



Mass Ave Partial Construction Project



*Joint Transportation
Committee
May 15, 2024*

Topics

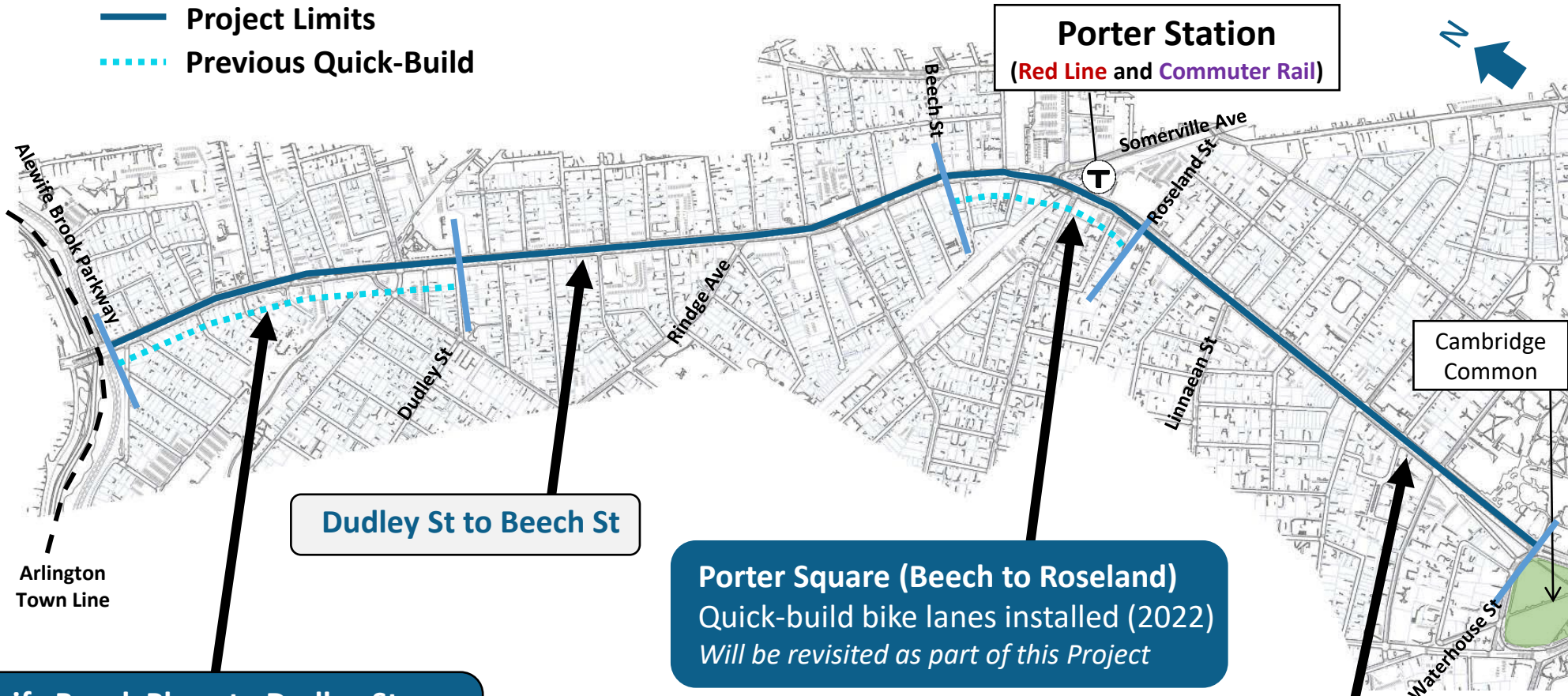
- Project Status
- Concept Design Overview
- Intersection Operations
- Crosswalks & Curb Uses
- Feedback & Discussion
- Project Next Steps



Partial Construction Project Limits

Massachusetts Ave from Waterhouse Street to Alewife Brook Parkway

- Project Limits
- - - Previous Quick-Build



Porter Station
(Red Line and Commuter Rail)

Dudley St to Beech St

Porter Square (Beech to Roseland)
Quick-build bike lanes installed (2022)
Will be revisited as part of this Project

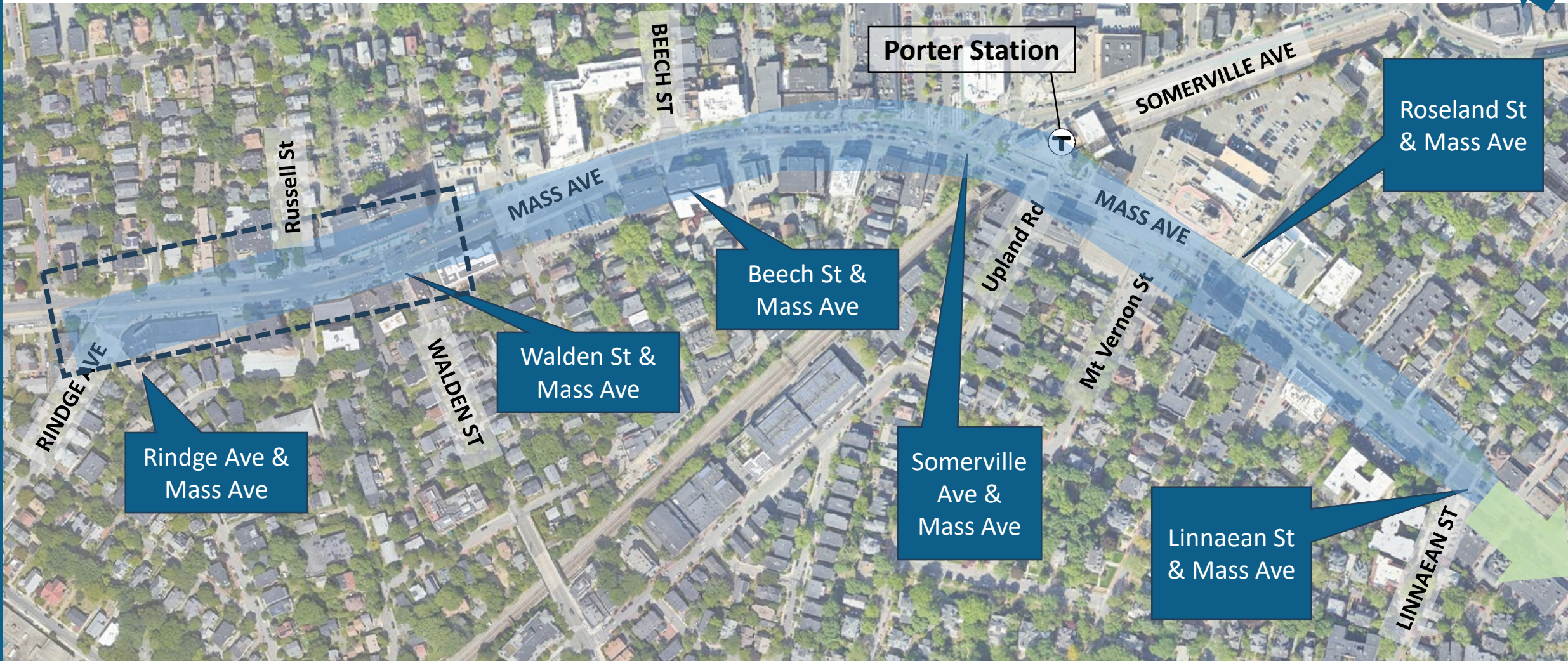
Alewife Brook Pkwy to Dudley St
Quick-build bike lanes installed (2021)
Will be revisited as part of this Project

Roseland St to Waterhouse St

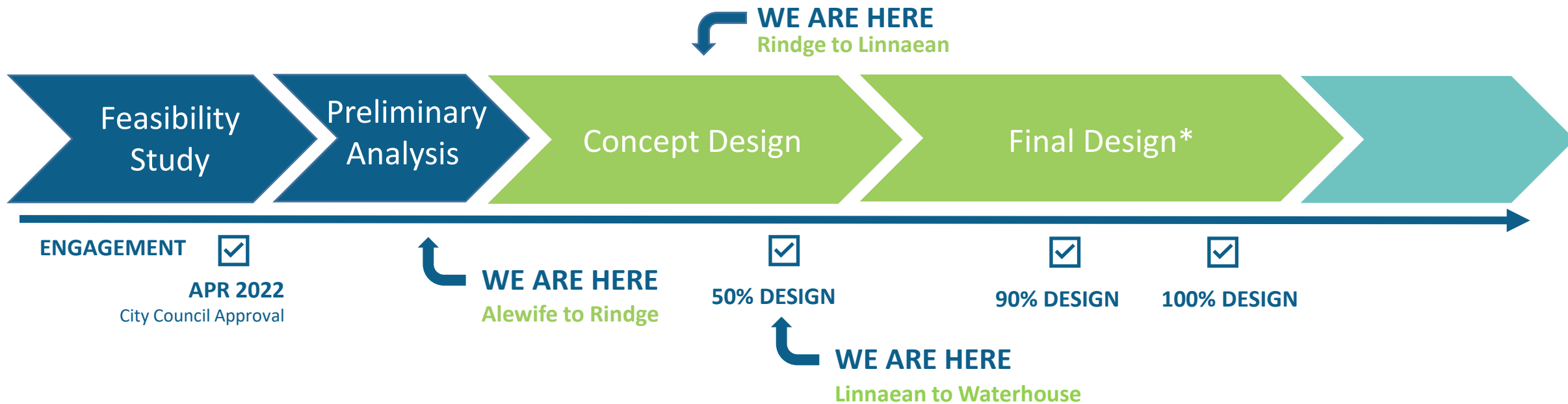


Focus Today

Concept Design Operations 50% Design



Project Status



Project Milestone



Rindge Ave to Linnaean Street
Concept Design - Cross Section



Transit Ridership



Average Weekday Bus Ridership (2023)

- Route 77 – 4,853
- Route 83 – 1,302
- Route 96 – 1,041

Average daily boardings - Porter Square Station

- Red Line ~ 8,100 (2020)
- Commuter Rail ~ 1,500 (2018)



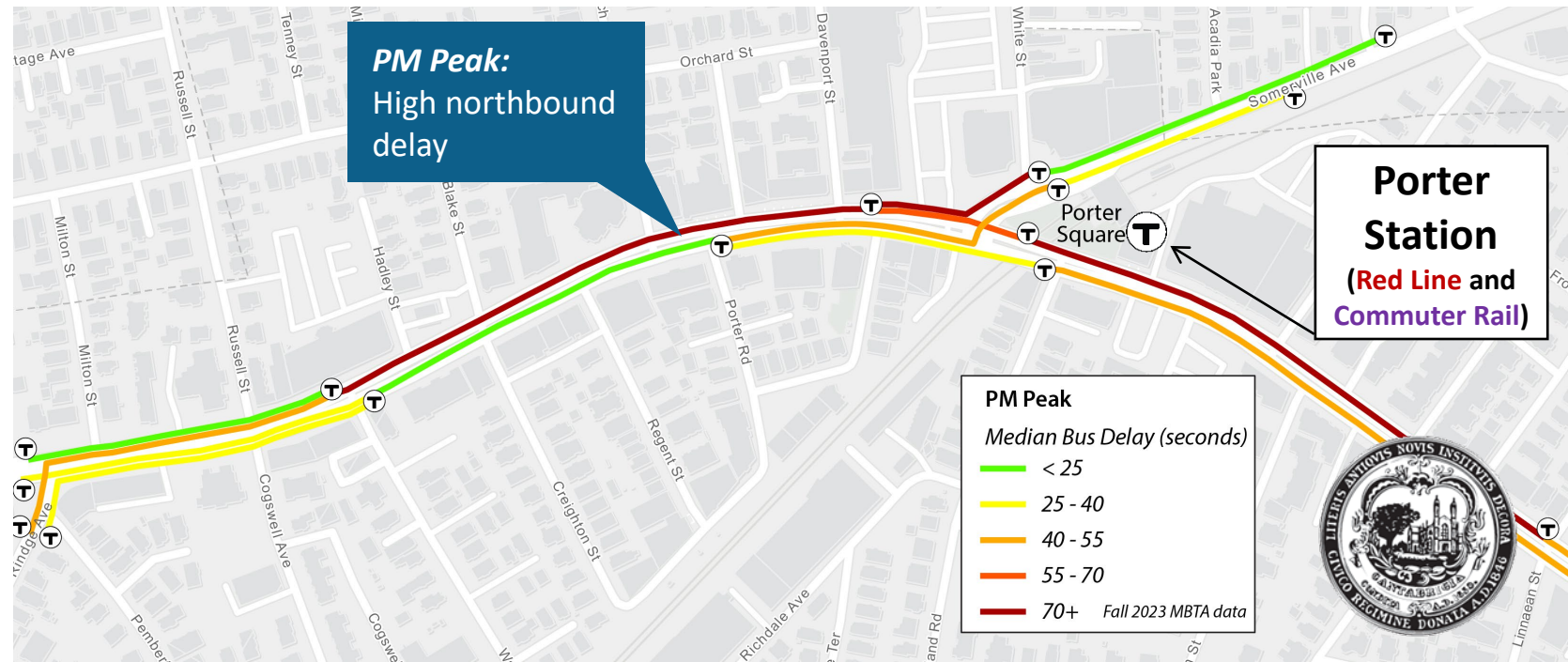
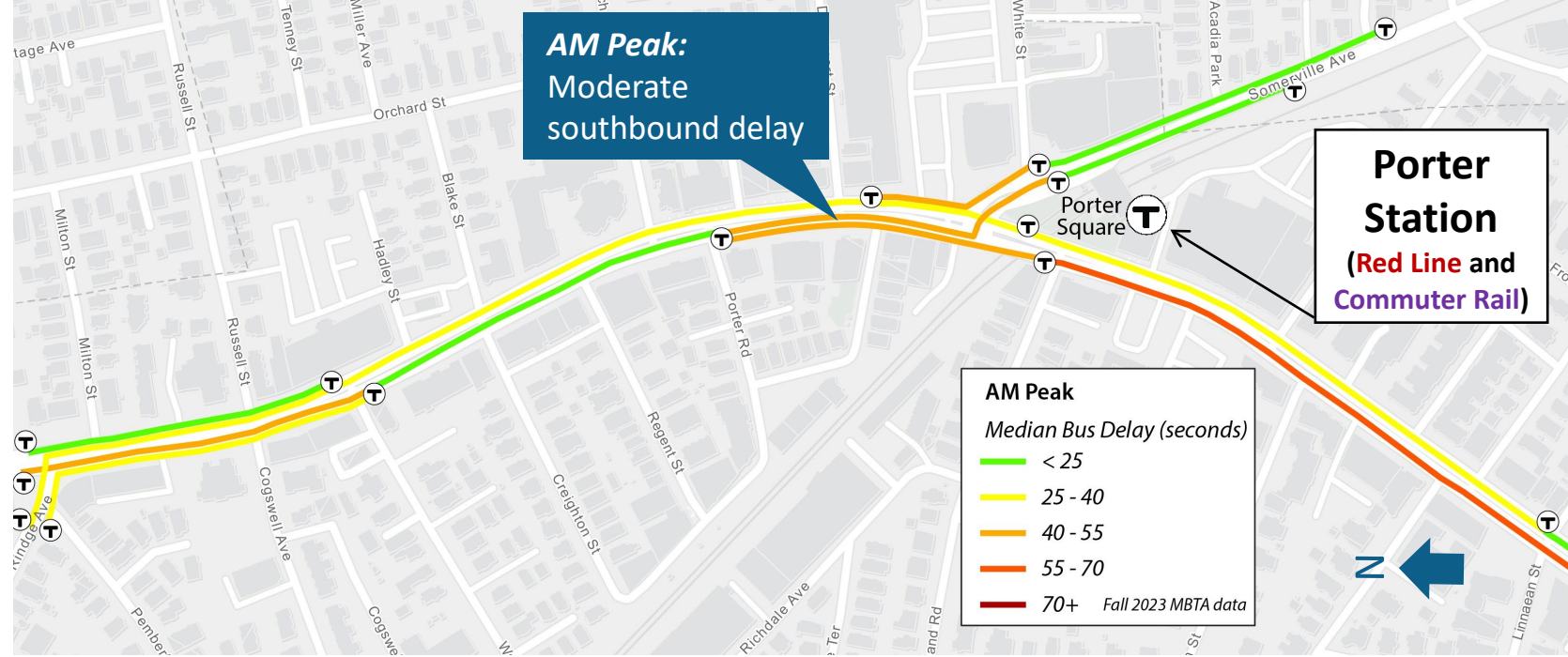
Important connections



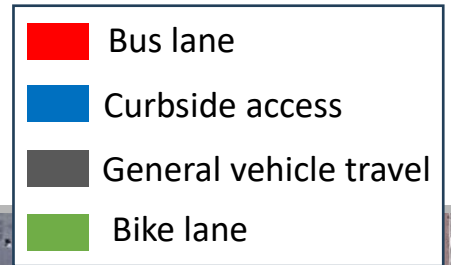
Existing Bus Delay



This shows a recent analysis of bus delay. We do not have a recent analysis for bus travel time variability or unreliability.



