



ARLINGTON  
BRT

# Massachusetts Avenue Bus Priority Pilot

Evaluating Success in Arlington, MA:  
MBTA Data Results

February 2019

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# Goals & Data Collection



## Goals of Pilot

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1. Improve Traffic Flow
2. Reduce Travel Time
3. Increase Reliability



# Data Collection

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Data for analysis was collected from the MBTA across 3 time frames: pre-pilot, pilot, and post-pilot.

**Pre-pilot** data was collected from **September 9 to October 8**

**Pilot** data was collected from **October 9 to November 9**

**Post-pilot data\*** was collected from **November 10 to December 14**

*\*All of the bus-priority pilot treatments remained permanent after the pilot except the dedicated lane*

# Data Collection

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Route performance and BRT impacts were measured by assessing running time, on time performance, and travel time collected from AVL and APC data obtained from the MBTA.

## AVL – Automatic Vehicle Location

- Geographic locator data at various points along a transit route

## APC – Automated Passenger Count

- Provides data on dwell time and time between stops
- Passenger count data



# Full Route Observations

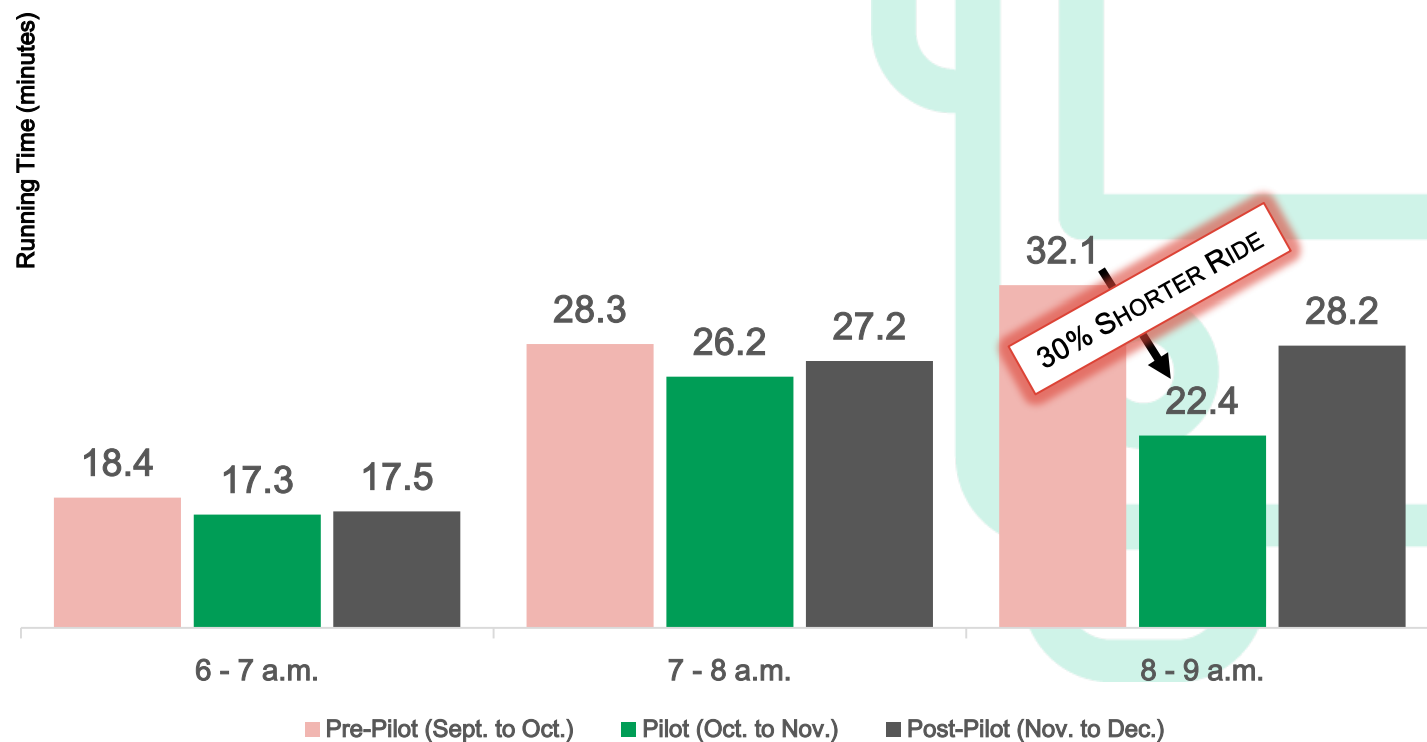


# Route 79 – Overall Route 50<sup>th</sup> Percentile (Median)

From 6 to 7 a.m., the overall route's running time decreased 6% (1 minute faster).

From 7 to 8 a.m., the overall route's running time decreased 7% (2 minutes faster).

From 8 and 9 a.m., the route operated almost 10 minutes faster during the pilot running time.



