

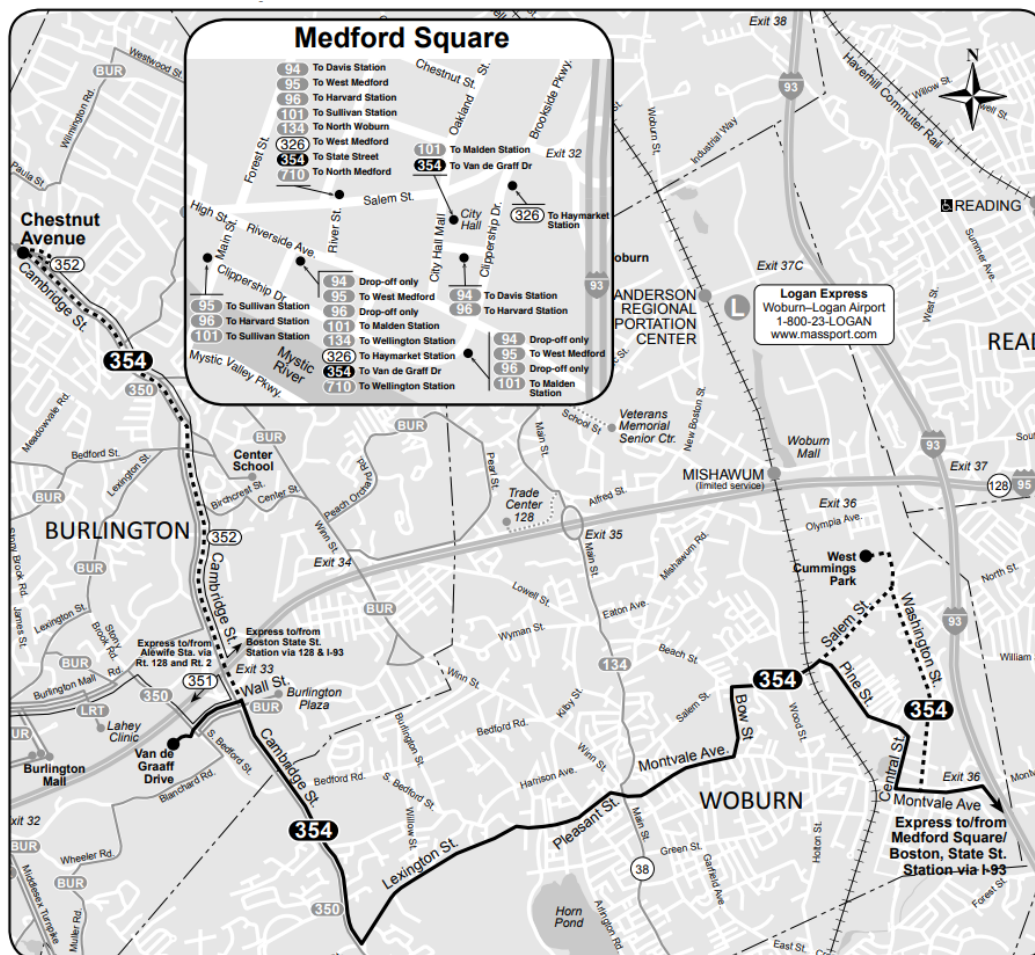
# Route 354

Express – Woburn – Boston

## Route Overview

Route 354 Woburn – Boston is a Commuter route that operates between Burlington, Woburn and downtown Boston with express service on I-93 to/from State Street Station in Boston. Several trips also include stops in Medford Square.

