Wellington Circle Study

WELLINGTON CIRCLE STUDY

massDOT
Massachusetts Department of Transportation

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Working Group Meeting #4

January 5, 2022

Ground Rules

- This meeting is being recorded
- Technical Support: Leah Epstein, lepstein@HNTB.com
- Working Group Members
  - Use "Raise Hand" button during clarification/discussion periods

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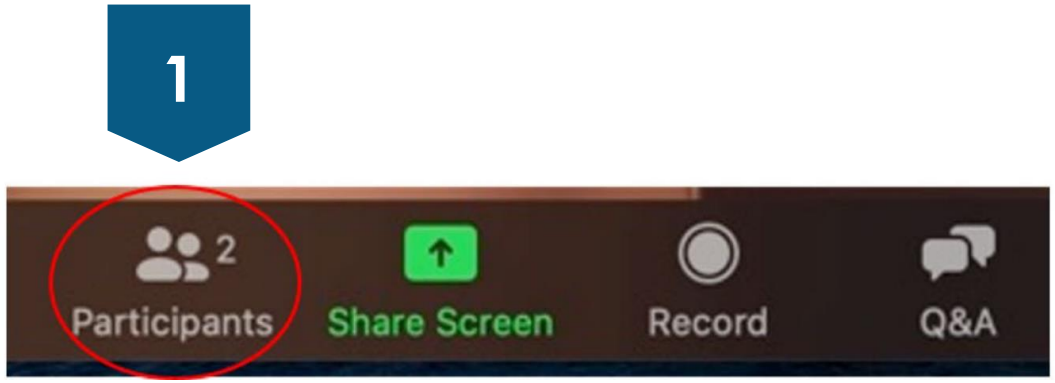
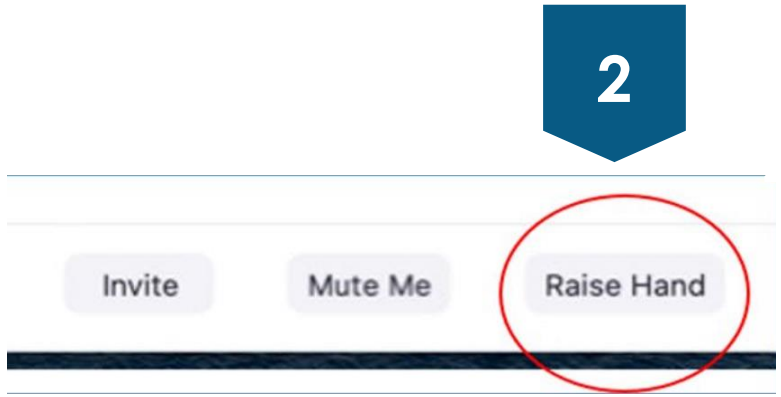




Agenda

- Study Process
- Concept Development Process Update
- Alternatives Development
  - Short/Medium-Term
  - Long-Term
- Working Group Discussion
- Next Steps

STUDY PROCESS

Study Overview

- Conceptual planning study to evaluate existing and future multimodal transportation conditions at Wellington Circle
- Examine ways to redesign Wellington Circle to provide better connectivity and improve multimodal mobility throughout the area of the City of Medford and surrounding region
- Develop short-, medium-, and long-term recommendations that will be included in a Final Report

Project Goals & Objectives Inform Alternatives Development

Mobility/Access

- Provide facilities for pedestrians, bicyclists, and transit
- Improve connectivity to Wellington Station
- Mitigate traffic congestion

Safety

- Reduce speeds
- Reduce conflict points between modes
- Dedicate space for pedestrians & bicyclists

Quality of Life

- Enhance attractiveness
- Minimize public health & environmental impacts
- Provide fair and equitable treatment for environmental justice populations

Connectivity

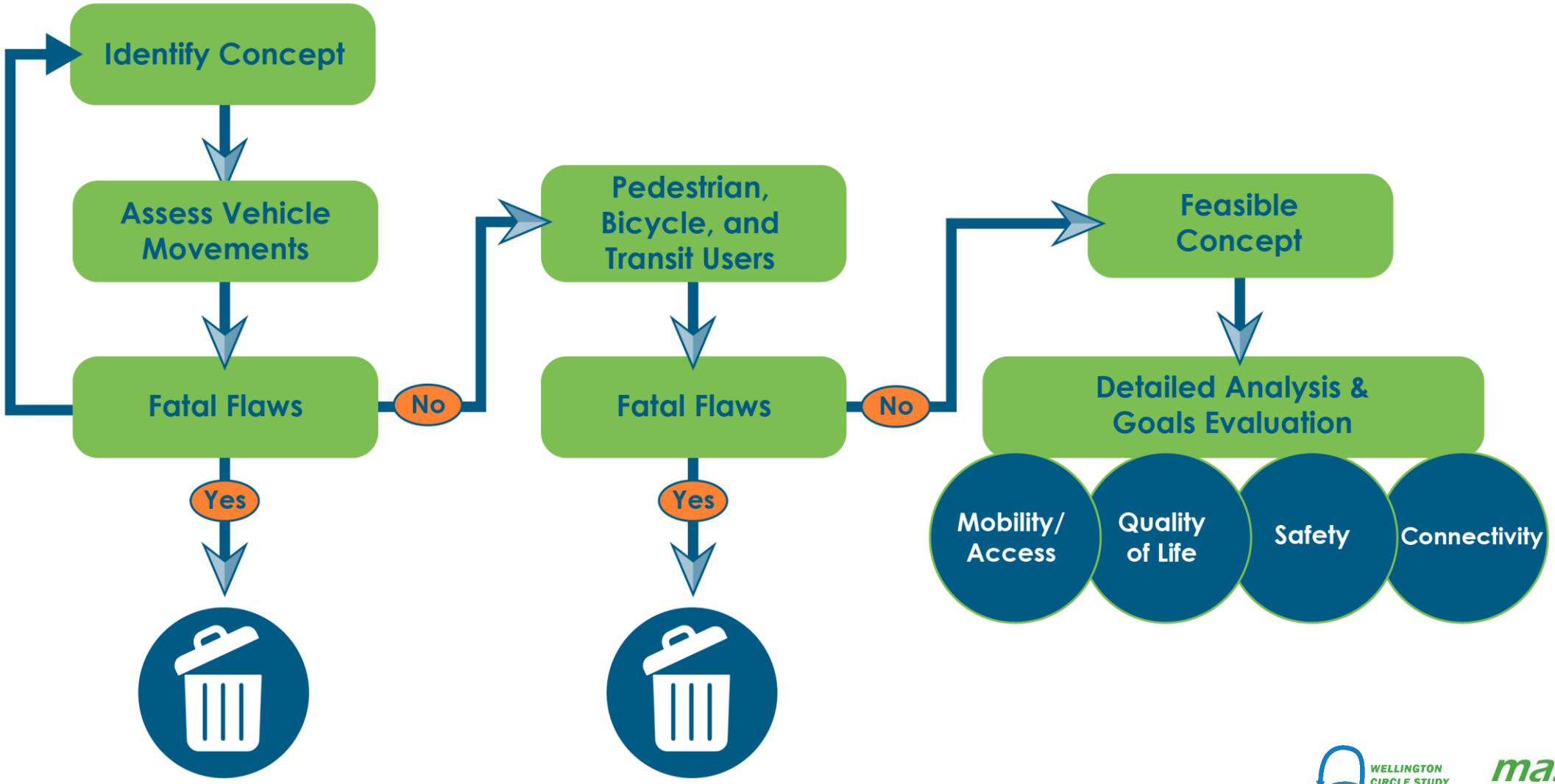
- Promote active transportation
- Reduce travel delays
- Improve access and circulation

Study Process

1	• Public Participation, Study Area, Goals & Objectives, Evaluation Criteria	Public Involvement Plan, Study Area, Goals and Objectives, Evaluation Criteria
2	• Existing Conditions, Future No-Build Conditions, Evaluation of Issues and Opportunities	Data Collection, Existing Conditions Analysis, Future Year Scenarios, Constraints Identification
3	• Alternatives Development	Short-, Medium-, and Long-Term Alternatives
4	• Alternatives Analysis	Mobility & Accessibility, Safety, Environmental Effects, Land Use & Economic Development, Community Effects/Title VI/Environmental Justice
5	• Recommendations	Short-, Medium-, and Long-Term Recommendations, Implementation Plan
6	• Final Report	Draft and Final Report

