



**River Street
Reconstruction**



Working Group # 8

Tuesday, December 17, 2019

Today's Agenda

- **Welcome and Overview** **5 minutes**
- **Memorial Drive to Auburn Street**
 - **Recap of Public Meeting and Working Group Input** **30 minutes**
 - **Discussion** **15 minutes**
- **Auburn Street to Massachusetts Avenue (MBTA Busway & Carl Barron Plaza)**
 - **Progress report** **30 minutes**
 - **Feedback on Design Approaches** **20 minutes**
- **Public Comment** **15 minutes**
- **Next Steps** **5 minutes**

Goals for Today's Meeting

- 1. Present refined design approach for River Street between Memorial Drive and Auburn Street, and answer some key questions**
- 2. Clarify, explore, and discuss the two potential design approaches for River Street between Auburn Street and Massachusetts Avenue (including Carl Barron Plaza and the MBTA busway)**

Welcome and Overview

Shared Design Goals

- Safe
- Inclusive
- Human Scale
- Ecological
- Multimodal
- Activated
- Resilient



Western Avenue

Memorial Drive to Auburn Street

Recap of Public Meeting and Working Group Input

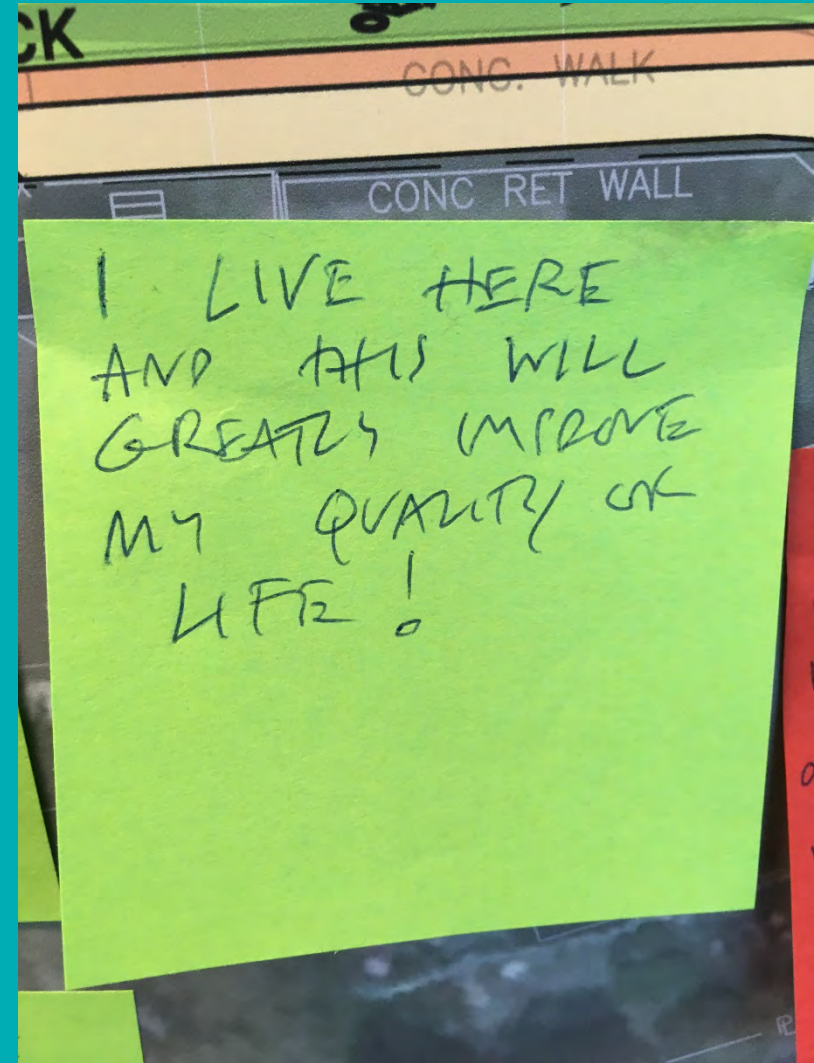
Comments on the Memorial Drive to Auburn Street Concepts:

Working Group # 7

- Attendees: 13 WG and 11 Public
 - Main Corridor – 49 comments
 - Tubman Square – 15 Comments

Public Meeting #2 11/19/19

- Attendees: 8 WG and over 30 members of the Public
 - Main Corridor – 91 Comments
 - Tubman Square – 32 Comments



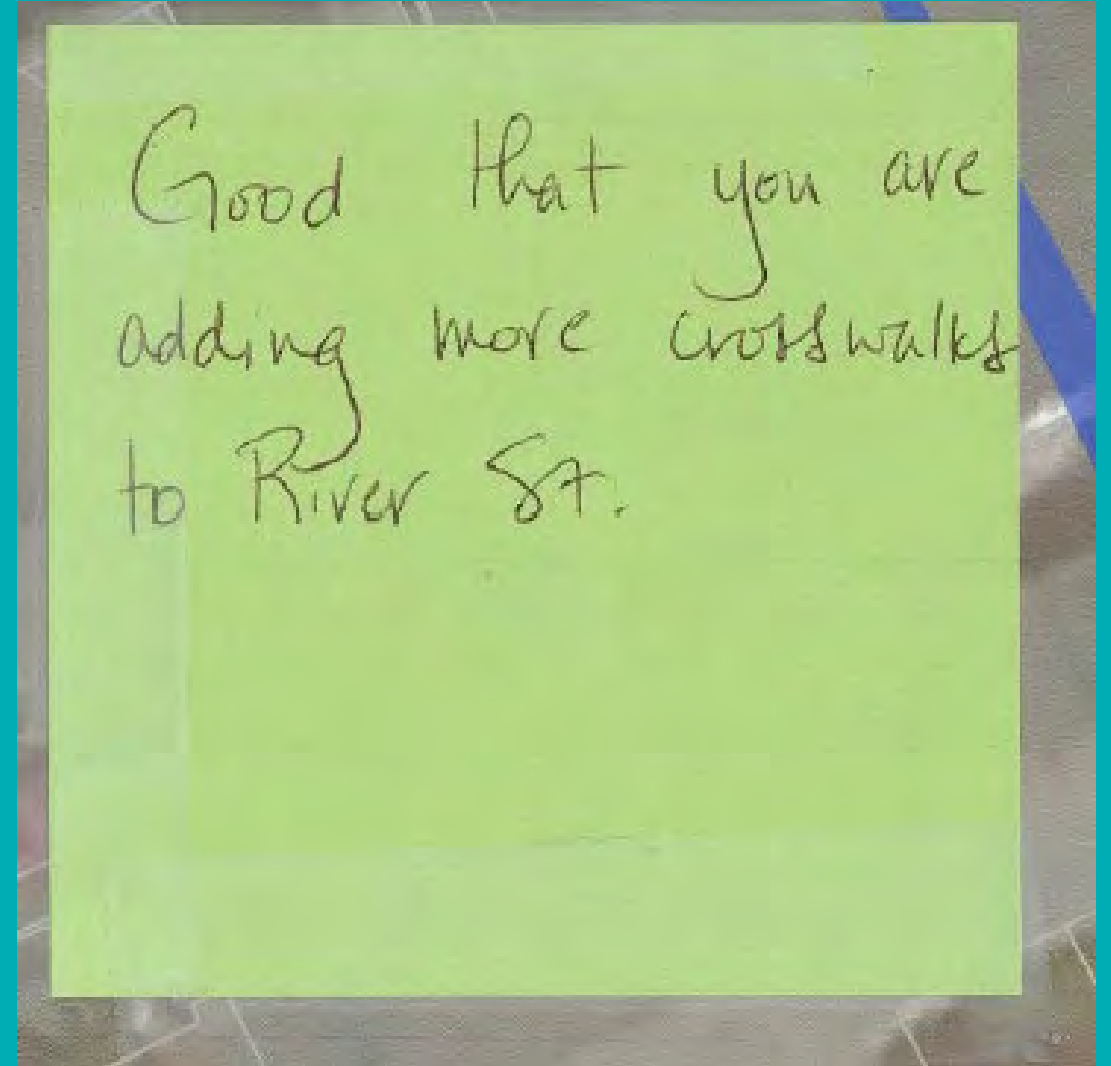
Common feedback themes:

- Support for:
 - Providing a separated bike lane
 - Providing a Bluebikes station
 - Incorporating pedestrian safety measures including new and improved crosswalks
 - Preserving and adding street trees
- Suggestions for:
 - Urban design
- Mixed Opinions on:
 - Single travel lane and bus lane operations
 - Right balance of Flex Zone uses (activation, business needs, residential parking, etc.)
 - Tubman Square options (preference for "Kinnaird Street Closed" option?)



Pedestrian Crossings – 24 Comments

- Support for new crossings at:
 - Blackstone Street
 - Pleasant Street
 - Kelly Road/Howard Street
- Support for curb extensions at crosswalks and raised crossings on side streets
- Support for converting the signal at Putnam Avenue to concurrent signal phasing



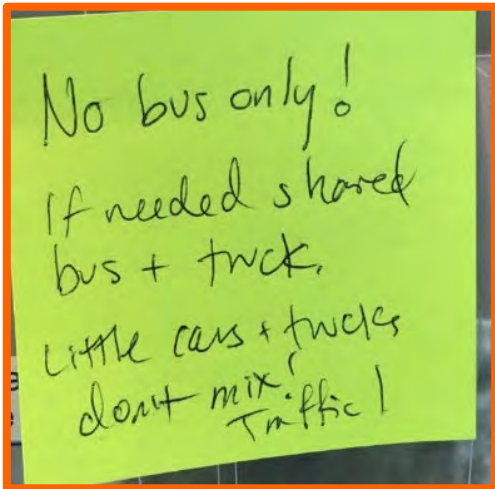
Urban Design Suggestions (25 comments)

Examples:

- Food Truck/Farmer's Market opportunities
- Support for improving connection to Hoyt Field
- Requests for more benches, tables, and greenery, trash receptacles
- Consider how the former River Gods building can relate to Tubman Square
- Rocks that you can climb on
- Preserving/adding trees

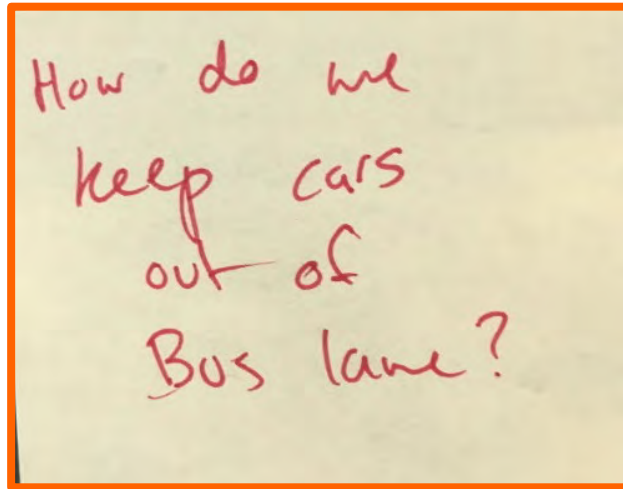


A Wide Range of Feedback on Single Lane Plus Bus Lane



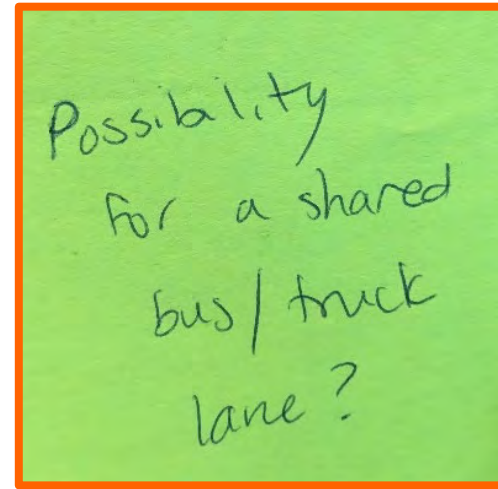
No bus only!
If needed shared
bus + truck.
Little cars + trucks
don't mix
Traffic!

Against a bus-only lane



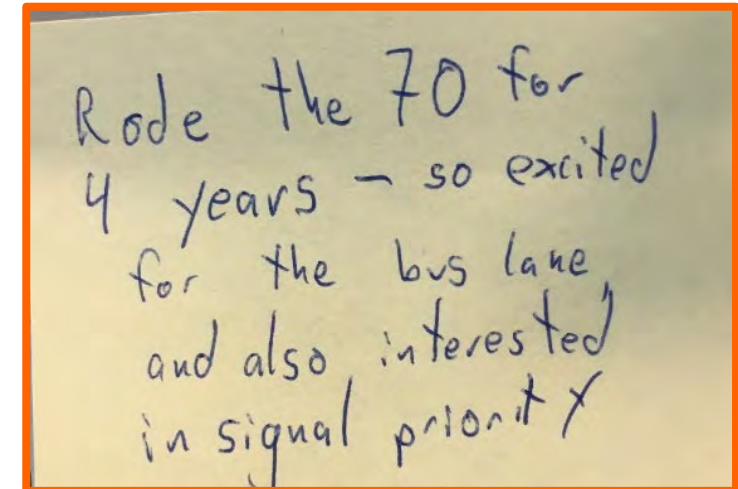
How do we
keep cars
out of
Bus lane?

Concern about how bus-only lanes operate



Possibility
for a shared
bus/truck
lane?