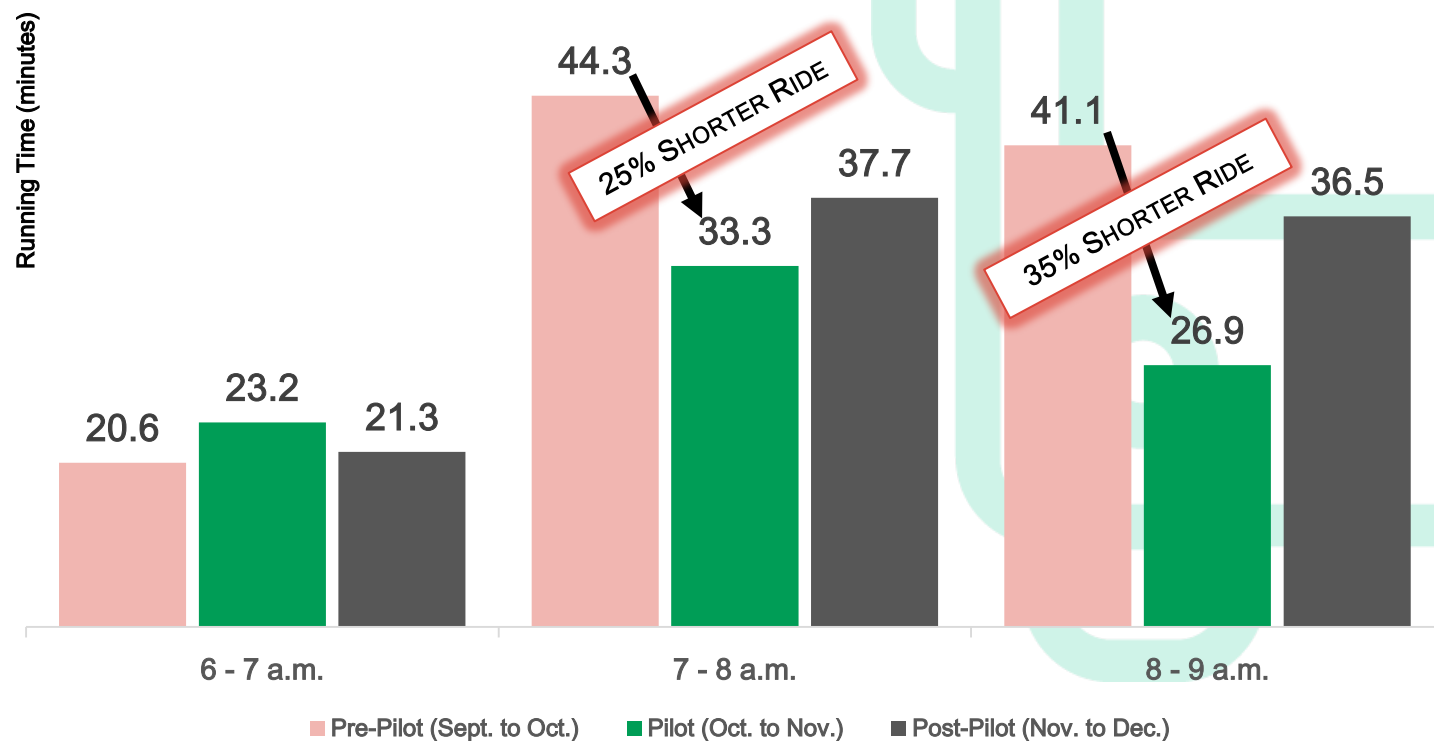


# Route 79 – Overall Route 90<sup>th</sup> Percentile

The 90<sup>th</sup> percentile suggests the system performance on a typical bad day or bus run.

Between 7 and 8 a.m., the BRT pilot decreased the 90<sup>th</sup> percentile by 25%, or 11 minutes.

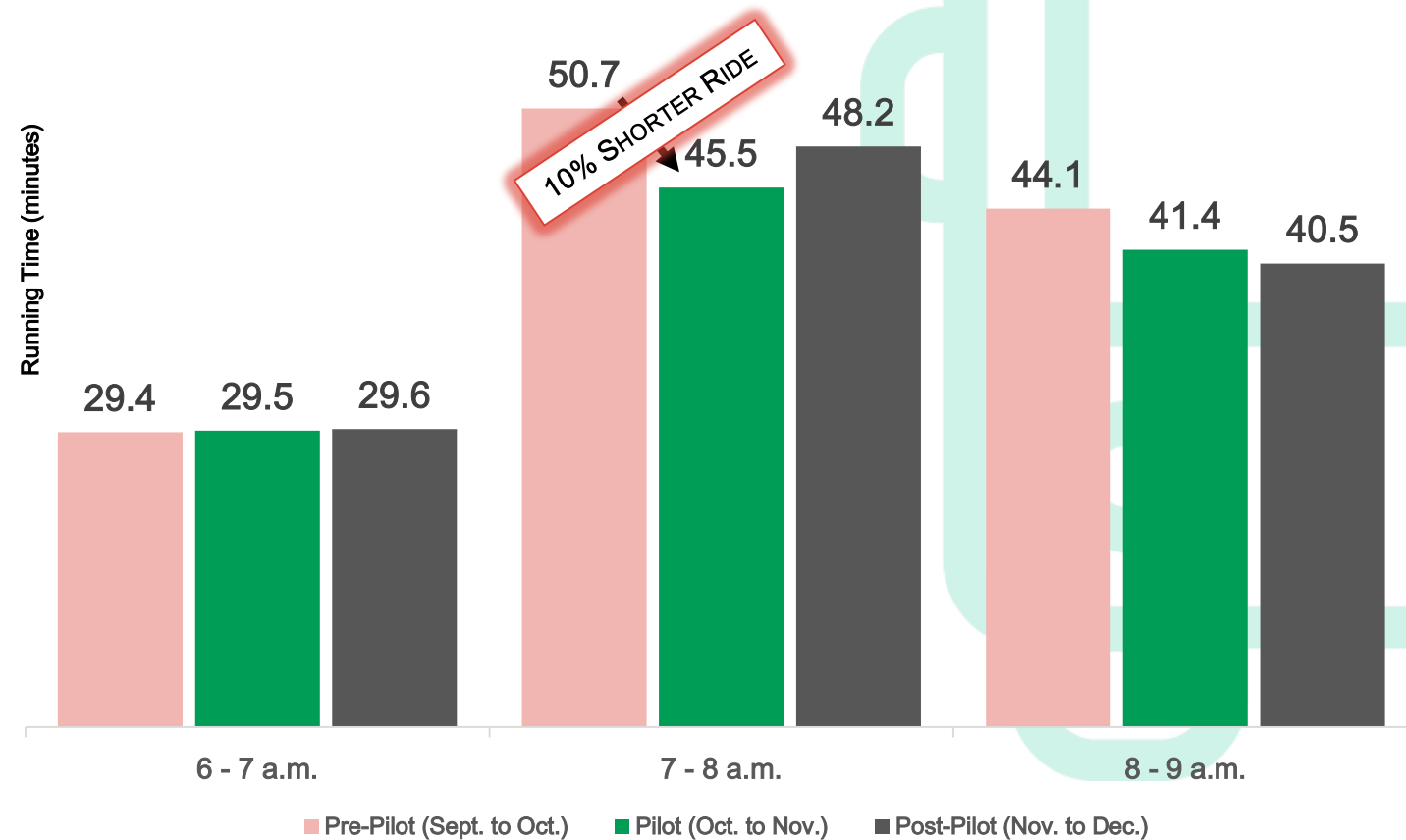
Between 8 and 9 a.m., operating times decreased 35% and **saved 14 minutes**.



