

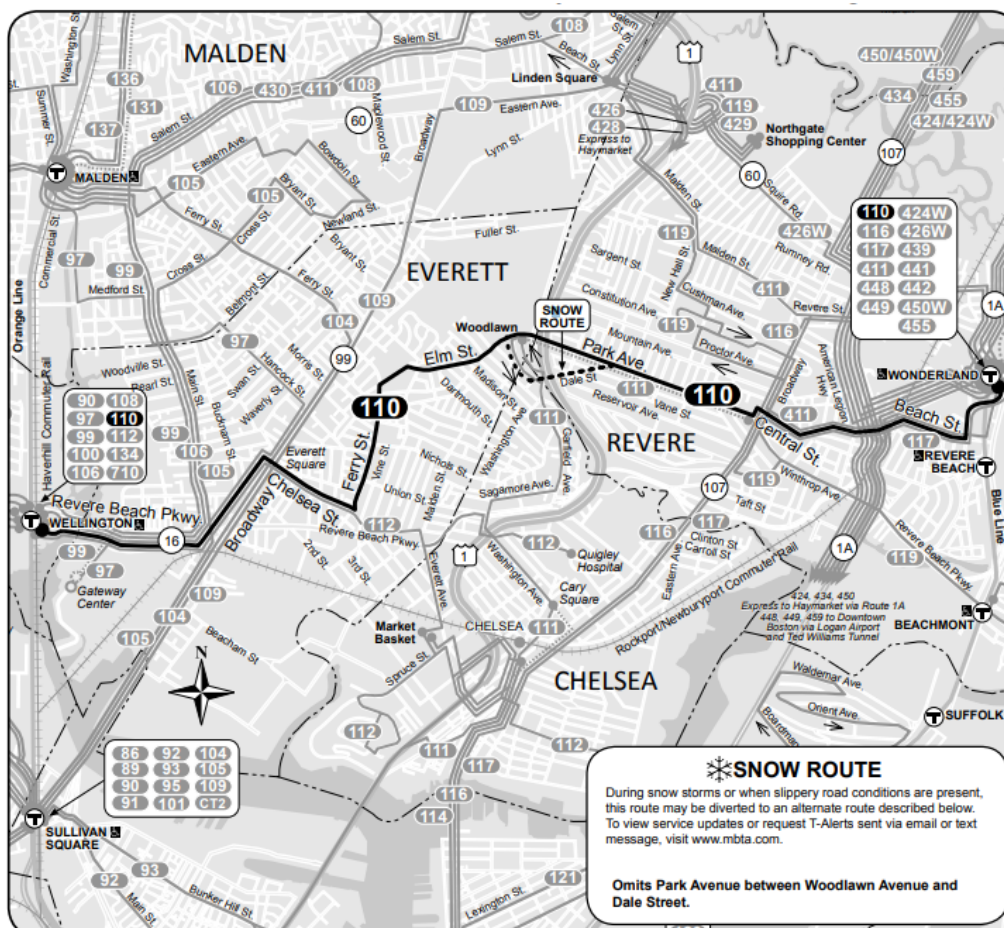
# Route 110

## Wonderland or Broadway & Park Avenue - Wellington Station

### Route Overview

Route 110 Wonderland or Broadway & Park Avenue - Wellington Station is a Local route that provides crosstown service between Wonderland Station and Wellington Station via Everett and Revere (see Figure 1). In Everett, it operates along the same alignment as Route 112 Wellington Station-Wood Island between Ferry Street and Chelsea Street in Everett and Wellington Station. However, Route 112 provides only very limited service. In Revere, Route 110 is one of many routes that operate between downtown Revere and Wonderland Station. One of the others include Route 117 Wonderland Station-Maverick Station via Beach Street, which is a Key Bus route that provides more frequent service for longer hours.

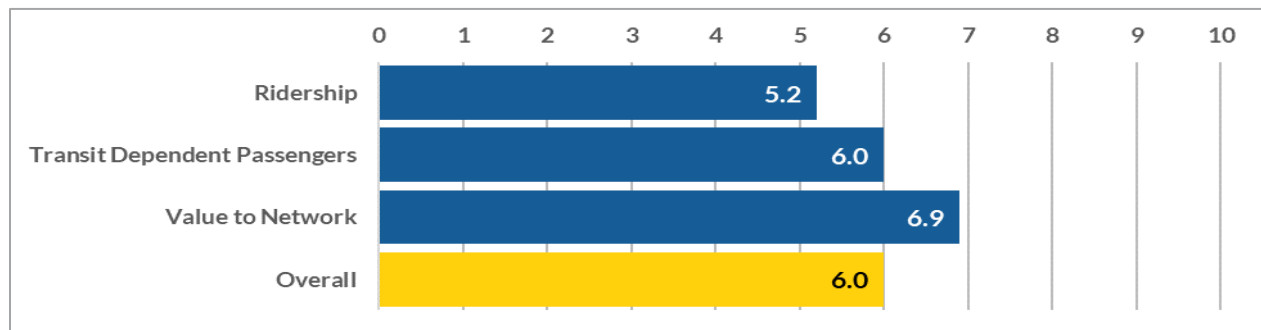
Figure 1 | Service Map



## Network Importance

Route 110 is a moderately important route within the MBTA bus network (see Figure 2). On a relative scale of 0 to 10, the route rates 5.2 in terms of ridership, 6.0 in terms of transit dependent ridership, and 6.9 in terms of its value to the network (which reflects the number of people who are uniquely served, the number of jobs and other important destinations, and the number of transferring passengers). Its overall score, which gives a 70% weighting to overall ridership and a 15% weight to both other measures, is 6.0.

