

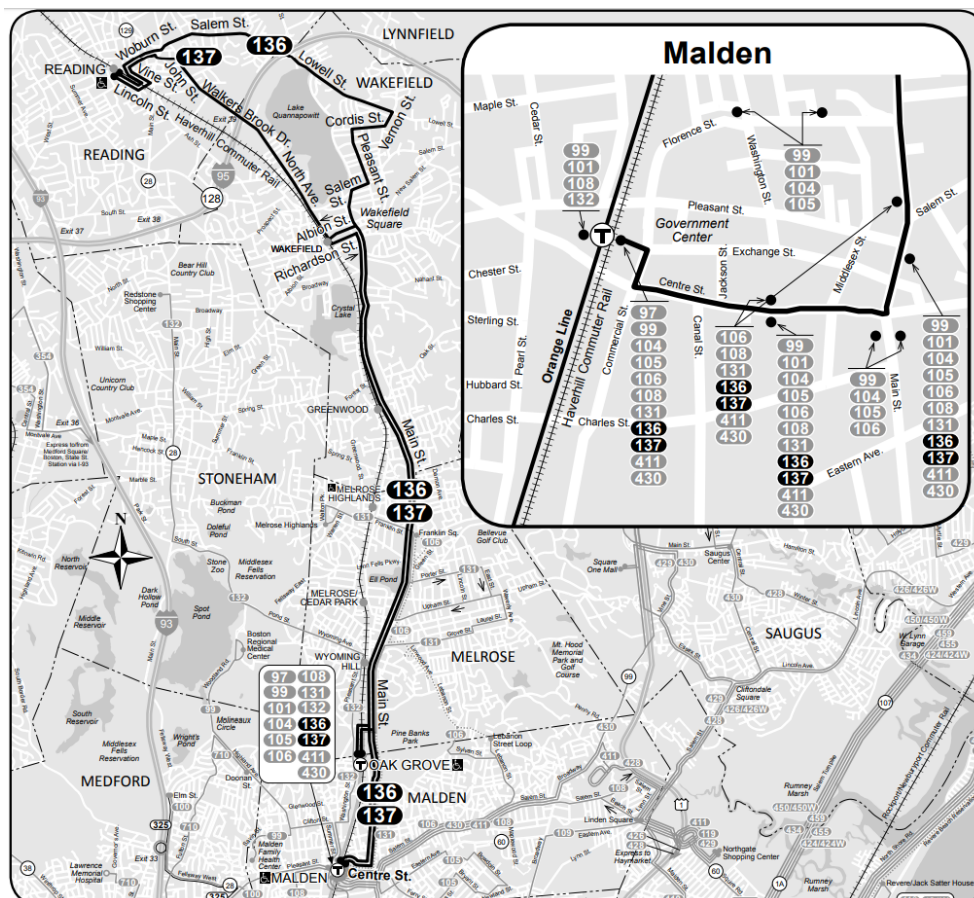
Route 136/137

Reading Depot – Malden Center

Route Overview

Routes 136/137 Reading Depot – Malden Center are Local bus routes that connect the communities of Reading, Wakefield, and Melrose with the Orange Line’s Oak Grove Station and Malden Center Station. The two routes share the same origin and destinations and largely operate along the same Main Street corridor, paralleling the Haverhill Commuter Rail Line, except for a short segment in Wakefield where the two routes operate on opposite sides of Lake Quannapowitt. Along this segment, Route 136 operates via the east side of the lake on Salem Street/Lowell Street, and Route 137 operates along the west side of the lake on North Avenue/Walkers Brook Drive. The routes are also complemented by Route 131 Melrose Highlands - Oak Grove Station, a Commuter bus route that operates between Melrose Highlands, Oak Grove Station, and Malden Center Station.

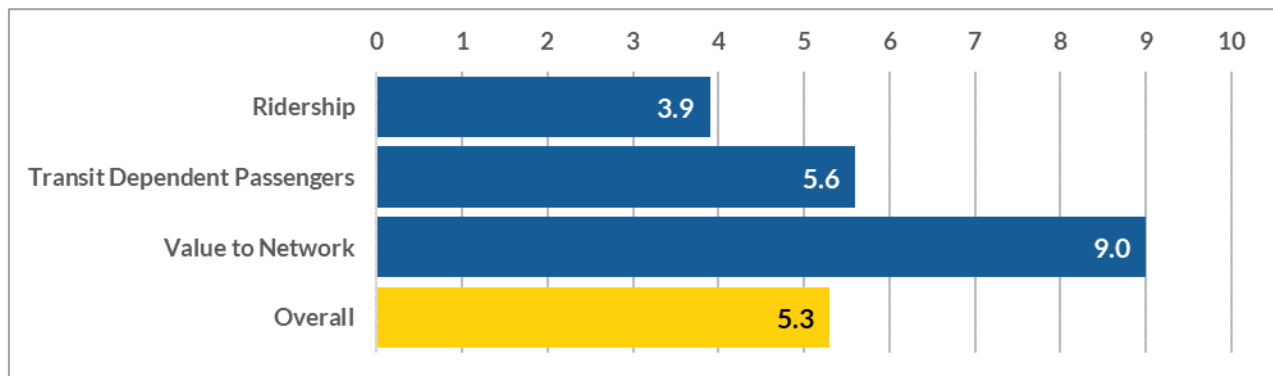
Figure 1 | Service Map



Network Importance

Route 136/137 are moderately important to the MBTA network overall (see Figure 2). On a relative scale of 0 to 10, both routes rate 3.9 in terms of ridership, 5.6 in terms of transit dependent ridership, and 9.0 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% weight to overall ridership and a 15% weight to both other measures, is 5.3.

Figure 2 | Relative Importance of Route 136 within MBTA Bus Network (on a scale of 0 to 10)



Service Patterns

Schedule

On weekdays, Routes 136/137 provide frequent service during the AM Peak period, moderately frequent service during the Early AM and Midday School periods, and infrequent service at all other times (see Table 1). On weekends, the routes provides infrequent service.

In more detail, weekday service operates from 5:30 AM to 9:20 PM with the following service frequencies:

- Every 30 minutes from the start of service to 6:00 AM.
- Every 15 to 30 minutes in the Early AM period, but mostly every 15 minutes.
- Every five to 20 minutes during the AM Peak, but predominantly every 10 to 15 minutes.
- Every five to 35 minutes during the Midday Base and Midday School periods, but predominantly every 35 minutes.
- Every 30 to 35 minutes during the PM Peak.
- After the PM Peak, frequencies vary significantly, from every 25 to 35 minutes between 6:30 PM and 7:30 PM to 78 minutes after 7:30 PM.

On Saturdays, Routes 136/137 operate from 6:00 AM to 8:30 PM every 45 to 75 minutes, but predominantly every 45 to 50 minutes. On Sundays, Routes 136/137 operate from 6:00 AM to 4:15 PM at service frequencies of 90 minutes.

Routes 136/137 generally meet the MBTA’s span of service and frequency standards for weekdays and Saturdays. However, the routes fail to meet the agency’s span of service and frequency standards for Sunday service, which require minimum service frequencies of 60 minutes between 10:00 AM and 6:30 PM. The routes also fail to meet the service frequency standard for weekday service during the PM Peak, which is 30 minutes.

