

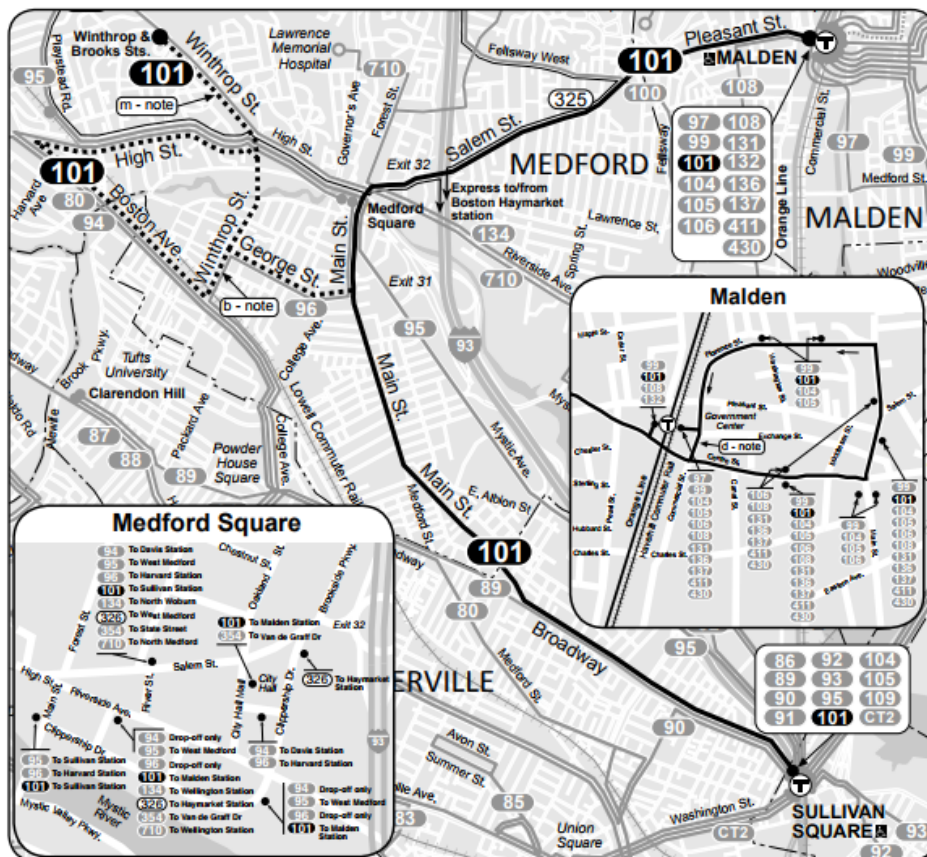
Route 101

Malden Center Station – Sullivan Square Station via Medford Square

Route Overview

Route 101 Malden Center Station – Sullivan Square Station via Medford Square is a Local route that operates between Malden Center Station and Sullivan Square Station via Medford Square (see Figure 1). The route operates largely along Salem Street between Malden Center and Medford Square and along Main Street and Broadway between Medford Square and Sullivan Square Station.

Figure 1 | Service Map

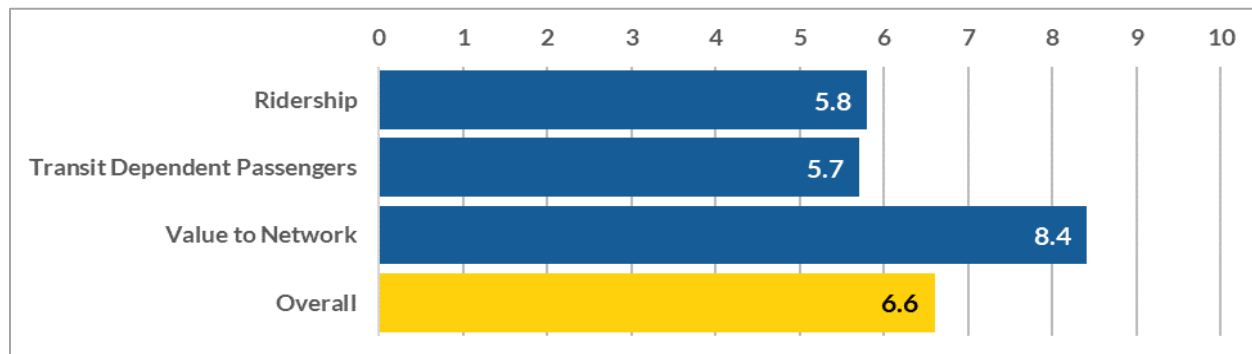


Network Importance

Route 101 has moderately high importance within the overall system (see Figure 2). On a relative scale of 0 to 10, the route rates 5.8 in terms of ridership, 5.7 in terms of transit dependent ridership, and 8.4 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 6.6.

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



Service Patterns

Schedule

On weekdays, Route 101 generally provides frequent service during peak periods and the shoulders of the peaks, and much less frequent service during other periods (see Table 1). On weekends, it provides infrequent service.

In more detail, on weekdays, service operates from 4:56 AM to 12:30 AM with the following service frequencies:

- Every 10 to 24 minutes from the beginning of service through 6:00 AM.
- Every one to 20 minutes in the early AM and AM peak periods, with very irregular headways.
- Every 10 to 30 minutes in the midday base and school periods, with more frequent service before 9:30 AM, then mostly every 30 minutes between 9:30 AM and approximately 2:30 PM, and then again more frequent service.
- Every seven to 20 minutes in the PM peak period, with most service running every 11 minutes.
- Every 12 to 61 minutes in the evening and late evening periods, with most service operating every 45 minutes.
- Every 60 minutes after midnight.

