

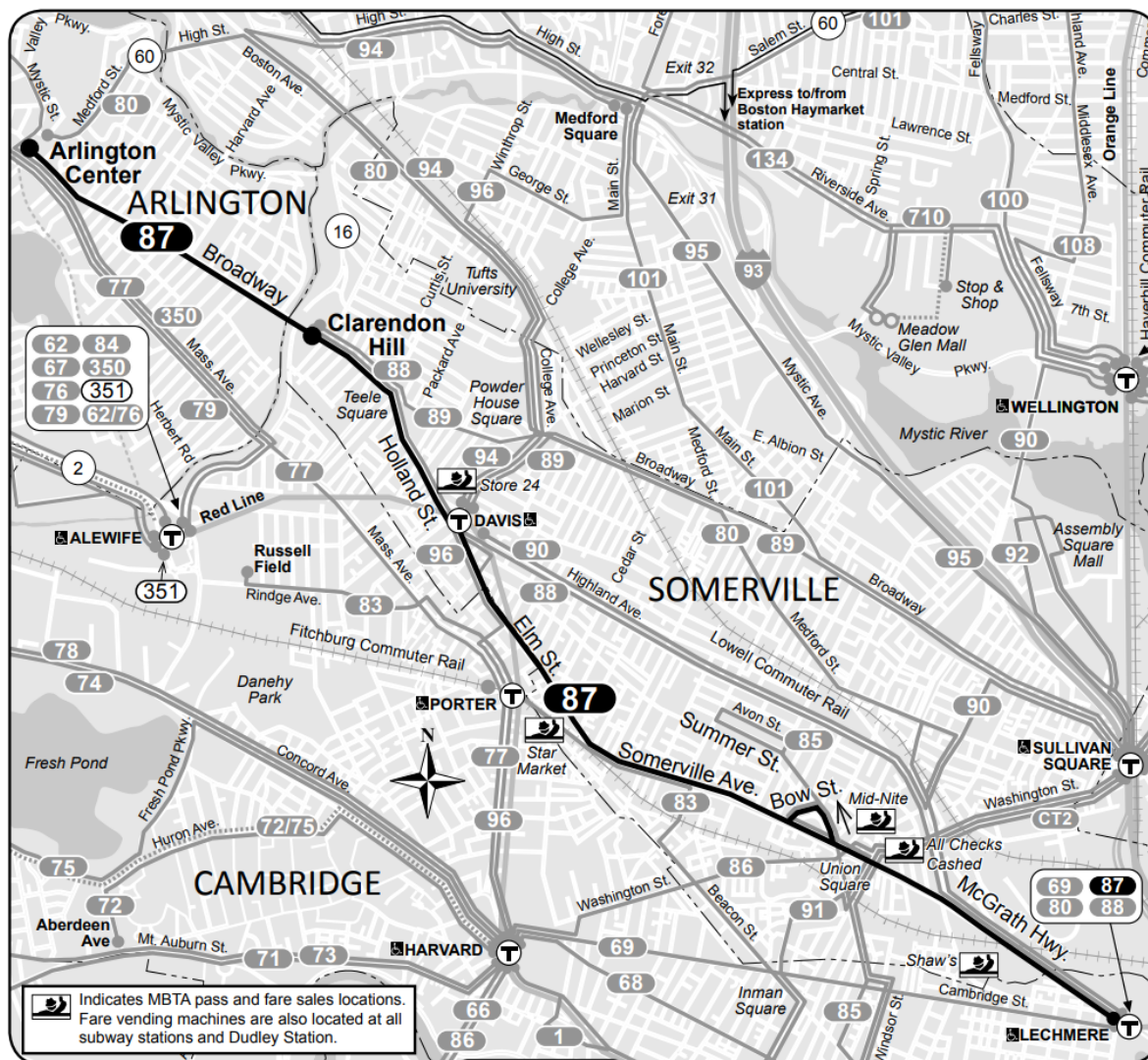
Route 87

Arlington Center or Clarendon Hill – Lechmere Station

Route Overview

Route 87 Arlington Center or Clarendon Hill – Lechmere Station is a Local route that operates between Arlington Center or Clarendon Hill and Lechmere Station (see Figure 1). It operates via Broadway, Clarendon Hill, Teele Square, Davis Square, and Union Square. Route 87 is one of five routes that connect Arlington Center with the rapid transit system.

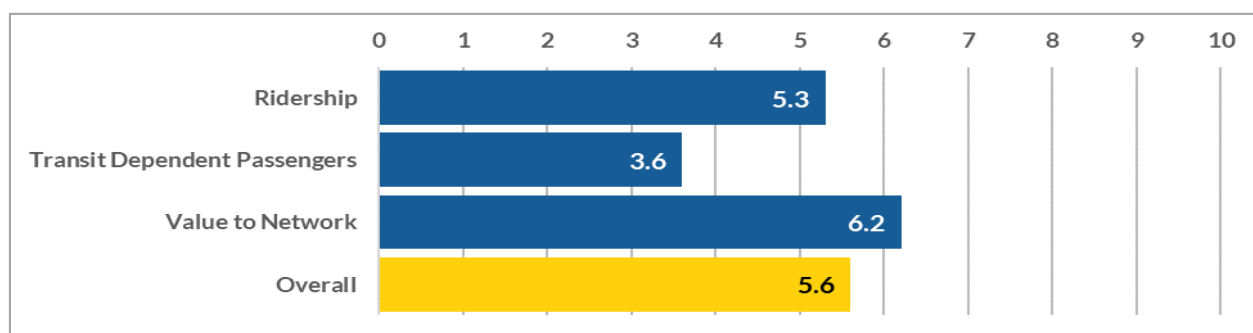
Figure 1 | Service Map



Network Importance

Route 87 is moderately important to the MBTA bus network (see Figure 2). On a relative scale of 0 to 10, the route rates 5.3 in terms of ridership, 3.6 in terms of transit dependent ridership, and 6.2 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 measure, is 5.6.

