4 Transit Network Analysis

The Transit Network Analysis is an overview of the state of public transit in the study area. It details transit routes operating in the area, highlights transit infrastructure and key transfer locations, and analyzes ridership. It assesses the role that high-capacity transit could play in the state's existing and planned transit network.

RIPTA Bus Service

The Metro Connector Study Area contains three of RIPTA's four major transit centers, including Kennedy Plaza, which is served by most of RIPTA's routes. As a result, the Study Area contains the highest density of RIPTA service in the entire state. To understand the role that HCT could play in the study area, this section provides a summary of the primary RIPTA bus routes that serve similar markets to those of the two HCT corridors identified in RIPTA's Transit Forward Rhode Island 2040 plan. Route profiles describe the 14 primary routes in the study area and a summary table (Table 4-1) provides an understanding of the major operating statistics of the other routes in the corridor. The following Primary and Other Routes are described in this section.

Table 4-1 Existing Bus Service

Route	Monthly Ridership (Oct. 2023)*	Monthly Ridership within Study Area*	Weekday Peak/Off-Peak Existing Headway	Planned TMP Peak/Off-Peak Weekday Headway
Primary Routes				
R-Line	203,210	203,210	10/15	Rapid Bus
QX	680	590	Express (hourly peak periods only)	Discontinued and replaced with microtransit or flex service
1	72,350	69,620	25/35	Rapid Bus
3	12,410	5,900	40/60	30 All Day
4	9,190	3,800	40/55	30 All Day
17	27,130	9,570	35/60	Rapid Bus
18	11,000	3,710	30/60	20 Peak
19	34,770	9,800	35/60	15 All Day
20	60,250	32,830	18/30	Rapid Bus
21	24,050	11,730	35/35	Light Rail/BRT
22	31,810	12,480	35/45	15 All Day
31	50,700	17,770	17/25	Rapid Bus
54	35,500	3,330	45/45	Regional Rapid 15
72	48,510	8,700	25/35	20 Peak
Other Routes				
12X	620	350	Express	Express
13	7,840	3,900	60/60	30 All Day
14	17,290	11,200	60/60	Regional Rapid
16	4,360	1,840	60/60	30 Peak
23	3,540	1,040	60/60	30 Peak
24X	2,230	690	Express	Express
27	33,850	15,280	30/60	Rapid Bus
28	29,240	14,320	30/45	15 All Day
29	3,520	1,420	60/60	30 Peak
30	12,880	11,360	45/50	30 All Day
32	5,820	3,590	60/60	20 Peak
33	25,820	11,370	30/60	20 Peak
34	14,160	6,760	60/60	20 Peak
35	9,510	3,910	45/60	30 All Day
40	4,490	3,230	45/60	30 All Day
50	32,080	18,700	30/45	15 All Day
51	22,000	16,060	45/60	15 All Day
55	21,070	11,500	35/60	20 Peak
56	48,570	29,860	20/25	Rapid Bus
57	17,900	10,660	35/45	20 Peak
58	12,030	6,210	60/60	30 All Day
59X	710	250	Express	Express
6	6,410	3,040	30/50	30 Peak
60	50,270	15,430	60/60	Regional Rapid 15

Route	Monthly Ridership (Oct. 2023)*	Monthly Ridership within Study Area*	Weekday Peak/Off-Peak Existing Headway	Planned TMP Peak/Off-Peak Weekday Headway
9X	1,450	490	Express	Express
61X	1,200	680	Express	Express
65X	1,680	980	Express	Express
66	25,760	13,880	Express	Regional Rapid
71	7,990	7,990	45/45	20 Peak
73	2,920	1,460	60/60	15 All Day
75	4,070	2,750	60/60	30 All Day
76	1,770	1,250	60/60	30 All Day
78	16,170	8,230	45/60	Rapid Bus
80	1,400	760	60/60	30 Peak
92	42,920	24,360	30/30	15 All Day
95X	1,200	580	Express	Express

**Data note: To determine the percentage of ridership within the study area, a combination of two separate RIPTA ridership datasets was used. To find the actual percentage of ridership in the study area, the report 'Stop Summary – Trip Average' was used. This percentage was then applied to RIPTA's 'Route Ridership (NTD Statistics)' ridership numbers for each route during the time period.*

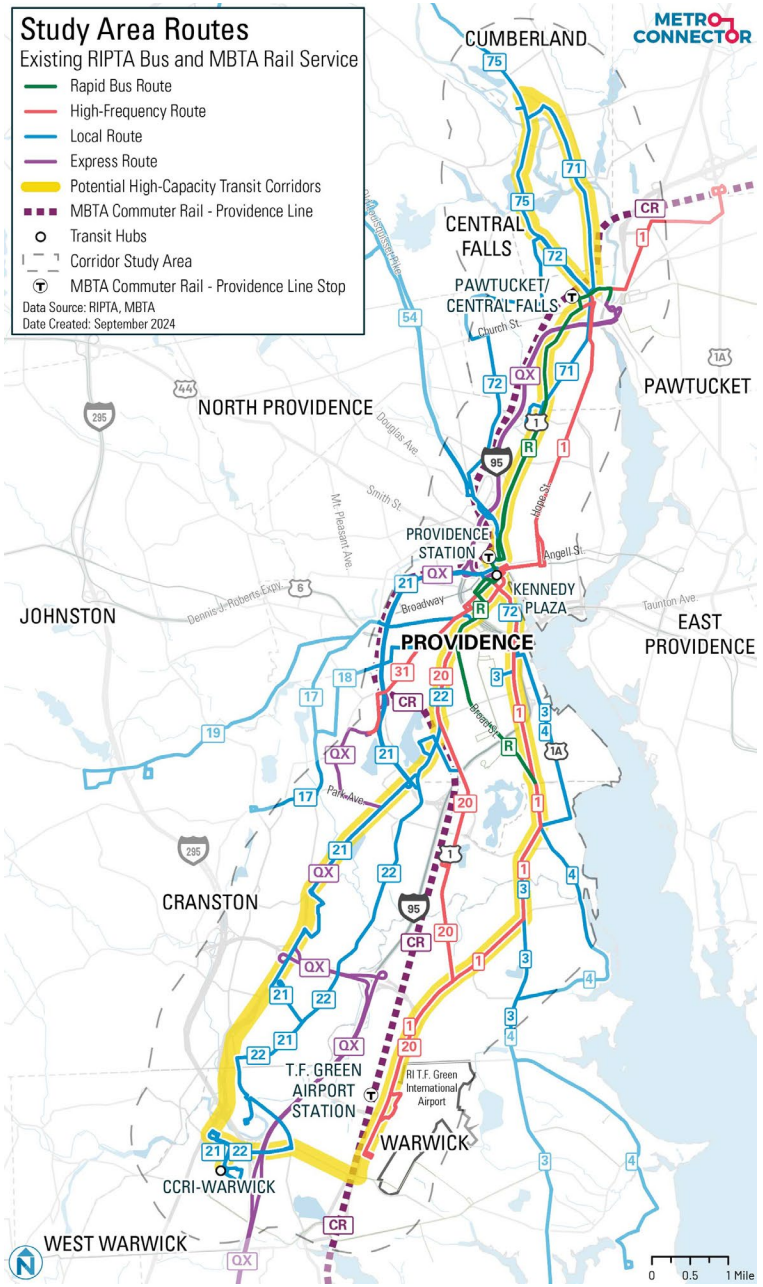


Figure 4-1 RIPTA Routes within Study Area

Primary Route Descriptions

R Line

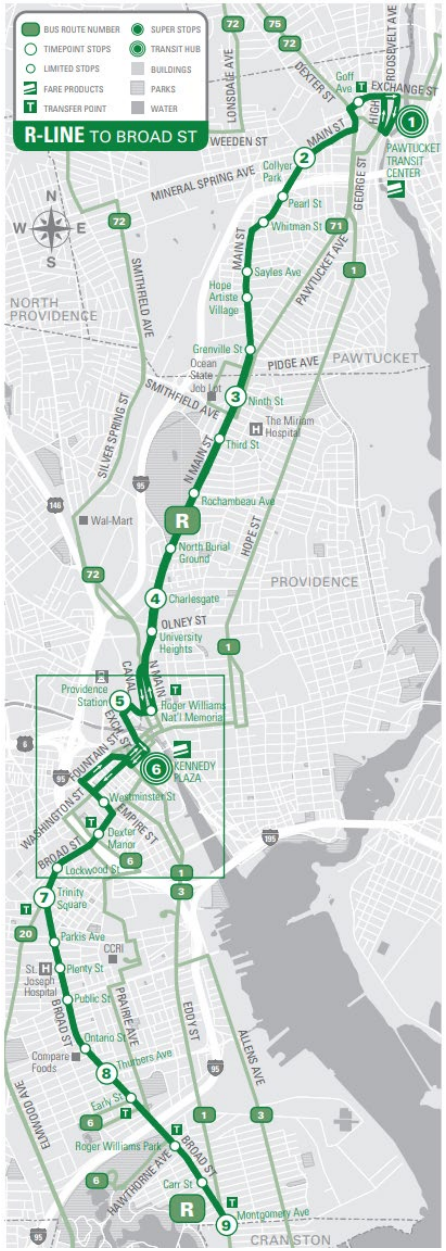
The R-Line is RIPTA's sole existing rapid bus service and the highest ridership route in the system. The R-Line operates between Broad St. in southern Providence to Roosevelt St & Main St. in Pawtucket, notably serving stops at Kennedy Plaza, Providence Station, and Pawtucket/Central Falls Station.

