Wellington Circle Study

WELLINGTON CIRCLE STUDY

massDOT
Massachusetts Department of Transportation

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

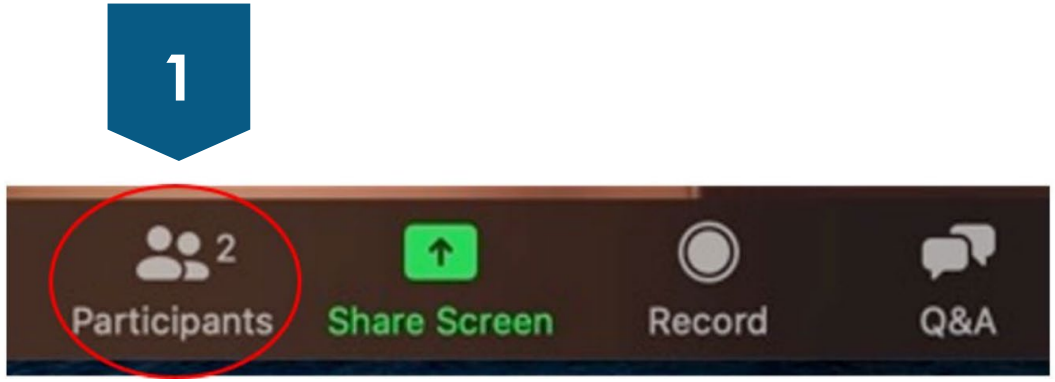
Working Group Meeting #5

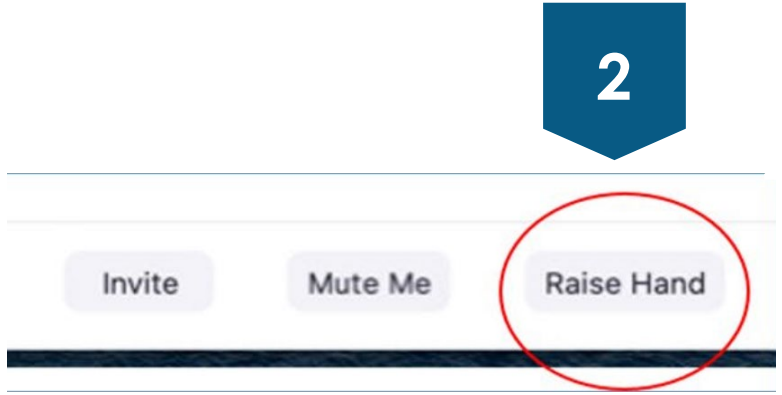
December 8, 2022

Ground Rules

- This meeting is being recorded
- Technical Support: Sara Stoja, sstoja@hntb.com
  - Zoom Support: 888-799-9666
- Working Group Members
  - Use "Raise Hand" button during clarification/discussion periods

Bottom Panel of Zoom Screen





Agenda

- Study Process
- Alternatives Review
  - Short/Medium-Term
  - Long-Term At-Grade
    - At-Grade Dual Quadrant (square, triangle, and transit-enhanced concepts)
    - Pedestrian bridge option
  - Long-Term Grade Separated
    - Grade-Separated Single Quadrant
- Alternatives Evaluation
- 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

Safety

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

Connectivity

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

Mobility/Access

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

Quality of Life

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

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

ALTERNATIVES REVIEW

Alternatives Update

- Develop traffic projections and analysis
- Refinement of cross section and access (lane designation, sidewalks, bike lanes, driveways)
- Addition of bus lane for transit-enhanced alternative
- Consideration of pedestrian bridge

Short/Medium-Term Alternatives

Short/Medium-Term Alternative Option A

- Removes right turn channelization
- Relocates Middlesex Avenue
- Prohibits eastbound left turns
- Impacts:
  - Small improvements to bicycle and pedestrian access and connectivity
  - Increases open space
  - Degrades right turn operations

Cost: $6.2 M

Short/Medium-Term Alternative Option B

- Maintains channelized right turns for the EB and WB directions to accommodate right turn volumes
- Signalizes right turn lane crosswalks
- Impacts:
  - Small improvements to bicycle and pedestrian access and connectivity
  - Increases open space