CONCEPT DEVELOPMENT PROCESS UPDATE

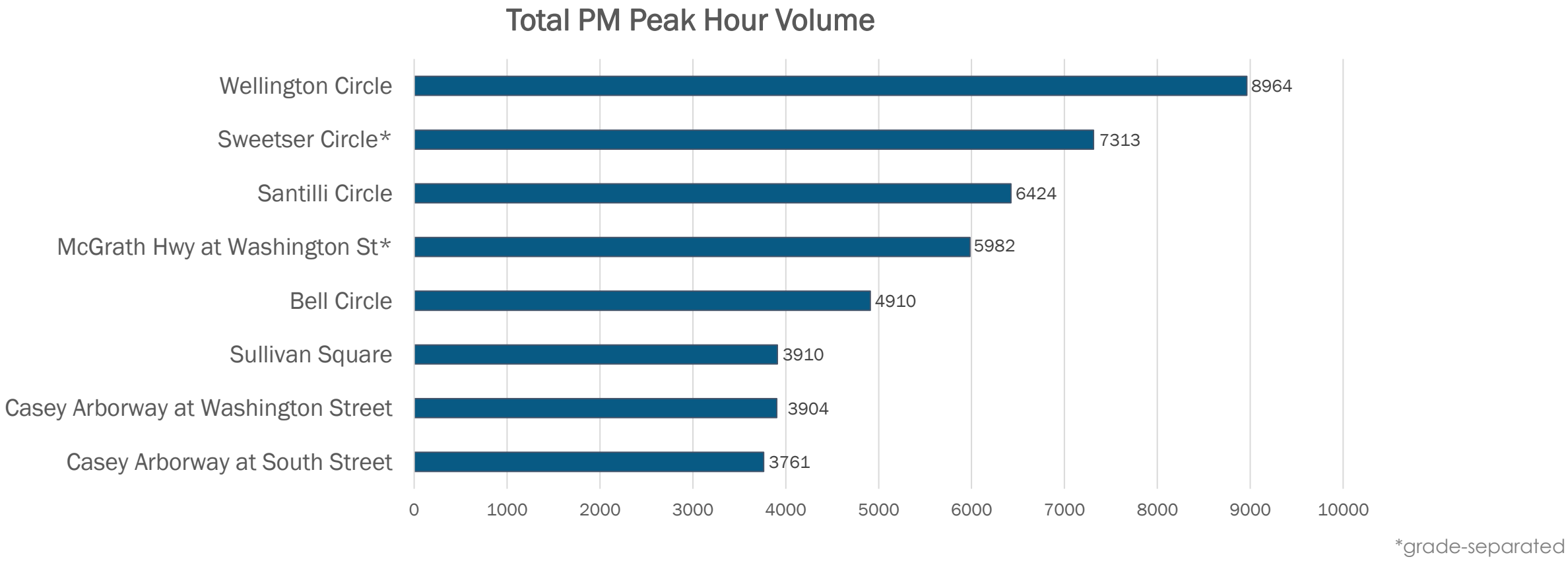
Process/Methodology



Follow Up from Previous Meeting

- Comparable Intersection Volumes
- Concept Update and Review
- Quadrant Roadway Examples
- Process Update

Comparable Intersections



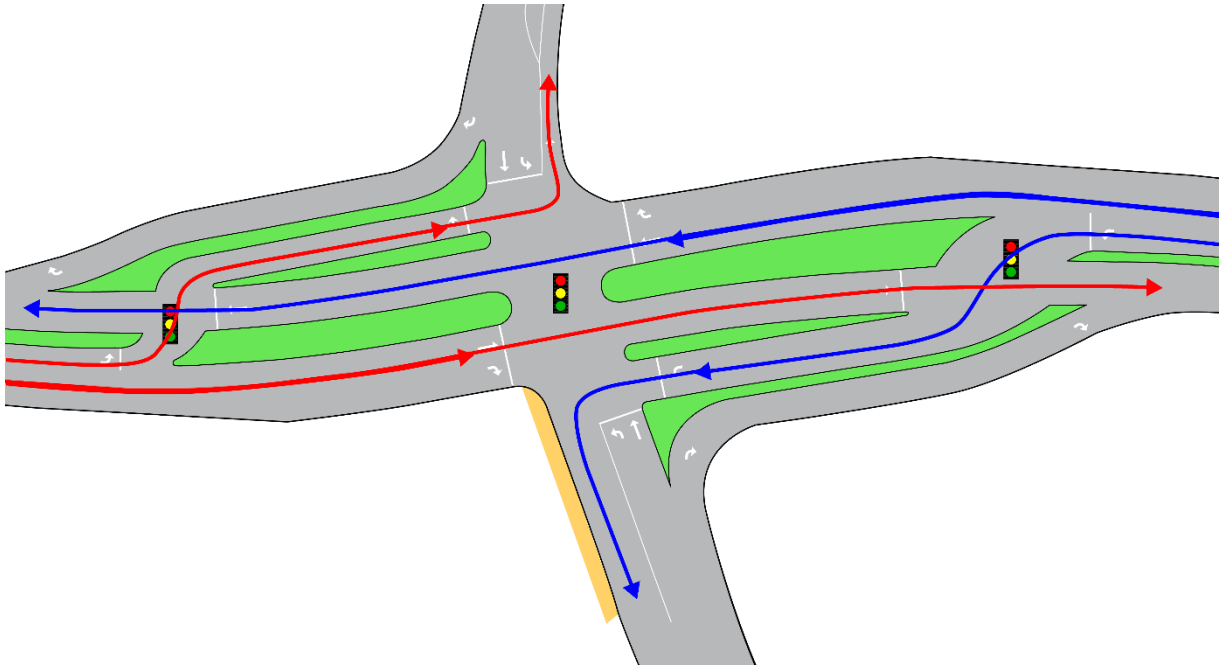
Based on a review of comparable complex, urban intersections, Wellington Circle has the highest vehicle volumes.

Concept Review

- Basic concepts – separating Middlesex/Fellsway intersection offers improvements that warrant further consideration
- Advanced concepts – potential for reducing confusion and improving flow; warrant further development
  - Continuous Flow Intersection
  - Quadrant Roadway
- Grade separation
  - East ↔ west warrants further consideration
  - Further surface road concept development needed

Concept Review: Continuous Flow

- Left-turn traffic crosses over opposing traffic ahead of intersection
- Large, complex intersection is challenging for pedestrians and bicyclists
- Since August 31 Working Group meeting: determined not to offer substantial operational benefits over quadrant roadway concepts

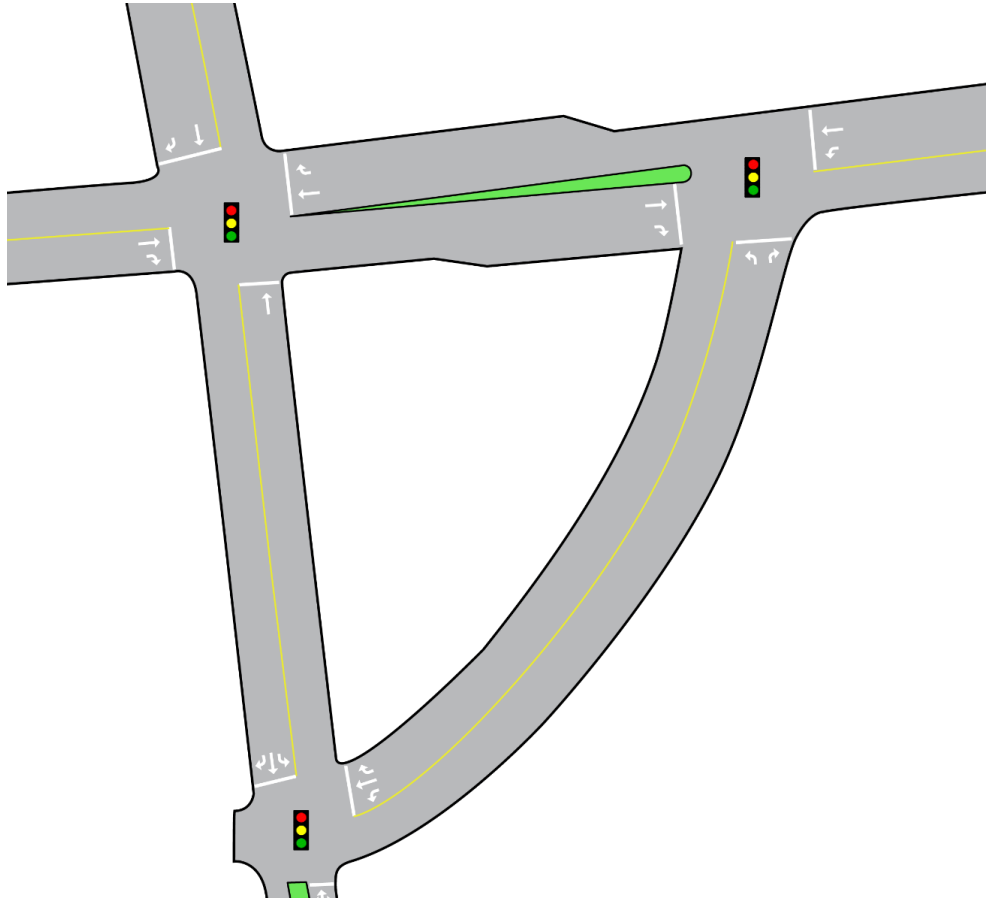


For illustration purposes only

East-West Continuous Flow Intersection w/channelized right turns

Concept Review: Quadrant Roadway

- Redirects some turning movements
- Allows for potentially conflicting movements to move simultaneously
- Helpful for intersections with both high through volumes and large turning volumes
- Best for locations where space is not a major constraint