On Saturdays, service operates from 5:00 AM to 1:10 AM, which is a longer span than on weekdays. Service operates every 30 to 75 minutes throughout the day. Most service operates every 35 minutes, with the longer service frequencies after 7:00 PM. On Sundays, service operates from 5:50 AM to 12:30 AM, every 55 to 70 minutes throughout the day, but mostly every 70 minutes.

Table 1 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
Monday-Friday	4:56 AM to 12:30 AM			65/69
Sunrise	4:56 AM to 5:59 AM	5 – 29	15	5/2
Early AM	6:00 AM to 6:59 AM	17 – 20	17	3/6
AM Peak	7:00 AM to 8:59 AM	1 – 17	8	15/14
Midday Base	9:00 AM to 1:29 PM	10 – 30	26	11/9
Midday School	1:30 PM to 3:59 PM	5 – 30	15	10/7
PM Peak	4:00 PM to 6:29 PM	7 – 20	12	12/12
Evening	6:30 PM to 9:59 PM	12 – 60	34	6/6
Late Evening	10:00 PM to 11:59 PM	60 – 61	61	2/2
Night	12:00 AM to 12:30 AM	60	60	1/1
Saturday	5:00 AM to 1:10 AM	30 – 75	39	30/30
Sunday	5:50 AM to 12:30 AM	55 – 70	64	17/17

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

Route 101 meets the MBTA's span of service standards for local routes on all days. However, it does not meet a number of frequency standards:

- The 11:05 PM inbound trip operates 61 minutes after the previous trip, versus the maximum frequency of 60 minutes. This could be easily resolved through a scheduling adjustment.
- Saturday service after 9:00 PM, which operates every 70 to 75 minutes versus the standard of every 60 minutes.
- Sunday service throughout most of the day, which operates every 65 to 70 minutes versus the standard of 60 minutes.

Service Patterns

Pattern 101.3 is Route 101's primary service alignment, and operates between Malden Center Station via Medford Square as shown with the solid line in Figure 1. In addition (see Table 2):

Weekdays

- Pattern 101.1 makes five inbound trips and two outbound trips that are short turns that operate between Medford City Hall and Sullivan Station. These trips either begin or end service at the Wellington Garage.
- Pattern 101.8 makes four AM outbound trips and four PM inbound trips that are school trips that serve Medford High School. The AM outbound trips operate between the Medford/Somerville city line and Medford High School. The PM

inbound trips operate between Medford High School and Sullivan Square Station via Medford Square. These trips are only loosely related to the route's main alignment, with service to and from Medford running as indicated with the dotted line in Figure 1.

Table 2 | Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
INBOUND				65	30	17
101.0	Fellsway Garage	Sullivan Square Station	Early AM Sunday service	-	-	3
101.1	Medford City Hall	Sullivan Square Station	Service from garage	5	-	-
101.3	Malden Center Station	Sullivan Square Station	Primary pattern	41	7	-
101.4	Malden Center Station	Sullivan Square Station	Provides one way loop to serve Malden Square	15	23	14
101.8	Medford High School	Sullivan Square Station	PM school trips	4	-	-
OUTBOUND				69	30	17
101.0	Sullivan Square Station	Fellsway Garage	Early AM Sunday service	-	-	2
101.1	Sullivan Square Station	Medford City Hall	Service to garage	2	-	-
101.2	Medford/Somerville City Line	Medford High School	AM school trips	4	-	-
101.3	Sullivan Square Station	Malden Center Station	Primary pattern	34	7	-
101.4	Sullivan Square Station	Malden Center Station	Via Malden Square	19	23	15

- Pattern 101.4 runs between 8:25 AM and 2:00 PM. All outbound trips extend past Malden Center Station along a counter-clockwise loop to Malden Square and back to Malden Center Station along Centre Street, Ferry Street, and Florence Street.

Saturdays

- Pattern 101.4 runs after 8:55 AM. All outbound trips extend past Malden Center Station along the counter-clockwise loop to Malden Square and back to Malden Center Station.

Sundays

- Pattern 101.0 makes the first three inbound and first two outbound trips, which are short-turns that operate between the Fellsway Garage and Sullivan Square Station.
- Pattern 101.4 runs after 8:25 AM. All outbound trips extend past Malden Center Station along the counter-clockwise loop to Malden Square and back to Malden Center Station.