The R-Line operates service on weekdays and weekends, with service from 5:00 AM – 12:30 AM on weekdays, 5:00 AM – 12:15 AM on Saturdays, and 6:30 AM – 11:30 PM on Sundays. It also has the highest frequencies in the system, with 10-minute frequency all day on weekdays (5:00 AM to 7:30 PM) and 15-minute frequency all day on weekends (7:00 AM to 7:00 PM).

In October 2023, the R-Line had an average of 7,780 passenger trips each weekday, 3,140 each Saturday, and 3,230 each Sunday, for a total of 203,210 passenger trips during a calendar month. Of the average weekday passenger trips, all 7,780 took place within the study area. The R-Line is on-time (between 1 minute early and 5 minutes late) 76% of the time, just below RIPTA's on-time performance target of 80%.

The R-Line runs completely within the study area buffers and has extremely high ridership demand. With the addition of high-capacity transit, the R-Line would potentially offer duplicative coverage north of Kennedy Plaza.

Figure 4-2 R Line Route Map



Route 1

Route 1 Eddy/Hope/Benefit is a high-frequency route that provides service from T.F. Green International Airport to Bristol Place in South Attleboro via Kennedy Plaza and Pawtucket/Central Falls Transit Center.

Route 1 operates service on weekdays and weekends, with service from 5:45 AM – 10:35 PM on weekdays, 6:40 AM – 9:20 PM on Saturdays, and 6:45 AM – 8:15 PM on Sundays.[10] Although it is categorized as a high-frequency route, Route 1 has peak frequencies of 20 minutes on weekdays, and 40 minutes on weekends.

Route 1 has the second highest ridership in RIPTA's system, with 72,350 passenger trips in October 2023. On average, Route 1 served 3,020 passenger trips on weekdays, 890 on Saturdays, and 850 on Sundays. Of the average weekday passenger trips, 2,900 took place in the study area. Route 1 runs on-time 76% of the time, which is 4% below RIPTA's on-time performance standard of 80%.

Route 3

Route 3 Oakland Beach is a local route that provides service from Oakland Beach in Warwick to Providence Station, making stops in the Hospital District on Eddy St. and Kennedy Plaza.

Route 3 operates service on weekdays and weekends, with service from 6:00 AM – 9:00 PM on weekdays, 6:30 AM – 7:00 PM on Saturdays, and 8:00 AM – 7:00 PM on Sundays. Route 3 has peak frequencies of 40 minutes on weekdays, 75 minutes on Saturdays, and 100 minutes on Sundays.

Route 3 has the twenty-eighth highest ridership in RIPTA's system, with 12,410 passenger trips in October 2023. On average, Route 3 served 490 passenger trips on weekdays, 240 on Saturdays, and 175 on Sundays. Of the total passenger trips, 5,900 took place in the study area. Route 3 runs on-time 82% of the time.

Route 4

Route 4 Warwick Neck is a local route that provides service from Bayside Field in Warwick to Providence Station, making stops in the Hospital District on Eddy St. and Kennedy Plaza.

Route 4 operates service on weekdays and weekends, with service from 5:45 AM – 9:45 PM on weekdays, 7:00 AM – 7:40 PM on Saturdays, and 7:00 AM – 6:00 PM on Sundays. Route 4 has peak frequencies of 40 minutes on weekdays and 75 minutes on Saturdays, and 100 minutes on Sundays.

Route 4 has the thirty-third highest ridership in RIPTA's system, with 9,190 passenger trips in October 2023. On average, Route 4 served 365 passenger trips on weekdays, 165 on Saturdays, and 110 on Sundays. Of the total passenger trips, 3,800 took place in the study area. Route 4 runs on-time 83% of the time.

Route 17

Route 17 Dyer/Pocasset is a local route that provides service from the Stop & Shop on Atwood Ave. in Cranston to Kennedy Plaza in Downtown Providence, operating primarily along Dyer Ave, Westminster St, and Washington St.

Route 17 operates service on weekdays and weekends, with service from 6:15 AM – 10:00 PM on weekdays, 6:30 AM – 10:00 PM on Saturdays, and 7:45 AM – 7:30 PM on Sundays. Route 17 has peak frequencies of 32 minutes on weekdays, 44 minutes on Saturdays, and 42 minutes on Sundays.

Route 17 has the fifteenth highest ridership in RIPTA's system, with 27,130 passenger trips in October 2023. On average, Route 17 served 1,090 passenger trips on weekdays, 430 on Saturdays, and 415 on Sundays. Of the total passenger trips, 960 took place in the study area. Route 17 runs on-time 73% of the time.

Route 18

Route 18 Union Avenue is a local route that provides service from Dyer Ave & Chestnut Hill in Cranston to Kennedy Plaza in Downtown Providence, operating primarily along Union Ave, Cranston St, and Washington St.

Route 18 operates service on weekdays and Saturdays, with service from 6:00 AM – 7:15 PM on weekdays, and 7:30 AM – 7:00 PM on Saturdays. Route 18 has peak frequencies of 30 minutes on weekdays and 60 minutes on Saturdays.

Route 18 has the thirtieth highest ridership in RIPTA's system, with 10,995 passenger trips in October 2023. On average, Route 18 served 500 passenger trips

[10] Span of service is defined by RIPTA's Service Standards. The beginning of service refers to the departure of the first inbound trip, and the ending span of service refers to the departure time of the last peak direction trip.

on weekdays and 130 on Saturdays. Of the total passenger trips, 3,710 took place in the study area. Route 18 runs on-time 78% of the time.

Route 19

Route 19 Plainfield/Westminster is a local route that provides service from the Cranston Industrial Park to Kennedy Plaza in Downtown Providence, additionally serving the Cranston Walmart and operating primarily along Plainfield St, Westminster St, and Washington St.

Route 19 operates service on weekdays and weekends, with service from 6:00 AM – 11:15 PM on weekdays, 6:45 AM – 11:15 PM on Saturdays, and 7:30 AM – 8:00 PM on Sundays. Route 19 has peak frequencies of 32 minutes on weekdays, 40 minutes on Saturdays, and 43 minutes on Sundays.

Route 19 has the tenth highest ridership in RIPTA's system, with 27,130 passenger trips in October 2023. On average, Route 19 served 1,350 passenger trips on weekdays, 630 on Saturdays, and 630 on Sundays. Of the total passenger trips, 9,800 took place in the study area. Route 19 runs on-time 72% of the time.

Route 20

Route 20, Elmwood/T.F. Green International Airport is a high-frequency route that provides service from T.F. Green International Airport in Warwick to Kennedy Plaza in Downtown Providence, primarily running along Elmwood Ave.

Route 20 operates service on weekdays and weekends, with service from 5:15 AM – 11:00 PM on weekdays, 5:45 AM – 10:00 PM on Saturdays, and 5:30 AM – 9:00 PM on Sundays. Route 20 has peak frequencies of 15 minutes on weekdays and 30 minutes on weekends.

Route 20 has the third highest ridership in RIPTA's system, with 60,250 passenger trips in October 2023. On average, Route 20 served 2,470 passenger trips on weekdays, 775 on Saturdays, and 700 on Sundays. Of the average weekday passenger trips, 2,030 took place in the study area. Route 20 runs on-time 76% of the time, which is only 4% below RIPTA's on-time performance standard of 80%.

Route 21

Route 21 Reservoir/Garden-City/CCRI-Warwick is a local route that provides service from CCRI in Warwick to Kennedy Plaza, making stops in Cranston and Garden City Center.

Route 21 operates service on weekdays and weekends, with service from 6:00 AM – 10:10 PM on weekdays, 7:00 AM – 10:40 PM on Saturdays, and 7:00 AM – 8:30 PM on Sundays. Route 21 has peak frequencies of 32 minutes on weekdays, 35 minutes on Saturdays and 45 minutes on Sundays.

Route 21 has the nineteenth highest ridership in RIPTA's system, with 24,050 passenger trips in October 2023. On average, Route 21 served 930 passenger trips on weekdays, 580 on Saturdays, and 380 on Sundays. Of the total passenger trips, 11,730 took place in the study area. Route 21 runs on-time 76% of the time.

Route 22

Route 22 Pontiac Avenue is a local route that provides service from The Community College of Rhode Island (CCRI) – Warwick Campus to Kennedy Plaza in Downtown Providence, with stops at Warwick Mall and along Pontiac and Elmwood Avenues.

Route 22 operates service on weekdays and weekends, with service from 5:50 AM – 10:20 PM on weekdays, 6:30 AM – 10:00 PM on Saturdays, and 7:00 AM – 9:15 PM on Sundays. Route 22 has peak frequencies of 30 minutes on weekdays and 45 minutes on weekends.

Route 22 has the thirteenth highest ridership in RIPTA's system, with 31,810 passenger trips in October 2023. On average, Route 22 served 1,250 passenger trips on weekdays, 530 on Saturdays, and 550 on Sundays. Of the total passenger trips, 12,480 took place in the study area.

Route 22 runs on-time 68% of the time.

Route 31

Route 31 Cranston Street is a high-frequency route offering transportation from Brewery Parkade in Cranston to Kennedy Plaza via Cranston and Washington Streets.

Route 31 operates daily, with weekday service running from 6:00 AM to 11:15 PM, Saturday service from 6:30 AM to 10:00 PM, and Sunday service from 7:00 AM to

8:00 PM. During peak times, the route has frequencies of 16 minutes on weekdays, 18 minutes on Saturdays, and 20 minutes on Sundays.

In October 2023, Route 31 recorded the fourth highest ridership within RIPTA's system, with a total of 50,700 passenger trips. On average, the route accommodated 1,890 passenger trips on weekdays, 1,320 on Saturdays, and 940 on Sundays. Of the average weekday passenger trips, 660 occurred within the study area.