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



Service Overview

Schedule

Route 87 provides moderately frequent service during most of the day on weekdays and infrequent service on evenings and weekends (see Table 1). On weekdays, service operates from 5:10 AM to 1:05 AM with the following service frequencies

- Every 10 to 26 minutes from the start of service through the end of the AM peak, with average frequencies of 20 to 22 minutes.
- Every 20 to 35 minutes during the midday base period, but predominantly every 30 minutes.
- Every 20 to 30 minutes during the midday school period, with 30-minute headways earlier in the period and 20 minutes later.
- Every 19 to 25 minutes during the PM peak, but predominately close to every 20 minutes.
- Every 17 to 40 minutes in the evening, late evening, and night periods, but predominantly close to every 30 minutes.

On Saturdays, service operates from 5:15 AM to 1:00 AM. Service operates every 25 to 50 minutes. Most operates close to every 30 minutes before 7:30 PM, and then every 40 minutes thereafter. On Sundays, service operates from 6:00 AM to 1:00 AM, every 25 to 60 minutes. Before 8:00 AM, service operates every 60 minutes, then briefly drops to as

frequently as every 30 minutes on some trips between 8:00 AM and 10:00 AM, then every 40 minutes until close to midnight when it drops again to as low as every 30 minutes.

Table 1 | Schedule Statistics

SERVICEDAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
Monday-Friday	5:10 AM to 1:05 AM			48/45
Sunrise	5:10 AM to 5:59 AM	22	22	3/1
Early AM	6:00 AM to 6:59 AM	10 – 26	20	3/3
AM Peak	7:00 AM to 8:59 AM	20 – 27	22	5/5
Midday Base	9:00 AM to 1:29 PM	20 – 35	28	10/9
Midday School	1:30 PM to 3:59 PM	20 – 30	22	6/6
PM Peak	4:00 PM to 6:29 PM	19 – 25	21	8/8
Evening	6:30 PM to 9:59 PM	17 – 40	28	8/7
Late Evening	10:00 PM to 11:59 PM	30 – 40	33	3/4
Night	12:00 AM to 1:05 AM	30	30	2/2
Saturday	5:15 AM to 1:00 AM	25 – 50	31	37/37
Sunday	6:00 AM to 1:00 AM	25 – 60	40	28/28

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

Route 87 meets the MBTA’s span of service and frequency standards for Local routes during all service days and periods.

Service Patterns

Pattern 87.2 runs the full length of the route between Arlington Center and Lechmere Station on weekdays and Saturdays between approximately 6:00 AM and 8:00 PM (see Table 2). Pattern 87.0 operates between Clarendon Hill and Lechmere Station before 6:00 AM and after 8:00 pm on weekdays and Saturdays, and all day on Sundays.

Table 2 | Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
INBOUND				48	37	28
87.0	Clarendon Hill	Lechmere Station	Early and late service on weekdays and Saturdays and all day on Sundays	13	9	28
87.2	Arlington Center	Lechmere Station	Service between 6:00 AM and 8:00 PM on weekdays and Saturdays	35	28	-

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
OUTBOUND				45	37	28
87.0	Lechmere Station	Clarendon Hill	Early and late service on weekdays and Saturdays and all day on Sundays	11	8	28
87.2	Lechmere Station	Arlington Center	Service between 6:00 AM and 8:00 PM on weekdays and Saturdays	34	29	-

Ridership

Route 87 carries approximately 3,640 passengers on weekdays, 2,140 on Saturdays, and 1,480 on Sundays. Weekend ridership is proportionately high, including on Sundays when service does not operate to Arlington.

