Better Bus Project

Making transit better together

Gateway East Bus Priority Lanes Pilot Evaluation

Quarter 2 Analysis

November 1, 2024 – January 31, 2025

Presentation to Brookline Transportation Board

March 19, 2025

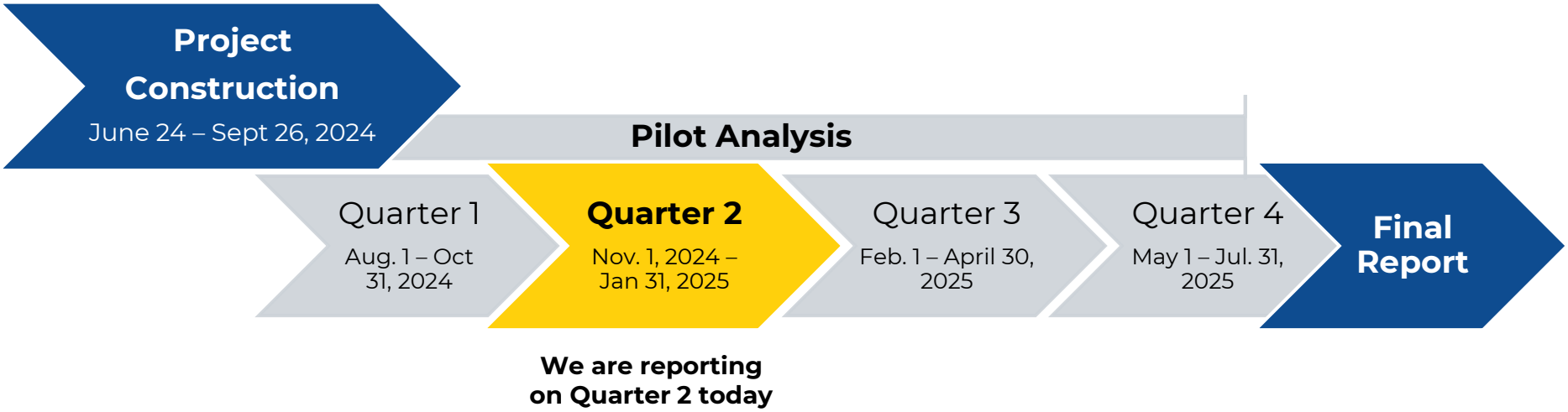
CEX

BROOKLINE DPWorks Department of Public Works

Agenda

- Project Context & Status
- Summary of Quarter 2 Analysis & Changes from Quarter 1
    - Bus Travel Times
    - Vehicle Volumes & Speeds
    - Vehicle Travel Times & Control Delay
    - Vehicle Queuing
- Key Findings
- Next Steps

Pilot Analysis Schedule



We are reporting on Quarter 2 today

Project Status & Operations Update

Transit Signal Priority

- Due to technical difficulties, the Transit Signal Priority elements of the adaptive traffic signaling system are not currently functioning, but are being troubleshooted by the vendor

Bus Lane Enforcement

- BPD is working on an enforcement program. MBTA provided educational flyer that explains regulations & how to turn across bus lanes

Route 9 Eastbound Approach to Bus Lane

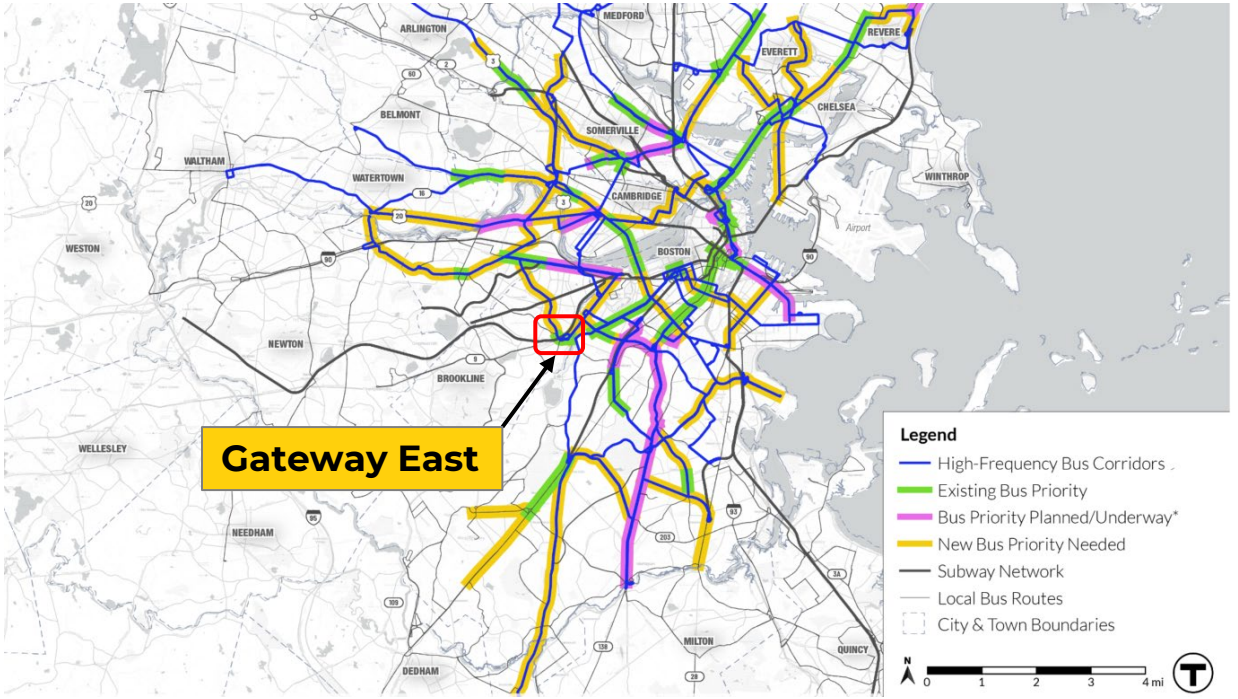
- Town reviewing opportunities for advanced warning signage to better organize queues

Other Factors Affecting Local Travel Patterns

- The **Pierce School closure** may explain reduced traffic on Cypress St and increased traffic on Walnut St, as the school was relocated to the old Lincoln School between Boylston St and Walnut St

MBTA's Bus Priority Vision Plan

- **Targets existing delay** and service along 26 corridors
- Improves service to **220,000 daily bus riders**
- Covers 10-15% of the bus network; **impacts 80% of all bus riders**
- 5-7+ years of implementation



Gateway East:
Route 66 Network Context

Route 66 is **the 2nd busiest line in the entire MBTA bus system**

Connects Red Line, Green Line, Orange Line, Silver Line, & several Frequent Bus Routes between Harvard & Nubian Stations

Gateway East project benefits nearly **15,000 daily riders** on Routes 60, 65, 66 – half of which travel through the project

Route 66 is a **Frequent Bus Route** (every 15 min or better)

Gateway East: Route 66 Network Context

Existing Projects

- Gateway East Bus Lanes
- Brighton Ave Bus Lanes
- Harvard Bus Tunnel Reroute
- TSP at Packard's Corner
- Huntington Ave Bus Lanes
- Tremont Street Queue Jump

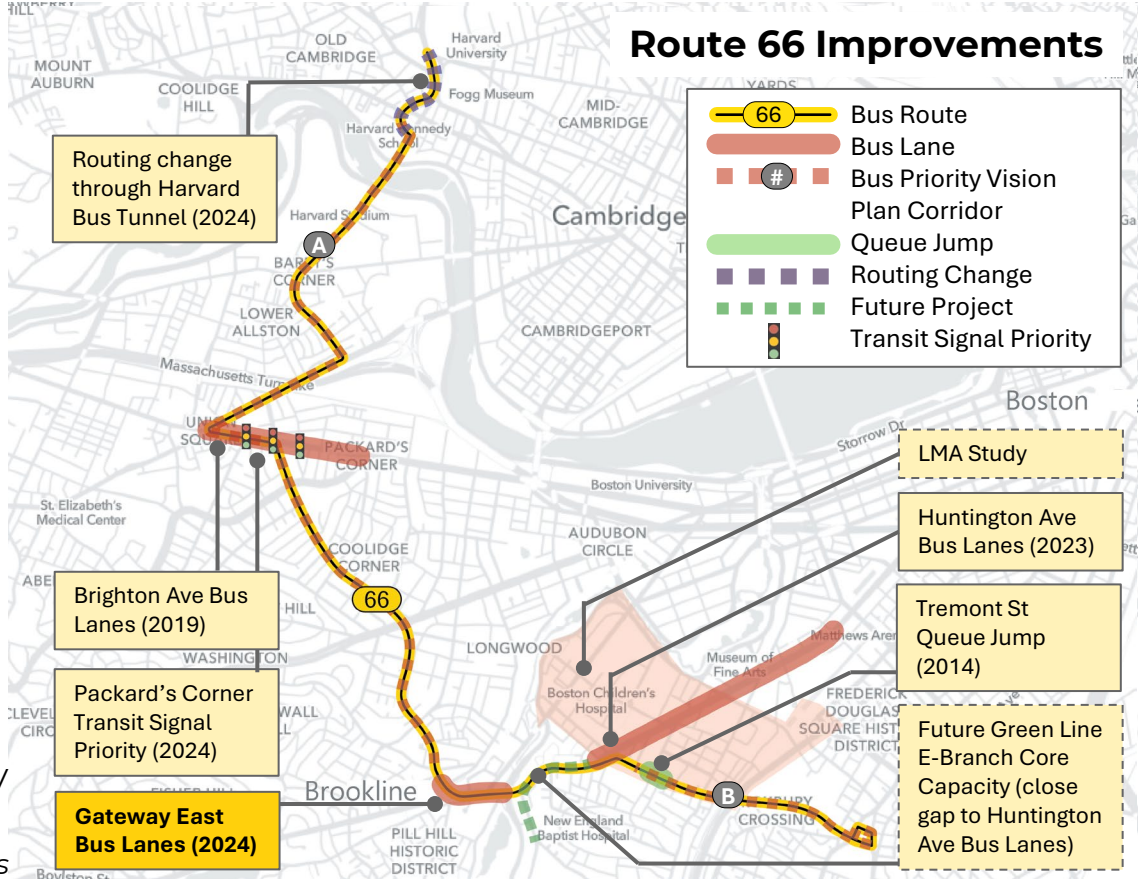
MBTA Bus Priority Vision Plan Corridors

- (A) Harvard Sq - Brookline Village
- (B) Nubian Sq - LMA (via Malcom X Blvd)

In Development

- Green Line E-Branch Core Capacity: Transit Lanes on Huntington Ave
- Longwood Medical Area Study

Future approach will address delays along the 66 by targeting key junctions



Quarter 2 Findings

Quarter 2 Summary

Gateway East, after
Photo Credit: Toole Design

Bus lanes have provided consistent travel times for bus riders

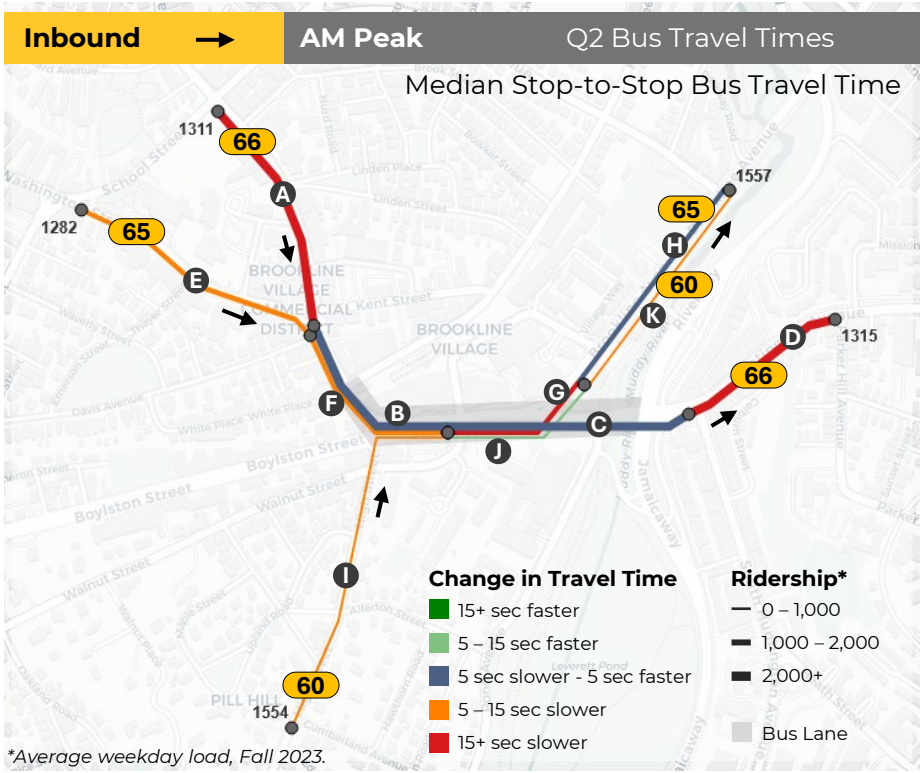
Overall, bus travel times in Quarter 2 are:

- Generally consistent from Quarter 1
- Slower outside of the bus lanes, indicating delays related to moving back into mixed traffic

During AM inbound trips, the bus lanes are **protecting bus service from getting worse**

Changes of note from Quarter 1:

- Segment A continues its trajectory and needs further investigation
- Performance worsened on segments I, F, and E - monitor through next quarter



**See Appendix B for full details of Bus Service Analysis*

Travel time has improved for bus riders

Overall, bus travel times in Quarter 2 are:

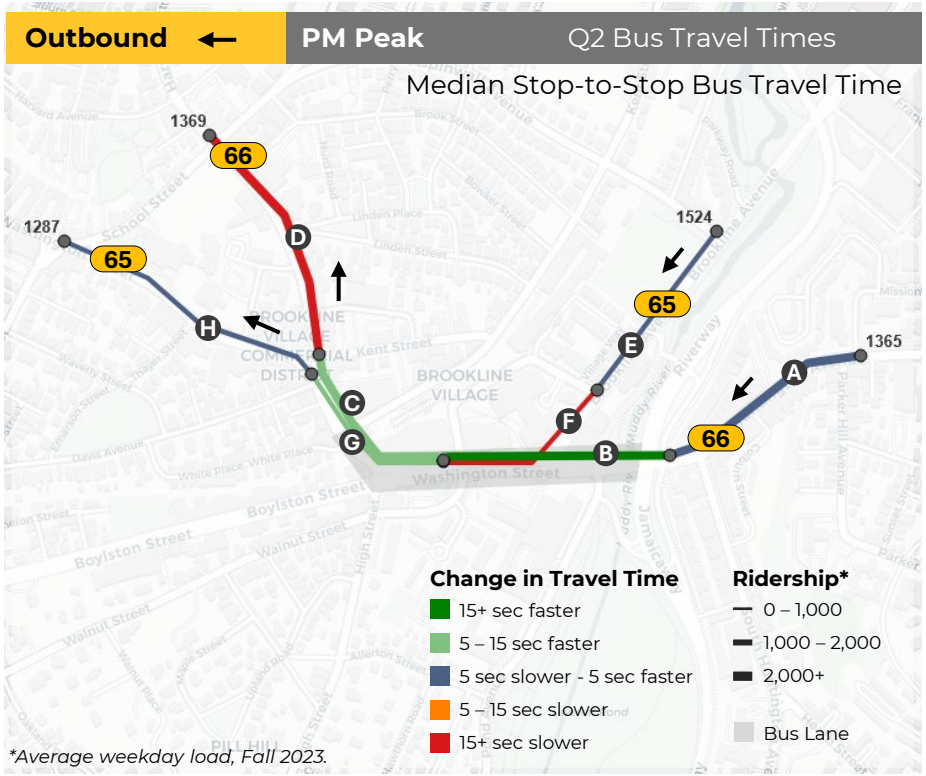
- Generally consistent from Quarter 1
- Consistent or faster in the bus lanes
- Slower outside of the bus lanes, indicating delays related to moving back into mixed traffic

During PM outbound trips, the bus lanes are performing well & **achieving significant time savings.**

Changes of note from Quarter 1:

- Segment F continues its trajectory and needs further investigation
- Performance worsened on segment D - monitor through next quarter

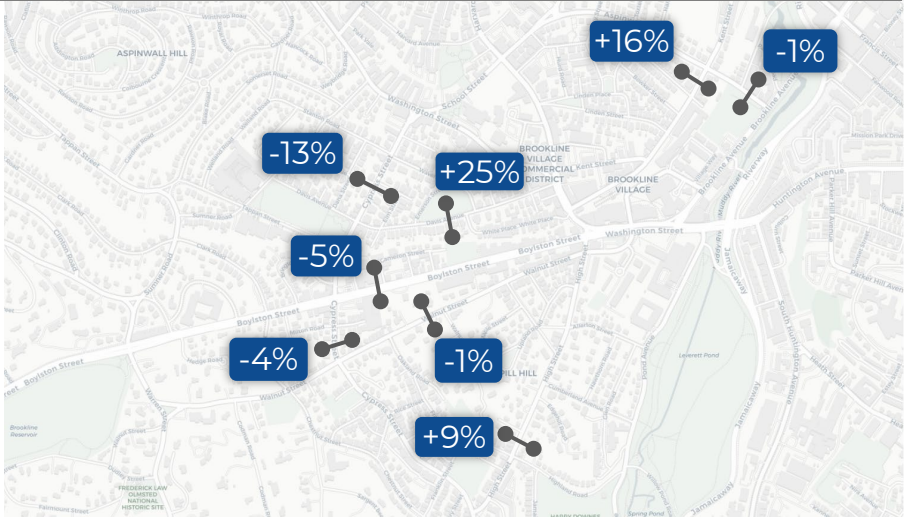
**See Appendix B for full details of Bus Service Analysis*



Vehicle volumes & speeds have remained similar to Quarter 1

- **Volumes decreased in and around study area by approximately 3%** on average, relative to baseline
- Volumes on Route 9 **decreased slightly** with **moderate increase** of volume on side streets
- Some fluctuation with speeds, but in general **most observed speeds decreased**
- Could be options for **traffic calming** in the future if trends don't correct
- Nearby traffic patterns: **Pierce School** closed for construction and relocated to Old Lincoln School on Boylston St/Walnut St

Q2 Average Daily Traffic (ADT) Volume Change – Percentage



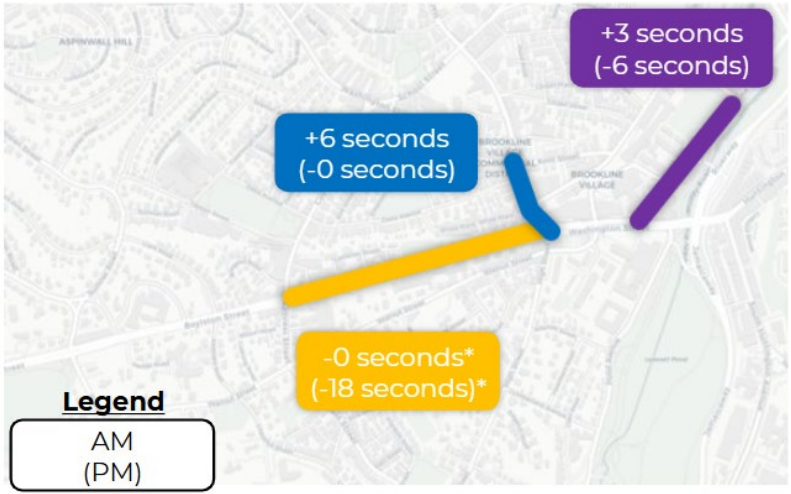
+00% = Change in vehicle volumes (compared to baseline volumes)

**See Appendix C for full details of Vehicle Volumes & Speeds*

Travel times for general traffic have somewhat improved, and delays have remained similar

Intersection delay either remains constant or decreases slightly

- Remain broadly similar to Quarter 1 and baseline



**See Appendix D for full details of Vehicle Travel Times & Control Delay*

Corridor travel times:

- Reduced slightly from Q1
- One exception is the inbound AM peak, which increased by ~30 seconds – we will monitor through next quarter

Inbound

Period	Baseline	Quarter 1	Quarter 2
AM Peak	9.0 minutes	9.7 minutes	10.3 minutes
MD Peak	5.7 minutes	6.6 minutes	6.0 minutes
PM Peak	7.0 minutes	7.5 minutes	6.4 minutes

Outbound

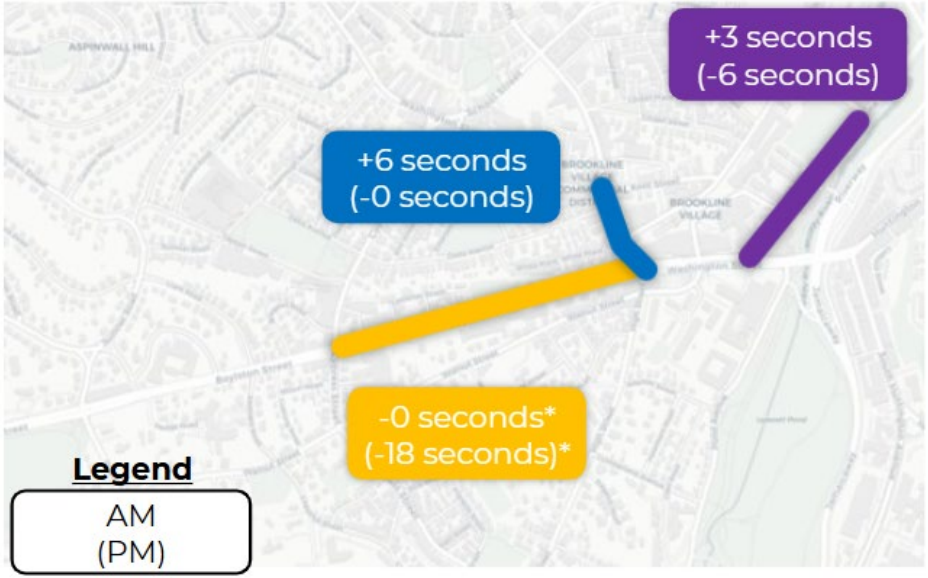
Period	Baseline	Quarter 1	Quarter 2
AM Peak	6.2 minutes	6.0 minutes	6.0 minutes
MD Peak	5.5 minutes	5.9 minutes	5.7 minutes
PM Peak	8.5 minutes	8.8 minutes	8.3 minutes

Vehicle queue lengths have seen minor increases at most approaches

Minimal increases in queue lengths at most approaches, but delays are similar to baseline and Q1

- One exception was at the Boylston Street eastbound approach, which saw a significant increase (similar to Q1)

Intersection delays



**See Appendix E for full details of Vehicle Queue Lengths*

Summary & Next Steps

Key Findings

- **Bus Travel Times & Variability** in Q2 are relatively consistent from Q1
    - Travel times are consistent or faster in the bus lanes, but are slower outside the bus lanes, indicating delays related to moving back into mixed traffic
- **Vehicle Volumes** are relatively consistent from Q1
    - Traffic decreased slightly on Route 9 and moderate increase on side streets.
- **Vehicle Speeds** mostly decreased, consistent from Q1.
- **Vehicle Travel Times** reduced slightly from Q1
    - One exception was the inbound AM peak, which increased by ~30 seconds
    - Intersection delays remain broadly similar to Quarter 1 and baseline
- **Vehicle Queue Lengths** increased minimally, while delays remained consistent
    - One exception was at the Boylston Street eastbound approach, which saw a significant increase (similar to Q1)
- **User Feedback Surveys** will remain open throughout the pilot