Quadrant Roadway Examples

- Huntersville, NC
- NC-73/US-21

Quadrant Roadway Examples

- Florence, KY
- US-42/KY-873

Quadrant Roadway Examples

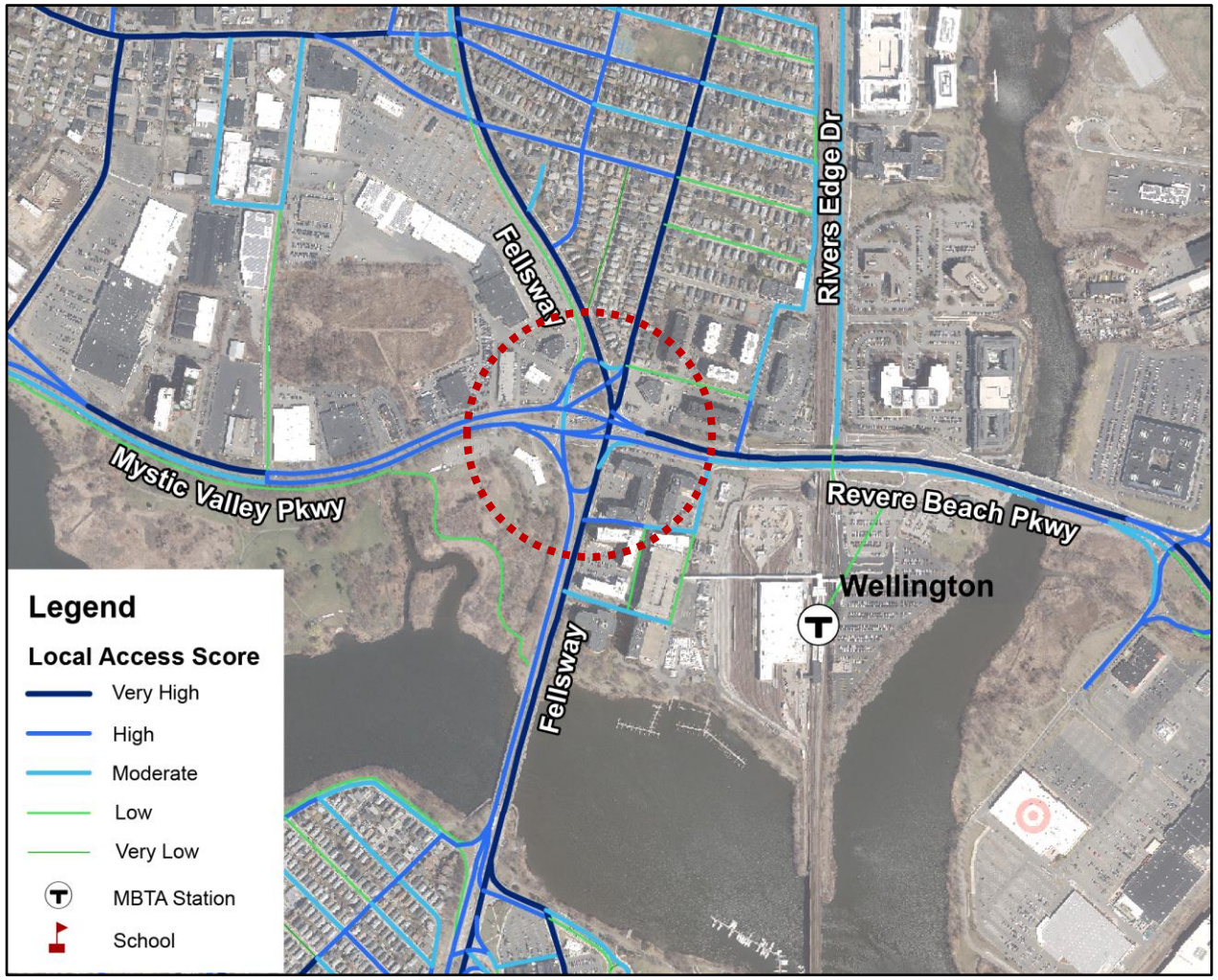
- Bloomfield Hills, MI
- US-24/West Maple Road Partial Quadrant Roadway Intersection

Concept Development Outcome

- Focusing on two “core” long-term concepts, including grade-separated concept
- Developing short- and medium-term concepts
- Incorporating other modes into alternatives
- Eliminated one-way Middlesex from consideration

ALTERNATIVES DEVELOPMENT

Bicycle/Pedestrian Considerations



Wellington Circle

All major roadways leading to Wellington Circle have high potential to serve walking and biking trips because they provide access to amenities such as schools, shops, restaurants, transit, and parks.

Bicycle Considerations

Wellington Circle

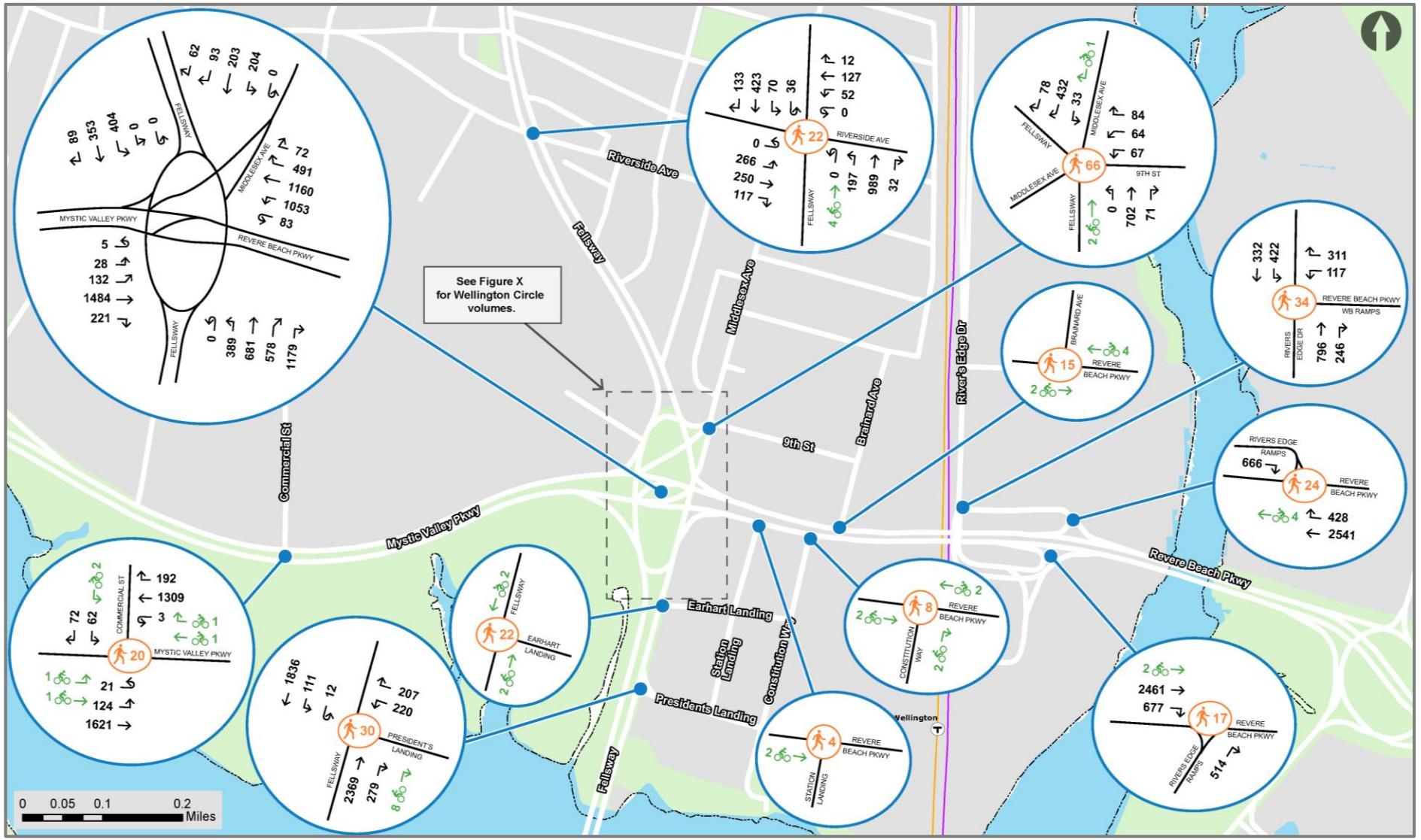
Wellington Circle is a gap in the region's bicycle network.