Route 31 achieves on-time performance 79% of the time.

Route 54

Route 54 Lincoln/Woonsocket is a regional route that provides service from Kennedy Plaza in Downtown Providence to Woonsocket, primarily operating along RI 146.

Route 54 operates service on weekdays and weekends, with service from 5:15 AM – 12:00 AM on weekdays, 6:45 AM – 11:00 PM on Saturdays, and 6:30 AM – 11:00 PM on Sundays. Route 54 has peak frequencies of 40 minutes on weekdays, 40 minutes on Saturdays, and 43 minutes on Sundays.

Route 54 has the ninth highest ridership in RIPTA's system, with 35,500 passenger trips in October 2023. On average, Route 54 served 1,320 passenger trips on weekdays, 730 on Saturdays, and 750 on Sundays. Of the total passenger trips, 3,330 took place in the study area. Route 54 runs on-time 76% of the time.

Route 72

Route 72 Weeden/Central Falls is a local route that provides service from Pawtucket/Central Falls Transit Center to Kennedy Plaza in Downtown Providence, providing service to Fairlawn and North Providence including Providence Station.

Route 72 operates service on weekdays and weekends, with service from 5:30 AM – 10:30 PM on weekdays, 7:00 AM – 9:15 PM on Saturdays, and 7:15 AM – 7:30 PM on Sundays. Route 72 has peak frequencies of 23 minutes on weekdays and 32 minutes on weekends.

Route 72 has the seventh highest ridership in RIPTA's system, with 48,513 passenger trips in October 2023. On average, Route 72 served 1,810 passenger trips on weekdays, 870 on Saturdays, and 980 on Sundays. Of the total passenger trips, 8,700 took place in the study area. Route 72 runs on-time 76% of the time.

Quonset Express

The Quonset Express is an express route that provides service from Quonset in southern Rhode Island to Pawtucket/Central Falls Transit Center. The Quonset Express operates along Interstate 95 from Quonset to Warwick and along State Highway 6 until it reaches Kennedy Plaza. The Quonset Express also serves Providence Station.

The Quonset Express operates service on weekdays only, with morning trips heading south from Pawtucket/Central Falls transit Center to Quonset at 4:40 AM and 5:33 AM, and afternoon trips heading north from Quonset to Pawtucket/Central Falls at 3:00 PM and 3:34 PM.

The Quonset Express has the fifth lowest ridership in RIPTA's system, with 680 passenger trips in October 2023. On average, the Quonset Express served 24 passenger trips on weekdays, with an average of 6 passengers per trip. Of the total passenger trips, 590 took place in the study area. The Quonset Express runs on-time 82% of the time.

Providence/Stoughton MBTA Commuter Rail Line

The Providence/Stoughton Line is an MBTA Commuter Rail Line that provides service from South Station in Boston to Wickford Junction, via Providence. It is branched service, so some trips go only between South Station and Stoughton and do not go to Providence, so the Providence variants are the only ones relevant to the high-capacity transit study. 21 round trips are offered on the Providence branch during weekdays, and 10 trips are offered on both Saturday and Sunday.

Ridership on the Providence line is highest in the study area at Providence Station, which accommodates 1,400 boardings and 1,200 alightings on an average weekday. Providence Station has double the ridership of Pawtucket-Central Falls Station, and seven-times the ridership of both T.F. Green International Airport Station and Wickford Junction.

The fare for traveling on the Commuter Rail is based on the Zone the station is located in. Pawtucket-Central Falls Station and Providence Station are in Zone 8, and T.F. Green International Airport Station is in Zone 9. Traveling from Zone 8 to Zone 9 is $3.25 and traveling within Zone 8 is $2.75. The fare for traveling to Boston from Zone 8 is $12.75.

Speed and Reliability

Often, taking transit is slower than driving, primarily because transit vehicles need to stop to pick up and drop off passengers. Slower service discourages many people from using transit. Beside stopping for passengers at bus stops, transit speeds in Rhode Island are impacted by general roadway conditions and infrastructure including stop signs, traffic signals, mid-block crossings, traffic congestion, double parking, and circuitous streets.

Speed and reliability improvements are critical to improving bus service.

Along with the frequency and span of service, speed and reliability are important attributes of transit service. Bus riders want to know how long it will take for them to get to their destination, and know they can count on this information, so they can plan their trip and be assured they will arrive on time.

Transit Speed

Speed is important because bus riders want to reach their destination quickly. Outside of Downtown Providence, Downtown Pawtucket, near highway on- and off-ramps for Route 10 in Providence, and near major destinations in Warwick and Cranston, bus speeds in the study area generally operate at acceptable speeds of at least 20 miles per hour (Figure 4-3). The MBTA's Providence Line averages speeds of approximately 35 miles per hour between Providence Station and T.F. Green International Airport Station. Along the corridors shown in red to the right, however, many factors can make buses slow and unpredictable:

- Providence and Pawtucket's narrow streets are difficult to navigate. Roads are also often blocked by delivery trucks and double-parked cars.
- Traffic congestion slows down buses and is unpredictable, especially in Providence and Pawtucket. Traffic can be better or worse depending on the day and hour.
- Bus stops that are blocked by illegal parking or double-parked cars.
- Some routes are long, increasing more opportunities for delays.
- Some routes have circuitous alignments. Bus routes that travel on smaller streets and make numerous turns result in trips that are longer and harder to keep on time.