Figure 2 | Relative Importance within MBTA Bus Network (on a scale of 0 to 10)



## Service Patterns

### Schedule

On weekdays, Route 110 generally provides frequent service during peak periods and the shoulders of the peaks, and infrequent service during other periods (see Table 1). On weekends, it provides infrequent service.

In more detail, on weekdays, service operates from 5:00 AM to 1:00 AM with the following service frequencies:

- Every 17 to 18 minutes from the beginning of service through 6:00 AM.
- Every 10 to 20 minutes in the early AM and AM peak periods, but mostly every 10 to 18 minutes
- Every 15 to 40 minutes in the midday base and midday school periods, approximately every 20 minutes before 10:00 AM, then mostly every 40 minutes between 10:00 AM and approximately 3:00 PM, and then every 30 minutes.
- Every 10 to 30 minutes in the PM peak, but predominantly every 12 minutes outbound.
- Every 20 to 60 minutes in the evening, but predominantly every 20 minutes.
- Every 50 to 60 minutes in the late evening, and night periods, but predominantly every 60 minutes.

Table 1 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
<b>Monday-Friday</b>	<b>5:00 AM to 1:00 AM</b>			<b>49/48</b>
Sunrise	5:00 AM to 5:59 AM	18	18	4/3
Early AM	6:00 AM to 6:59 AM	17 - 18	18	3/3
AM Peak	7:00 AM to 8:59 AM	10 - 20	13	9/7
Midday Base	9:00 AM to 1:29 PM	15 - 40	30	9/9
Midday School	1:30 PM to 3:59 PM	20 - 40	32	5/5
PM Peak	4:00 PM to 6:29 PM	10 - 30	14	11/12
Evening	6:30 PM to 9:59 PM	20 - 60	48	5/5
Late Evening	10:00 PM to 11:59 PM	50 - 60	55	2/2
Night	12:00 AM to 1:00 AM	50	50	1/2
<b>Saturday</b>	<b>5:00 AM to 1:00 AM</b>	<b>22 - 60</b>	<b>41</b>	<b>29/29</b>
<b>Sunday</b>	<b>6:15 AM to 10:15 PM</b>	<b>40 - 70</b>	<b>58</b>	<b>17/16</b>

Note: Span of service reflects the time the first bus begins service until the time the last bus finishes service.

On Saturdays, service operates from 5:00 AM to 1:10 AM, which is the same as on weekdays. Service operates every 22 to 60 minutes throughout the day. Most service operates every 35 minutes, with 60-minute frequencies before 9:30 AM after 9:00 PM. On Sundays, service operates from 6:15 AM to 10:15 PM, every 40 to 70 minutes. Service before 7:30 AM operates every 40 minutes, but with most service operating every 60 to 70 minutes.

Route 110 meets the MBTA’s span of service on all days and frequency standards for weekdays and Saturdays. However, it does not meet the frequency standard for Sundays, when much of the service operates every 70 minutes versus the standard of 60 minutes.

### Service Patterns

Pattern 110.0 makes up about three-quarters of trips on both weekdays and weekends, and operates the full route between Wonderland Station and Wellington Station, as shown in Figure 1. Pattern 110.4 makes up the remaining trips, and only runs short-turns between downtown Revere and Wellington Station.

Table 2 | Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
<b>INBOUND</b>				<b>49</b>	<b>29</b>	<b>17</b>
110.0	Wonderland Station	Wellington Station	Primary pattern	36	23	12
110.4	Broadway at Park Avenue	Wellington Station	Short-turns between downtown Revere and Wellington Station	13	6	5
<b>OUTBOUND</b>				<b>48</b>	<b>29</b>	<b>16</b>
110.0	Wellington Station	Wonderland Station	Primary pattern	35	22	12
110.4	Wellington Station	Broadway at Park Avenue	Short-turns between Wellington Station and downtown Revere	13	6	4

## Ridership

Route 110 serves 3,517 riders on weekdays, 1,591 riders on Saturdays, and 897 riders on Sundays. This ranks in the top quarter of MBTA bus routes for total weekday and weekend ridership, ranking 34<sup>th</sup> out of all routes for weekday riders, 37<sup>th</sup> on Saturdays, and 40<sup>th</sup> on Sundays.

### Ridership by Stop

US Route 1 approximately bisects Route 110 and ridership on the western half in Medford and Everett is significantly higher than ridership in Revere (78% of all boardings and alightings versus 28%). On weekday inbound trips (to Wellington Station):

- 280 passengers, or 15% of all passengers, board at Wonderland Station.
- A total of 270 passengers board and 130 alight at the nine stops between Wonderland Station and Broadway at Park Avenue.
- 90 passengers board and 10 alight at Broadway at Park Avenue, including at the busway entrance. This is where the short-turn trips between Revere and Wellington Station begin and end.
- A total of 130 passengers board and 90 alight at the eight stops between Broadway and Park Avenue and US Route 1.
- A total of 780 passenger board and 230 alight at the 10 stops between US Route 1 and Ferry Street at Chelsea Street, where is the point at which Route 110 and Route 112 start to use the same alignment to Wellington Station.

- A total of 110 passengers board and 40 alight at the next three stops before Everett Square.
- 130 passengers board and 100 alight on Broadway at Norwood Street in Everett Square.
- 1,120 passengers, or 62% of all inbound passengers, alight at Wellington Station

Outbound ridership is roughly the reverse of inbound ridership on weekdays. Weekend ridership patterns are similar, but with lower volumes.

### **Ridership by Trip**

On weekdays, Route 110 has high ridership per trip throughout most of the day. On inbound trips (see Figure 4):

- The first trip at 5:00 AM carries 46 passengers, which indicates demand for earlier service.
- Ridership drops to 34 on the next trip but then rapidly increases back to nearly 50 at 5:54 AM.
- Ridership then ranges from 55 to 65 per trip until nearly 8:00 AM and most trips are overcrowded.