New bicycle facilities should make all ages and abilities feel comfortable.

Legend

- Two-Way Buffered Bike Lane
- Dedicated Bike Lane
- Buffered Bike Lane
- Off-Street Path
- Planned Bike Lane
- Planned Off-Street Path

Vehicle, Bike, Pedestrian Weekday PM Peak Hour Volumes

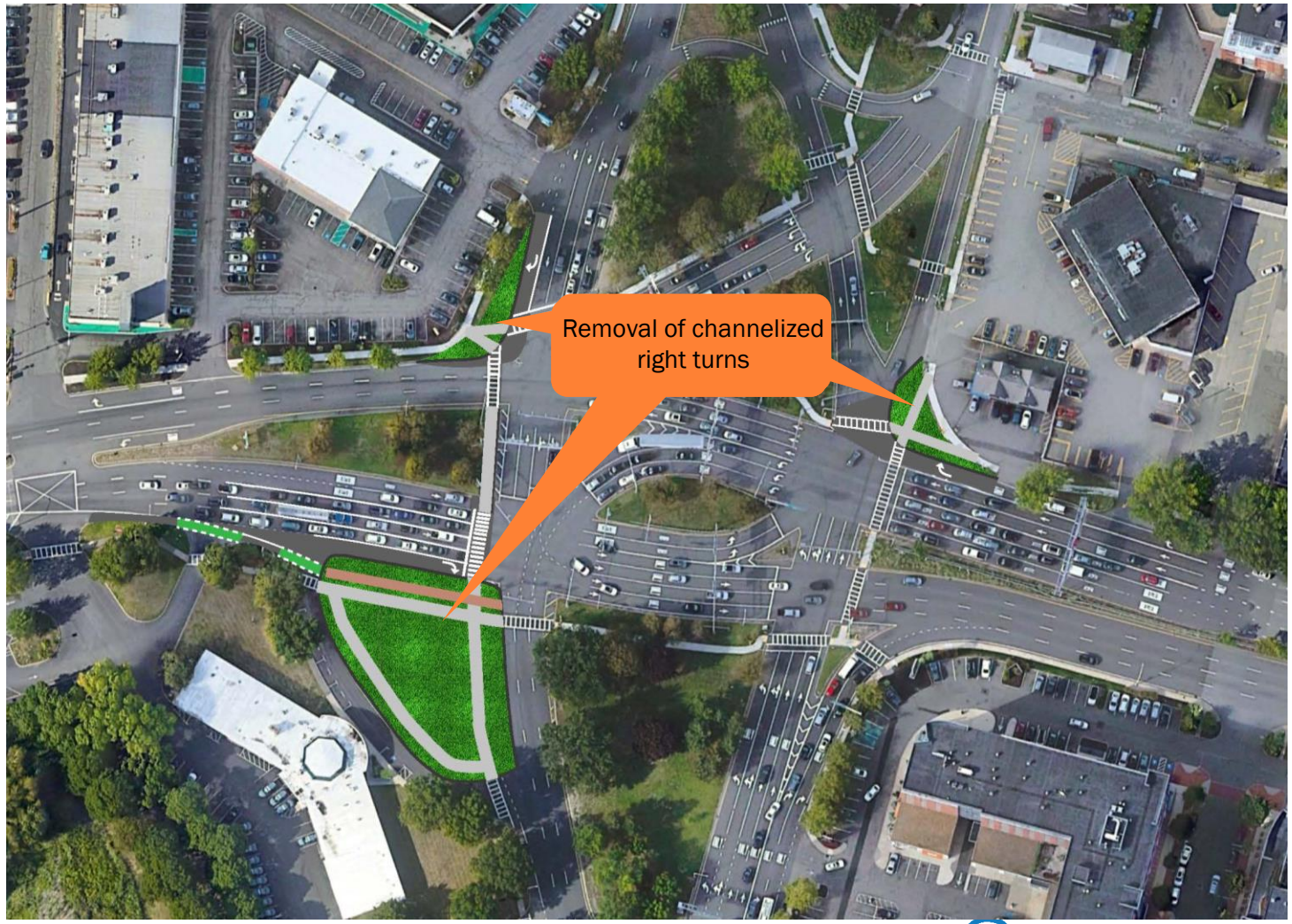


Short/Medium-Term Alternatives

- Remove Right Turn Channelization
- Prohibit Eastbound Left Turns
- Relocate Middlesex Avenue Intersection
- Relocate Middlesex & Prohibit Eastbound Left Turns

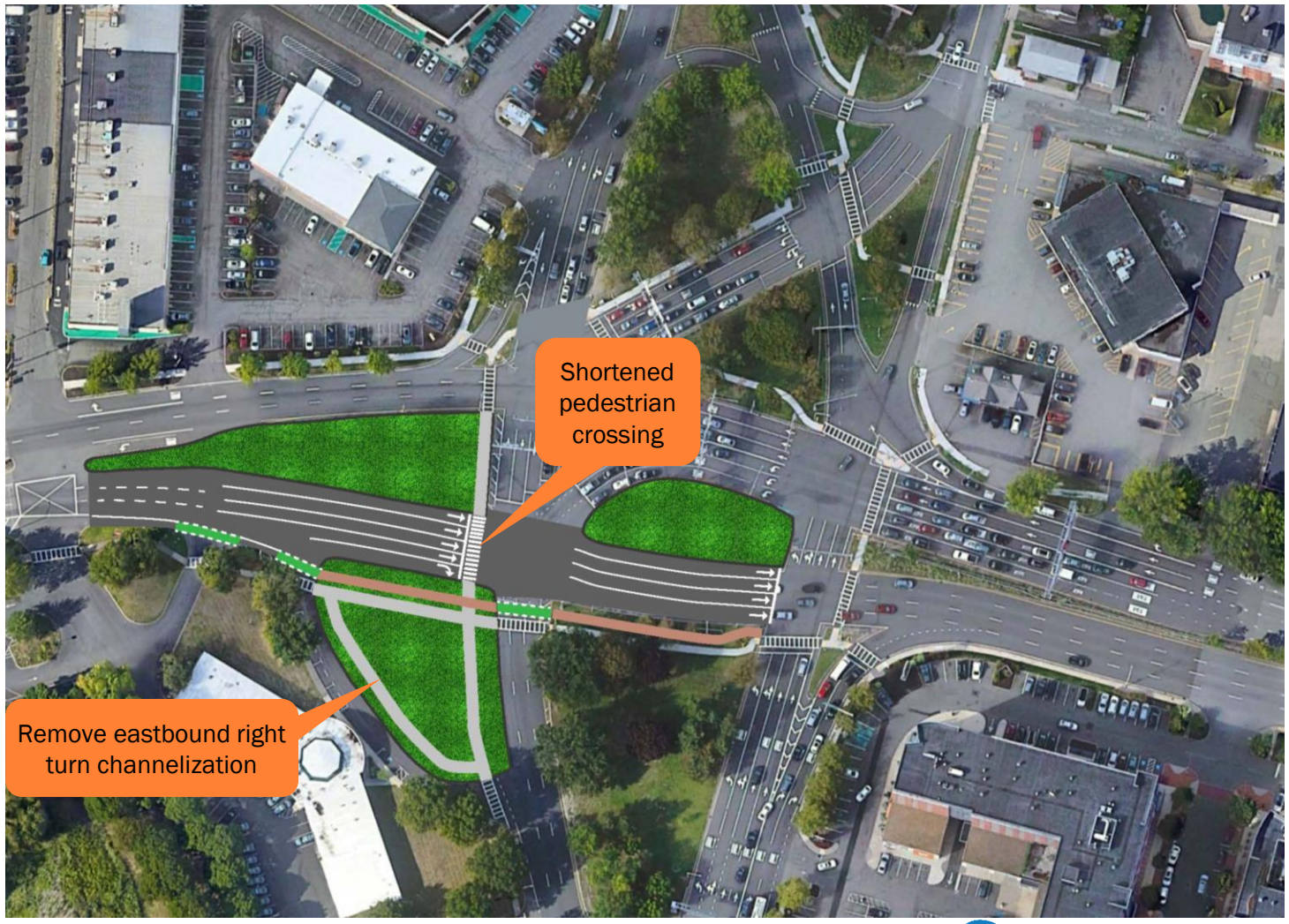
Remove Right Turn Channelization

- Removal of sweeping right turn lanes to improve pedestrian safety and comfort
- Case-by-case basis
- Trade off between comfort & delay for both pedestrians and vehicles