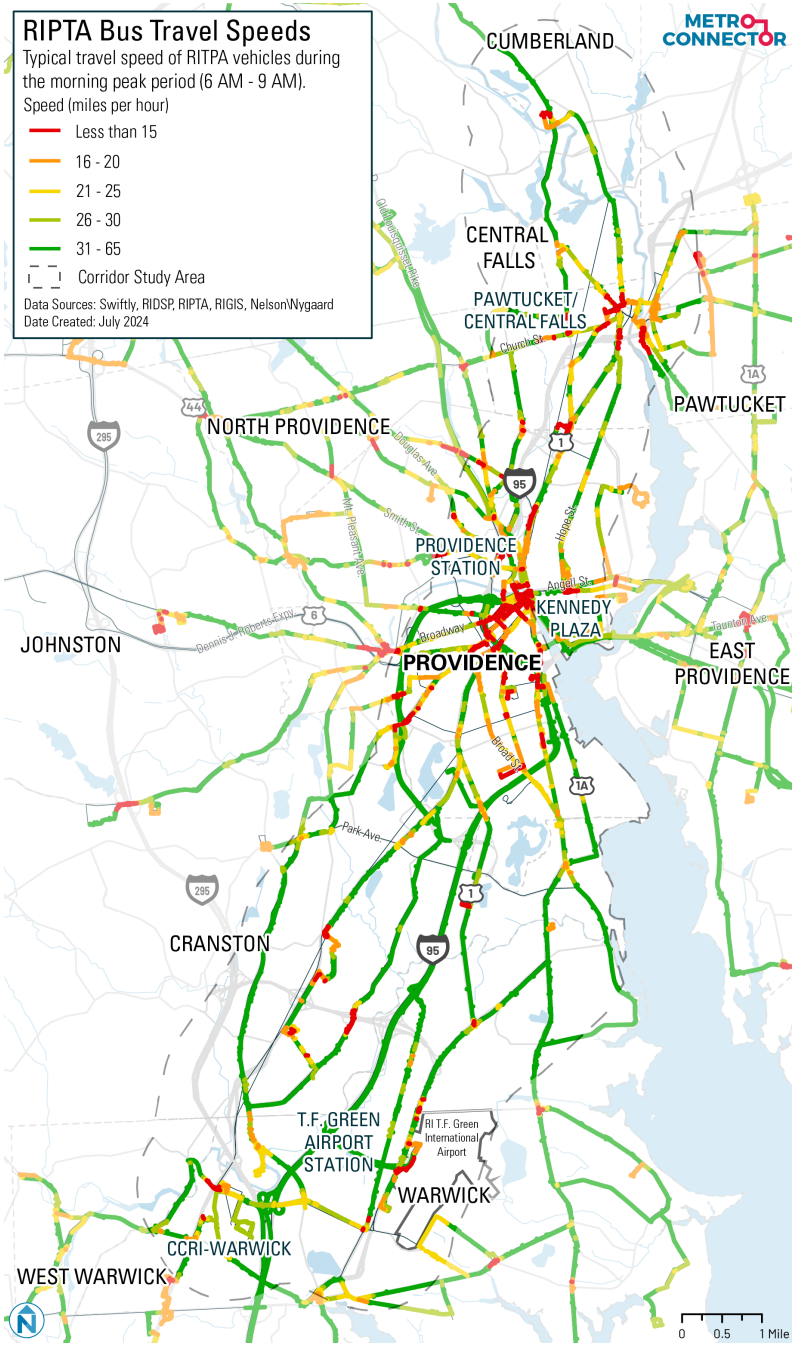


Figure 4-3 RIPTA Bus Travel Speeds

Reliability

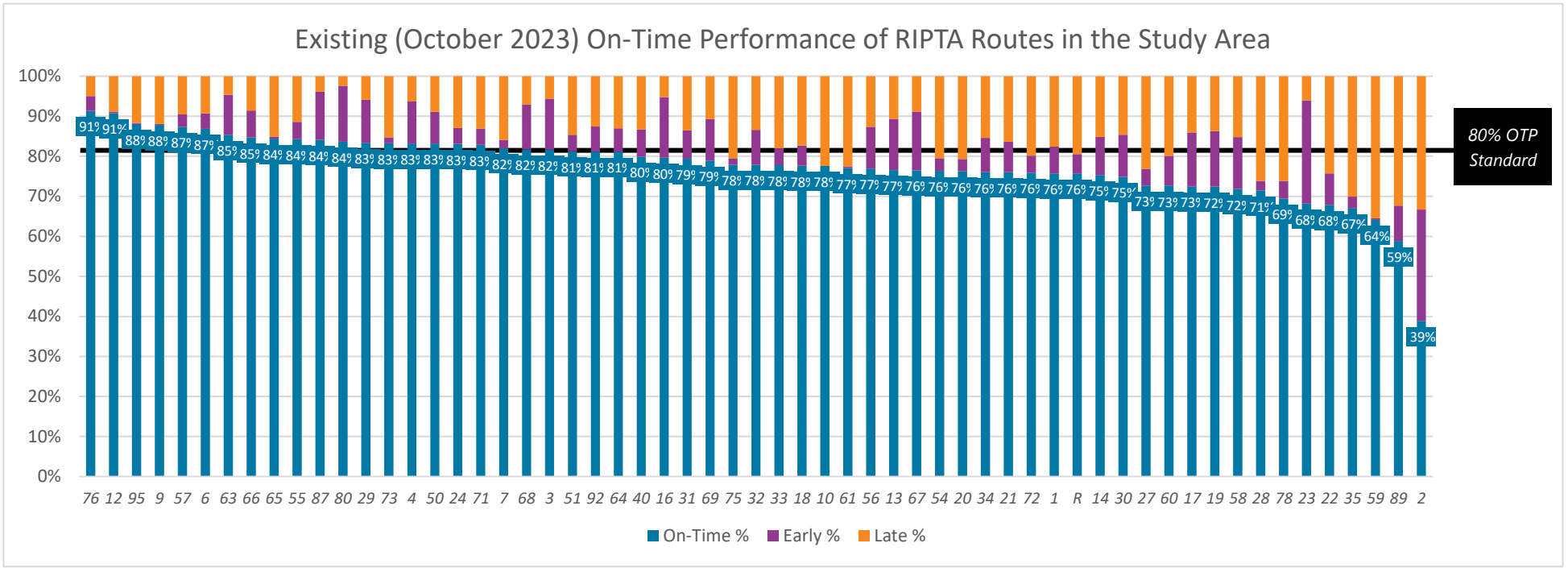
Riders need to be able to rely on RIPTA to get them where they are going when they need to be there. RIPTA works to ensure that nearly all buses leave on time, but once they leave, unavoidable and sometimes unforeseen events on the street mean that they can get delayed. For these reasons, RIPTA cannot ensure that all service is always on time. However, there are many things that RIPTA does to keep on-time performance as high as possible. For fixed-route services, these include:

- Including enough time in schedules to ensure that late arrivals on one trip do not cause late departures on the next trip.
- Including enough time in schedules to accommodate minor delays.
- Setting timepoints at key points along the route where early buses hold until their scheduled departure time. This practice reflects that early service often impacts passengers more than late departures as the wait for the next bus is almost always longer than the short hold time.

Twenty-two of the 49 Primary and Other Routes in the study area meet or exceed RIPTA's OTP standard of 80%.

For fixed-route services, RIPTA measures on-time performance at each mid-route timepoint, with on time defined as no more than one minute early and no more than five minutes late. RIPTA's goal is that 80% of all service departs from each timepoint within this window. As shown in Figure 4-4, reliability of RIPTA routes in the study area range from very high (over 90% for Route 76 and Route 12) to low (Route 89). As discussed in the following section, there is a major opportunity to expand transit priority infrastructure in the study area to reliably convey future high-capacity transit services at higher speeds. This transit priority infrastructure is likely to confer systemwide reliability benefits, since many RIPTA routes must necessarily provide service on the same corridors in dense areas like Downtown Providence and Pawtucket.

Figure 4-4 RIPTA Existing Bus On-Time Performance



Transit Priority Infrastructure

Transit priority infrastructure refers to measures and design elements that prioritize and expedite public transit vehicles over general traffic, such as dedicated bus lanes, signal priority systems, and streamlined boarding processes. This infrastructure is crucial for improving the reliability, efficiency, and attractiveness of transit services by reducing delays and making transit more competitive with private vehicle travel. For high-capacity transit services, transit priority infrastructure ensures that these systems can operate at their full potential, maintaining high speeds and minimizing congestion impacts. It supports such systems by providing the necessary physical and operational conditions to keep them moving smoothly and on schedule. This section and Figure 4-5 provide an overview of current and planned transit priority infrastructure, including:

- Transit Emphasis Corridors
- Transit Signal Priority and Queue Jumps
- Dedicated Busways
- Bus-On-Shoulder Lanes

High-Capacity Transit in the study area could build on and potentially utilize existing transit emphasis corridors in Providence and Pawtucket.

Transit Emphasis Corridors

Transit Emphasis Corridors feature several transit priority elements that are utilized by multiple bus and rapid bus routes. RIPTA has two Transit Emphasis Corridors: The Downtown Transit Connector (DTC), and the Pawtucket Transit Emphasis Corridor. RIPTA's Transit Master Plan identified a third for east-west service in College Hill on Waterman Street and Angell Street. The transit-priority elements on these corridors include:

- High-quality and larger shelters with seating, real-time information, and lighting
- Transit signal priority through extension of green lights and special signal phases
- Dedicated bus lanes on portions of the route
- Bicycle infrastructure through the inclusion of bikeshare stations and bike lanes and parking
- Branding and unique design for stations so that the corridor is identifiable through a consistent color theme and design

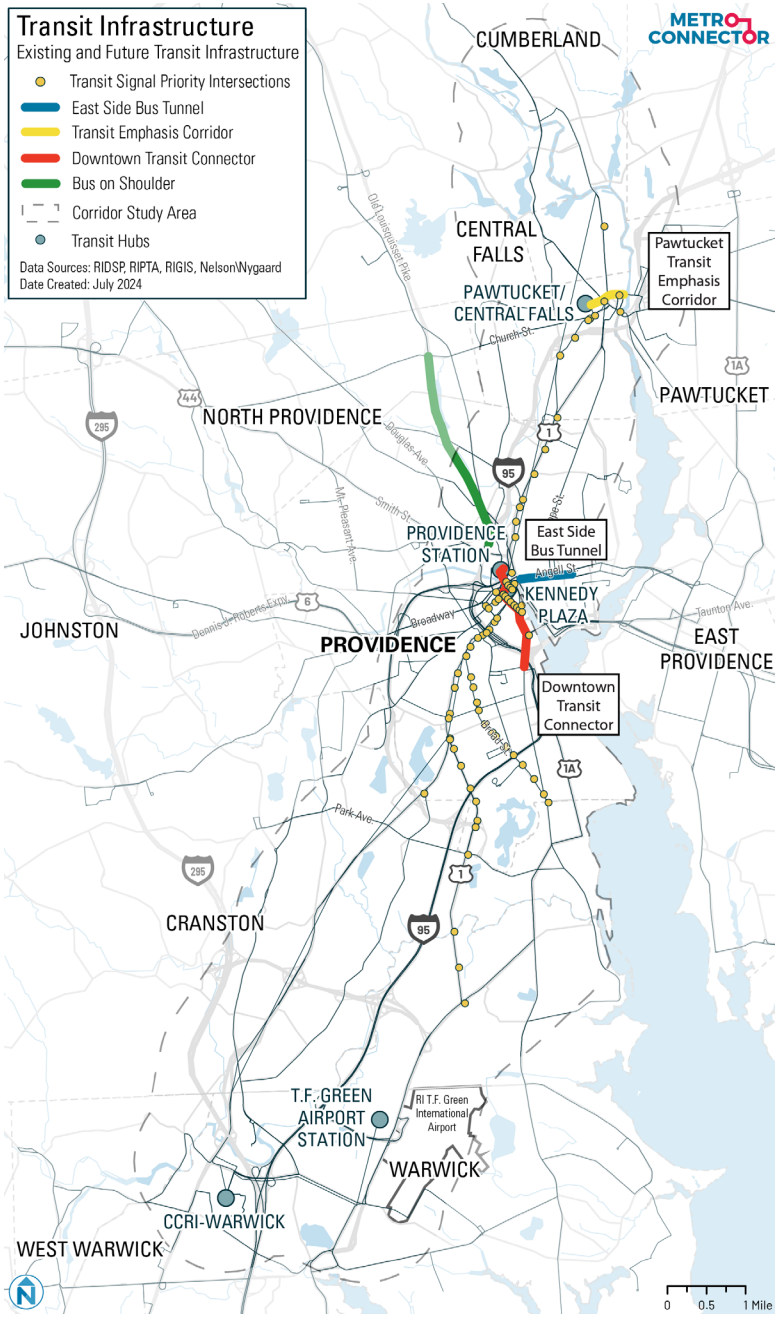


Figure 4-5 Existing and Under-Construction Transit Infrastructure

Transit Signal Priority

Transit signal priority helps buses run more efficiently by either extending green lights, allowing for buses to get through the intersection, or shortening red lights where buses are waiting. There are 112 intersections in the Providence region that are expected to become integrated with transit signal priority or already have transit signal priority capabilities. These intersections are primarily focused on the R-Line corridor, with 51 located along Broad St., Main St., North Main St., and other streets along the corridor. The Downtown Transit Connector has 13 TSP-enabled intersections, primarily along Dorrance St. and Exchange St. Other areas of focus are along Elmwood Ave., West Main Rd. (Aquidneck Island), and East Main Rd. (Aquidneck Island).