Ridership

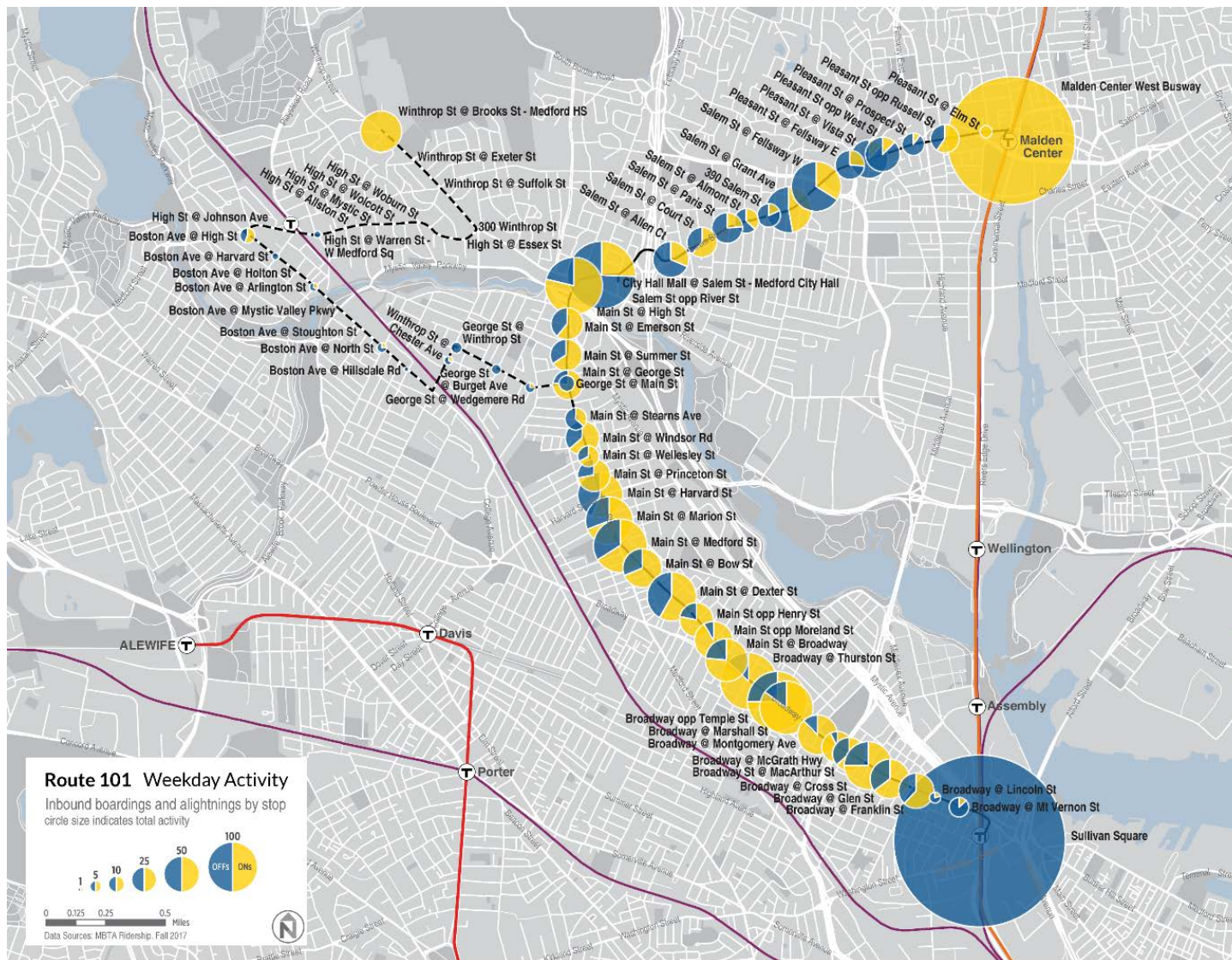
Route 101 carries approximately 4,350 passengers on weekdays, 1,710 on Saturdays, and 910 on Sundays. Based on weekday ridership, it is the MBTA's 29th highest ridership route and the 10th highest ridership local route. However, compared to most other high ridership routes, Saturday and Sunday ridership is proportionately lower.

Ridership by Stop

Route 101 primarily acts as a feeder to the Orange Line, with large numbers of transfers made at both ends. In general, people traveling to or from points north of Medford Square use Route 101 to make connections at Malden Center Orange Line and Station and those south of Medford Square make connections at Sullivan Square Station. On weekday inbound trips (see Figure 3):

- 650 passengers, or over 25% of all inbound riders, board at Malden Center Station. The highest numbers of these boardings are in the PM.
- 210 passengers board and 380 alight at the 13 stops along Pleasant and Salem Streets between Malden Center Station and I-93, just east of Medford Square.

Figure 3 | Weekday Inbound Ridership by Stop Map



- 140 passengers board and 160 alight at the two stops in Medford Square.
- 600 passengers board and 300 alight at the 15 stops along Main Street between Medford Square and Broadway.
- 310 passengers board and 70 alight at the first three stops on Broadway.
- 260 passengers board and 130 alight at the next eight stops on Broadway.
- 1,180 passengers, or over 50% of all riders, alight at Sullivan Square Station.
- 80 passengers board and 30 alight on the unique segment of the four trips from Medford High School, or approximately 20 boardings per trip. Seventy of the boardings are at Medford High School.

Outbound patterns are similar, but in reverse, plus the following:

- The midday loop to Malden Square has very little ridership – a total of only 40 boardings and 40 alightings on 14 trips.
- 30 passengers, board and 130 alight on the unique segment of the four trips to Medford High School, or over 30 alightings per trip. Virtually all of the alightings are at Medford High School.

Weekend patterns are also similar but with lower passenger volumes and without the school trips.

Ridership by Trip

Weekday ridership on Route 101 is very peak-oriented, with the highest ridership during peak periods. Midday ridership per trip is high, to a significant extent because service is relatively infrequent (every 30 minutes). On weekday inbound trips (see Figure 4):

- Service begins with 35 riders on the first trip at 4:56 AM indicating demand for earlier service.
- It then drops to slightly over 20 but builds quickly to 50 shortly after 6:00 AM.
- Ridership then ranges from 40 to over 70 passengers per trip until approximately 8:15 AM, and two trips have maximum loads that exceed loading standards.
- Ridership generally ranges from 40 to over 50 passengers between 8:15 AM and 4:00 PM.
- After 4:00 PM ridership gradually declines to 10 passengers on the last trip at 12:05 AM.