Interest in a bus/truck lane

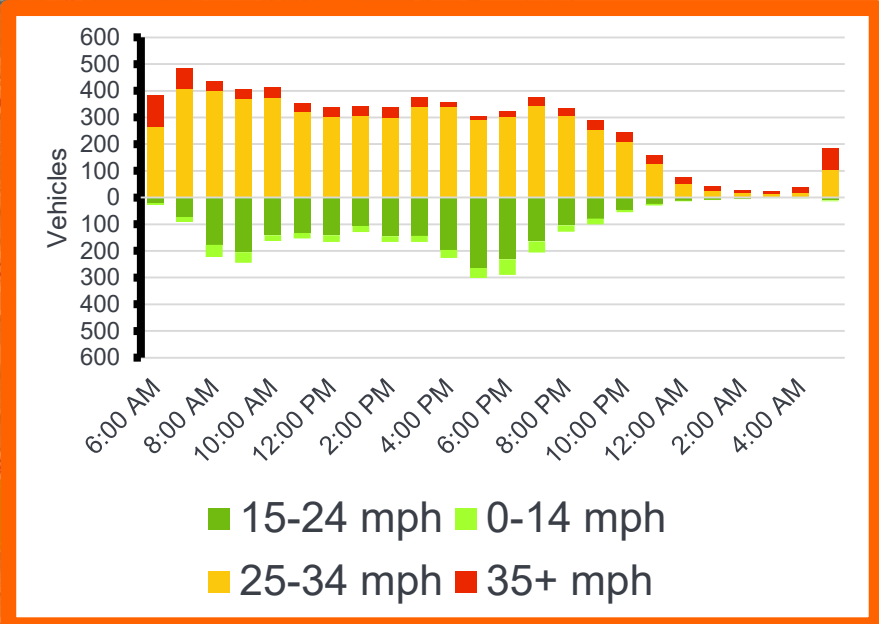
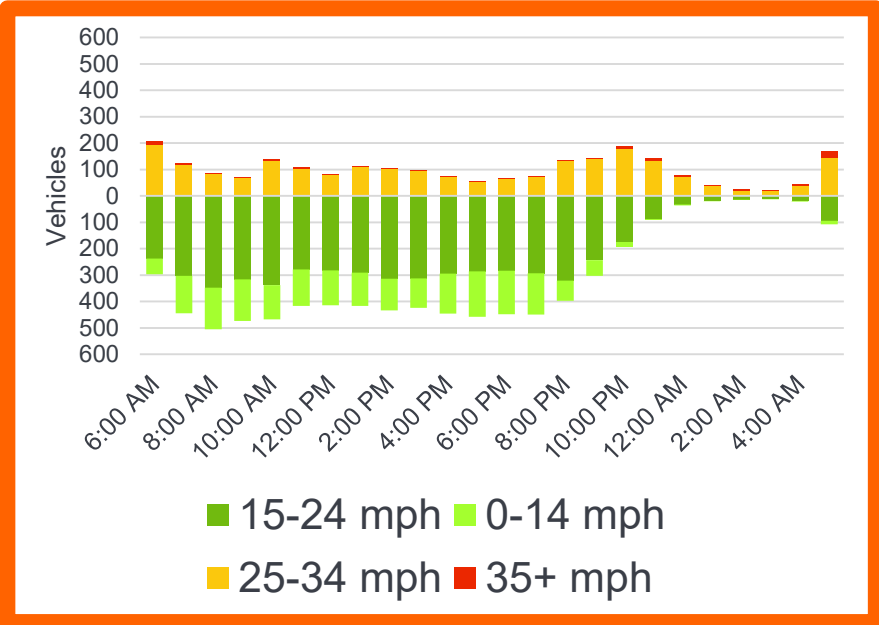


Rode the 70 for
4 years - so excited
for the bus lane
and also interested
in signal priority

Support for a single travel lane with bus-only lane

Existing Traffic Speeds

Speeding is a problem here even in peak hour traffic. Reconfiguring the roadway to a single general travel lane (plus bus lane) will help slow people down.



<p>HIT BY A VEHICLE TRAVELING AT:</p> <p>20 MPH</p> <p>9 out of 10 pedestrians survive</p>	<p>HIT BY A VEHICLE TRAVELING AT:</p> <p>30 MPH</p> <p>5 out of 10 pedestrians survive</p>	<p>HIT BY A VEHICLE TRAVELING AT:</p> <p>40 MPH</p> <p>Only 1 out of 10 pedestrians survives</p>
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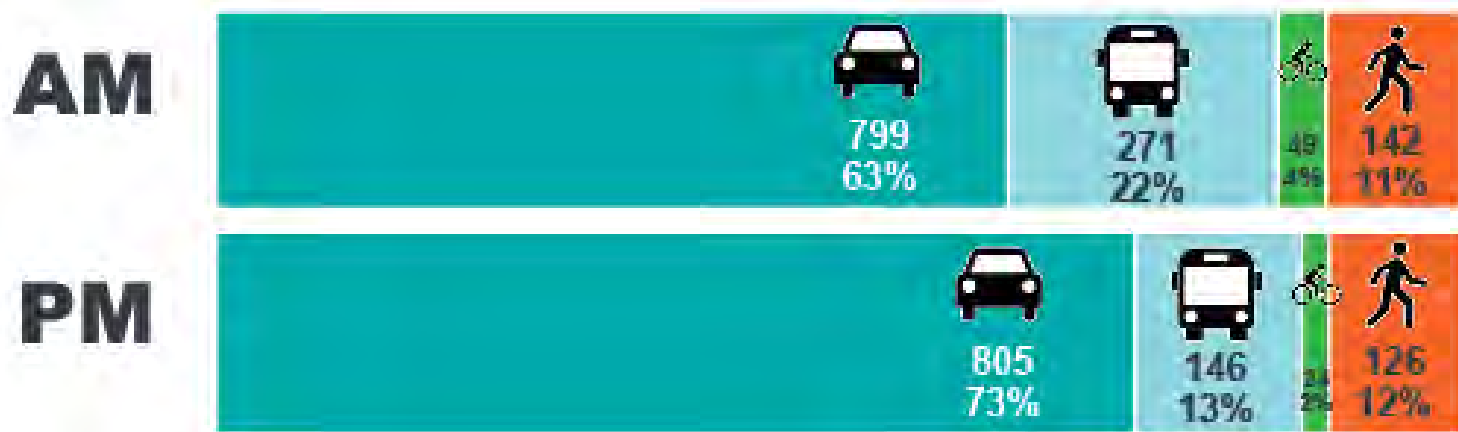
Traffic Calming Roundup (review from Working Group Meeting #6)

- Raises all side-street crossings
- Narrows turning radii on most intersections
- Improves visibility at all intersections
- Increases vertical elements (trees)
- **One travel lane naturally regulates speeding – only able to go as fast as the car in front of you**
- **Provides an extra buffer between most traffic and pedestrians/ cyclists (except buses and right-hand turns)**
- Some studies have shown that the presence of parking also slows down traffic
- All corners have a more pedestrian neighborhood feeling
- Added two new crosswalks

How people are travelling on River Street in the Peak Hour today

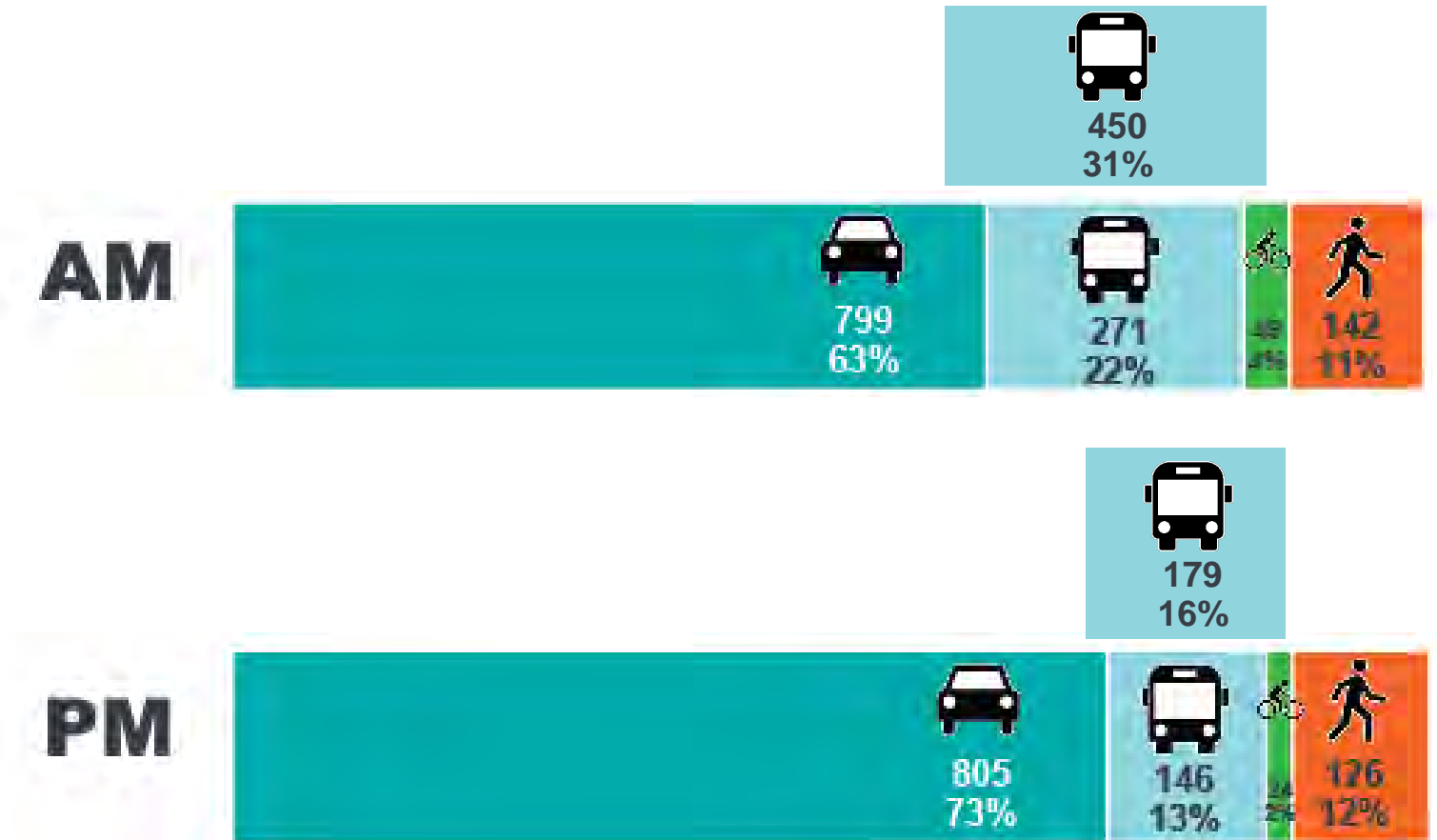
Additional bus types not calculated at left (estimated peak hour ridership):

- Corporate Shuttles for:
 - Alexandria (approx. 40 riders at peak hour)
 - MASCO (unknown # of riders)
- School buses (unknown)
- Tour buses (unknown)



Based on traffic counts taken on River Street at the Kelly Street/Howard Street intersection.

Bus Ridership on River Street with potential addition of Route 64



With Route 64 re-routed from Magazine Street to River Street

- 31% of users in AM peak are bus riders
- 16% of users in PM peak are bus riders

In the future, likely that walkers, bikers, transit users, and other types of bus users would increase as well

Based on traffic counts taken on River Street at the Kelly Street/Howard Street intersection.

Transit Delays



Street segments recorded with the most bus delay and reliability issues in the City

Each end of the corridor experiences the most bus delay

Average Vehicle Delay at Signals - AM



Putnam

Existing



34 seconds

Projected



18 seconds

Howard/Kelly



14 seconds



7 seconds

Future Projected Traffic Queues - AM



New concurrent signal phasing at Putnam Avenue would mean a more efficient intersection that does not increase congestion, even with one lane becoming right-turn only.

Traffic Queues

- Existing (Observed)
- Future One-Lane (Projected)

- Minor adjustments to traffic signal timing may be required in final design
- Requires coordinated signals with Memorial Drive project
- Existing queues at Kelly/Howard are projected based on traffic counts

Future Projected Traffic Queues - PM



New concurrent signal phasing at Putnam Avenue would mean a more efficient intersection that does not increase congestion, even with one lane becoming right-turn only.

Traffic Queues

- Existing (Observed)
- Future One-Lane (Projected)

- Minor adjustments to traffic signal timing may be required in final design
- Requires coordinated signals with Memorial Drive project
- Existing queues at Kelly/Howard are projected based on traffic counts

Other Similar Curbside Bus Lanes with Separated Bike Lanes to Check Out

- Broadway, Somerville – WB between Temple Street and Bond Street
- South Massachusetts Ave, Cambridge between Sidney and Windsor Streets



Why a Truck/Bus Lane is not being considered

- Would be less comfortable for cyclists, pedestrians, and people on buses
- May encourage delivery operations to occur in bus lane
- Keeping traffic in single lane helps control vehicle travel speeds, including truck speeds
- Trucks in right lane would likely cause visibility issues for crossing pedestrians (multiple threat)



Flex Zone / Curbside Space



Function	Definition	Examples of Uses
Access for commerce	Goods and services reach their customers	Commercial vehicle loading, truck loading
Access for People	Arrivals, transfers between modes	Bus stops, bike parking, curb extensions, pick up/drop off, short-term parking, taxi zones
Activation	Offers vibrant social spaces	Food truck parking, seating, parklets and streateries, public art, street festivals
Greening	Enhances aesthetics and environmental health	Trees, ornamental plantings, rain gardens, bio-swales, green infrastructure
Mobility	Moves People & Goods	Sidewalks, bus lanes, bike lanes, travel lanes, turning lanes
Storage (less than 24-hour)	Provides storage for vehicles and equipment	Bus layover, private vehicle parking, reserved spaces (police, govt., etc.), construction needs.