Bus Lanes and Queue Jumps

Bus lanes are the most effective way to improve transit speed and schedule reliability as they make the timing of the bus more predictable by allowing them to avoid traffic congestion. Currently, the City of Providence has some bus lanes along the Downtown Transit Connector and Pawtucket features bus lanes along Exchange Street concurrent with the Transit Emphasis Corridor.

Bus queue jump signals provide a leading bus interval to a bus located in a short bus-only lane located at a traffic signal. A leading bus interval is an advanced indication provided by dedicated bus signal that turns green before general traffic signals. Currently, there are no queue jumps in Rhode Island.

Dedicated Transitways

RIPTA has one dedicated busway in the East Side of Providence, which is the East Side Transit Tunnel. The tunnel was originally built in 1914 so that trolleys could more efficiently navigate College Hill. The tunnel was closed for renovation throughout much of 2024 but has reopened for service. The updates include bus shelter improvements, addition of amenities—lighting, shelters, signage—and overall structural and drainage repairs to the tunnel.

The MBTA's Providence/Stoughton Line operates in a dedicated railway right-of-way that allows the Commuter Rail to operate safely at high speeds. The right-of-way spans the entire length of the study area from north to south and its southern terminal is at Warwick Junction.

Bus On Shoulder (Route 146 Reconstruction Project)

Bus delays are often caused by car traffic. With services that operate on highways, buses can be given a travel time advantage when they can use highway shoulders during times of heavy traffic congestion. RIDOT is currently working on the Route 146 Reconstruction Project, which will accommodate bus-on-shoulder travel on RIPTA's Route 54 along the southern end of the highway in North Providence and Providence.

Figure 4-6 Bus Lanes and High-Quality Stations on Providence's Downtown Transit Connector

Bus Stop Infrastructure

RIPTA's buses provide service to approximately 3,360 bus stops statewide. RIPTA has six bus stop typologies that can be found within the study area including Transit Center/Mobility Hubs, Downtown Transit Connector (DTC) stops, Transit Emphasis Corridor (TEC) stops, High Activity stops, Standard stops, and Park & Ride lots. These bus stops vary in terms of their capacity to serve future high-capacity transit service, and they range from standard stops with few amenities to high-end transit centers:

- **Transit Center/Mobility Hubs** - provide connections to other routes and other transit services or modes of travel (e.g., MBTA Commuter Rail). Mobility hubs provide a comfortable waiting environment for riders and additional amenities for RIPTA staff during layovers and breaks. Kennedy Plaza is an example of a Transit Center in the study area.
- **Downtown Transit Connector (DTC)** - provide high-frequency transit service (5 minutes or better) between the Providence Train Station and the Hospital District and on Exchange Street in Pawtucket. This stop type is located along a high-frequency corridor with transit priority elements including dedicated bus lanes and transit signal priority.
- **Transit Emphasis Corridor Stops (TEC)** - most likely to be served by 3 or more routes with truncated service. These stops are in dense neighborhoods that are very walkable and provide connections between major activity centers.
- **High Activity Stops** – provide service to areas with high ridership volumes and are located adjacent to major destinations such as hospitals and universities.
- **Standard Stops** – most common type of RIPTA bus stop and are typical throughout Rhode Island at stops with lower ridership.
- **Park & Ride Lots** - mostly located in suburban and rural environments that allow riders to park their vehicle and transfer to RIPTA local and/or express bus routes for the remainder of their trip.

Figure 4-7 RIPTA High Activity Bus Stop

Service characteristics, frequency, land uses, and passenger volumes influence the type of bus stops located on a route. Available RIPTA amenities include benches, shelters, trash cans, real-time information, digital advertising, bike racks, leaning rails, and lighting. Additional investments for larger transit facilities may include boarding platforms, distinct branding (similar to R-Line), and landscaping.

Future high-capacity transit service would likely serve higher-end stops like DTC stops, TEC stops, and high activity stops. Should light rail be built in the study area, RIPTA may consider adding a 7th stop type to its typology for light rail service, which would include many of the same elements as DTC stops but with level boarding, additional real-time information, and longer platforms. Guidance regarding RIPTA's bus stop amenities and placement criteria can be found in RIPTA's Bus Stop Design Guidelines document.

Figure 4-8 Kennedy Plaza is one of three existing Transit Centers located in the study area.

Key Transit Hubs and Transfer Locations

There are several key locations in the study area facilitating connections between routes in the RIPTA system, as well as connection points to other transit providers serving Southern New England. The primary transfer locations are Kennedy Plaza, Providence Station, Pawtucket-Central Falls Transit Center, T.F. Green International Airport, and CCRI-Warwick (Figure 4-9).

These transit centers and high-volume transfer locations are key areas of focus to determine the placement of future high-capacity transit services.

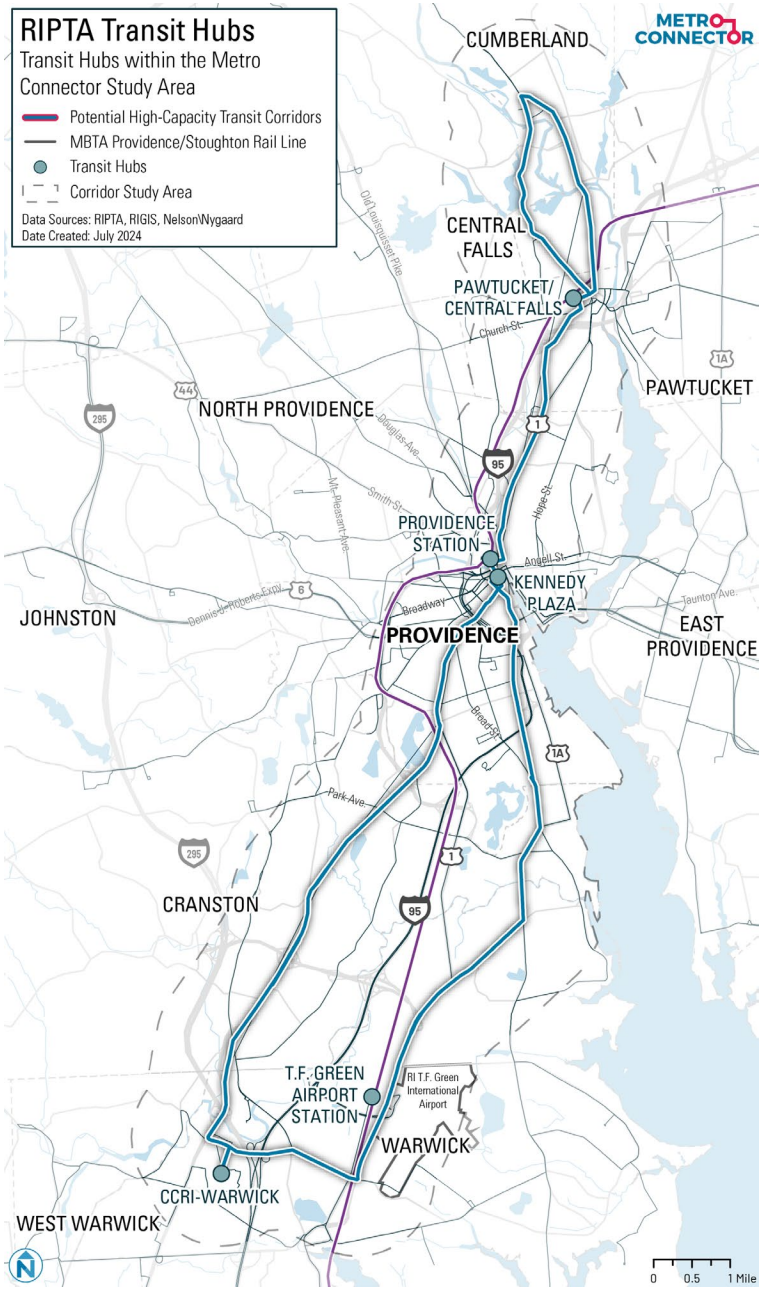


Figure 4-9 RIPTA Transit Hubs

Kennedy Plaza (under study for relocation)

Kennedy Plaza is located in Downtown Providence and is RIPTA's highest rider activity stop, averaging 11,500 daily boardings and 10,980 daily alightings among the 11 stops. Kennedy Plaza is a key transfer location, serving 45 of RIPTA's 56 routes (not including special service). Kennedy Plaza has 12 bus shelters, benches, lighting, real-time arrival information, and a passenger terminal building.

Kennedy Plaza is currently under study for relocation, as RIPTA and the City of Providence are researching locations for an alternative, higher-capacity transit center.