On weekday outbound trips (see Figure 5):

- Service begins with 30 riders on the first trip at 5:25 AM indicating demand for earlier service.

Figure 4 | Weekday Ridership by Trip: Inbound

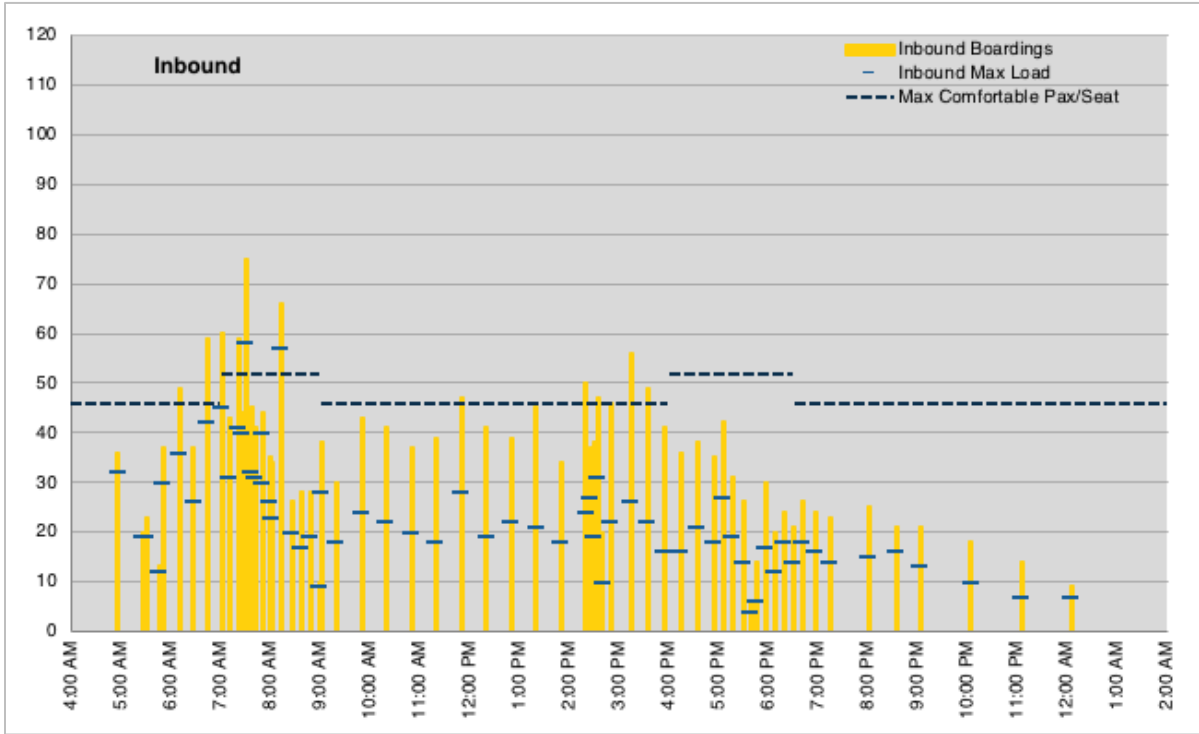
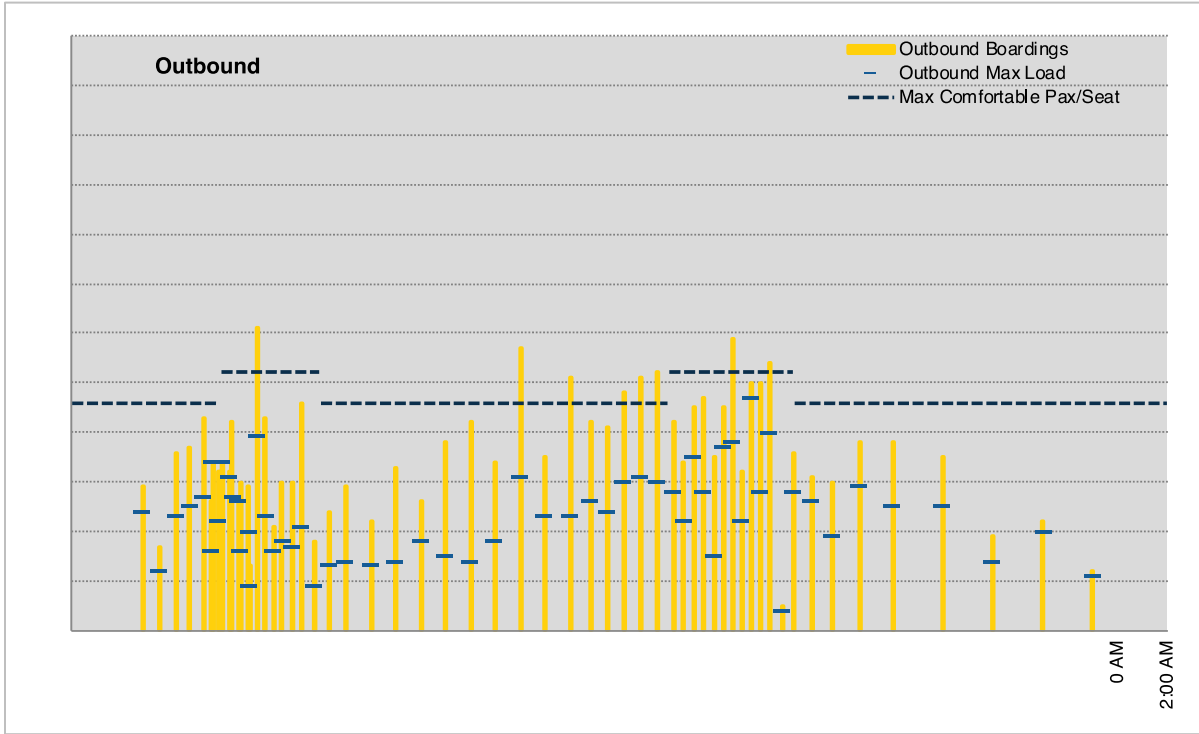