Potential Options to Balance Curbside Uses and Bus Operations



← Northbound- Alewife Brook Parkway Southbound - Harvard Square →

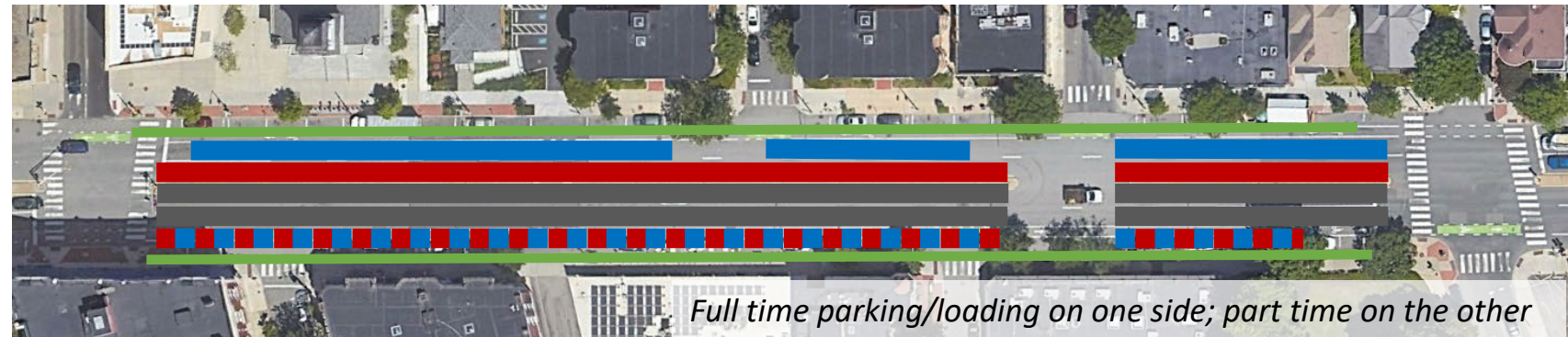
Full time bus lanes

- Curbside access on one side at a time
- Benefits to bus operations



Part time bus lane on one side

- Continuous curbside access on one side, off-peak access on other
- Benefits to buses during peak periods

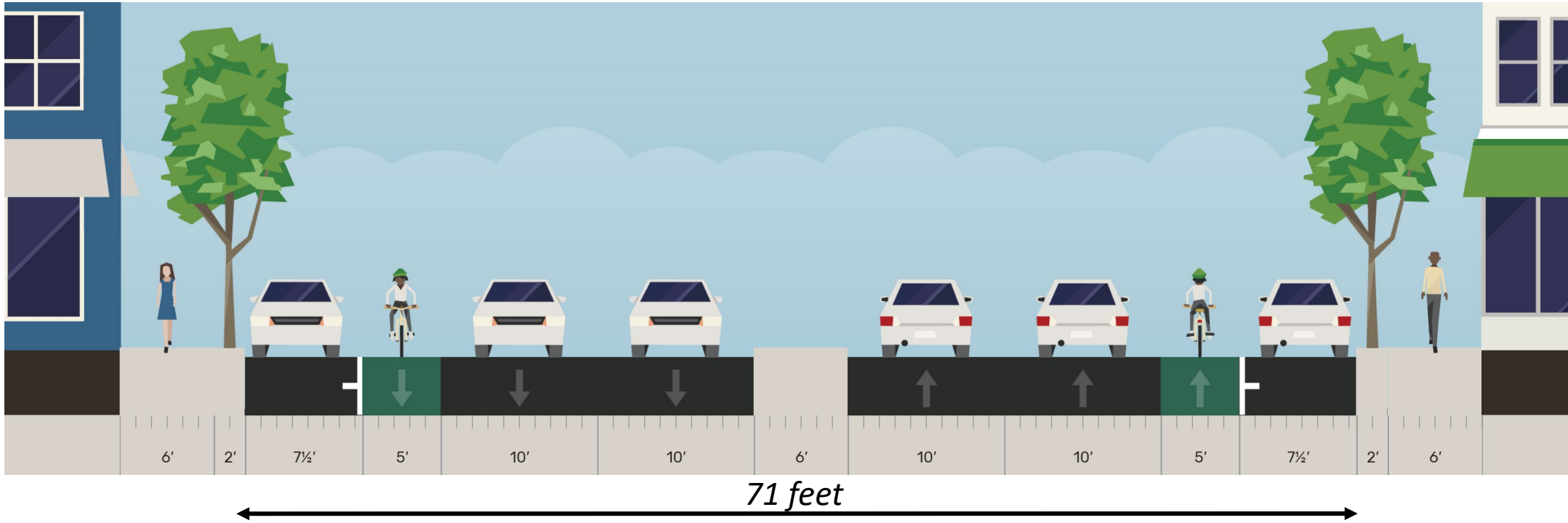
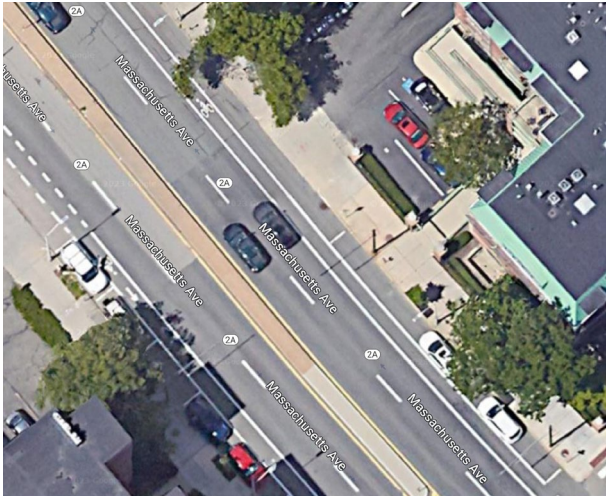


Bus lane on one side only

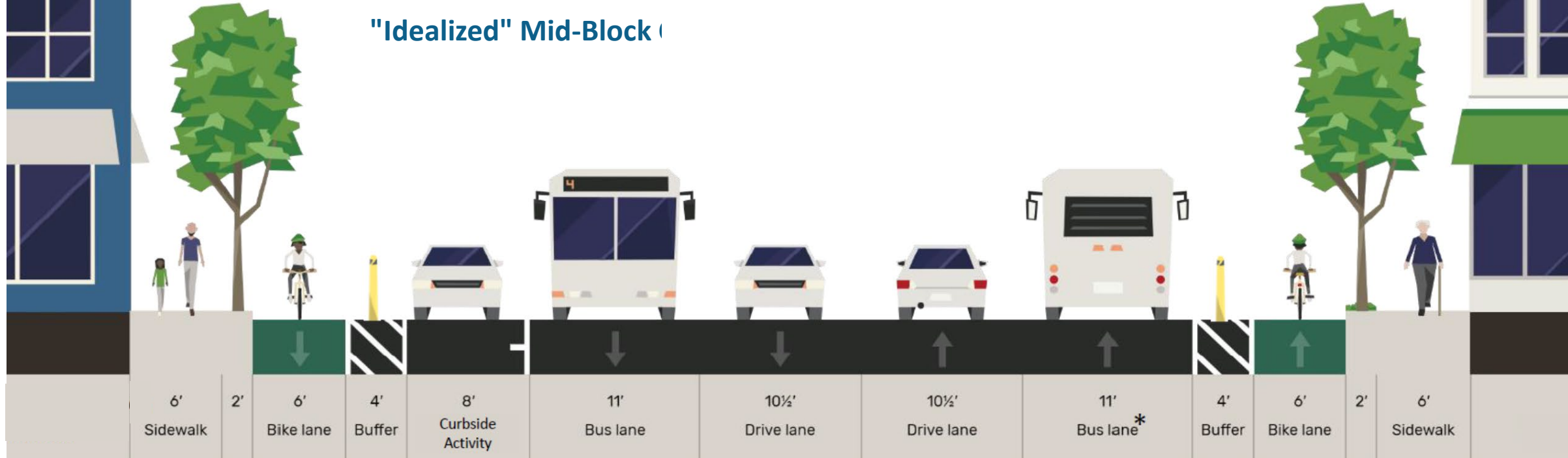
- Continuous curbside access on both sides
- Southbound bus in mixed traffic



Existing typical cross section

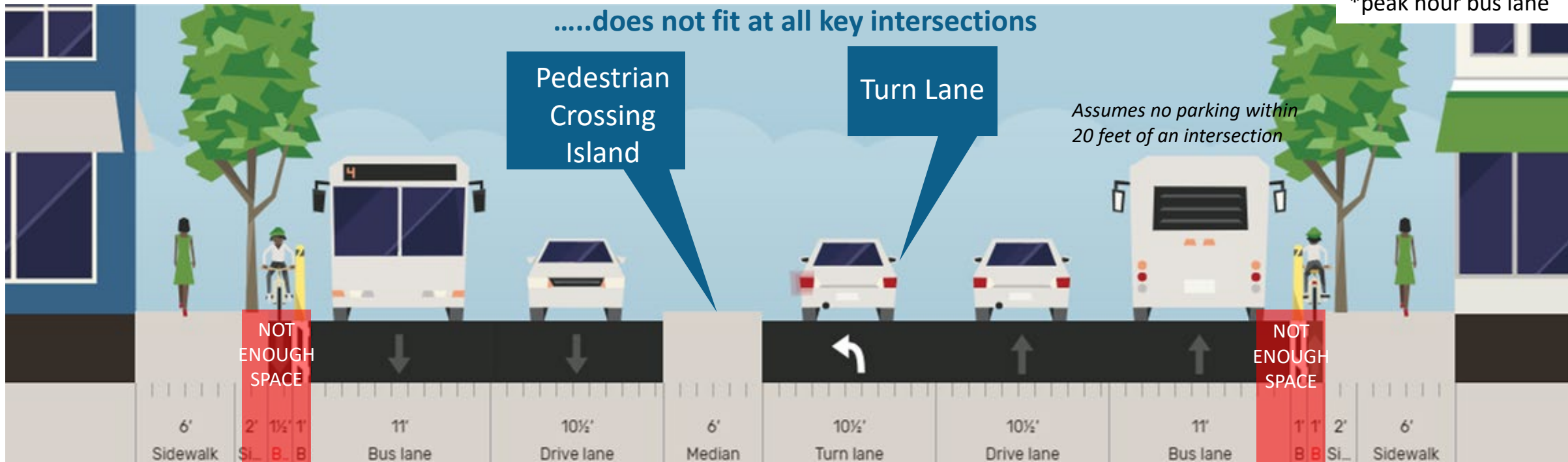


"Idealized" Mid-Block



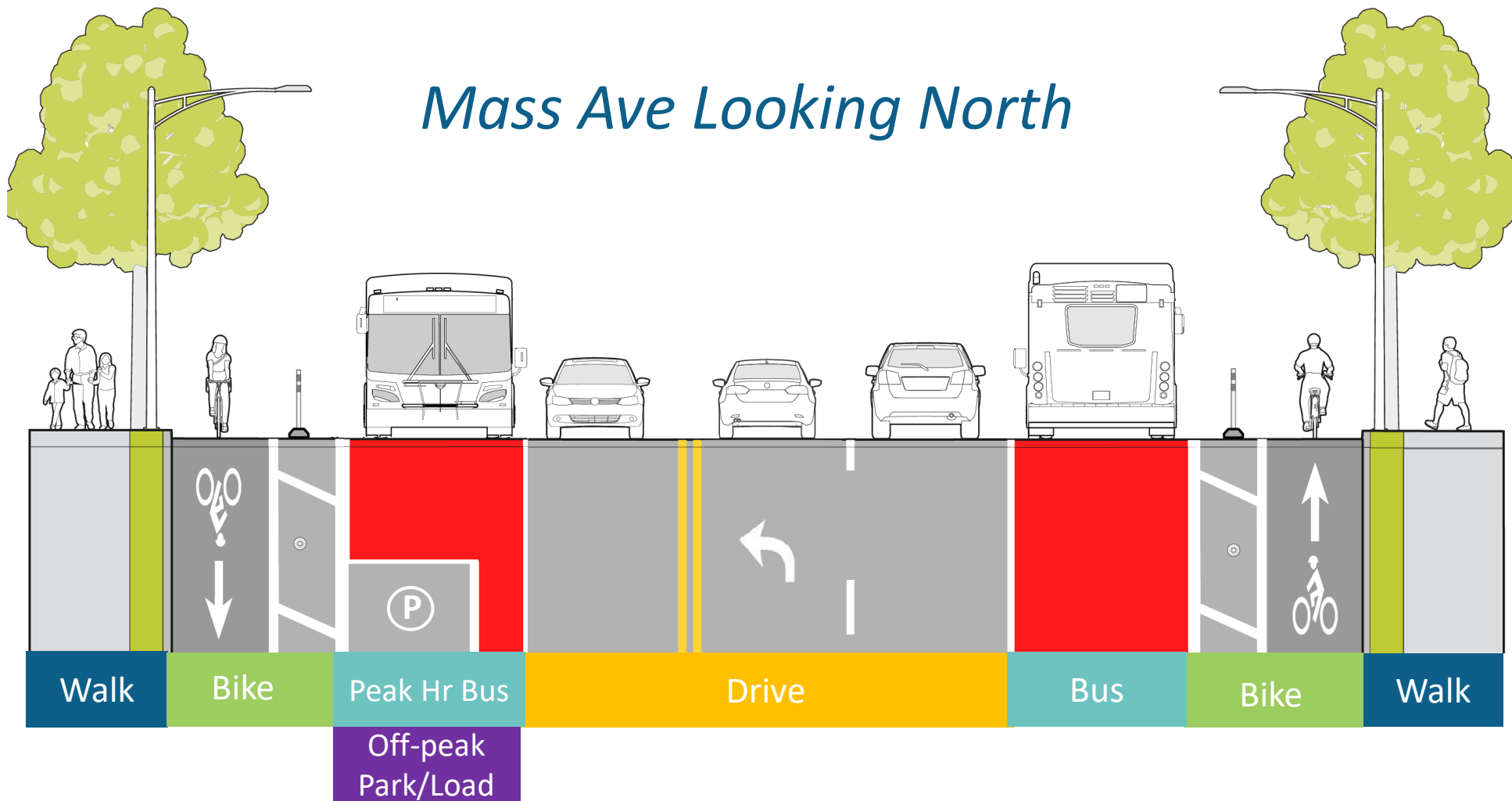
*peak hour bus lane

.....does not fit at all key intersections



Typical Proposed Cross Section: Rindge Avenue to Upland Street



Mass Ave Looking North



Bus Lane Configuration



LEGEND

-  All Day Bus Lane
-  AM Peak Bus Lane (7am-10am)
Parking/Loading (10am-7am)

Transition to three lane cross section south of Upland



Key Features of the Draft Concept

Between Rindge Ave and Linnaean Street, the following are proposed:

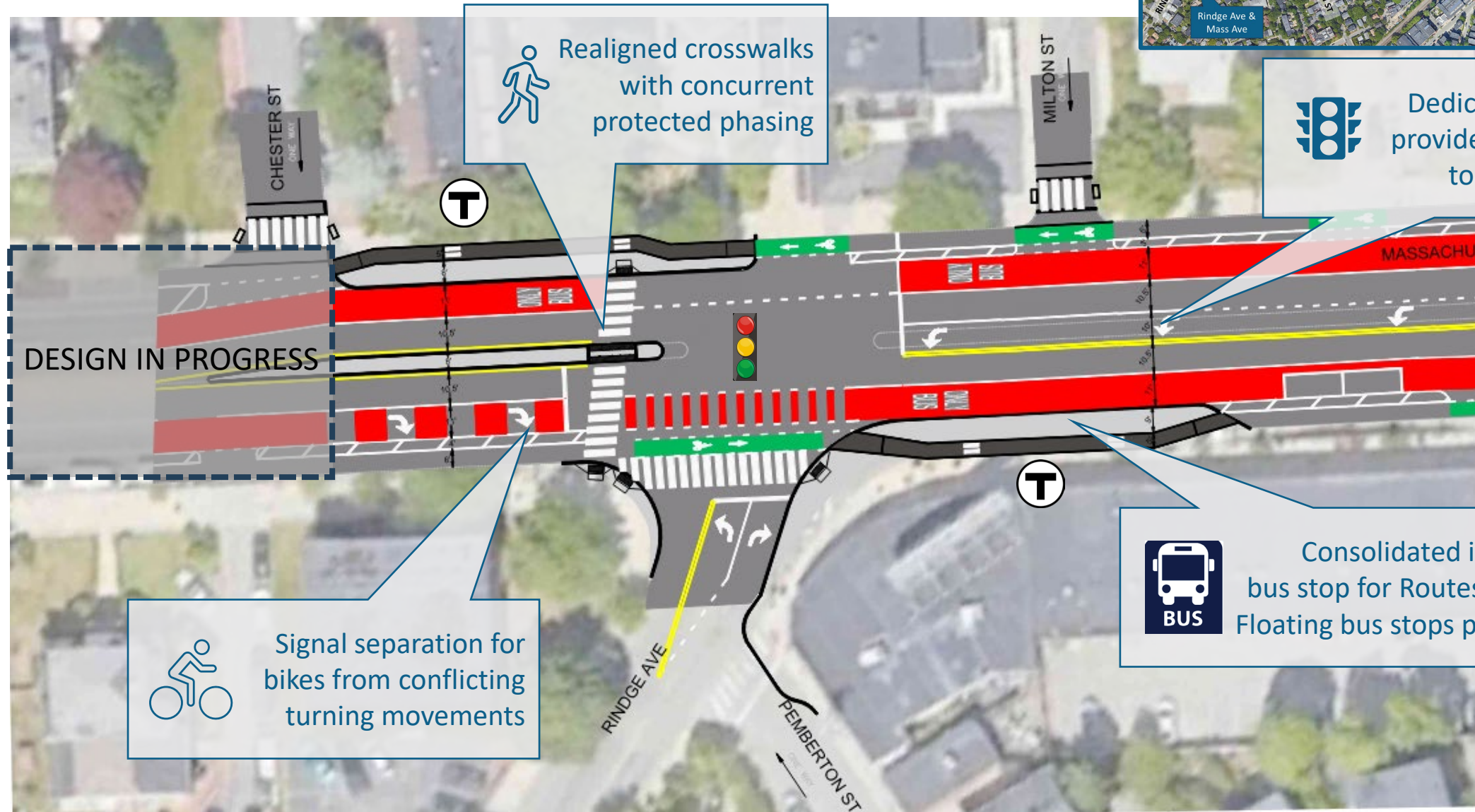
- Separated bike lanes
- Northbound bus lane
- Southbound bus lane where needed
 - AM peak only between Rindge and Beech
 - Full time between Beech and Upland
 - No SB bus lane south of Upland
- Dedicated turn lanes
- Floating bus stop islands
- Crosswalk signal timing improvements
- New crosswalk locations
- Accessible parking maintained or shifted to side streets
- Loading and pick-up/drop-off activity accommodated where feasible



Rindge Ave to Linnaean Street
Concept Design





Rindge Ave Intersection



 Realigned crosswalks with concurrent protected phasing

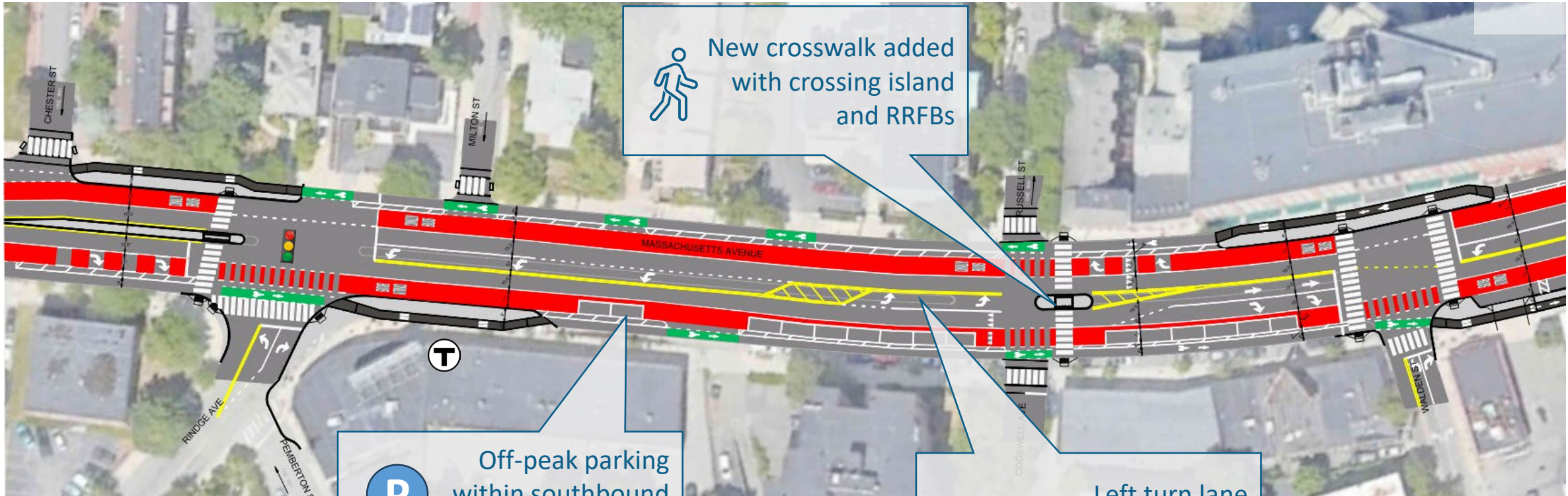
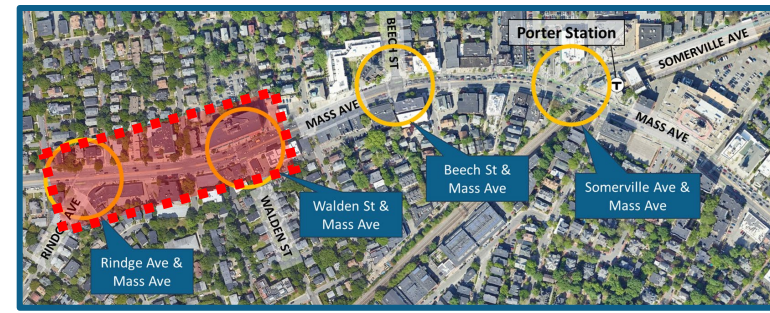
 Dedicated turn lanes provided on Mass Ave to reduce friction

 Consolidated inbound bus stop for Routes 77/83. Floating bus stops provided


 Signal separation for bikes from conflicting turning movements




Rindge to Walden



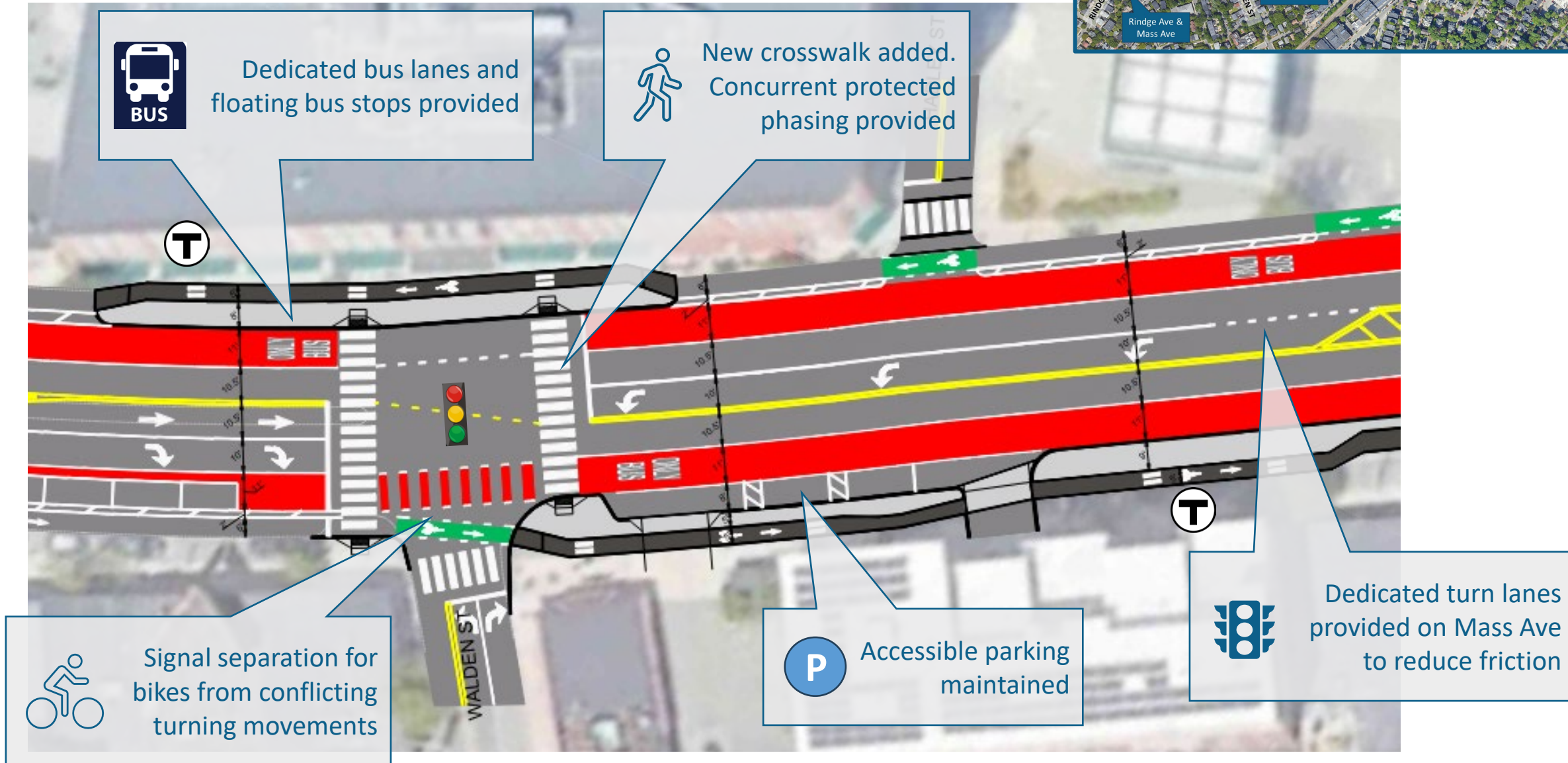
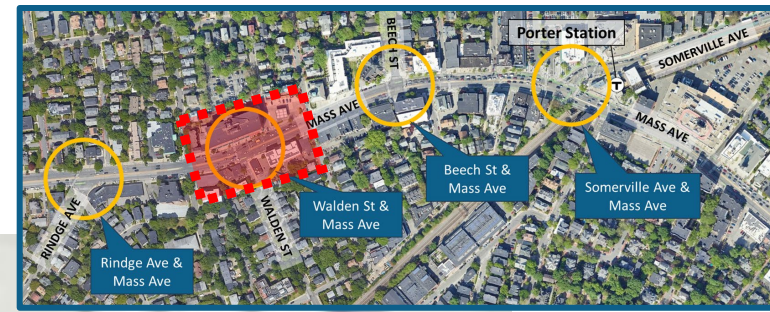
 New crosswalk added with crossing island and RRFBS

 Off-peak parking within southbound bus lane

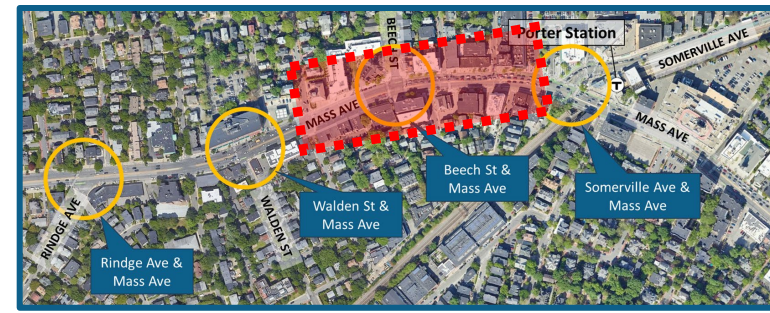
 Left turn lane provided for turns onto Russell Street