Many requests for Flex Zone Uses

- Resident Permit parking
- Greenery
- Parking for businesses, including requests for metered parking
- Electric vehicle charging
- Activation (outdoor seating) for businesses
- Pick up/drop off
- Pedestrian curb extensions for shorter crossings
- Parking for people with disabilities
- Little free library
- Commercial loading
- Trash receptacles

Very excited to see new parking uses of flex spaces!

Like activation @ coast cafe

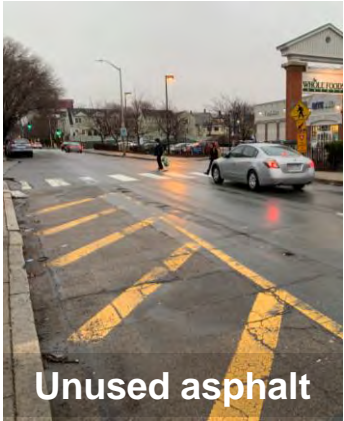
Love the shorter crosswalks!
Are there other ways to make it safe? Currently it's a bit of a scramble with cars turning many ways + lots of pedestrians

WILL REQUIRE RESIDENT ONLY PARKING

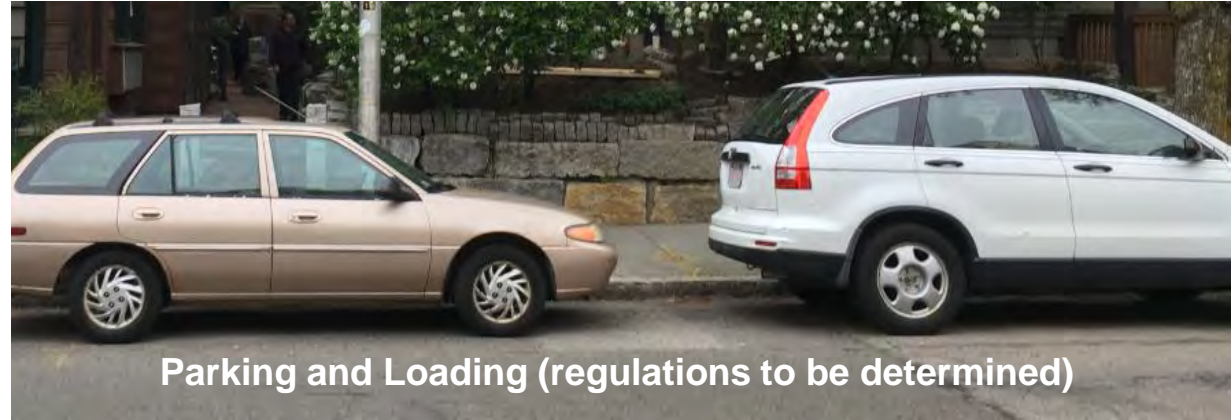
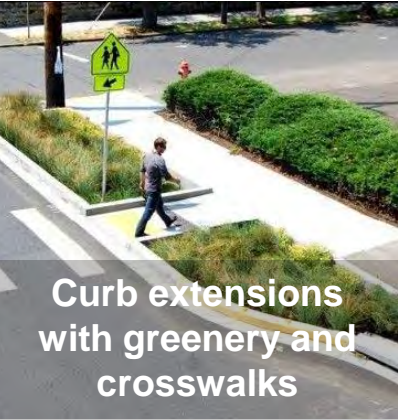
WG
Good to have parking near coast for customers!

River St parking should not be taken away — residents need it!

Existing Flex Zone Allocation



Proposed Flex Zone Allocation



Tubman Square Comments



Limited
Access
Pleasant St.,
4 Against

Kinnaird St.
Closed, 6 for

Limited Access Pleasant St., 2 for

Kinnaird St. Closed, 1 Against

Tubman Square Options Compared

Kinnaird Street Closed

- Eliminates 3 conflict points for River Street pedestrians and cyclists
- More usable open space with a definite shape, safer for integrating play & learning
- Potential future building frontage connected to park allows for better activation & comfort
- Slightly more circuitous route for drivers, complex intersection at Cottage Street
- Eliminates 4 to 7 parking spaces

Limited Access Pleasant Street

- Eliminates 1 conflict point for River Street pedestrians and cyclists
- Some more usable space (but nearly half is shared with local traffic)
- Avoids existing blank wall
- Eliminates 8 parking spaces

Ongoing Design Notes

Memorial Drive to Putnam Avenue

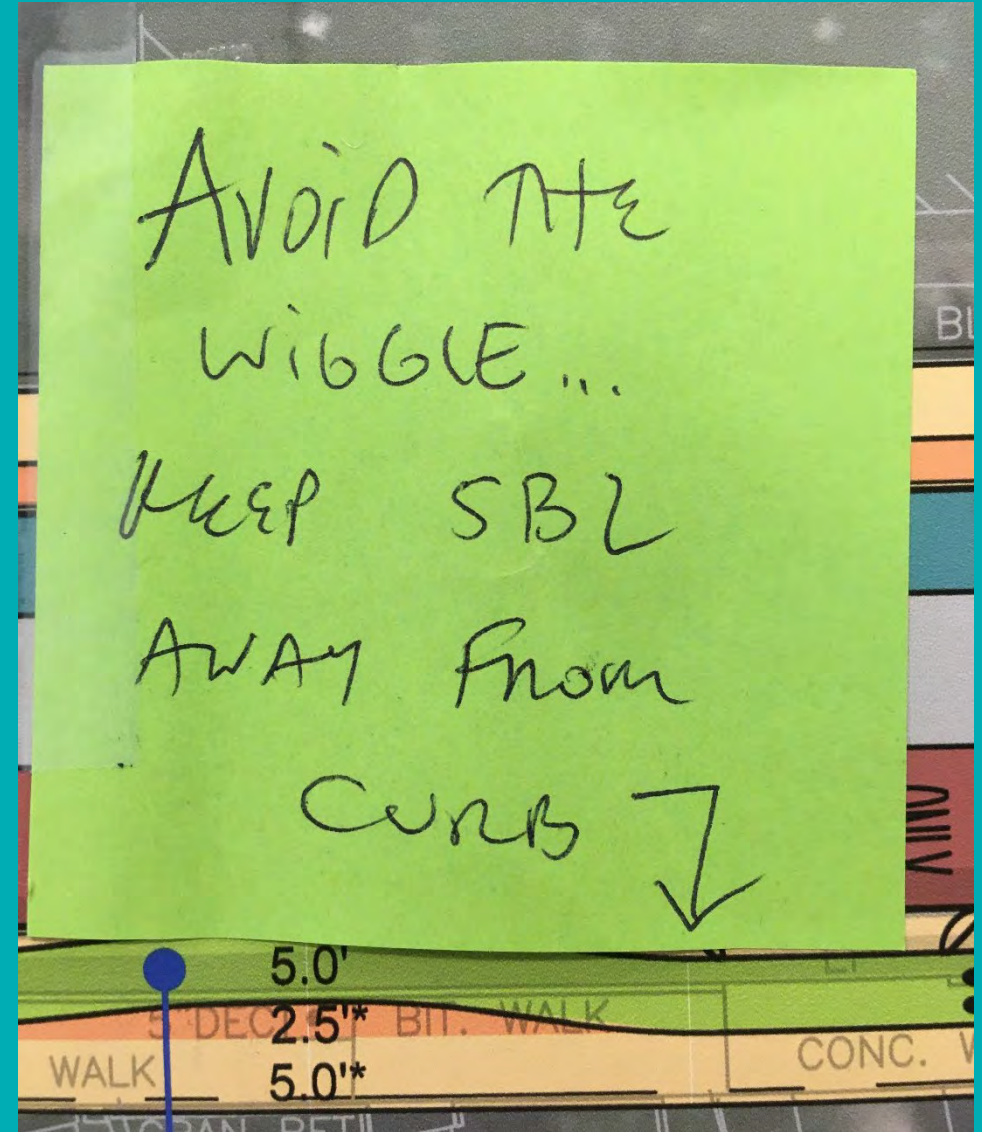
- Investigating Bluebikes station in coordination with choosing bus stop location

The separated bike lane “wiggle”

- Adjusting the alignment of the bike lane to minimize tree impacts while integrating pedestrian ramps and driveways.

Multi-modal connections to parks

- Evaluating enhanced connections to Hoyt Field and Riverside Press Park



Memorial Drive to Auburn Street

Discussion

Auburn Street to Massachusetts Avenue

Progress Report



Challenge 1: The Busway at Central Square is Over Capacity Today

- Layovers occupy bus stops. Buses stop at different locations based on availability
- Very confined sidewalks and waiting areas
- Crowding overwhelms seating and shelters
- Substandard conditions for bus operations create traffic problems

Challenge 2: Green, Magazine and River Street Intersection

- Short length of Green Street between Magazine and River Streets leads to congestion
- Vehicles waiting at intersection of River Street at Massachusetts Avenue queue past Green Street, adding to congestion on Green Street
- Drivers ignore "Stop" sign on Green Street at Magazine Street on green lights, resulting in pedestrian safety issue at a busy crosswalk
- Competition between buses, shuttles, delivery trucks, and motor vehicles for the same space
- Difficult sharp right-hand turn for large vehicles from Green Street to River Street

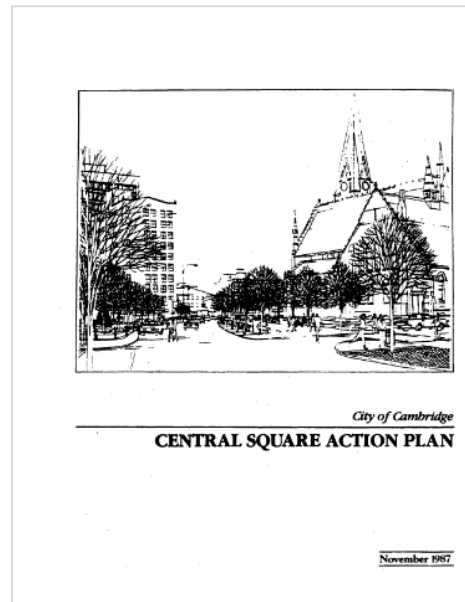


Challenge 3: Fitting in Sidewalk and a Separated Bike Lane

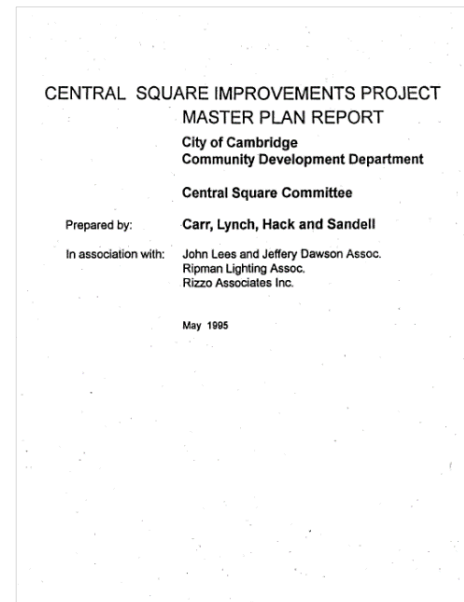
- Several constraints and pinch points means a tight fit for sidewalk and separated bicycle lane
- High pedestrian volumes will require urban design elements to help maintain bike and pedestrian separation



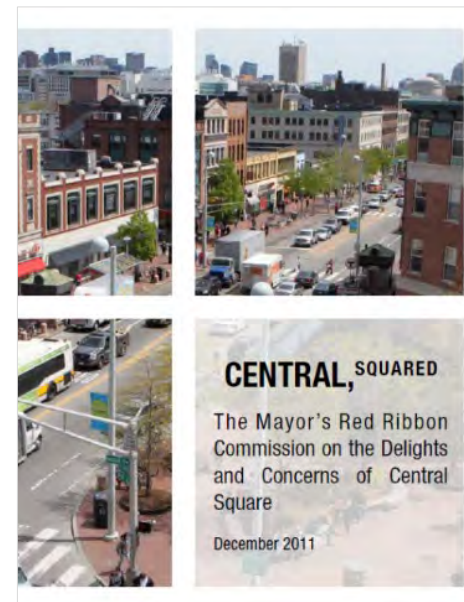
Challenge 4: Longstanding Desire to Increase Public Space in Central Square



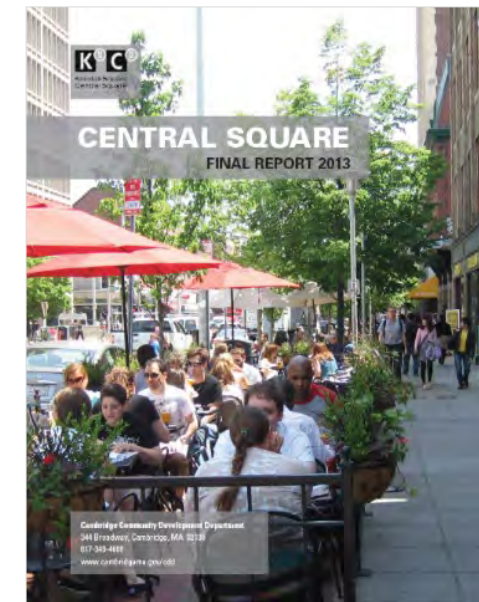
1987



1995



2011



2013

Increasing Public Space is Part of a Long Evolution in Central Square



1920s



1970s



1990s



2010s

... And Many Other Carl Barron Plaza Area Shared Design Goals

Inclusive	Attract a wide range of users while preserving usability for the existing regulars
Activated	Create a vibrant space through everyday activities and special programming
Safe	Create a feeling of safety for everyone
Flexible	Allow for a wide range of uses and activities that can evolve over time
Attractive	Improve the perception of the space
Comfortable	Provide seating, lighting and amenities that promote short- and long-term lingering
Multimodal	Ensure pedestrian and bicyclist flow, and coordinate with transit users' needs
Functional	Provide materials and amenities that are functional and easily maintained
All-Season	Provide comfortable year-round use and reduce microclimate influence