Figure 1 | Service Map

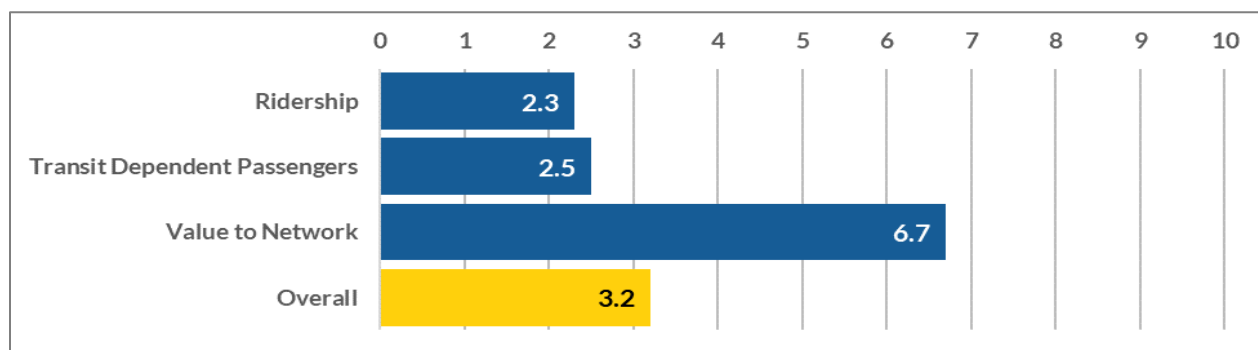


## Network Importance

Route 354 is of lesser importance in the MBTA network overall (see Figure 2). On a relative scale of 0 to 10, the route rates 2.3 in terms of ridership, 2.5 in terms of transit dependent ridership, and 6.7 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 3.2. Low scores are typical of express routes that only operate for limited hours and thus serve fewer riders than all day routes.

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



## Service Patterns

### Schedule

Route 354 operates between 5:35 AM and 9:30 AM and 2:45 PM and 8:15 PM on weekdays, with no service on weekends (see Table 1). In the AM peak direction service operates every 25 to 30 minutes. In the PM, peak direction service operates every 16 to 30 minutes.

Table 1 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
<b>Monday-Friday</b>	<b>5:35 AM to 9:30 AM</b> <b>2:45 PM to 8:15 PM</b>			<b>15/20</b>
Sunrise	5:35 AM to 5:59 AM	1 trip	-	1/0
Early AM	6:00 AM to 6:59 AM	25	25	3/2
AM Peak	7:00 AM to 8:59 AM	25 - 30	26	4/3
Midday Base	9:00 AM to 9:30 PM	30	30	2/0
Midday School	2:45 PM to 3:59 PM	25 - 60	38	1/2
PM Peak	4:00 PM to 6:29 PM	16 - 60	20	4/8
Evening	6:30 PM to 8:15 PM	16 - 30	26	0/5
Late Evening	-	-	-	-
Night	-	-	-	-
<b>Saturday</b>	-	-	-	-
<b>Sunday</b>	-	-	-	-

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

Route 354 meets the minimum span of service and frequency standards for Commuter routes.

## Service Patterns

Table 2 | Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
<b>INBOUND</b>				<b>15</b>	-	-
354.0	Van De Graff Drive, Burlington	State Street Washington Mall	AM peak inbound service	9	-	-
354.3	Van De Graff Drive, Burlington	State Street at Washington Mall	Late AM inbound trip via West Cummings Park but not Medford Square	1	-	-
354.5	Van De Graff Drive, Burlington	State Street at Washington Mall	PM inbound trip via West Cummings Park and Medford Square	5	-	-
<b>OUTBOUND</b>				<b>20</b>	-	-
354.0	State Street at Washington Mall	Van De Graff Drive	PM peak outbound service	8	-	-
354.3	State Street at Washington Mall	Cambridge Street opposite Lincoln Knoll Lane	Early PM outbound trip via West Cummings Park but not Medford Square	1	-	-
354.4	State Street at Washington Mall	Chestnut Avenue at Cambridge Street	Extended service to North Burlington after 6:00 PM	6	-	-
354.5	State Street at Washington Mall	Van De Graff Drive	AM outbound service via West Medford and West Cummings Park	5	-	-

Route 354 operates with four service patterns (see Table 2):

- Pattern 354.0 runs all peak period, peak direction service except for the last AM outbound trip and the first PM inbound trip operates as shown with the solid black line in Figure 1, with service to downtown Boston via I-93.
- Pattern 354.3 runs the last AM inbound and first PM outbound trips deviate via West Cummings Park, which is a retail complex near the intersection of Route 128 and I-93.
- Pattern 354.5 runs the peak period reverse direction service (AM outbound and PM inbound), and includes a stop in Medford Square and a deviation to the West Cummings Park.

- Patterns 354.4 runs outbound service after 6:15 PM, and continues north on Cambridge Street to Chestnut Avenue in North Burlington. This service is in lieu of Route 352 Express Burlington-Boston, which ends service after its 6:00 PM departure.

## Ridership

Route 354 serves 640 passengers per weekday.