Table 1 | Route 136/137 Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
Monday-Friday	5:30 AM to 9:20 PM			37/36
Sunrise	5:30 AM to 5:59 AM	30	30	1/2
Early AM	6:00 AM to 6:59 AM	15 - 30	18	4/4
AM Peak	7:00 AM to 8:59 AM	5 - 20	11	11/6
Midday Base	9:00 AM to 1:29 PM	25 - 35	33	8/7
Midday School	1:30 PM to 3:59 PM	5 - 35	28	5/6
PM Peak	4:00 PM to 6:29 PM	30 - 35	32	5/7
Evening	6:30 PM to 9:20 PM	25 - 78	46	3/4
Late Evening	-	-	-	-
Night	-	-	-	-
Saturday	6:00 AM to 8:30 PM	45 - 75	50	19/18
Sunday	8:00 AM to 4:15 PM	90	90	7/6

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

Service Patterns

Routes 136/137 are signed as independent routes, but operate on the same Main Street corridor for the majority of their alignment and differ only in northern Wakefield and Reading, where they diverge in separate routes around Lake Quannapowitt. Route 136’s primary service pattern (Pattern 136.5) takes the northern route around the lake, via Lowell Street and Salem Street. Route 137 trips (Pattern 137.3) take the southern approach, via North Avenue and Walkers Brook Drive. 32 out of 38 inbound trips and 30 of 36 outbound trips on Routes 136/137 operate along these primary service patterns (see Table 2). Route 136 also operates with three additional patterns, described below:

- Pattern 136.3 is a short-turn alignment that operates between Oak Grove Station and Wakefield Square, with no service to Reading or Malden Center. One weekday inbound trip and one weekday outbound trip operate this service pattern.
- Pattern 136.4 is also a short-turn alignment that operates between Wakefield Square, Malden Center Station and Oak Grove Station, with no service to Reading. Five weekday inbound trips, two weekday outbound trips, and one Saturday trip in each direction operate this service pattern.

- Pattern 136.6 operates between Reading Depot and Oak Grove Station, with no service to Malden Center Station. Three weekday outbound trips operate this service pattern.

On Sundays, Routes 136/137 operate in combination with a one-way loop around Lake Quannapowitt, with outbound trips running as Route 136 (Pattern 136.5) and inbound trips returning as Route 137 (Pattern 137.5).

Table 2 | Routes 136/137 Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
INBOUND				38	19	7
136.3	Main Street at Water Street	Oak Grove Station	Short turn to Oak Grove via Wakefield Square	1	-	-
136.4	Main Street at Water Street	Malden Center Station	Short turn to Malden Center via Wakefield Square	5	1	-
136.5	Reading Depot at Lincoln Street	Malden Center Station	Primary pattern via Lowell Street/Salem Street	15	10	-
137.3	Reading Depot at Lincoln Street	Malden Center Station	Primary pattern via Walkers Brook Drive/North Avenue	17	8	7
OUTBOUND				36	18	6
136.3	Oak Grove Station	Main Street at Water Street	Short turn to Wakefield Square via Oak Grove	1	-	-
136.4	Malden Center Station	Main Street at Water Street	Short turn to Wakefield Square via Malden Center	2	1	-
136.5	Malden Center Station	Reading Depot at Lincoln Street	Primary pattern via Lowell Street/Salem Street	12	8	6
136.6	Oak Grove Station	Reading Depot at Lincoln Street	Short turn to Reading Depot via Oak Grove	3	-	-
137.3	Malden Center Station	Reading Depot at Lincoln Street	Primary pattern via Walkers Brook Drive/North Avenue	18	9	-

Ridership

Routes 136/137 serve a combined 1,946 riders on weekdays, 729 riders on Saturdays, and 288 riders on Sundays. This is moderately high compared to other MBTA routes.

Ridership by Stop

On Routes 136/137 weekday inbound trips (to Malden Center Station):

- A total of 67 riders board at Reading Depot, served by both routes and the Haverhill Commuter Rail Line.
- A total of 26 riders board and three alight at Reading Square (Woburn Street at Lowell Street).
- Ridership on the west side of Lake Quannapowitt (served by Route 137) is higher than on the east side (served by Route 136). The western approach serves 54 boardings and eight alightings at seven stops, compared to 45 boardings and five alightings at 23 stops on the eastern approach.
- Wakefield Square (Main Street at Water Street) is the third-most popular stop on both routes, generating 139 daily boardings and 13 daily alightings.
- Ridership is evenly distributed along the Main Street corridor between Wakefield Square and Franklin Street, in northern Melrose. This segment serves 231 daily boardings and 55 daily alightings along its 16 stops.
- In central Melrose, ridership increases on the Main Street corridor from Franklin Street to Wyoming Avenue, with 345 boardings and 60 alightings at nine stops.
 - The highest-activity stop on this segment is at Main Street at Wyoming Avenue, the route's fourth-highest ridership stop, with 76 boardings and 12 alightings. This stop is a short walk to the Wyoming Hill Commuter Rail Station, and is in an area with some of the highest densities on the routes.
- Ridership declines between Wyoming Avenue and Oak Grove Station, with just 31 daily boardings and 12 daily alightings at the five stops of this segment.
- Oak Grove Station has the highest ridership activity on Routes 136/137, with 19 boardings and 588 alightings. High ridership here reflects the transfer opportunities for the Orange Line and the Haverhill Commuter Rail Line.
- Ridership between Oak Grove Station and Malden Center Station is fairly low, with 57 daily boardings and 68 daily alightings at this segment's eight stops.
- Malden Center Station is the second-most popular stop, with 166 daily alightings. This stop attracts less than a third of the ridership at Oak Grove Station. As at Oak Grove Station, riders can transfer to the Orange Line or Haverhill Commuter Rail Line at Malden Center Station. The stop also offers transfer opportunities to numerous other local bus routes. However, most riders traveling to downtown Boston have a shorter bus trip by getting on/off at Oak Grove.

Outbound ridership generally mirrors inbound ridership on weekdays. Weekend ridership patterns are similar, but with lower volumes.

Figure 3 | Routes 136/137 Weekday Inbound Ridership by Stop Map



Ridership by Trip

Ridership on Routes 136/137 is clustered in peak periods and in peak directions (morning trips traveling inbound and afternoon trips traveling outbound). Both routes also have somewhat high ridership on their first weekday inbound trips, suggesting there may be a need to start service earlier. On weekday inbound trips (see Figure 4 and Figure 6):

- Route 136 has a relatively high volume of boardings just before the AM peak, with a maximum load of 38 riders on the 6:30 AM inbound trip. Similarly, on Route 137, the 6:15 AM and 6:45 AM trips typically have maximum passenger loads of 38 and 43. This suggests there may be a need to start service before 6:00 AM.
- Ridership declines from its peak during the early morning to maximum passenger loads of 25 to 40 riders per trip during the AM peak on Route 136. On Route 137, ridership declines after the 7:15 AM trip (maximum load of 39 riders) to 10 to 20 riders per trip through the end of the AM peak.
- On both routes, ridership is moderate through the midday, with maximum passenger loads of 15 to 30 riders per trip through 6:00 PM. Ridership on Route 136 spikes on the 2:25 PM inbound trip, with a maximum passenger load of 31. Demand on this trip reflects demand from Galvin Middle School in Wakefield and Melrose Middle/High School in Melrose.
- After 6:00 PM, ridership declines to maximum passenger loads of five to 15 riders per trip through the end of service.

On weekday outbound trips (see Figure 5 and Figure 7):

- Ridership is under 20 passengers per trip through 9:00 AM on both routes.
- On Route 136, ridership increases to 29 passengers per trip by 9:30 AM before falling to five riders per trip by 10:40 AM.
- On Route 137, ridership remains between 10 to 20 passengers per trip through 2:00 PM. On Route 136, trips carry 15 to 25 passengers per trip through 4:00 PM.
- On Route 136, ridership increases during the PM peak to between 35 and 41 riders per trip, with ridership highest on the 4:50 PM trip. Ridership remains high through the end of service, suggesting that service should be extended into the evening past 7:00 PM to satisfy unmet rider demand.
- On Route 137, ridership increases to 25 to 40 passengers per trip between 2:00 PM and 7:00 PM. Demand is unusually high on two outbound trips just before the PM peak (2:45 PM and 3:55 PM). However, crowding on average does not occur.
- After 7:00 PM, ridership on Route 137 falls to 18 passengers on the 9:20 PM trip.