Cost: $6.2 M

Long-Term Alternative: At-Grade

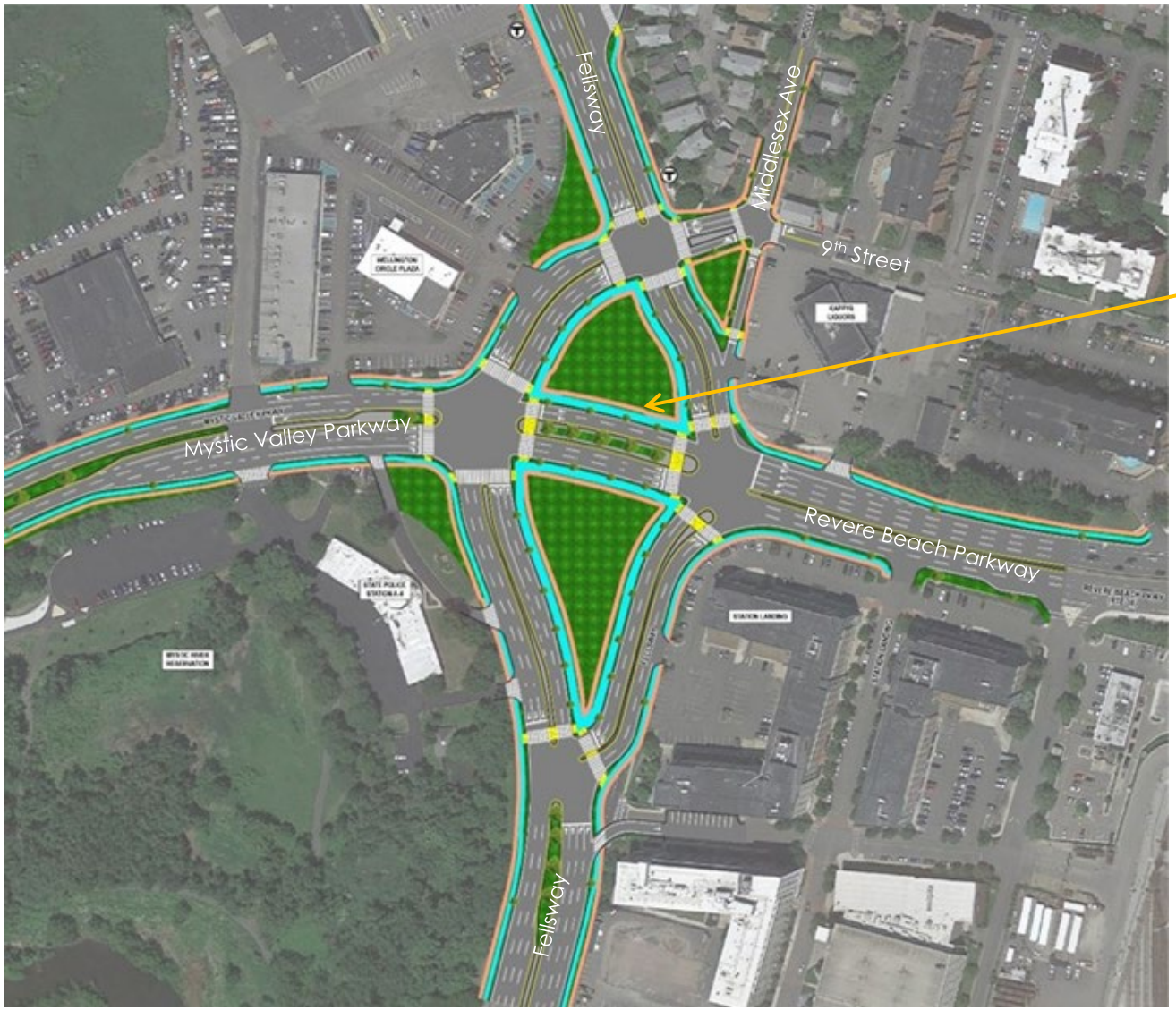
At-Grade Alternative: Dual Quadrant

At-Grade Alternative: Dual Quadrant

"Square" Concept