Walden Street Intersection



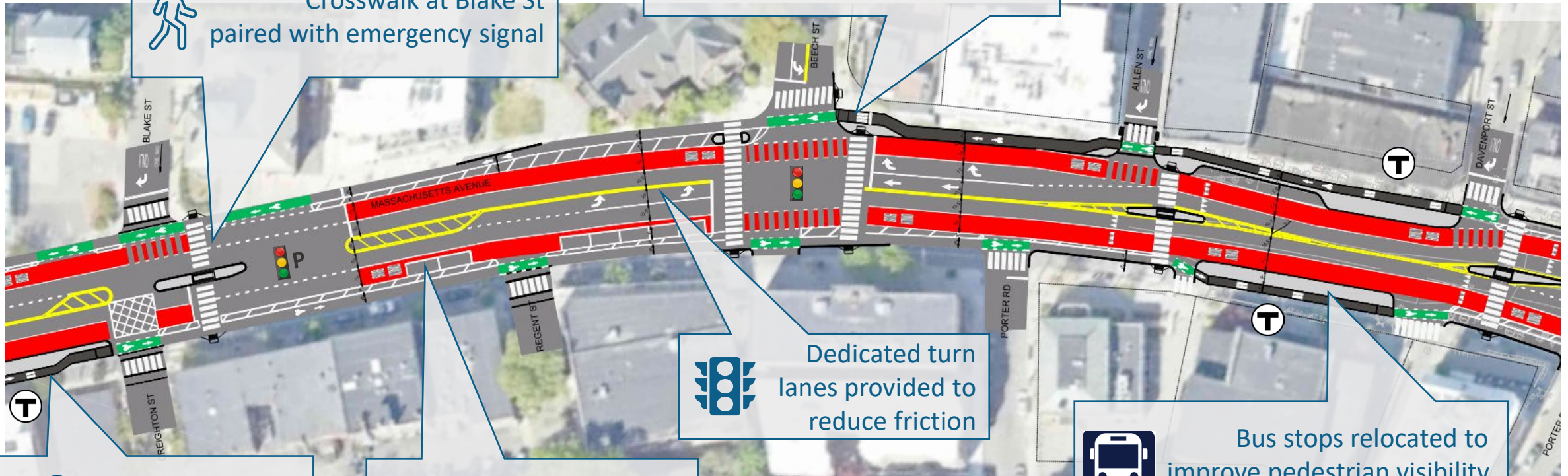
Walden to Davenport



Signal separation and protected intersection treatment to reduce conflicts



Crosswalk at Blake St paired with emergency signal



Dedicated turn lanes provided to reduce friction



Tree condition to be confirmed



Off-peak parking within southbound bus lane




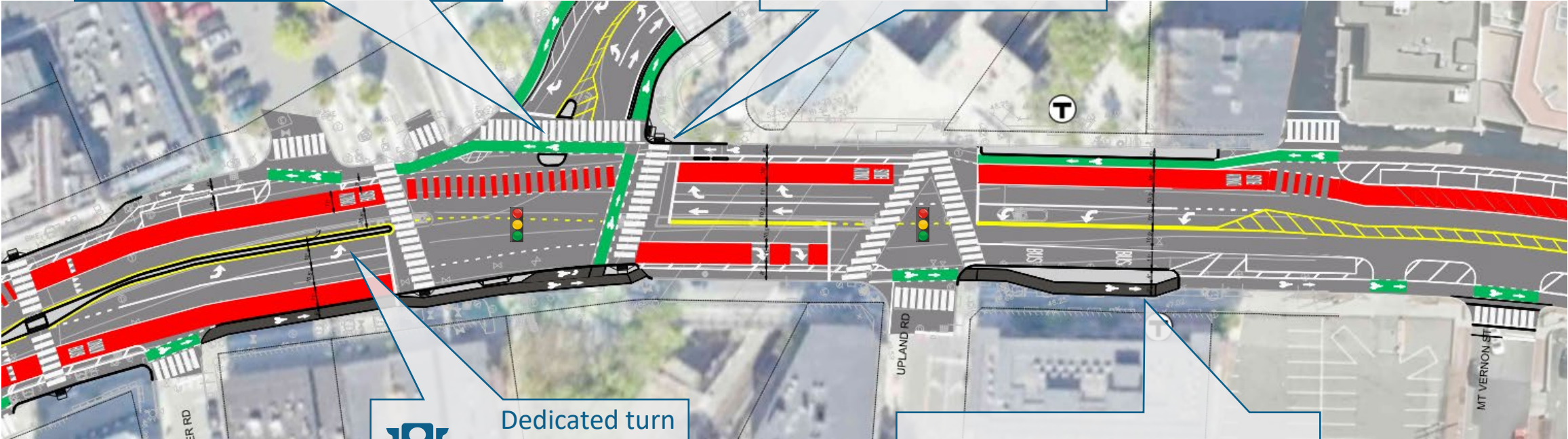
Bus stops relocated to improve pedestrian visibility. Floating stops provided





Davenport to Mt Vernon

 Median island relocated to allow for improved bike buffers


 Crosswalks shortened with curb extension




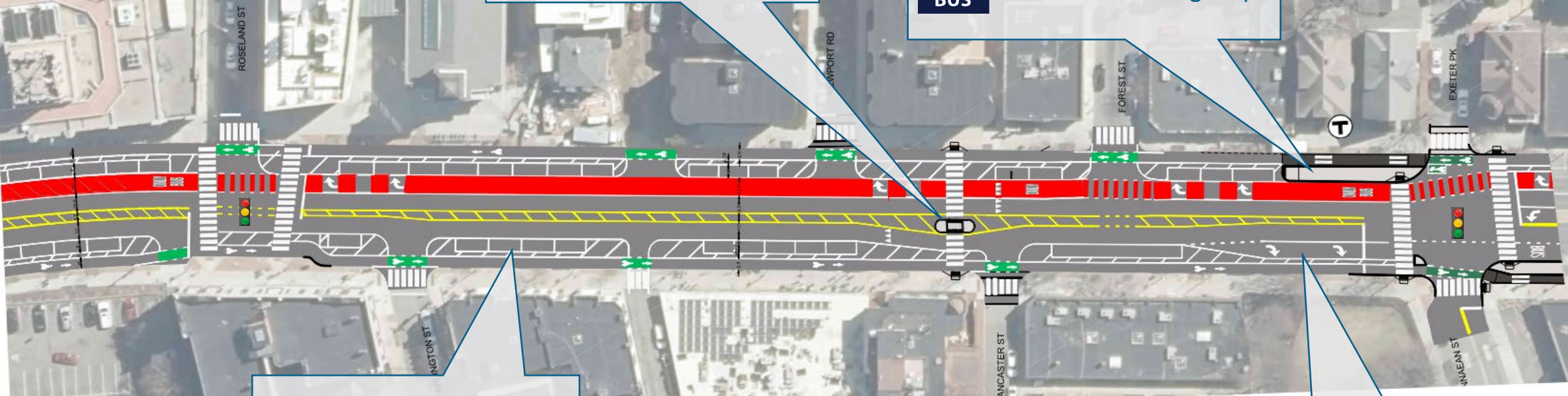
 Dedicated turn lanes provided to reduce friction


 Bus stops relocated to improve operations. Floating stop provided


Mt. Vernon to Linnaean

 New mid-block crosswalk at Lancaster

 Dedicated NB bus lane with floating stops



 Three lane cross section allows for parking on both sides

 Dedicated turn lanes provided to reduce friction

Q&A

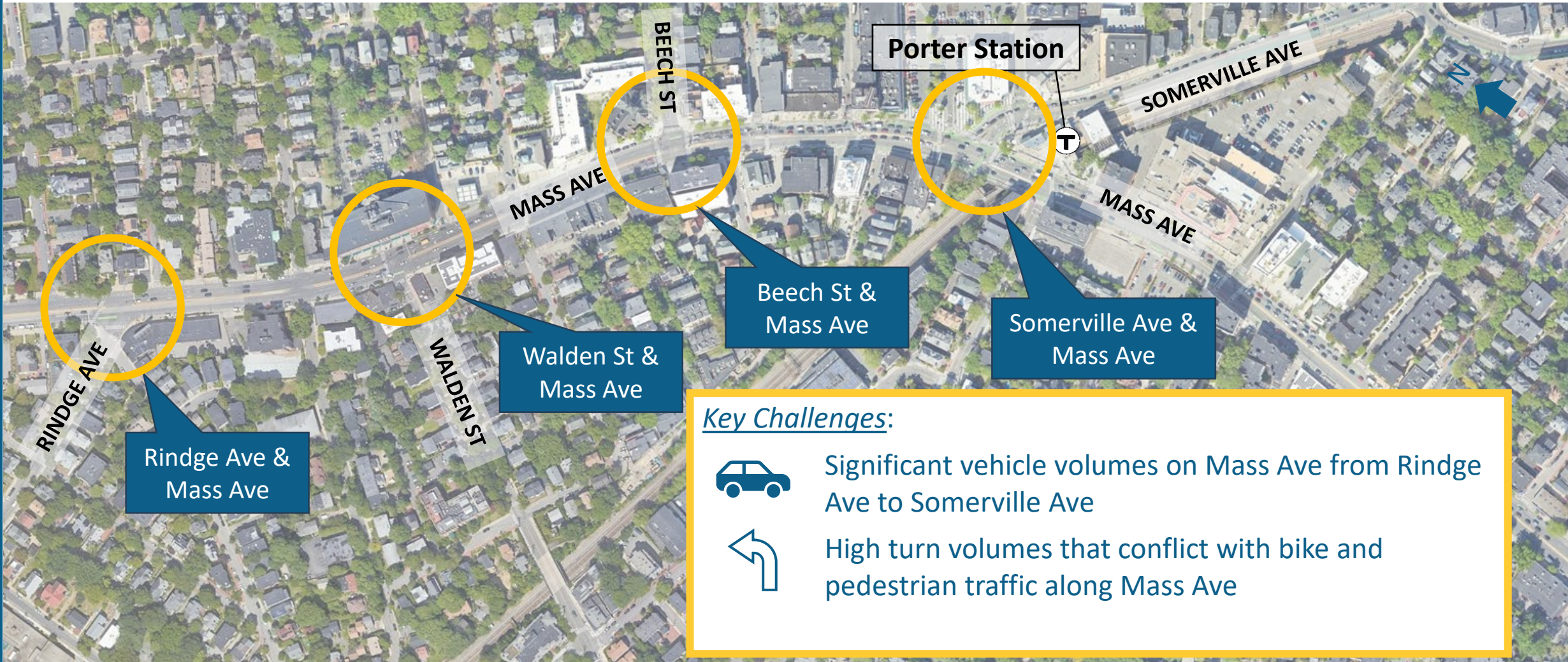


Rindge Ave to Walden St *Traffic Operations*



Traffic Operations

Rindge Ave to Somerville Ave has several intersections with complex multimodal challenges



Rindge Ave & Mass Ave



Walden St & Mass Ave

Beech St & Mass Ave

Somerville Ave & Mass Ave

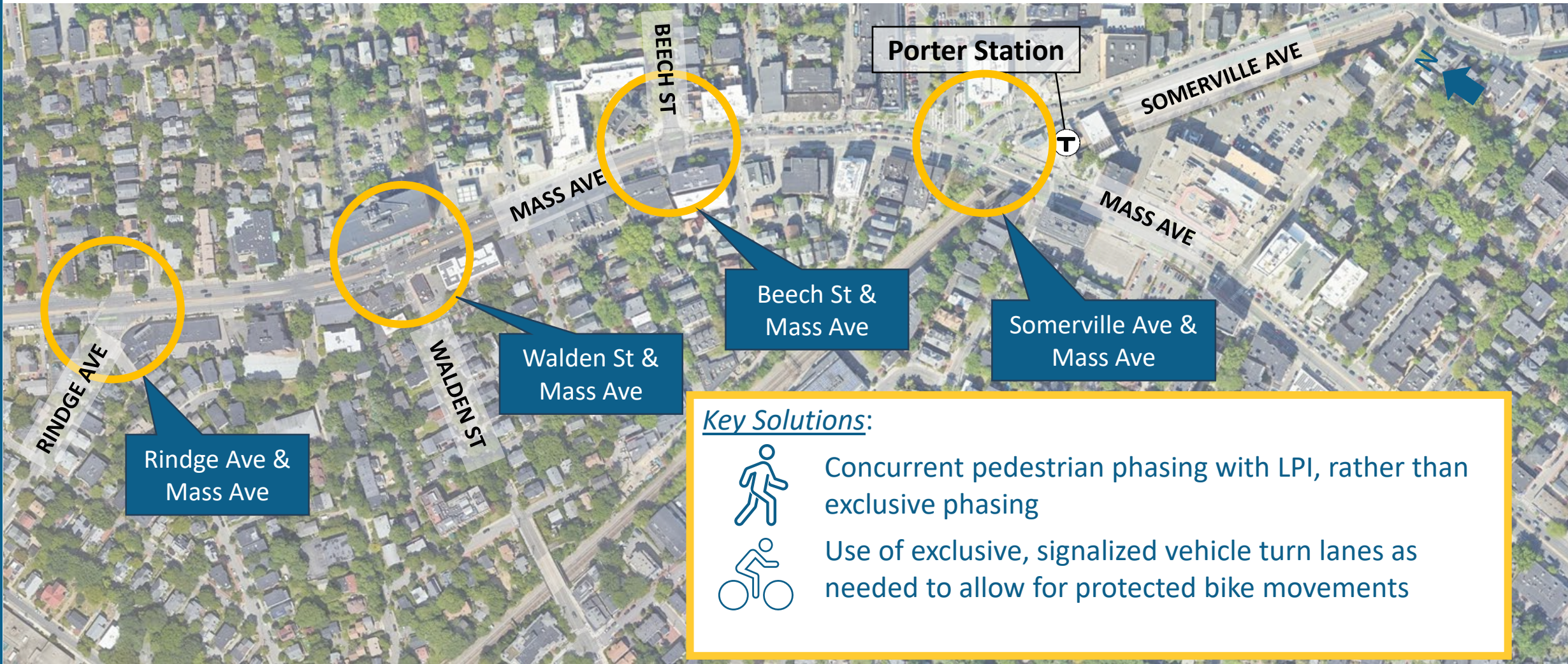
Porter Station

Key Challenges:

-  Significant vehicle volumes on Mass Ave from Rindge Ave to Somerville Ave
-  High turn volumes that conflict with bike and pedestrian traffic along Mass Ave

Traffic Operations

The **Concept Design** includes key solutions to address intersection challenges



Rindge Ave & Mass Ave


Walden St & Mass Ave

Beech St & Mass Ave

Somerville Ave & Mass Ave

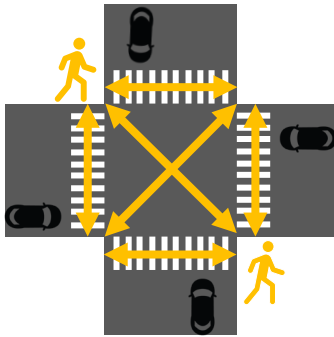
Porter Station

Key Solutions:

-  Concurrent pedestrian phasing with LPI, rather than exclusive phasing
-  Use of exclusive, signaled vehicle turn lanes as needed to allow for protected bike movements

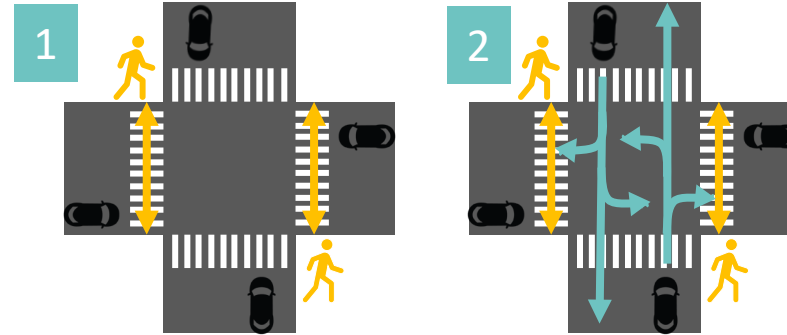
Pedestrian Signal Phasing

Exclusive Phasing



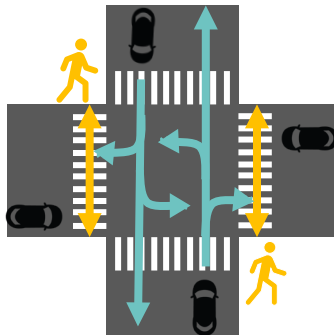
Includes phase where only pedestrians move

Concurrent with Leading Pedestrian Interval



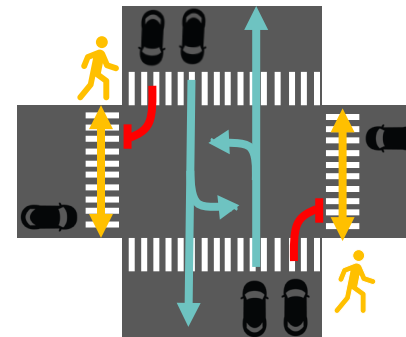
Concurrent phase where pedestrians get a head start