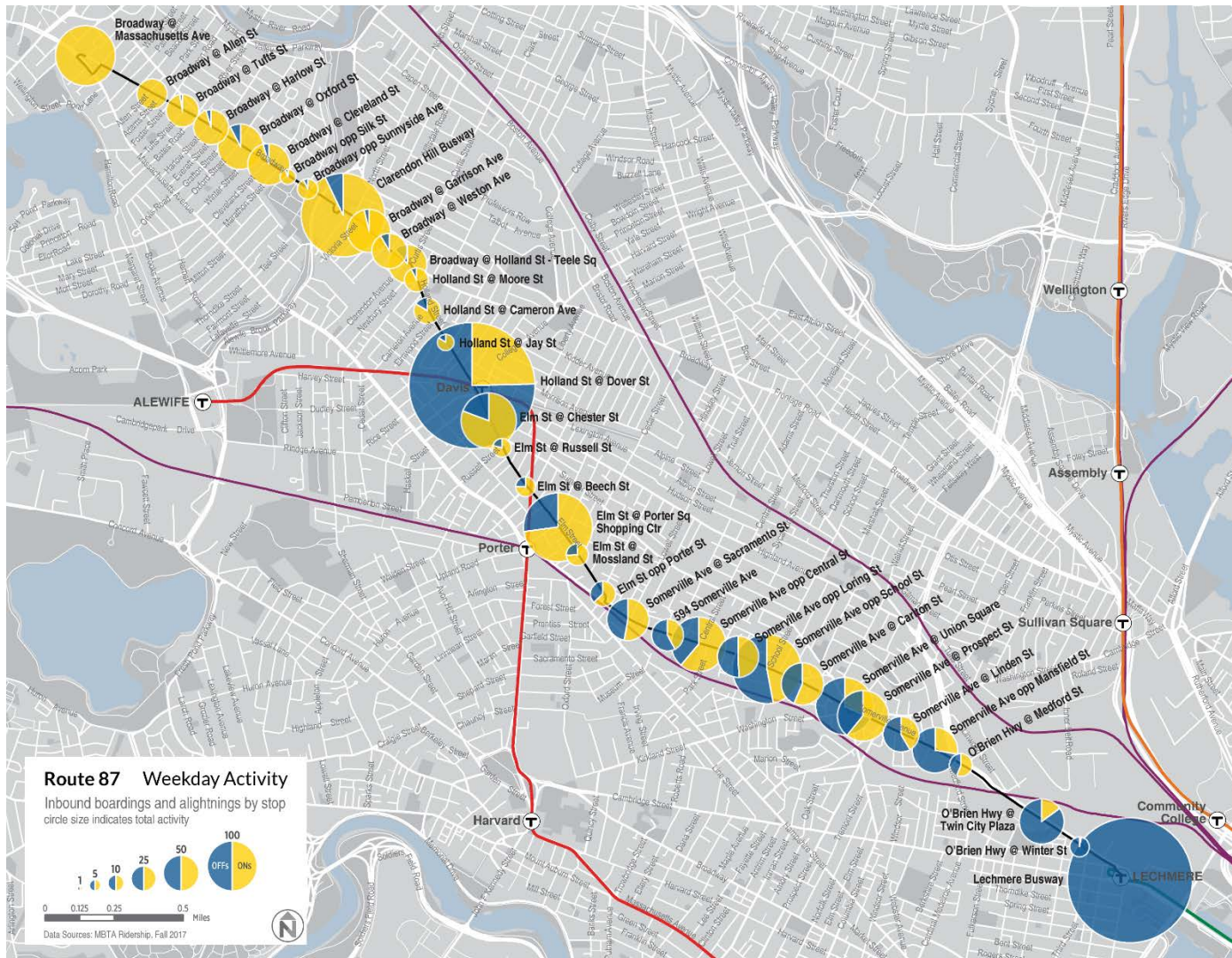
Ridership by Stop

Route 87 serves four primary markets:

- Riders from Arlington and West Somerville who connect with the Red Line at Davis Station or are traveling to Davis Square.
- Passengers, east of Davis Square use Route 87 for travel to Porter Square (primarily for shopping), various destinations along Somerville Avenue, Union Square, East Cambridge, and Lechmere Station.
- Passengers traveling from Cambridge to the Green Line at Lechmere Station.
- Passengers traveling to intermediate locations, the large majority of which are between Porter Square and Lechmere Station.

On weekday inbound trips (see Figure 3):

Figure 3 | Weekday Inbound Ridership by Stop Map



- A total of 440 passengers board and only 15 alight between Arlington Center and Clarendon Hill.
 - 150 passengers board at the first stop in Arlington Center, and another 80 board at the next two stops.
 - A total of 220 board and 10 alight at the next six stops.
- 260 passengers board and 20 alight at the Clarendon Hill busway stop.
- A total of 220 passengers board and 20 alight at the next six stops before Davis Station.
- 160 passengers board and 480 alight at Holland Street at Dover Street, which is the stop closest to Davis Station, and which is the highest ridership stop on the route (just ahead of Lechmere Station). The 640 alightings are represent 52% of all boardings before that point.
- A total of 290 passengers board and 100 alight along Elm Street in Somerville and Cambridge. Of these, 140 passengers board and 50 alight at the Porter Square Shopping Center. This is also the stop closest to Porter Commuter Rail Station.
- A total of 430 passengers board and 550 alight along Somerville Avenue and O'Brien Highway.
- 620 passengers, or 34% of all inbound riders, alight at Lechmere Station.
- Overall, boardings are split almost exactly 50/50 between the half west of Davis Station and the half east of Davis Station.