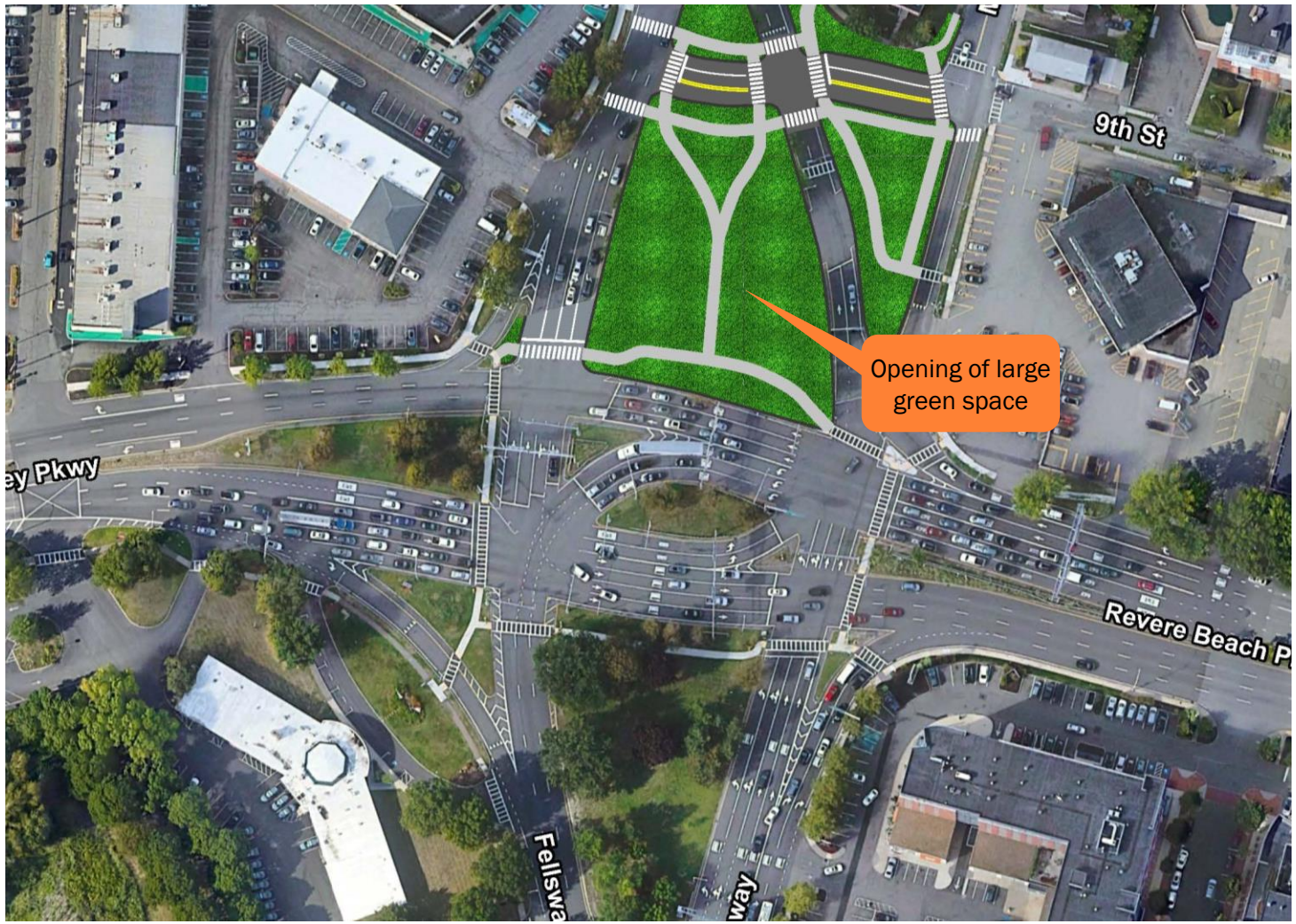
Prohibit Eastbound Left Turns

- Requires removal of eastbound right turn channelization
- Localized eastbound bicycle enhancements
- Small reduction in vehicle delay for westbound movements, particularly right turns
- Mitigates impacts of removing westbound right turn channelization



Relocate Middlesex Avenue

- Simplified, reduced, and shortened pedestrian crossings
- Reduced vehicle delays for southbound and critical westbound left-turn movements
- Minimizes impact of removing eastbound right turn channelization



Combined Short/Medium-Term Concepts

- Relocating Middlesex and prohibiting eastbound left turns mitigate impacts of removing eastbound and westbound turn channelization
- Overall vehicle operational benefits of concepts combine

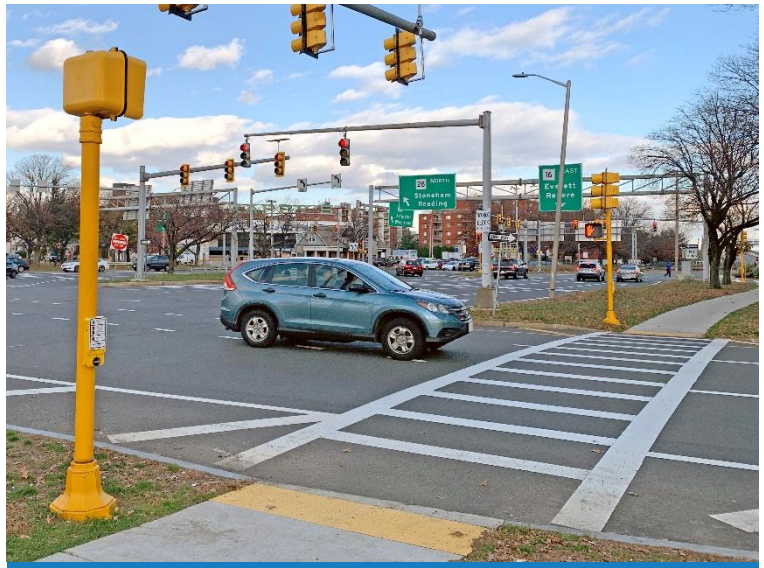
Short/Medium-Term Alternatives Conclusions

- Removing right turn channelization provides pedestrian safety & comfort benefits but may not be feasible at all locations
- Prohibiting eastbound lefts and relocating Middlesex mitigates impacts of removing right-turn channelization at specific locations
  - Both also provide pedestrian and vehicle benefits independently

Long-Term Alternatives

- Multimodal Considerations
- At-Grade Dual Quadrant Alternative
  - “Triangle” Concept
  - “Square” Concept
- Grade-Separated Single Quadrant Alternative