# Route 77 – Overall Route 50<sup>th</sup> Percentile (Median)

Route 77 experienced a 10% decrease in overall route running time at 7 a.m., saving just over 5 minutes.

Between 8 and 9 a.m., the BRT pilot decreased the median running time by 3 minutes, or 6%.

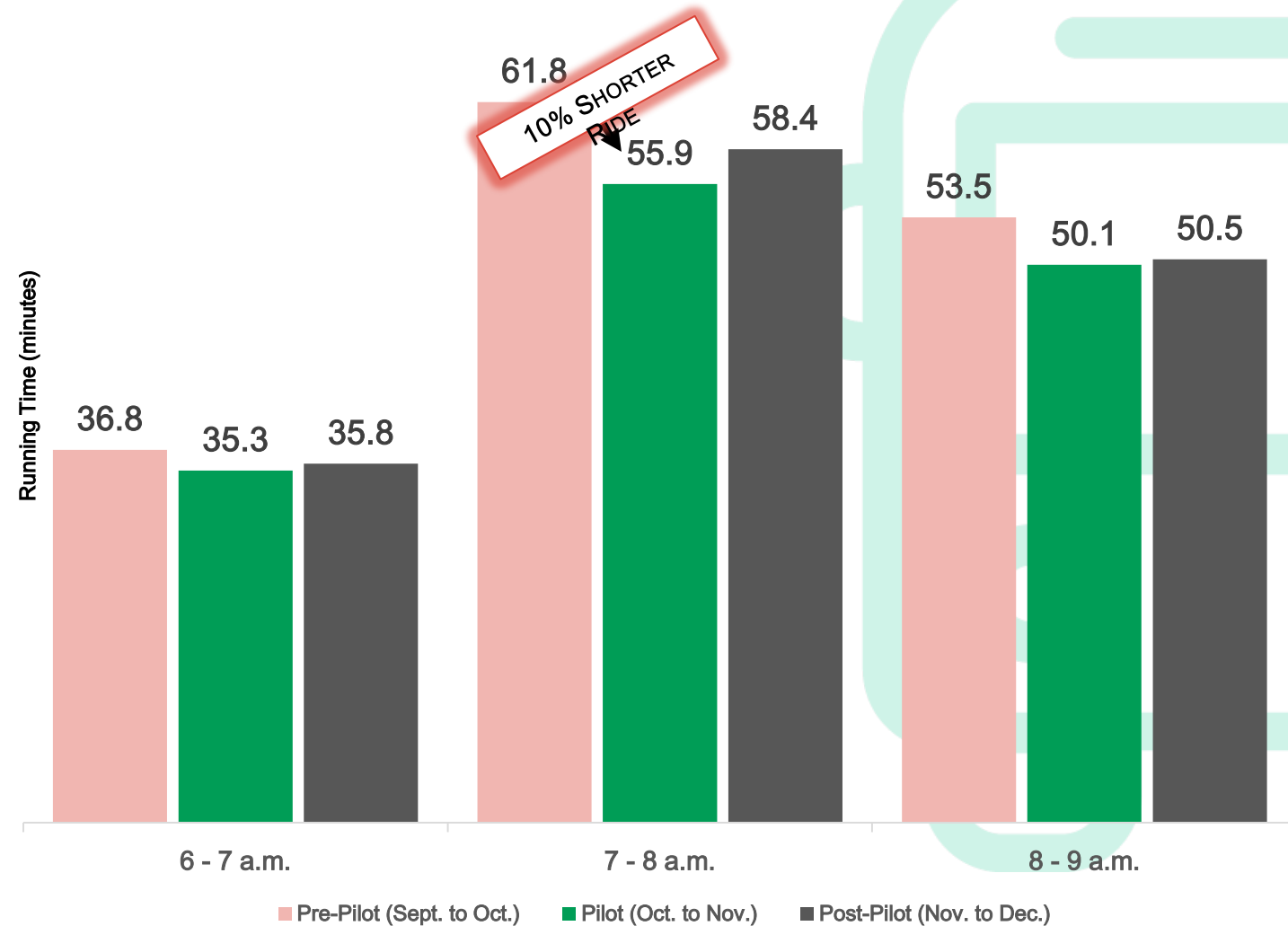


# Route 77 – Overall Route 90<sup>th</sup> Percentile

The BRT pilot reduced Route 77's 90<sup>th</sup> percentile by 1 minute, or 4% at 6 a.m.

Between 7 and 8 a.m., the 90<sup>th</sup> percentile dropped 10%, speeding up the route by 6 minutes.

At 8 a.m., the route ran 6% faster and saved 3 and a half minutes.