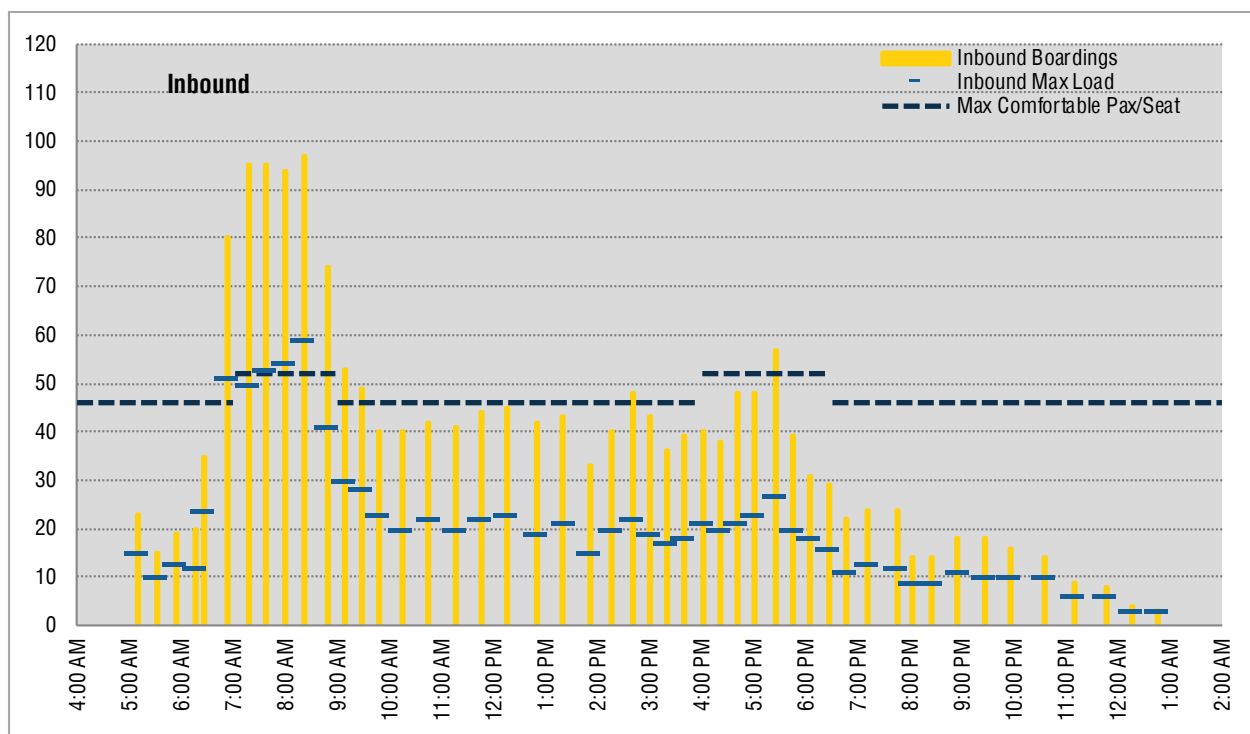
Outbound ridership is roughly the reverse of inbound ridership on weekdays. Weekend ridership patterns are similar, but with lower volumes and without any Sunday ridership between Arlington Center and Clarendon Hill (because that service does not operate on Sundays).

Ridership by Trip

On weekdays, Route 87 has high ridership per trip throughout most of the day, and in particular on peak period peak direction trips. On weekday inbound trips (see Figure 4):

- Ridership before 6:30 AM ranges from 15 to 35 passengers per trip.
- It then increases significantly to 80 to 95 passengers between 6:30 AM and 8:30 AM. Nearly all trips operate with maximum loads that are near or above the MBTA's maximum load standards.
- From 8:30 AM to 6:00 PM, ridership per trip is generally between 40 and 50 passengers, with a few trips over 50 passengers. This is the case even though most service is infrequent (every 30 minutes between approximately 10:00 AM and 2:00 PM).

Figure 4 | Weekday Ridership by Trip: Inbound



- Ridership per trip then tails off steadily to fewer than five passengers on the last trip at 12:45 AM.

On weekday outbound trips (see Figure 5):

- Ridership per trip begins low and then builds to an AM peak high of 44 passengers on the 7:35 AM outbound trip.
- It is then approximately 30 passengers per trip until about 12:30 PM, when it jumps to over 40 through 4:00 PM.
- From 4:00 PM to 6:00 PM, ridership per trip ranges from nearly 60 to over 110 passengers per trip. Most trips are near or above capacity.
- Ridership then tails off from 68 passengers at 6:35 PM to less than five on the last trip at 1:05 AM.

On Saturdays, inbound ridership is highest between 7:30 AM and 6:30 PM, when most trips carry 30 to over 40 passengers (see Figure 6). Outbound ridership is highest between 12:00 PM and 7:00 PM, when most trips carry 30 to over 50 passengers (see Figure 7).

On Sundays, inbound ridership is highest from the beginning of service at 6:00 AM and 3:00 PM, when most trips carry 30 to over 50 passengers (see Figure 8). Outbound ridership is highest between 1:00 PM and 7:00 PM, when most trips also carry 25 to over 40 passengers (see Figure 9). These numbers are very high considering that