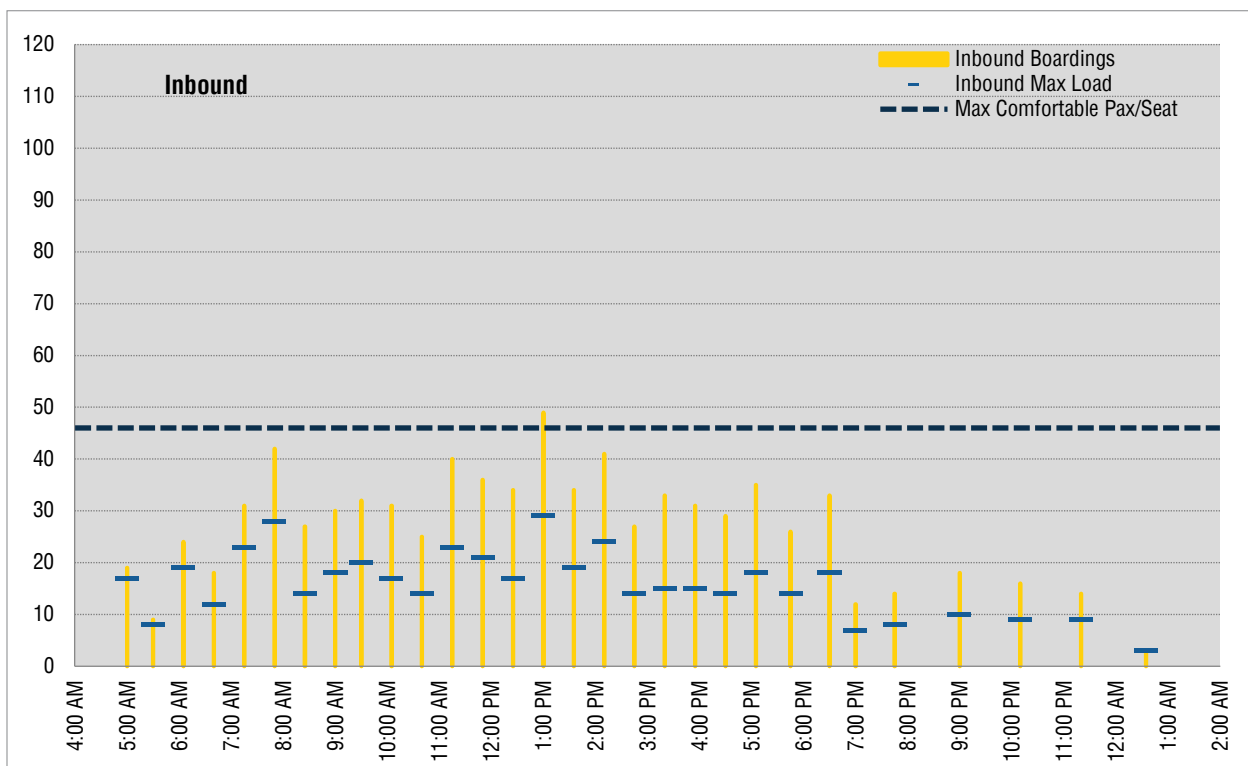
Figure 5 | Weekday Ridership by Trip: Outbound



- Ridership then drops to less than 20 passengers per trip but then builds quickly to over 40 shortly at around 6:30 AM.
- Ridership ranges from 30 to over 60 passengers per trip until approximately 8:30 AM.
- Ridership generally ranges from 30 to 40 passengers per trip between 8:30 AM and 1:00 PM.
- Ridership increases to 40 to 60 passengers per trip between 1:00 PM and 6:00 PM.
- It then declines steadily to only five on the last outbound trip at 12:30 AM.

On Saturdays, inbound ridership is highest between 11:30 AM and 7:00 PM, when most trips carry 30 to nearly 60 passengers (see Figure 6). Outbound ridership is highest between 9:00 AM and 3:00 PM, when most trips carry 30 to over 40 passengers (see Figure 7).

Figure 6 | Saturday Ridership by Trip: Inbound



On Sundays, inbound ridership is highest between 9:00 AM and 3:00 PM, when most trips carry approximately 40 passengers (see Figure 8). Outbound ridership is highest between 1:00 PM and 8:00 PM, when most trips also carry approximately 40 passengers (see Figure 9). These numbers are very high considering the infrequent service (generally every 45 minutes) and indicate demand for more frequent service.