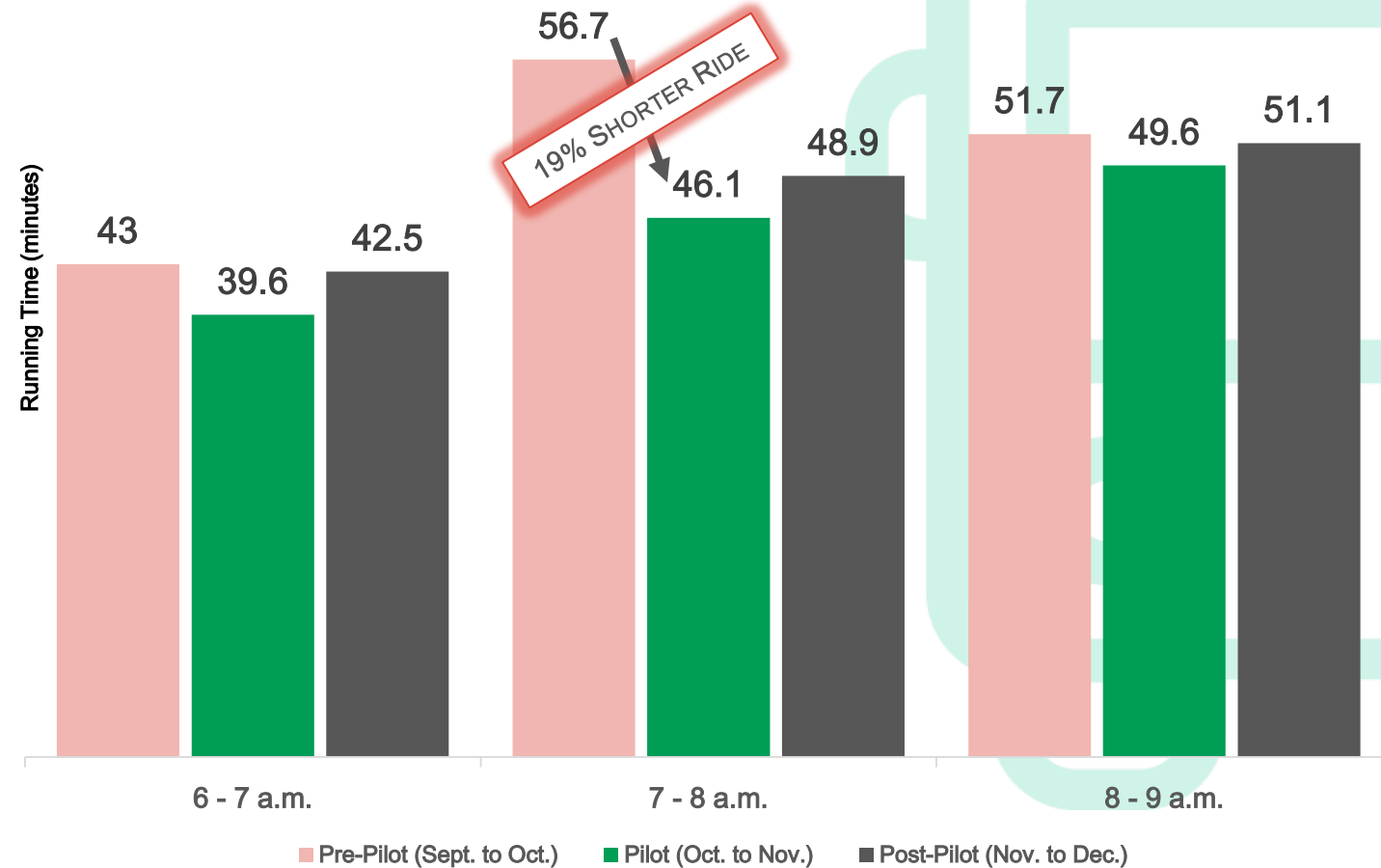


# Route 350 – Overall Route 50<sup>th</sup> Percentile (Median)

The median running time of Route 350 decreased 8% and saved 3 and a half minutes at 6 a.m.

A 19% shorter running time between 7 and 8 a.m. saved just over 10 minutes.

And between 8 and 9 a.m., riders experienced a 2 minute shorter ride (4% faster).



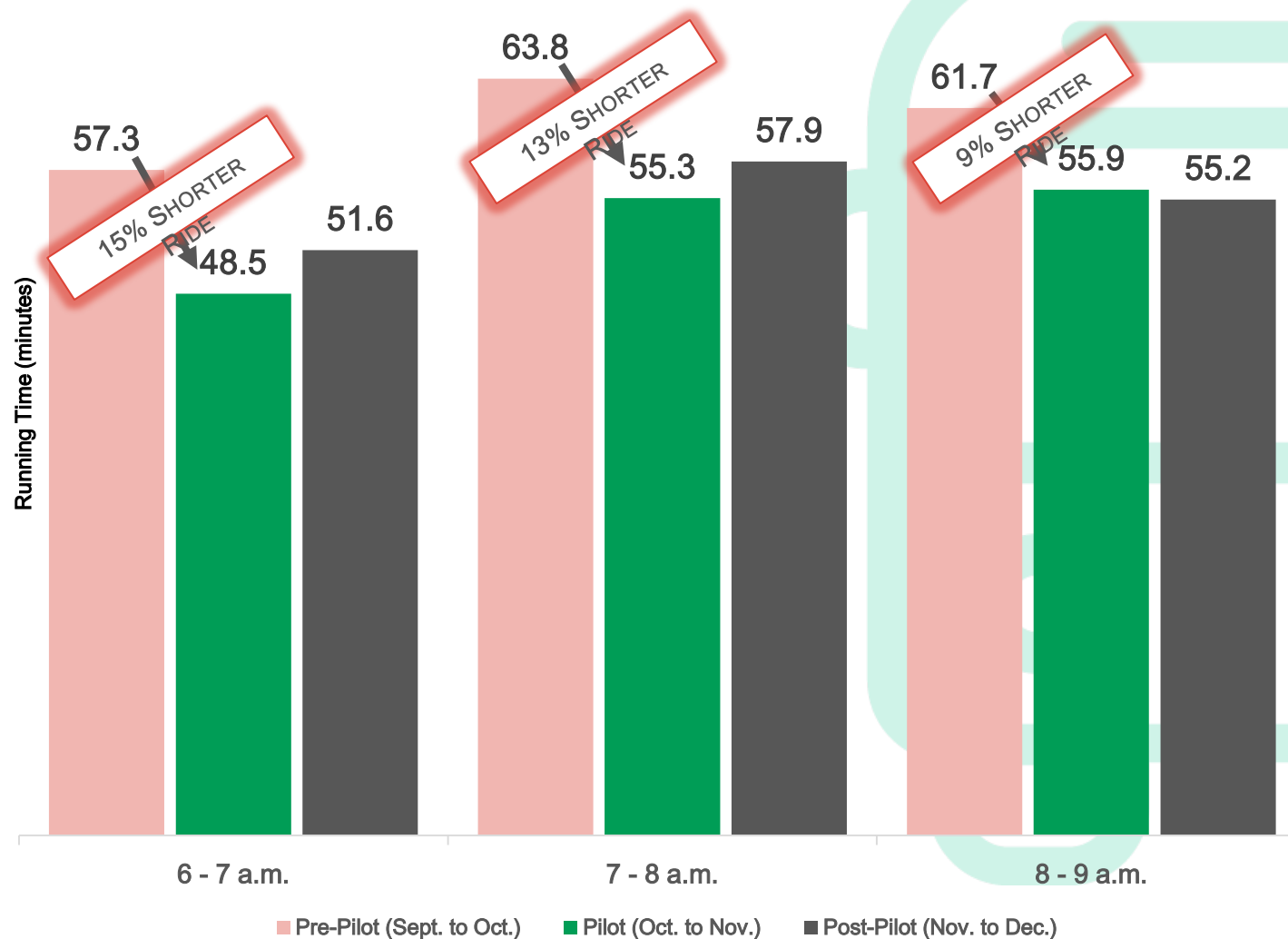
# Route 350 – Overall Route 90<sup>th</sup> Percentile