Concurrent Phasing



Includes phase where vehicles and pedestrians move together

Protected Concurrent Phasing



Concurrent phase where turning movements are controlled

Considerations

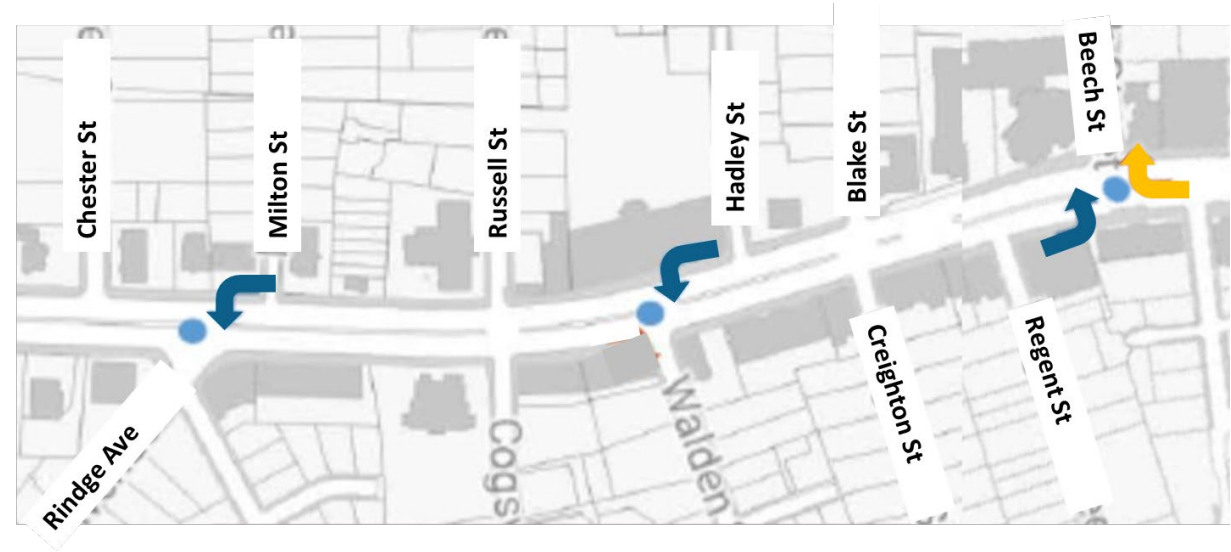
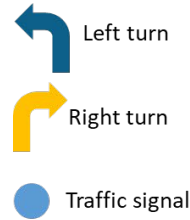
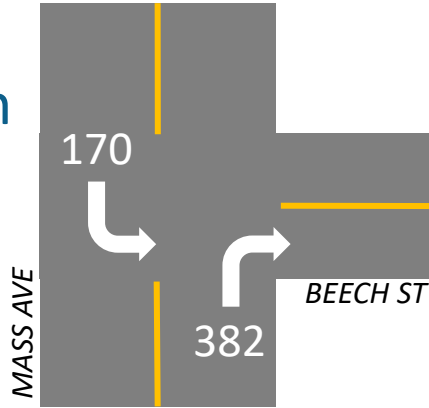
Volume of turning conflicts

Geometry of intersection

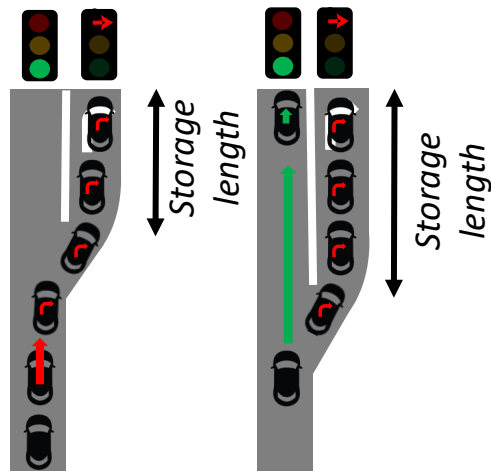
	Waiting time	Conflicts
Concurrent	↓	↑
Exclusive	↑	↓

Manage Vehicle Queues

At locations with high turning volumes...



...we need to consider appropriate storage lengths



Cambridge City Council votes to ban turns on red - Boston News, Weather, Sports | WHDH 7News

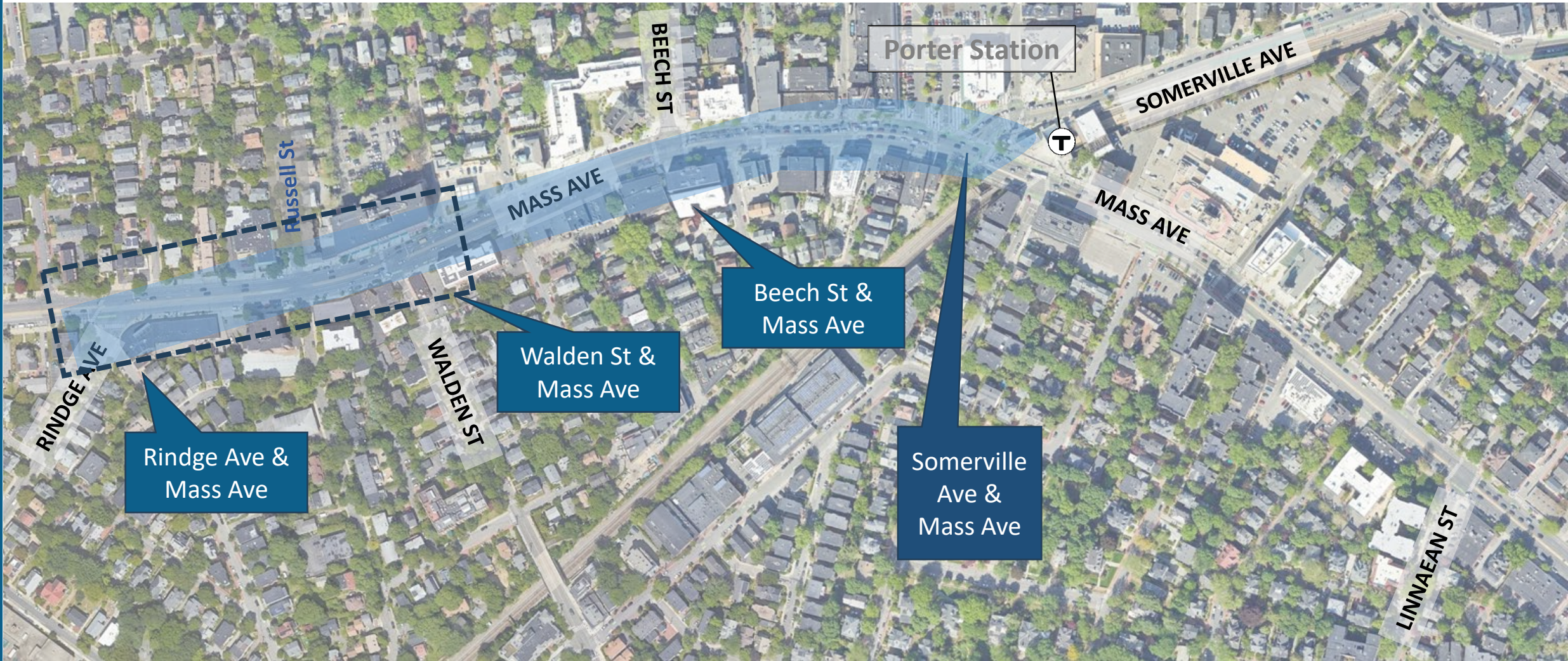
CAMBRIDGE, MASS. (WHDH) - After a city council vote Monday night, Cambridge joins a handful of cities in America where turning on red is illegal. The excerpt-read-more"

 Boston News, Weather, Sports | WHDH 7News



Traffic Operations

Rindge Ave to Walden St



Rindge Ave Intersection



Peak Hour Volumes



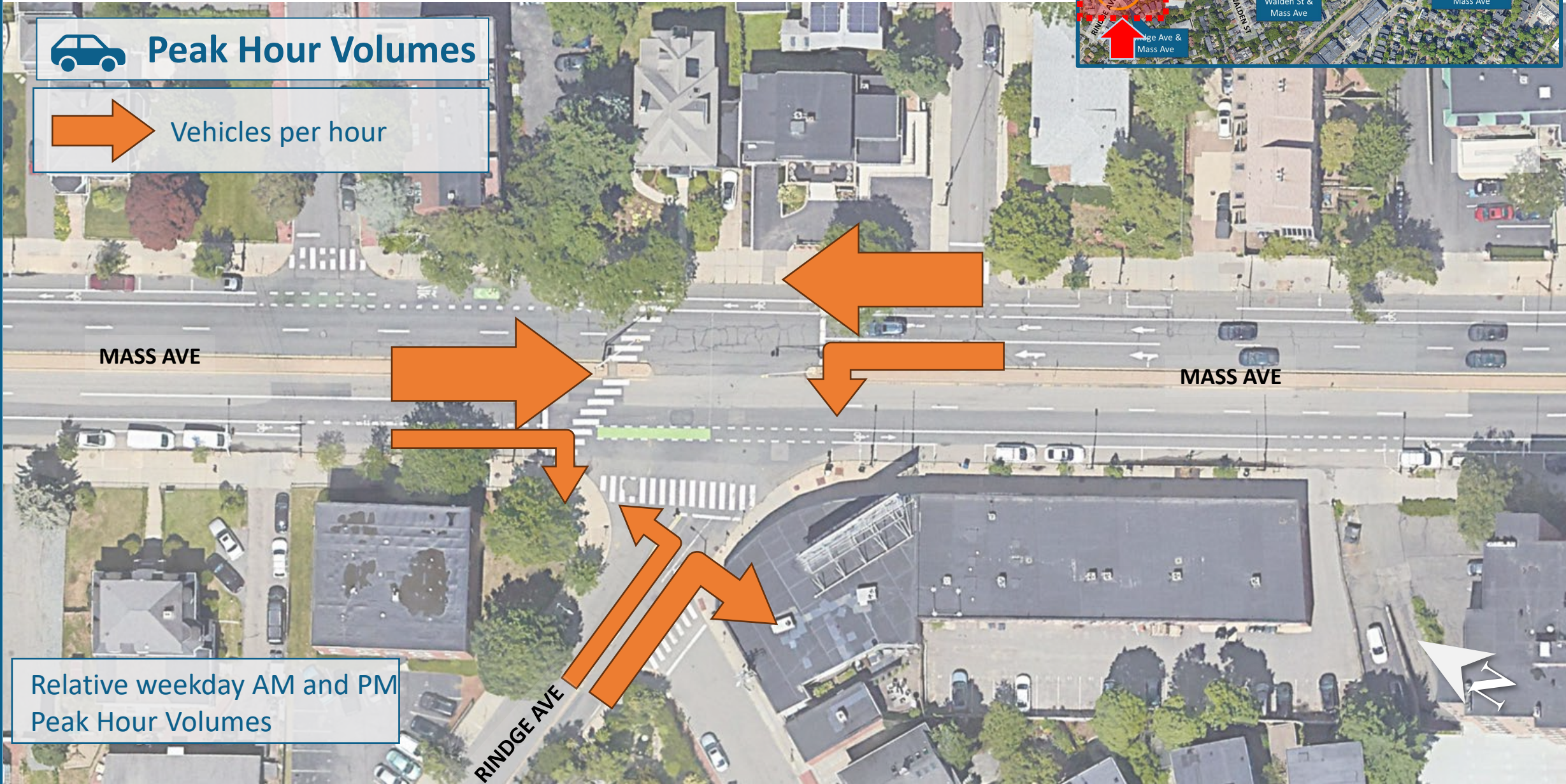
Vehicles per hour

MASS AVE

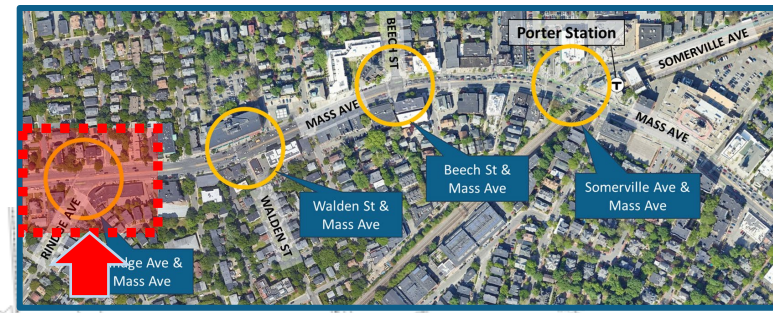
MASS AVE

Relative weekday AM and PM
Peak Hour Volumes



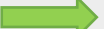
RINDGE AVE

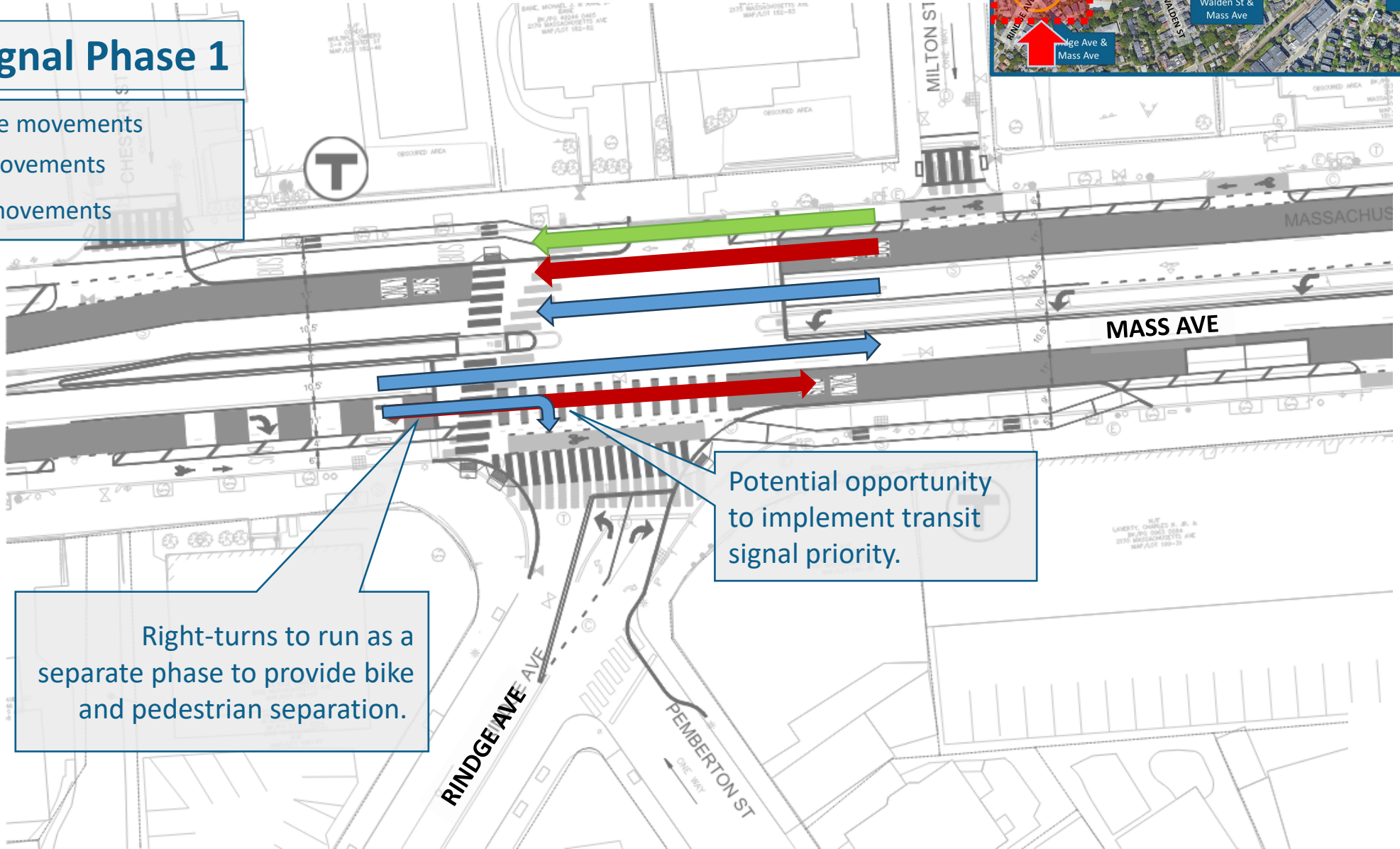


Rindge Ave Intersection



 **Signal Phase 1**

-  Vehicle movements
-  Bus movements
-  Bike movements




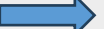



Right-turns to run as a separate phase to provide bike and pedestrian separation.