Next Steps

- **Continue monitoring** & reporting quarterly throughout pilot duration
    - **Next report - Spring 2025: Quarter 3 (Feb. 1, 2025 – April 30, 2025)**
    - Summer 2025: Quarter 4 (May 1, 2025 – July 31, 2025)
    - Summer/Fall 2025: Final Report
- MBTA continue coordination on Transit Signal Priority with **adaptive signal system** vendor
- Brookline continue coordination with BPD on **education & enforcement**

Appendix

Appendix A

Project Background

MBTA Bus Priority

MBTA's Bus Priority Vision Plan

- **Targets existing delay** and service along 26 corridors
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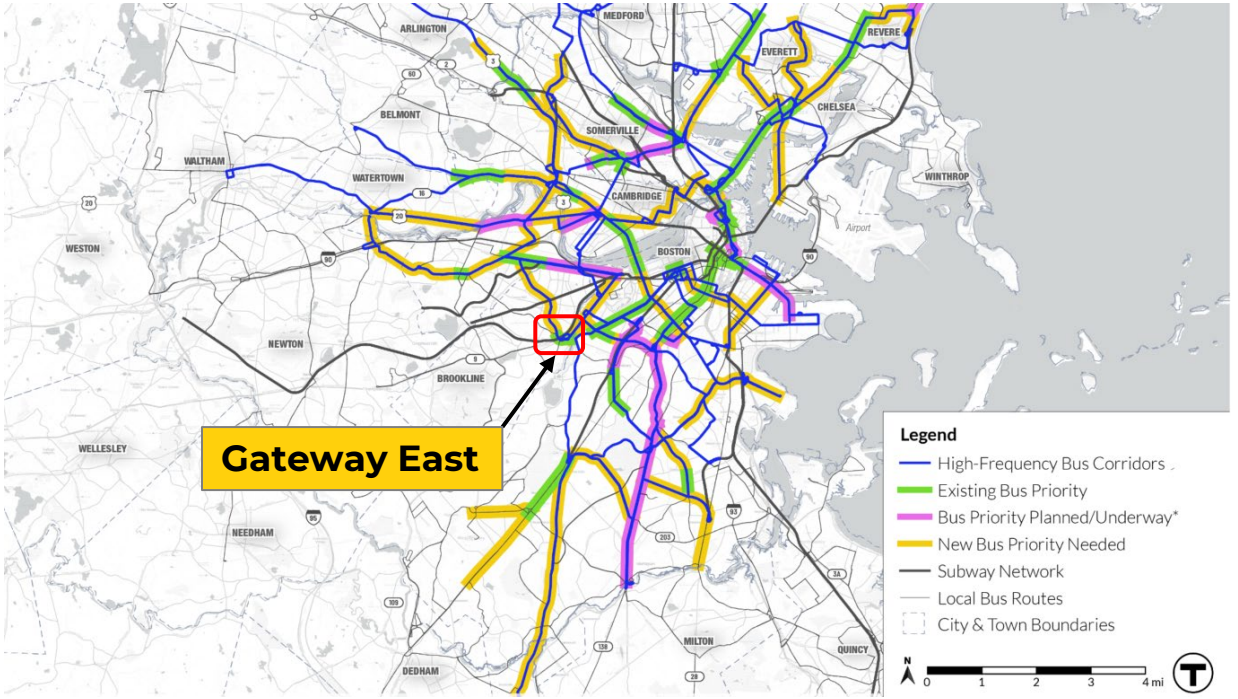

Gateway East:
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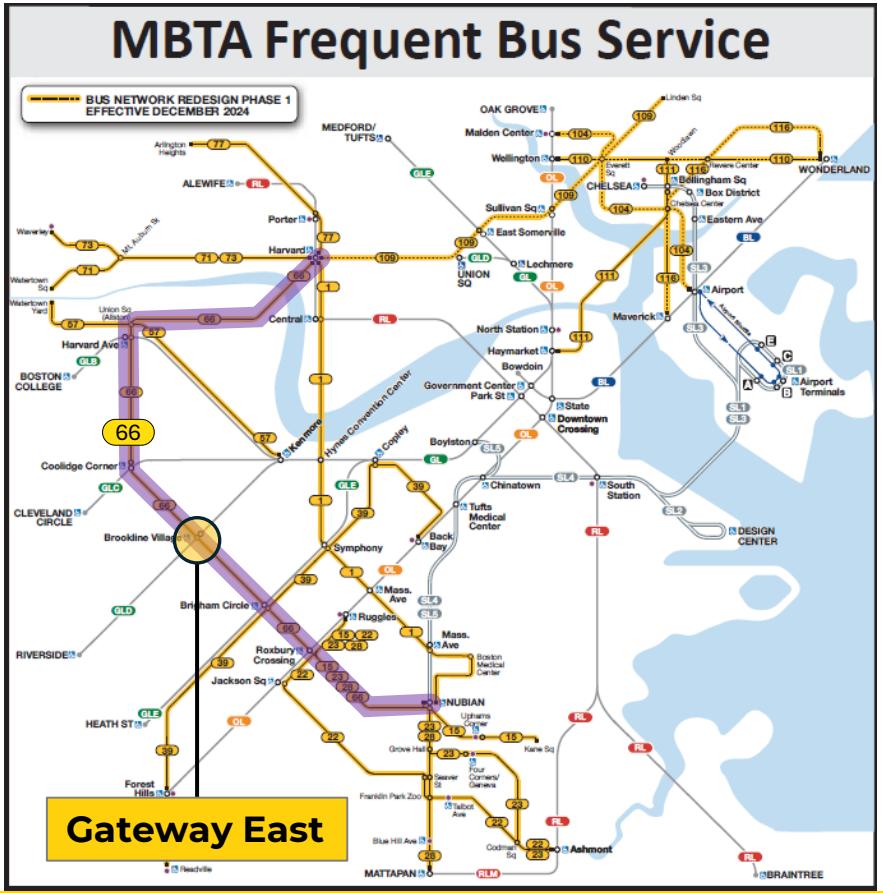
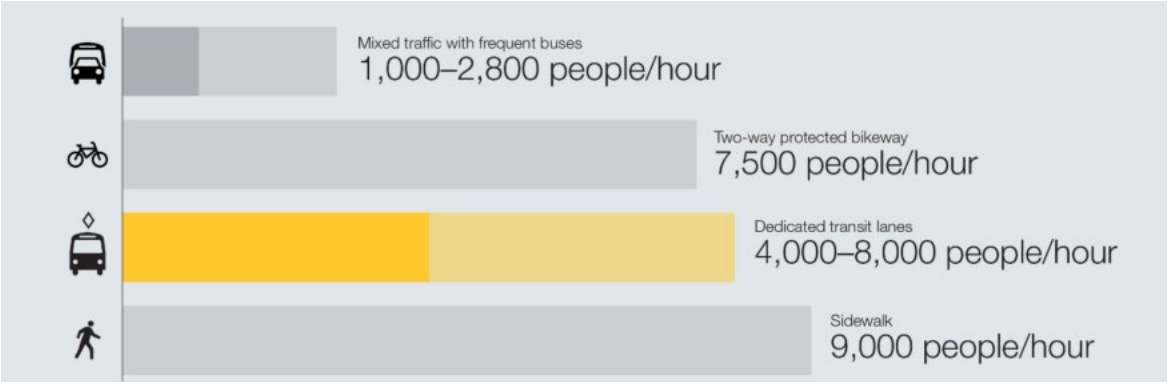
Gateway East project benefits nearly **15,000 daily riders** on Routes 60, 65, 66 – half of which travel through the project



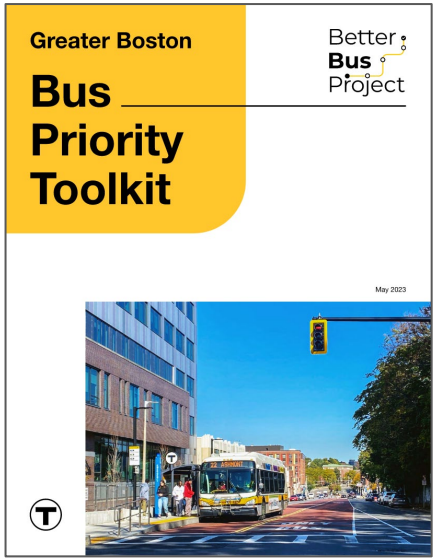
Transit Priority Moves More People

How many people can the space of one travel lane serve?



Person-Throughput Capacity (Graphic from MBTA Bus Priority Toolkit)

By repurposing space for transit, bus lanes can **increase the number of people that can travel along the corridor**, supporting future growth and mode shift to transit.



Project Goals: Why Are Bus Lanes Needed?

- **Fastest, most affordable way** to improve transit service for riders in a short time frame
- **Improving access** to Longwood Medical Area, grocery stores, and other essential services throughout the pandemic and recovery
- **Improving transit equity** by supporting the commuting needs of essential workers, low-income people, and people of color
- **Moving more people more efficiently**

Gateway East, before the bus lanes

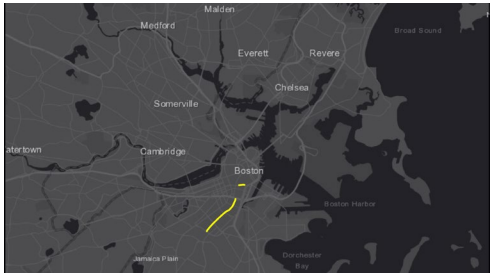
MBTA's Bus Priority Projects

Advance the Bus Priority Vision Plan to reduce bus rider delay through projects such as

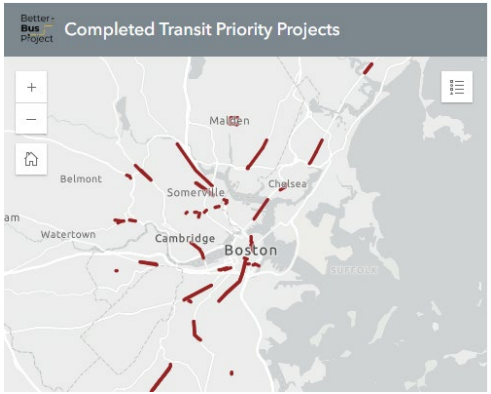
- Bus lanes
- Queue jumps
- Transit signal priority (TSP)

Growth of Bus Priority Projects in Greater Boston

- 40+ miles of bus lanes have been installed
- TSP has been activated at 85+ locations
- Collaboration is ongoing between MBTA and 12+ partner municipalities



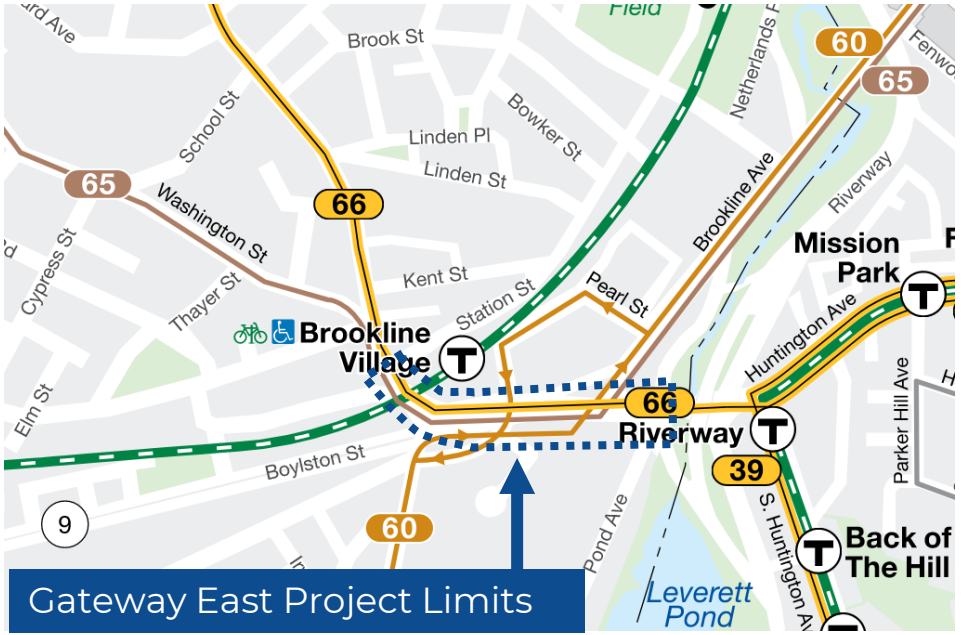
*Bus lanes completed as of **2015***



*Bus lanes completed as of **2024***

Project Motivation: Critical Transit Connection

- **Crossroads for three busiest bus routes** servicing Brookline: 60, 65, and 66 - highest bus ridership in all of Brookline
- Route 66 is **the 2nd busiest line in the entire MBTA bus system**
- Critical connections to and from the **Longwood Medical Area**, the Green Line (D and E branches), and other transit services
- Gateway East is the **busiest section of roadway** in Brookline for MBTA buses



MBTA Bus Map

Project Motivation: Bus Ridership & Equity

Typical Ridership on the Route 66 Bus

- 55% are from households without vehicles
- 40% are from households with incomes of less than $43,500
- 40% are people of color
- 67% are women

Benefits nearly **15,000 daily riders** on Routes 60, 65, 66 – half of which travel through the Gateway East Corridor

During peak hours, the average 66 bus passing through the corridor has 35-45 riders - this means **multiple riders standing**

Route Number	Total Weekday	Through Riders
66*	**11,293**	5,086
65	**2,396**	1,833
60	**873**	343
Total	**14,562**	7,262

**Second-highest ridership* *in entire MBTA bus system*

Gateway East Bus Lane Pilot

Project Background

The **Gateway East Bus Lane Pilot** is a collaborative effort between MBTA, MassDOT, and The Town of Brookline to **build on the 2021 corridor reconstruction.**

One of principles the Brookline Transportation Board set for the Priority Bus Lane Pilot:

- **"To prioritize safe, space-efficient, and energy efficient movement of people and goods over the movement and parking of private vehicles when designing and improving our public ways** with particular focus on **high traffic routes connectivity and directness** consistent with Brookline Town meetings almost unanimously approval of Warrant Article 31 (WA31), titled as a "**resolution to respond to climate change by prioritizing health, access, and equity of Brookline's public ways**."

Pilot Performance Indicators

- User Feedback Surveys
- MBTA Bus Travel Time
- MBTA Bus Travel Time Variability
- Volume and Speed tracked on Boylston St, Secondary Roads, and Residential Side Streets
- Vehicle Travel Times and Control Delay
- Queue Length Analysis

Project Timeline

2020: Collaborative planning effort began.

2021: Brookline Transportation Board authorized Gateway East Bus Priority Lane Pilot project, funded by the MBTA.

2024: Dedicated bus lanes were implemented on Washington St between Station St and the Town Line in both directions.

2024-2025: The pilot is expected to run for one year between August 2024 and July 2025 (note: bus lane installation occurred 6/24/2024 to 9/26/2024).

Quarterly evaluations of the pilot's impacts on bus travel times and car traffic are being conducted by Arcadis and Toole Design Group.

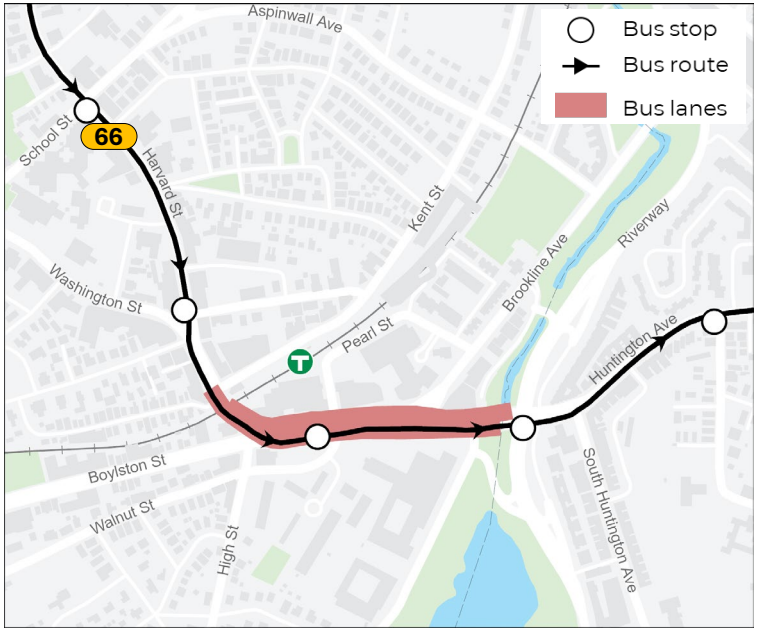
Gateway East, before

Gateway East, after

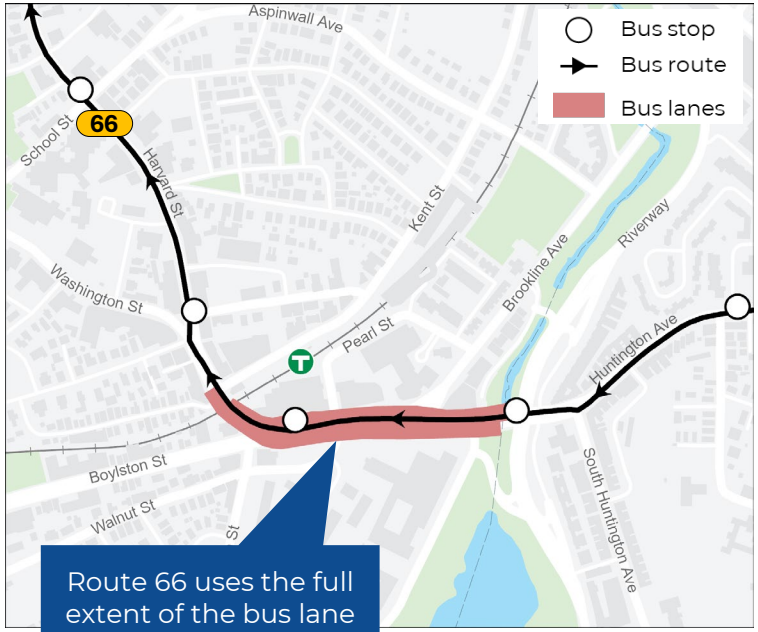
Gateway East, after
Photo Credit: Toole Design

Bus Routing Through the Project Area

66 Inbound

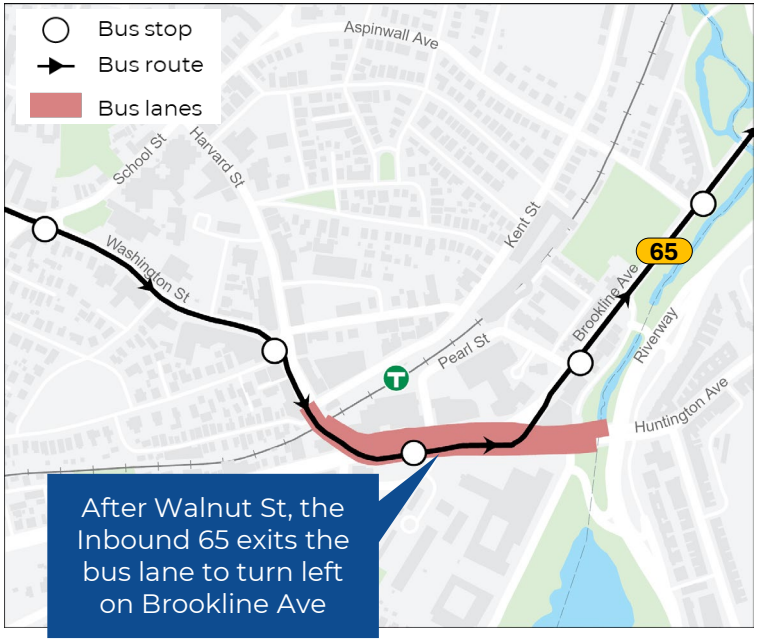


66 Outbound

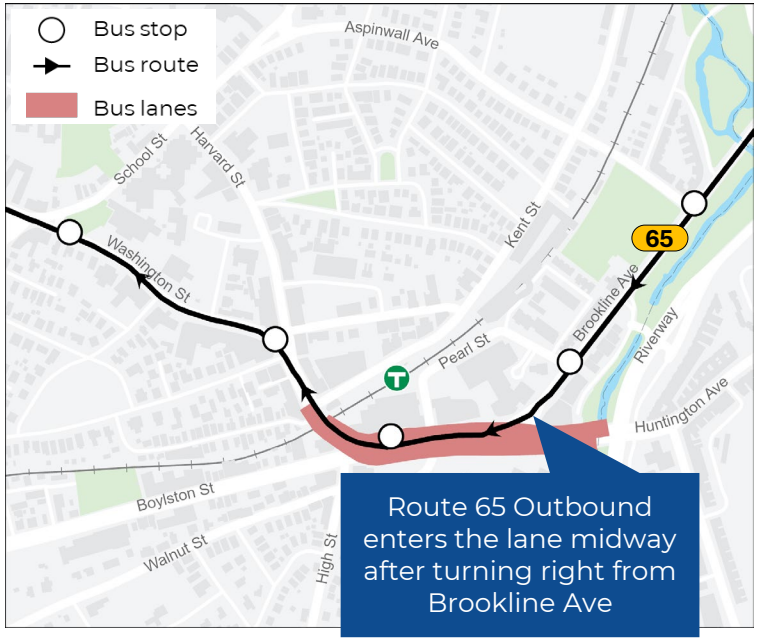


Bus Routing Through the Project Area

65 Inbound

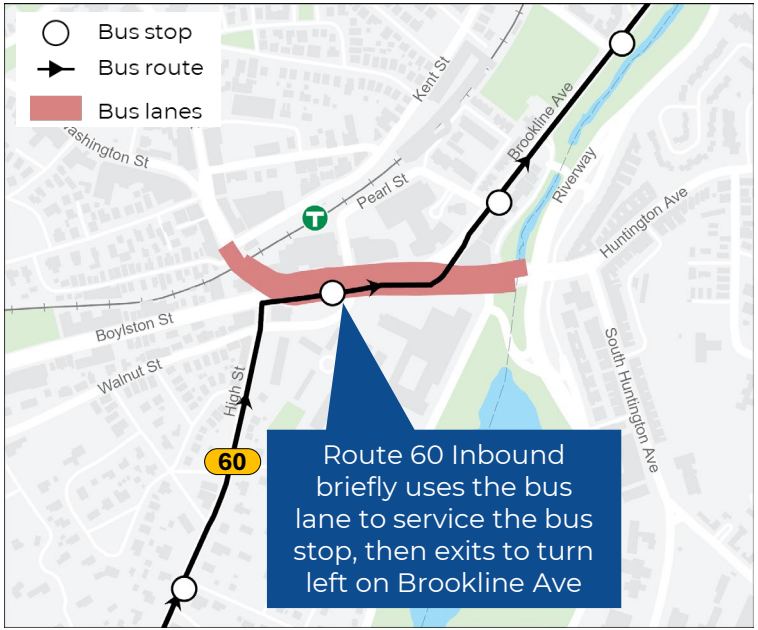


65 Outbound

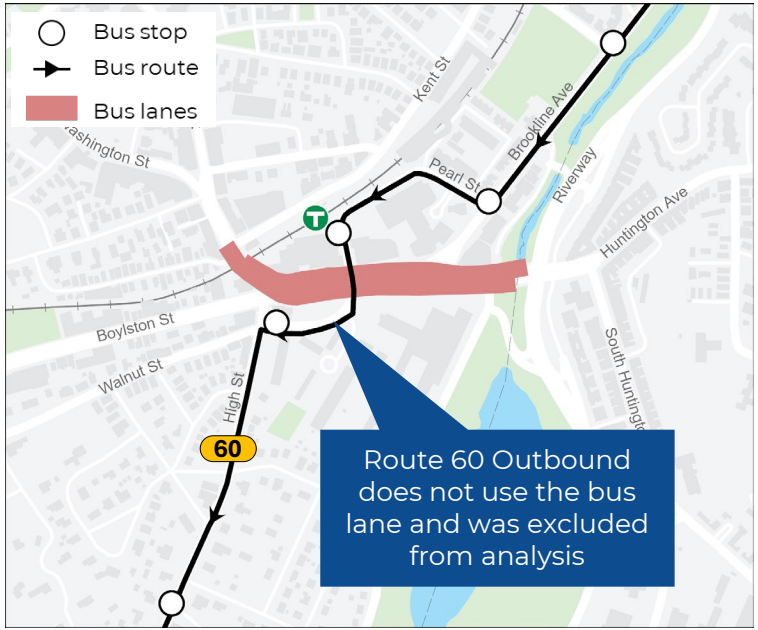


Bus Routing Through the Project Area

60 Inbound



60 Outbound



Project Status

Project Status & Operations

Construction – Markings & Signs Completed late September

- Installation period extended well into the Q1 analysis period, ending 9/26/24 due to delays with signage installation

Traffic Signals – New Signaling System Not Currently Activated

- Due to technical difficulties with the vendor, the Adaptive Signal System with Transit Signal Priority is only in partial operation.