Figure 3 | Weekday Inbound Ridership by Stop Map

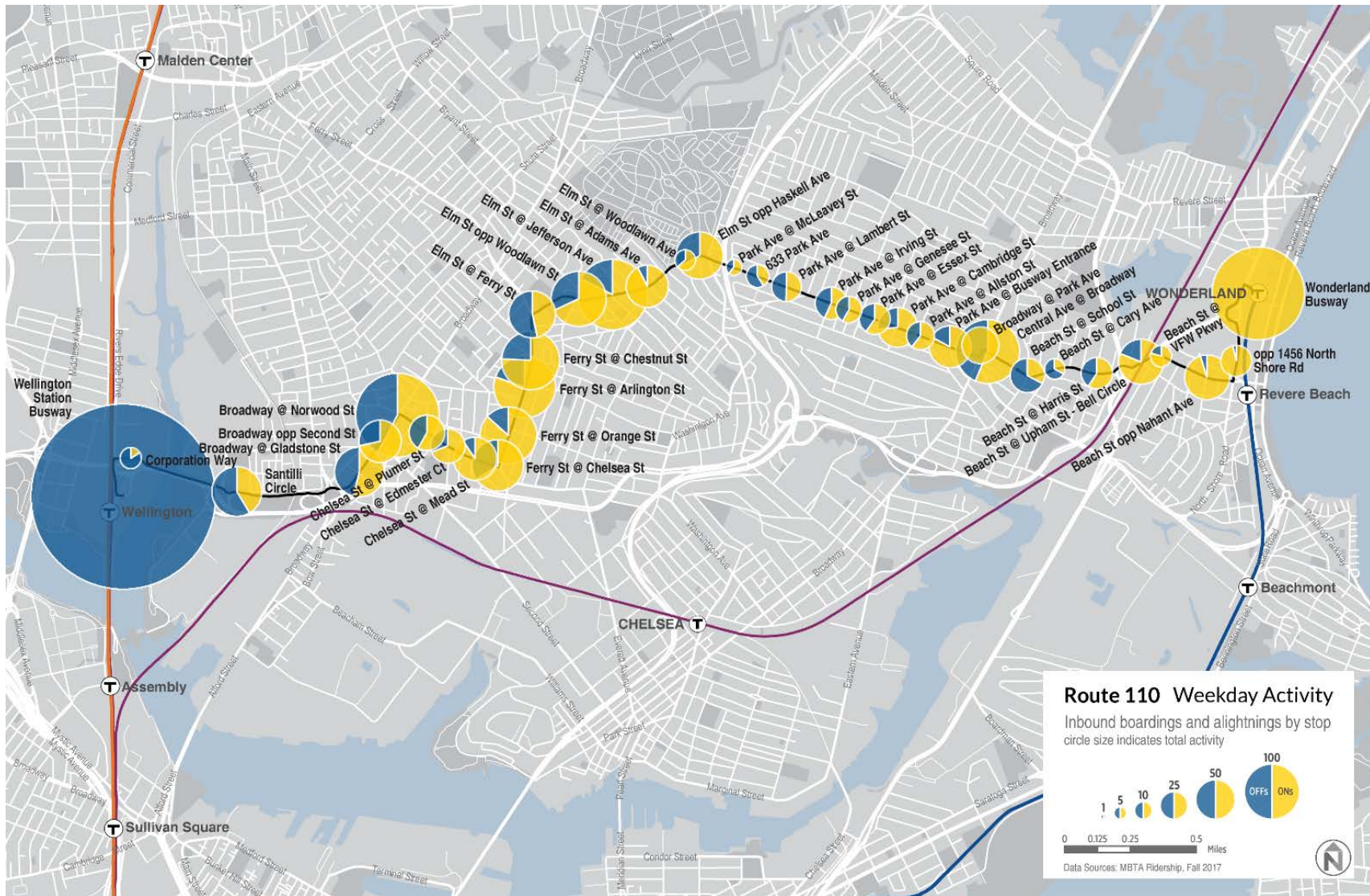
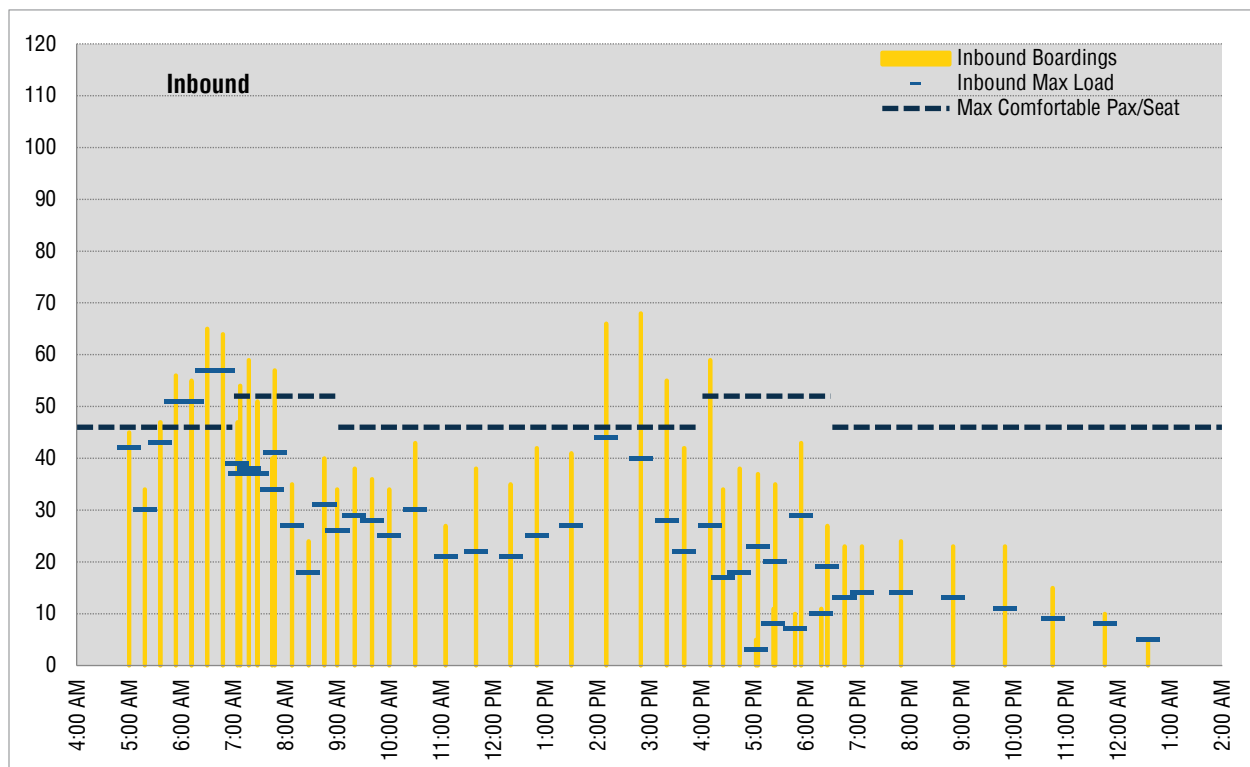