Two Design Approaches

The Island Approach

Motto: “Minimize the changes”

- Minimize route changes
- Move layovers to Magazine Street
- Option to change route of 47 to keep the width of the busway through the plaza narrow, or keep the Route 47 the same and put the layover next to Carl Barron Plaza

The Butterfly Approach

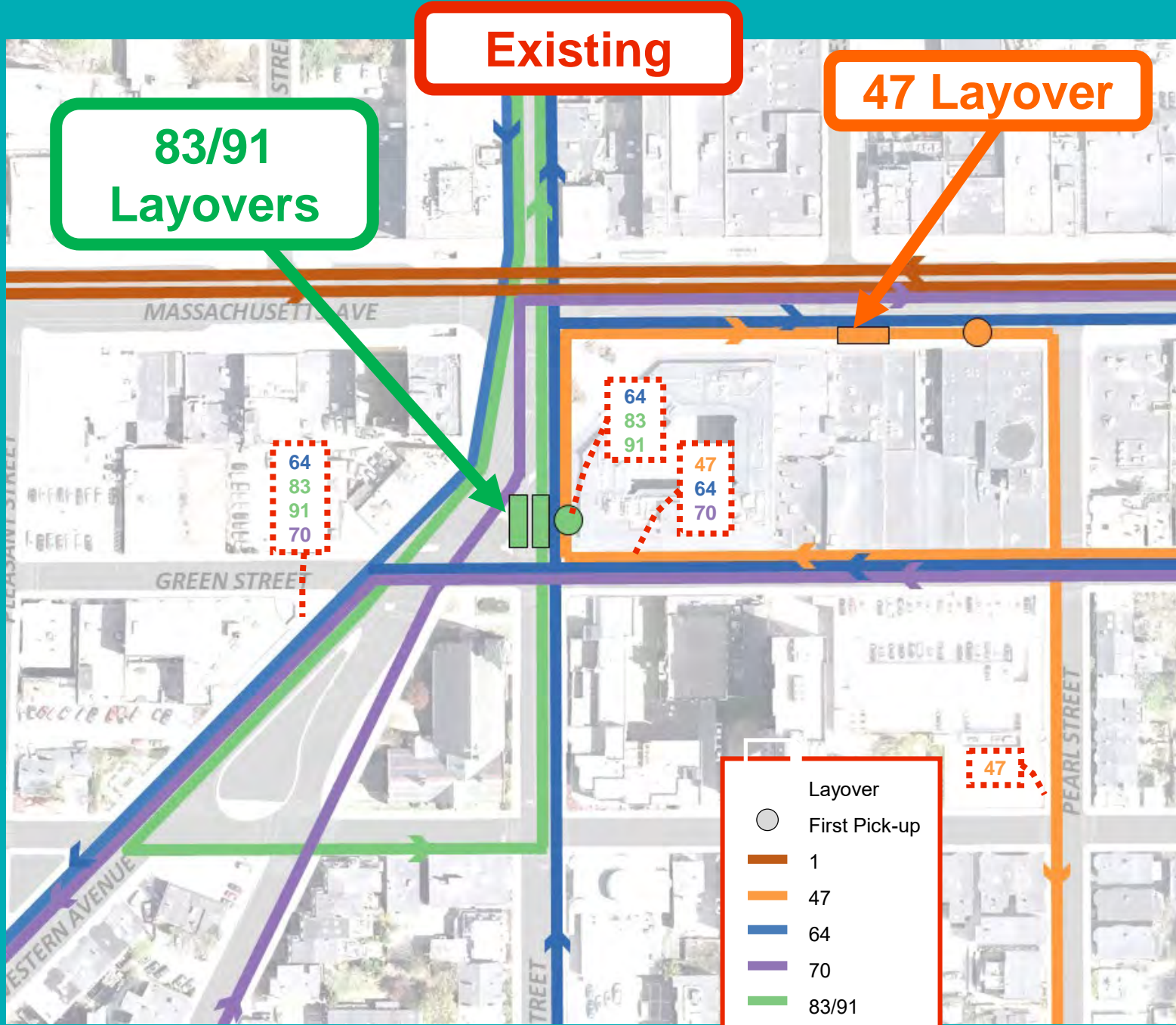
Motto: “Everything out of the busway”

- Move 83/91 layovers out of the busway to River Street
- Move 64 to River Street to avoid cutting through the busway
- Change route of 47 to avoid cutting through busway and put its layover on Green Street

What Does a Layover Look Like?

- The 83 bus currently occupies the layover space for an average of 6.4 minutes, two to three times per hour
- The 91 bus currently occupies the layover space for an average of 4 minutes, two to three times per hour

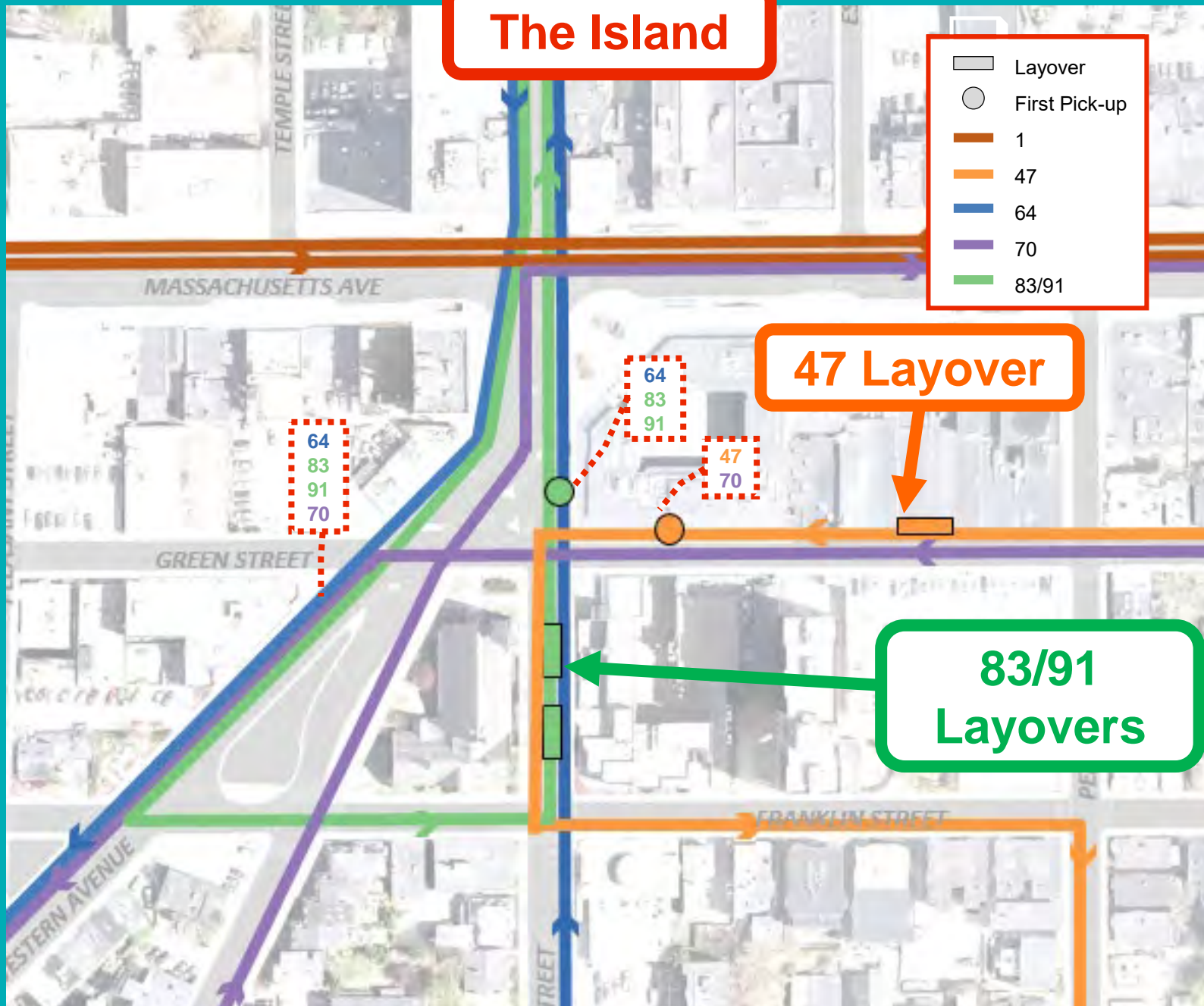




Existing Bus Routes and Layovers

- Having buses layover for Route 83 and 91 make operations challenging and take space
- The layover location for Route 47 on Massachusetts Avenue is problematic for Route 1 and other curb uses

The Island

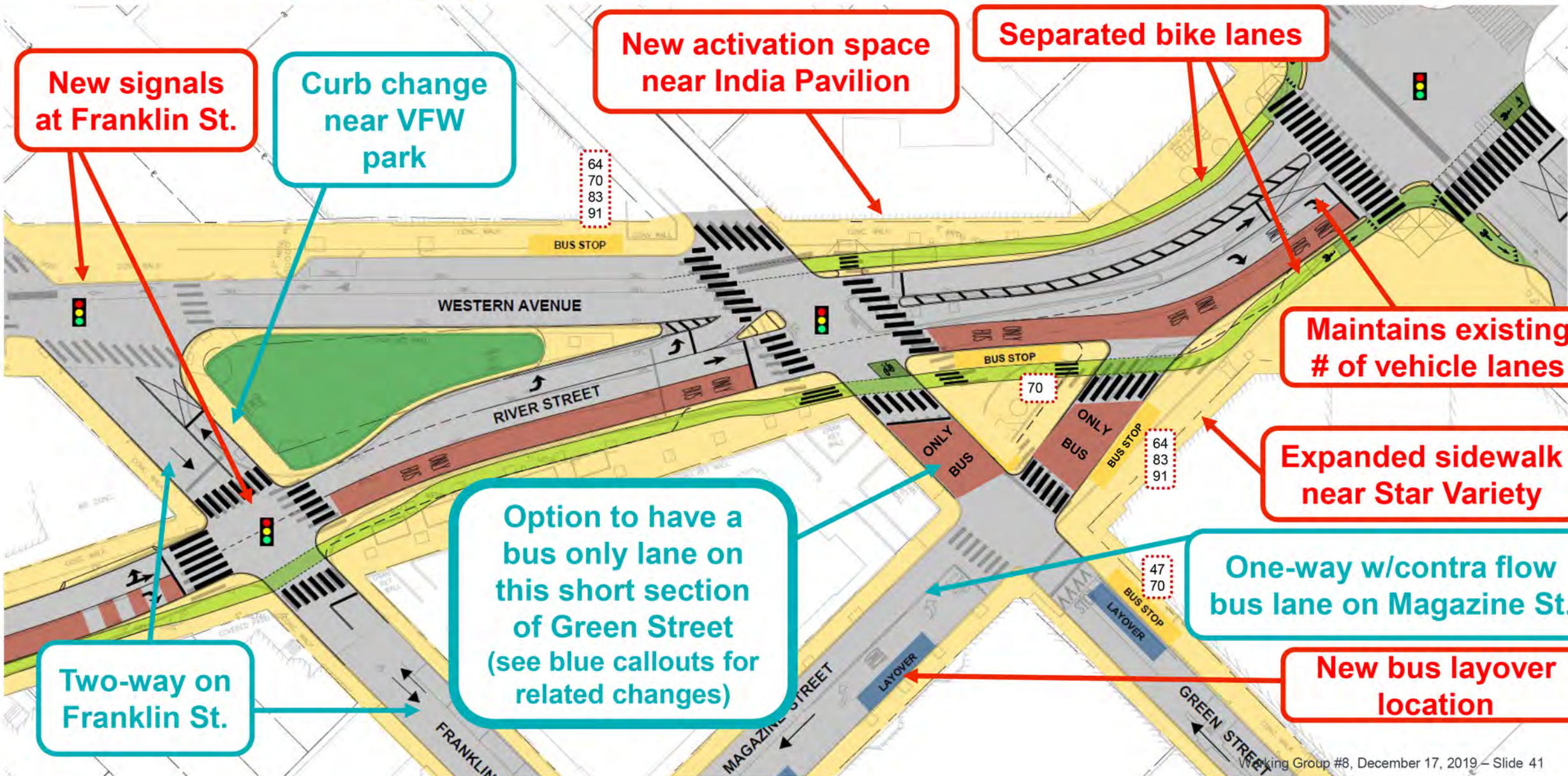


The Island Approach

Key Strategies:

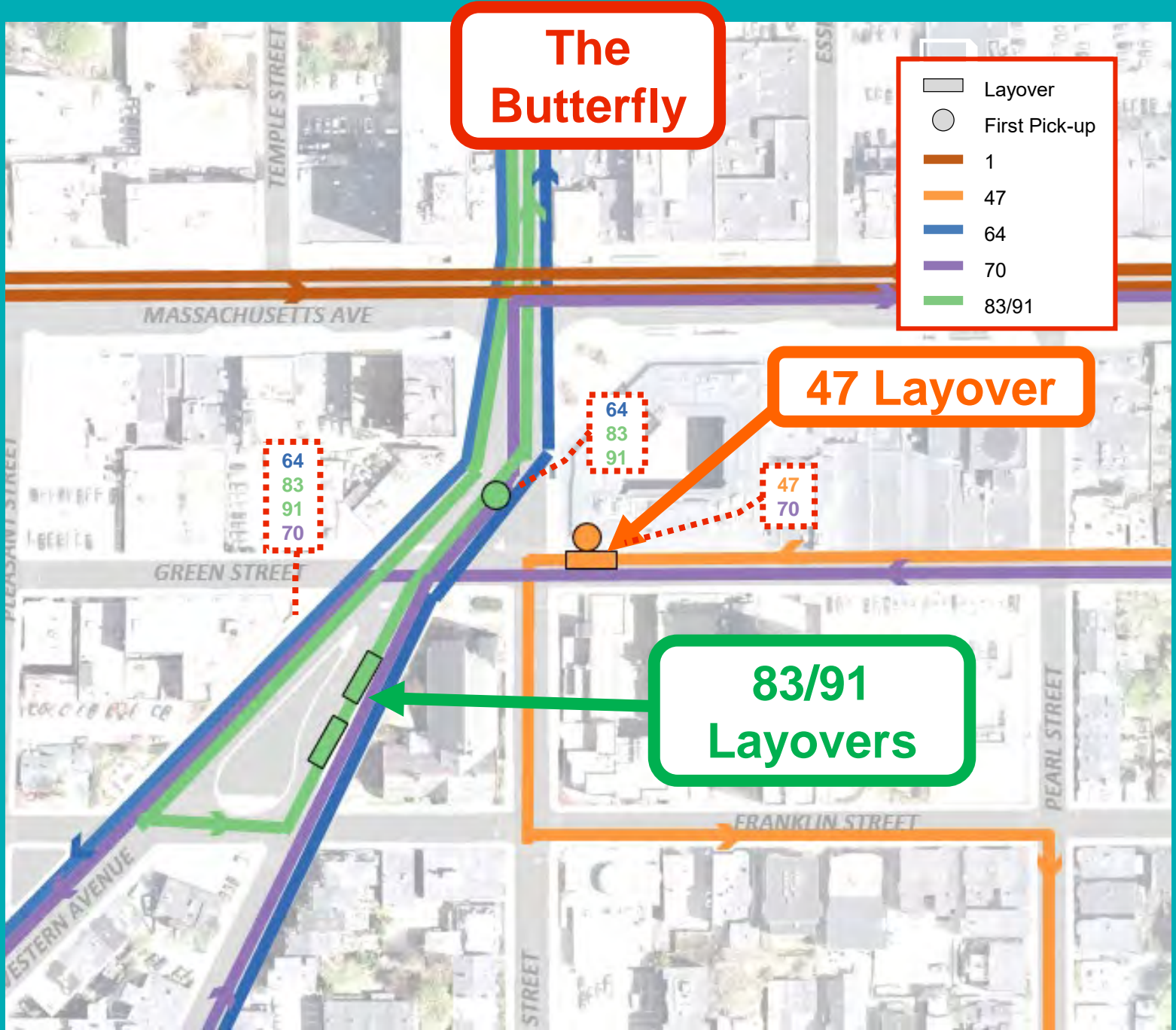
- Minimize route changes
- Move 83/91 bus layovers to Magazine Street
- Option to **change routing of 47** to keep the width of the busway through the plaza narrow

Island Approach Overview (shown with 47 route change)



Island Design Rendering



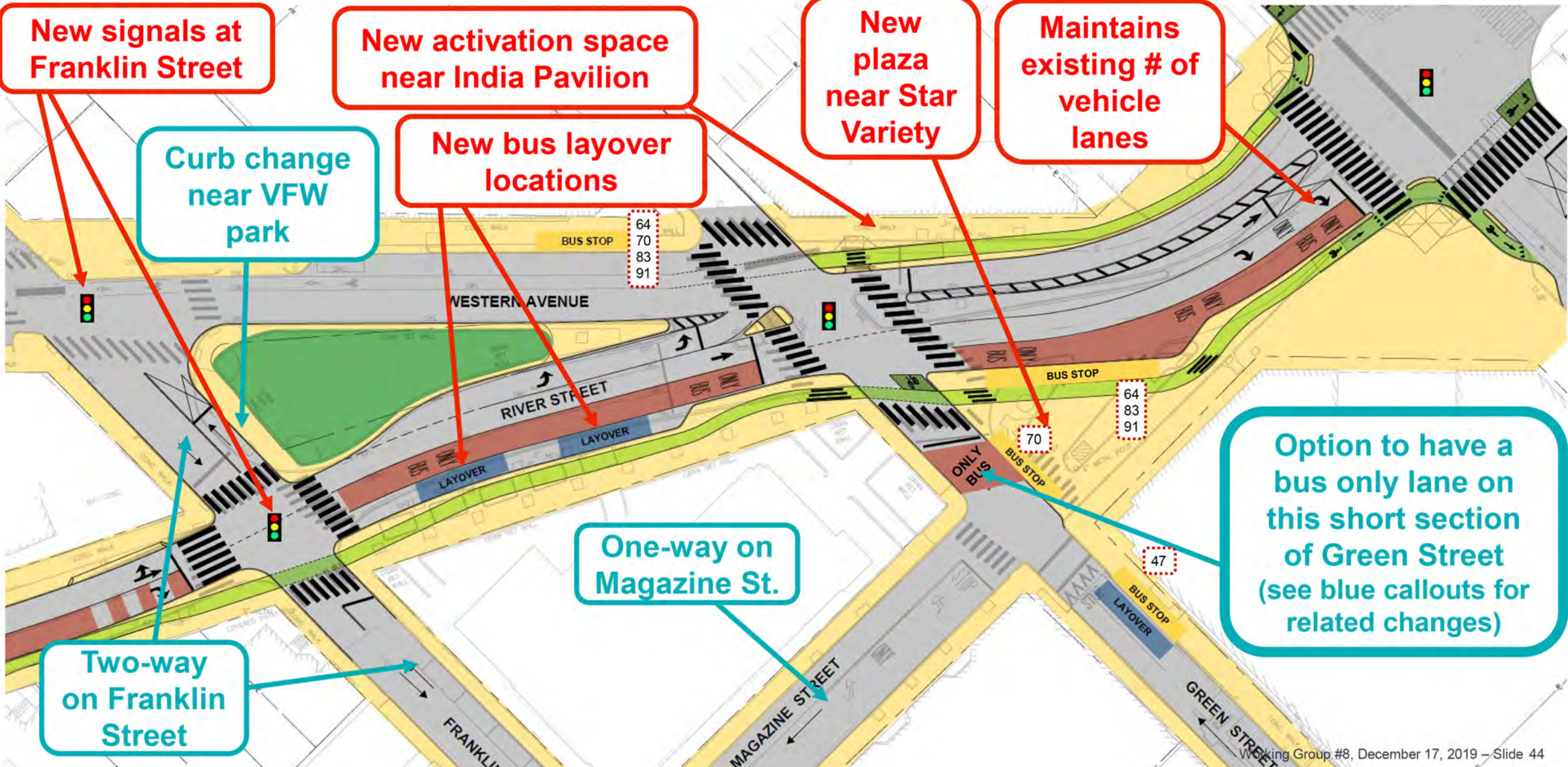


Butterfly Approach

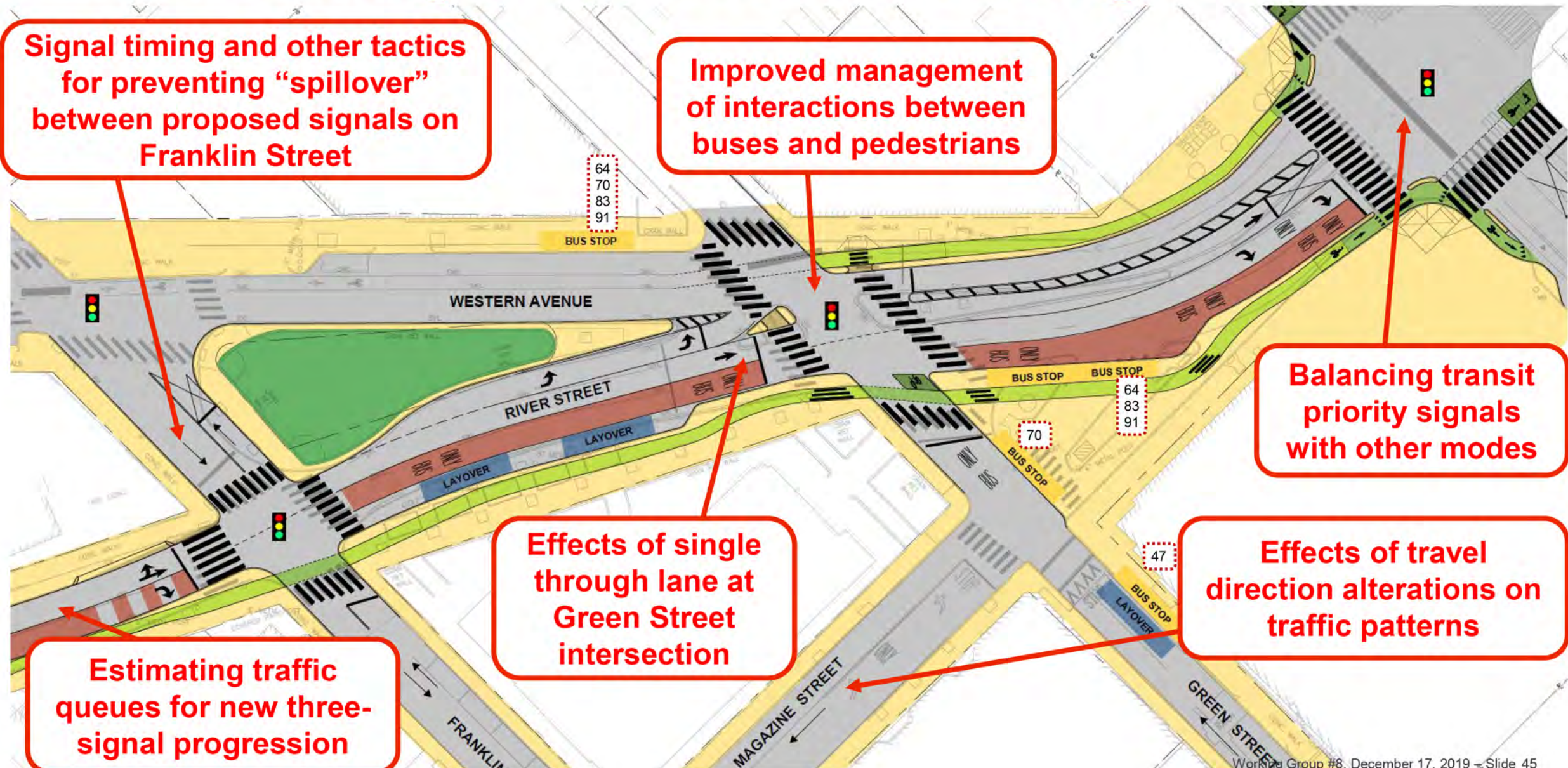
Key Strategies:

- **Move 83/91 layovers to River Street**, out of the busway
- **Move 64 to River Street** to avoid cutting through the busway
- **Change routing of 47** to avoid cutting through busway and locate its layover on Green Street

Butterfly Approach Overview



Next Steps for Traffic Analysis



Signal timing and other tactics for preventing “spillover” between proposed signals on Franklin Street