Figure 5 | Weekday Ridership by Trip: Outbound

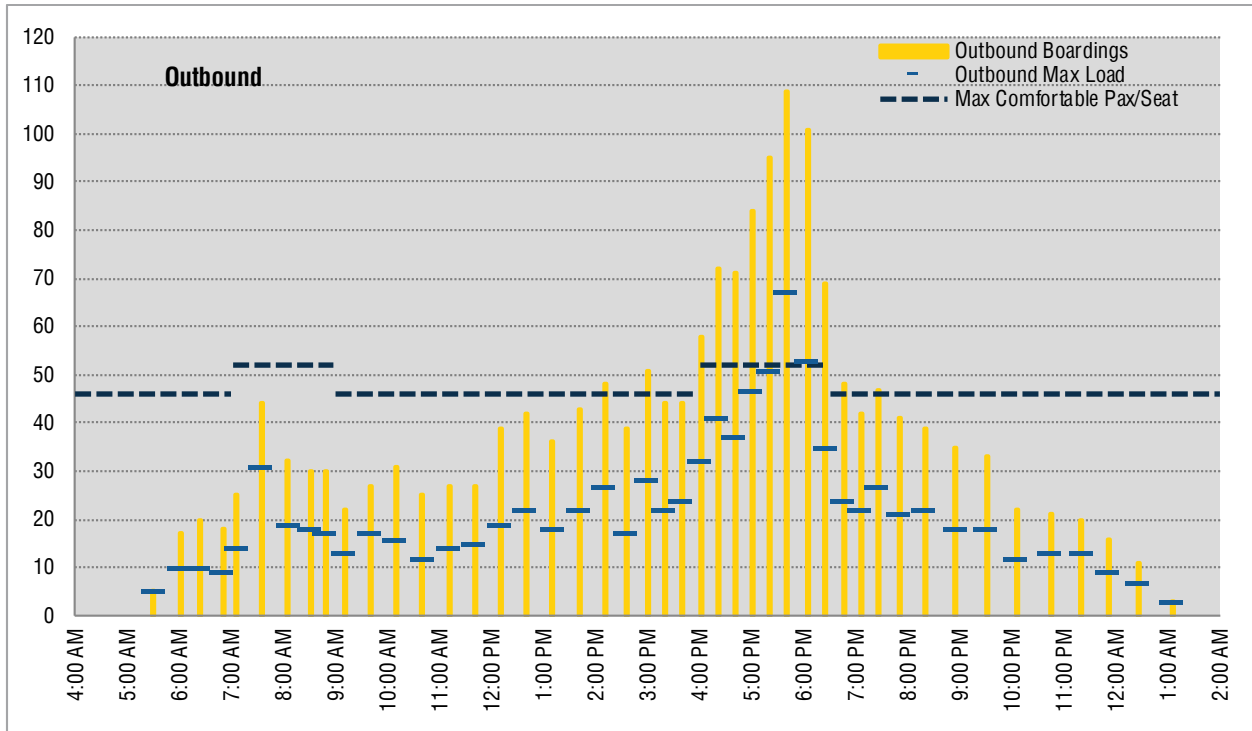


Figure 6 | Saturday Ridership by Trip: Inbound

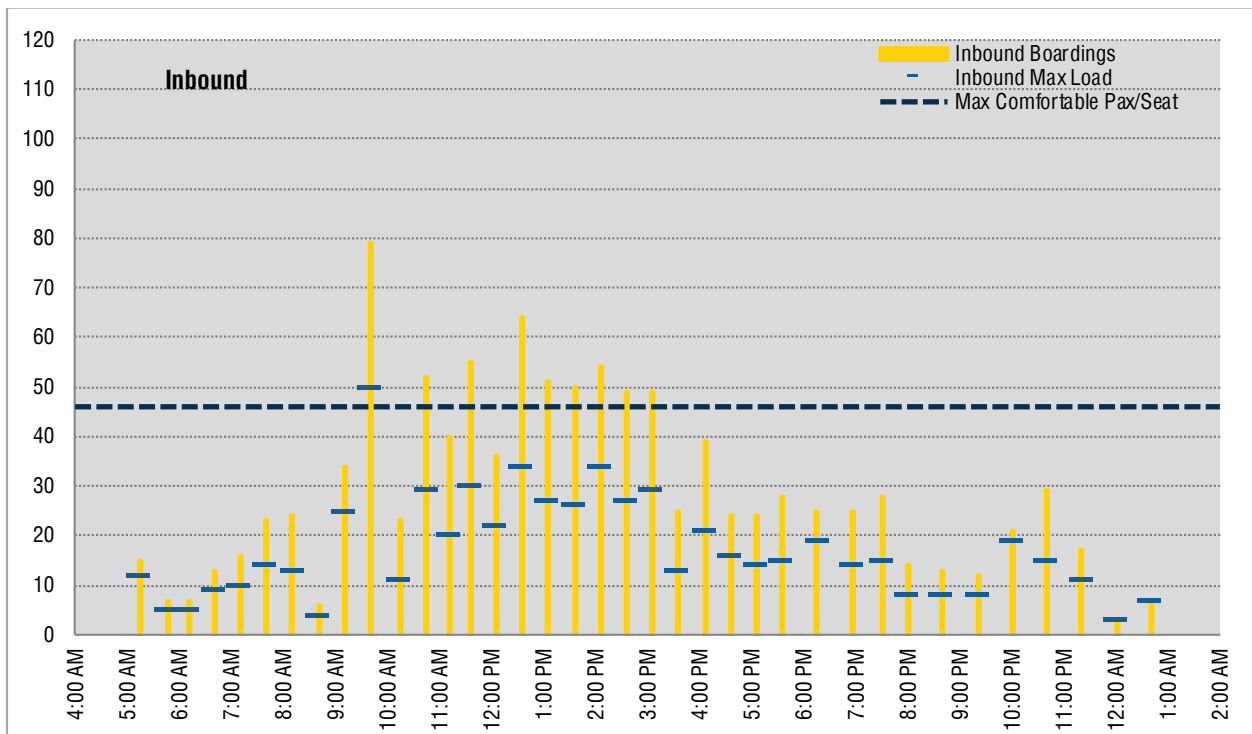


Figure 7 | Saturday Ridership by Trip: Outbound

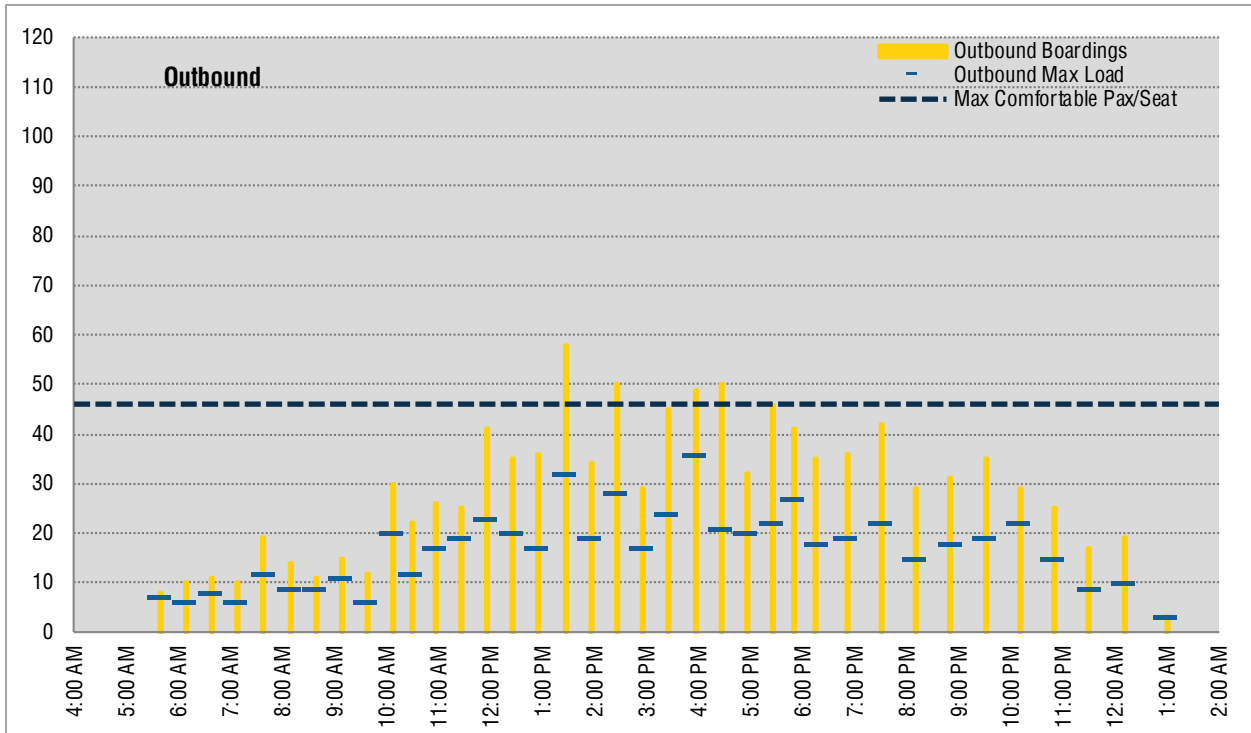


Figure 8 | Sunday Ridership by Trip: Inbound

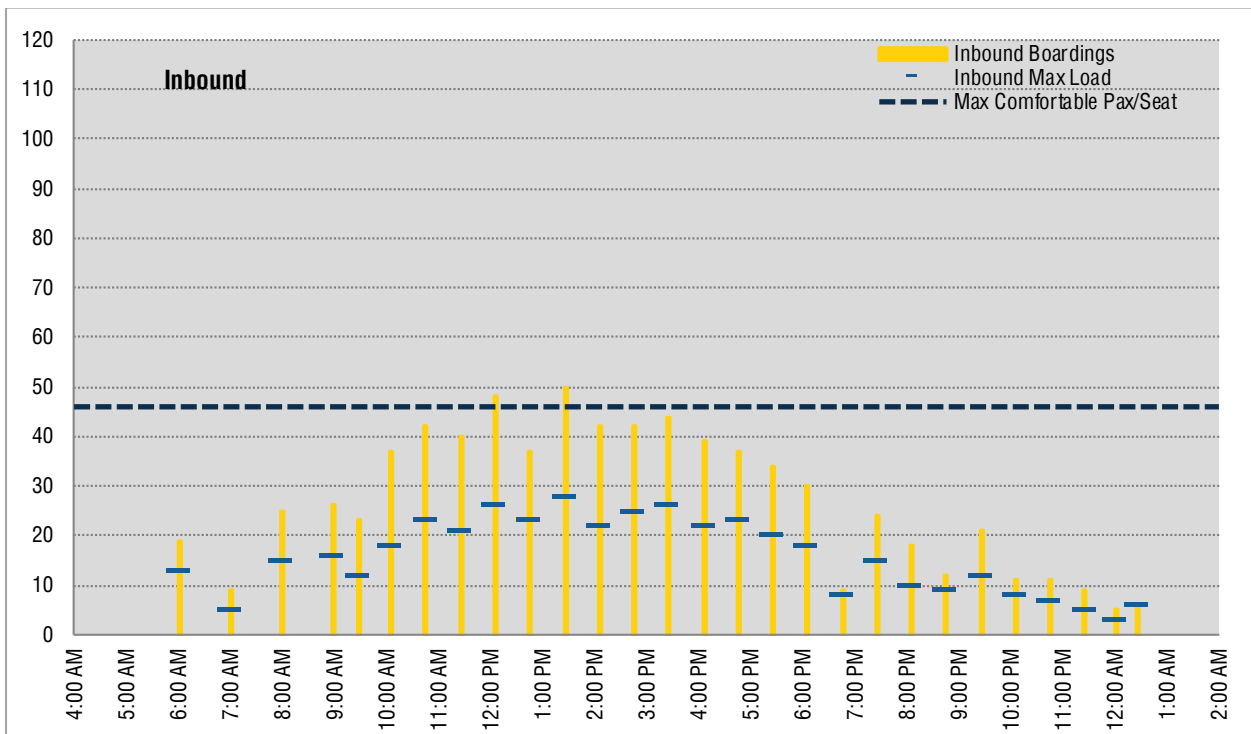
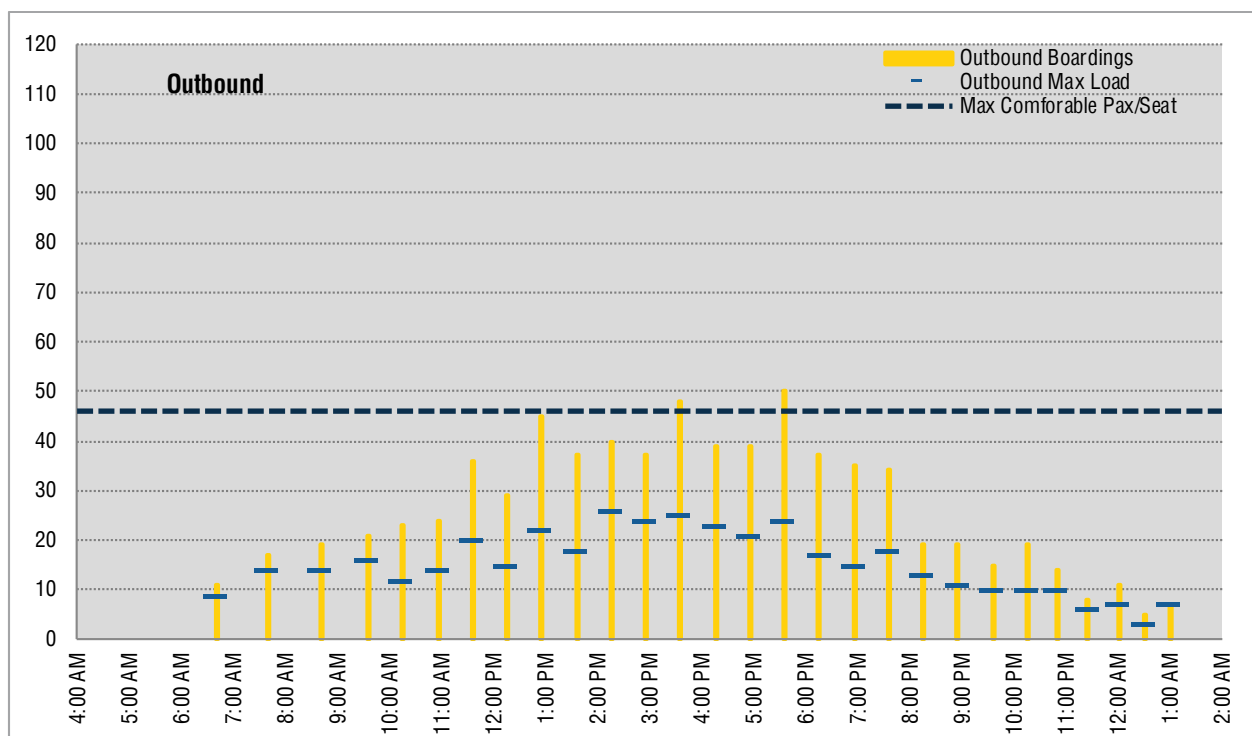


Figure 9 | Sunday Ridership by Trip: Outbound



service is infrequent (generally every 40 minutes). This indicates demand for more frequent service.

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 87, 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). The below target performance is due to overcrowding on peak period peak direction trips.

Table 3 | Passenger Time Spent Traveling in Comfortable Conditions

	WEEKDAYS	SATURDAYS	SUNDAYS
Minimum Standard	92%	92%	92%
Target	96%	96%	96%
Actual	92.7%	99.3%	100%

Reliability and Speed

Reliability

Route 87's overall reliability is only 64% on weekdays, 63% on Saturdays, and 66% on Sundays (see Table 4). These levels are all below the minimum standard of 70% for local bus routes.

Table 4 | Reliability

SERVICEDAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
Monday-Friday	66%	59%	64%	0.3%
Saturday	63%	60%	63%	-
Sunday	68%	56%	66%	-

Running Times

A major reason for Route 87's poor on-time performance is that actual running times are significantly longer than scheduled times. Inbound, service operates up to 14 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 87 Inbound