Figure 4 | Weekday Ridership by Trip: Inbound

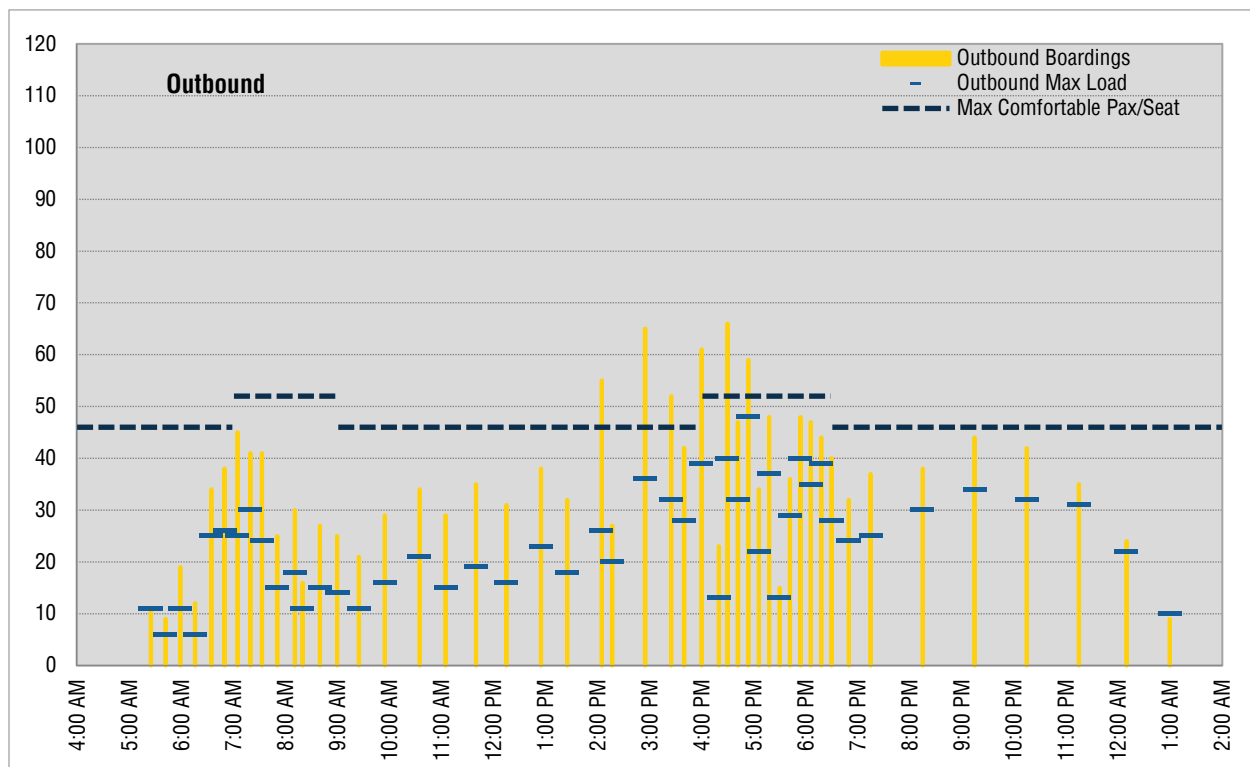


- Between 8:00 AM and 2:00 PM, ridership per trip generally ranges between 30 and 40 passengers per trip. These numbers are high considering that service only operates every 30 minutes.
- Ridership then increases to 50 to over 70 passengers per trip between 2:00 PM and 4:30 PM. However, no trips are overcrowded.
- It then drops to 30 to 40 passengers per trip through 6:00 PM and then move steadily to less than 10 passengers on the last trip at 12:35 AM.

On weekday outbound trips (see Figure 5):

- Ridership is less than 20 passengers per trip through 6:30 AM.
- It then increases to around 40 passengers per trip until close to 8:00 AM.
- Between 8:00 AM and 2:00 PM, ridership per trip generally ranges between 20 and 35 passengers per trip.
- Between 2:00 PM and 6:30 PM, most trips carry 50 to over 60 passengers. However, a few trips, both of which are short-turns, carry fewer than 25 passengers. On average, no trips are overcrowded.