Figure 7 | Saturday Ridership by Trip: Outbound

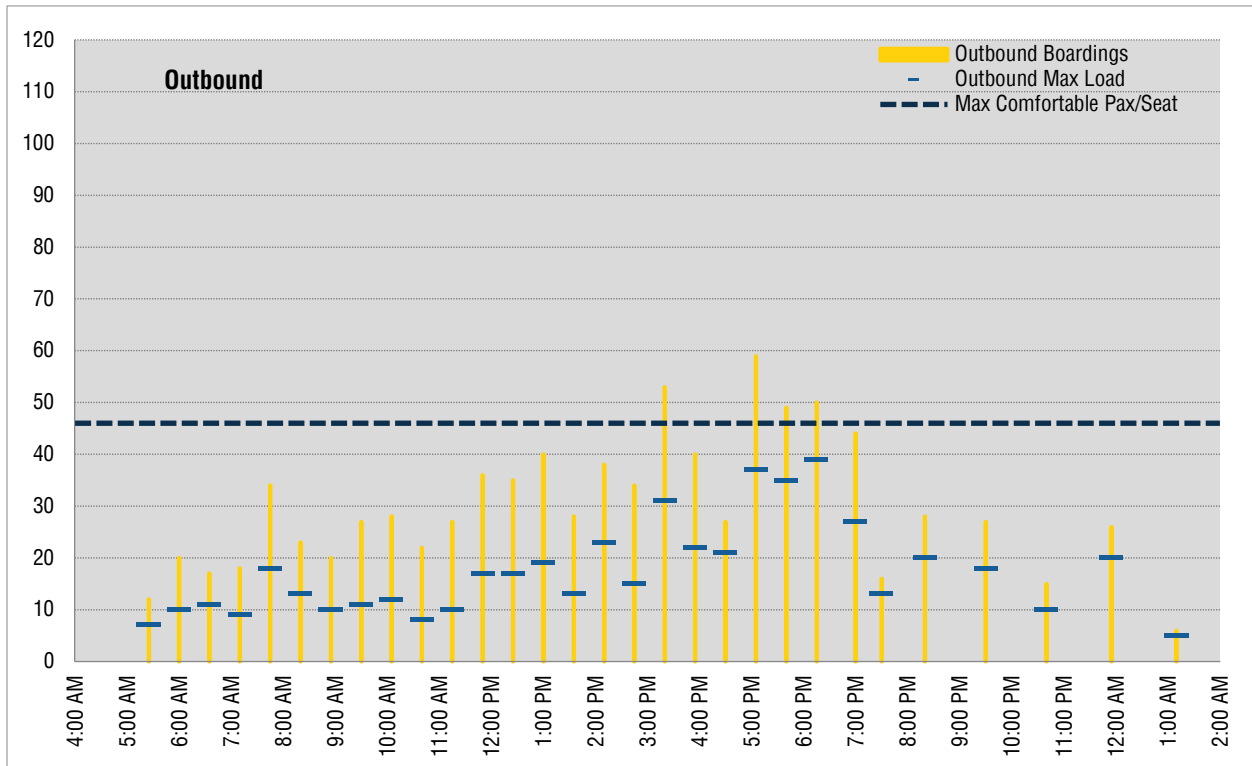


Figure 8 | Sunday Ridership by Trip: Inbound

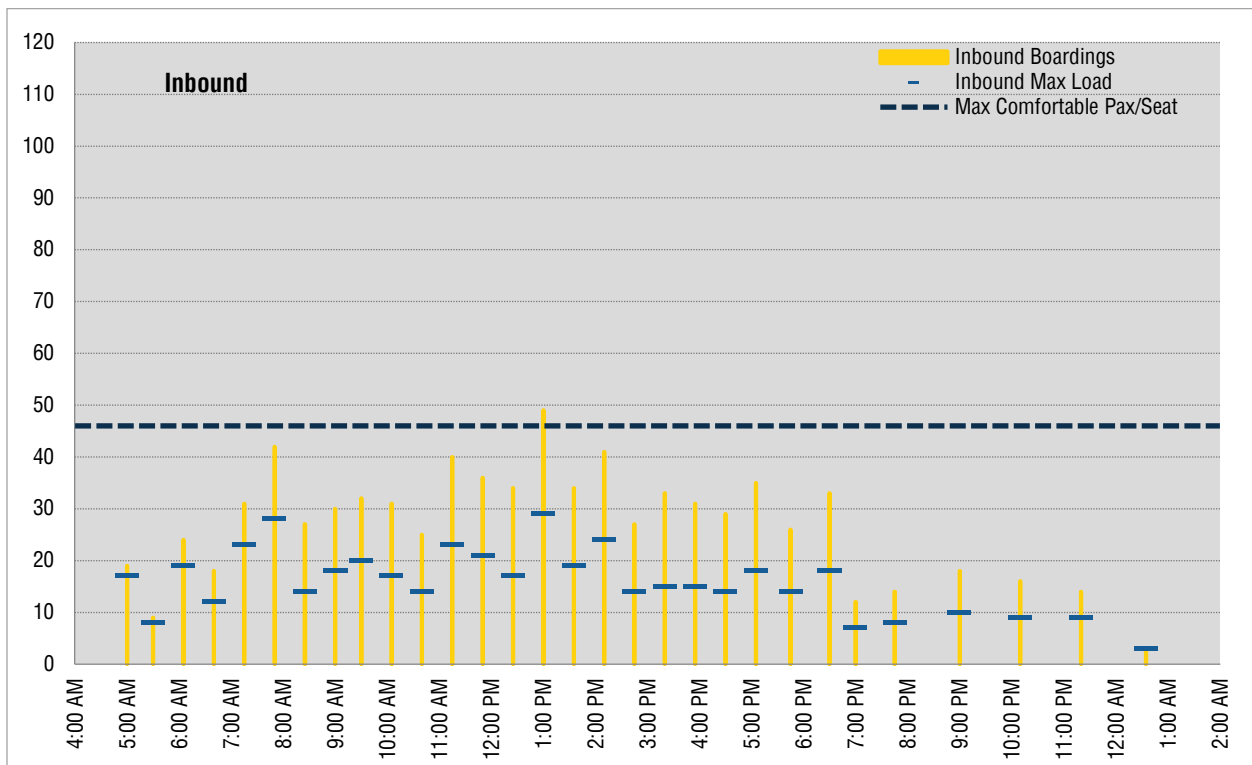
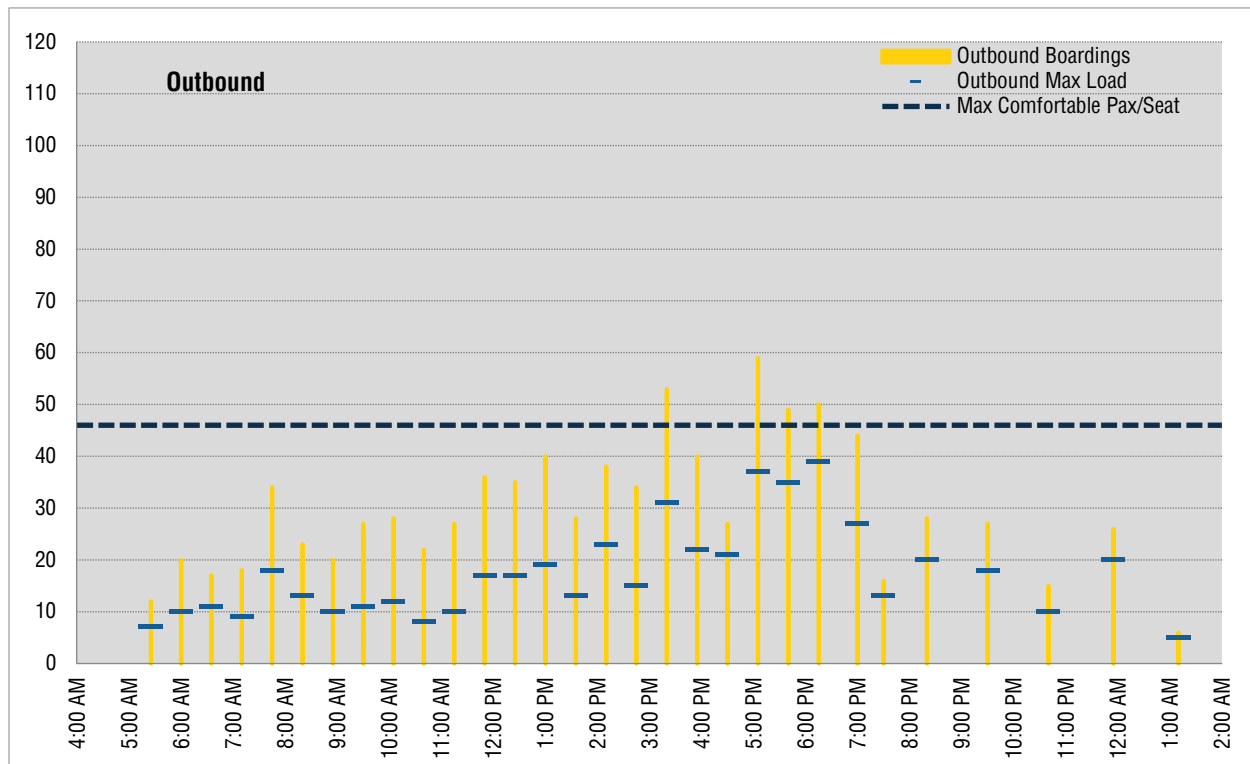


Figure 9 | Sunday Ridership by Trip: Outbound



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 101, 93% of weekday passengers travel in comfortable conditions (see Table 3). This is above the minimum standard of 92% but below the target level of 96%. Saturday and Sunday comfort levels are nearly 100%.

Table 3 | Passenger Time Spent Traveling in Comfortable Conditions

	WEEKDAYS	SATURDAYS	SUNDAYS
Minimum Standard	92%	92%	92%
Target	96%	96%	96%
Actual	93%	99.6%	99.8%

Reliability and Speed

Reliability

Route 101's overall reliability is only 64% on weekdays, 65% on Saturdays, and 66% on Sundays (see Table 4). These levels are all below the minimum standard of 70% for local bus routes. Dropped trips are a minor issue, with 1.2% of weekday trips dropped in the Fall of 2017.

Table 4 | Reliability

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
Monday-Friday	63%	72%	64%	1.2%
Saturday	65%	62%	65%	N/A
Sunday	67%	64%	66%	N/A

Running Times

A major reason for Route 101's poor on-time performance is that actual running times are significantly longer than scheduled times. Inbound, service operates five to 10 minutes behind schedule during peak periods and three to five minutes behind at other times (see Figure 10).