Passenger loads are typically light on weekends, with maximum loads between 10 and 20 riders throughout the day (see Figure 8 through Figure 13). One notable exception is

Route 137's 10:35 AM Saturday inbound trip, which has a maximum load of 30 passengers (see Figure 10). Route 137's first Sunday outbound trip (8:00 AM) has the strongest demand of any Sunday trip, with a maximum load of 24 riders (Figure 12 and Figure 13).

Figure 4 | Route 136 Weekday Ridership by Trip: Inbound

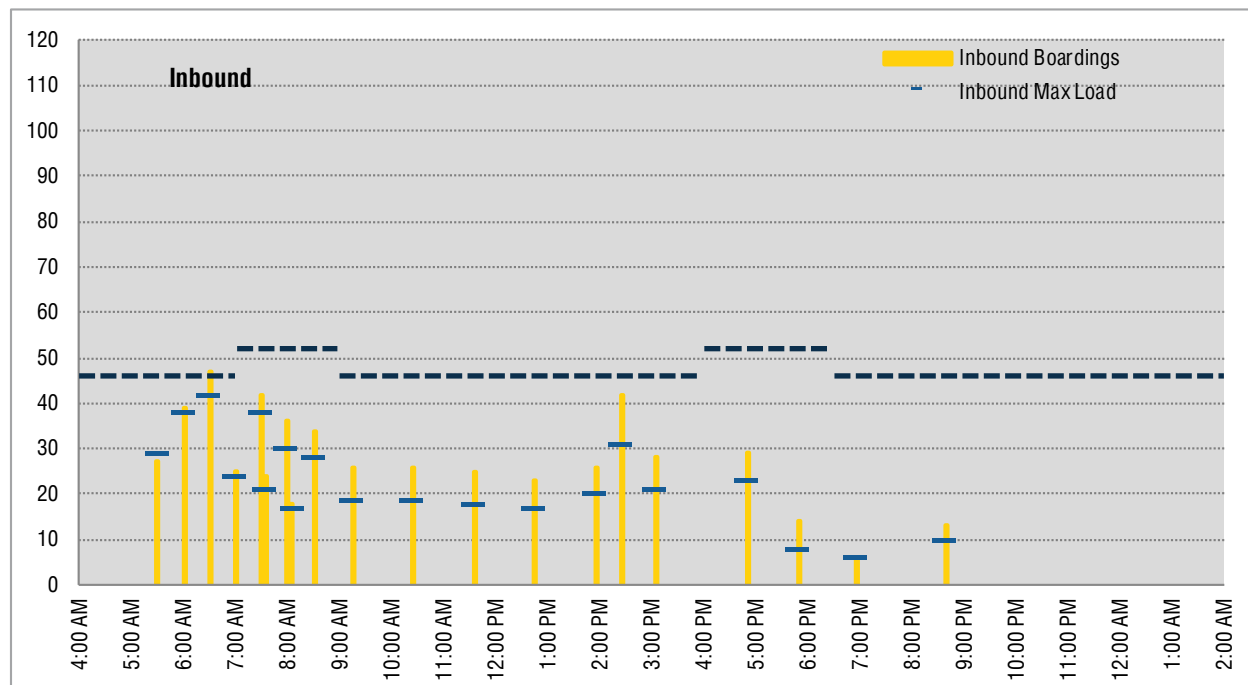


Figure 5 | Route 136 Weekday Ridership by Trip: Outbound

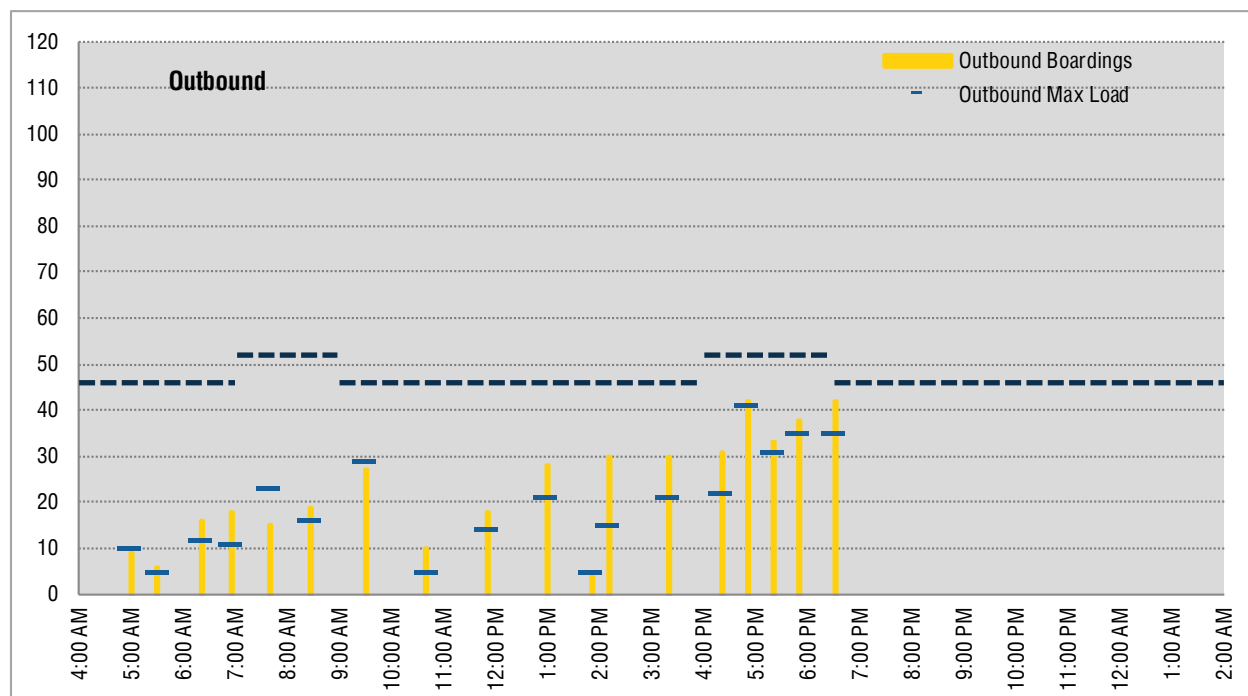


Figure 6 | Route 137 Weekday Ridership by Trip: Inbound

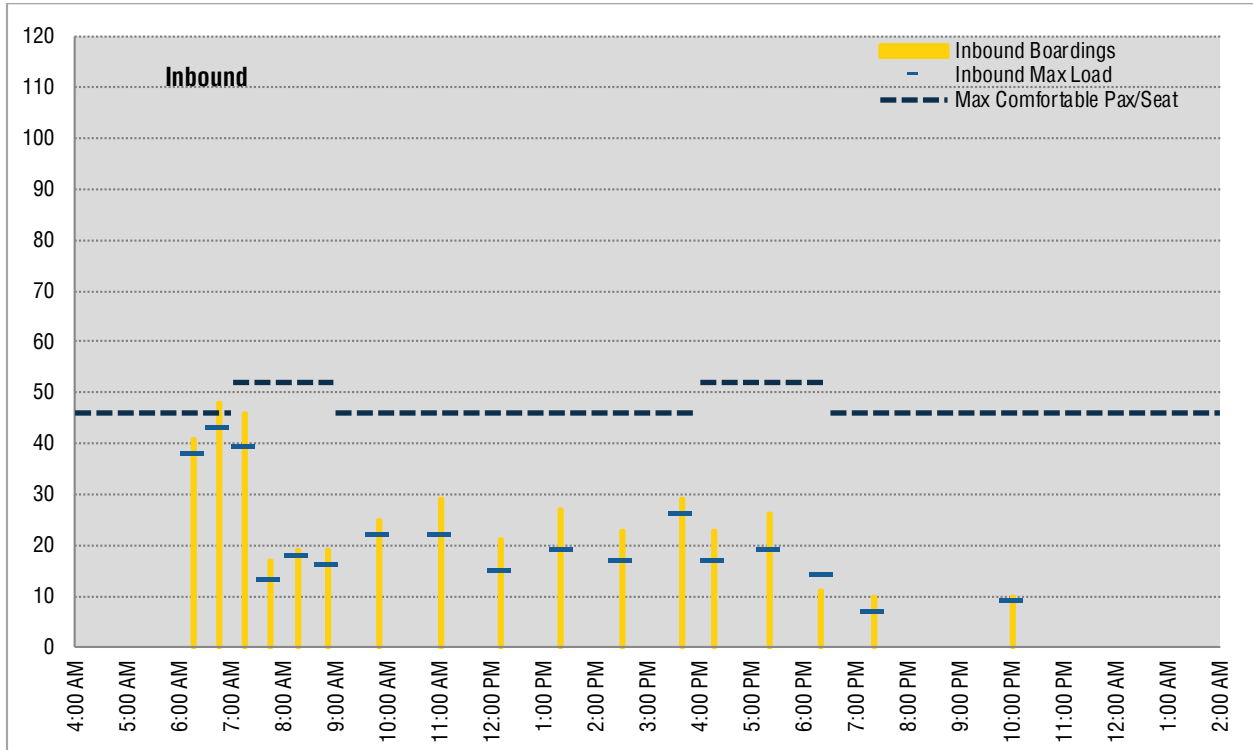


Figure 7 | Route 137 Weekday Ridership by Trip: Outbound

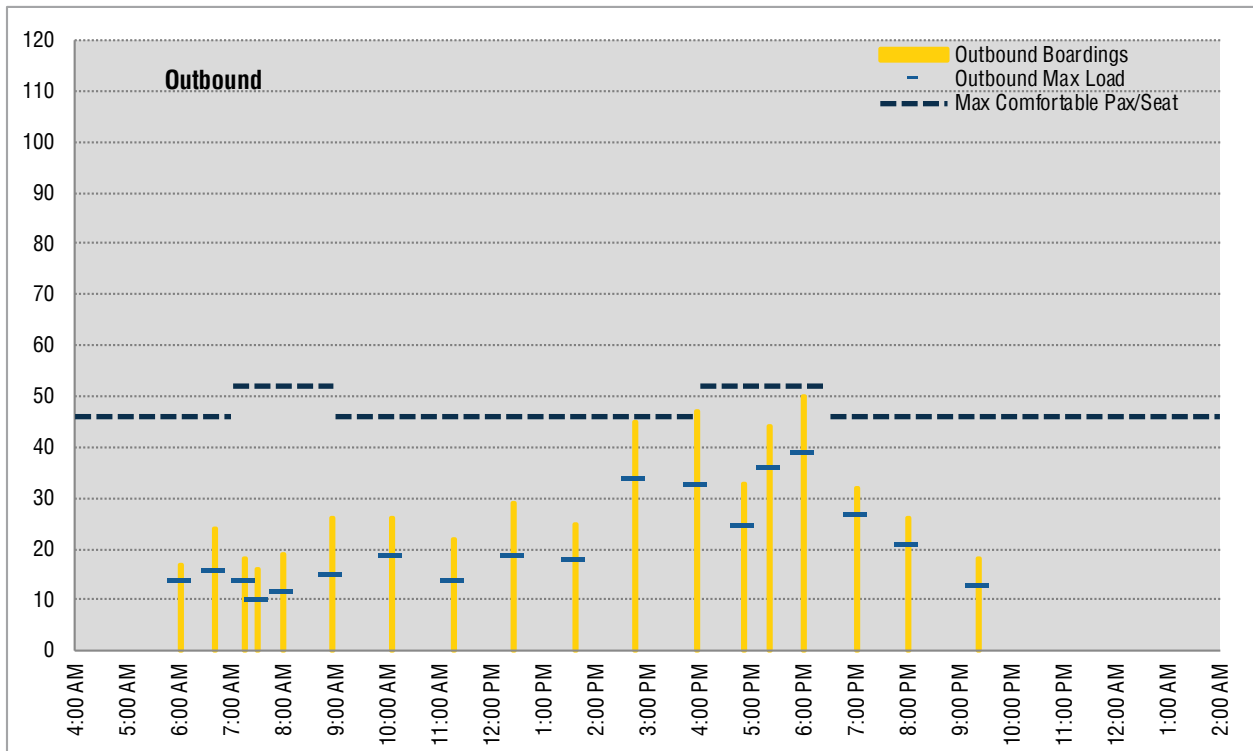


Figure 8 | Route 136 Saturday Ridership by Trip: Inbound

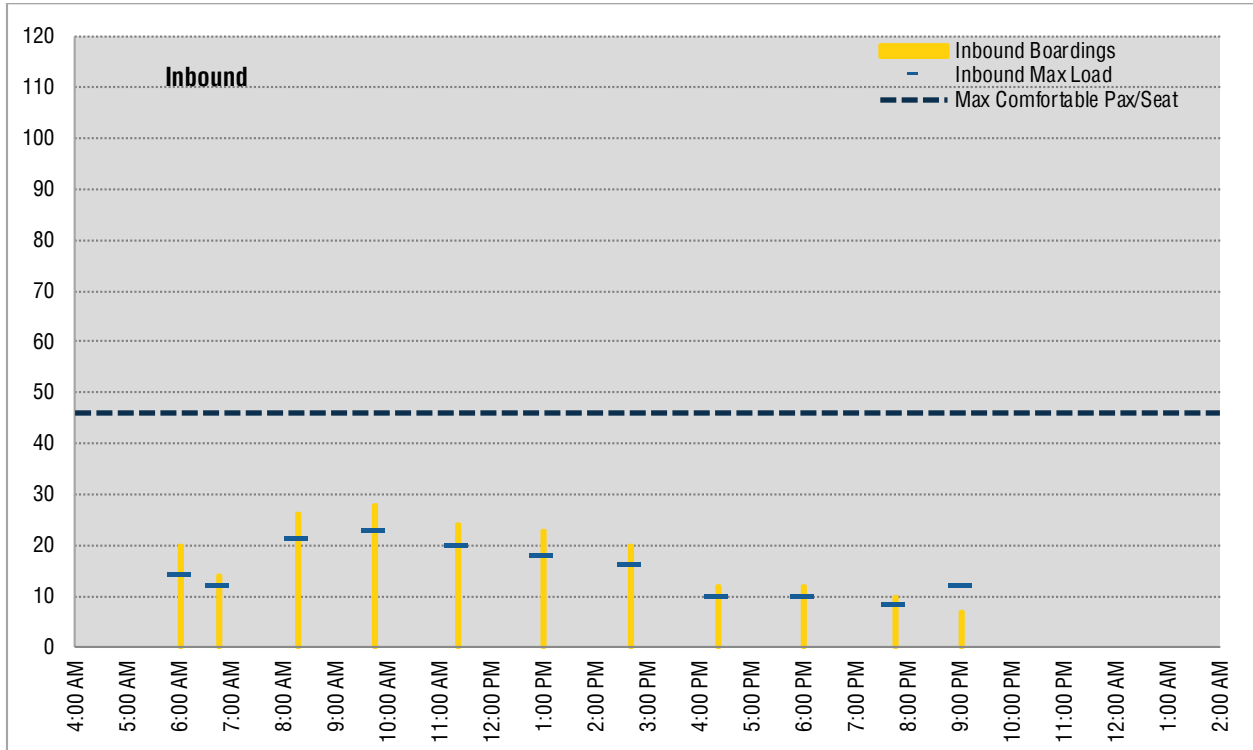


Figure 9 | Route 136 Saturday Ridership by Trip: Outbound