Route 350's 90<sup>th</sup> percentile operated significantly faster at all hours of the peak commute while the pilot was in place.

Between 6 and 7, the 90<sup>th</sup> percentile running time decreased 15%, saving almost 10 minutes.

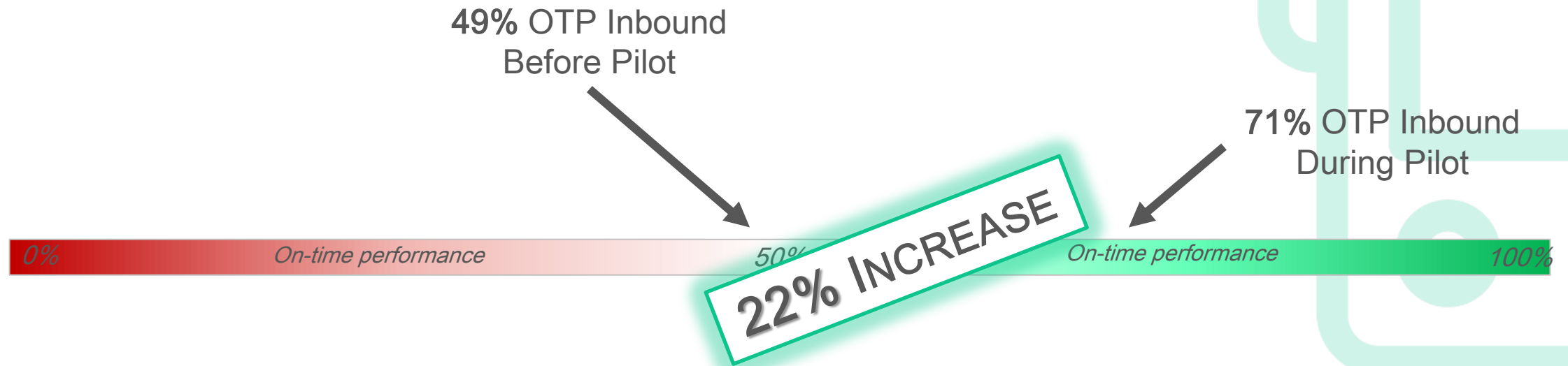
Between 7 and 8, the running time decreased 13% and saved 9 minutes.

The smallest improvement was seen between 8 and 9 am when the total running time improved by 9% and decreased 6 minutes.



# On-Time Performance—Route 79

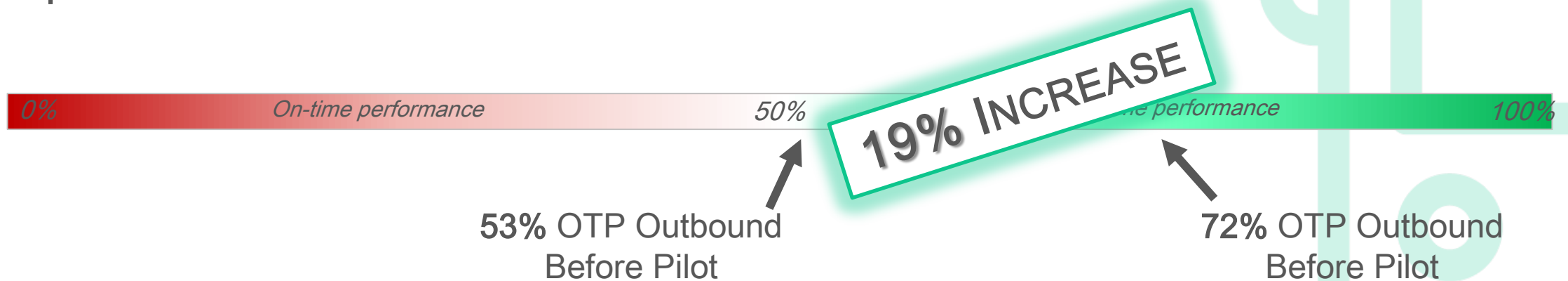
During the pilot and peak-morning rush hour, Route 79 operated on-schedule **22%** more of the time (inbound).



After the BRT pilot ended in November, OTP increased slightly to **72%**.