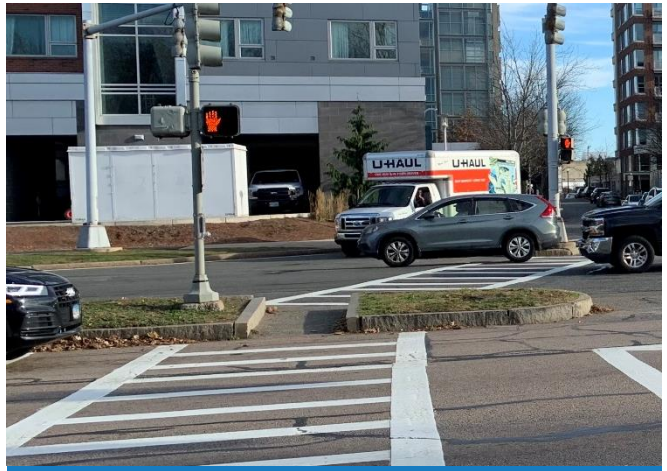
Pedestrian Toolbox



Crosswalk, curb ramp, and pedestrian signal

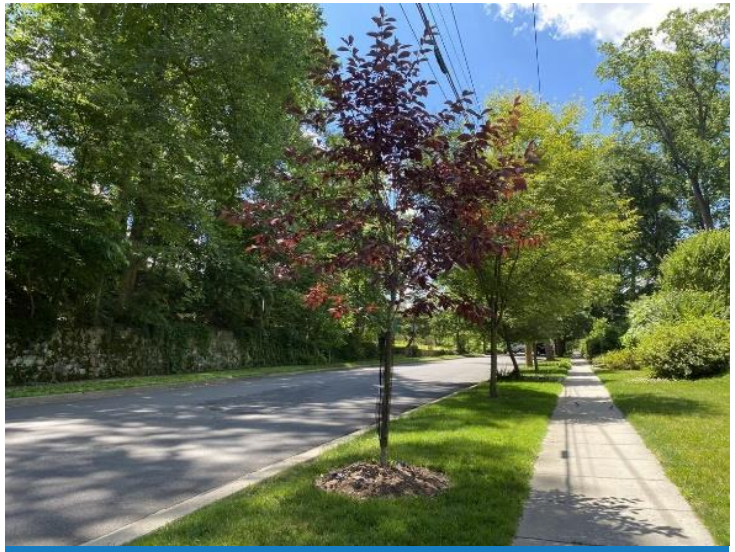
Curb Extension

Flashing Warning Device

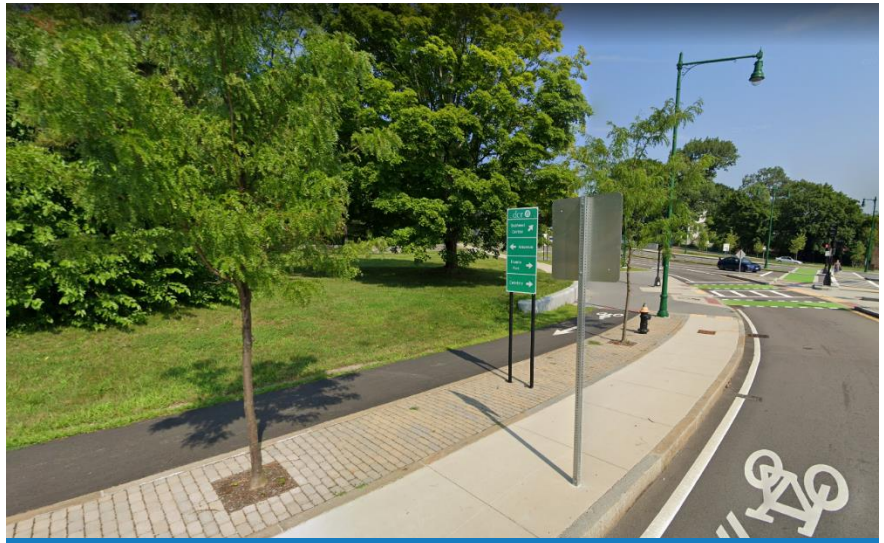


Pedestrian Refuge Island

Pedestrian Toolbox



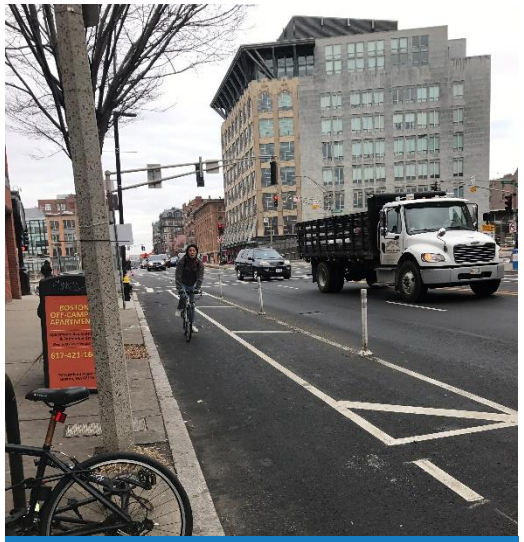
Buffered Sidewalk



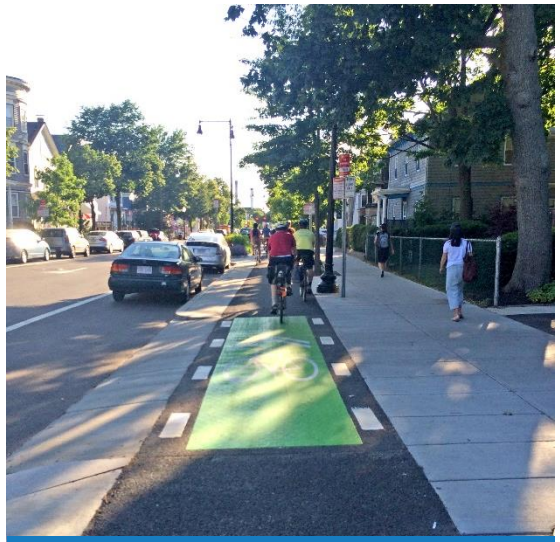
Green Space

Lighting & Street Furniture

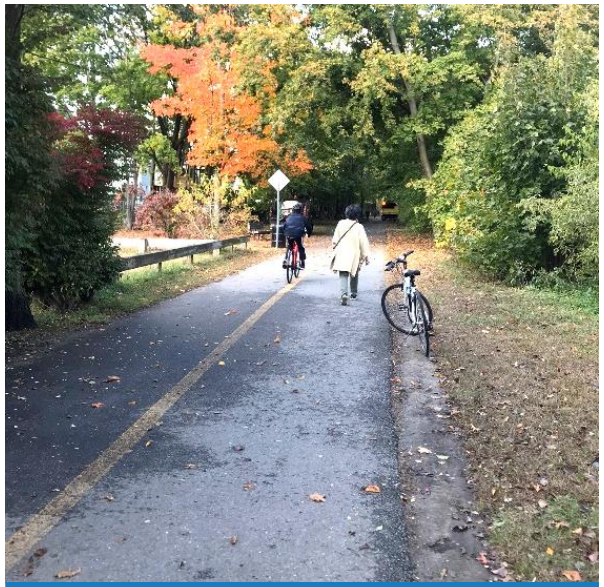
Bicycle Toolbox



Buffered Bike Lane
(painting/flex post)



Separated Bike Lane
(sidewalk level)



Multi-use Path

Two-way Separated Bike Lane

Bicycle Toolbox

Bike Signal

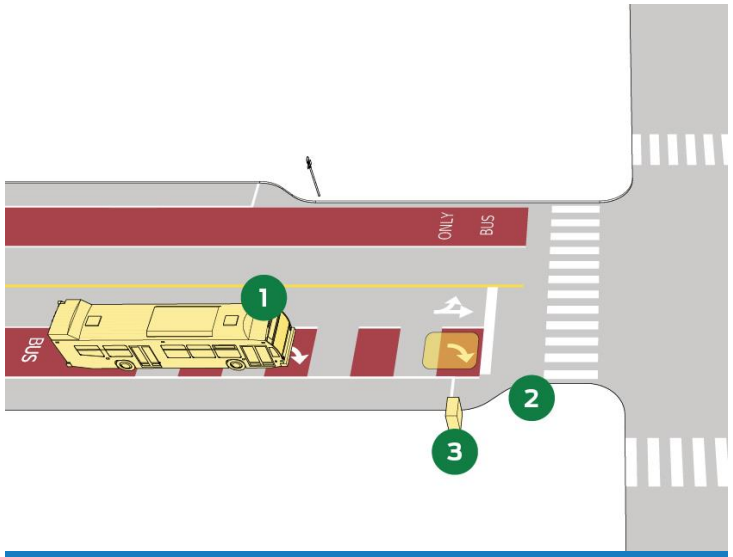
Bike Boxes

Protected Intersection/
Bike Crossing

Transit Toolbox

Exclusive Bus Lane

Bus Queue Jump Lane



Transit Signal Priority

Transit Toolbox

Bus Shelter and Amenities

Level and Clear Boarding Area

Pull-Out Bus Stop

Floating Bus Stop

At-Grade Dual Quadrant "Triangle" Concept

Triangle Alternative Conclusions

Benefits:

- Able to handle existing vehicle volumes
- Creates open space for multimodal considerations or greenery
- Allows future bicycle connections to Fellsway and Route 16
- Provides mostly protected, single-phase crossings for pedestrians

Drawbacks:

- Overall geometry is atypical and maintains high number of vehicle lanes
  - Particularly impactful on northern side of intersection
- Concurrent or multiple-phase pedestrian crossings at a few locations

At-Grade Dual Quadrant "Square" Concept

Square Alternative Conclusions

Benefits:

- Able to handle existing vehicle volumes
- Creates open space for multimodal considerations or greenery
  - Particularly concentrated on northern side of intersection
- Provides mostly protected, single-phase crossings for pedestrians