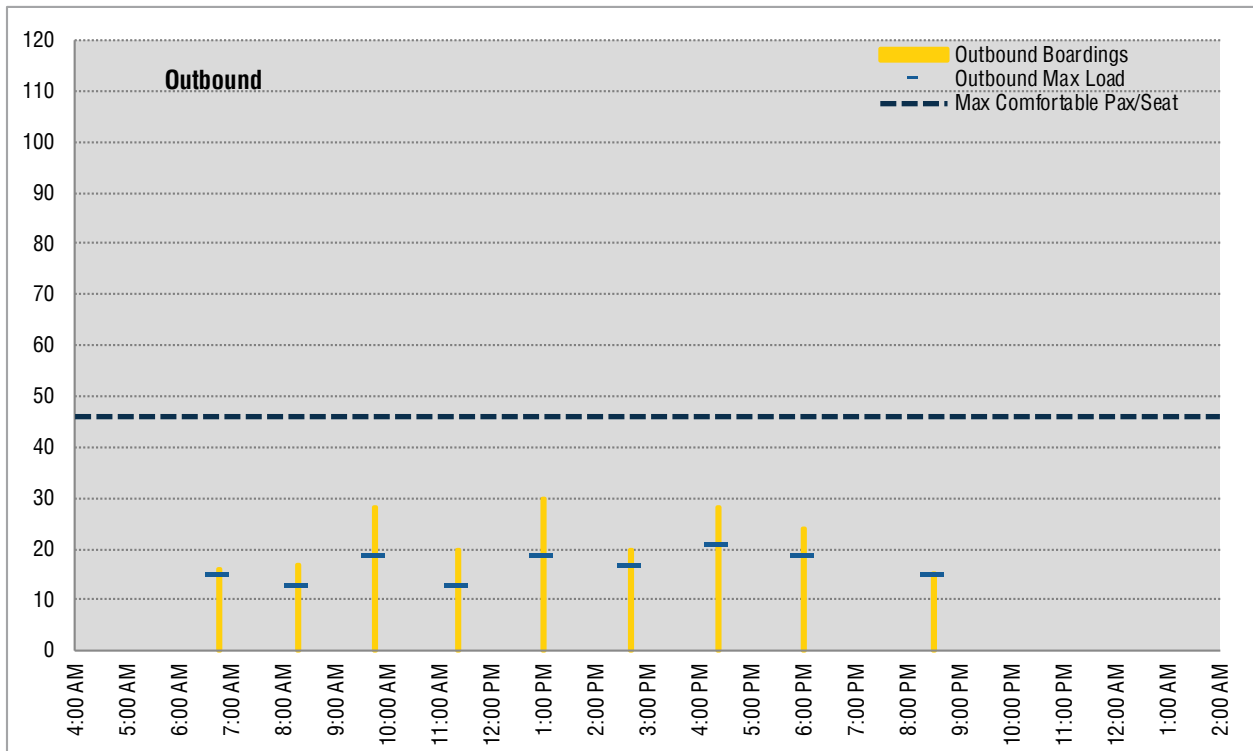


Figure 10 | Route 137 Saturday Ridership by Trip: Inbound

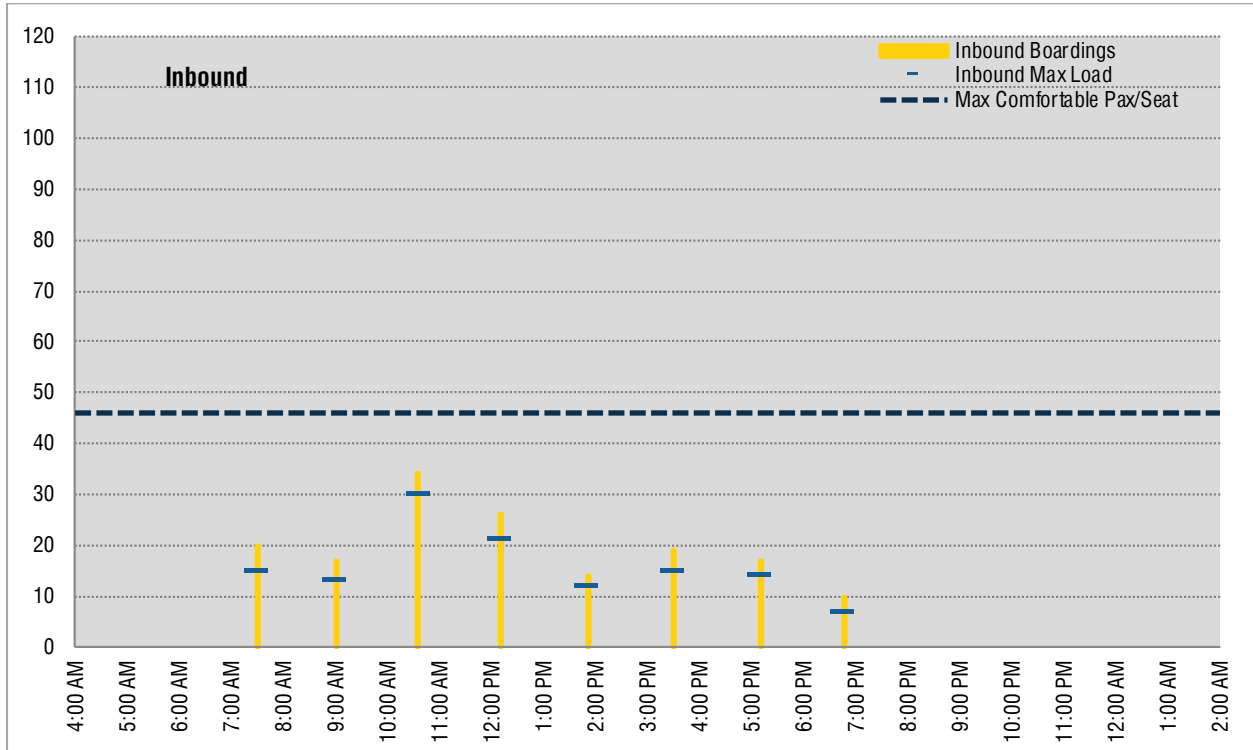


Figure 11 | Route 137 Saturday Ridership by Trip: Outbound

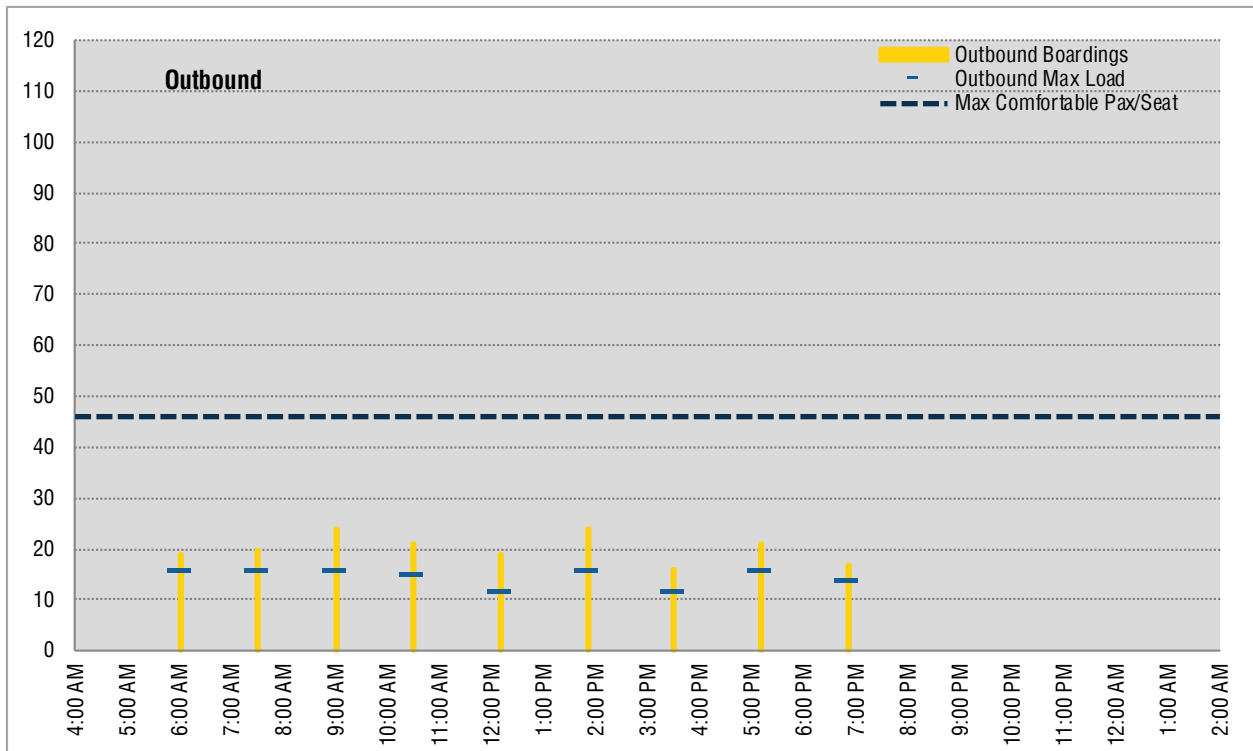


Figure 12 | Routes 136/137 Sunday Ridership by Trip: Inbound

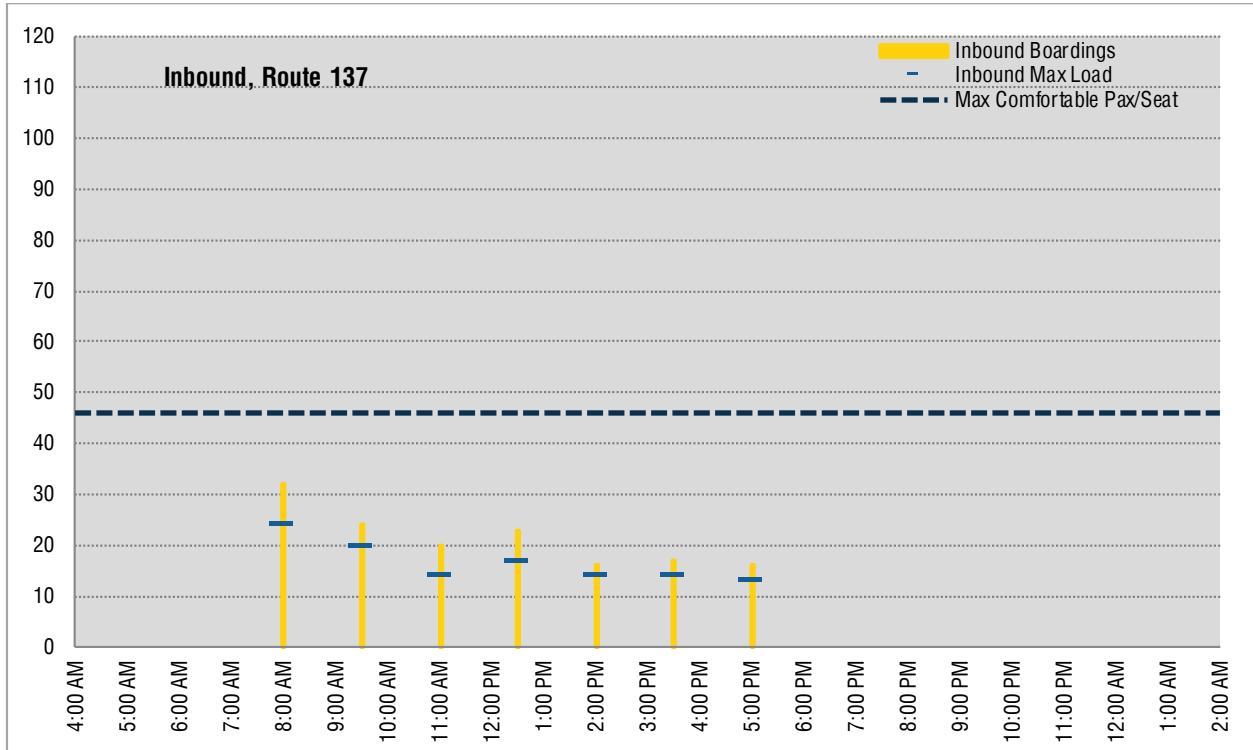
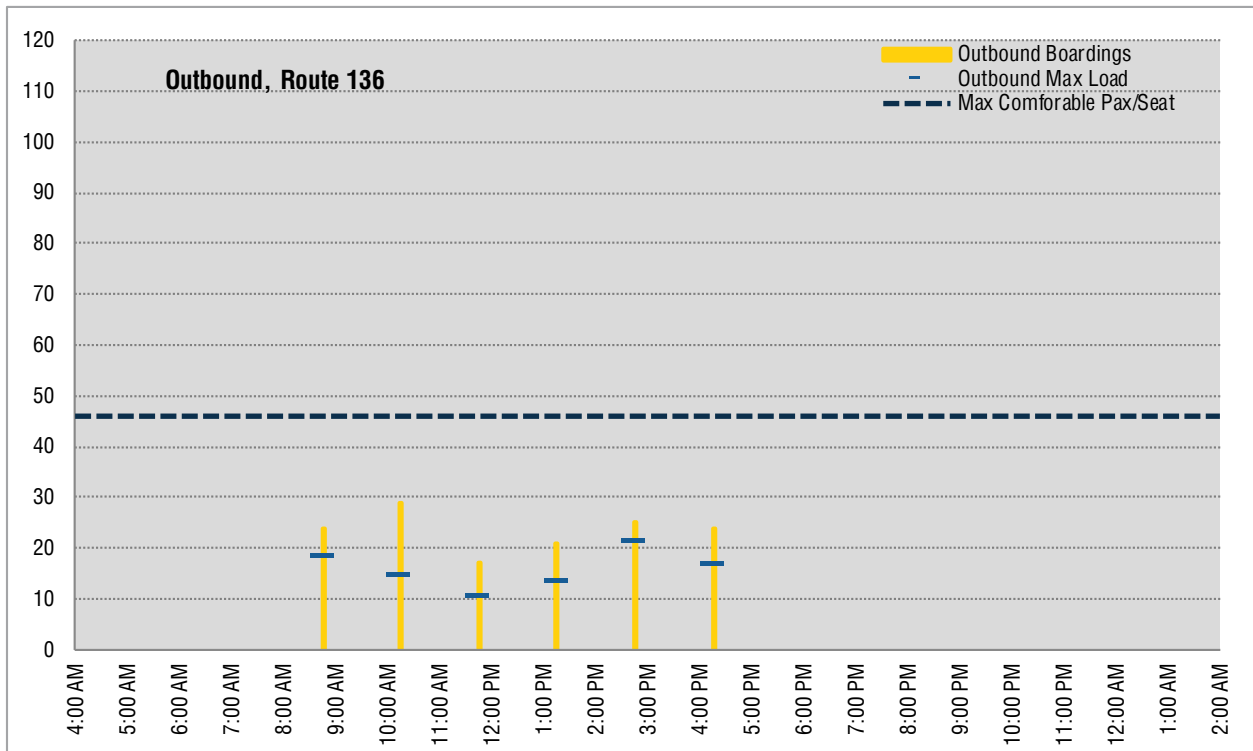


Figure 13 | Routes 136/137 Sunday Ridership by Trip: Outbound



Passenger Comfort

The MBTA expects that its passengers will 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 136, 96% of passenger minutes are in comfortable conditions, which meets the agency’s target (see Table 3).

Table 3 | Route 136 Passenger Time Spent Traveling in Comfortable Conditions

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

On Route 137, 97% of passenger minutes are in comfortable conditions, which is above the agency’s target (see Table 4).