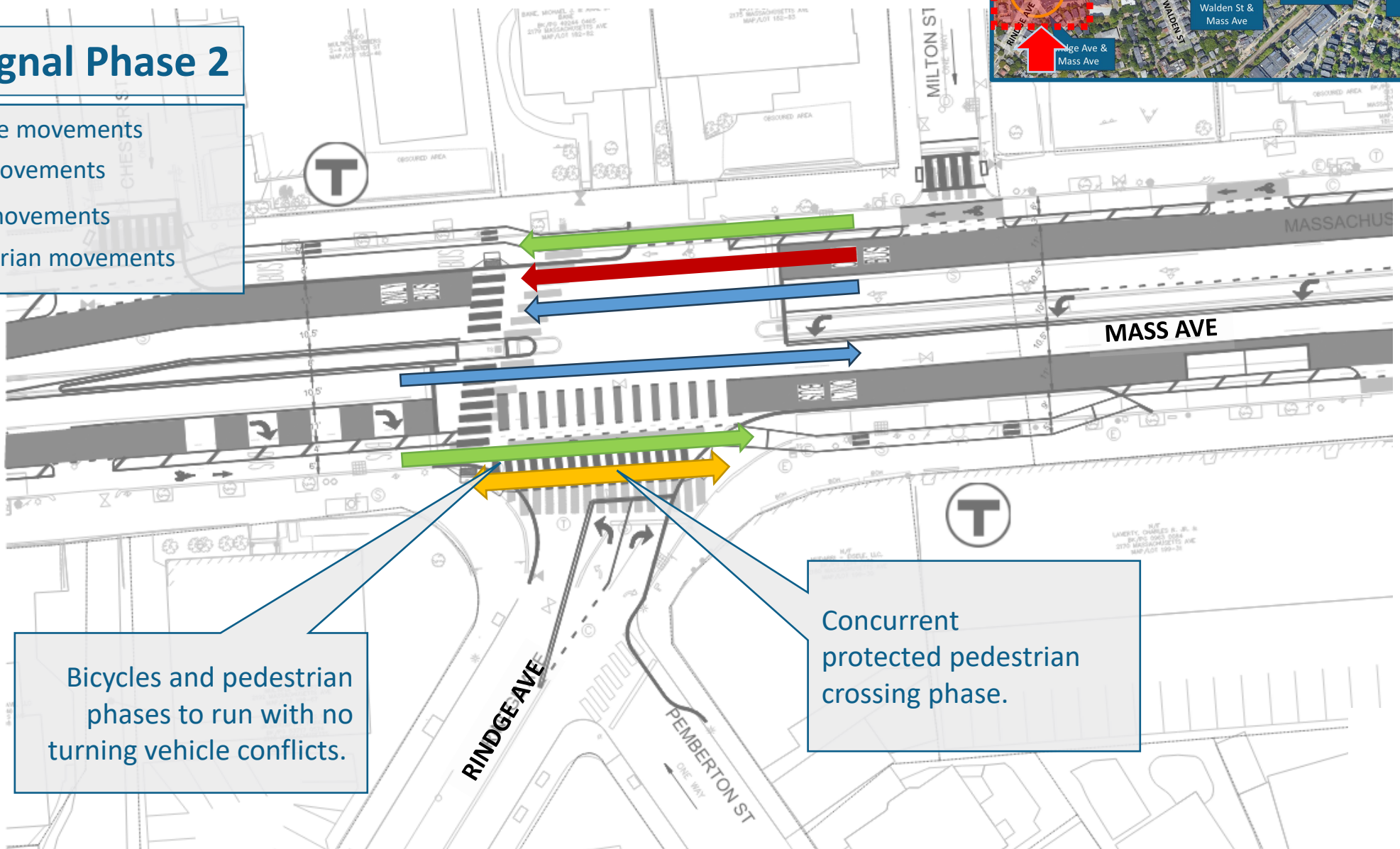
Potential opportunity to implement transit signal priority.

Rindge Ave Intersection



 **Signal Phase 2**

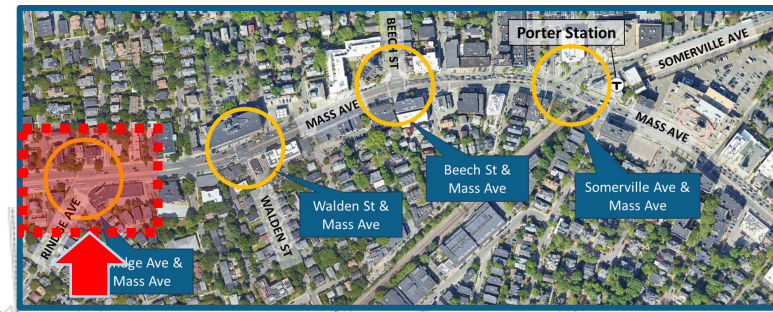
-  Vehicle movements
-  Bus movements
-  Bike movements
-  Pedestrian movements



Bicycles and pedestrian phases to run with no turning vehicle conflicts.

Concurrent protected pedestrian crossing phase.

Rindge Ave Intersection



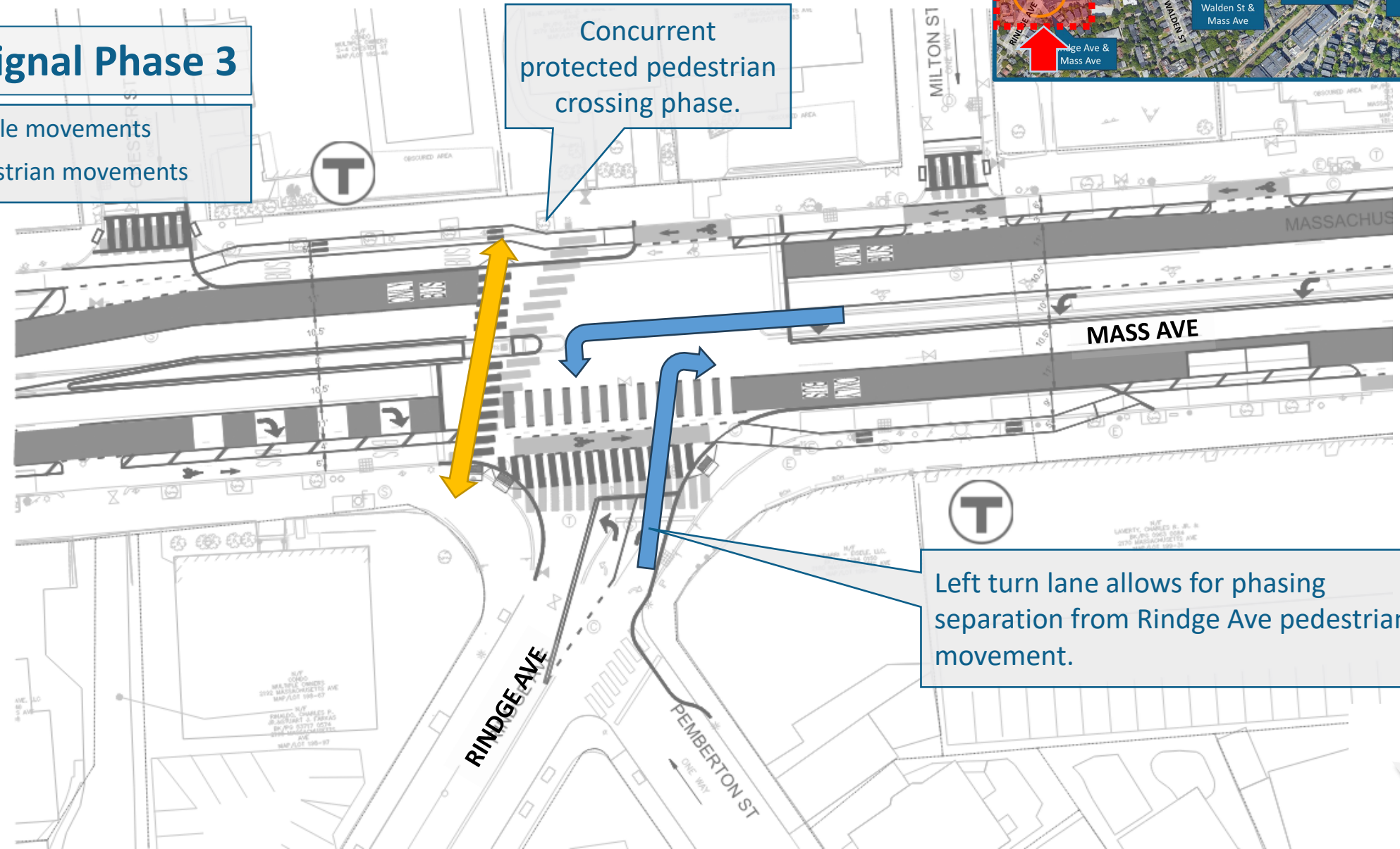
 **Signal Phase 3**

 Vehicle movements

 Pedestrian movements

Concurrent protected pedestrian crossing phase.

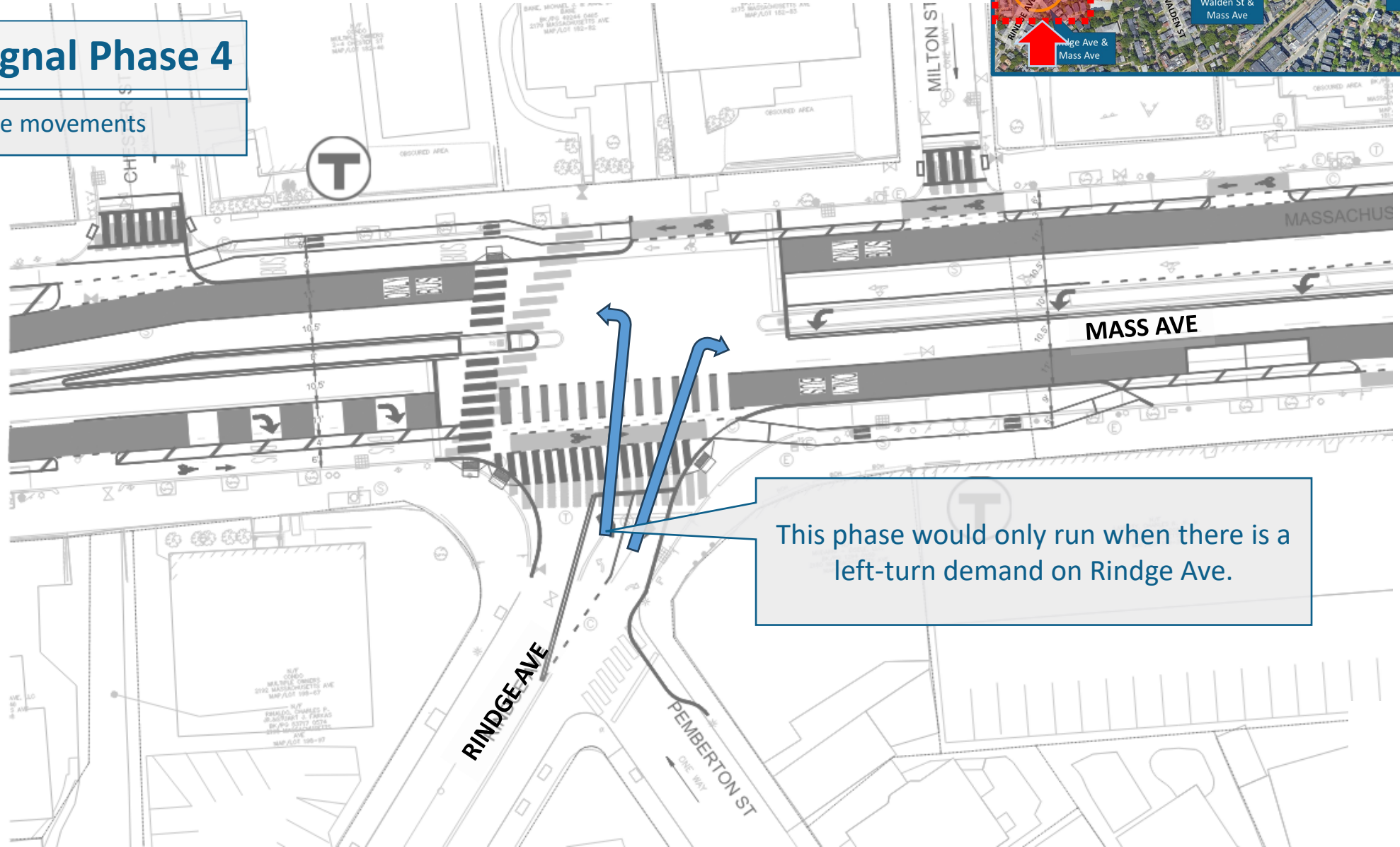
Left turn lane allows for phasing separation from Rindge Ave pedestrian movement.



Rindge Ave Intersection

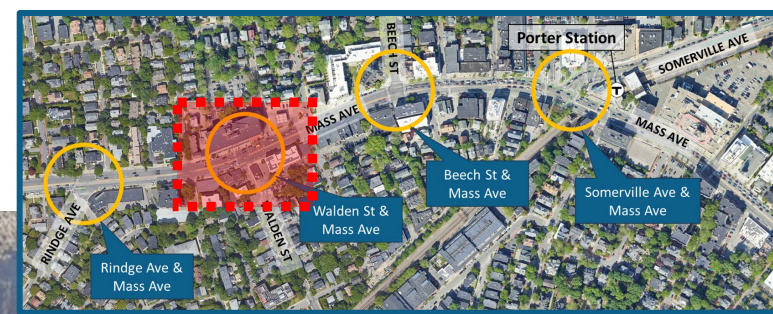
 **Signal Phase 4**

 Vehicle movements



This phase would only run when there is a left-turn demand on Rindge Ave.