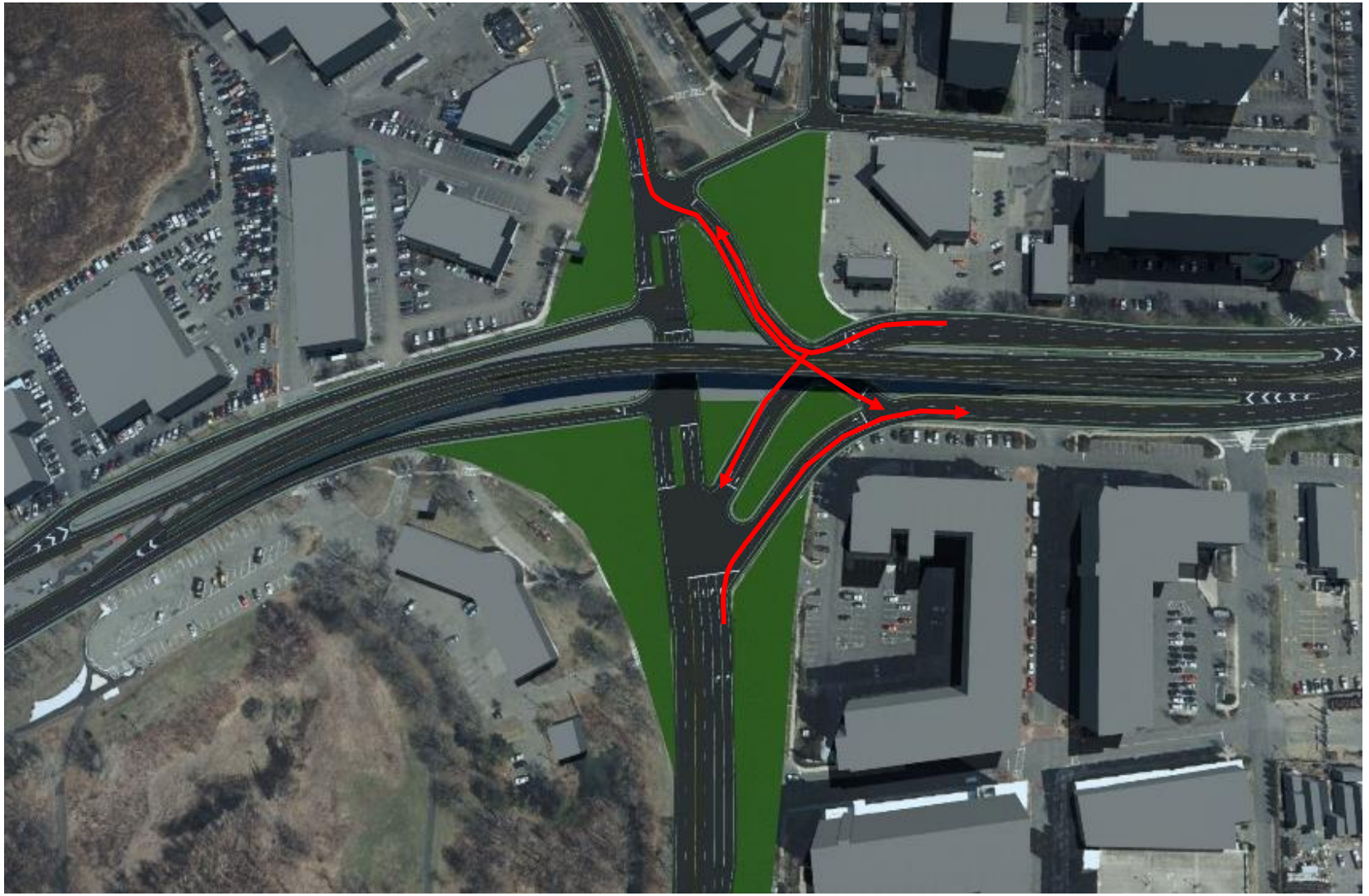
Drawbacks:

- Overall geometry maintains high number of vehicle lanes
- Requires additional signalized intersection at Middlesex Ave at 9th Street
- Concurrent or multiple-phase pedestrian crossings at a few locations

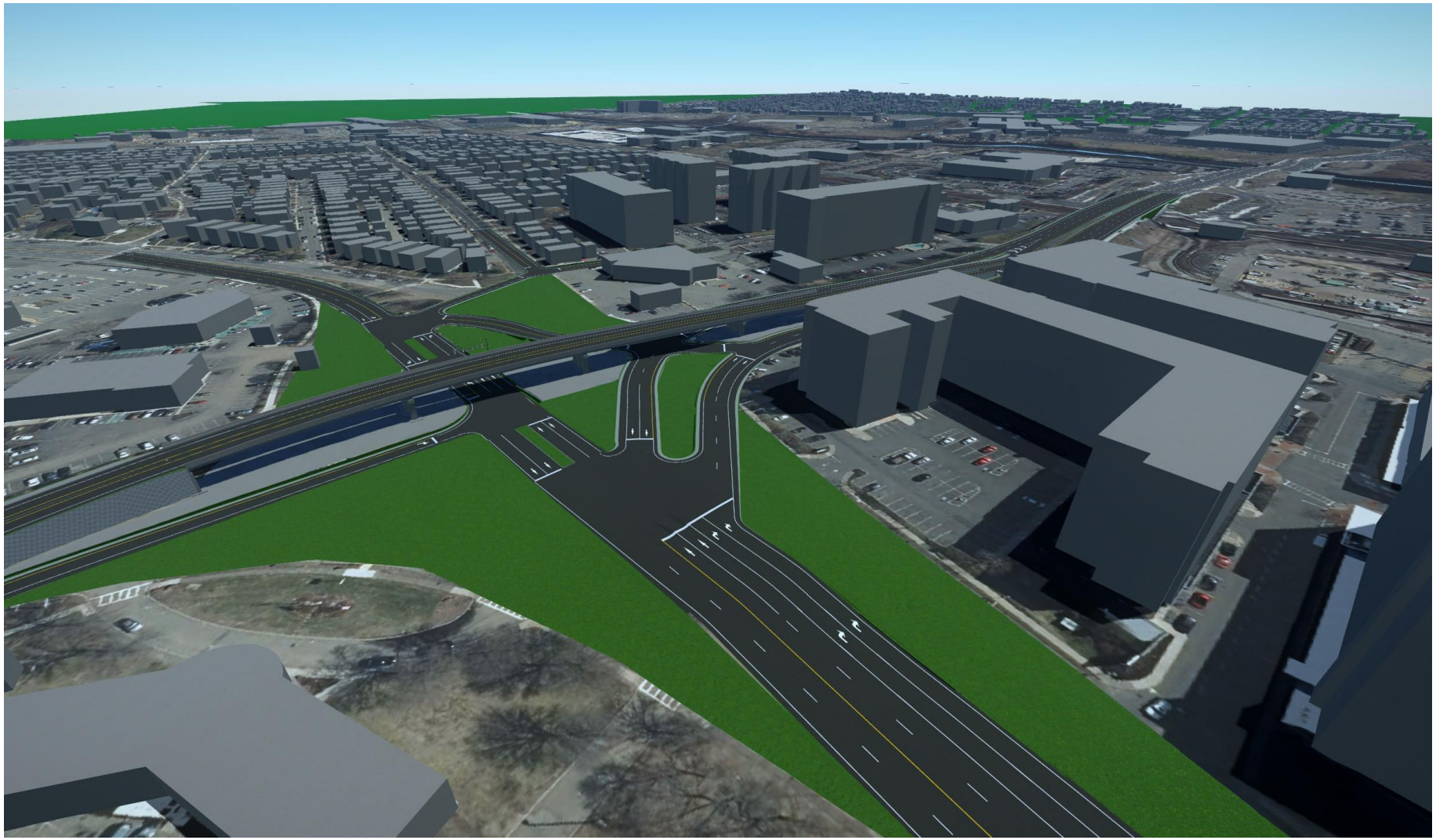
At-Grade Alternatives Comparison

- Both concepts able to handle existing vehicle volumes
- Both alternatives create additional open space which could be used for multimodal considerations or as green space
  - Open space more concentrated on square alternative, but more overall space on triangle
- Square is more “traditional” in intersection geometry and overall layout, but has more total vehicle lanes
- Triangle concept requires one fewer signalized intersection