Table 4 | Route 137 Passenger Time Spent Traveling in Comfortable Conditions

	WEEKDAYS	SATURDAYS	SUNDAYS
Minimum Standard	92%	92%	92%
Target	96%	96%	96%
Actual	97%	100%	100%

Reliability and Speed

Reliability

Route 136 has extremely poor overall reliability on all service days, with just 51% on-time performance on weekdays, 53% on Saturdays, and 46% on Sundays. All three scores are well below the MBTA target of 75% and its minimum standard of 70% (see Table 5). Route 137 performs worse than Route 136 in terms of on-time performance, averaging 41% on weekdays, 46% on Saturdays, and 43% on Sundays (see Table 6). Both routes have destination on-time performance below their origin/mid-route on-time performance, demonstrating the effect of traffic and slow speeds on reliability. As described in the next section, poor on-time performance is largely due to actual running times that exceed scheduled running times.

Table 5 | Reliability for Route 136

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
Monday-Friday	52%	42%	51%	0.1%
Saturday	55%	42%	53%	-
Sunday	48%	30%	46%	-

Table 6 | Reliability for Route 137

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
Monday-Friday	42%	29%	41%	0.1%
Saturday	46%	40%	46%	-
Sunday	44%	44%	43%	-

Running Times

On inbound trips, Route 136’s on-time performance is poorest during the AM Peak, when the route runs up to 15 minutes behind schedule (see Figure 14). The discrepancy between actual and scheduled travel times is smaller throughout the rest of the day, with the bus traveling about three to five minutes behind schedule during midday and PM peak periods. On outbound trips, Route 136 operates five to eight minutes behind schedule throughout the day (see Figure 15).

On inbound trips, Route 137 is better able to stay on schedule in the morning but starts to run behind schedule in the PM peak, when actual travel times exceed scheduled travel times by about 12 minutes (see Figure 16). On outbound trips, the route runs five to 12 minutes behind schedule throughout the day (see Figure 17).