Project Status & Operations

Enforcement

- Start of enforcement postponed due to delays with signage installation
- Provided time for drivers to adjust
- BPD is working on an enforcement program. MBTA provided educational flyer that explains regulations & how to turn across bus lanes

Other Factors Affecting Local Travel Patterns

- The **Pierce School closure** may explain reduced traffic on Cypress St and increased traffic on Walnut St, as the school was relocated to the old Lincoln School between Boylston St and Walnut St

Gateway East, after
Photo Credit: Toole Design

Quarter 1 should be viewed as an adjustment period due to the conditions listed above.

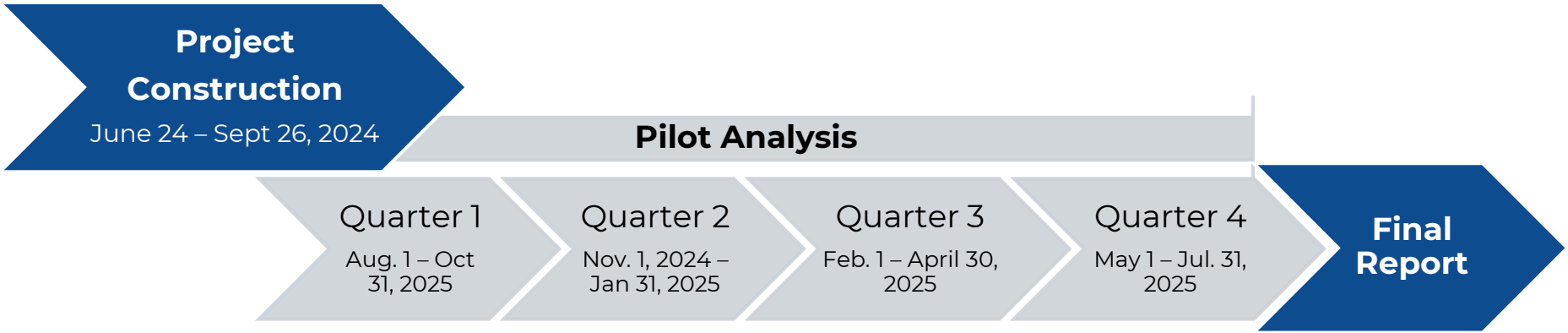
Public Feedback - Gateway East Bus Lane Pilot Survey

The survey was launched in mid-November and promoted through various channels, including:

- DPW and Town social media
- The Town Administrators' Newsletter
- The Longwood Collective Newsletter
- Eye-catching yard signs along the corridor
- The survey remains open for the duration of the pilot and we'd love to hear from you! Haven't taken the survey? Go to: https://www.surveymonkey.com/r/CN3S9WZ
- Survey results are included in the final Appendix.

Gateway East, after
Photo Credit: Toole Design

Pilot Analysis Schedule



Data Collection Schedule

Period	Period Dates*	Traffic Count Dates	INRIX Dates	Queuing Dates
Baseline	Aug 1 – Oct 31, 2023	Sep 26-28, 2023	Jun 2024**	May 18, 2021***
Quarter 1	Aug 1 – Oct 31, 2024	Oct 8-10, 2024	Oct 2024	Dec 3, 2024
Quarter 2	Nov 1, 2024 – Jan 31, 2025	Jan 2025	Jan 2025	
Quarter 3	Feb 1 – Apr 30, 2025	Apr 2025	Apr 2025	
Quarter 4	May 1 – Jul 30, 2025	Jul 2025	Jul 2025	

**APC data for travel time analysis collected over entire period.*

***INRIX Blackout from 6/2023 – 2/2024*

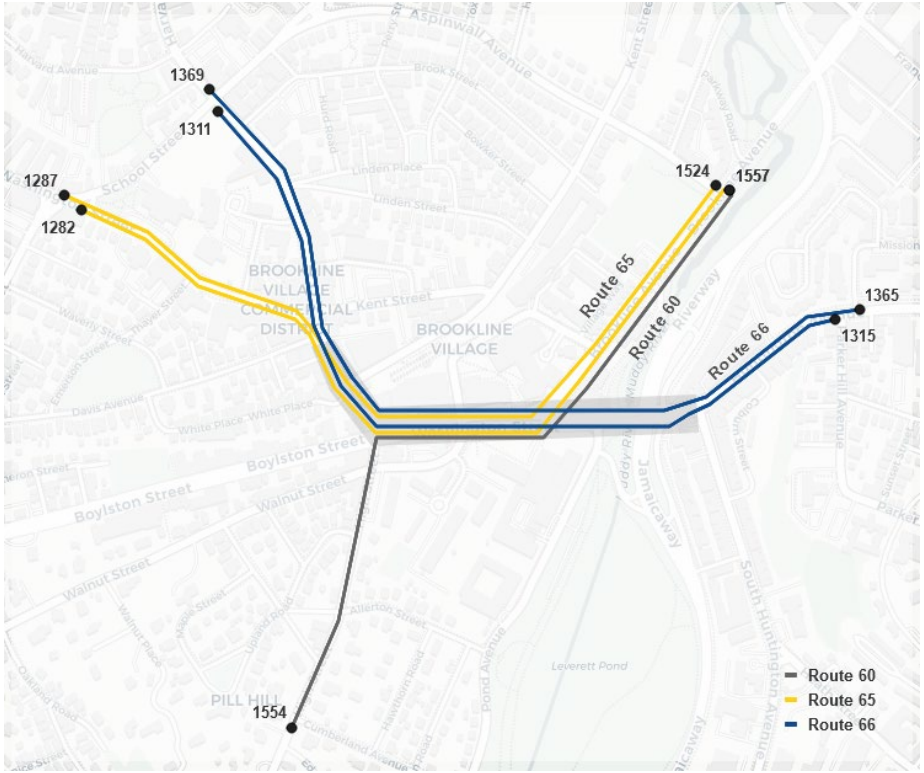
****Baseline queue data may be affected by decreased traffic in wake of COVID-19 pandemic*

Appendix B

Bus Travel Times

Methodology

Analysis Area



Route 60 inbound between High St at Cumberland Ave (1554) and Brookline Ave opposite Aspinwall Ave (1557)

Route 65 inbound between Washington St at Cypress St (1282) and Brookline Ave at Aspinwall Ave (1557)

Route 65 outbound between Brookline Ave at Aspinwall Ave (1524) and Washington St at School St (1287)

Route 66 inbound between Harvard St at School St (1311) and Huntington Ave at Parker Hill Ave (1315)

Route 66 outbound between Huntington Ave opposite Parker Hill Ave (1365) and Harvard St at Aspinwall Ave (1369)

Data

- All analysis was completed using stop arrival and departure times in **automatic passenger counter (APC)** data.
- Data was collected for **weekdays** from November 2024 through January 2025.
    - The baseline period was weekdays from November 2023 through January 2024.
- MBTA-defined **time periods**:
    - AM Peak: 7:00 AM to 9:00 AM
    - Afternoon: 2:00 PM to 4:00 PM *(corresponds with the end of school)*
    - PM Peak: 4:00 PM to 7:00 PM

Metrics

Travel Time	Variability (MBTA Metric)	Travel Time Quality of Service (TTQOS)	Travel Time Variability Quality of Service (TTVQOS)
Median travel time of a vehicle over a segment at a given time.	**Relative difference** between the median and 90th percentile of travel times.	Letter grade (A to E) for **how much delay** vehicles experience on average over a segment at a given time.	Letter grade (A to E) for **how consistent** vehicle travel time is over a segment at a given time.

Metrics

$$\text{TTQOS} = \frac{\text{average travel time (}\textit{observed}\text{)}}{\text{reference travel time*}}$$

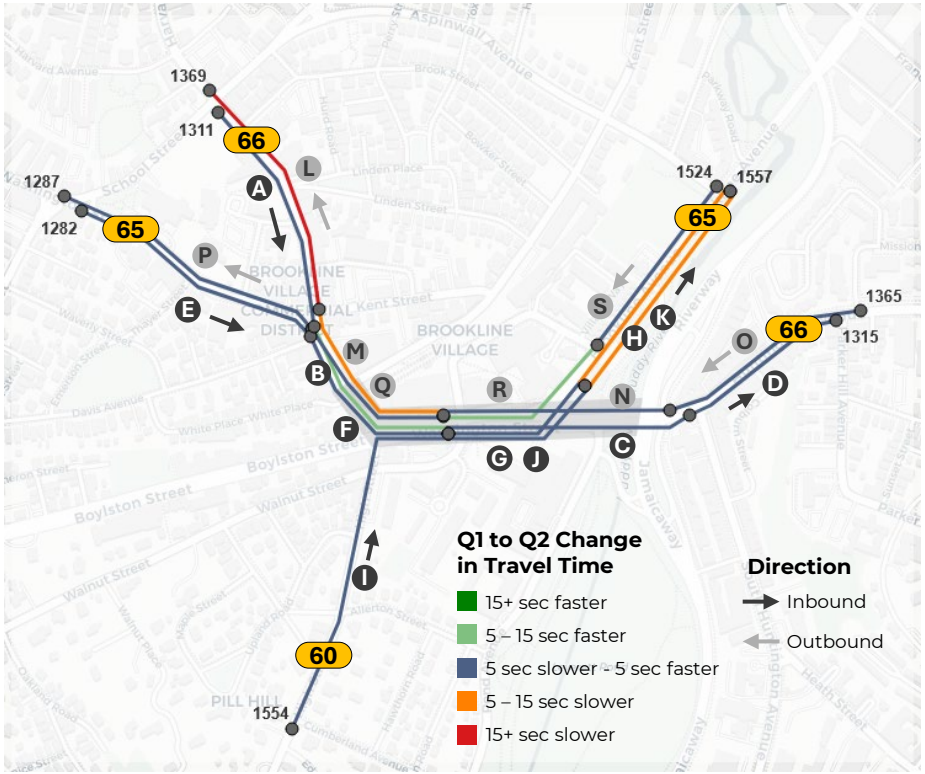
$$\text{TTVQOS} = \frac{\text{standard deviation travel time (}\textit{observed}\text{)}}{\text{average travel time (}\textit{observed}\text{)}}$$

Grade	Metric Upper Threshold		Representative Bus Service
	TTQOS	TTVQOS	
A	1.4	1.4	Fully grade-separated
B	1.8	2.7	Reserved right-of-way, subject to traffic signal control
C	2.4	3.8	Mixed traffic, little to no traffic congestion
D	3.0	5.1	Mixed traffic, modest traffic congestion
E	4.0	8.0	Mixed traffic, moderate traffic congestion
F	N/A	N/A	*Perceived as too slow to be a good travel choice*

**Based on segment length.*

Quarter 2 Findings

What has changed in bus travel times between Q1 and Q2?



Change in Median Stop-to-Stop Bus Travel Time* (seconds)

Represents a combination of AM, PM, and afternoon peak periods

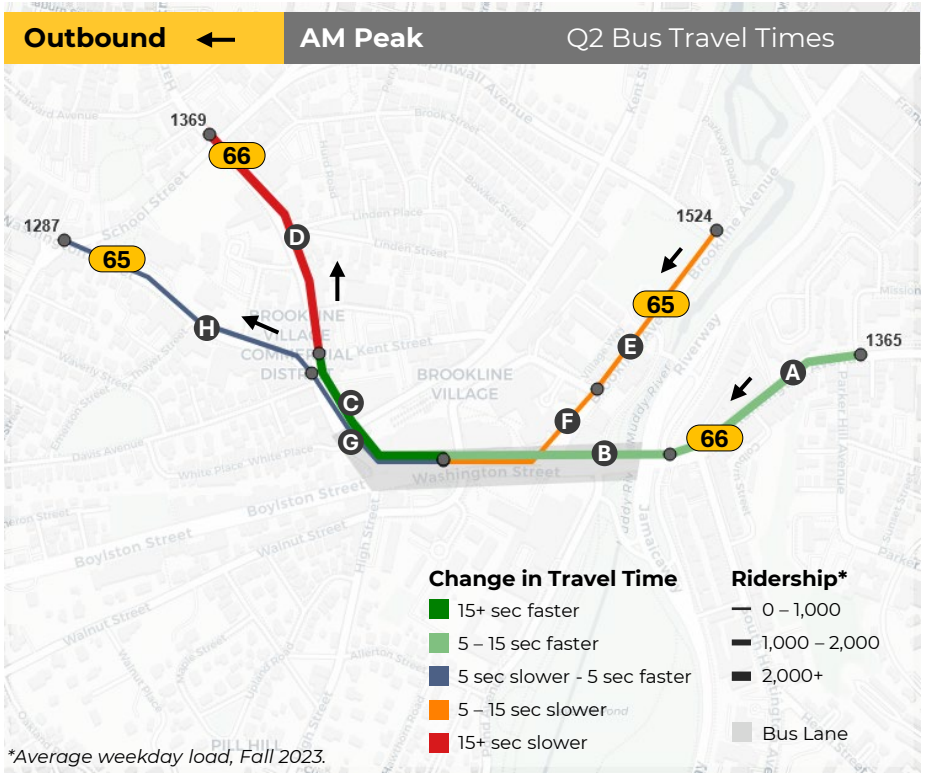
	Inbound		
	Q1 to Q2 Diff*	Baseline Diff**	
		Q1	Q2
Route 66			
A	+4	+37	+36
B	-7	-13	-13
C	-2	-5	+1
D	-2	+23	+25
Route 65			
E	+5	+1	+4
F	-3	+2	0
G	-1	+13	+10
H	+6	-13	0
Route 60			
I	-4	+11	+8
J	-3	+19	+2
K	+6	-16	+6

	Outbound		
	Q1 to Q2 Diff*	Baseline Diff**	
		Q1	Q2
Route 66			
L	+30	+7	+31
M	+10	-23	-12
N	+5	-30	-23
O	+3	-5	-2
Route 65			
P	+2	0	+1
Q	-2	-1	-2
R	-5	+19	+17
S	-2	+5	+5

**Difference in travel time (s) between Q1 and Q2.*

***Difference in travel time (s) between each quarter and its baseline.*

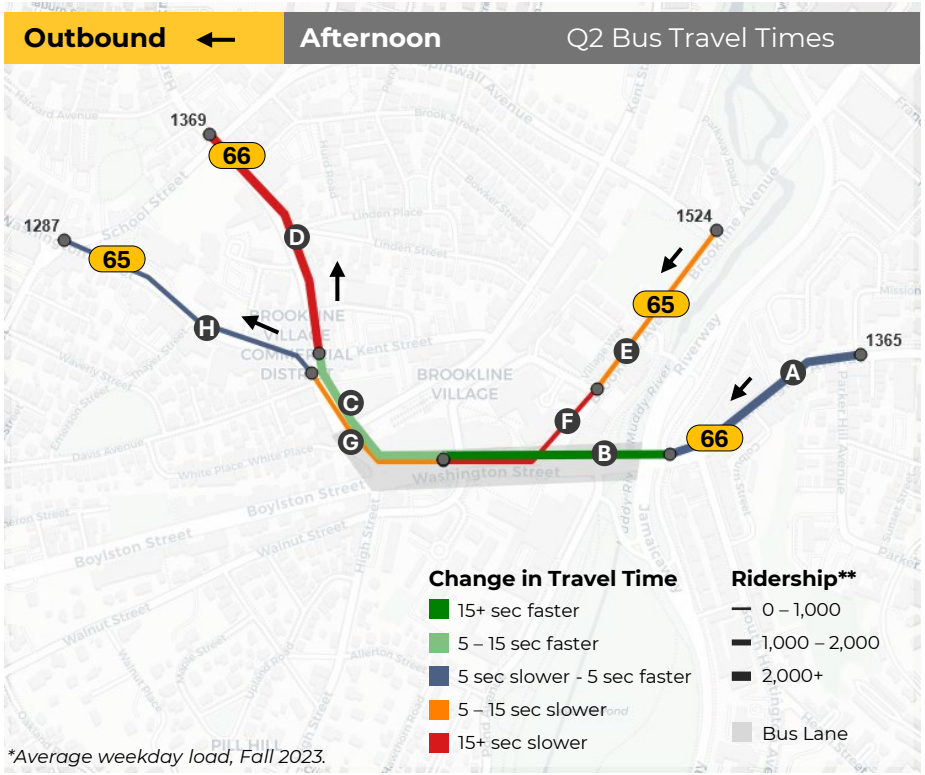
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline	Q2	Change (s)
Route 66			
Full corridor	8:33	8:39	+6
A	2:07	1:57	-10
B	2:16	2:03	-12
C	2:04	1:38	-26
D	1:59	2:37	+38
Route 65			
Full corridor	5:40	5:39	-1
E	1:04	1:10	+6
F	1:31	1:43	+12
G	1:31	1:30	-2
H	1:03	1:04	+2

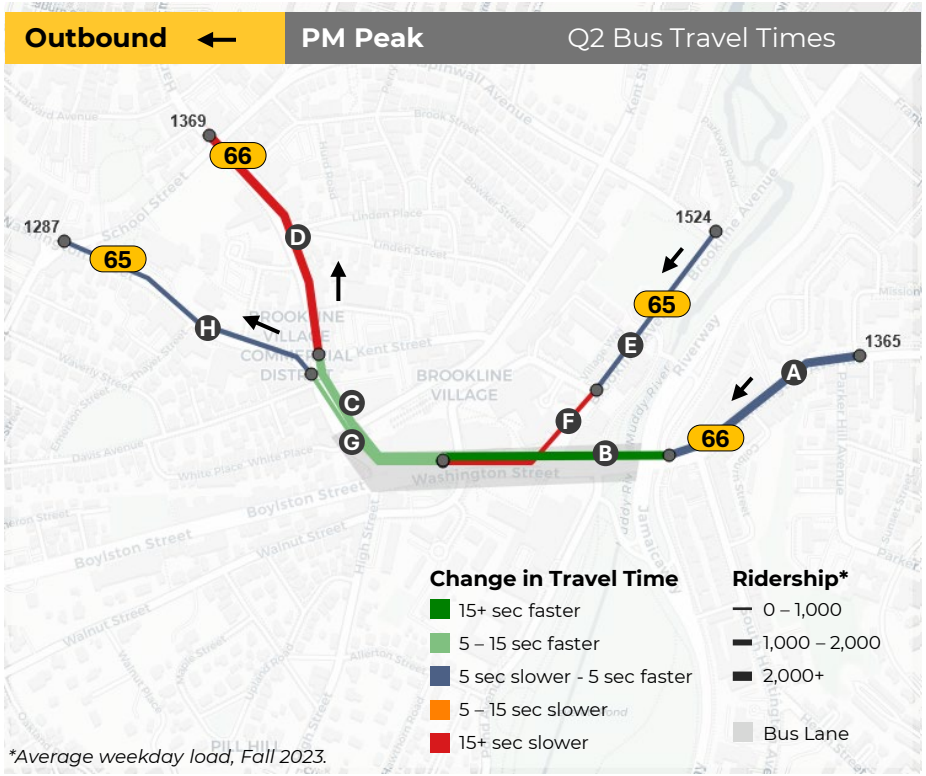
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline	Q2	Change (s)
Route 66			
Full corridor	8:31	8:46	+14
A	2:03	2:06	+3
B	2:18	2:01	-16
C	1:46	1:40	-7
D	2:07	2:39	+32
Route 65			
Full corridor	6:09	6:34	+26
E	1:14	1:21	+6
F	1:40	1:55	+16
G	1:46	1:52	+6
H	1:04	1:07	+3

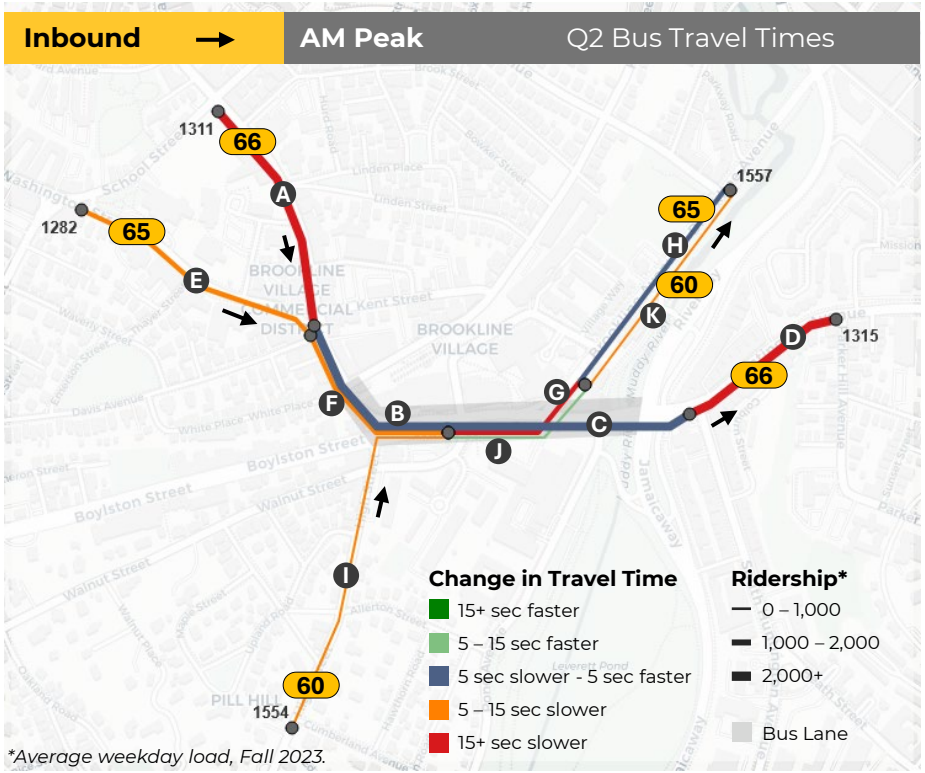
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline	Q2	Change (s)
Route 66			
Full corridor	8:42	8:30	-12
A	1:58	2:04	+5
B	2:34	2:00	-34
C	1:48	1:39	-9
D	2:06	2:31	+26
Route 65			
Full corridor	6:25	6:37	+12
E	1:13	1:18	+4
F	1:40	2:07	+26
G	1:54	1:45	-8
H	1:09	1:09	0