Improved management of interactions between buses and pedestrians

Balancing transit priority signals with other modes

Effects of single through lane at Green Street intersection

Effects of travel direction alterations on traffic patterns

Estimating traffic queues for new three-signal progression



Butterfly Design Approach

Bicycle lane behind
bus stop waiting area

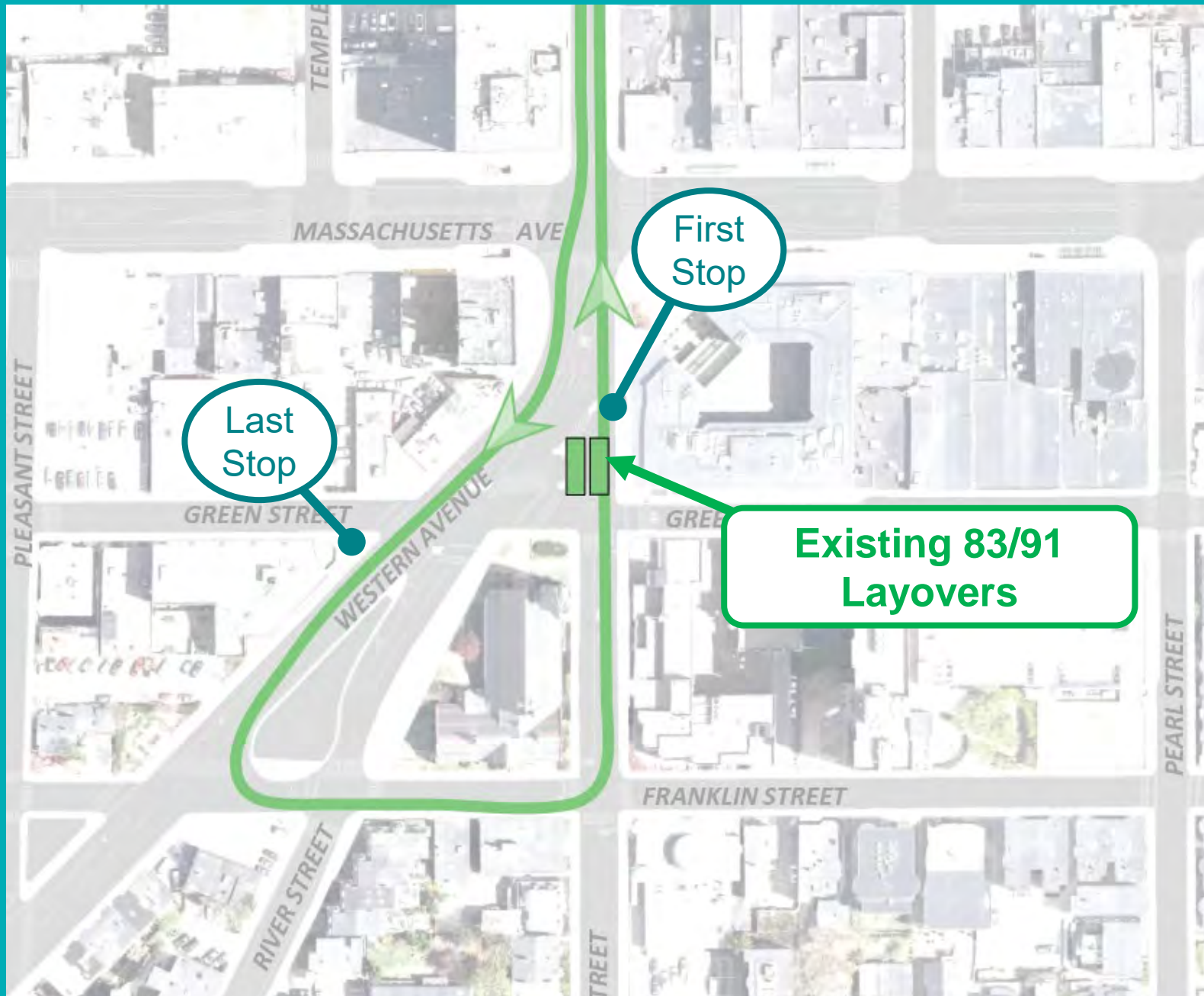
More discussion
about separation and
treatment needed

Rules for Relocating Layovers

- No significant route extensions, as this would result in less bus service
- Location must be between the first and last stop

— 83/91 Route

▬ Layover Space

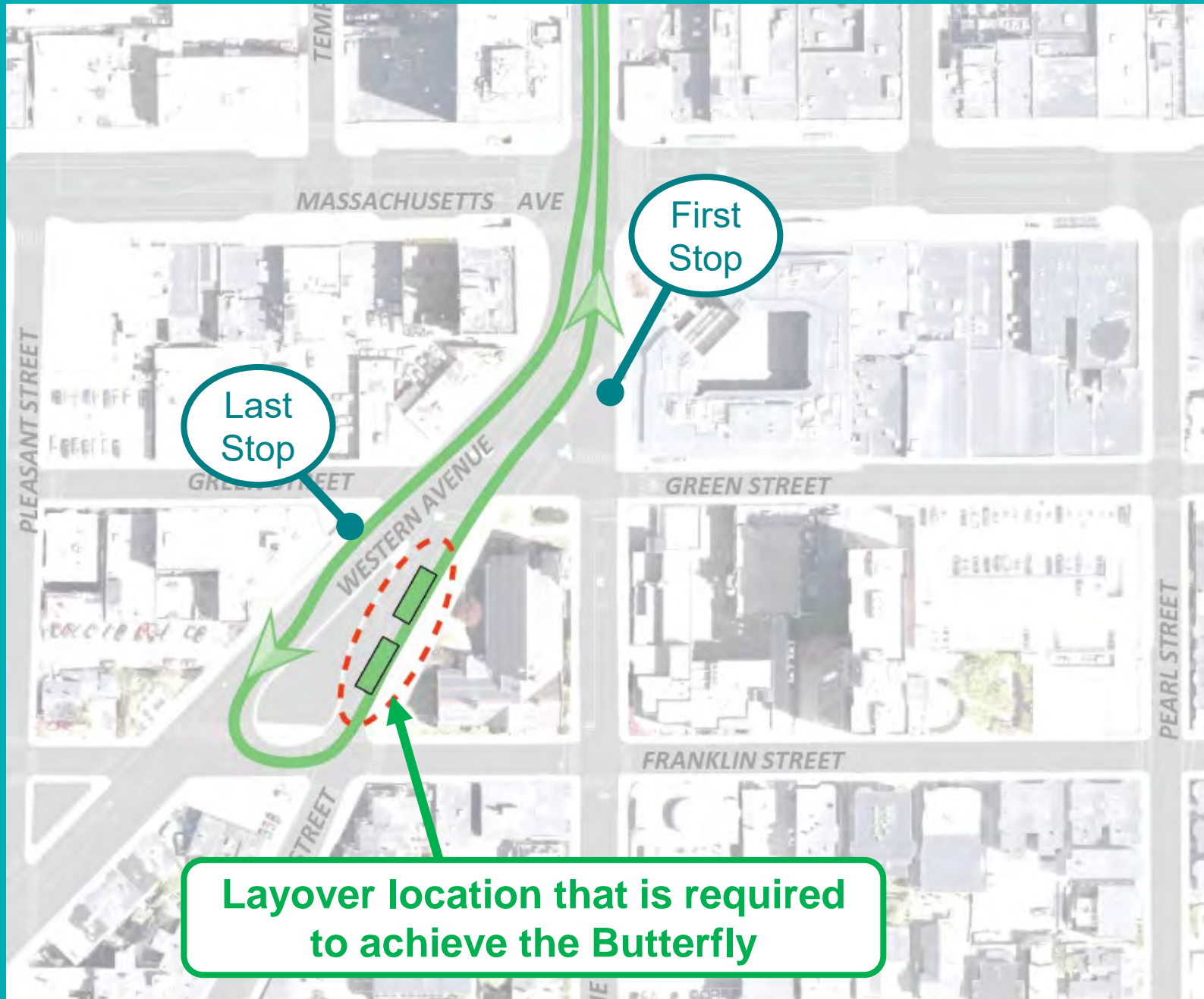


83/91 Layover for the Butterfly

- Reduces public space at River Street sidewalk next to First Baptist Church
- Increases public space at plaza in place of existing busway

— Bow-Tie 83/91 Route

— Layover Space



Layover location that is required to achieve the Butterfly



The Butterfly
only has one
option for the
83 and 91
layovers:
River Street



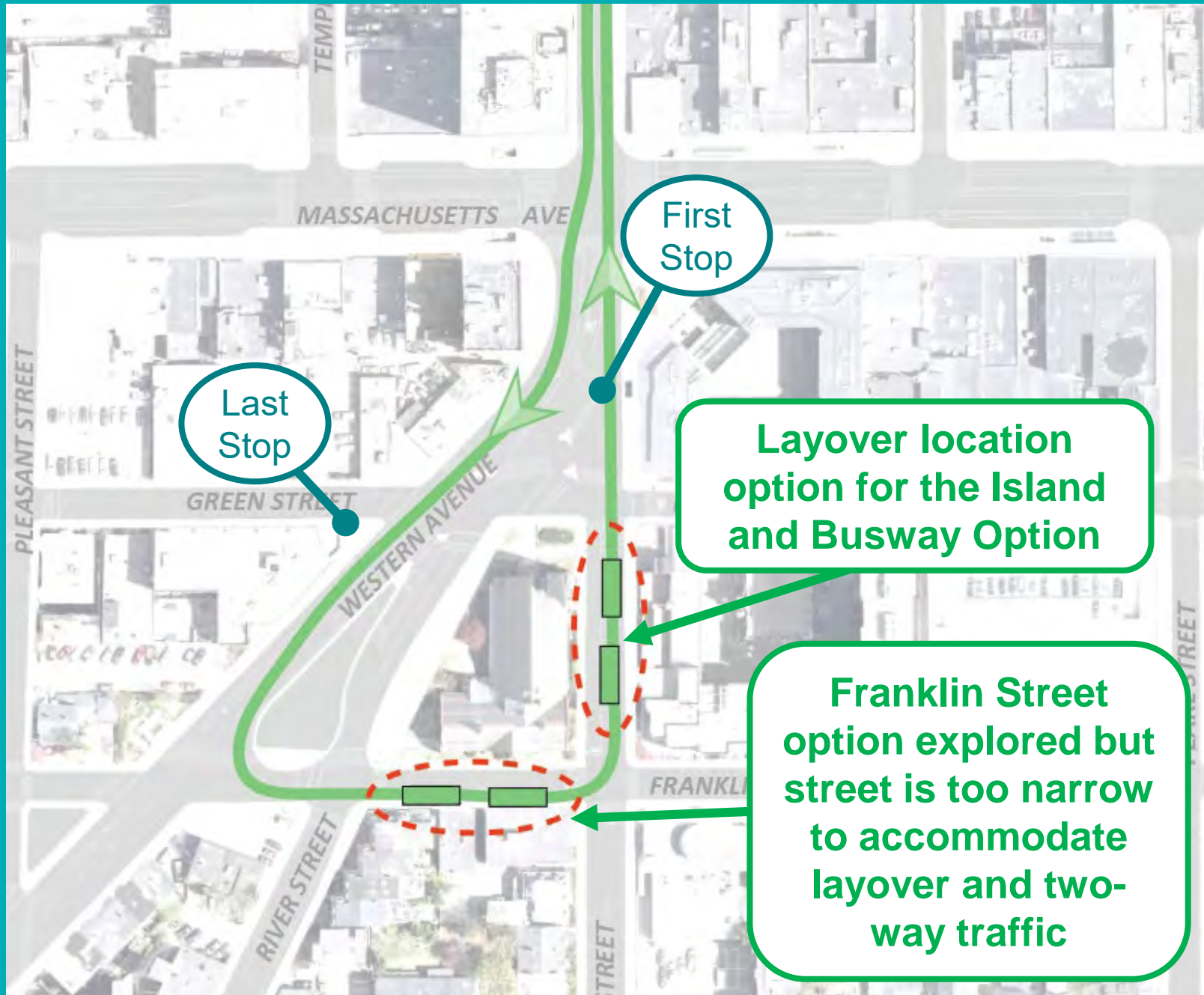
Potential River Street bus layover space

- Separation between uses with benches, planters and trees.

83/91 Layover Options for The Island

- Both have parking impacts
- Both require dividing the plaza, similar to existing busway

- 83/91 Route
- Layover Space





Franklin Street Not Wide Enough for Layovers

- If a Green Street busway is implemented, Franklin Street would be two-way between Magazine Street and Western Avenue
- May or may not involve parking impacts
- Changes will require community and rider input



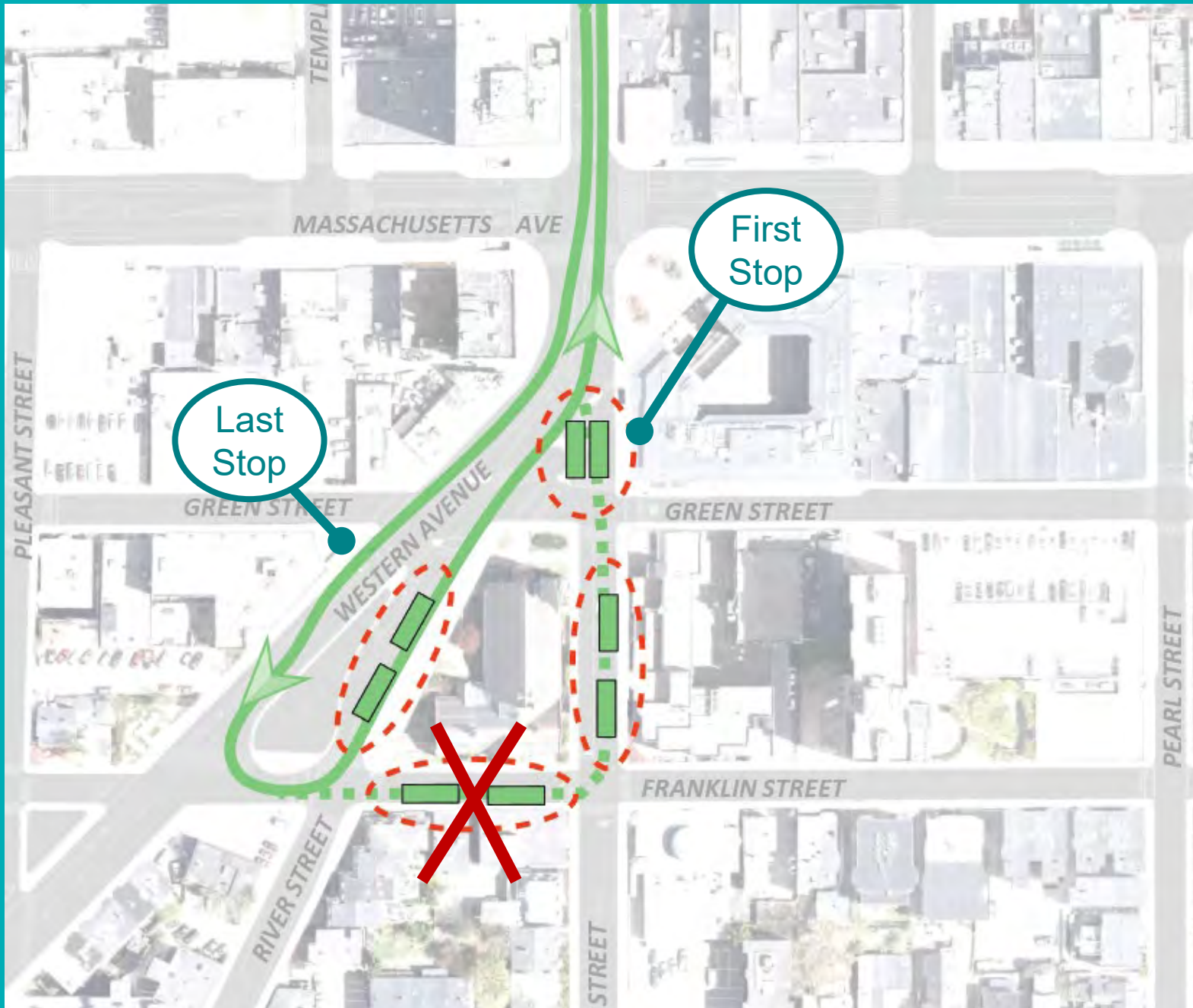
Potential Magazine Street bus layover space