Figure 14 | Scheduled & Median Travel Time by Trip: Inbound

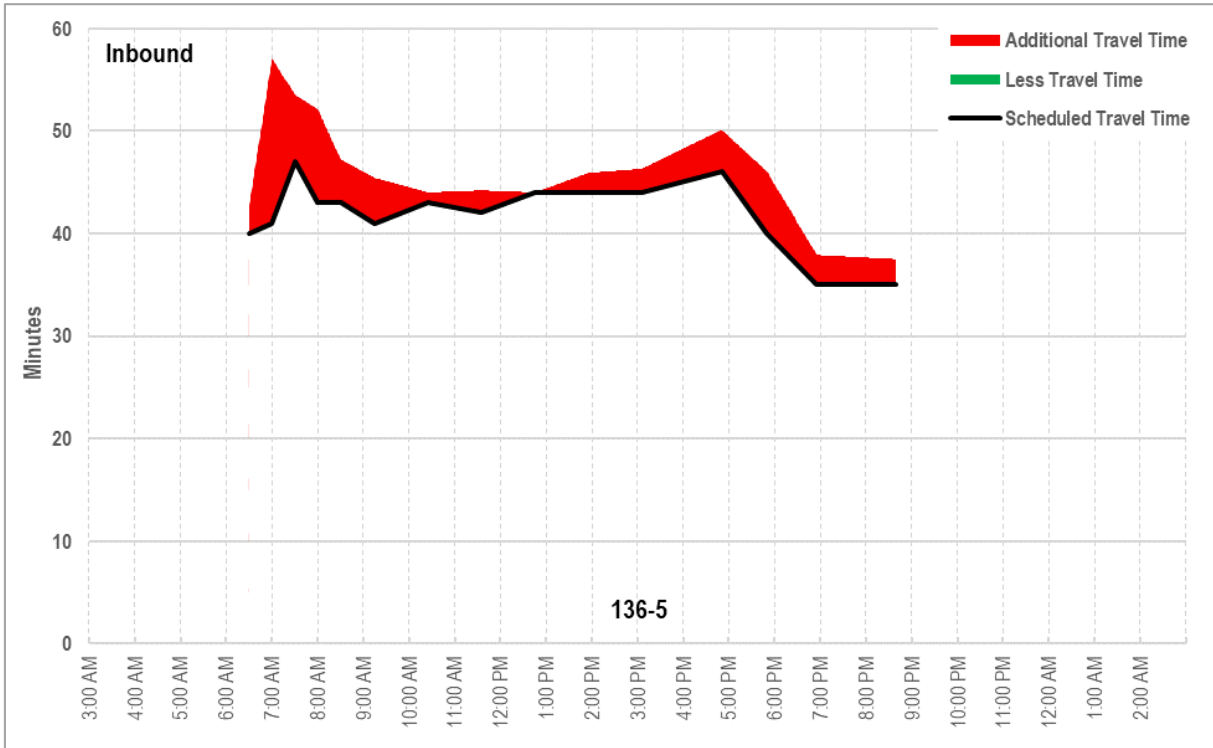


Figure 15 | Scheduled & Median Travel Time by Trip: Outbound

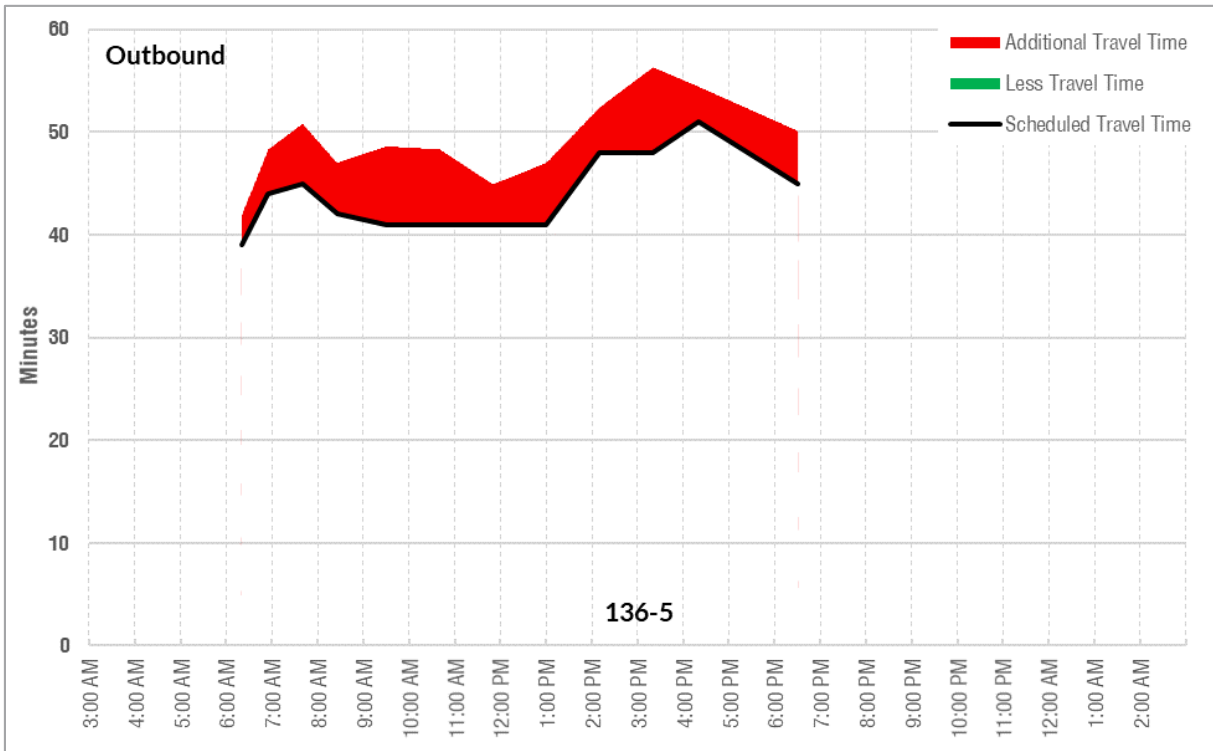


Figure 16 | Scheduled & Median Travel Time by Trip: Inbound

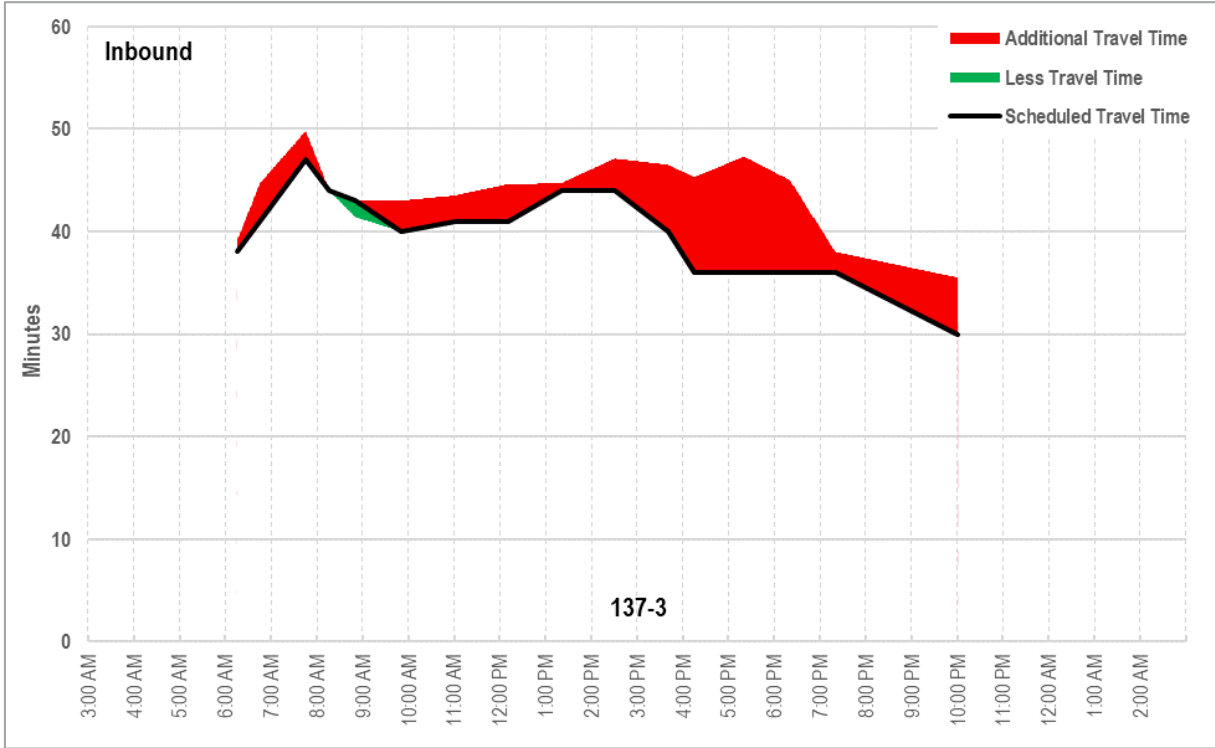
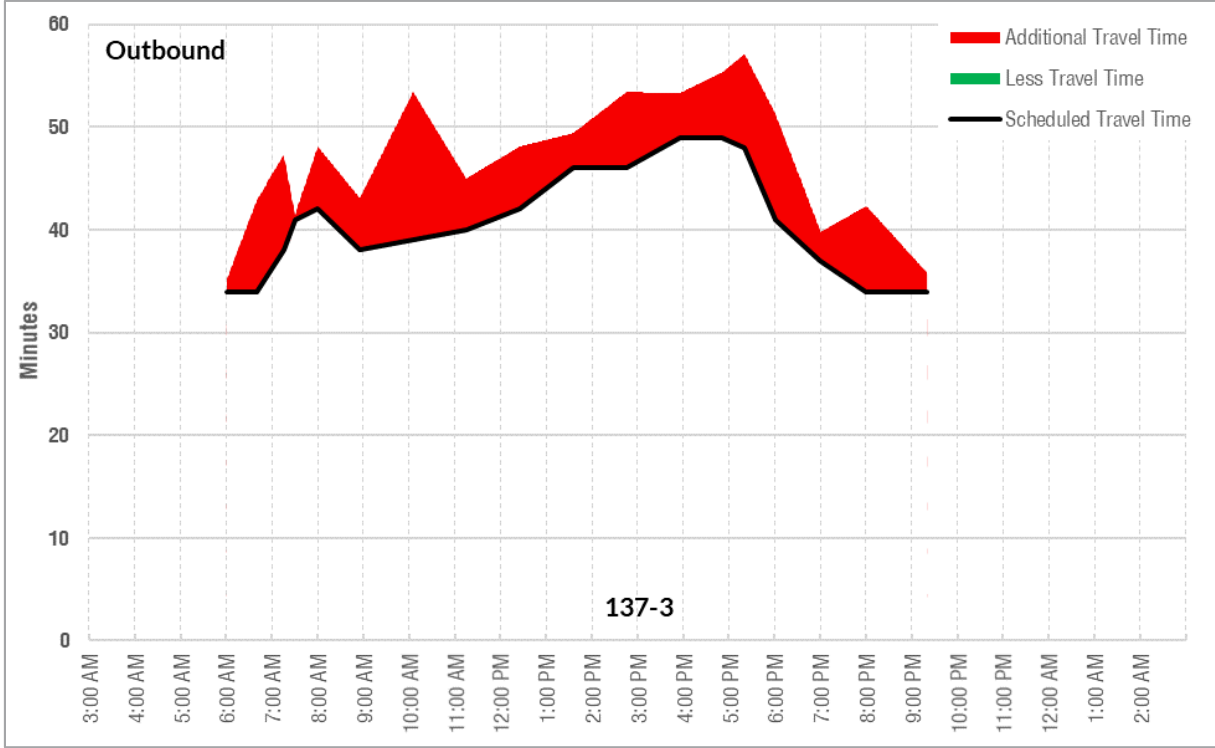


Figure 17 | Scheduled & Median Travel Time by Trip: Outbound



Stop Spacing

Routes 136/137 have an average of 5.5 stops per mile. This is roughly in line with the MBTA's standard of four to seven stops per mile in urban areas.

In some areas, however, stops are spaced much more closely than the route-wide average, with some stops spaced as close as 500 feet apart and others as close as 400 feet apart. Some of the most closely-spaced stop pairs on Routes 136/137 include:

- Main Street at Clifton Street / Main Street at Mountain Avenue: 450 feet, both directions
- Main Street at Rosemont Street / Main Street at Winter Street: 550 feet, inbound
- Main Street at Sylvan Street / Main Street at Banks Place: 550 feet, both directions
- Main Street at Pitman Avenue / Main Street opposite Marion Court: 500 feet, outbound
- Main Street at Franklin Street / Main Street at Nahant Street: 450 feet, outbound

Consolidating the most closely spaced stop pairs would bring Routes 136/137 in line with the MBTA's stop spacing standards and improve on-time performance by reducing stop-related dwell time.

Summary

Routes 136/137 provide connections to the MBTA's Orange Line and Haverhill Commuter Rail Line for the communities of Melrose, Wakefield, and Reading. Combined, the two routes operate relatively direct and frequent service during peak periods. Most riders use the services to connect with the rapid transit network and board /alight at Oak Gove Station. Other riders also use Routes 136/137 to travel along Main Street, with relatively high ridership evenly-distributed along the segment between Greenwood Plaza and Wyoming Avenue.

Routes 136/137 share a handful of challenges, primarily associated with insufficient service frequencies and low on-time performance. Service frequencies on Sundays and during the PM peak on weekdays do not meet the agency's service frequency standards. Both routes have very poor reliability and on-time performance for much of the day. Existing ridership patterns indicate there may be demand for earlier and later service along the corridor.