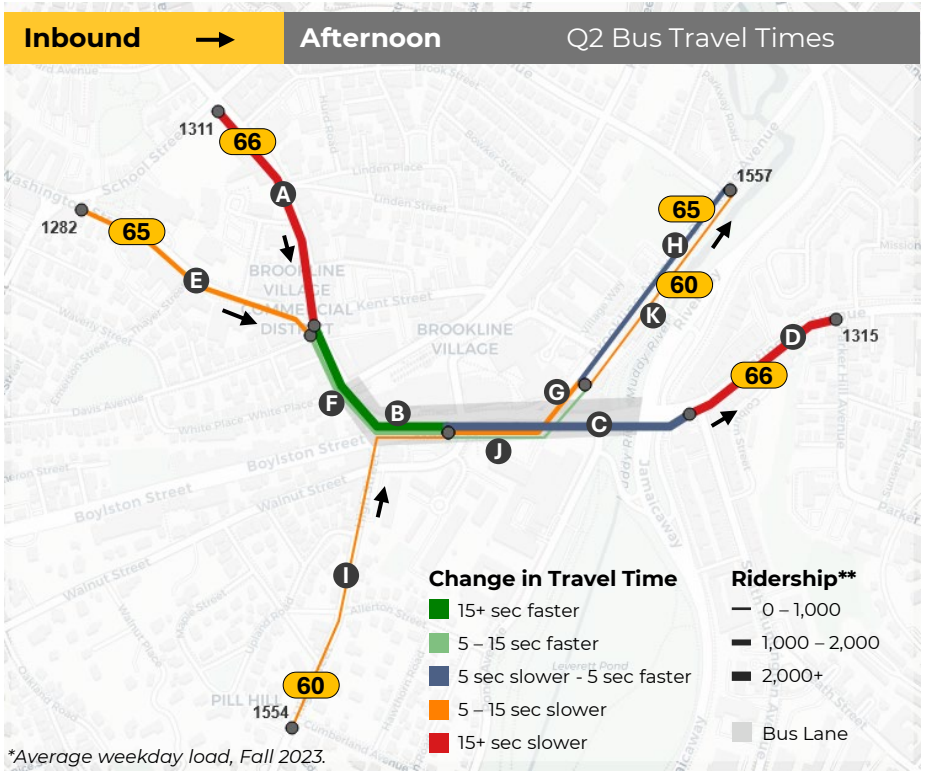
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline	Q2	Change (s)
Route 66			
Full corridor	8:16	8:54	+37
A	1:16	1:51	+34
B	2:37	2:34	-2
C	1:34	1:34	0
D	2:19	2:36	+17
Route 65			
Full corridor	6:59	7:19	+20
E	1:18	1:24	+6
F	2:21	2:29	+8
G	1:42	1:58	+16
H	0:58	0:58	+1
Route 60			
Full corridor	6:43	6:58	+15
I	3:30	3:40	+10
J	1:58	1:49	-9
K	1:03	1:13	+11

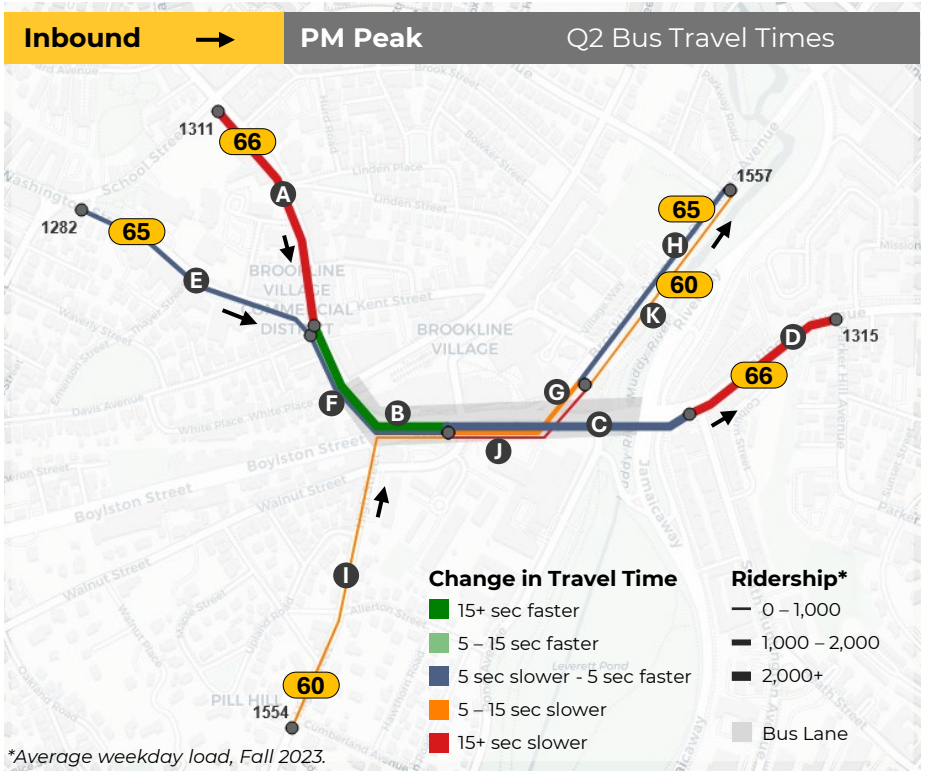
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline	Q2	Change (s)
Route 66			
Full corridor	8:21	8:52	+30
A	1:45	2:16	+31
B	2:58	2:42	-16
C	1:31	1:31	-1
D	1:45	2:09	+24
Route 65			
Full corridor	6:42	6:52	+10
E	1:20	1:27	+6
F	2:21	2:16	-6
G	1:36	1:48	+12
H	0:56	0:52	-4
Route 60			
Full corridor	5:43	5:51	+8
I	2:28	2:40	+11
J	2:00	1:52	-7
K	0:51	0:58	+8

Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline	Q2	Change (s)
Route 66			
Full corridor	8:06	8:52	+46
A	1:40	2:16	+36
B	2:55	2:40	-15
C	1:38	1:39	0
D	1:45	2:13	+28
Route 65			
Full corridor	6:40	6:48	+7
E	1:24	1:25	+1
F	2:19	2:15	-4
G	1:40	1:46	+6
H	0:55	0:57	+1
Route 60			
Full corridor	5:48	6:07	+19
I	2:34	2:42	+8
J	1:48	2:07	+19
K	0:55	1:01	+6

Quarter 2 Complete Results

Travel Times, Dwell, and QOS Ratios | Time Period: AM Peak

Q2 Baseline (Nov 2023 – Jan 2024)

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	**1554**	**1557**	**404.0**	**746.8**	**11.0**	**14.4**	**34%**	**0.85**	**4.1**	**F**	**6.1**	**E**
		1554	1555	210.0	558.7	12.0	26.0	90%	1.66	6.0	F	8.1	F
		1555	1556	119.0	171.0	9.5	24.0	54%	0.44	3.8	E	4.3	D
		1556	1557	63.0	129.7	11.0	14.4	34%	1.06	2.0	C	5.0	D
65	inbound	**1282**	**1557**	**419.5**	**570.5**	**9.0**	**15.0**	**23%**	**0.36**	**3.1**	**E**	**3.6**	**C**
		1282	1283	78.0	128.0	13.0	31.3	68%	0.64	2.2	C	3.2	C
		1283	1555	141.0	243.0	14.0	29.0	83%	0.72	4.6	F	4.9	D
		1555	1556	102.0	208.0	9.0	16.0	57%	1.04	4.0	F	4.5	D
		1556	1557	58.0	123.0	9.0	15.0	23%	1.12	1.9	C	4.6	D
65	outbound	**1524**	**1287**	**340.0**	**433.6**	**8.0**	**12.6**	**23%**	**0.28**	**2.5**	**D**	**3.1**	**C**
		1524	1525	65.0	105.0	9.0	18.1	46%	0.62	2.0	C	3.3	C
		1525	1526	91.0	156.0	9.0	17.0	66%	0.71	2.9	D	4.1	D
		1526	1286	92.0	155.0	10.0	13.0	61%	0.68	3.2	E	3.7	C
		1286	1287	63.0	107.0	8.0	12.6	23%	0.7	1.9	C	3.6	C
66	inbound	**1311**	**1315**	**497.0**	**695.4**	**22.0**	**61.0**	**88%**	**0.4**	**3.7**	**E**	**4.8**	**D**
		1311	1313	77.0	138.0	15.0	36.0	88%	0.79	2.3	C	3.7	C
		1313	1555	157.0	255.0	16.0	40.0	86%	0.62	5.1	F	4.5	D
		1555	1314	95.0	159.0	15.0	32.0	92%	0.67	3.1	E	3.7	C
		1314	1315	139.0	216.2	22.0	61.0	88%	0.56	4.4	F	8.6	F
66	outbound	**1365**	**1369**	**513.5**	**746.0**	**11.0**	**20.0**	**75%**	**0.45**	**3.7**	**E**	**5.5**	**E**
		1365	1366	127.0	192.0	14.0	30.9	85%	0.51	3.5	E	11.0	F
		1366	1526	136.0	212.0	13.0	24.3	92%	0.56	4.0	F	4.0	D
		1526	1367	124.5	182.0	11.0	20.8	84%	0.46	3.7	E	4.0	D
		1367	1369	119.5	244.5	11.0	20.0	75%	1.05	3.7	E	5.8	E

*Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).

Travel Times, Dwell, and QOS Ratios | Time Period: Afternoon

Q2 Baseline (Nov 2023 – Jan 2024)

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	**1554**	**1557**	**343.0**	**479.4**	**9.0**	**12.4**	**5%**	**0.4**	**3.1**	**E**	**3.7**	**C**
		1554	1555	149.0	290.4	11.0	20.5	87%	0.95	3.6	E	5.1	E
		1555	1556	120.0	185.0	9.0	14.2	55%	0.54	4.0	E	4.2	D
		1556	1557	51.0	121.0	9.0	12.4	5%	1.37	1.8	B	4.4	D
65	inbound	**1282**	**1557**	**402.0**	**528.3**	**8.0**	**12.8**	**9%**	**0.31**	**2.9**	**D**	**3.3**	**C**
		1282	1283	80.5	127.6	11.0	34.0	67%	0.59	2.3	C	3.5	C
		1283	1555	141.5	228.9	11.0	22.0	83%	0.62	4.5	F	4.4	D
		1555	1556	96.0	193.9	9.0	19.0	52%	1.02	3.5	E	4.5	D
		1556	1557	56.5	118.3	8.0	12.8	9%	1.09	1.8	B	3.9	D
65	outbound	**1524**	**1287**	**369.0**	**479.6**	**10.0**	**19.6**	**52%**	**0.3**	**2.7**	**D**	**2.8**	**C**
		1524	1525	74.5	112.0	10.0	22.8	68%	0.5	2.3	C	2.9	C
		1525	1526	100.0	171.6	13.0	29.4	83%	0.72	3.3	E	3.8	D
		1526	1286	107.0	169.0	11.0	22.0	72%	0.58	3.6	E	3.6	C
		1286	1287	64.0	104.0	10.0	19.6	52%	0.62	1.9	C	2.6	B
66	inbound	**1311**	**1315**	**501.5**	**649.6**	**13.0**	**35.1**	**85%**	**0.3**	**3.7**	**E**	**3.3**	**C**
		1311	1313	105.0	183.9	15.0	47.5	82%	0.75	3.1	E	4.0	D
		1313	1555	178.0	274.0	19.0	44.0	89%	0.54	5.6	F	3.9	D
		1555	1314	92.0	132.3	13.0	24.7	84%	0.44	2.7	D	3.3	C
		1314	1315	105.0	170.0	13.0	35.1	85%	0.62	3.3	E	4.7	D
66	outbound	**1365**	**1369**	**512.0**	**647.0**	**13.0**	**29.0**	**77%**	**0.26**	**3.6**	**E**	**4.4**	**D**
		1365	1366	123.0	164.8	16.0	38.0	81%	0.34	3.2	E	4.0	D
		1366	1526	138.0	198.8	15.5	38.0	90%	0.44	4.0	E	8.1	F
		1526	1367	107.0	173.8	15.0	30.5	84%	0.62	3.5	E	4.0	D
		1367	1369	127.0	210.8	13.0	29.0	77%	0.66	3.6	E	4.9	D

*Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).

Travel Times, Dwell, and QOS Ratios | Time Period: PM Peak

Q2 Baseline (Nov 2023 – Jan 2024)

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	**1554**	**1557**	**348.0**	**499.6**	**8.0**	**14.0**	**11%**	**0.44**	**3.2**	**E**	**4.4**	**D**
		1554	1555	154.0	284.0	12.0	21.0	92%	0.84	3.7	E	5.9	E
		1555	1556	108.0	187.0	9.0	16.0	49%	0.73	4.0	E	4.7	D
		1556	1557	55.0	134.6	8.0	14.0	11%	1.45	2.0	C	5.3	E
65	inbound	**1282**	**1557**	**401.0**	**544.0**	**8.0**	**16.1**	**7%**	**0.36**	**3.0**	**D**	**3.2**	**C**
		1282	1283	84.0	134.0	10.0	21.0	51%	0.6	2.3	C	3.4	C
		1283	1555	139.0	227.2	11.0	22.4	70%	0.63	4.4	F	4.2	D
		1555	1556	101.0	184.0	9.0	15.0	41%	0.82	3.6	E	4.3	D
		1556	1557	56.0	122.2	8.0	16.1	7%	1.18	1.8	B	4.4	D
65	outbound	**1524**	**1287**	**385.0**	**517.8**	**12.0**	**28.0**	**61%**	**0.34**	**2.9**	**D**	**3.4**	**C**
		1524	1525	74.0	117.2	12.0	27.5	66%	0.58	2.3	C	3.5	C
		1525	1526	101.0	182.0	14.0	27.0	80%	0.8	3.4	E	4.1	D
		1526	1286	114.0	180.6	12.0	24.0	63%	0.58	3.8	E	3.9	D
		1286	1287	69.0	110.6	12.0	28.0	61%	0.6	2.1	C	2.9	C
66	inbound	**1311**	**1315**	**486.5**	**664.3**	**13.0**	**30.2**	**78%**	**0.37**	**3.6**	**E**	**4.7**	**D**
		1311	1313	100.0	170.0	15.0	51.7	80%	0.7	2.8	D	6.2	E
		1313	1555	175.0	270.3	21.0	50.0	89%	0.54	5.5	F	4.9	D
		1555	1314	98.5	154.0	14.0	31.0	89%	0.56	3.0	D	6.1	E
		1314	1315	105.0	167.0	13.0	30.2	78%	0.59	3.3	E	6.7	E
66	outbound	**1365**	**1369**	**522.0**	**706.0**	**15.0**	**33.8**	**75%**	**0.35**	**3.7**	**E**	**5.5**	**E**
		1365	1366	119.0	202.4	18.0	44.8	82%	0.7	3.4	E	6.4	E
		1366	1526	155.0	215.4	16.5	43.0	85%	0.39	4.2	F	7.4	E
		1526	1367	108.0	173.0	16.0	36.0	77%	0.6	3.5	E	6.1	E
		1367	1369	126.0	208.8	15.0	33.8	75%	0.66	3.6	E	7.8	E

*Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).

Travel Times, Dwell, and QOS Ratios | Time Period: AM Peak **Q2 (Nov 2024 – Jan 2025)**

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	**1554**	**1557**	**419.0**	**711.0**	**10.0**	**14.0**	**33%**	**0.7**	**3.9**	**E**	**5.3**	**E**
		1554	1555	220.0	494.6	12.0	23.0	96%	1.25	5.5	F	7.0	E
		1555	1556	110.0	167.0	10.0	23.0	35%	0.52	3.8	E	4.1	D
		1556	1557	74.0	124.2	10.0	14.0	33%	0.68	2.1	C	3.6	C
65	inbound	**1282**	**1557**	**440.0**	**618.3**	**9.0**	**12.3**	**26%**	**0.41**	**3.2**	**E**	**3.9**	**D**
		1282	1283	84.0	138.3	12.0	27.0	72%	0.65	2.4	C	4.2	D
		1283	1555	149.5	250.0	13.0	22.0	89%	0.67	4.8	F	4.8	D
		1555	1556	118.0	207.0	9.0	14.6	54%	0.75	4.2	F	4.2	D
		1556	1557	59.0	114.0	9.0	12.3	26%	0.93	1.8	C	4.4	D
65	outbound	**1524**	**1287**	**339.0**	**430.6**	**8.0**	**11.0**	**18%**	**0.27**	**2.5**	**D**	**2.7**	**C**
		1524	1525	70.5	105.0	9.0	14.8	47%	0.49	2.1	C	3.0	C
		1525	1526	103.0	158.3	11.0	19.0	76%	0.54	3.1	E	3.7	C
		1526	1286	90.0	155.0	9.0	14.7	47%	0.72	3.1	E	3.6	C
		1286	1287	65.0	101.0	8.0	11.0	18%	0.55	1.9	C	2.7	B
66	inbound	**1311**	**1315**	**534.0**	**747.0**	**18.0**	**48.0**	**88%**	**0.4**	**3.9**	**E**	**3.8**	**D**
		1311	1313	111.0	169.0	14.0	29.8	89%	0.52	3.1	E	3.8	C
		1313	1555	155.0	261.6	15.0	33.2	88%	0.69	5.0	F	4.8	D
		1555	1314	95.0	156.8	13.0	29.0	95%	0.65	3.0	D	3.7	C
		1314	1315	156.0	249.8	18.0	48.0	88%	0.6	4.7	F	4.2	D
66	outbound	**1365**	**1369**	**519.0**	**778.4**	**11.0**	**21.1**	**73%**	**0.5**	**3.9**	**E**	**4.8**	**D**
		1365	1366	117.0	201.1	13.0	26.0	81%	0.72	3.5	E	4.1	D
		1366	1526	123.5	199.0	13.0	21.0	89%	0.61	3.8	E	7.1	E
		1526	1367	98.5	165.1	12.0	21.0	72%	0.68	3.2	E	4.5	D
		1367	1369	158.0	326.3	11.0	21.1	73%	1.07	4.8	F	6.0	E

*Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).

Travel Times, Dwell, and QOS Ratios | Time Period: Afternoon **Q2 (Nov 2024 – Jan 2025)**

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	**1554**	**1557**	**351.0**	**448.0**	**8.0**	**11.4**	**7%**	**0.28**	**3.2**	**E**	**5.8**	**E**
		1554	1555	160.0	238.0	13.0	22.0	95%	0.49	3.6	E	5.1	D
		1555	1556	113.0	179.0	9.0	14.9	39%	0.58	4.0	F	5.4	E
		1556	1557	59.0	114.0	8.0	11.4	7%	0.93	1.9	C	5.8	E
65	inbound	**1282**	**1557**	**412.0**	**541.4**	**8.0**	**11.0**	**7%**	**0.31**	**3.0**	**E**	**3.0**	**C**
		1282	1283	87.0	146.0	11.0	31.4	68%	0.68	2.5	D	3.3	C
		1283	1555	136.0	219.0	11.0	19.0	88%	0.61	4.4	F	4.5	D
		1555	1556	108.0	189.0	9.0	13.4	44%	0.75	3.8	E	3.7	C
		1556	1557	53.0	114.8	8.0	11.0	7%	1.17	1.7	B	4.2	D
65	outbound	**1524**	**1287**	**394.5**	**510.0**	**10.0**	**24.0**	**49%**	**0.29**	**3.0**	**D**	**3.4**	**C**
		1524	1525	81.0	123.4	10.5	20.5	61%	0.52	2.5	D	3.3	C
		1525	1526	116.0	185.4	13.0	23.0	86%	0.6	3.7	E	4.3	D
		1526	1286	113.0	186.4	11.0	19.0	74%	0.65	3.7	E	3.6	C
		1286	1287	67.0	109.0	10.0	24.0	49%	0.63	2.1	C	4.1	D
66	inbound	**1311**	**1315**	**532.0**	**677.4**	**13.0**	**34.0**	**81%**	**0.27**	**3.9**	**E**	**5.0**	**D**
		1311	1313	136.0	207.6	13.0	50.0	83%	0.53	3.7	E	3.9	D
		1313	1555	162.0	253.6	16.5	37.0	84%	0.57	5.1	F	4.7	D
		1555	1314	91.0	142.0	13.0	25.0	83%	0.56	2.8	D	3.3	C
		1314	1315	129.0	199.2	13.0	34.0	81%	0.54	4.0	F	10.9	F
66	outbound	**1365**	**1369**	**526.5**	**676.5**	**13.0**	**26.0**	**79%**	**0.28**	**3.7**	**E**	**5.5**	**E**
		1365	1366	126.0	195.7	16.0	30.0	84%	0.55	3.6	E	8.1	F
		1366	1526	122.0	191.0	15.0	31.0	92%	0.57	3.6	E	6.8	E
		1526	1367	100.0	150.0	14.0	30.0	81%	0.5	3.0	E	11.9	F
		1367	1369	159.5	272.7	13.0	26.0	79%	0.71	4.6	F	6.7	E

*Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).