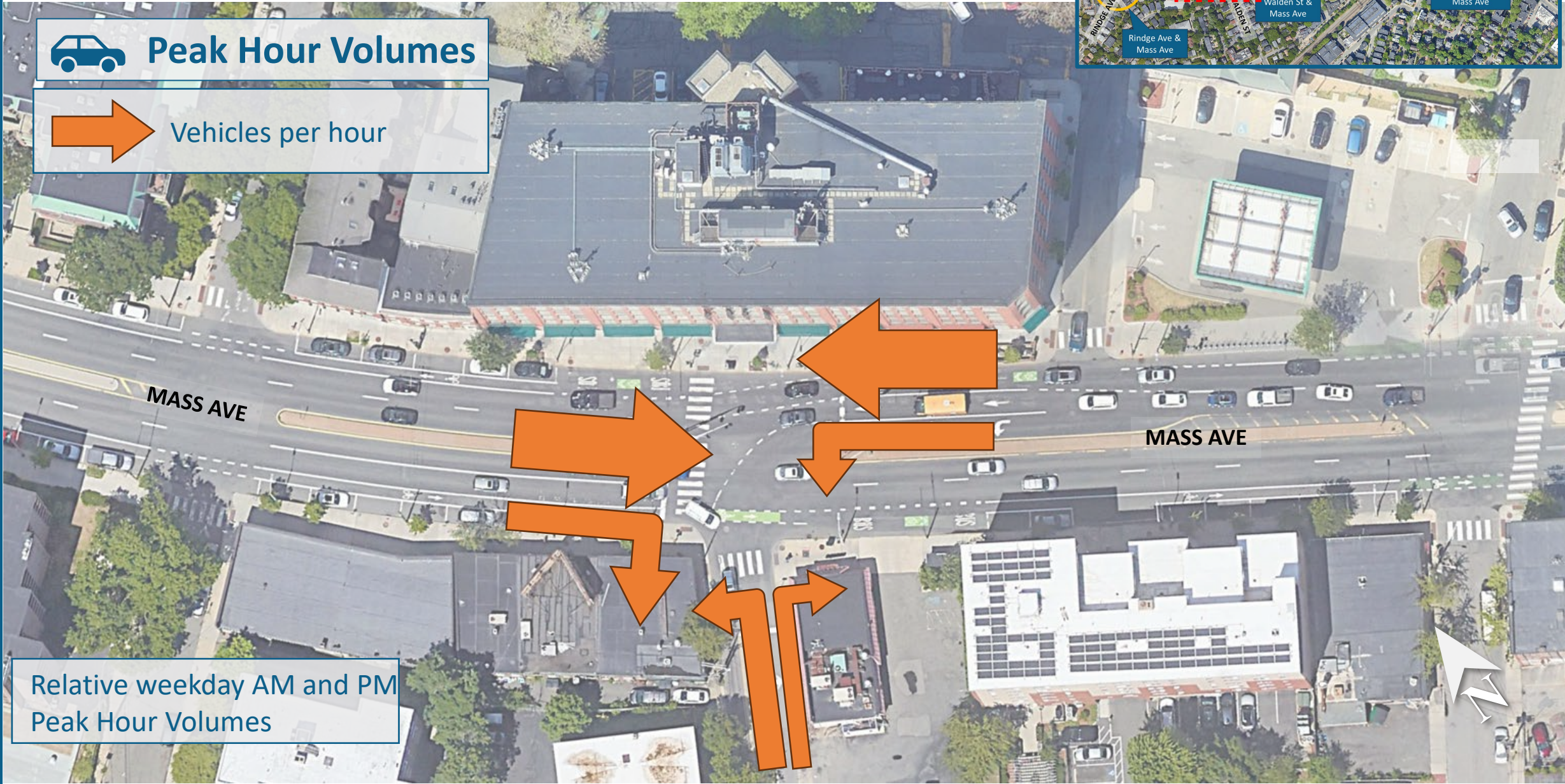
Walden Street Intersection



Peak Hour Volumes



Vehicles per hour

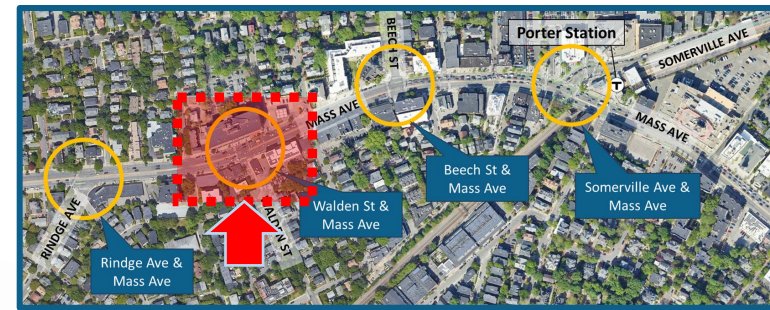


MASS AVE




MASS AVE

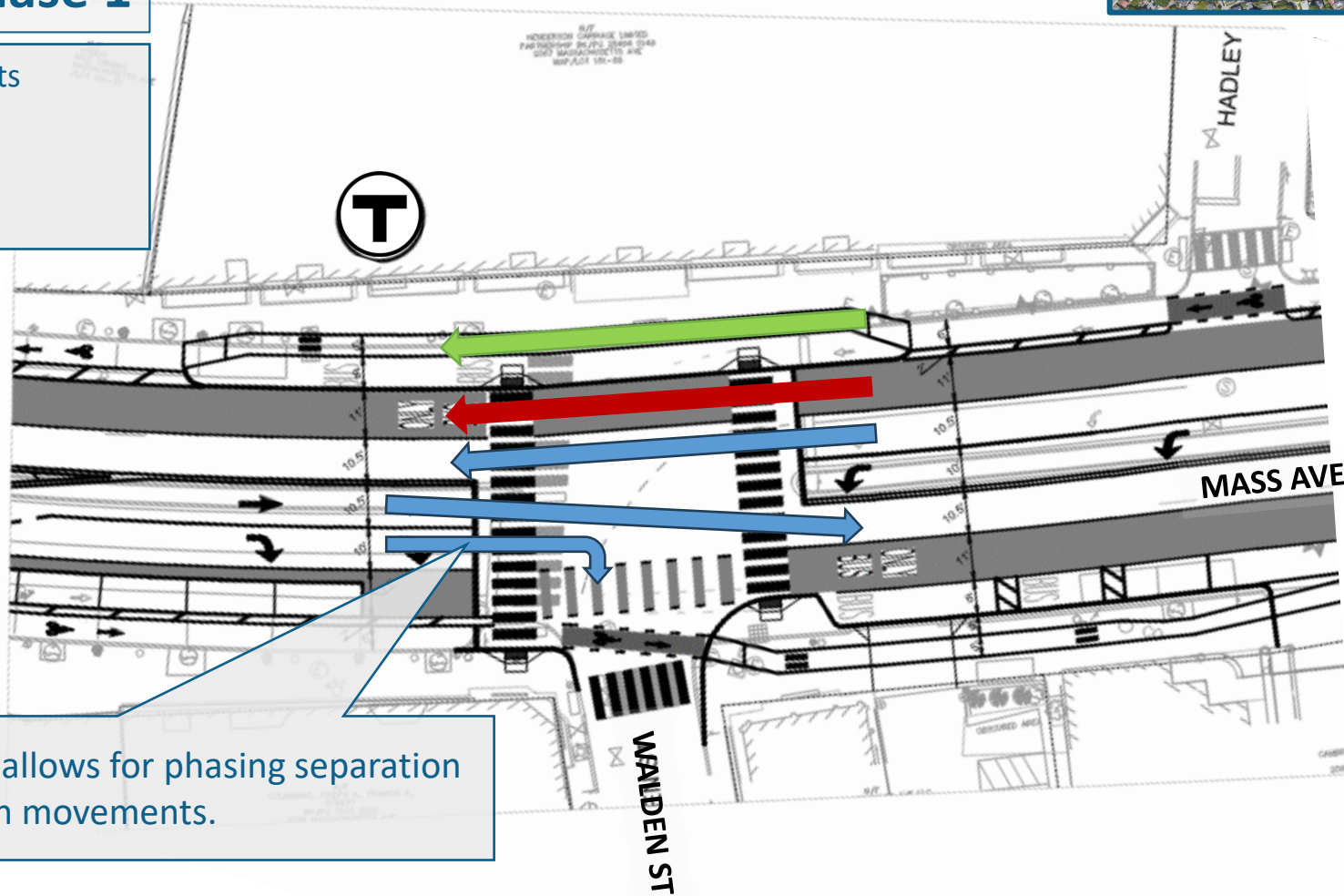
Relative weekday AM and PM
Peak Hour Volumes

Walden Street Intersection



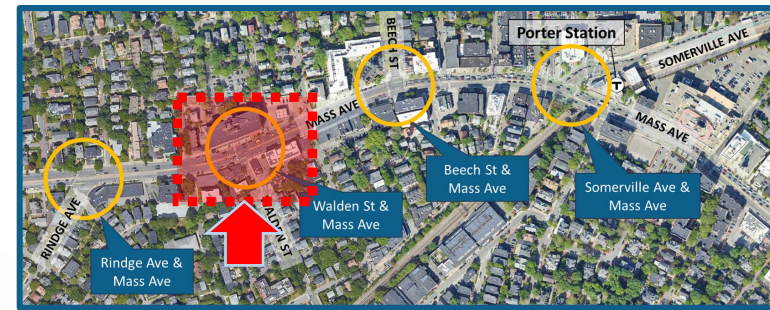
Signal Phase 1

-  Vehicle movements
-  Bus movements
-  Bike movements







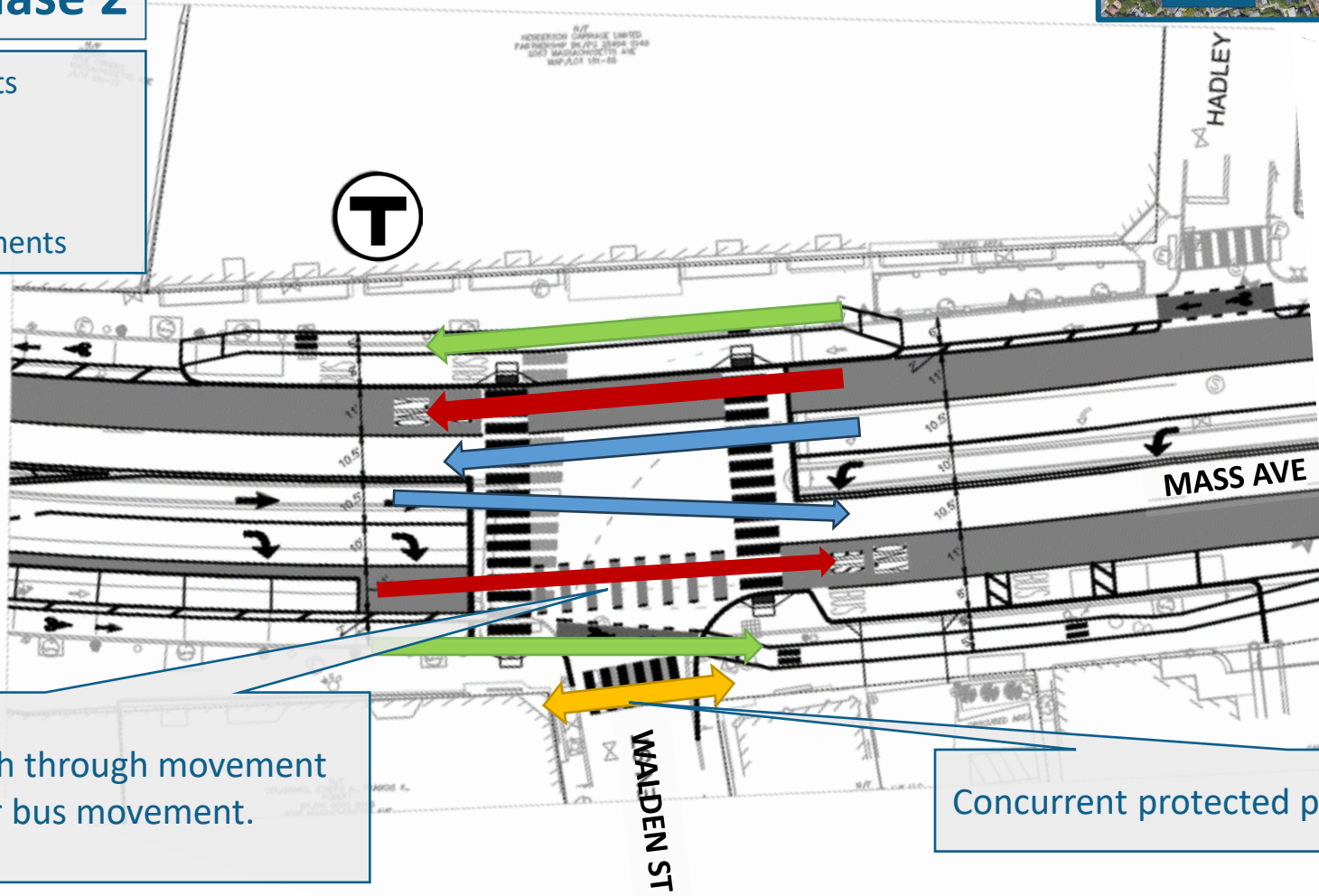
Providing right-turn lane allows for phasing separation from bike, and pedestrian movements.

Walden Street Intersection



Signal Phase 2

-  Vehicle movements
-  Bus movements
-  Bike movements
-  Pedestrian movements



Running the bus lane with through movement maximizes green time for bus movement.

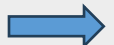
Concurrent protected pedestrian crossing phase.



Walden Street Intersection



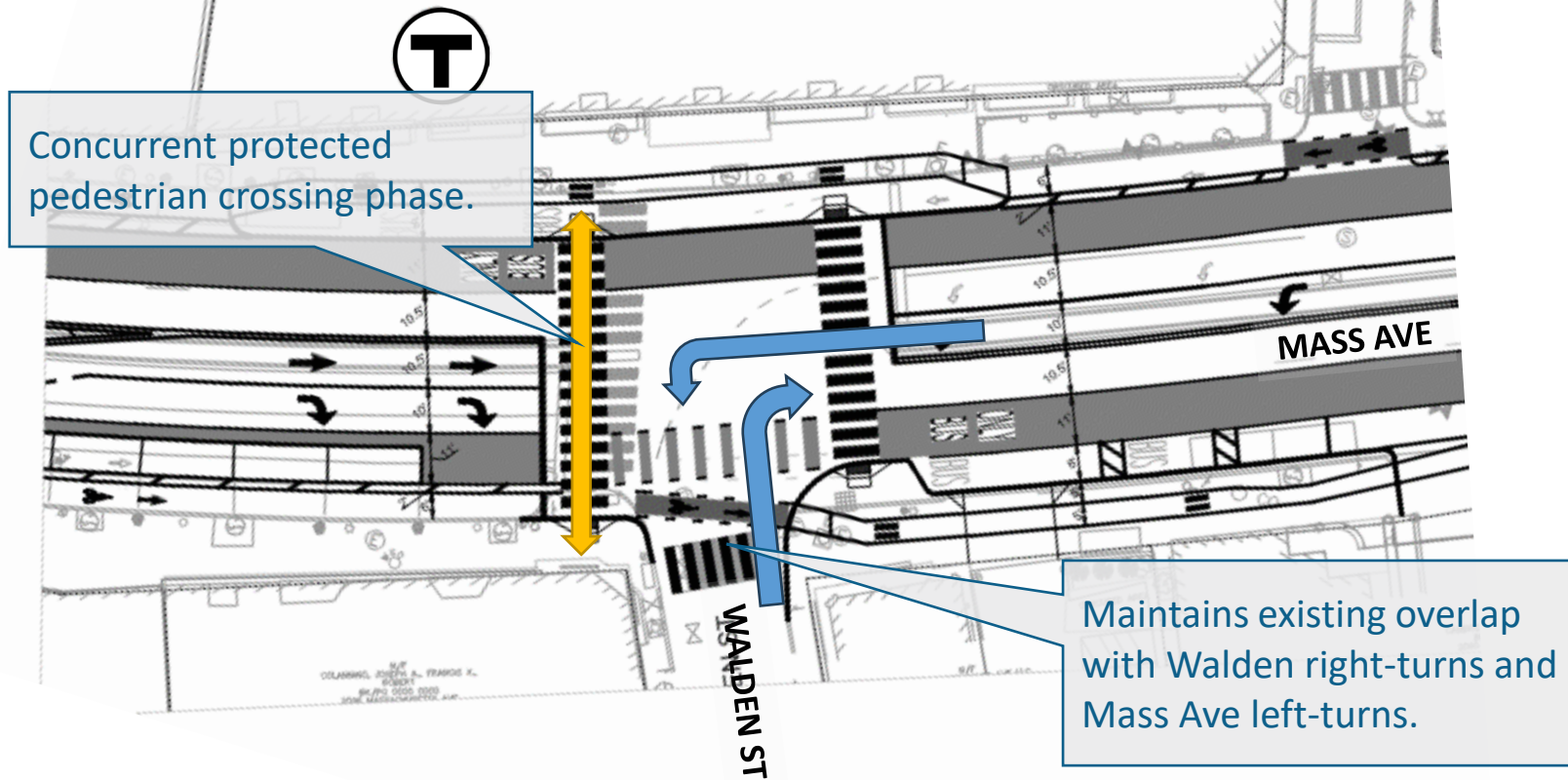
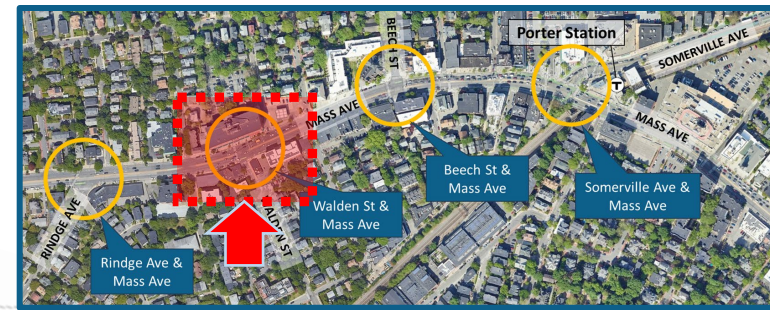
Signal Phase 3