Cost: $36.7 M

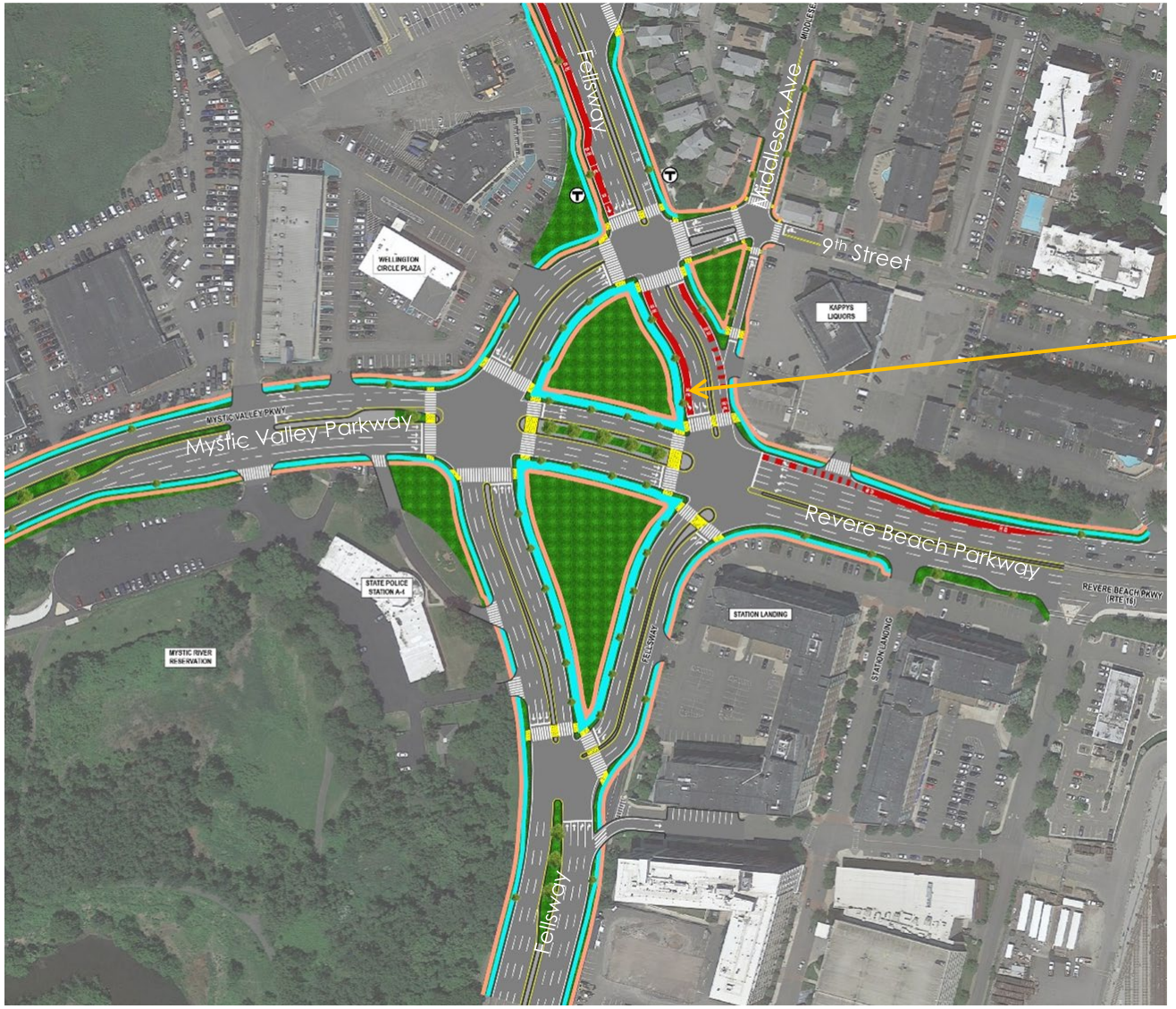
At-Grade Alternative: Dual Quadrant



"Triangle" Concept

Cost: $36.7 M

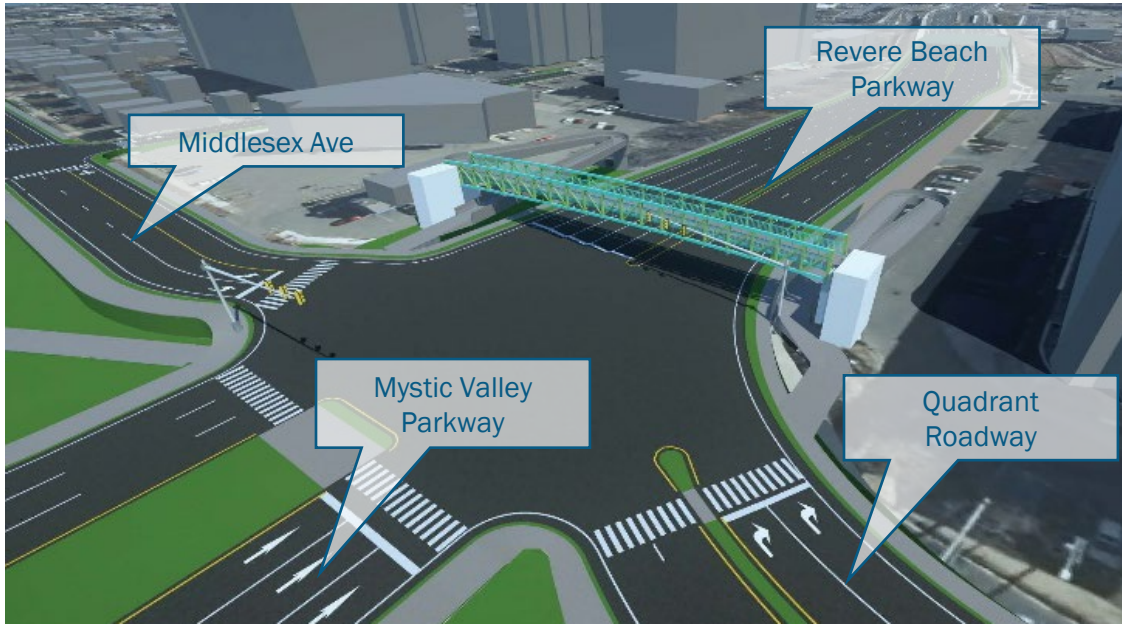
At-Grade Alternative: Dual Quadrant