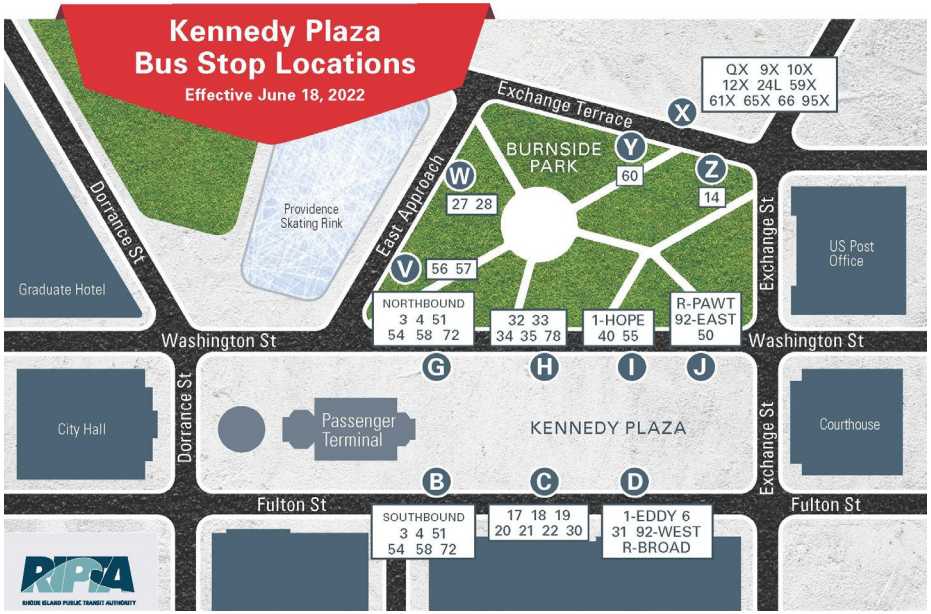


Figure 4-10 Kennedy Plaza Map

Source: KP-Map-Card-6_22-v2-Front8.pdf (ripta.com)

Providence Station

Providence Station is the connecting point for Amtrak and MBTA Commuter Rail in Providence. Nine routes serve three stops at Providence Station. The station itself offers seating, restrooms, a café, and real-time arrival information on incoming trains. There is one bus shelter at Providence Station which is at a stop that is served by eight routes, intended for riders departing the station, and additionally there are stops on Gaspee street, which is on the northwestern side of the Station, that serve an additional four routes. Providence Station averages 400 daily boardings and 340 daily alightings. During weekdays, there is RIPTA bus service at least every 10 minutes between Providence Station and Kennedy Plaza. Future HCT could facilitate travel between Providence Station and Downtown Providence.

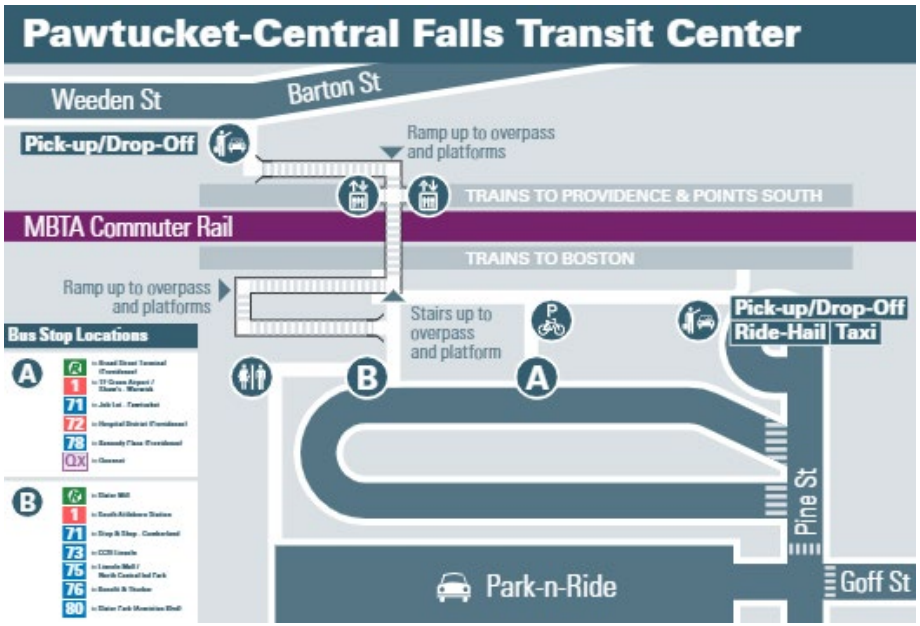
Figure 4-11 Providence Station Entrance

Source: https://www.railfanguides.us/ri/providence/index.htm

Pawtucket-Central Falls Transit Center

Pawtucket-Central Falls Transit Center serves 10 routes and the MBTA Commuter Rail. The station offers parking, bike storage, and enclosed waiting spaces. Pawtucket-Central Falls Transit Center is near the northern terminus of the R-Line, so Pawtucket-Central Falls is also a transfer location to routes that cover areas further north, northeast, or northwest of Providence. The Transit Center averages 560 daily boardings and 600 daily alightings.

Figure 4-12 Map of Pawtucket-Central Falls Transit Center



T.F. Green Airport Station

T.F. Green Airport Station is located at T.F. Green International Airport and provides riders access to four bus routes—Route 1, Route 14, Route 20, and Route 66—and the MBTA Commuter Rail. MBTA Commuter Rail currently provides 8 round trips serving the station each weekday and no weekend service. T.F. Green Airport Station averages 70 daily bus boardings and 40 daily bus alightings, and 186 commuter rail boardings and 167 commuter rail alightings each day.

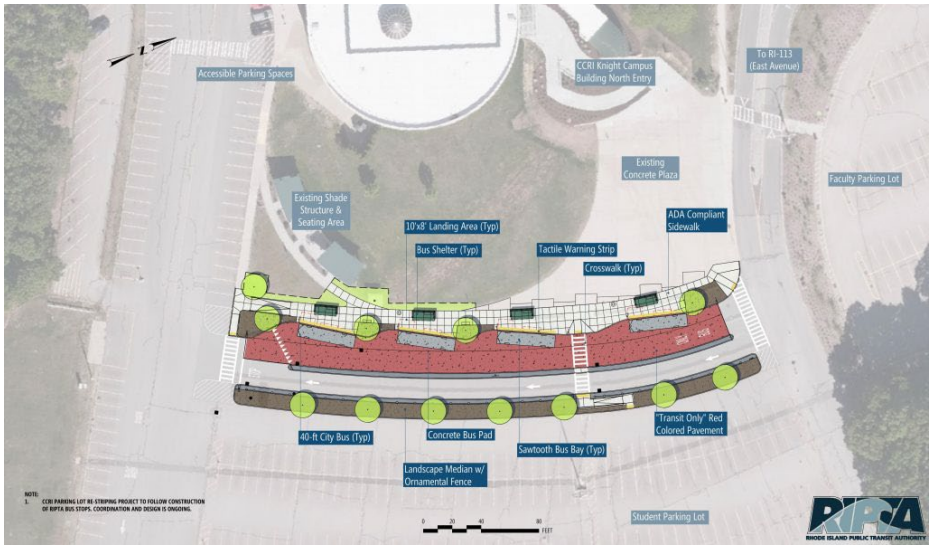
T.F. Green Airport Station is part of the InterLink transportation hub, which offers connections among multiple forms of travel. The airport is connected to MBTA Commuter Rails, RIPTA Bus Service, a parking garage, and rental car services. T.F. Green Station has a few options for a high-capacity transit stop based on what is already in use:

- Curbside at the airport, the eastern side of InterLink would be the most convenient option for riders, as this would provide service directly to the airport terminal.
- Jefferson Boulevard is on the western side of Interlink, connected via an approximately 1/3 mile walk through the skyway and parking garage. A high-capacity transit stop located on Jefferson would be most convenient for connections to the MBTA Providence/Stoughton Commuter Rail Line.
- Route 1, or Post Road, is another option, but this would require new InterLink infrastructure. This would be the middle-ground between curbside and Jefferson Boulevard. Route 1 was projected as a high-capacity transit corridor in RIPTA's Transit-Forward RI Plan.

CCRI Transit Center

CCRI-Warwick is a key southern transportation hub in RIPTA's system that provides service for nine routes—Route 13, Route 14, Route 16, Route 21, Route 22, Route 23, Route 29, Route 30, and Route 66. RIPTA and the Community College of Rhode Island have worked together to enhance the bus stops at the Warwick campus. The new bus hub has multiple loading bays that each include a shelter, real-time information, seating, lighting, and improved security. These improvements were proposed as part of Transit-Forward RI and have already been completed. The transit center averages 570 daily boardings and 580 daily alightings.

Figure 4-13 Diagram of improvements at CCRI Transit Center



Source: [CCRI Warwick Bus Stop Enhancement Project - RIPTA]

Ridership

Existing ridership volumes and patterns in the study area are important context for planning future rapid transit. This section documents ridership by stop in the study area and ridership distribution along key study area routes throughout the day. It is intended to describe the existing strength of the transit market in the study area.

Ridership by Stop

Understanding ridership levels at different stops can indicate where ridership responds most to current service levels (Figure 4-14).

In the study area, the highest levels of transit ridership occur in Providence, Pawtucket, and at major destinations in Cranston and Warwick like TF Green International Airport and CCRI-Warwick.

Other takeaways regarding high-ridership locations in the study area include:

- Stops along the R-Line, and Broad Street specifically, are also among the system's highest ridership stops.
- Kennedy Plaza is the highest ridership stop in the system by far, with an average of 11,500 boardings each weekday.
- The highest ridership stop outside the study area is at the University of Rhode Island's Memorial Union Center, which has 370 average daily boardings.
- Transit Centers and Hubs, such as Providence Station, Pawtucket-Central Falls, Newport Transit Center, and CCRI-Warwick, are among the highest ridership stops. Providence Station is the highest ridership Commuter Rail Station of the three within the study area, doubling the ridership at Pawtucket-Central Falls Station.

Future High-Capacity Transit service would likely capture much of the existing high ridership north of Park Avenue. It could also serve to facilitate connections between existing destinations in Warwick and Cranston, where bus service today must operate in a circuitous manner due to the many high-speed intersections in the area.

