	\$4.75 + \$0.50 shipping

Source: www.PVTA.com; PVTA Fare Impact Study, March 30, 2018; PVTA FY19 Annual Report

4.8.3 Fare Policy

On March 30, 2018, PVTA completed its Fare Impact Study to help create a better understanding of what is likely to happen to PVTA's ridership and fare revenue if prices of bus and van fares are raised. The Fare Impact Study and its results can be found on PVTA's website.³⁸

To support the PVTA Board's Fare Policy approved on April 9, 2018, which includes a potential fare change for FY 2022, PVTA will be conducting a fare impact analysis in 2021. In addition to reviewing a fare increase scenario, the study will also include examining the benefits and disadvantages of offering a student fare and a low-income fare and examining the impacts of a fare reduction, fare elimination, and fare capping.

³⁸ PVTA 2018 Fare Impact Study <http://www.pvta.com/documents/planning/PVTA%20Fare%20Impact%20Study%20FINAL%2003-30-18.pdf>.