Travel Times, Dwell, and QOS Ratios | Time Period: PM Peak **Q2 (Nov 2024 – Jan 2025)**

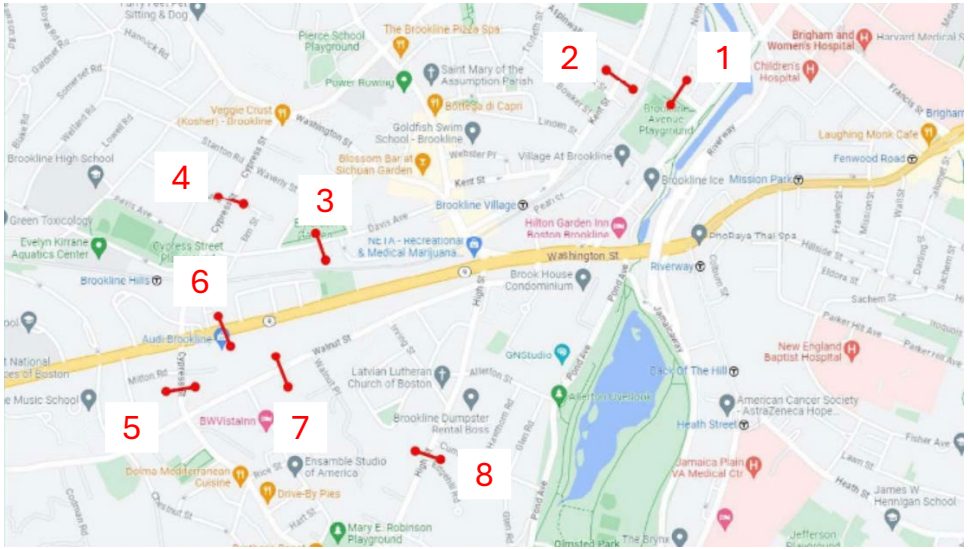
Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	**1554**	**1557**	**367.0**	**511.4**	**8.0**	**11.2**	**13%**	**0.39**	**3.3**	**E**	**3.2**	**C**
		1554	1555	162.0	284.4	14.0	23.0	91%	0.76	3.9	E	4.3	D
		1555	1556	127.0	188.4	9.0	15.0	38%	0.48	4.3	F	3.8	C
		1556	1557	61.0	108.2	8.0	11.2	13%	0.77	1.8	C	4.1	D
65	inbound	**1282**	**1557**	**408.0**	**541.0**	**8.0**	**12.8**	**13%**	**0.33**	**3.0**	**D**	**3.4**	**C**
		1282	1283	85.0	141.0	9.0	15.3	51%	0.66	2.4	C	3.7	C
		1283	1555	135.0	218.5	11.0	19.0	77%	0.62	4.3	F	4.3	D
		1555	1556	106.5	186.5	9.0	13.0	36%	0.75	3.9	E	4.0	D
		1556	1557	57.0	110.0	8.0	12.8	13%	0.93	1.7	B	3.7	C
65	outbound	**1524**	**1287**	**397.0**	**532.0**	**11.0**	**23.0**	**54%**	**0.34**	**3.0**	**D**	**3.6**	**C**
		1524	1525	78.0	127.0	12.0	25.0	66%	0.63	2.5	D	4.2	D
		1525	1526	127.0	196.9	13.0	25.0	84%	0.55	3.8	E	4.1	D
		1526	1286	105.5	169.0	11.0	20.0	70%	0.6	3.5	E	3.7	C
		1286	1287	69.0	112.9	11.0	23.0	54%	0.64	2.1	C	3.1	C
66	inbound	**1311**	**1315**	**532.0**	**689.3**	**12.0**	**26.0**	**81%**	**0.3**	**3.9**	**E**	**5.6**	**E**
		1311	1313	136.0	201.0	14.0	44.0	84%	0.48	3.7	E	4.7	D
		1313	1555	160.0	260.0	18.0	42.0	89%	0.62	5.1	F	4.8	D
		1555	1314	99.0	143.1	14.0	28.7	93%	0.45	3.0	D	4.2	D
		1314	1315	133.5	180.0	12.0	26.0	81%	0.35	4.0	F	10.6	F
66	outbound	**1365**	**1369**	**510.5**	**750.9**	**13.0**	**27.1**	**78%**	**0.47**	**3.7**	**E**	**7.1**	**E**
		1365	1366	124.0	238.7	16.0	39.0	82%	0.92	3.6	E	15.3	F
		1366	1526	120.5	194.0	15.0	31.0	89%	0.61	3.6	E	5.2	E
		1526	1367	99.0	165.9	14.0	30.0	77%	0.68	3.5	E	9.6	F
		1367	1369	152.0	261.0	13.0	27.1	78%	0.72	4.1	F	11.2	F

*Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).

Appendix C

Highway Volumes

Data Collection Locations

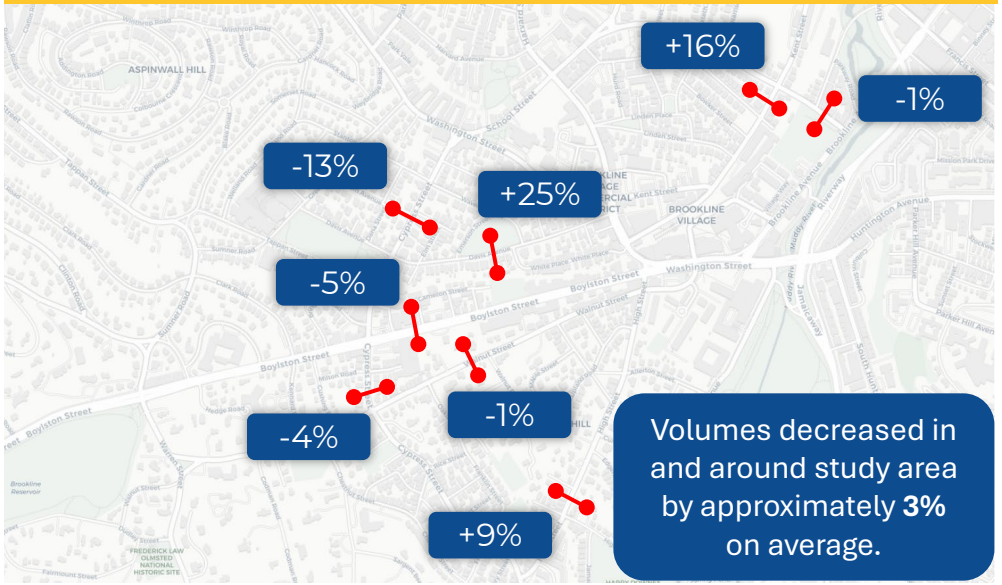


1. Aspinwall Ave, between Brookline Ave & Kent St
2. Kent St, between Aspinwall Ave & Brook St
3. Davis Ave, between Cypress St & Washington St
4. Cypress St, between Tappan St & Davis Ave
5. Cypress St, between Boylston St & Walnut St
6. Boylston St (Route 9), between Cypress St & High St
7. Walnut St, between Cypress St & High St
8. High St, between Cumberland Ave & Edgehill Rd

Quarter 2 Findings

Has the project impacted traffic on secondary streets and residential side streets?

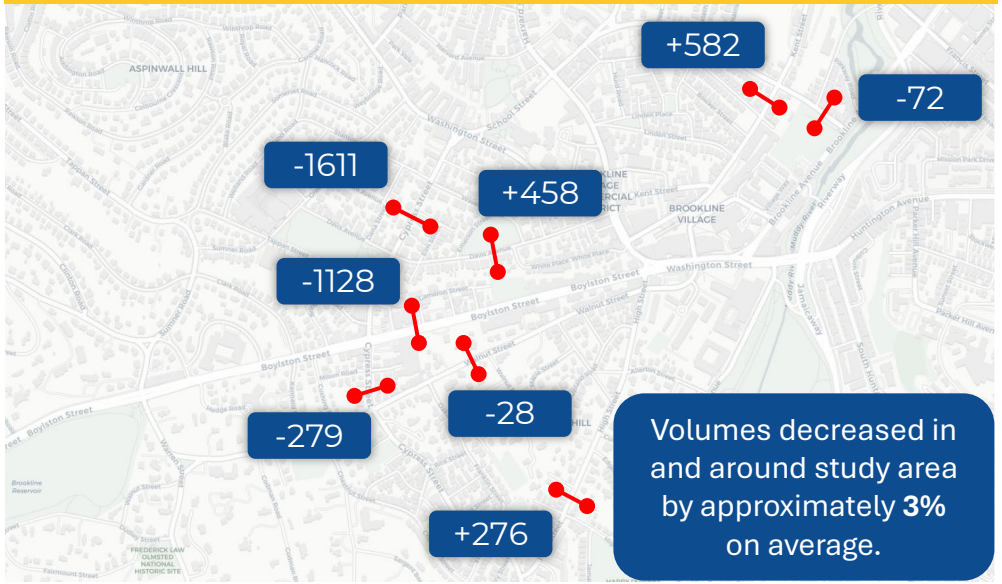
Q2 Average Daily Traffic (ADT) Volume Change – Percentage



- Traffic on Route 9 **decreased slightly** with **moderate increase** of traffic on side streets
- Some fluctuation with speeds, but in general **most observed speeds decreased**
- Could be options for **traffic calming** in the future if trends don't correct
- Nearby traffic patterns: **Pierce School** closed for construction and relocated to Old Lincoln School on Boylston St/Walnut St

Has the project impacted traffic on secondary streets and residential side streets?

Q2 Average Daily Traffic (ADT) Volume Change - Volumes



- Traffic on Route 9 **decreased slightly** with **moderate increase** of traffic on side streets
- Some fluctuation with speeds, but in general **most observed speeds decreased**
- Could be options for **traffic calming** in the future if trends don't correct
- Nearby traffic patterns: **Pierce School** closed for construction and relocated to Old Lincoln School on Boylston St/Walnut St

Has the project impacted speed on side streets?

Northbound/Eastbound

Location	NB/EB **50th** Percentile Speeds (MPH)			NB/EB **85th** Percentile speeds (MPH)		
	Baseline Sept 2023	**Q2 Speeds Feb 2025**	**Change**	Baseline Sept 2023	**Q2 Speeds Feb 2025**	**Change**
Aspinwall Ave, between Brookline Ave & Kent St	20.2	**18.5**	**-8.6%**	24.7	**23.7**	**-4.0%**
Kent St, between Aspinwall Ave & Brook St	18.0	**16.7**	**-7.4%**	24.1	**22.7**	**-6.0%**
Davis Ave, between Cypress St & Washington St	22.7	**19.9**	**-12.0%**	27.7	**24.6**	**-11.2%**
Cypress St, between Davis Ave & Gorham Ave	21.4	**19.8**	**-7.4%**	26.4	**24.3**	**-7.8%**
Cypress St, between Boylston St & Walnut St	19.5	**21.3**	**9.3%**	24.1	**25.1**	**+4.1%**
Boylston St (Rt 9), between Cypress St & High St	28.8	**27.3**	**-5.3%**	34.6	**34.2**	**-1.2%**
Walnut St, between Cypress St & High St	23.5	**21.5**	**-8.8%**	28.4	**25.7**	**-9.6%**
High St, between Cumberland Ave & Edgehill Rd	22.6	**26.2**	**+15.7%**	27.4	**29.8**	**+8.9%**

Speed % Change Key:

<-10%	-10% to -5%	-5% to -1%	-1% to +1%	+1% to +5%	+5% to +10%	>+10 %

Some fluctuation with speeds, but in general most observed speeds have decreased

Has the project impacted speed on side streets?

Southbound/Westbound

Location	NB/EB **50th** Percentile Speeds (MPH)			NB/EB **85th** Percentile speeds (MPH)		
	Baseline Sept 2023	**Q2 Speeds Feb 2025**	**Change**	Baseline Sept 2023	**Q2 Speeds Feb 2025**	**Change**
Aspinwall Ave, between Brookline Ave & Kent St	20.2	**20.8**	**+1.3%**	24.7	**24.5**	**-1.7**
Kent St, between Aspinwall Ave & Brook St	18.0	**21.3**	**-2.0%**	24.1	**24.9**	**-4.9**
Davis Ave, between Cypress St & Washington St	22.7	**17.5**	**-17.8%**	27.7	**22.6**	**-13.3**
Cypress St, between Davis Ave & Gorham Ave	21.4	**19.7**	**+1.9%**	26.4	**24.8**	**+0.0**
Cypress St, between Boylston St & Walnut St	19.5	**19.0**	**+5.0%**	24.1	**24.5**	**+3.5**
Boylston St (Rt 9), between Cypress St & High St	28.8	**27.9**	**-4.4%**	34.6	**34.9**	**-2.4**
Walnut St, between Cypress St & High St	23.5	**21.1**	**-6.6%**	28.4	**25.0**	**-8.4**
High St, between Cumberland Ave & Edgehill Rd	22.6	**24.7**	**+4.6%**	27.4	**29.1**	**+2.4**

Speed % Change Key:

<-10%	-10% to -5%	-5% to -1%	-1% to +1%	+1% to +5%	+5% to +10%	>+10 %

Some fluctuation with speeds, but in general most observed speeds have decreased

Quarter 2 Complete Results

Baseline Volumes – Sept 2023

Location	ADT	Peak AM	Peak PM
Aspinwall Ave, between Brookline Ave & Kent St	5,484	465	501
Kent St, between Aspinwall Ave & Brook St	3,605	364	292
Davis Ave, between Cypress St & Washington St	1,840	264	177
Cypress St, between Davis Ave & Gorham Ave	12,553	1113	932
Cypress St, between Boylston St & Walnut St	7,730	879	585
Boylston St (Rt 9), between Cypress St & High St	22,520	1777	1765
Walnut St, between Cypress St & High St	3,193	472	435
High St, between Cumberland Ave & Edgehill Rd	3,224	321	310
Total Volumes	**60,149**	**5,655**	**4,997**

Q2 Volumes – Feb 2025

Location	ADT	Change	Peak AM	Change	Peak PM	Change
Aspinwall Ave, between Brookline Ave & Kent St	5,412	**-1.3%**	626	**+34.6%**	559	**+11.6%**
Kent St, between Aspinwall Ave & Brook St	4,187	**+16.1%**	565	**+55.2%**	412	**+41.1%**
Davis Ave, between Cypress St & Washington St	2,298	**+24.9%**	336	**+27.3%**	248	**+40.1%**
Cypress St, between Davis Ave & Gorham Ave	10,942	**-12.8%**	877	**-21.2%**	980	**+5.2%**
Cypress St, between Boylston St & Walnut St	7,451	**-3.6%**	814	**-7.4%**	718	**+22.7%**
Boylston St (Rt 9), between Cypress St & High St	21,392	**-5.0%**	1,666	**-6.2%**	1,662	**-5.8%**
Walnut St, between Cypress St & High St	3,165	**-0.9%**	527	**+11.7%**	459	**+5.5%**
High St, between Cumberland Ave & Edgehill Rd	3,500	**+8.6%**	372	**+15.9%**	353	**+13.9%**
Total Volumes / Average % Change	58,347	**-3.0%**	5,783	**+2.3%**	5,391	**+7.9%**

Appendix D

Highway Travel Times and Control Delays

Study Locations

Intersections

1. Washington St at Station St
2. Boylston St (Route 9) at High St and Washington St
3. Washington St (Route 9) at Pearl St and Walnut St
4. Washington St (Route 9) at Brookline Ave

Corridors

1. Boylston St eastbound between Cypress St and High St
2. Washington St southbound between Boylston St and Harvard St
3. Brookline Ave northbound between Aspinwall Ave and Washington St.

Intersections

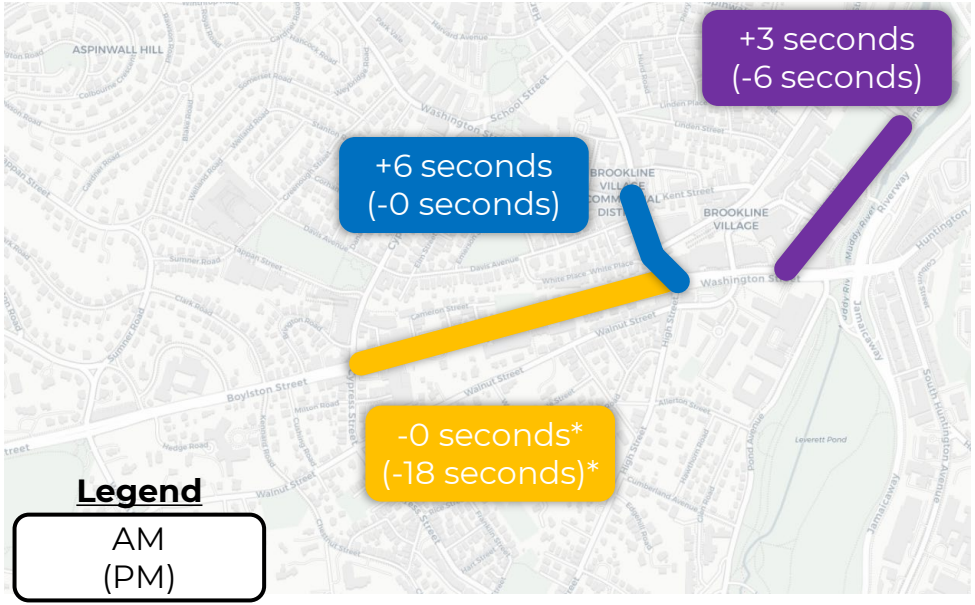
1. Washington St at Station St
2. Boylston St (Route 9) at High St and Washington St
3. Washington St (Route 9) at Pearl St and Walnut St
4. Washington St (Route 9) at Brookline Ave

Quarter 2 Findings

Has the project created impacts to general purpose traffic?

1. Boylston St eastbound between Cypress St and High St (**orange**)
2. Washington St southbound between Boylston St and Harvard St (**blue**)
3. Brookline Ave northbound between Aspinwall Ave and Washington St (**purple**)

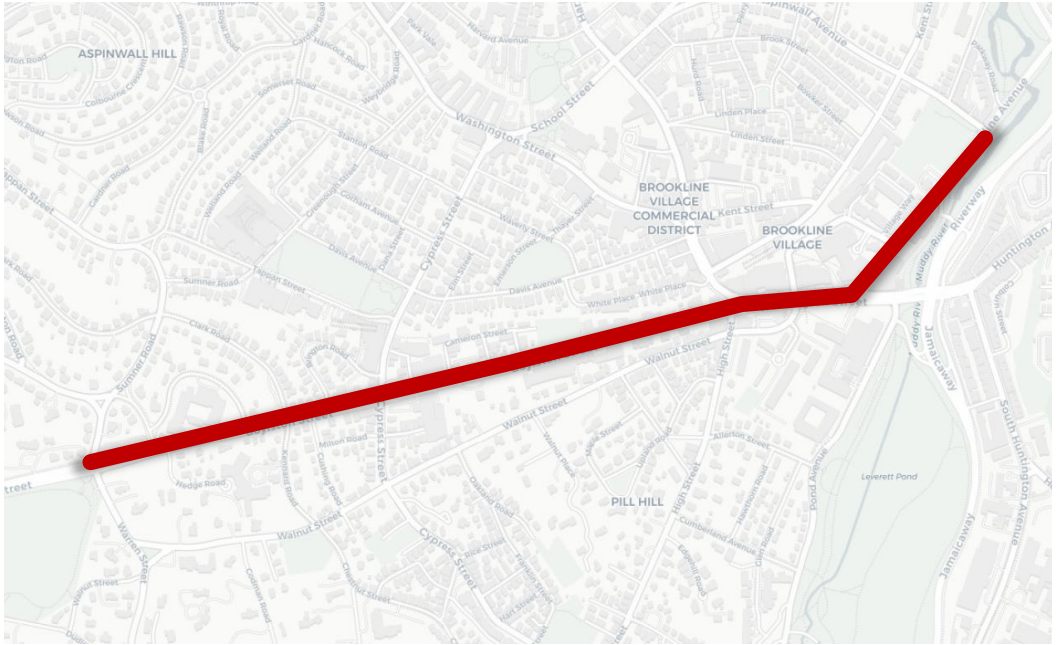
Has the project created impacts to general purpose traffic? Comparing Q2 to Baseline



- Intersection delay either remains constant or fluctuates slightly.
- *Data may be affected by INRIX platform limitations, but does not indicate significant increases in vehicle delay

Corridor Travel Time

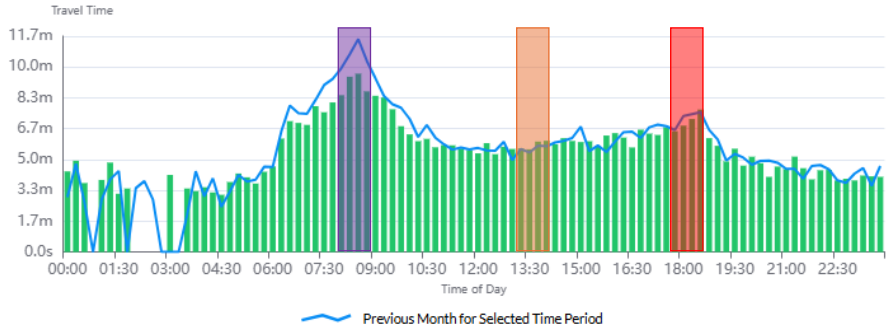
- Boylston Street & Brookline Avenue between Sumner Street and Aspinwall Avenue
- Approximately 1.2 miles
- Includes all three intersections in project area



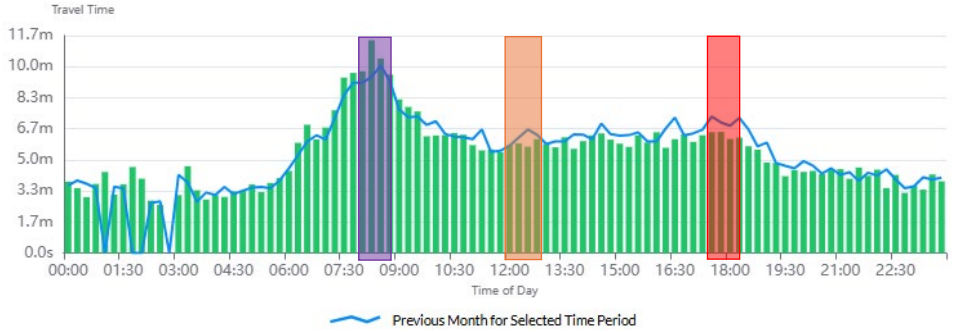
Q2 Travel Time - Boylston Street and Brookline Avenue inbound between Sumner Road and Aspinwall Avenue

Average Travel Time over Time of Day

Baseline



Quarter 2



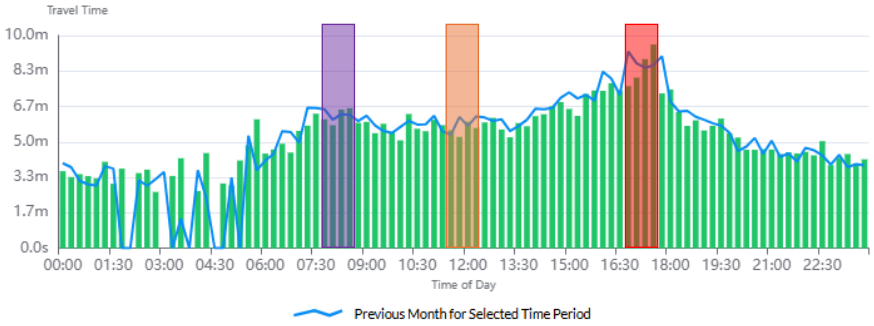
Period	Baseline Travel Time	Quarter 2 Travel Time
AM Peak Hour	9.0 minutes	10.3 minutes
MD Peak Hour	5.7 minutes	6.0 minutes
PM Peak Hour	7.0 minutes	6.4 minutes

Approximately 70 second increase in AM Peak travel time for vehicles travelling through all project area intersections, with MD and PM travel times remaining fairly constant

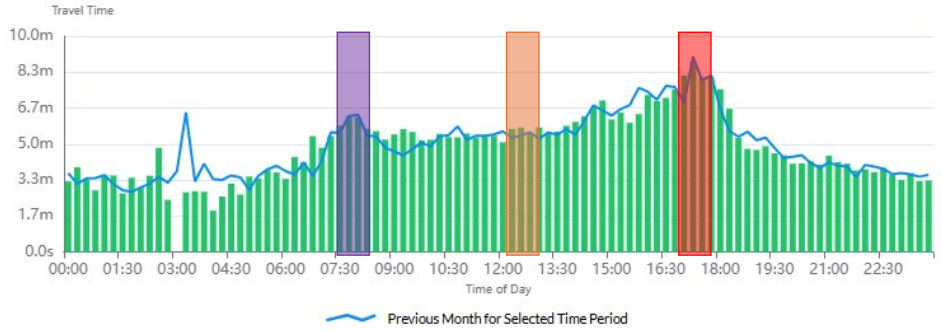
Q2 Travel Time - Boylston Street and Brookline Avenue outbound between Sumner Road and Aspinwall Avenue