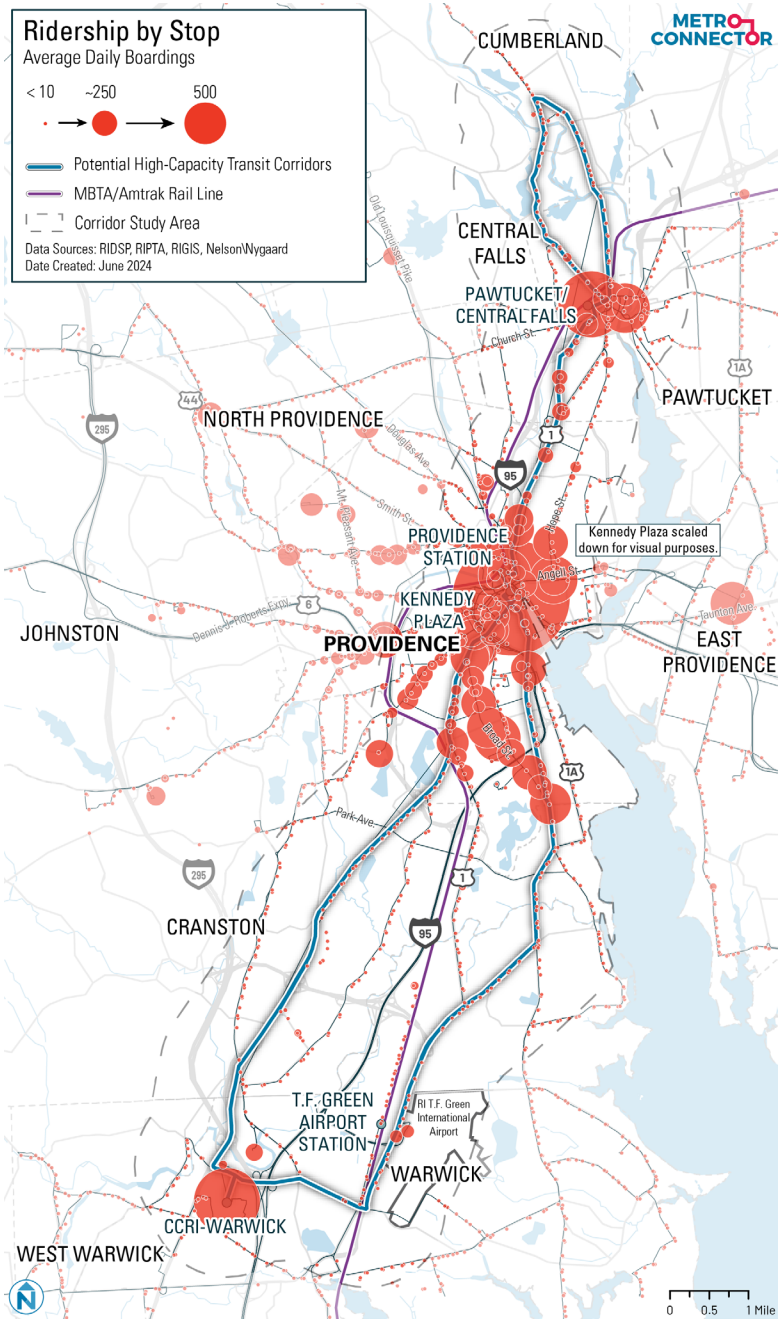


Figure 4-14 Ridership by Stop

Ridership by Time of Day

Transit agencies generally see their highest ridership during morning and afternoon peak periods, but some routes or regions see high ridership throughout the day, especially where fewer transit riders are office workers with 9:00 a.m. to 5:00 p.m. work schedules. Understanding the distribution of transit ridership throughout the day in the study area is an important context for assessing the potential demand for high-capacity transit over the course of a day.

Existing strong all-day ridership activity supports high-capacity transit, which typically provides very frequent service during most daytime hours and seven days a week.

RIPTA currently sees high demand for transit throughout the day in the study (Figure 4-15). From 6:00 AM – 7:00 PM, there are over 3,000 systemwide boardings and alightings each hour, with boardings exceeding 5,000 each hour from 7:00 AM – 5:00 PM. Boardings and alightings within the study area account for 60-70% of all boardings and alightings consistently throughout the day, even when ridership is lower in the early morning and late evening.

The MBTA Commuter Rail stations have boardings and alightings that are heavily based on peak-period travel; i.e, boardings peak on northbound trains between 6:30 AM and 7:30 AM and alightings peak in the evening between 4:30 PM and 7:00 PM. The afternoon peak is more spread out than the morning, with volume starting at 4:00 PM and lasting through 11:00 PM.

Figure 4-15 Systemwide Average Alightings by Hour (Oct. 2023)

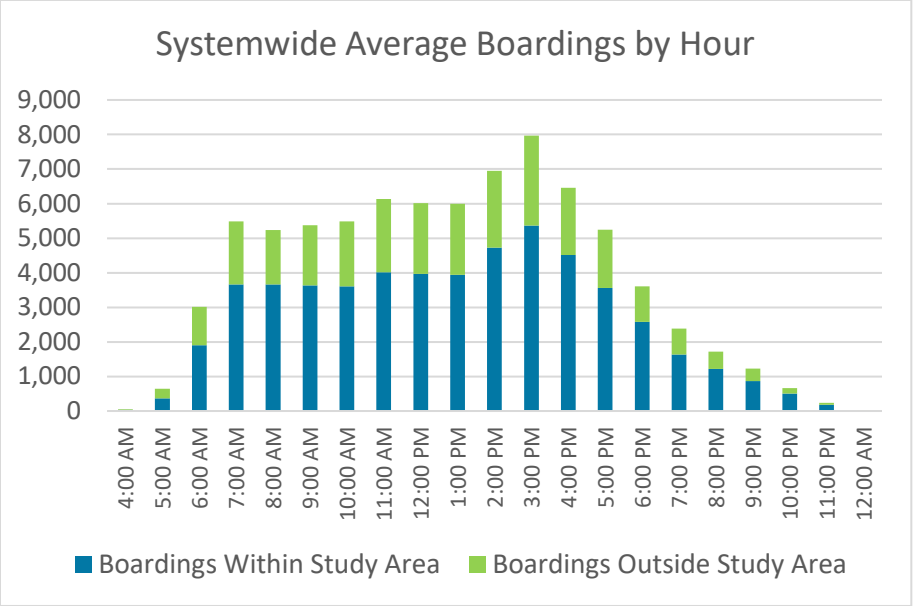
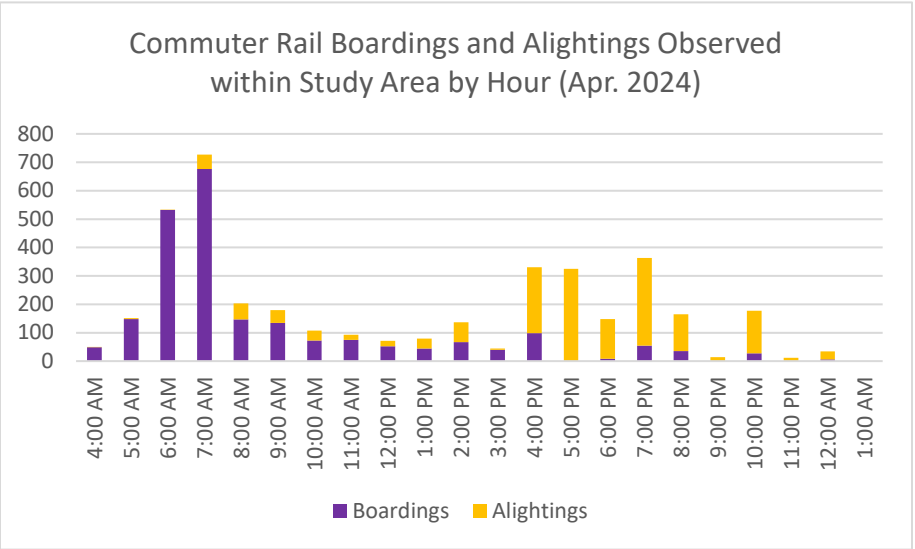


Figure 4-16 Commuter Rail Boardings and Alightings Observed within Study Area by Hour (Apr 2024)



Peak and Off-Peak Ridership

Figure 4-17 symbolizes RIPTA's bus stops based on the proportion of average weekday ridership that occurs during peak periods (from 6 AM – 9 AM and 3 PM – 6 PM) versus off-peak periods (all other times). A stop that is redder has a higher proportion of boardings occurring during peak periods, and a stop that is bluer has a higher proportion of boardings occurring during other times. On a stop level, most stops along key corridors are close to evenly split between peak and off-peak boardings, with slightly more off-peak than peak boardings. There are more off-peak hours than peak hours, so boardings that are split evenly between peak and off-peak see the same number of peak riders during the somewhat fewer peak hours as they do off-peak.

In general, boardings in the study area north of Park Avenue as well as at TF Green International Airport and CCRI Warwick are high no matter the time of day. There is high existing ridership during both peak and off-peak periods, which would be well served by future high-capacity transit.

The northern part of the study area in Central Falls and Cumberland as well as the portion of the study area south of Park Avenue in Cranston and Warwick is more off-peak driven than peak-driven, showing strong demand for transit all-day, but especially outside of traditional rush hour periods.

The central part of the study area in downtown Providence is mostly split between off-peak and peak boardings, showing the importance of having both high-quality peak and off-peak service in the study area.