# On-Time Performance—Route 79

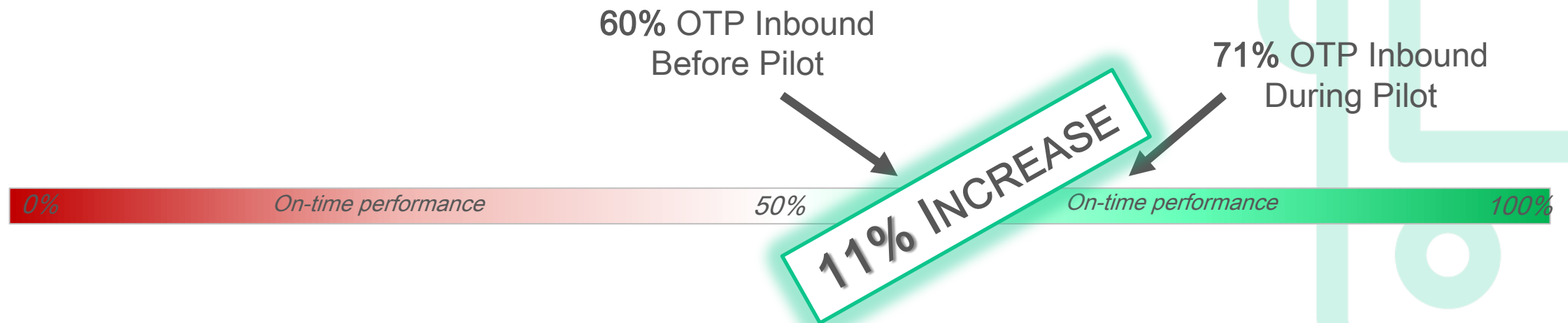
Outbound Route 79 operations performed on-time **19%** more frequently, on average, during the morning rush hour while the BRT pilot was in operation.



After the BRT pilot ended in November, OTP continued to increase to **75%**.

# On-Time Performance—Route 350

On-time performance improved 11% during the pilot, morning peak-hours (7 a.m. – 10 a.m.) for inbound service.

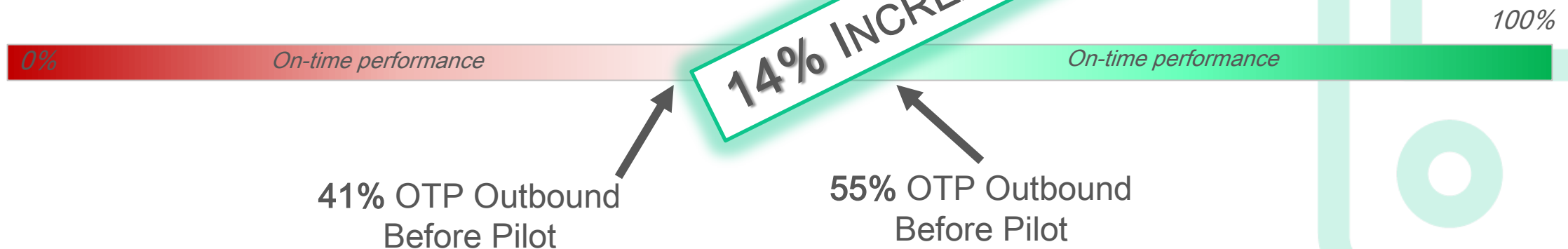


After the pilot concluded, on-time performance measured at 69%—higher than before the pilot, but slightly lower than during the implementation.



# On-Time Performance—Route 350

On-time performance improved during the pilot implementation **14%** for outbound Route 350 service during peak morning rush hour (7 a.m. – 10 a.m.) .



After the BRT pilot ended in November, OTP continued to increase to **60%**.

# Pilot Corridor Observations



# Routes 79 and 350—Pilot Area Travel Time: 50<sup>th</sup> Percentile (Median), 6 a.m. to 9 a.m. [towards Alewife]

*During peak morning commute hours, the pilot contributed to lowering median travel times by 28% at 7 a.m. and 41% at 8 a.m.*

6:00

Before Pilot: 6.4 minutes  
During Pilot: 6.5 minutes

7:00

Before Pilot: 13.4 minutes  
During Pilot: 9.7 minutes

28% faster  
during pilot

8:00

Before Pilot: 16.3 minutes  
During Pilot: 9.6 minutes

41% faster  
during pilot

# Routes 79 and 350—Pilot Area Travel Time: 90<sup>th</sup> Percentile, 6 a.m. to 9 a.m. [towards Alewife]

*During peak morning commute hours, the pilot contributed to lowering the worst case scenario travel times by 34% at 7 a.m. and 45% at 8 a.m.*

6:00

Before Pilot: 7.5 minutes  
During Pilot: 7.9 minutes

7:00

Before Pilot: 21.2 minutes  
During Pilot: 14 minutes

34% faster  
during pilot

8:00

Before Pilot: 23.9 minutes  
During Pilot: 13.2 minutes

45% faster  
during pilot

# Routes 77—Pilot Area Travel Time: 50<sup>th</sup> Percentile (Median), 6 a.m. to 9 a.m. [towards N. Cambridge]

*During peak morning commute hours, the pilot contributed to lowering median travel times by 41% at 7 a.m. and 53% at 8 a.m.*

6:00

Before Pilot: 3.2 minutes  
During Pilot: 3.2 minutes

No Change

7:00

Before Pilot: 8.3 minutes  
During Pilot: 4.9 minutes

41% faster  
during pilot

8:00

Before Pilot: 10.9 minutes  
During Pilot: 5.1 minutes

53% faster  
during pilot

# Routes 77—Pilot Area Travel Time: 90<sup>th</sup> Percentile, 6 a.m. to 9 a.m. [towards N. Cambridge]

*During peak morning commute hours, the pilot contributed to lowering the worst case scenario travel times by 47% at 7 a.m. and 57% at 8 a.m.*