Average Travel Time over Time of Day

Baseline



Quarter 2



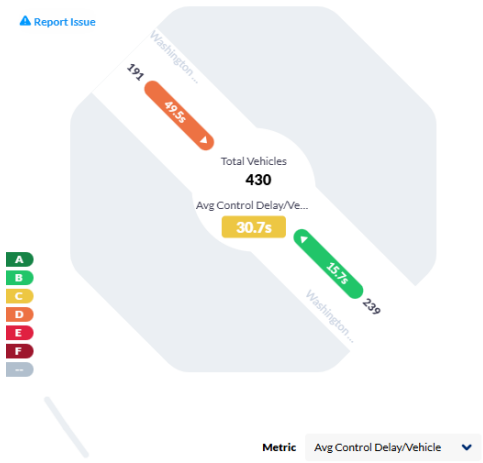
Period	Baseline Travel Time	Quarter 2 Travel Time
AM Peak Hour	6.2 minutes	6.0 minutes
MD Peak Hour	5.5 minutes	5.7 minutes
PM Peak Hour	8.5 minutes	8.3 minutes

Travel time remains relatively constant, increasing and decreasing by approximately 10 seconds for vehicles travelling through all project area intersections

Quarter 2 Complete Results

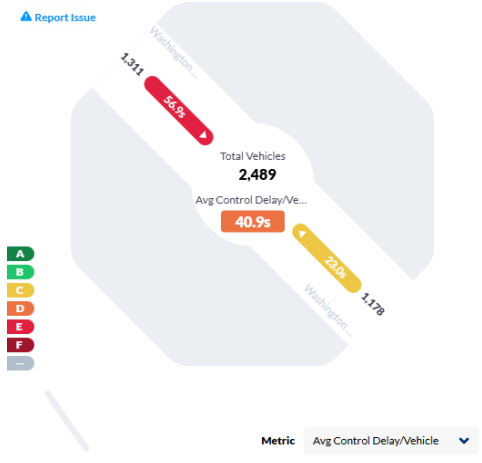
#1 Washington St at Station St – Baseline

Delay AM (6am-9am)



Delay PM (4pm-7pm)

Delay Avg. Daily



- Average intersection delay of about 40 seconds
- Average intersection delay varies from ~30-60 seconds during peak periods
- Most significant delay is Washington St southbound, in the PM peak (about 1.2 minutes)

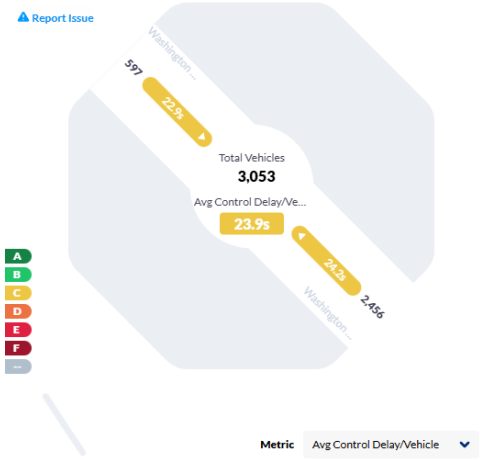
All data is from June 2024 weekdays.

#1 Washington St at Station St – Quarter 2

Delay AM (6am-9am)

Delay PM (4pm-7pm)

Delay Avg. Daily



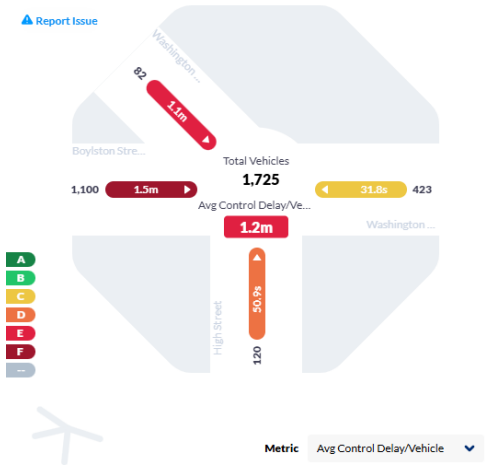
- **<u>9-29 second decrease in total intersection delay compared to Baseline</u>**
- Delay reduced for Washington St southbound at all times of day.

All data is from January 2025 weekdays.

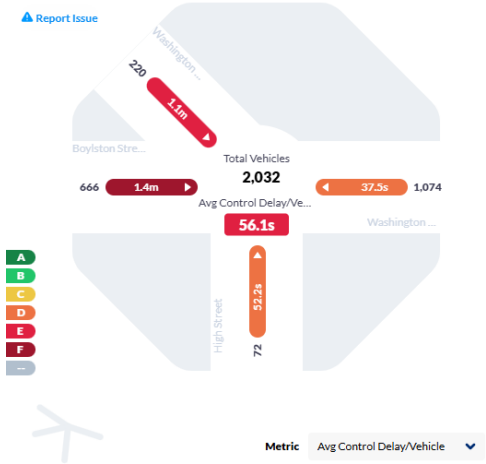
**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

#2 Boylston St (Route 9) at High St and Washington St – Baseline

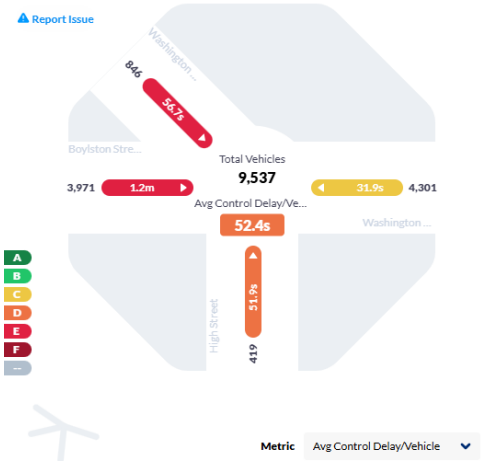
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily

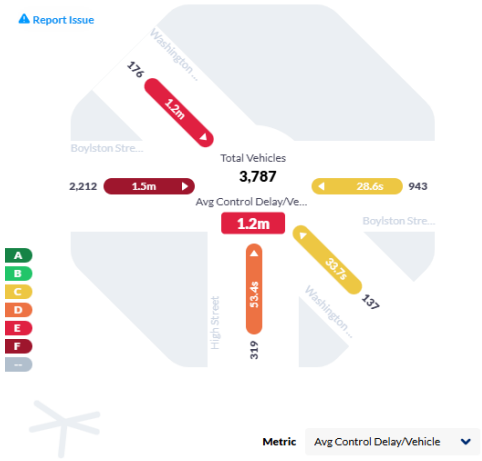


All data is from June 2024 weekdays.

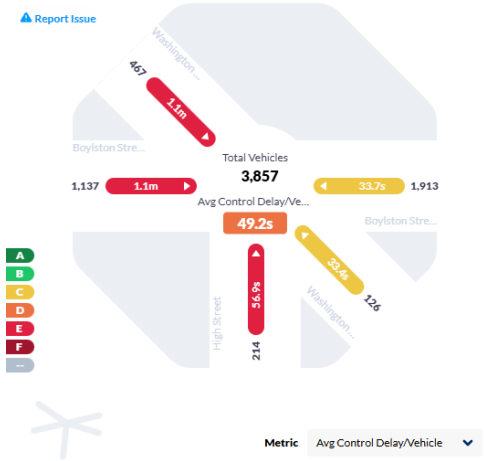
- Average intersection delay of about 1 minute throughout day
- Highest delay on Boylston St (Route 9), approximately 1.5 minutes during peak periods

#2 Boylston St (Route 9) at High St and Washington St – Quarter 2

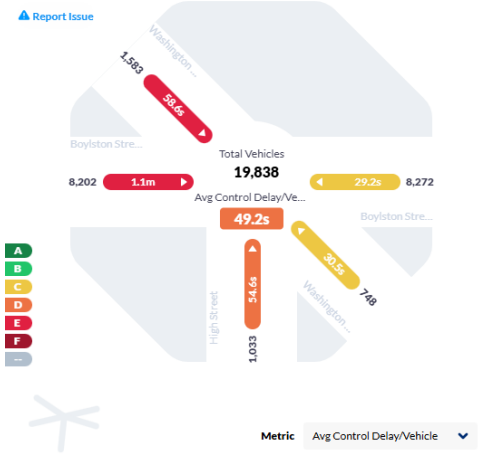
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



All data is from January 2025 weekdays.

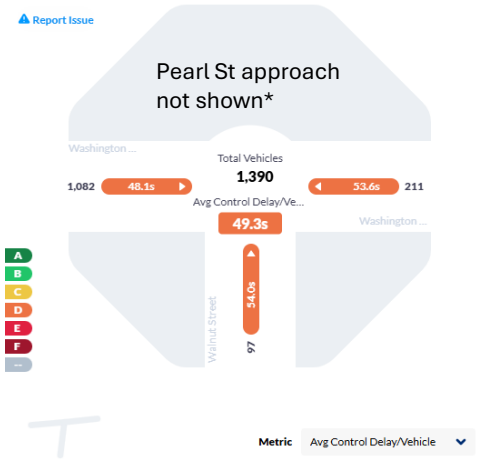
- **<u>Inrix shows slight decrease in total intersection delay compared to Baseline</u>**
- Long queue lengths extend past the 500' approach distance INRIX uses to collect data, so actual intersection delay is likely higher

**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

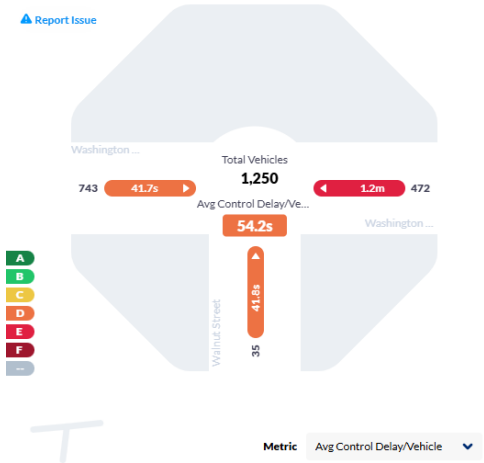
**Note Washington St northwest-bound approach represents westbound right turning movements. INRIX has changed how the approaches are displayed*

#3 Washington St (Route 9) at Pearl St and Walnut St – Baseline

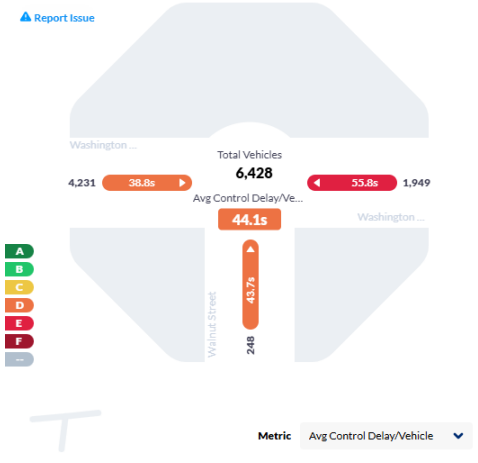
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



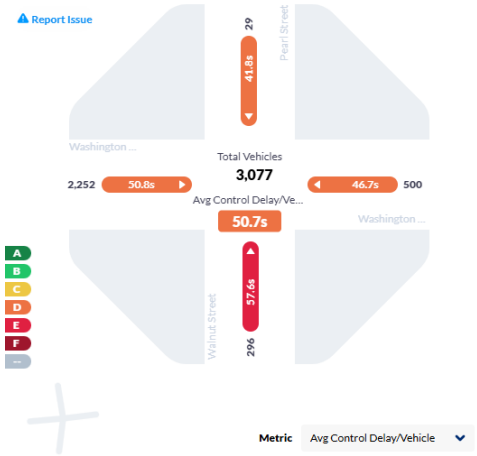
- Average intersection delay of 45-55 seconds throughout day
- Washington St (Route 9) through movements typically see highest delay

All data is from June 2024 weekdays.

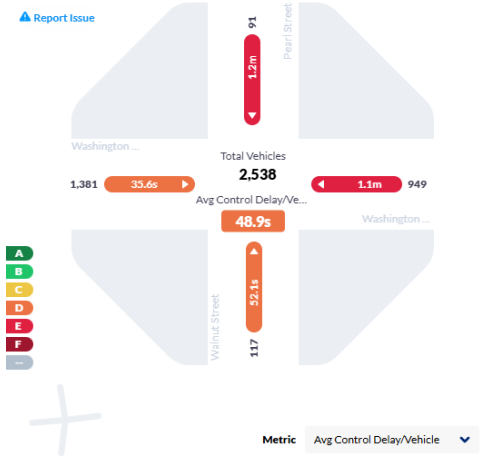
**Intersection diagram is missing the Pearl St approach because no volumes were recorded by INRIX at this approach during June 2024*

#3 Washington St (Route 9) at Pearl St and Walnut St – Quarter 2

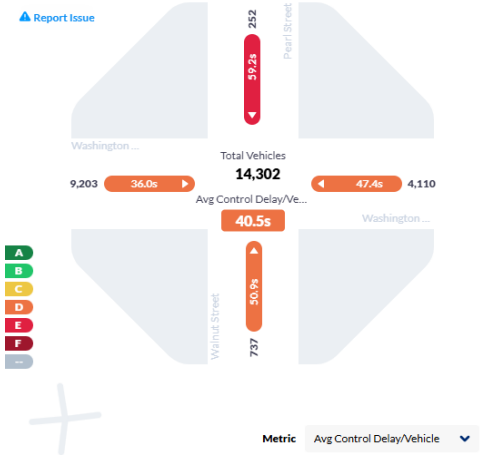
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



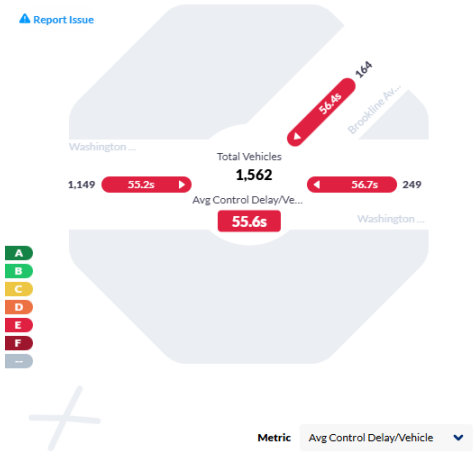
- **<u>~4 second decrease in average intersection delay compared to Baseline</u>**
- All movements see slight fluctuations in delay

All data is from January 2025 weekdays.

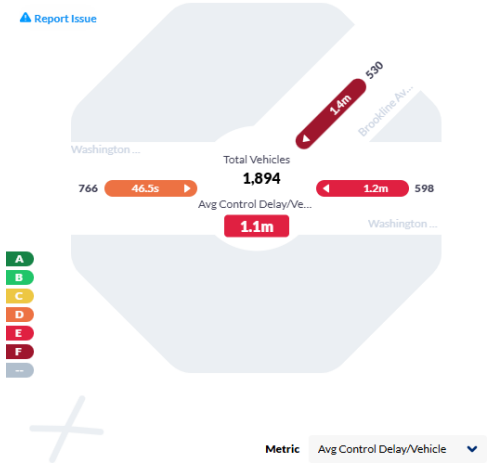
**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

#4 Washington St (Route 9) at Brookline Ave - Baseline

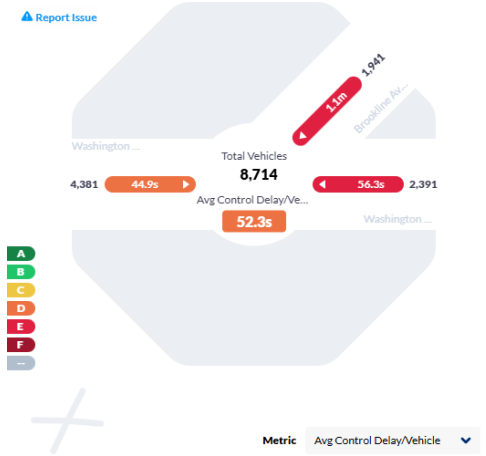
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



- Average intersection delay of ~50-70 seconds throughout day
- Highest delays are approaching project area
- Generally lesser delays leaving project area

All data is from June 2024 weekdays.

**Intersection diagram is missing the northbound approach because no volumes were recorded by INRIX at this approach during June 2024*

#4 Washington St (Route 9) at Brookline Ave – Quarter 2

Delay AM (6am-9am)

Delay PM (4pm-7pm)

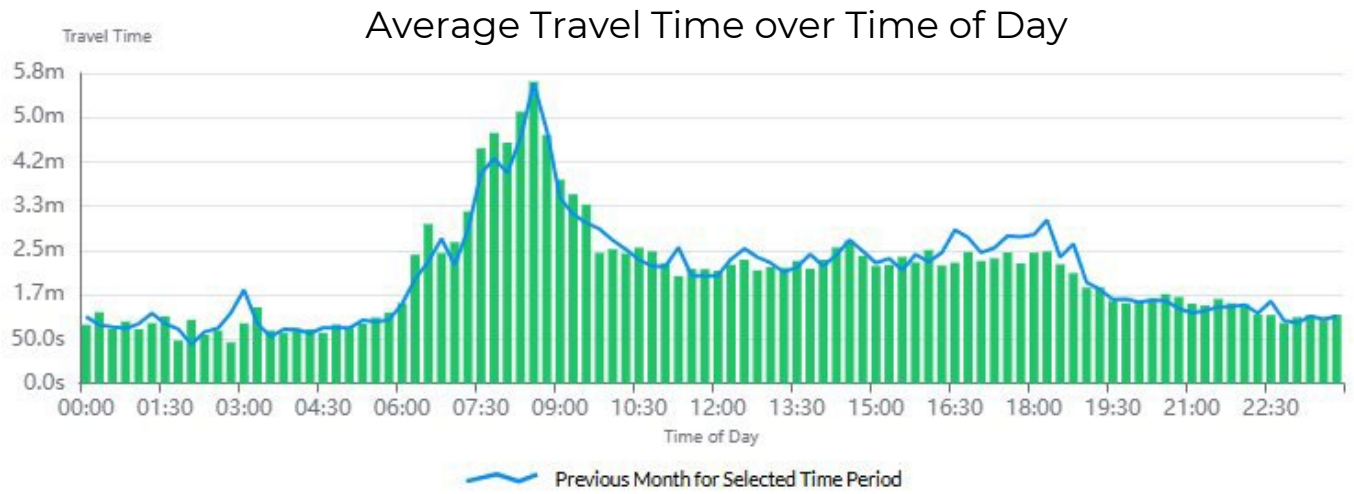
Delay Avg. Daily

- **<u>Generally, no change in total intersection delay</u>**
- All movements see slight fluctuations in delay

All data is from January 2025 weekdays.

**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

Q2 Travel Time - Boylston St eastbound from Cypress St to High St

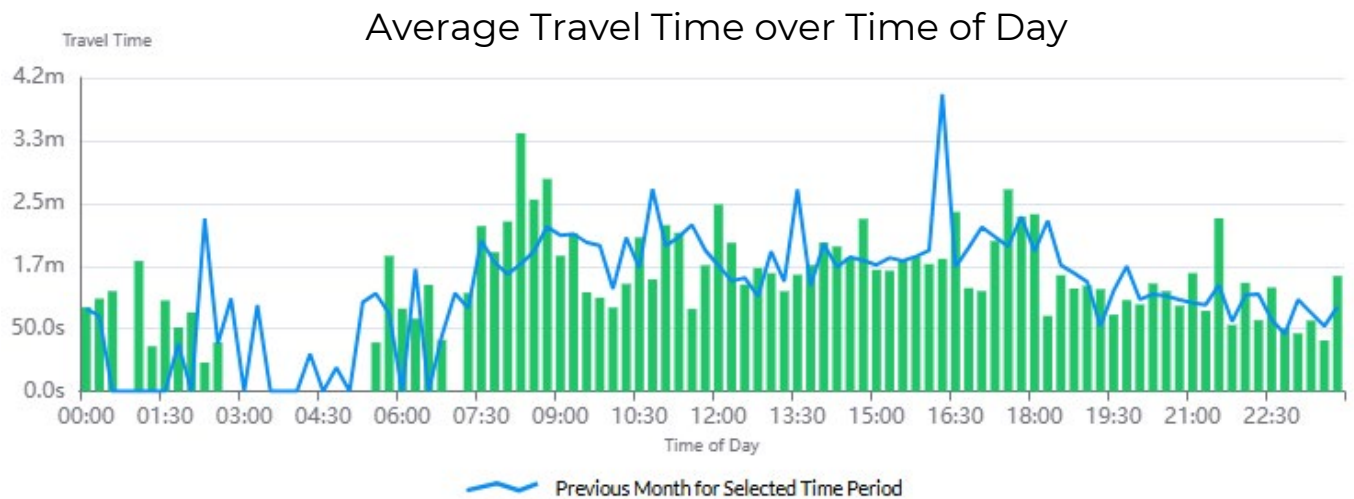


All data is from January 2025 weekdays.

Period	Travel Time	Time of Day
AM Peak Hour	5.0 minutes	8:00am-9:00am
MD Peak Hour	2.5 minutes	2:00pm-3:00pm
PM Peak Hour	2.5 minutes	5:30pm-6:30pm

**Baseline data not available from INRIX.*

Q2 Travel Time - Washington St southbound from Harvard St to Boylston St

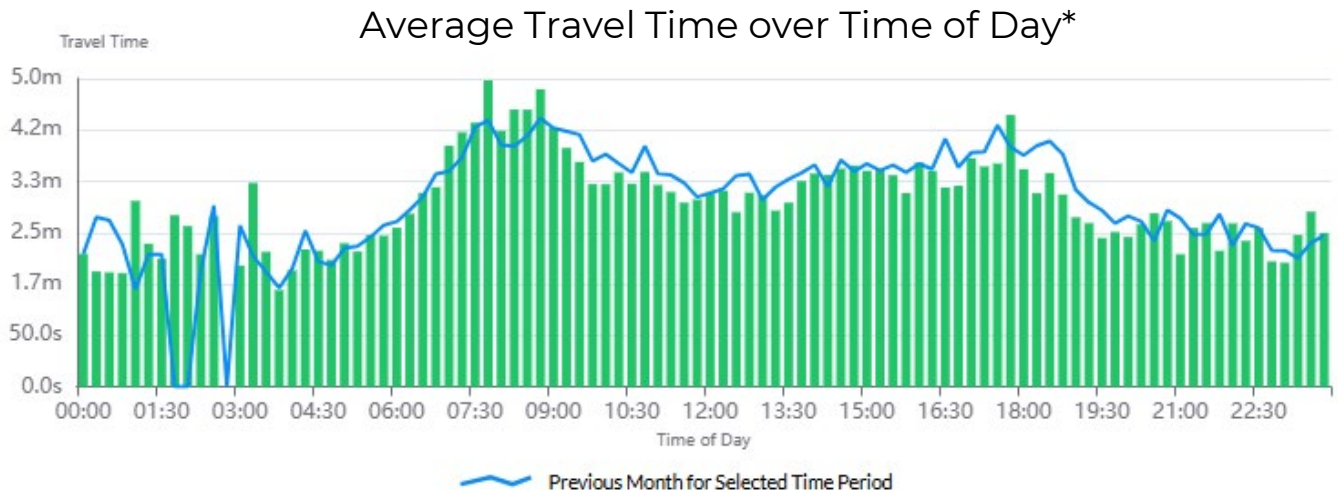


All data is from January 2025 weekdays.