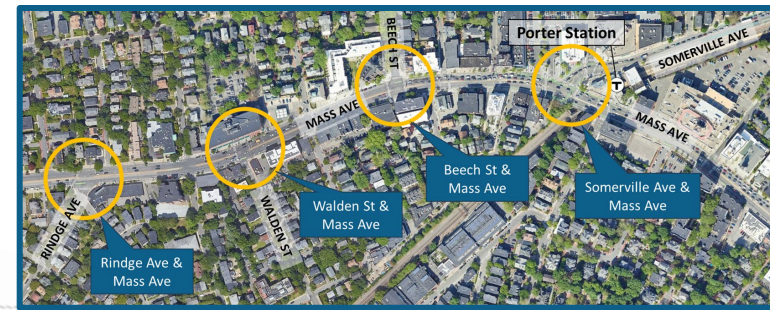
Vehicle movements





Pedestrian movements

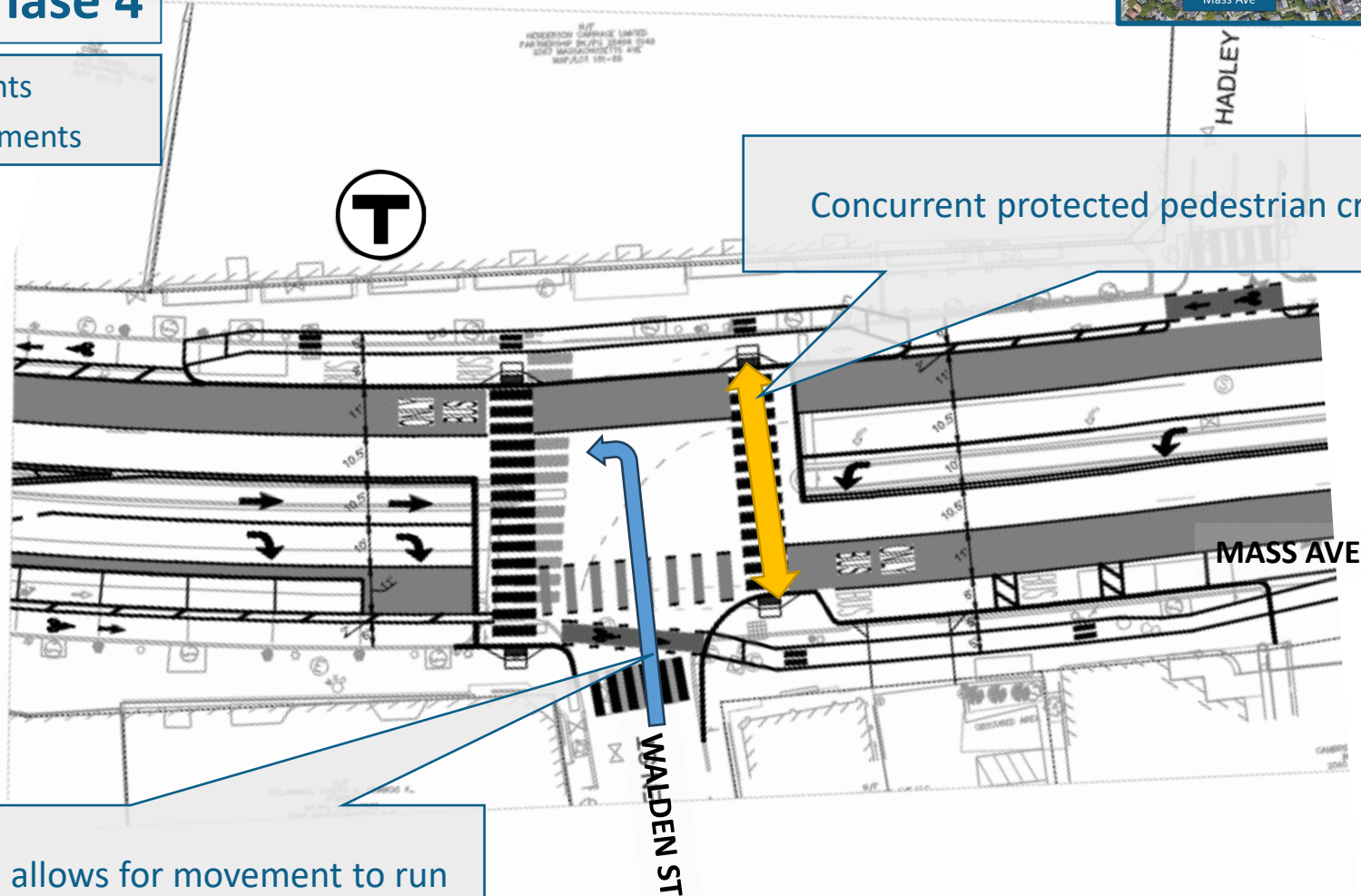


Walden Street Intersection



 **Signal Phase 4**

 Vehicle movements
 Pedestrian movements



Concurrent protected pedestrian crossing phase.

High left-turn demand allows for movement to run concurrent with new crosswalk on Mass Ave.



Q&A



Let's Talk About...



Crosswalk locations



Bus stops



Curb Uses

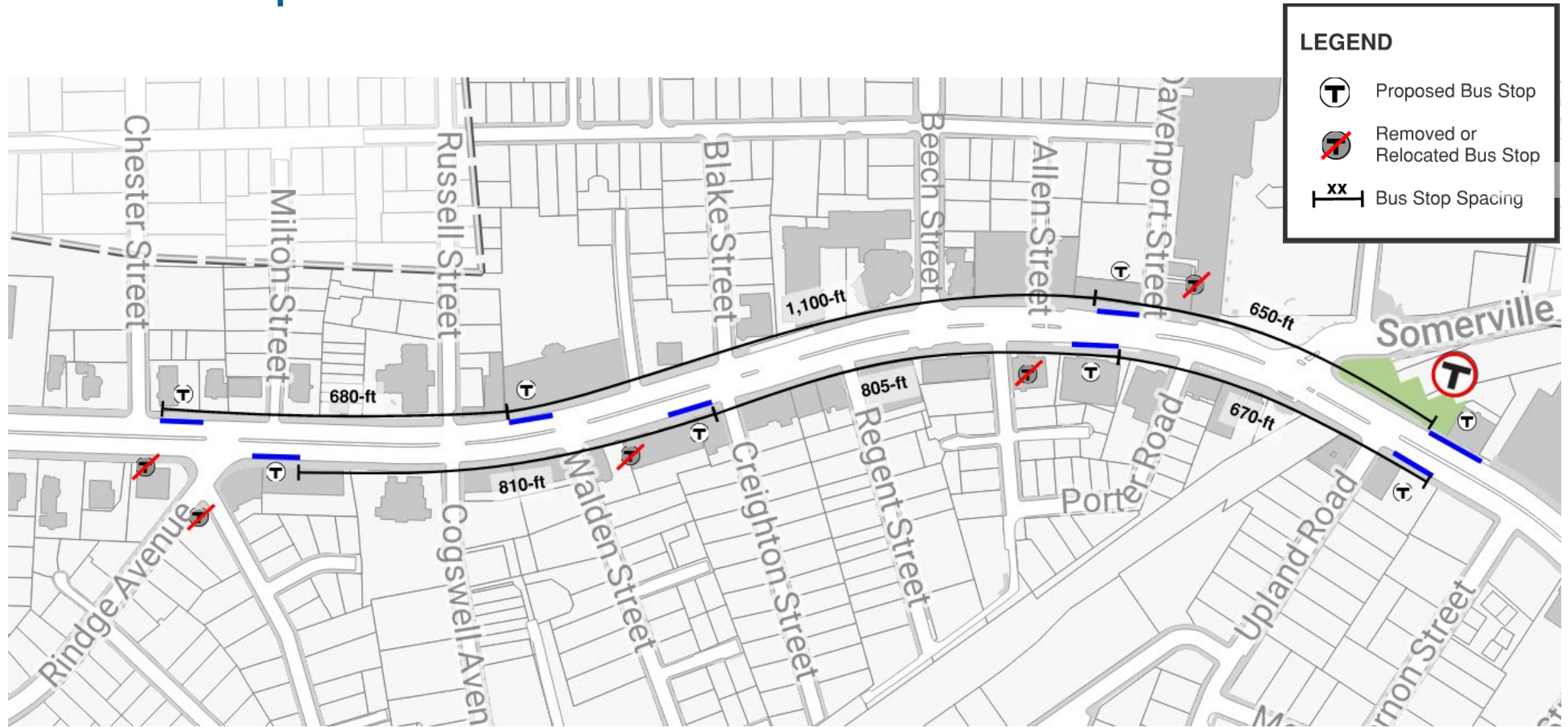
Crosswalks



HAWK on Binney Street



Bus Stops



Review of Curb Use Elements



Floating Parking



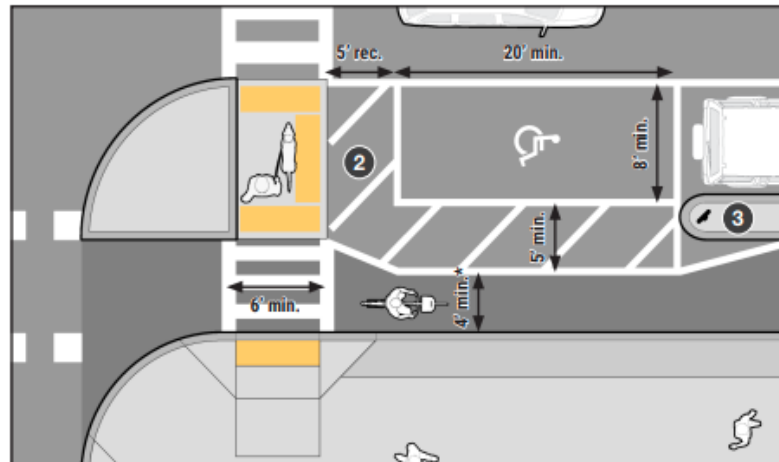
Side street curb regulations



Loading Zone



Curbside Accessible Space



"Floating" Accessible Space
(MassDOT Separated Bike Lane Design Guide)

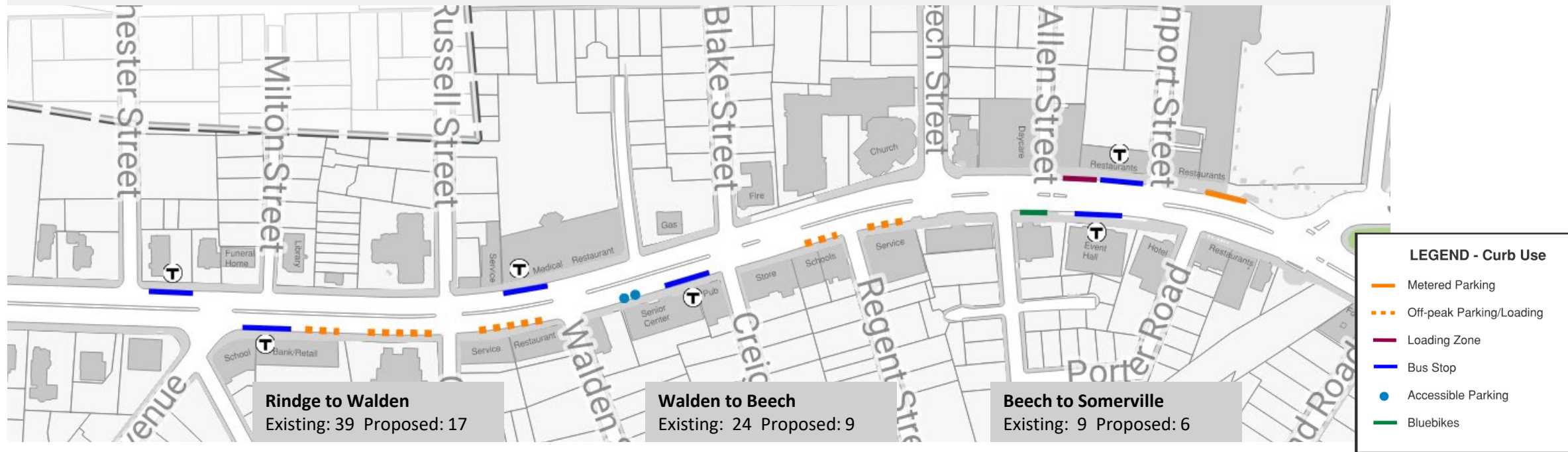


Floating Bus Stop

Draft Curbside Use Allocation Proposal

- With higher traffic demands in this section, curbside activity will primarily be provided after 10:00 am within the southbound bus lane
- Opportunities to provide additional accessible parking and loading along side streets is currently under review

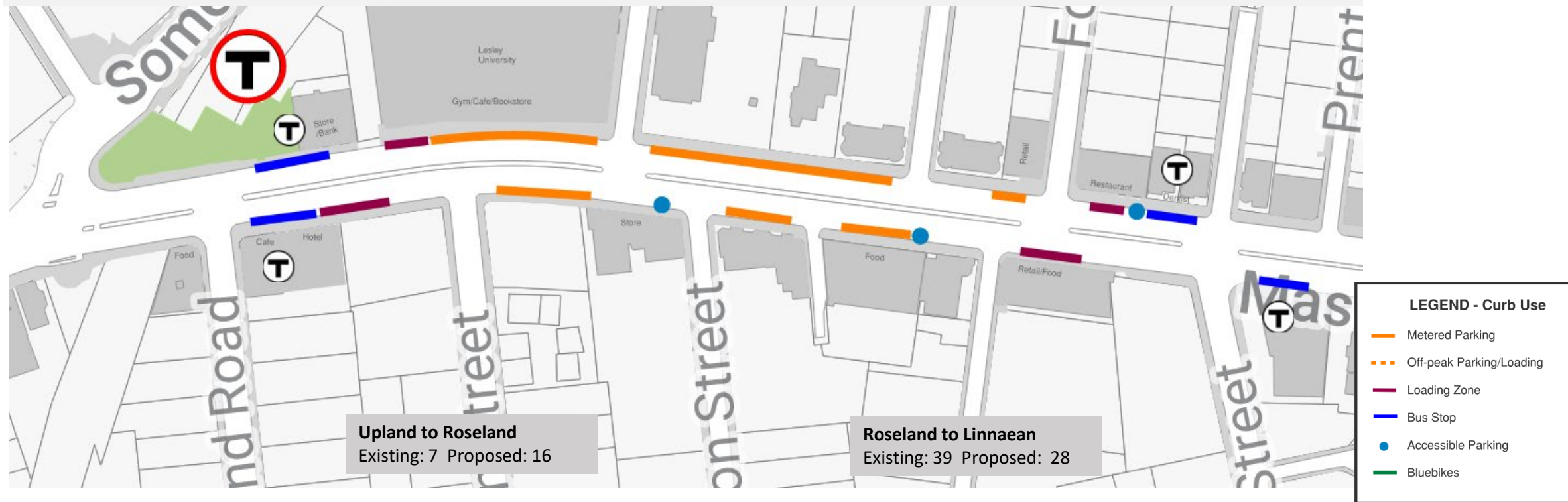
For Discussion – specific locations for loading, Bluebikes, etc TBD based on feedback and further study



Draft Curbside Use Allocation Proposal

- South of Upland Road, there are fewer traffic demands and less bus delay
- Parking and loading can be provided on both sides of the street

For Discussion – specific locations for loading, Bluebikes, etc TBD based on feedback and further study



Discussion & Feedback



Clarifications for June Open House

- More specifics regarding on-street parking and loading
 - Time of day/duration
 - Clarify spaces added and removed by block
 - Include names of businesses/landmarks in context of curb uses
- Locations where crosswalk distances are shorter/curb radii tightened
- Blake Street and Beech Street intersections
 - Bicycle accommodations
 - Clarification of turning lanes
- Potential street tree conflicts



Other
Suggestions?



Next Steps



Expected Timeline and Next Steps

April

- Working Group #4
- Business outreach

May

- Share draft concepts Rindge to Linnaean with City's joint transportation committee
- City reviewing 50% design south of Linnaean

June

- Public Open House on June 26



Questions?

Please reach out to our Project Team at

Email: MassAve4@Cambridgema.gov.

Webpage: cambridgema.gov/massavepartialconstruction