Figure 5 | Weekday Ridership by Trip: Outbound



- Ridership stays high between 6:30 PM and 11:30 PM, at over 40 passengers per trip. These numbers are very high considering that service only operates every 60 minutes for most of this period.
- Ridership then declines to 23 on the second to last trip at 12:10 AM and 10 on the last trip at 1:00 AM.

On Saturdays, inbound ridership is highest from the beginning of service until 5:00 PM, when most trips carry 30 to 40 passengers and some carry over 50 (see Figure 6).

Outbound ridership is highest between 6:30 AM 6:30 PM when many trips carry around 30 riders and a few over 40 (see Figure 7).

On Sundays, inbound ridership is highest from just before 8:00 AM until just before 7:00 PM, when most trips carry 30 to 40 passengers and some carry over 50 (see Figure 8).

These ridership numbers are very high considering that service operates infrequently. Outbound ridership is highest 12:30 PM and 9:30 PM when most trips carry around 30 riders (see Figure 9).



Figure 6 | Saturday Ridership by Trip: Inbound

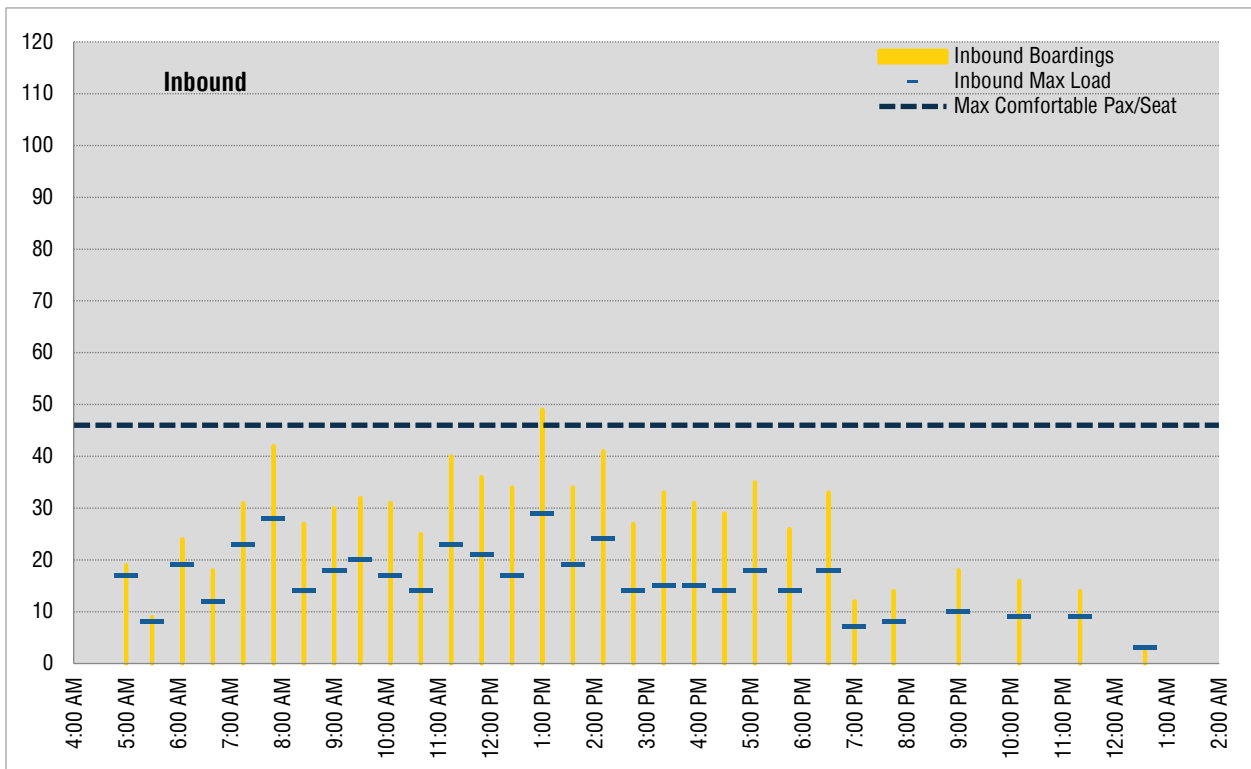


Figure 7 | Saturday Ridership by Trip: Outbound

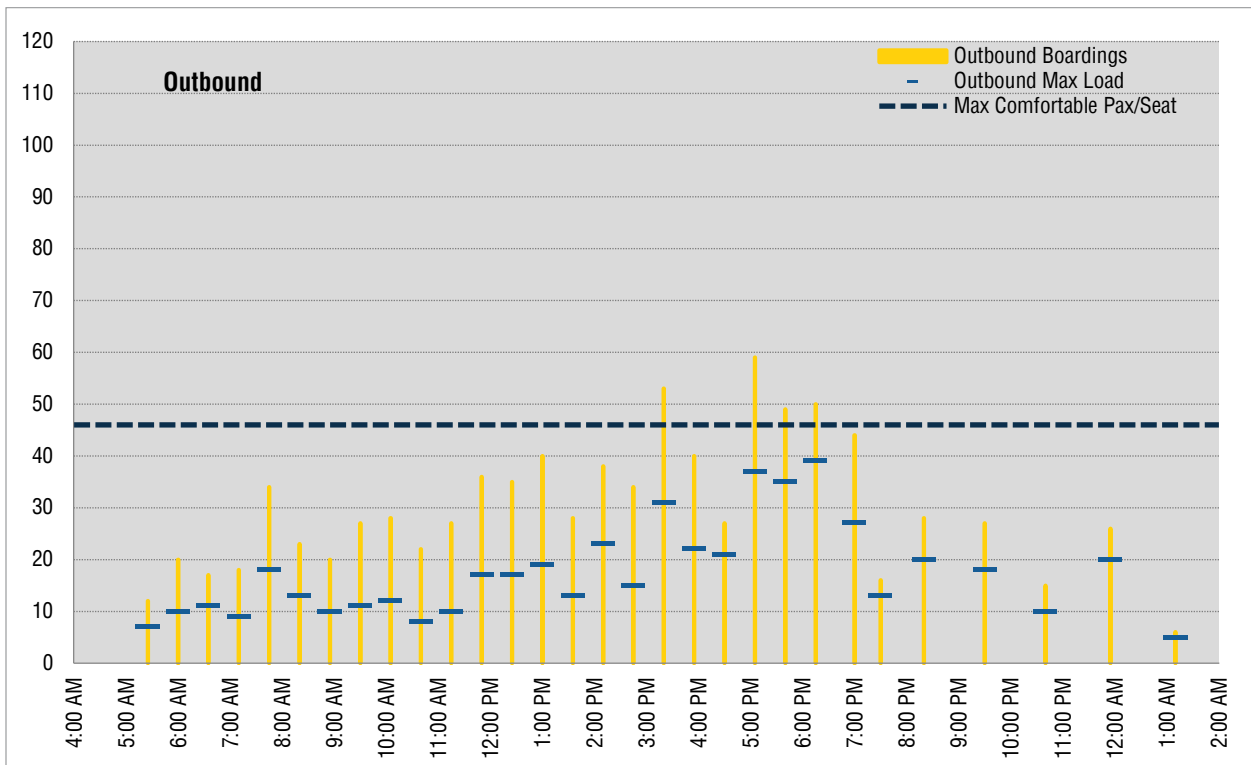


Figure 8 | Sunday Ridership by Trip: Inbound

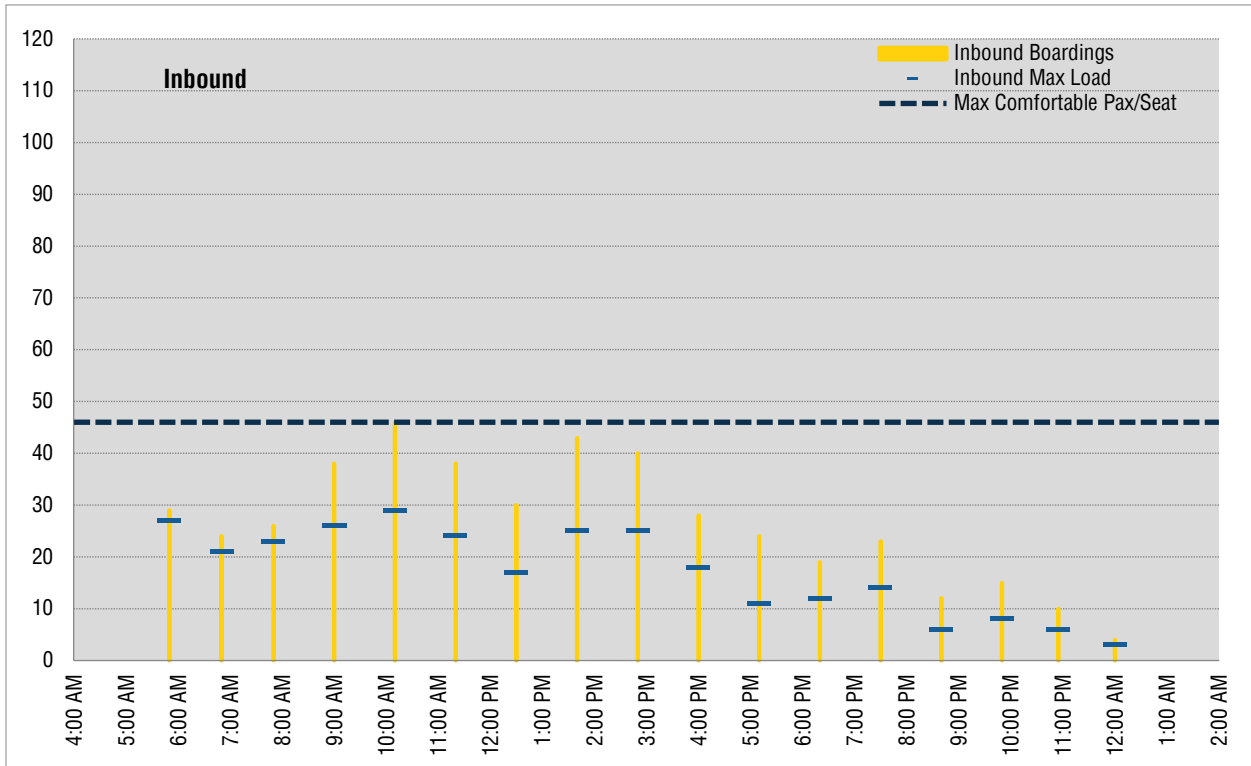
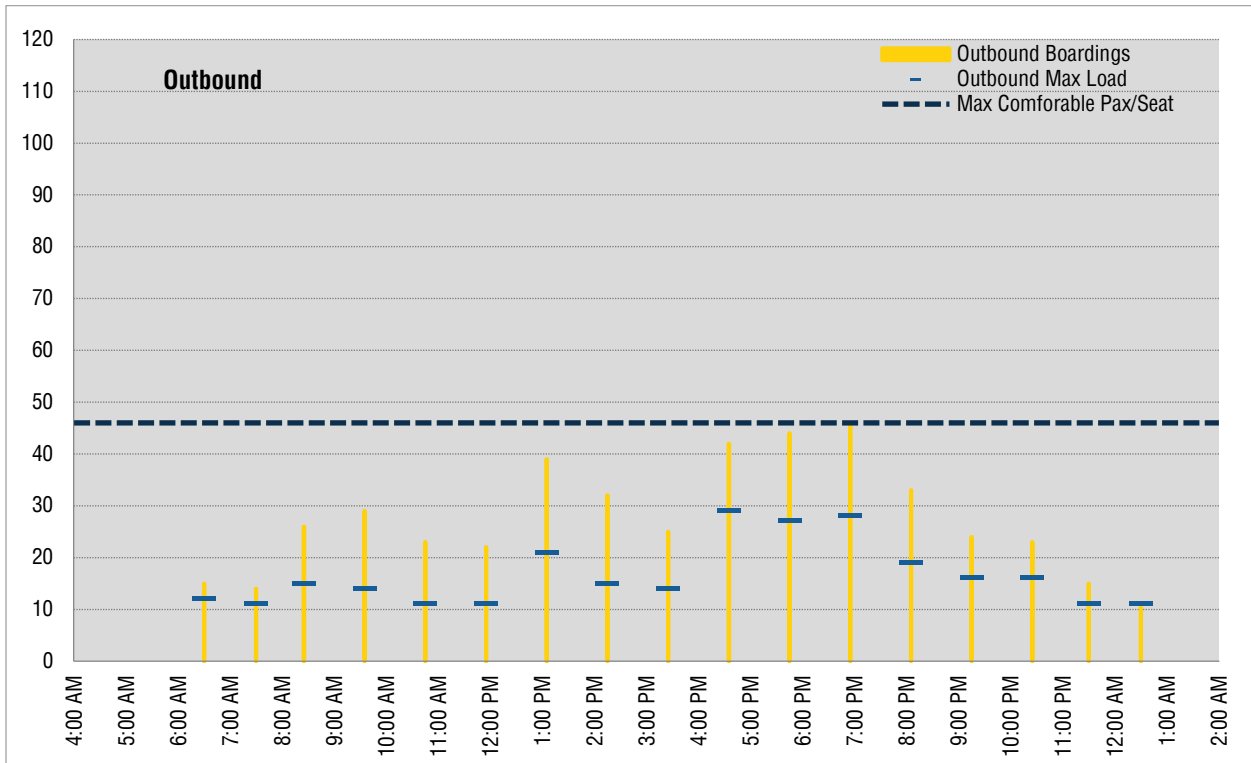