Period	Travel Time	Time of Day
AM Peak Hour	2.8 minutes	8:00am-9:00am
MD Peak Hour	2.0 minutes	2:00pm-3:00pm
PM Peak Hour	2.4 minutes	5:15pm-6:15pm

**Baseline data not available from INRIX.*

Q2 Travel Time - Brookline Ave northbound from Washington St to Aspinwall Ave



All data is from January 2025 weekdays.

Period	Travel Time**	Time of Day
AM Peak Hour	4.6 minutes	7:45am-8:45am
MD Peak Hour	3.5 minutes	2:00pm-3:00pm
PM Peak Hour	3.8 minutes	5:00pm-6:00pm

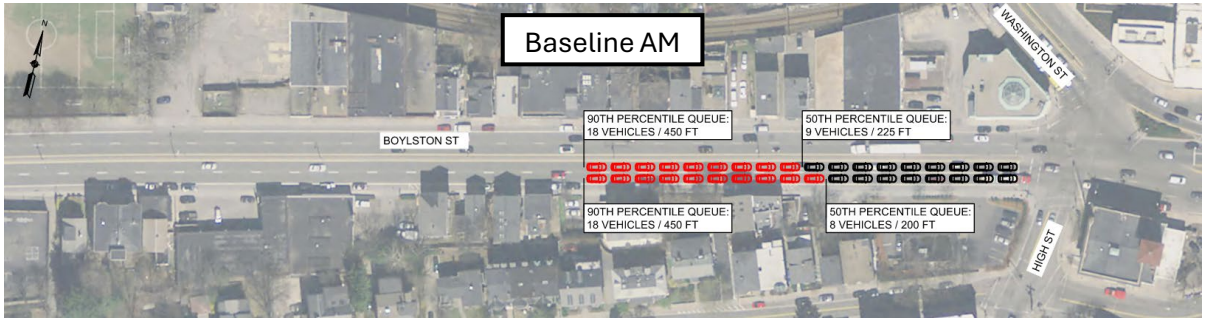
**Baseline data not available from INRIX.*
***Note this includes delay at the Washington St & Brookline intersection approach.*

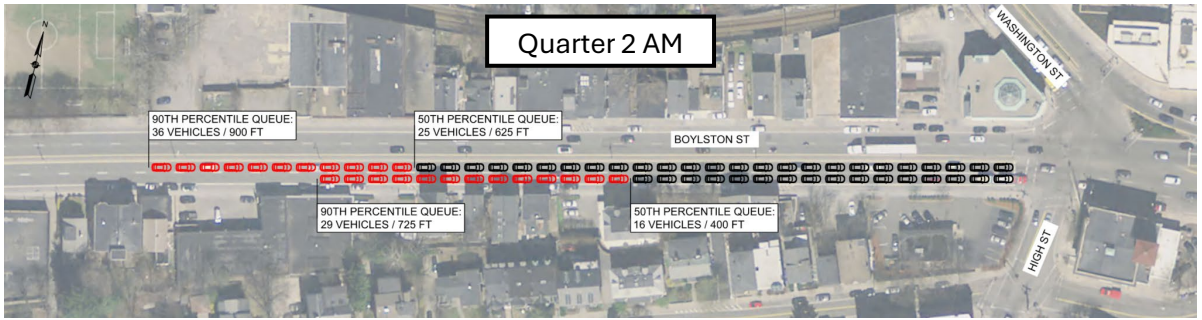
Appendix E

Queueing Data

Q2 Findings

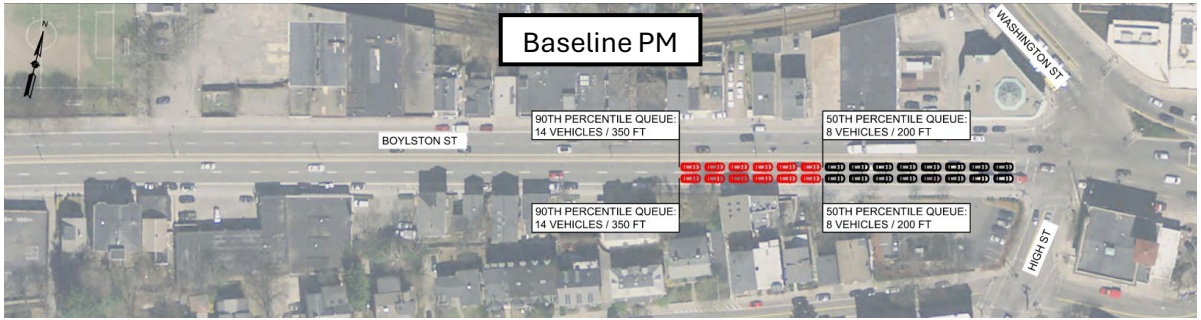
Boylston Street (Rt 9), approaching Washington Street, AM

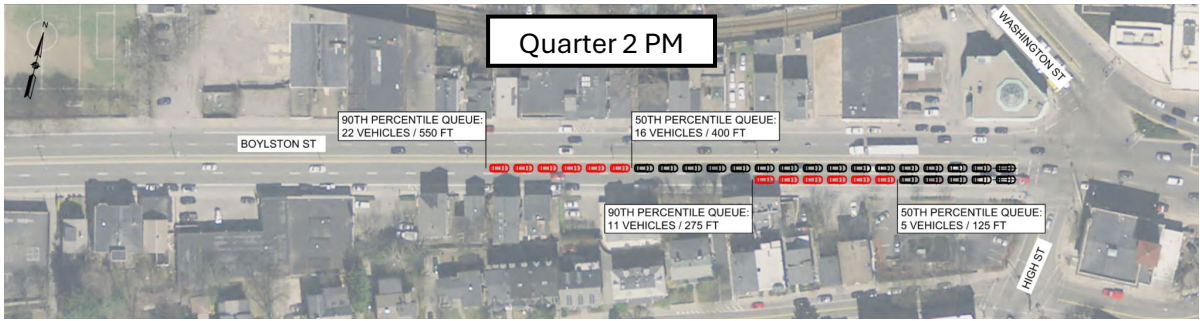




- Significant increase in AM vehicle queues

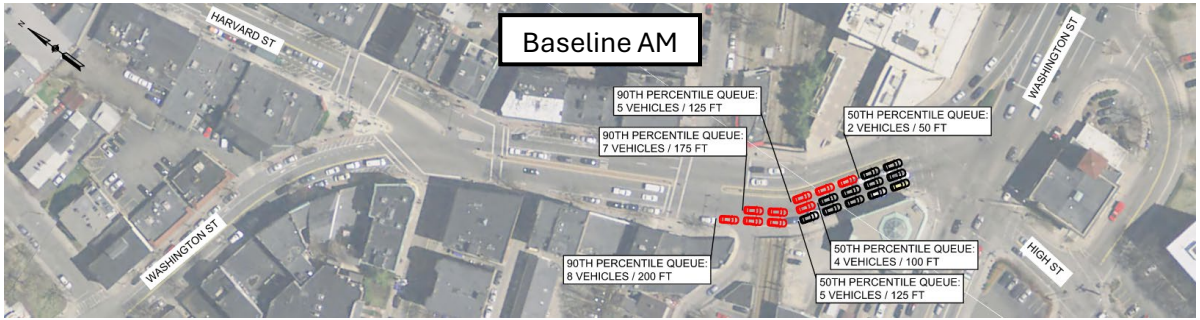
Boylston Street (Rt 9), approaching Washington Street, PM

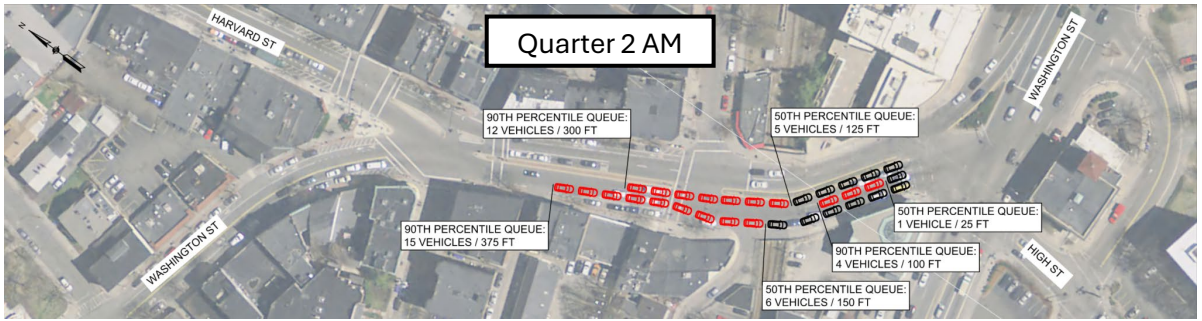




- Slight increase in PM vehicle queues

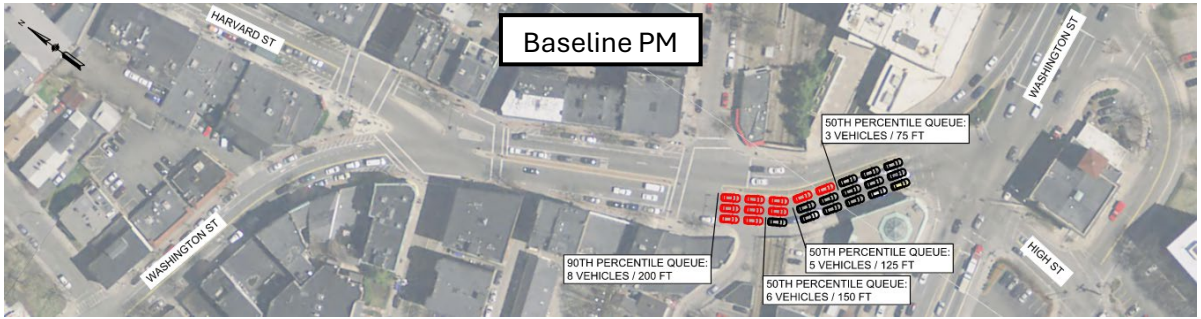
Washington Street, approaching Boylston Street (Rt 9), AM

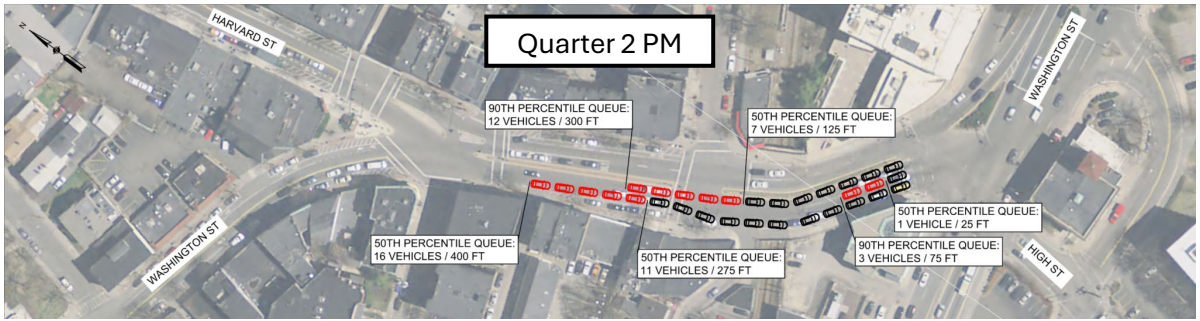




- Increase in AM vehicle queues

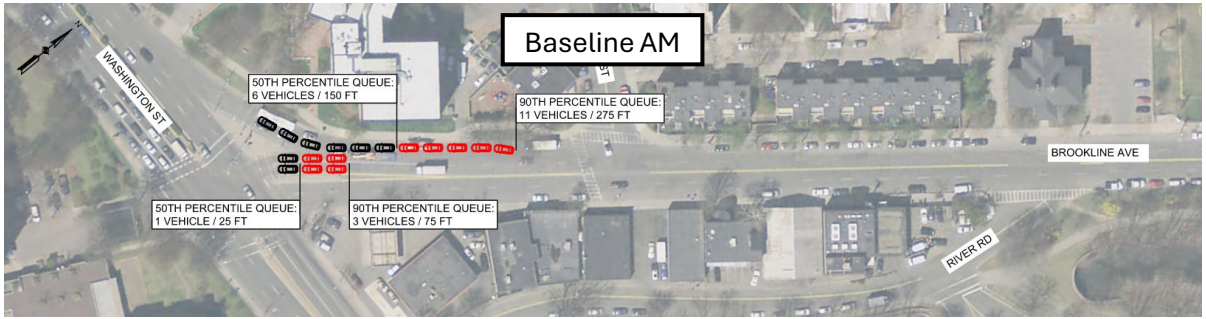
Washington Street, approaching Boylston Street (Rt 9), PM

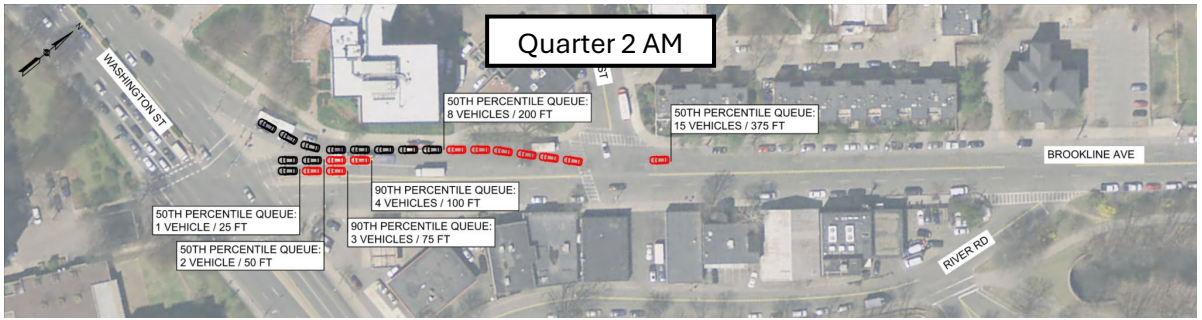




- Increase in PM vehicle queues

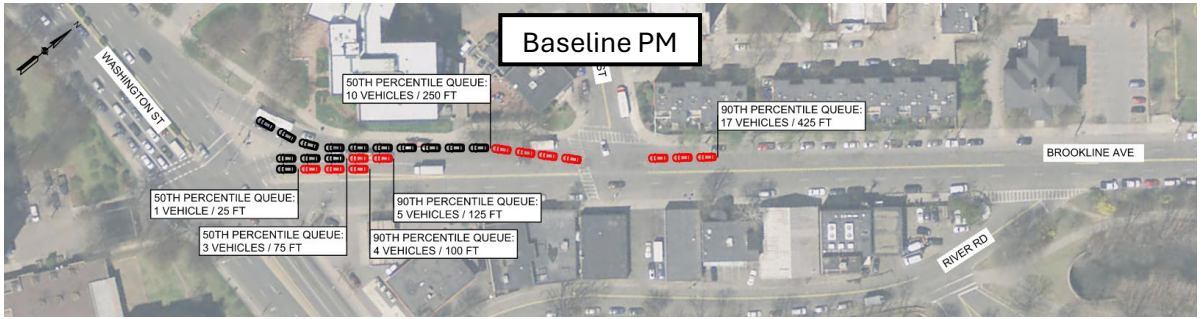
Brookline Avenue, approaching Washington Street (Rt 9), AM

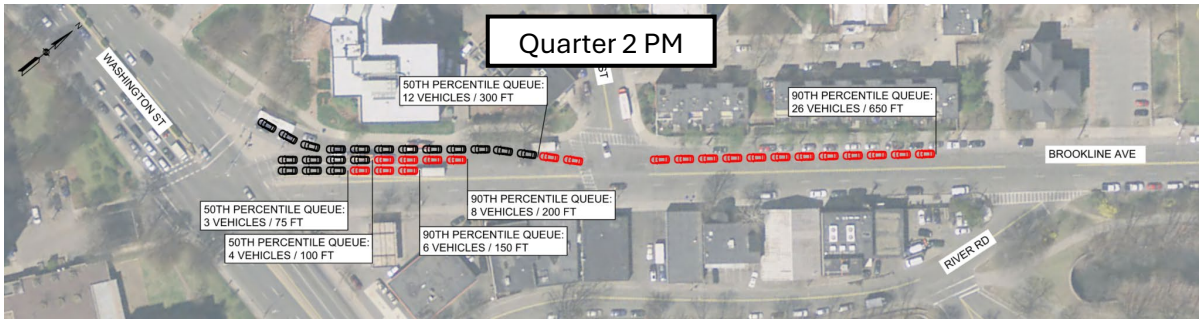




- Slight decrease in AM vehicle queues

Brookline Avenue, approaching Washington Street (Rt 9), PM





- Increase in PM vehicle queues

Quarter 2 Complete Results

Queue Length of Boylston St EB, west of Washington St

		Left Lane		Right Lane		Total		
		Baseline	Q2	Baseline	Q2	Baseline	Q2	Change
	10th %ile	2	12	1	3	3	15	+485%
AM	50th %ile	9	25	8	16	17	41	**+141%**
AM	90th %ile	18	36	18	29	36	65	**+80%**
	Longest	25	39	25	37	50	76	+52%
	10th %ile	1	6	1	1	2	7	+229%
PM	50th %ile	8	16	8	5	16	21	**+28%**
PM	90th %ile	14	22	14	11	28	33	**+19%**
	Longest	21	25	22	17	43	42	-2%

Queue Length of Washington St SB, north of Boylston St

		Left Lane		Center Lane		Right Lane		Total		
		Baseline	Q2	Baseline	Q2	Baseline	Q2	Baseline	Q2	Change
AM	10th %ile	0	1	2	0	2	1	4	2	-50%
	50th %ile	2	5	4	1	5	6	11	12	**+9%**
	90th %ile	5	12	7	4	8	15	20	31	**+55%**
	Longest	8	17	13	6	9	21	30	44	+47%
PM	10th %ile	1	3	1	0	4	5	6	8	+35%
	50th %ile	3	7	5	1	6	11	14	19	**+36%**
	90th %ile	8	12	8	3	8	16	24	31	**+29%**
	Longest	28	16	10	4	11	20	49	40	-18%

Bus only lane

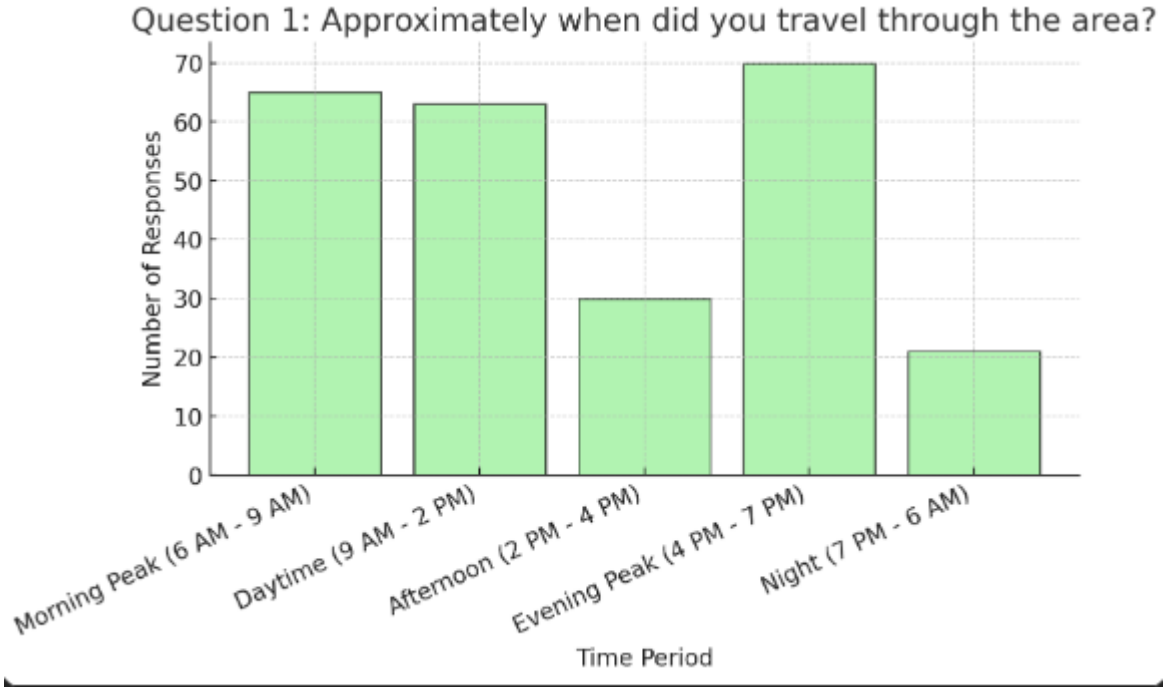
Queue Length of Brookline Ave SB, north of Boylston St

		Left Lane		Center Lane		Right Lane		Total		
		Baseline	Q2	Baseline	Q2	Baseline	Q2	Baseline	Q2	Change
AM	10th %ile	0	0	0	0	1	2	1	2	+100%
	50th %ile	1	1	1	2	6	8	8	11	**+38%**
	90th %ile	3	3	3	4	11	15	17	22	**+27%**
	Longest	4	6	4	7	16	16	24	29	+21%
PM	10th %ile	0	1	1	2	4	5	5	7	+51%
	50th %ile	1	3	3	4	10	12	14	19	**+32%**
	90th %ile	4	6	5	8	17	26	26	40	**+55%**
	Longest	6	10	8	11	21	41	35	62	+77%