### Ridership by Stop

#### AM Inbound

Inbound, approximately 265 passengers use the use the 10 AM trips and 60 use the five PM trips (see Figure 2). In AM inbound trips:

- The largest number of boardings is at the two stops in Woburn Square, where a total of 75 passengers board.
- A total of 15 passengers board at the two stops along Montvale Avenue before Bow Street.
- A total of 55 passengers board along the deviation north of Montvale Avenue along Bow Street, Pine Street and Central Street.
- Only one passenger boards on the deviation to West Cummings Park (and none alight).
- 25 passengers board at Montvale Avenue at I-93 where there is a park and ride lot.
- Over 90% of passengers alight at the routes terminal at State Street Station.

#### AM Outbound

AM Outbound service is designed primarily to transport passengers between downtown Boston and West Medford and West Cummings Park on the reverse legs on AM inbound trips. A total of 60 passengers ride these trips:

- 20 passengers, or one-third, board at State Street in downtown Boston.
- 15 passengers board at the stops at Government Center and Haymarket.
- 10 passengers board in Medford Square.
- Five passengers alight on Montvale Avenue in Stoneham at I-93.
- 25 passengers alight at West Cummings Park
- 15 passengers alight at the last stop on Van de Graff Drive in Burlington.

All other stops serve five or fewer boards and alightings.

### PM Outbound

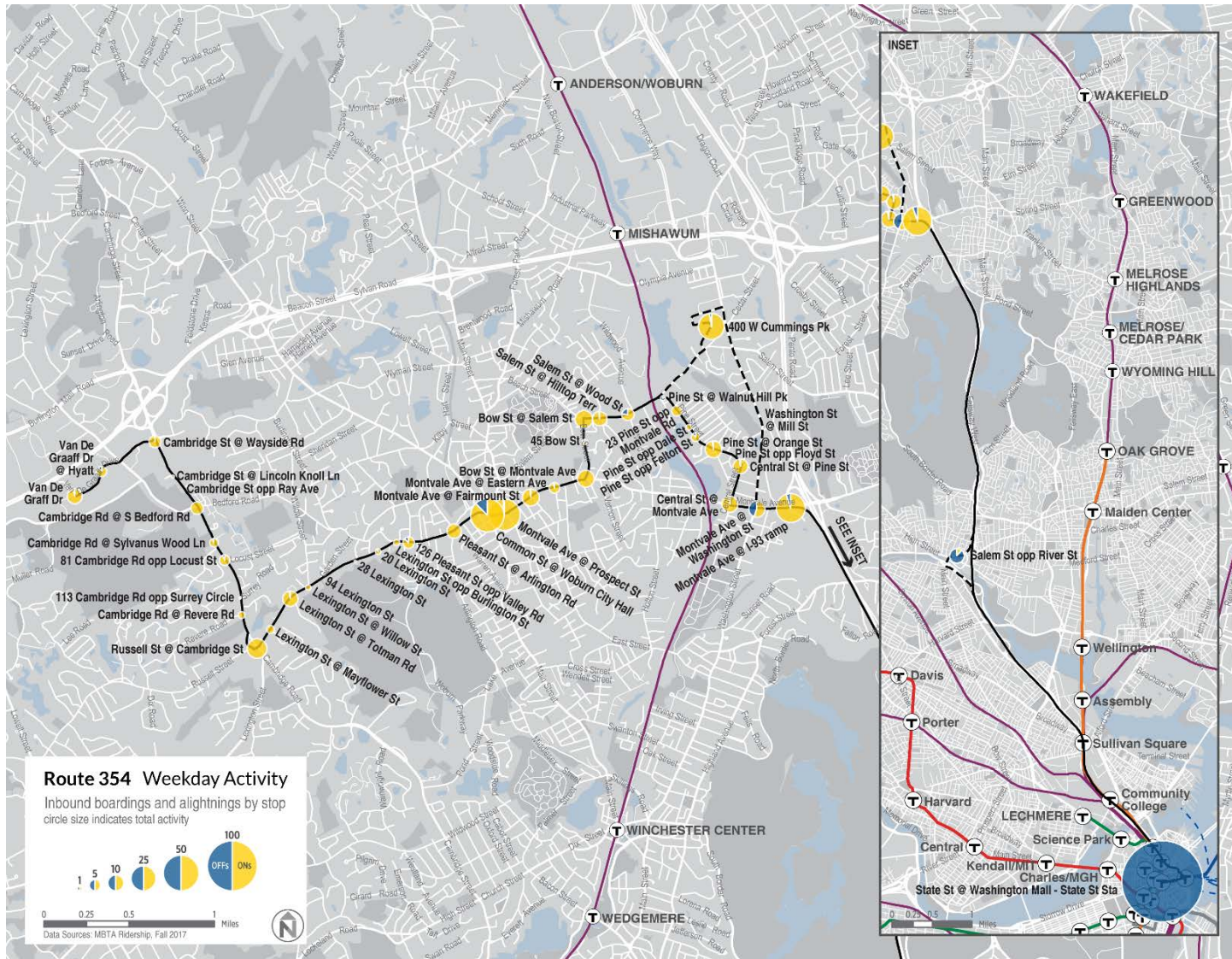
A total of 260 passenger use Route 354's PM service:

- 220 passengers, or 75 percent board at State Street.
- 35 passengers board at the stops at Government Center and Haymarket.
- 20 passengers alight on Montvale Avenue in Stoneham at I-93.
- Only one passenger alights on the single PM outbound trip that deviates via West Cummings Park.
- 70 passengers alight on the deviation north of Montvale Avenue via Central Street, Pine Street, Salem Street, and Bow Street.
- 85 passengers at the three stops in Woburn Square.
- 70 passengers alight between Woburn Square and Route 128.
- 40 passengers alight at stops on Cambridge Street north of Route 128 on the six stops that are extended to this area beginning at 6:15 PM.

### PM Inbound

On the PM inbound trips, ridership is low along nearly the entire route, at less than five boardings per stop. This is not surprising since this is non-peak direction service. However, the one notable exception is the deviation to West Cummings Park, which serves nearly 30 boardings. On the PM inbound trips, percentage-wise, there is more intermediate ridership, with 40% of passengers traveling to intermediate locations and 60% to downtown Boston.

Figure 3 | Weekday Inbound Ridership by Stop Map



## Ridership by Trip

Ridership per trip is strong on AM peak inbound trips, moderate on PM peak outbound trips and low on peak direction trips that operate in the shoulders of the peaks (see Figure 4 and Figure 5). More specifically:

- Inbound in the AM, ridership starts fairly strong at 28 passengers. It then increases to 38 on the 6:50 AM trip and stays above 30 passengers until the 7:40 AM trip. Ridership then falls off to around twenty on the 8:05 AM and 8:30 AM trips, and then to less than 10 on the last two trips.
- Outbound in the PM, much more service is provided than in the AM: 15 outbound trips compared to nine inbound trips and spread over a longer span. Consequently, ridership per trip is significantly lower. It starts at 10 per trip on the first two trips 2:45 PM and 3:35 PM. It then ranges between 15 and 25 until 6:30 PM with the exception of one trip that carries 44 passengers at 5:25 PM. After 6:30 PM, ridership per trip ranges from 10 to 15.
- Ridership on reverse direction trips via Cummings Park generally ranges from 10 to 15 passengers. These numbers are strong for non-peak direction service.

On average, nearly all passengers are provided with a seat. This is well below the MBTA's crowding thresholds of 125% of seated capacity during off-peak periods and 140% during high volume periods but appropriate for express services with long travel times operating on interstate highways.