Figure 9 | Sunday Ridership by Trip: Outbound



## Passenger Comfort

The MBTA desires that passengers travel in relatively comfortable conditions. At the same time, the MBTA's definition of comfort reflects the very high volume environment in which the MBTA operates, and that some passengers may have to stand for a portion of their trip. More specifically, at least 92% of passengers' travel times should be in comfortable conditions, and ideally, at least 96% of travel times should be in comfortable conditions. Comfortable conditions are considered to be 140% or less of seated capacity during high volume periods and 125% or less during other periods.

On Route 110, 93% of passenger minutes are in comfortable conditions, which is above the minimum standard of 92%, but below the target of 96% (see Table 3).

Table 3 | Passenger Time Spent Traveling in Comfortable Conditions

	WEEKDAYS	SATURDAYS	SUNDAYS
<b>Minimum Standard</b>	92%	92%	92%
<b>Target</b>	96%	96%	96%
<b>Actual</b>	93.3%	99.4%	100%

## Reliability and Speed

### Reliability

Route 110's overall reliability is poor on weekdays and Saturdays, at only 63% and 62% respectively, and well below the minimum standard of 70% for local bus routes. Sunday on-time performance, however, is above the target of 75%. As described in the next section, poor on-time performance is largely due to actual running times that exceed scheduled running times.

Table 4 | Reliability

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
<b>Monday-Friday</b>	64%	57%	63%	0.4%
<b>Saturday</b>	63%	53%	62%	-
<b>Sunday</b>	79%	78%	79%	-

### Running Times

Route 110's observed running times routinely exceed scheduled running times through most of the day on weekdays, with actual running times exceeding scheduled times by up to 15 minutes (see Figure 10). This is the major reason that on-time performance is poor.