Figure 10 | Scheduled & Median Travel Time by Trip: Route 101 Inbound

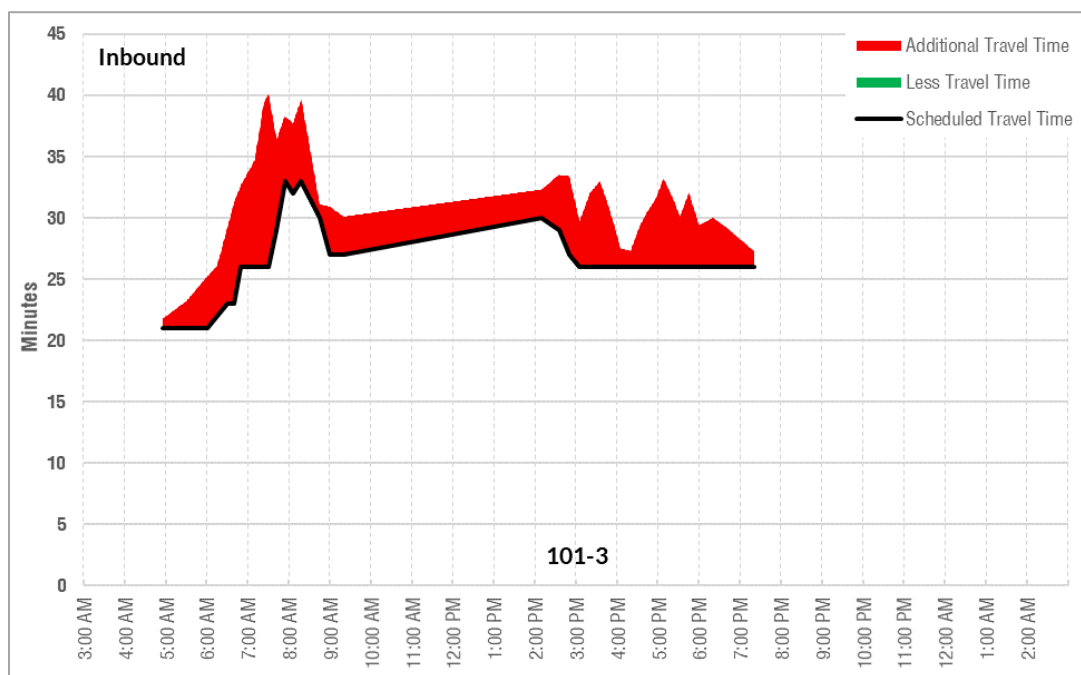
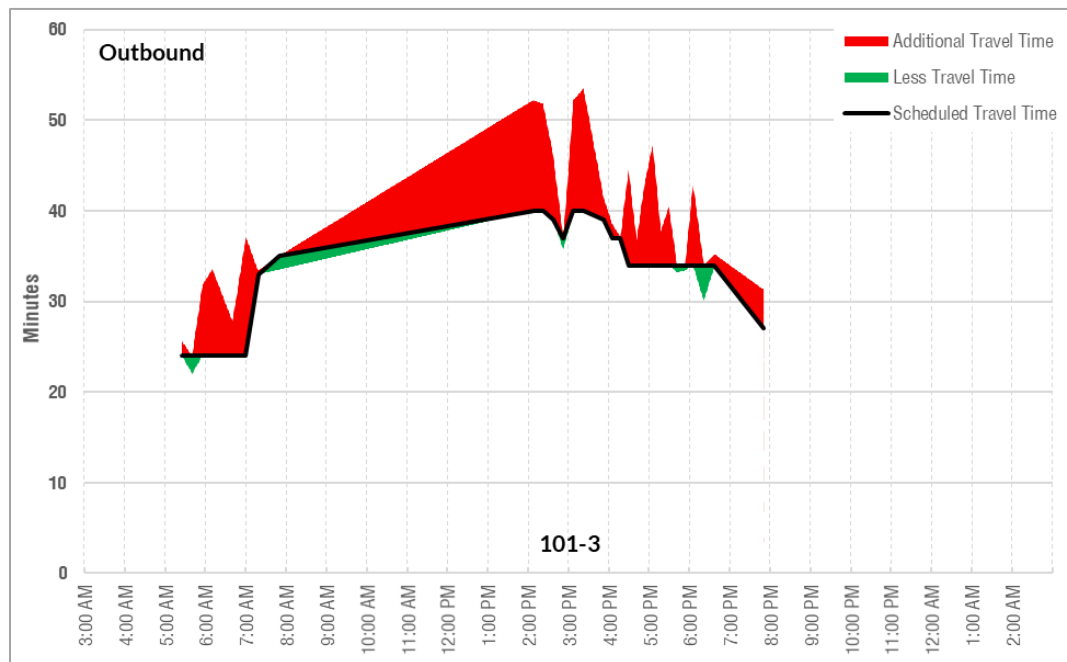


Figure 11 | Scheduled & Median Travel Time by Trip: Route 101 Outbound



Stop Spacing

Route 101 has an average of 7.3 stops per mile, which is more stops than the MBTA standard of four to seven stops for urban routes. Several stops are closer than 500 feet apart, and some are as close as 300 feet apart, particularly along Broadway. The very short stop spacing slows service and contributes to the route’s poor reliability.

Summary

Route 101 is a high ridership route that connects parts of Malden, Medford, and Somerville with the Orange Line at Malden Center Station and Sullivan Square Station. Major issues are very poor on-time performance, overcrowding on some trips, and infrequent off-peak and weekend service.