Figure 4 | Weekday Ridership by Trip: Inbound

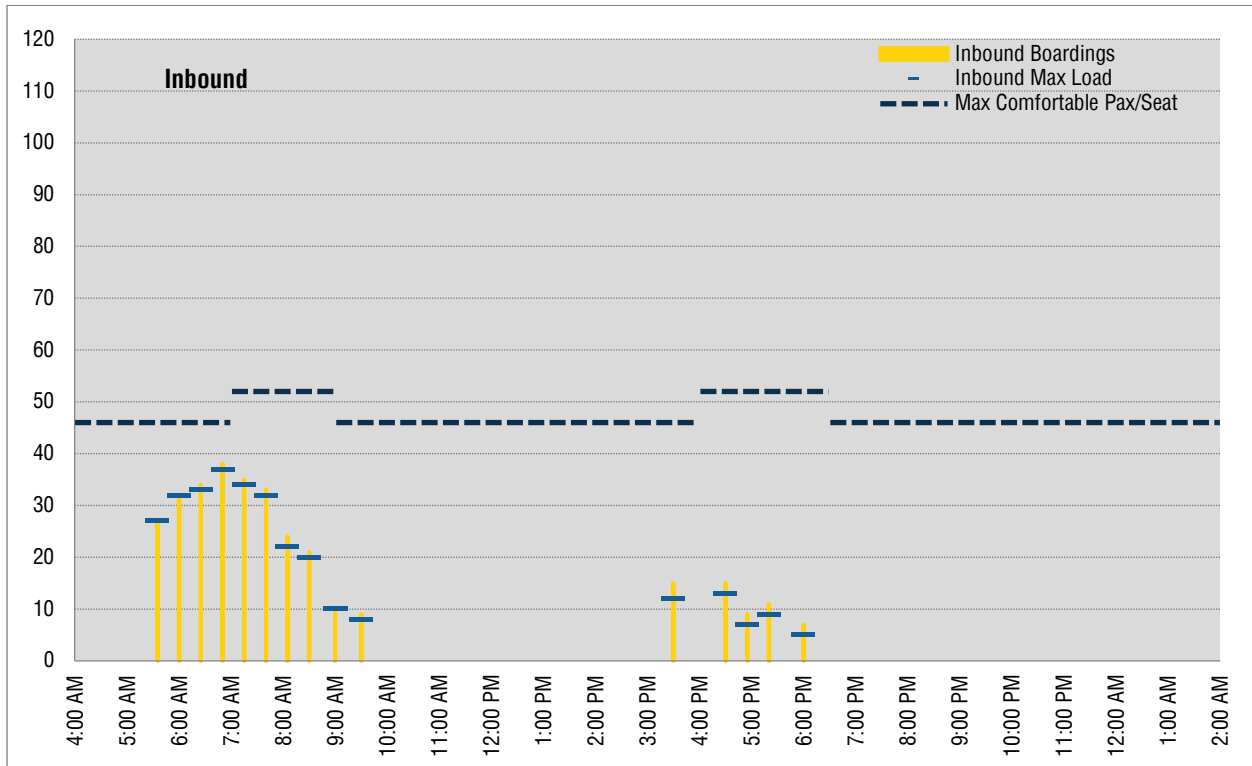
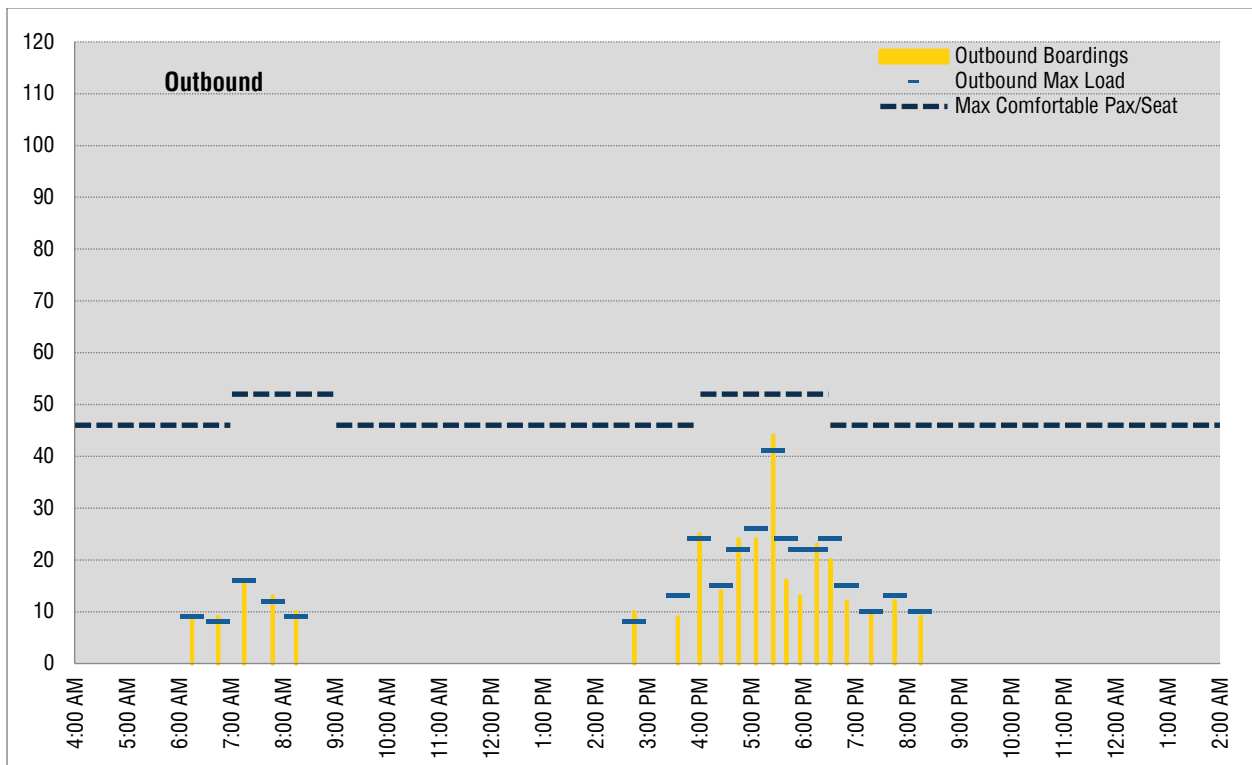