Figure 10 | Scheduled & Median Travel Time by Trip - Route 110 Inbound

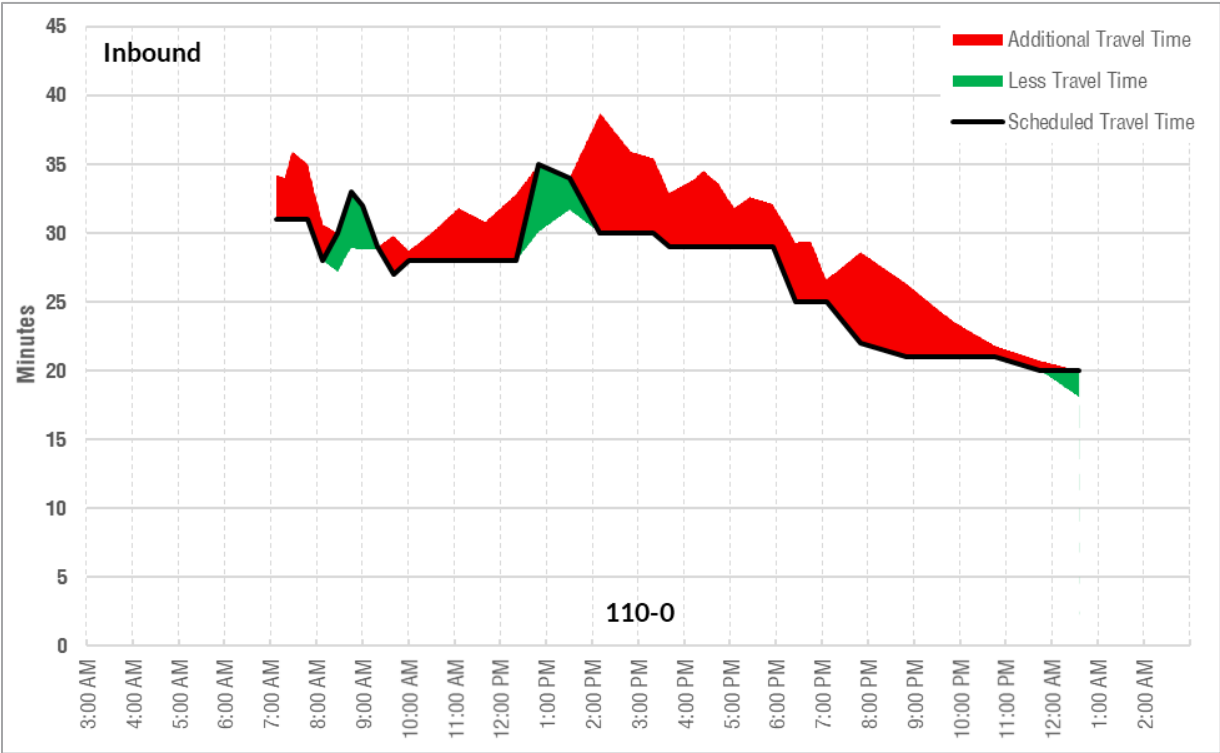
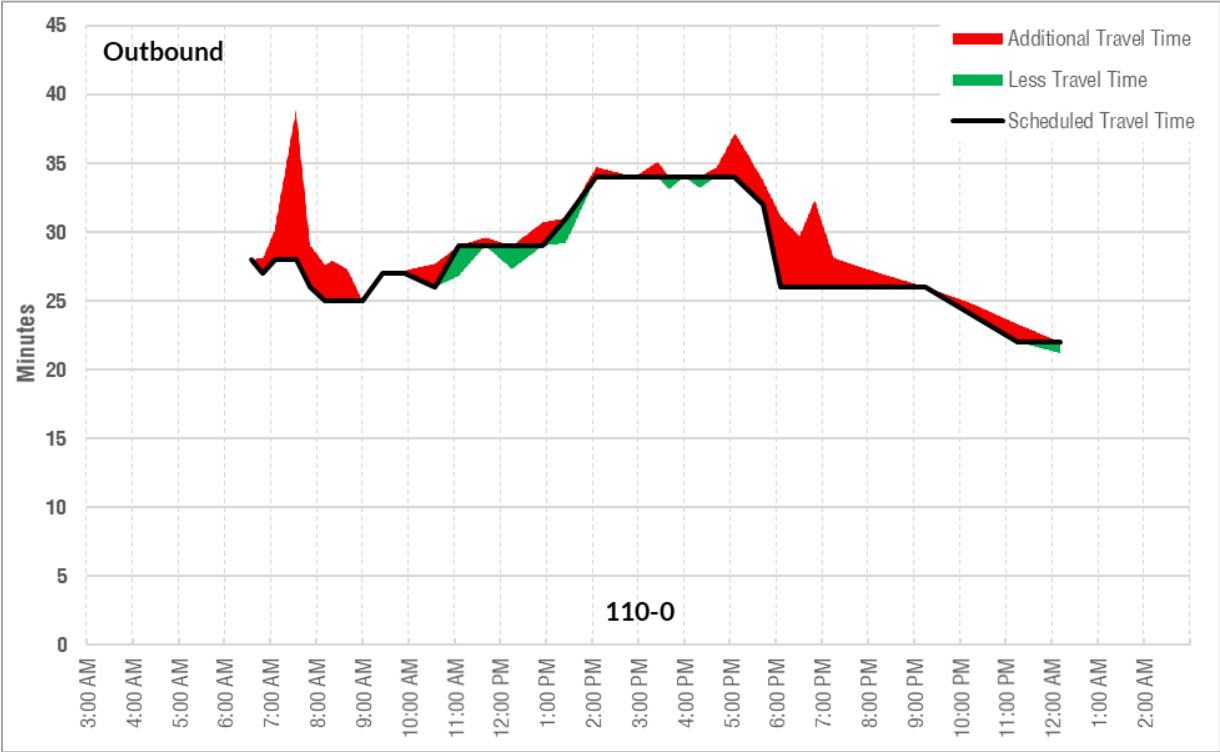


Figure 11 | Scheduled & Median Travel Time by Trip - Route 110 Outbound



## Stop Spacing

Route 110 has an average of 6.9 stops per mile, which is at the top end of the four to seven stops per mile recommended for urban areas under MBTA guidelines. There are a number of places where stops are even closer together:

- Inbound stops along Park Avenue are located at an average of 515 feet apart across eight stops. The Genesee and Irving Street stops are only 365 feet apart. Outbound stops average 610 feet apart.
- Outbound, there are four stops within 1,150 feet between Elm Street at Englewood Avenue and at Haskell Avenue, with Duncan Rd and 289 Elm Street stops only 260 feet apart.

Stop consolidation could make service faster and improve reliability.

## Summary

Route 110 is a high ridership route that provides crosstown service to Revere, Everett, and Medford between Wonderland Station and Wellington Station. Although it operates between two rapid transit stations, its ridership patterns are more similar to that of a radial route, with lower ridership at its outer end Wonderland and building with distance toward Wellington Station. This is due largely to higher transit demand in Everett than Revere, but also more service duplication at the Revere end.

Major issues are very poor on-time performance, overcrowding on some trips, and infrequent off-peak and weekend service.