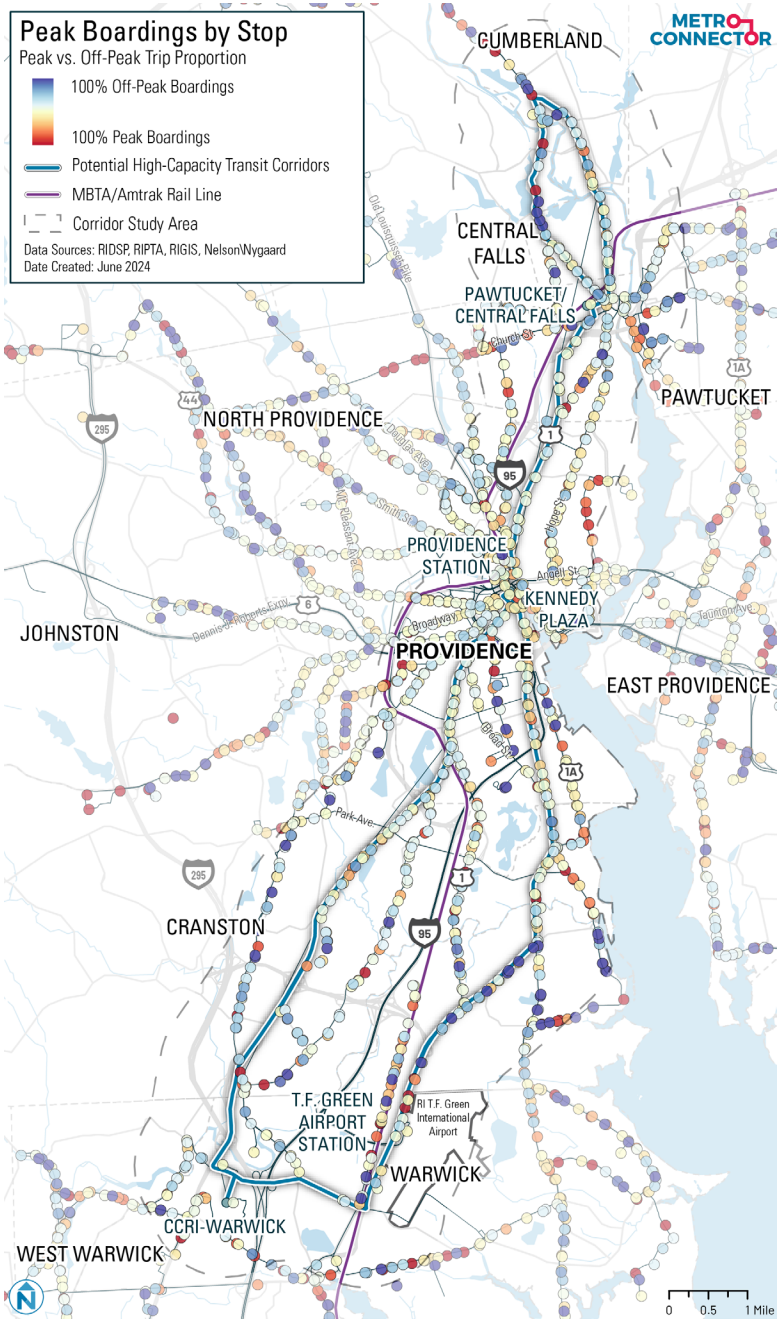


Figure 4-17 Percentage of Peak vs. Off Peak Boardings by Stop

Rail, Ferry, and Other Services

The Metro Connector Study Area is currently served by RIPTA, Amtrak, MBTA Commuter Rail, ferry, intercity bus, and several part-time and specialized services.

Amtrak

Rail lines between Rhode Island and Boston already offer a high-volume of service between the two cities. Within the study area, Amtrak only serves Providence Station. Amtrak operates 38 one-way trips on weekdays through Providence Station between its Northeast Regional and Acela services. The Northeast Regional's runtime between Providence and South Station in Boston is approximately 40 minutes and Acela's runtime is approximately 35 minutes. South of the study area, Amtrak services continue towards New York City, Philadelphia, and Washington, DC via Kingston, RI and Westerly, RI.

MBTA Commuter Rail

The MBTA operates the Providence/Stoughton Line between Boston and Wickford Junction, serving Providence Station, Pawtucket/Central Falls Transit Center, and T.F. Green International Airport in Warwick. Twenty weekday round trips serve the Providence branch on the Providence/Stoughton Line. The Providence/Stoughton Line's running time is approximately 75 minutes between Providence Station and South Station in Boston. The Providence/Stoughton Line's frequency during the peak is 25-30 minutes and 45-70 minutes off-peak.

The MBTA conducted the Rail Vision study in 2019, which identified cost-effective strategies to transform the existing commuter rail system. The study recommended that the entirety of the Providence/Stoughton line be electrified. It also created service alternatives for rail service and the four potential future service patterns for the Providence/Stoughton Line are listed below:

1. Higher Frequency: Increase all-day service to 30 minutes.
2. Regional Rail to Key Stations: 30-minute frequency at express service stops, which would include only Providence Station in the study area
3. Urban Rail: 15-minute frequency from South Station to Route 128, and 30-minute frequency from Canton Junction to Providence.
4. Full Transformation: High-frequency service systemwide, including 15-minute frequency from South Station to Route 128 and 30-minute frequency from Sharon to Providence.

Ferry, Intercity Bus, and Other Services

Outside of RIPTA, MBTA, and Amtrak services, transit in Rhode Island is also provided by Seastreak ferries, Greyhound, Peter Pan, vanpool, and various social service organizations.

Seastreak operates seasonal ferry services out of the Providence Ferry Terminal, running ferries three to four times a day from Providence to Bristol and Newport. Seasonal service begins June 21st and runs until October 14th. Run time is approximately 40 minutes from Providence to Bristol. Running time from Providence to Newport is 70 minutes direct, or 90 minutes via Bristol. A ferry dock shuttle runs from Providence Station to the Ferry Terminal three times a day. Other ferry services in the area operate out of Quonset, Newport, Jamestown, and Narragansett. Greyhound and Peter Pan operate intercity bus services, each with two stops in Providence. Greyhound buses depart from the Regency Plaza Apartments and the Convention Center, and Peter Pan buses depart from the Peter Pan bus terminal and the Convention Center. Both operators offer direct service to Boston at least twice a day, and direct service to New York City at least four times a day, among other direct and connecting routes.

In addition to these services oriented to the broader public, Providence Senior Services offers group transportation for senior high-rise residents and senior centers on weekdays between 9am and 3:30pm. Trips must be pre-arranged by Resident Services Coordinators or Senior Center Directors. The Non-Emergency Medical Transportation (NEMT) and Elderly Transportation Program (ETP) offer weekday transportation to non-emergency medical appointments to any Medicaid members and Rhode Island residents above the age of 60. Trips must be arranged at least two days in advance. Through its RIde program, RIPTA operates paratransit service for individuals unable to use fixed route systems due to disability. The door-to-door service requires pre-arranged reservations and operates within a ¾-mile corridor of RIPTA's fixed route services. Vanpool is another option for commuters, offering leased vans or SUVs to groups of commuters living or working in similar areas. RIPTA partners with Commute with Enterprise for this program and offers a vanpool subsidy of $100 per person each month.

Summary and Opportunities

The HCT study area has high transit demand and existing ridership, underscoring the potential of high-capacity transit to capture and better facilitate travel in the region. The analysis of RIPTA's existing transit network shows strong all-day transit activity throughout the study area. Considering the potential of high-capacity transit within the study area, the existing transit network offers the following findings and opportunities:

- **RIPTA has high ridership along the potential high-capacity transit corridors, and specifically along the R-Line alignment**. The R-Line accounts for 17% of RIPTA's systemwide ridership, showing extremely high existing transit demand for travel from Pawtucket/Central Falls area through downtown Providence—Kennedy Plaza and Providence Station—and along Broad St south of downtown Providence.
  - The R-Line is RIPTA's flagship service, offering the highest frequencies and spans of any route in their system. The success of the R-Line proves that there is existing transit demand for high-capacity transit in the study area. High-capacity transit could offer a service that exceeds the R-Line in terms of speed and capacity.
- **Downtown Providence is the central transit hub in the State of Rhode Island.** High-capacity transit service should maximize access to both downtown Providence as well as other key regional transfer points, such as Pawtucket-Central Falls Transit Center, CCRI-Warwick Campus, and T.F. Green International Airport. Other downtown destinations should be served as well, as places such as the Hospital District, the Jewelry District, Rhode Island School of Design, and Providence College are all high-volume travel destinations.
- **Existing ridership activity indicates high levels of travel during both peak and off-peak periods. High-capacity transit has the potential to offer high-frequency service along the corridors, while also improving all-day frequencies on connecting routes.**
- **RIPTA's existing transit network could become more efficient with high-capacity transit**, enabling existing bus routes to operate shorter alignments that connect to high-capacity transit stations. Bus routes in the study area could operate at a higher frequency and with a longer span of service:
- **Future BRT service could be designed to take advantage of existing and planned TSP.** RIPTA and RIDOT are working together to install transit signal priority (TSP) at many intersections throughout Rhode Island, and specifically in Providence along key corridors. Implementing TSP can help buses run more efficiently along corridors through shortening red lights for waiting buses and extending green lights for incoming buses.
- **T.F. Green Airport Station has the potential to be a more important transit hub within RIPTA's network with the addition of HCT service**. Currently, only a few bus routes and the MBTA Commuter Rail connect to the airport, with the Commuter Rail being the most direct path into Downtown Providence. High-Capacity Transit would establish a higher frequency means of transportation into downtown Providence, as opposed to the commuter rail, which only has trips eight times throughout the day. This study will consider which alignment a HCT route would take to serve airport passengers: curbside at the airport terminal, on Post Road (Route 1), or on Jefferson Boulevard at the MBTA station entrance/parking lot.