Figure 5 | Weekday Ridership by Trip: Outbound





## 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 354, 98% of passenger minutes are in comfortable conditions, which is above the minimum and target standards (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>	97.8%	-	-

## Reliability and Speed

### Reliability

Route 354's reliability is very poor, at only 45% overall (see Table 4). Most of the problem is increasing congestion on I-93 and scheduled running times that do not reflect actual running times (see Figure 6 and Figure 7). Inbound trips average five to ten minutes longer than scheduled. Evening trips median travel times are longer than the scheduled times and longer than morning inbound trips.

Table 4 | Reliability

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
<b>Monday-Friday</b>	46%	42%	45%	0.4%
<b>Saturday</b>	-	-	-	-
<b>Sunday</b>	-	-	-	-

Figure 6 | Scheduled & Median Travel Time by Trip: Route 354 Inbound

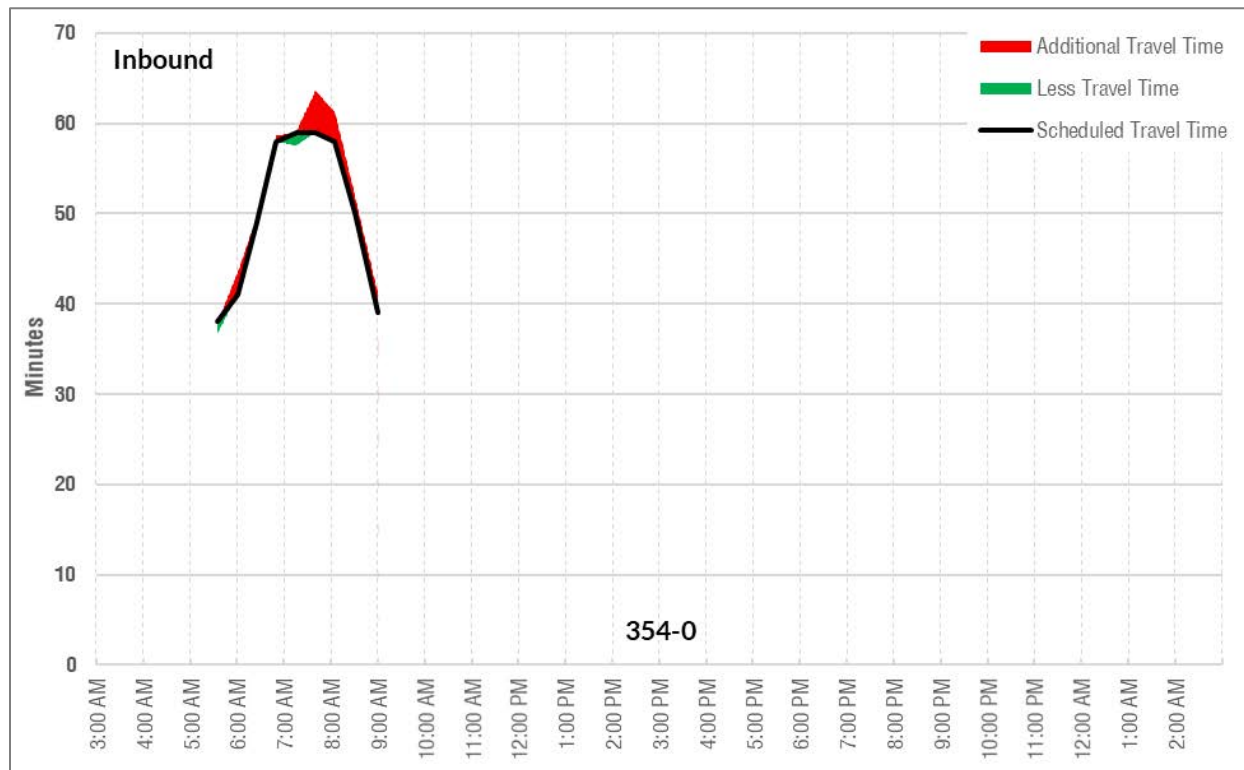
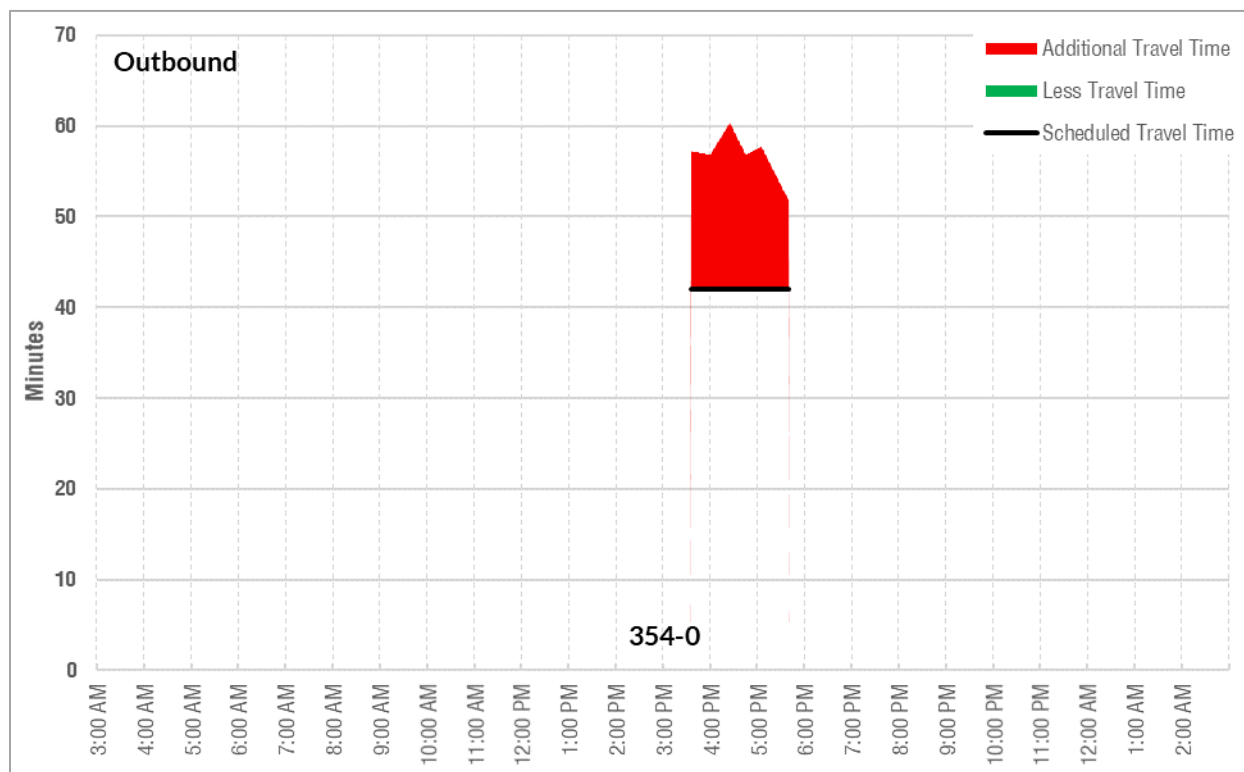


Figure 7 | Scheduled & Median Travel Time by Trip: Route 354 Outbound



## Stop Spacing

Although there are some exceptions on Lexington Street, Pleasant Street, and Montvale Street through Woburn, stop spacing on Route 354 is generally appropriate and consistent with the MBTA's stop spacing guidelines.

## Summary

Route 354 performs reasonably well, and in particular, the strategy of providing reverse Commuter service to West Cummings Park. The major problem with the route is its very poor on-time performance, which is largely due to increasing congestion on I-93. The route's service span is also slightly longer than required based on demand, as trips at the shoulders of the peak have low ridership.