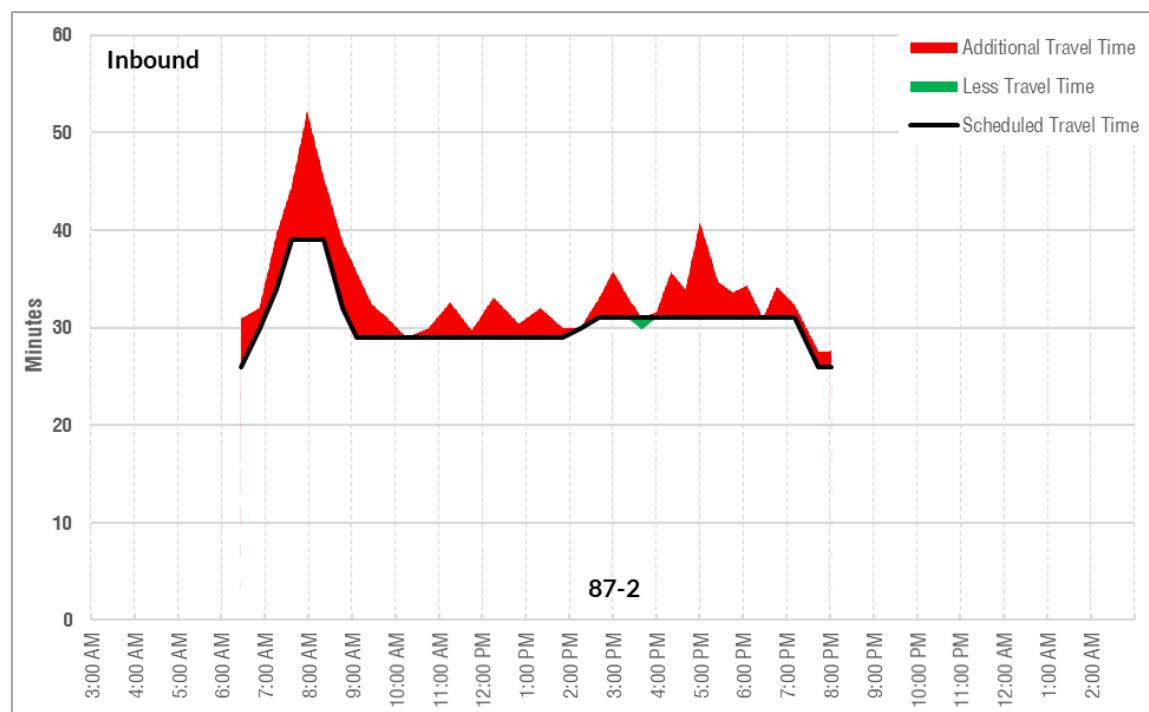
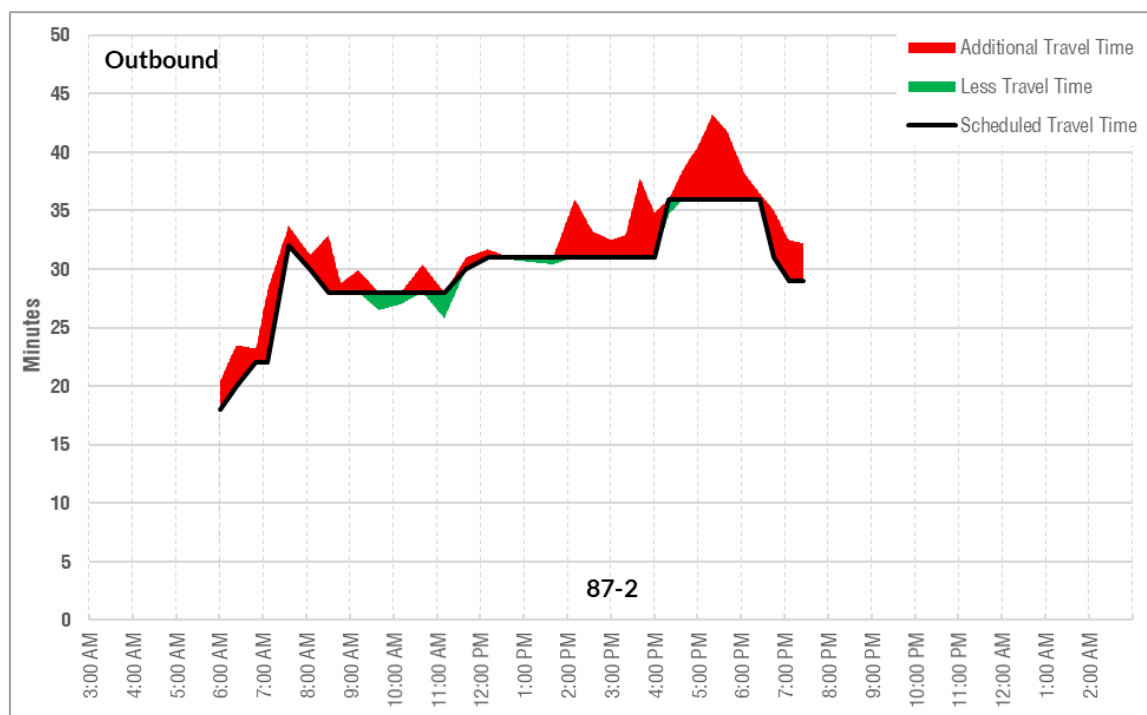


Figure 11 | Scheduled & Median Travel Time by Trip: Route 87 Outbound



Stop Spacing

Route 87 has approximately eight stops per mile, in excess of the four to seven stops per mile recommended for urban areas under MBTA guidelines. The very short stop spacing slows service and contributes to the route’s poor reliability. Stop consolidation could improve service while still providing convenient walk times to stops.

Summary

Route 87 is a high ridership local route that provides key connections between Arlington, Somerville, and Cambridge, and the Red Line and Green Line. Major issues are poor on-time performance, overcrowding on peak period trips, and infrequent off-peak and weekend service. Route 87 and Route 88 both travel the same section of Broadway between Clarendon Hill and Davis Station. This shared trunk would provide frequent service if schedules were coordinated, however the poor reliability of the route limits the effective trunk frequency.