Changes will require further community and rider input



Estimated bus layover location

All 83/91 Layover Options



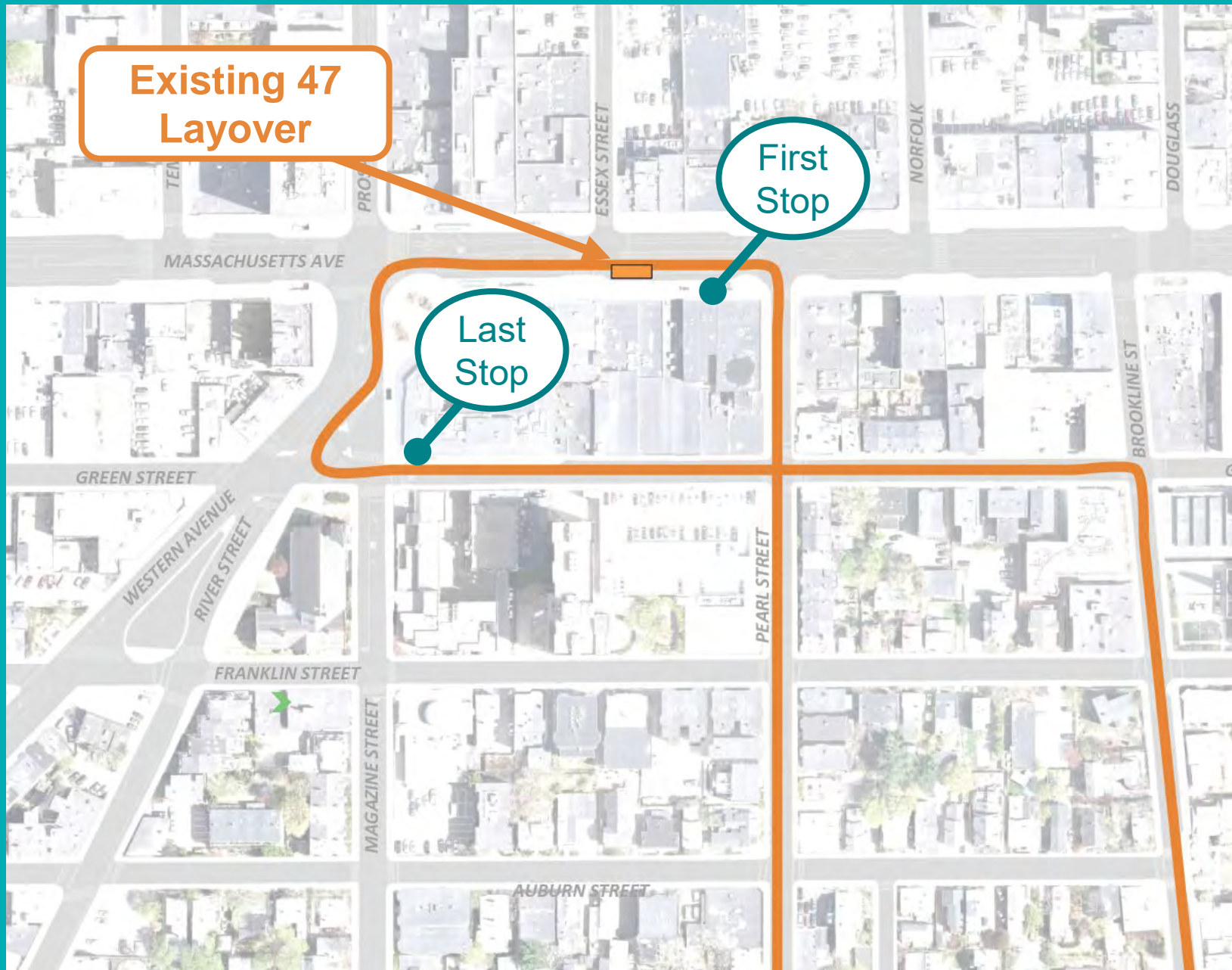
- River Street layovers support the Butterfly
- Magazine Street layovers support the Island
- Franklin Street not wide enough to support layovers

- Butterfly 83/91 Route
- ... Island 83/91 Route
- █ Potential Layover Locations

Relocating 47 Layover

- Off of Massachusetts Avenue
- No significant route extensions
- Must be between first and last stop

- Existing Route
- Layover Space

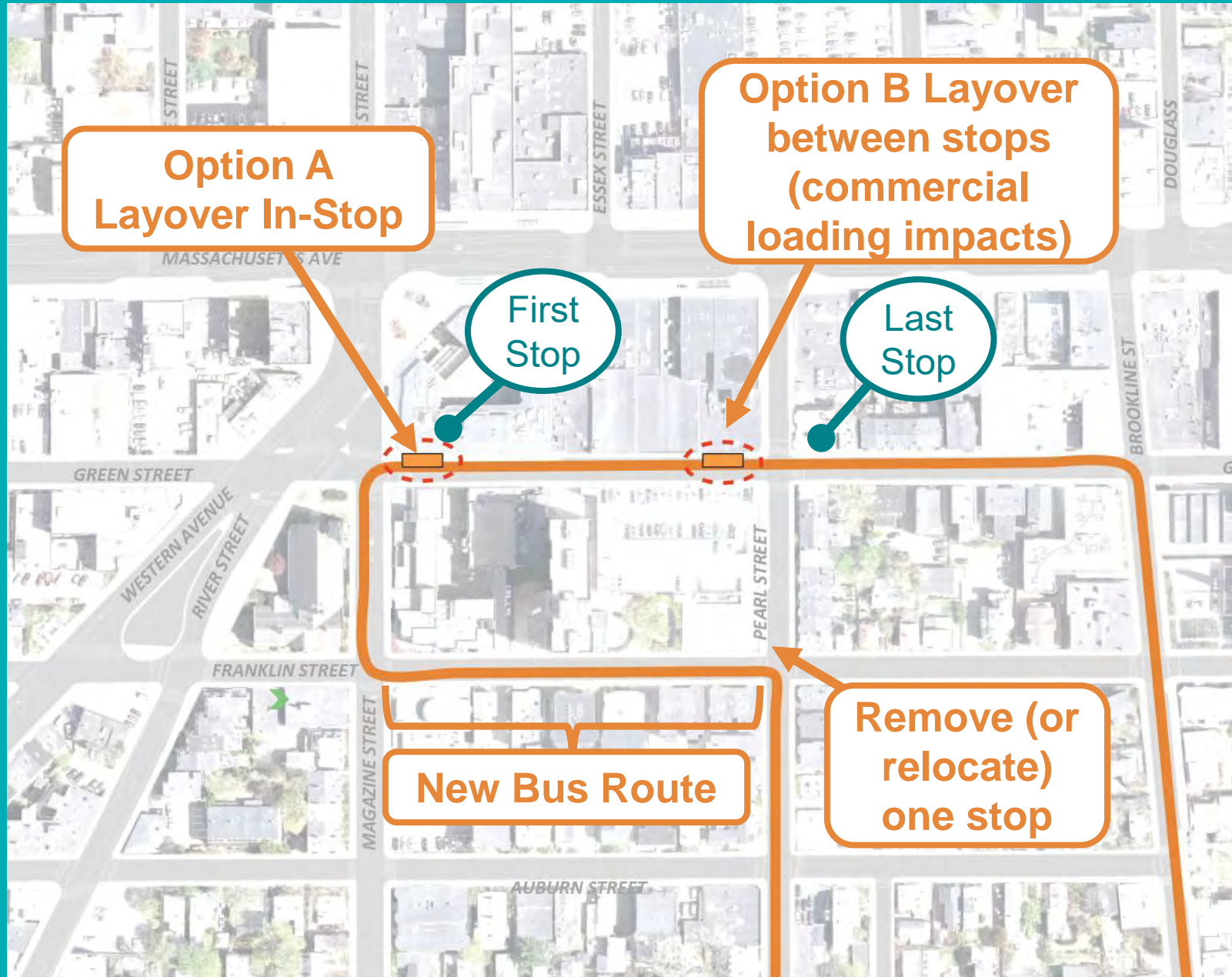


Option A: 47 Route Change (Required for Butterfly)

- Changes first and last stop locations
- Shortens route
- Increases some transfer distances
- Travels on Franklin Street where no buses currently travel
- May require turn improvements
- Closes stop at Pearl & Franklin Streets

— New 47 Route

▬ Layover Space



Option A
Layover In-Stop

Option B Layover
between stops
(commercial
loading impacts)

First
Stop

Last
Stop

New Bus Route

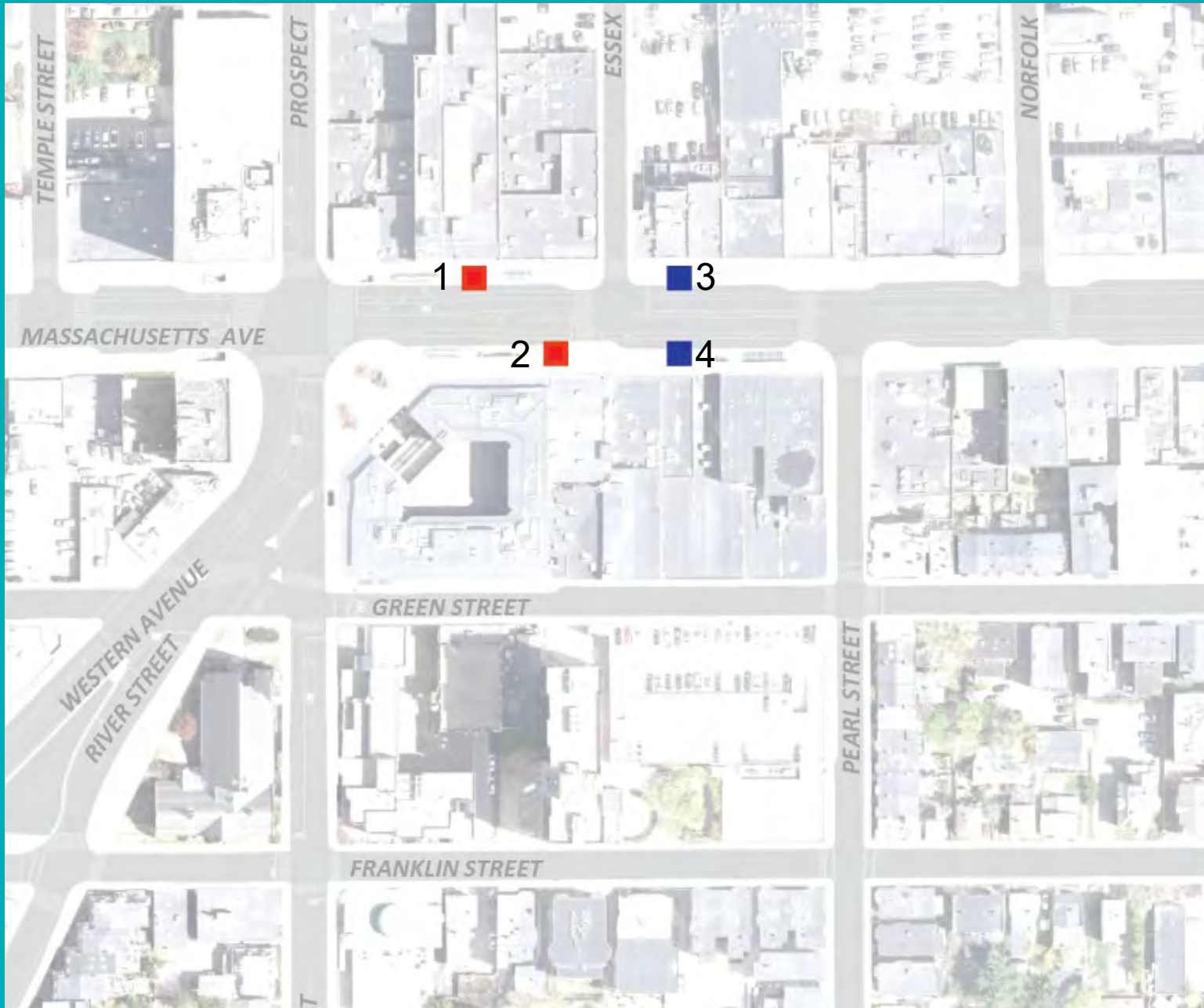
Remove (or
relocate)
one stop

47 Route Change Details

- The Pearl Street at Franklin Street stop would be served by both the Pearl Street at William Street and the Green Street at Magazine Stops (~600 feet away)
- **The distances to many transfers are reduced**, and only two are noticeably increased:
 - 47 to the Red Line outbound
 - 47 to the 83 or 91 outbound