6:00

Before Pilot: 4.1 minutes  
During Pilot: 4.1 minutes

No Change

7:00

Before Pilot: 15 minutes  
During Pilot: 8 minutes

47% faster  
during pilot

8:00

Before Pilot: 17.1 minutes  
During Pilot: 7.3 minutes

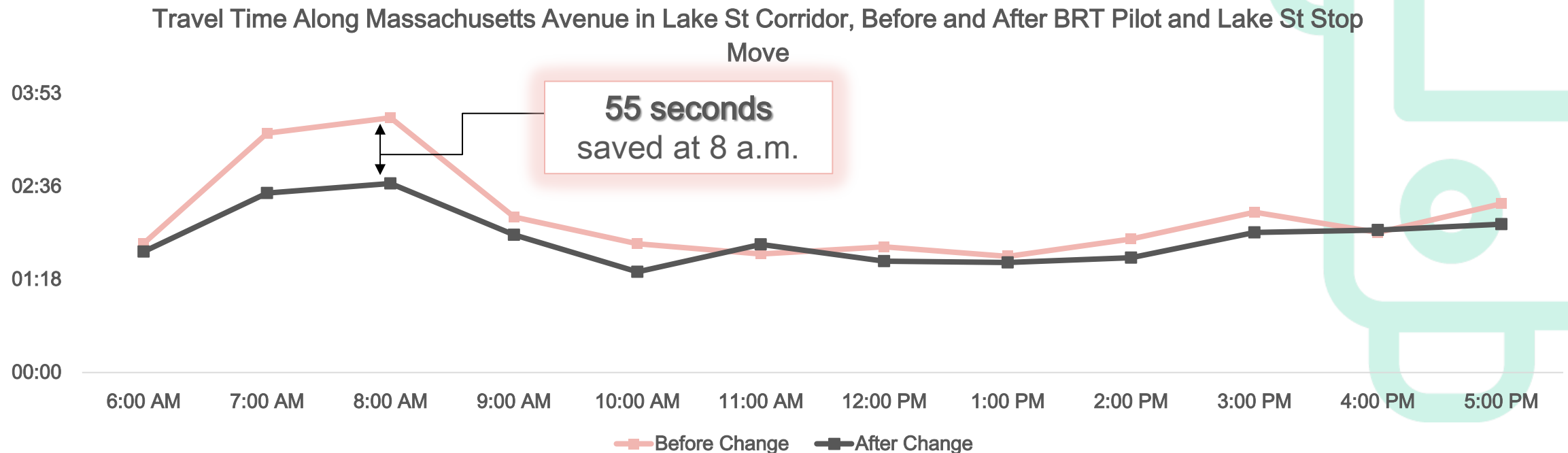
57% faster  
during pilot

# Lake Street Observations



# Run Time at Lake Street

In general, median travel times in the Lake St Corridor declined after the stop was moved to the curb after the traffic signal...especially during the peak morning commute hours. *(For this analysis, the travel time is the time it takes for the bus to travel from the stop before Lake Street to the stop after Lake Street.)*



Source: Massachusetts Bay Transportation Authority, APC Data—MBTA, September 9 – December 14, 2018



# Results & Reliability



# More Consistent, Faster Running Times



Buses did not just run faster, they consistently ran faster and reliability increased. Reliable service is attractive to more riders.

Prior to the pilot, differences between the 50<sup>th</sup> and 90<sup>th</sup> percentiles ranged as high as 16 minutes (Route 79 total running time, 7 am). These 16 minutes were **reduced to 7 minutes** during the pilot—a **56% decrease!**

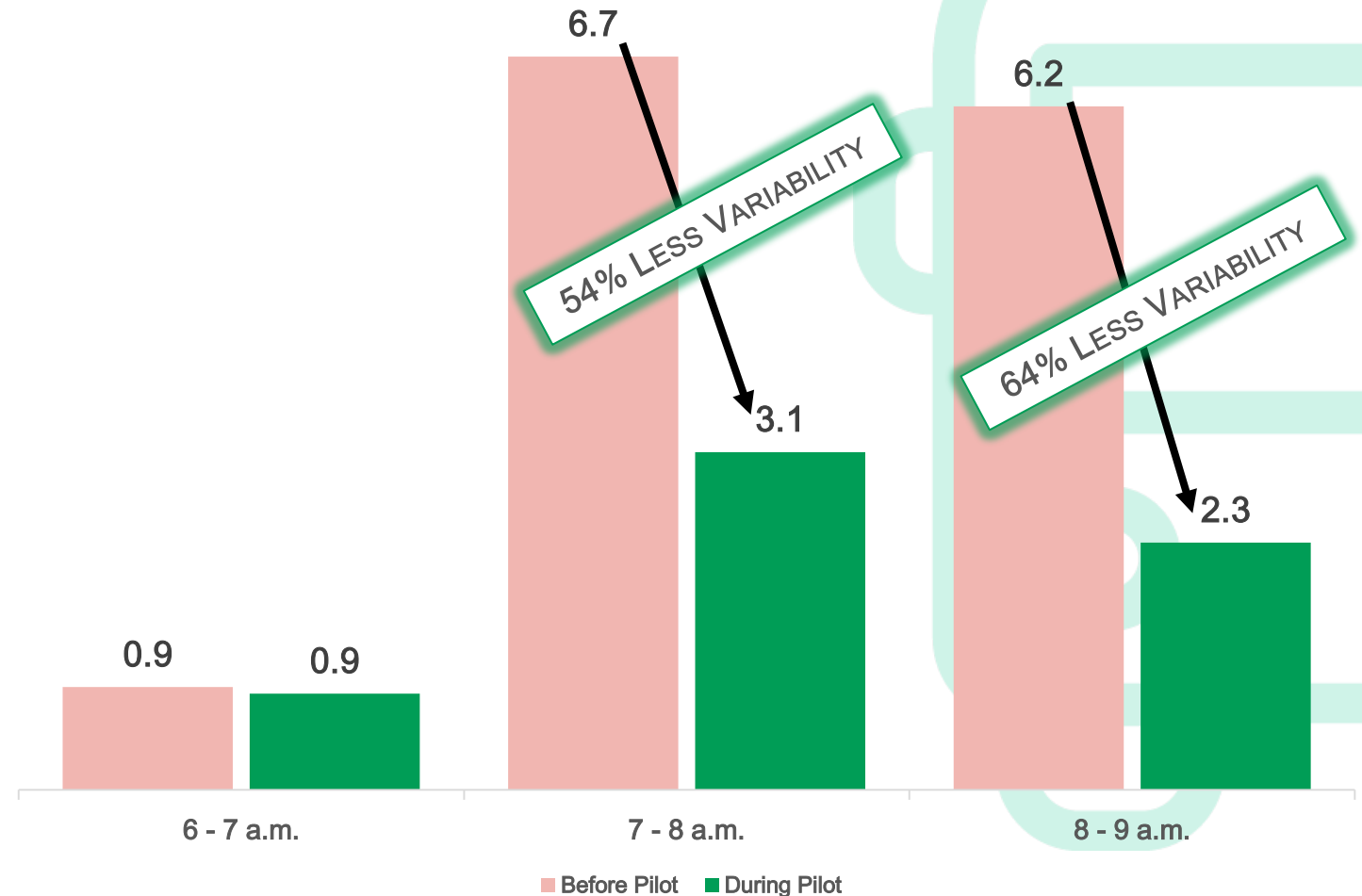
The variability during rush hour in the pilot area fell to **below 5 minutes**, for all routes (see figures on next slides).