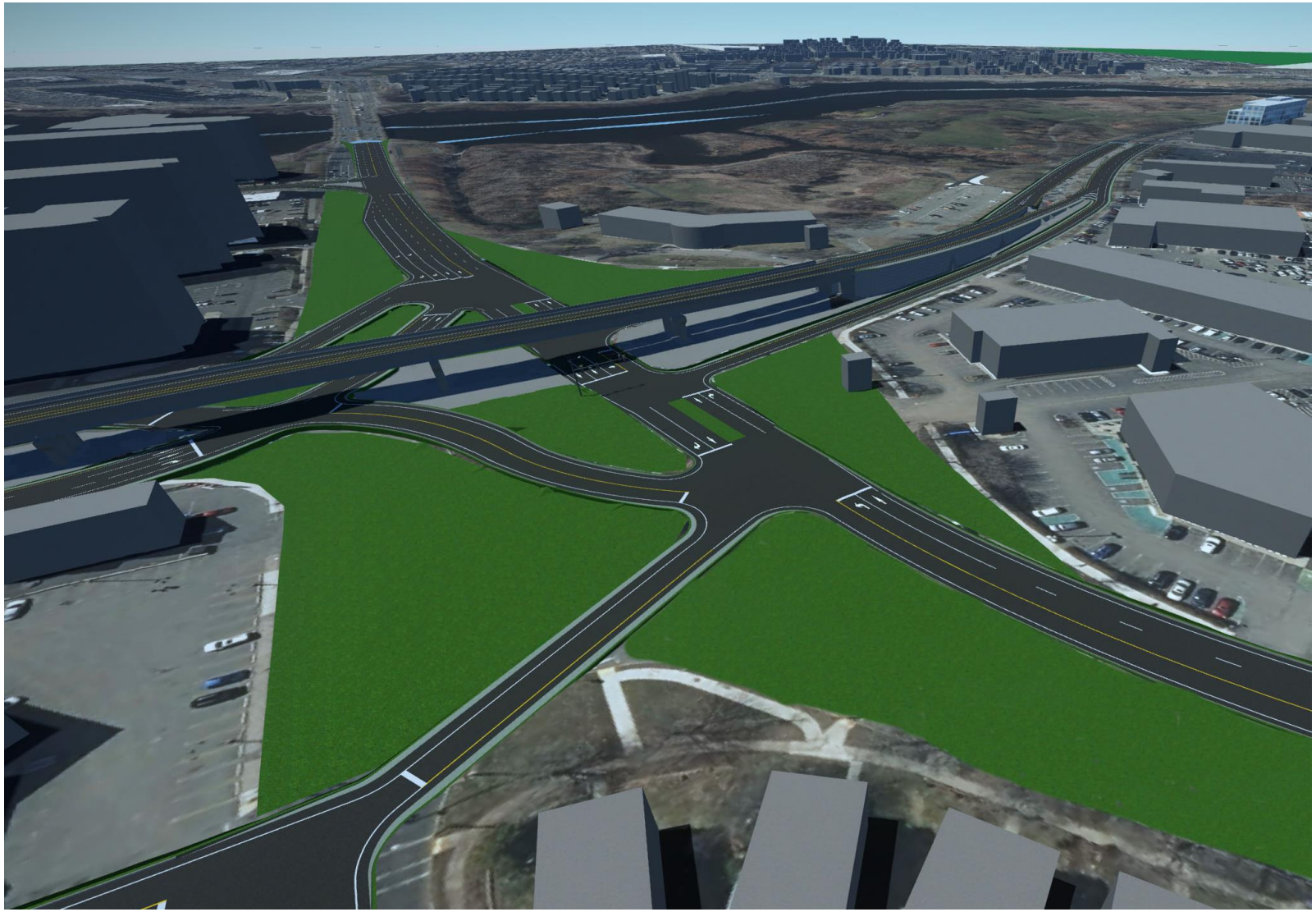
Grade-Separated Single Quadrant



Grade-Separated Single Quadrant



Grade-Separated Single Quadrant



Grade Separation: Underpass Concept

- Severe traffic impacts if underpass closed to flooding during heavy rainstorms. Pump required at station at low point.
- Increased probability of encountering utility conflict during construction, which would require relocation.
- Underpass likely to be 50% more expensive than bridge of equal length.
- May be more difficult to stage construction with increased support of excavation.
- May require safety and fire suppression utilities depending on length of underpass life.

Grade-Separated Alternative Conclusions

Benefits:

- Removes major movements from surface roadways, limiting number of lanes required to handle existing volumes

Drawbacks:

- Surface roadways still require high number of lanes
- Large bridge uses significant space at-grade
- Bridge acts a visual barrier, bisecting transit station from nearby residents and businesses

Alternatives Refinement

- Advancing short- and medium-term concepts, preliminary analysis of potential impacts

- Refining two at-grade quadrant roadway concepts
  - Bike, pedestrian, and transit integration
  - Connections to existing facilities

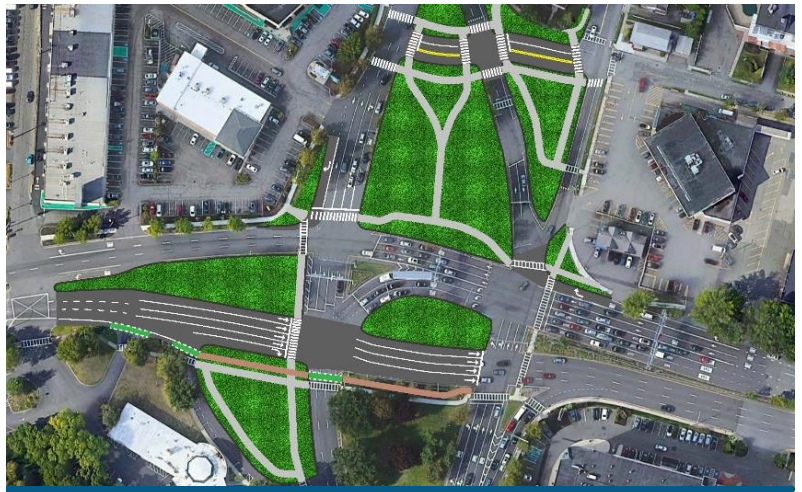
- Progressing grade-separated concept

WORKING GROUP DISCUSSION

Discussion

Working Group Discussion

- Short- and Medium-Term
- Long-Term At-Grade
- Long-Term Grade-Separated



Combined Short/Medium-Term Concepts

At-Grade Dual Quadrant – Triangle

Grade-Separated Single Quadrant

At-Grade Dual Quadrant – Square

Public Comment

- Use Q&A to submit questions/comments in writing
- Press the “Raise Hand” button to share a question/comment verbally

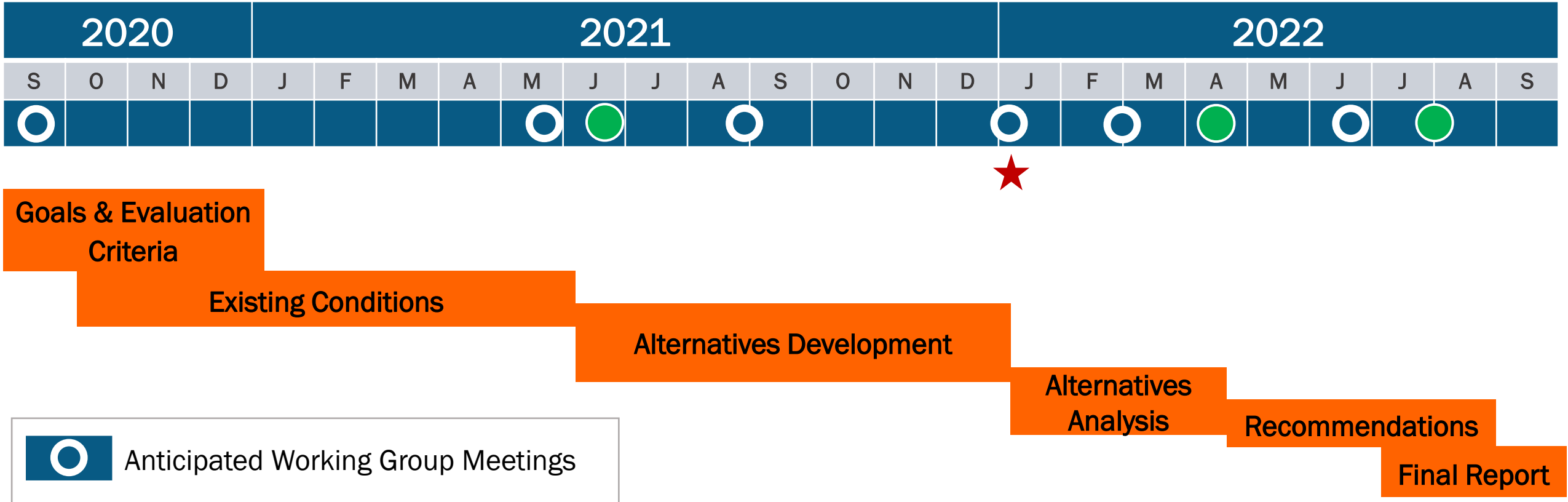
Bottom Panel of Zoom Screen

- If you are participating by phone only, you can press the star button then nine (*9) to raise your hand

- Comments may also be shared throughout the process via the study comment form

NEXT STEPS

Study Schedule



Next Steps

- Alternatives Refinement
- Future Year Conditions
  - CTPS baseline model
- Alternatives Analysis
- Working Group Input
- Public Meeting

Next Steps

- Next Working Group Meeting: Winter 2022
  - Alternatives analysis for top alternatives
- Public Meeting #2: Spring 2022
  - Present top alternatives and solicit feedback

More Information:

Makaela Niles, MassDOT Project Manager
makaela.niles@state.ma.us

Project Website: https://www.mass.gov/wellington-circle-study