New Red Line Elevators



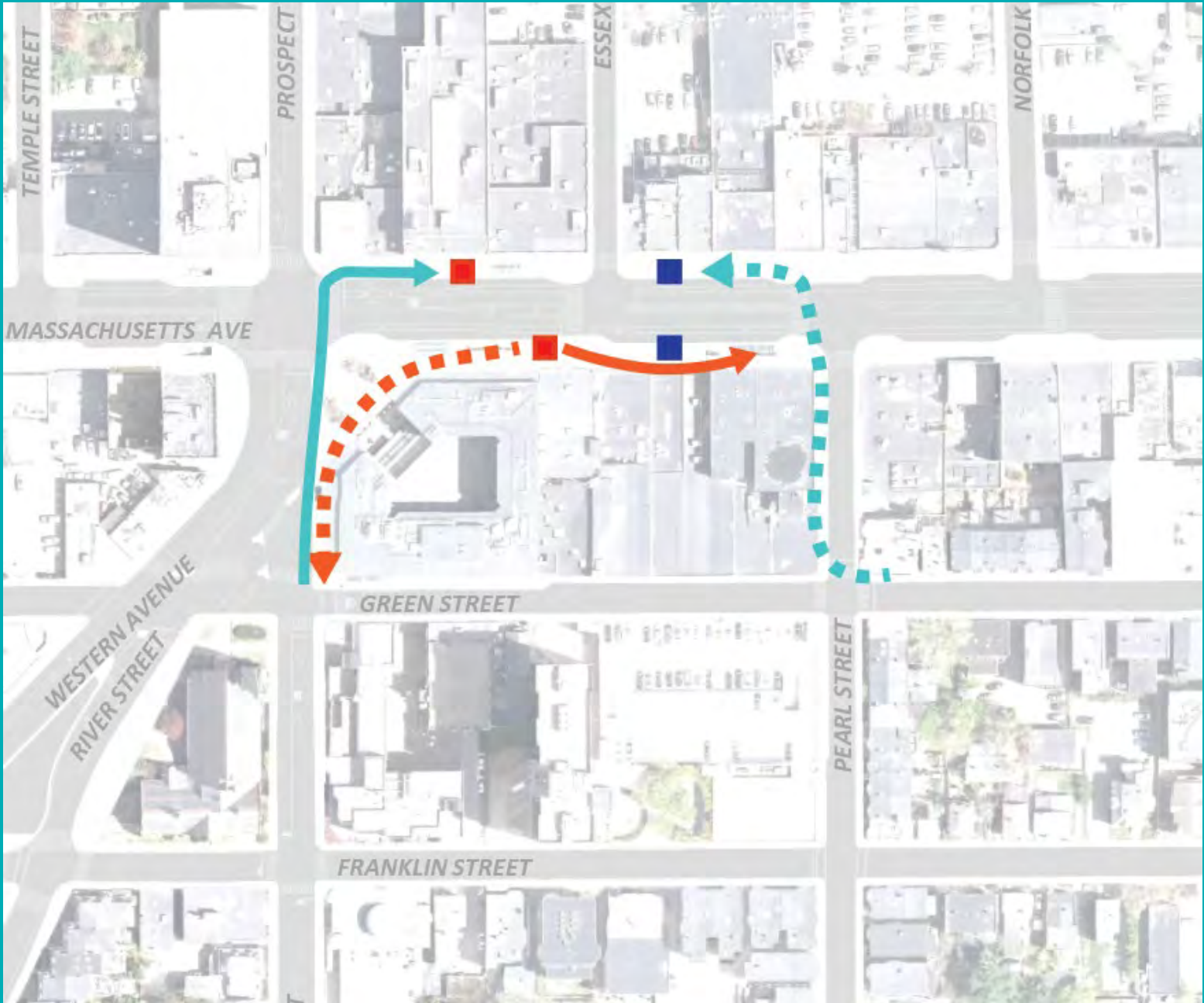
- The MBTA is creating two new elevators and renovating the two existing elevators
- #2 is under renovation now – completion in 2020
- #3 and #4 will then be built
- #1 will be renovated after #3 and #4 are completed
- Also renovating the outbound escalator near Prospect Street

Existing

Proposed









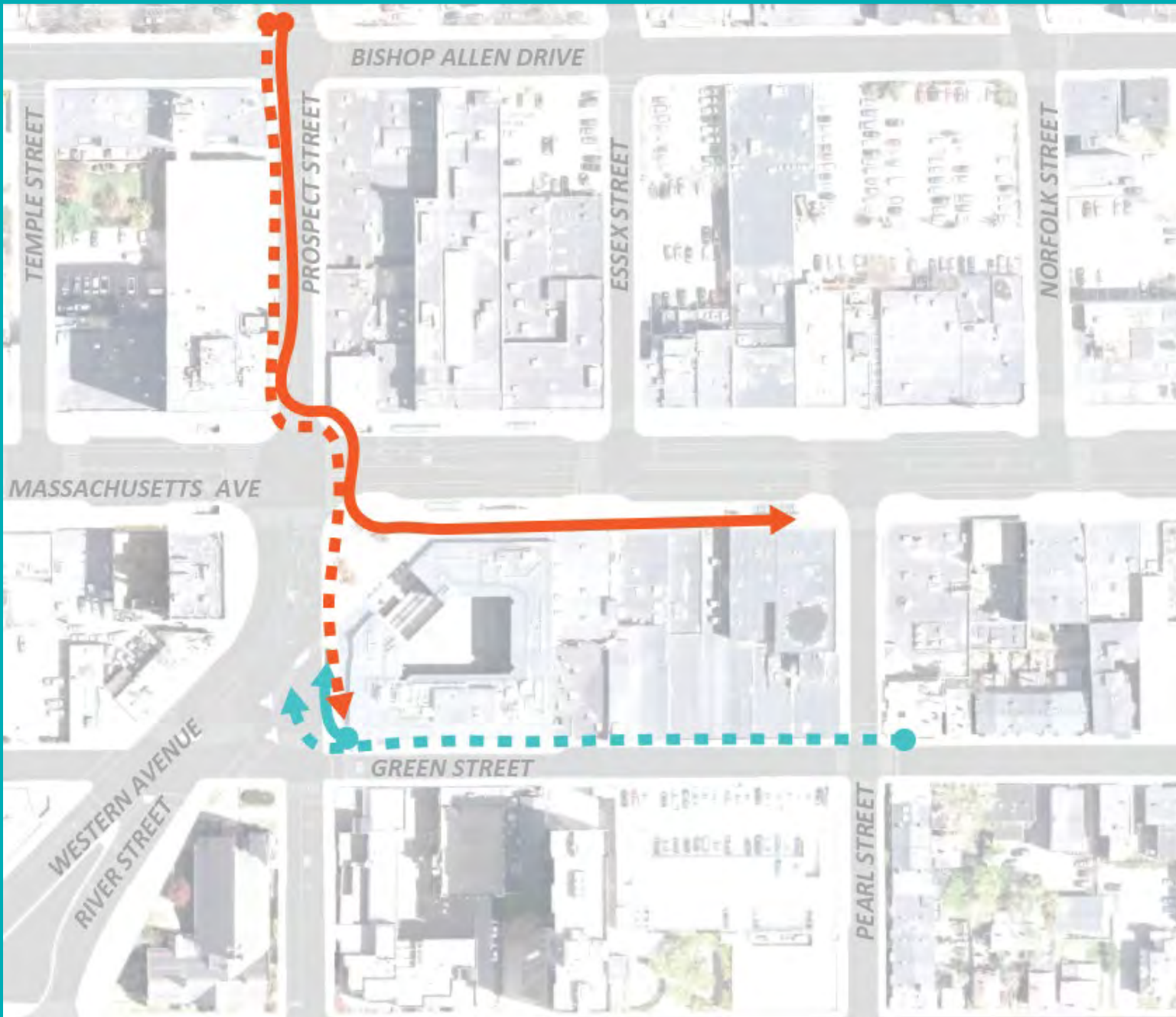
MBTA Elevators



Transfer paths between Route 47 and Red Line with change



- **Route change required** for Butterfly Option
- **Route change recommended** for Island Option



Existing	Proposed	
		Inbound to Inbound transfers (312 daily)
		Outbound to Outbound transfers (288 daily)
		MBTA Elevators



Transfer paths between Route 47 and 83/91 with change

- Assumes most 83/91 passengers exit the bus at Bishop Allen Drive
- **Route change required** for Butterfly Option
- **Route change recommended** for Island Option

Existing  Proposed  Inbound to Inbound transfers (203 daily)

  Outbound to Outbound transfers (136 daily)



MBTA Elevators

Island and Butterfly Compared

The Island Approach

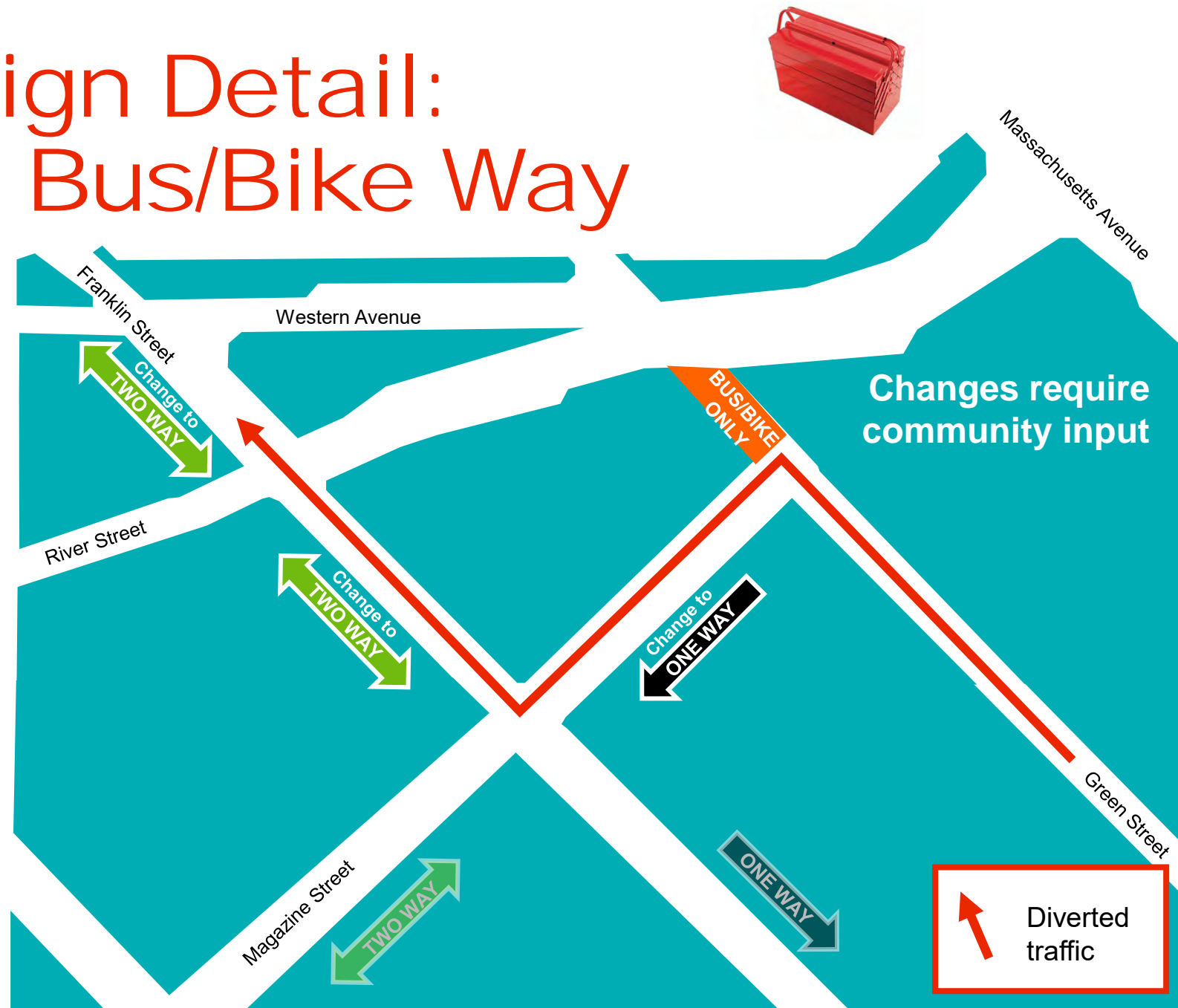
- Eliminates parking on last block of Magazine Street
- Less optimal for potential future MBTA bus-service expansion
- Re-routes the 47 bus
- Higher # of bike and pedestrian crossings
- Reconfigures traffic island and busway
- Reduces church-side space by 10%
- Expands Carl Barron Plaza by 7%

The Butterfly Approach

- Maintains parking on last block of Magazine Street
- Significant potential for future MBTA bus-service expansion
- Re-routes the 47, 64, 83, and 91 buses
- Lower # of bike and pedestrian crossings
- Eliminates traffic island and busway
- Reduces church-side space by 37%
- Expands Carl Barron Plaza by 41%

Optional Design Detail: Green Street Bus/Bike Way

- A variety of conflicts at Green Street are causing traffic congestion
- A short bus/bike way could alleviate traffic congestion and improve bus operations.
- Traffic circulation impacts would be studied
- Increased public space is possible with *or without* a Green Street bus/bike way



Auburn Street to Massachusetts Avenue

Feedback on Design Approaches

Public Comment

Next Steps

Next Meeting

- **Working Group #9:** Tuesday, February 25, Manning Apartments
 - Review of Urban Design progress

THANK YOU!

riverstreet@cambridgema.gov