# Route 77 – Difference Between Median and 90<sup>th</sup> Percentile

The difference between the median and the 90<sup>th</sup> percentile travel time in the pilot area decreased by more than half between 7 and 9 a.m.

Between 7 and 8 a.m., variability decreased 54% and reduced to only 3 minutes.

Between 8 and 9 a.m., variability decreased 64%—the difference during the pilot was only 2 minutes and 20 seconds!

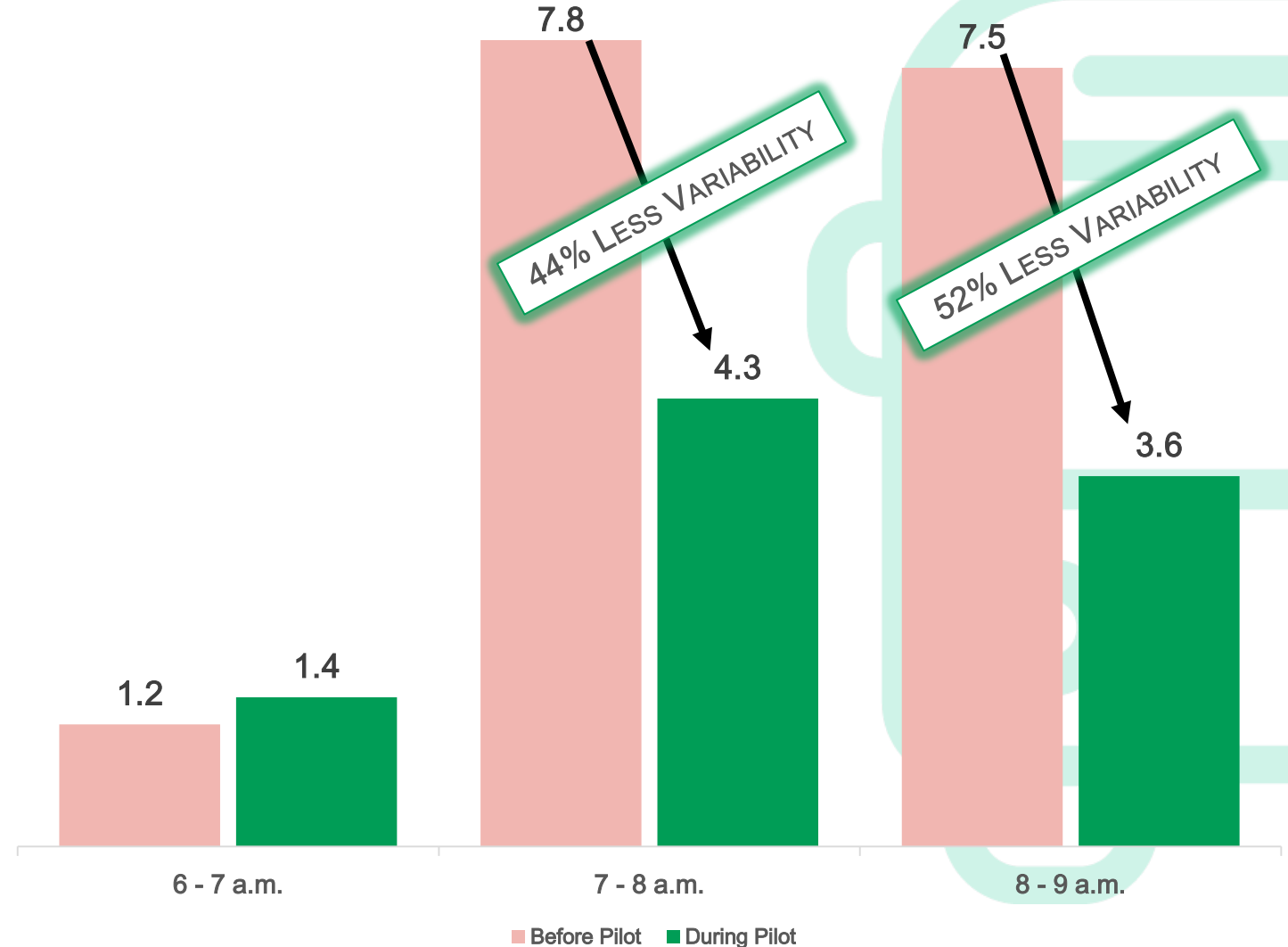


# Route 79/350 – Difference Between Median and 90<sup>th</sup> Percentile

Route 79 and 350 also experienced great decreases in its variability between 7 and 9 a.m.

Between 7 and 8 a.m., variability decreased 44% and reduced to only 4 minutes and 20 seconds.

Between 8 and 9 a.m., variability decreased 52%—the difference during the pilot was only 3 minutes and 3 seconds!



# Conclusions



# BRT Pilot in Arlington Saved Buses Time

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Both the overall route and the pilot corridor saw shorter overall running times while the BRT pilot was in effect—even at the 90<sup>th</sup> percentile. The biggest changes were seen between 7 and 9 a.m.

After the pilot ended, travel times increased, but on-time performance remained improved.

The move of the Lake St. bus stop led to shorter running times along the corridor between 260 Massachusetts Ave and Massachusetts Ave at Milton St.

***Buses consistently ran faster. When service is more reliable and meets the demand, it is a better experience for more riders.***