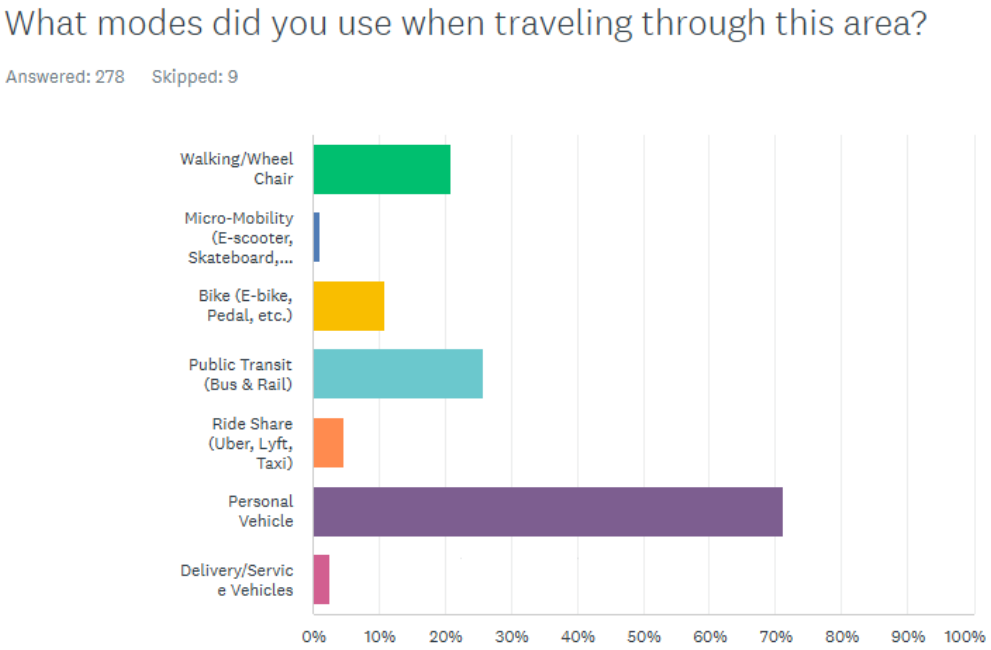
Appendix F

Survey Results as of March 5, 2025

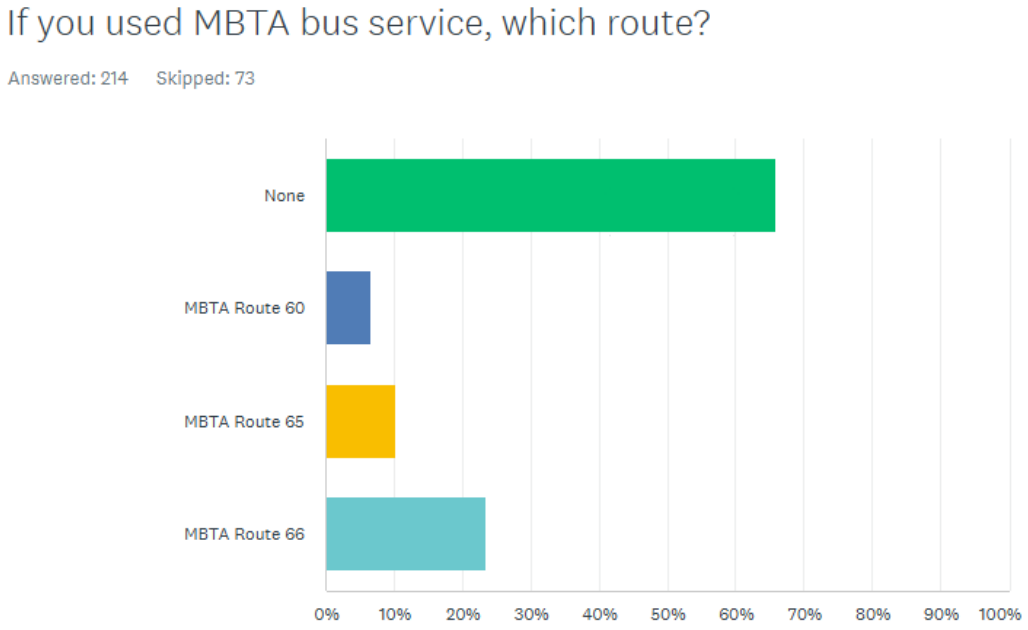
Gateway East Bus Lanes Pilot Survey: Question 1



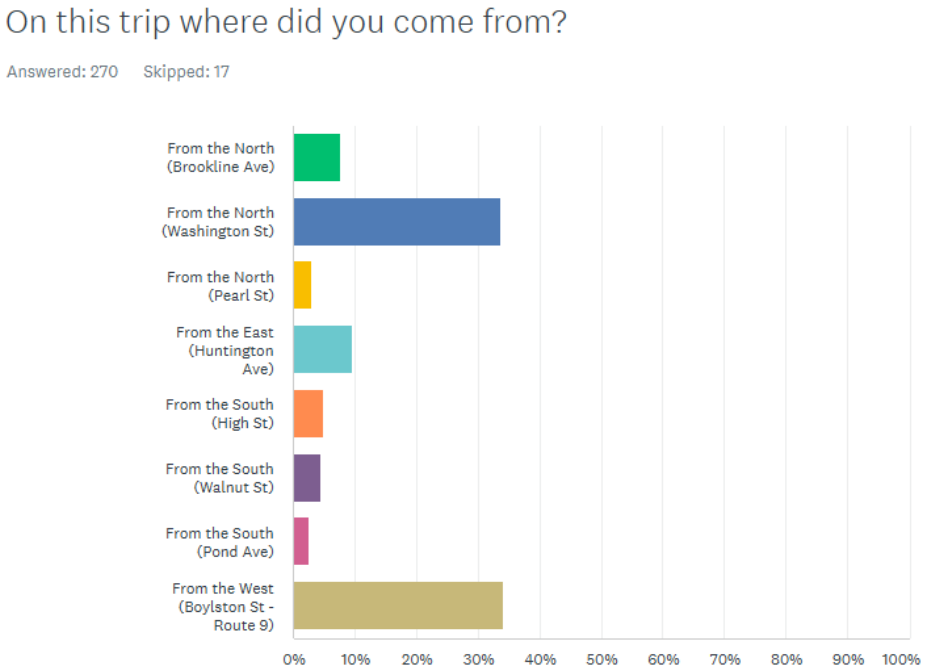
Gateway East Bus Lanes Pilot Survey – Question 2



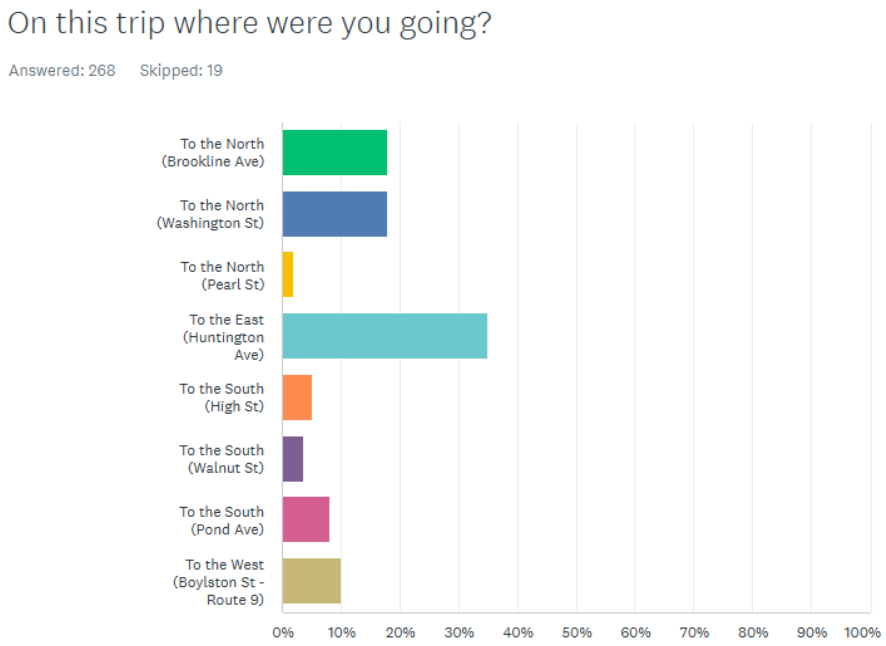
Gateway East Bus Lanes Pilot Survey – Question 3



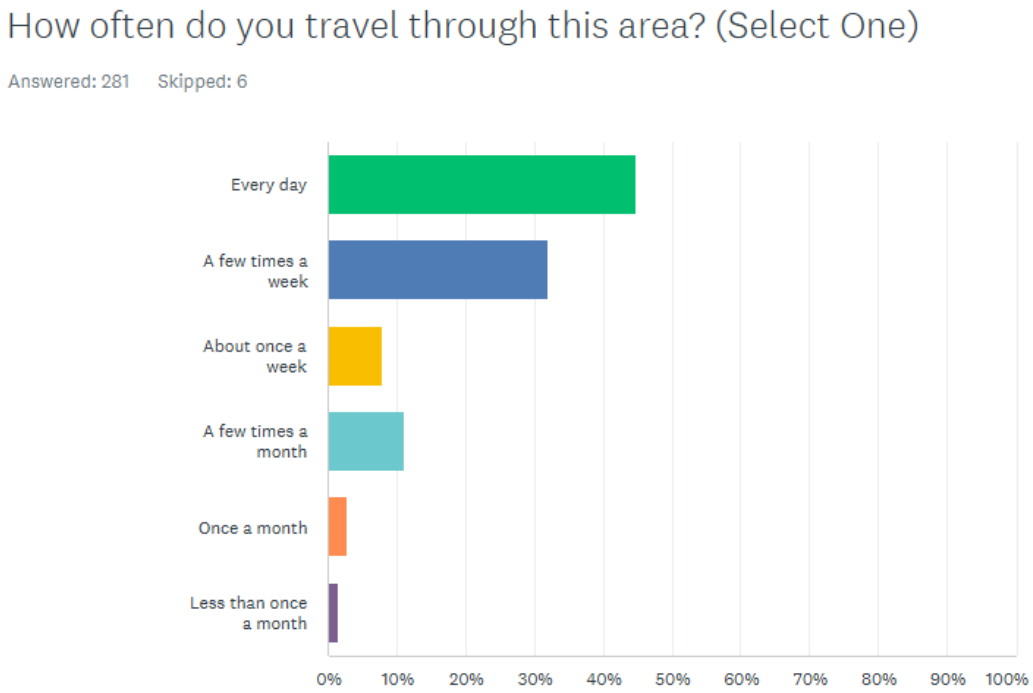
Gateway East Bus Lanes Pilot Survey – Question 4



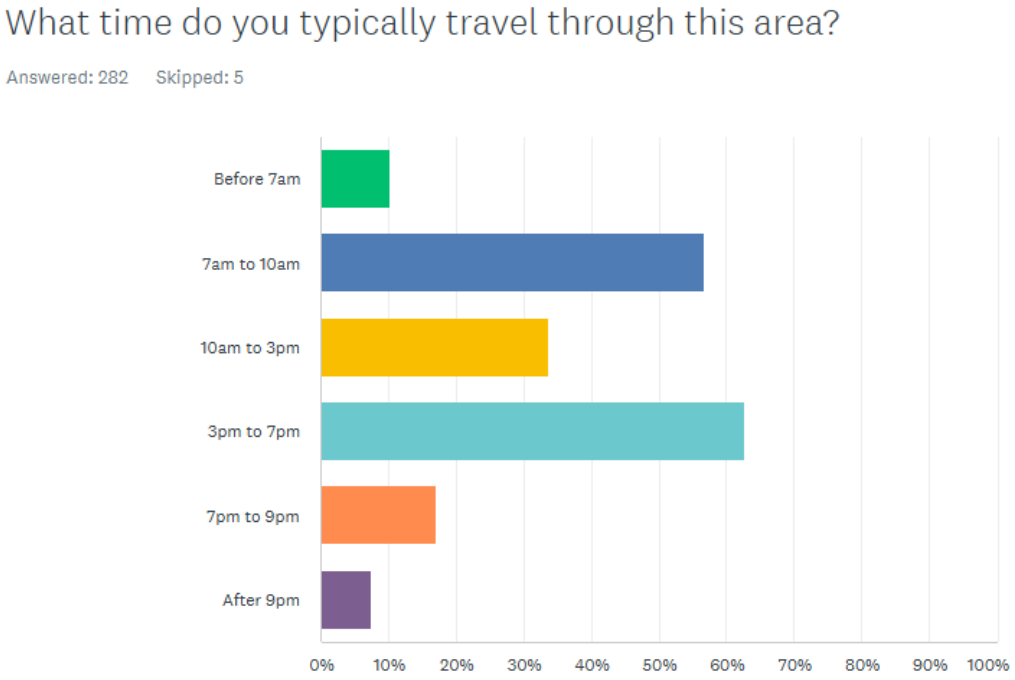
Gateway East Bus Lanes Pilot Survey – Question 5



Gateway East Bus Lanes Pilot Survey – Question 6



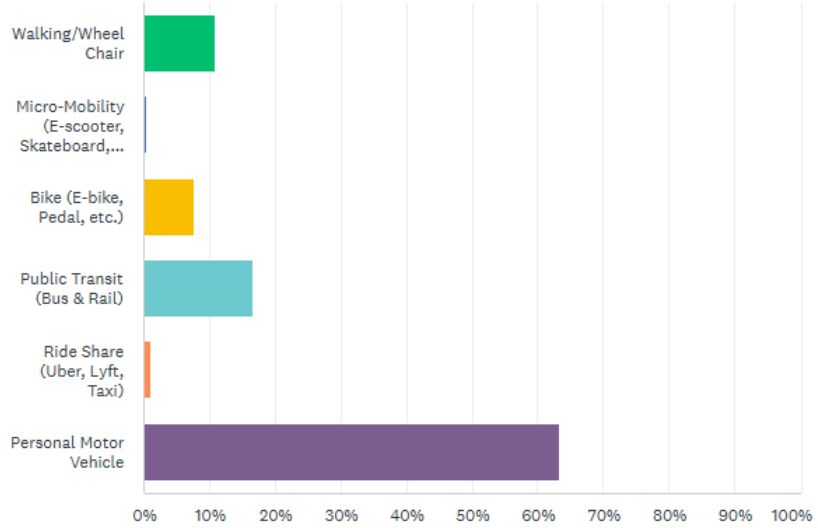
Gateway East Bus Lanes Pilot Survey – Question 7



Gateway East Bus Lanes Pilot Survey – Question 8

What is your primary mode of transportation when traveling through this area? (Select one)

Answered: 283 Skipped: 4



Gateway East Bus Lanes Pilot Survey – Question 9

The dedicated bus lane has improved safety for:

Answered: 283 Skipped: 4

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE	TOTAL
those walking through this area	38.18% 105	13.82% 38	25.45% 70	11.27% 31	11.27% 31	275
those biking or using micro-mobility devices through this area	37.50% 102	16.18% 44	23.16% 63	12.13% 33	11.03% 30	272
those taking public transit through this area.	24.72% 67	8.49% 23	28.41% 77	20.66% 56	17.71% 48	271
those driving through this area.	54.64% 153	12.50% 35	16.07% 45	10.00% 28	6.79% 19	280

Gateway East Bus Lanes Pilot Survey – Question 10

The dedicated bus lane has improved access for:

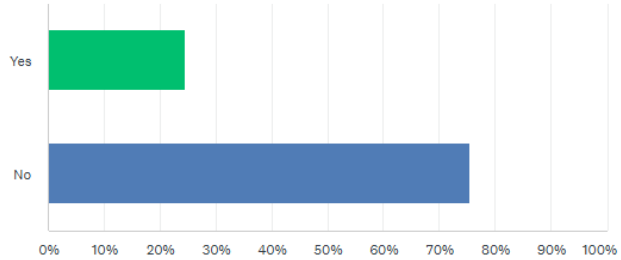
Answered: 282 Skipped: 5

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE	TOTAL
those walking through this area	36.59% 101	13.41% 37	29.35% 81	9.78% 27	10.87% 30	276
those biking or using micro-mobility devices through this area	33.46% 91	15.44% 42	26.47% 72	13.60% 37	11.03% 30	272
those taking public transit through this area.	23.33% 63	9.63% 26	21.48% 58	22.59% 61	22.96% 62	270
for those driving through this area.	58.27% 162	12.95% 36	20.14% 56	4.32% 12	4.32% 12	278

Gateway East Bus Lanes Pilot Survey – Question 11 & 12

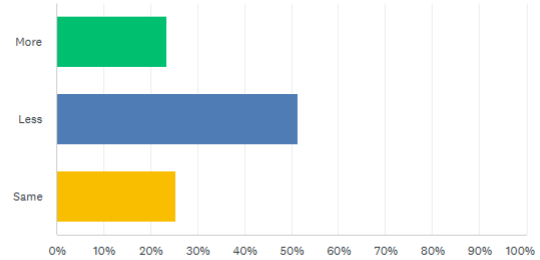
Do you feel your trip is faster with the bus lanes?

Answered: 274 Skipped: 13



Do you feel that your trip time is more or less consistent from day to day with the bus lanes?

Answered: 269 Skipped: 18



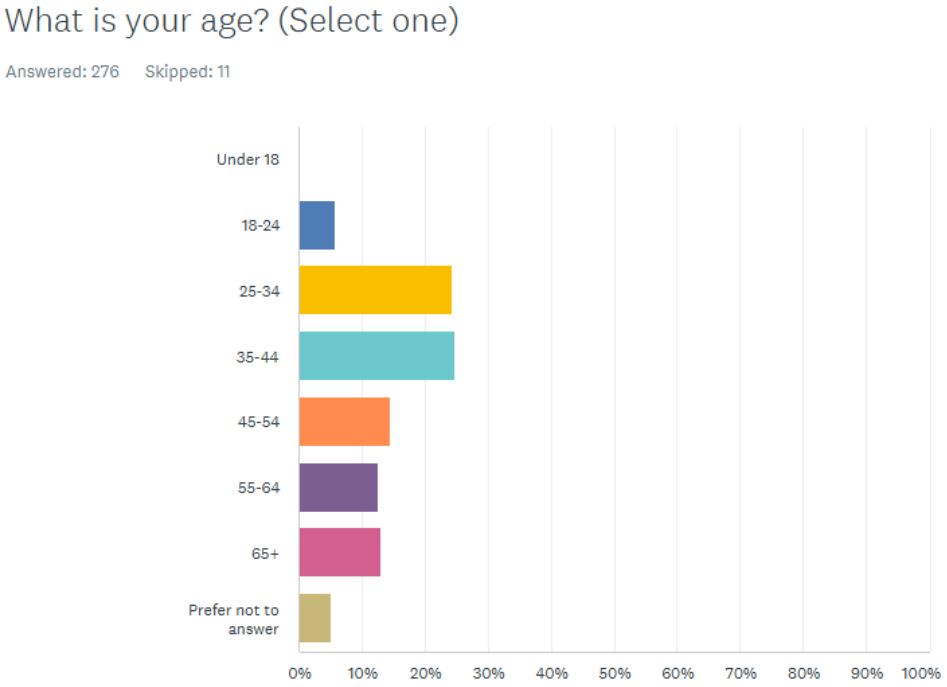
Gateway East Bus Lanes Pilot Survey – Question 13

- Q13 Has the dedicated bus lanes caused you to change how you travel through the area? (Open ended)
    - 175 responses Key Themes from the Open ended Comments:
        - Negative Feedback (~75%):
            - Increased Traffic congestion and delays.
            - Drivers feel confused and forced into last-minute lane changes.
            - Insufficient bus frequency to justify the dedicated lane.
            - Gridlock caused by poorly timed traffic signal and misuse of the lane.
            - Attempts to avoid area.
        - Positive Feedback (~10%):
            - Improved reliability and speed for buses.
            - Some responder are more likely to use buses.
        - Neutral or Unclear Feedback (~15%):
            - Observations without a clear stance (e.g., “no noticeable change”)
            - Mixed sentiments that acknowledge both pros and cons.

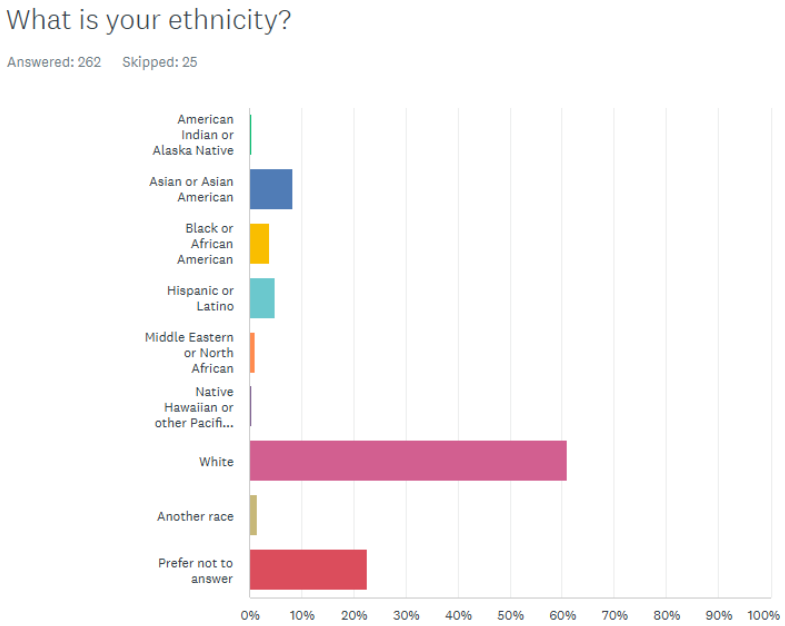
Gateway East Bus Lanes Pilot Survey – Question 14

- Q14 Should the Town and MBTA make changes to the dedicated bus lanes? (Open-ended)
    - 180 responses Key Themes from the Open ended Comments:
        - Negative Feedback (~60%):
            - Strong calls to remove remove the bus lanes or restrict their hours of operation.
            - Frustration over increased congestion and poor implementation while the bus lane is empty.
            - Concerns about drivers not respecting the bus lanes and safety issues with merging and turning.
            - Concerns about unsafe merging, turning conflicts, and widespread driver disregard for bus lane restrictions.
        - Positive Feedback (~20%):
            - Suggestions to adjust signal timings and improve enforcement.
            - Recognition of the potential for better transit efficiency if changes are made.
        - Neutral or Unclear Feedback (~20%)
            - Observations without a clear stance (e.g., “no noticeable change”, “lack of enforcement”)
            - Mixed sentiments that acknowledge both pros and cons.

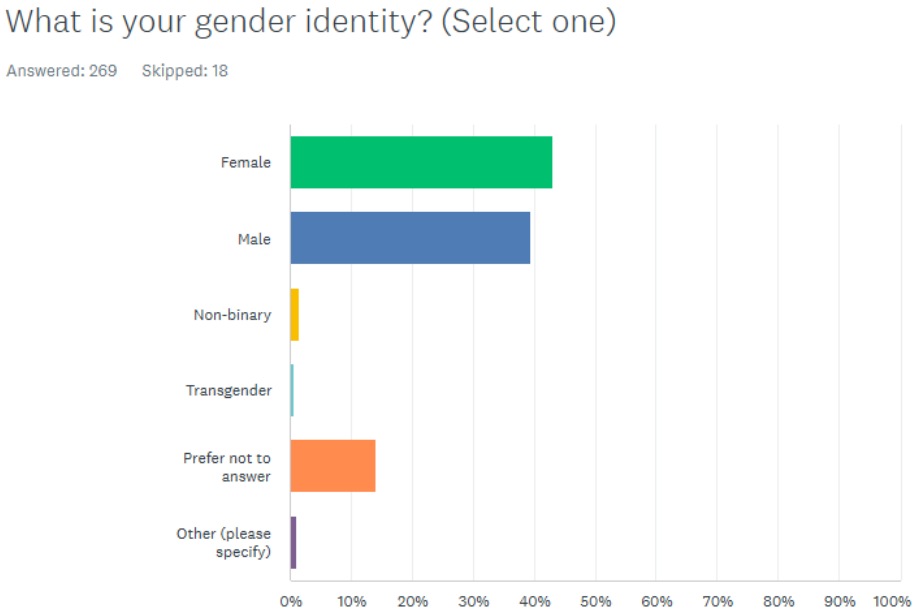
Gateway East Bus Lanes Pilot Survey – Question 15



Gateway East Bus Lanes Pilot Survey – Question 16



Gateway East Bus Lanes Pilot Survey – Question 17



Gateway East Bus Lanes Pilot Survey – Question 18