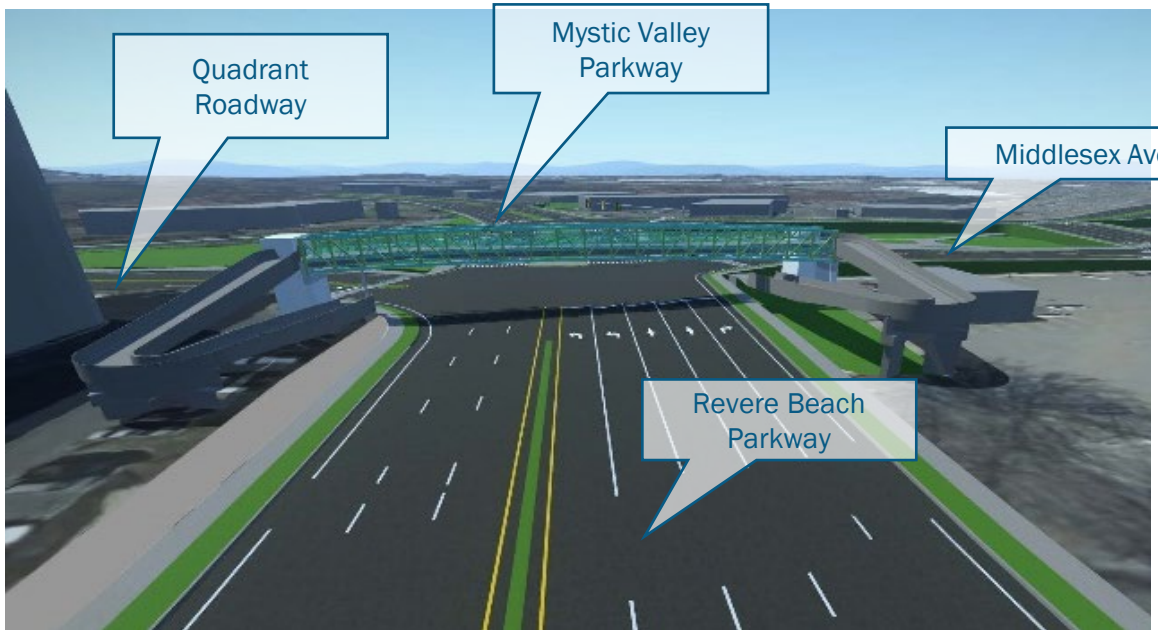


"Transit Enhanced" Concept

Cost: $38.3 M

At-Grade Option: Pedestrian Bridge





Could be added to any at-grade alternative

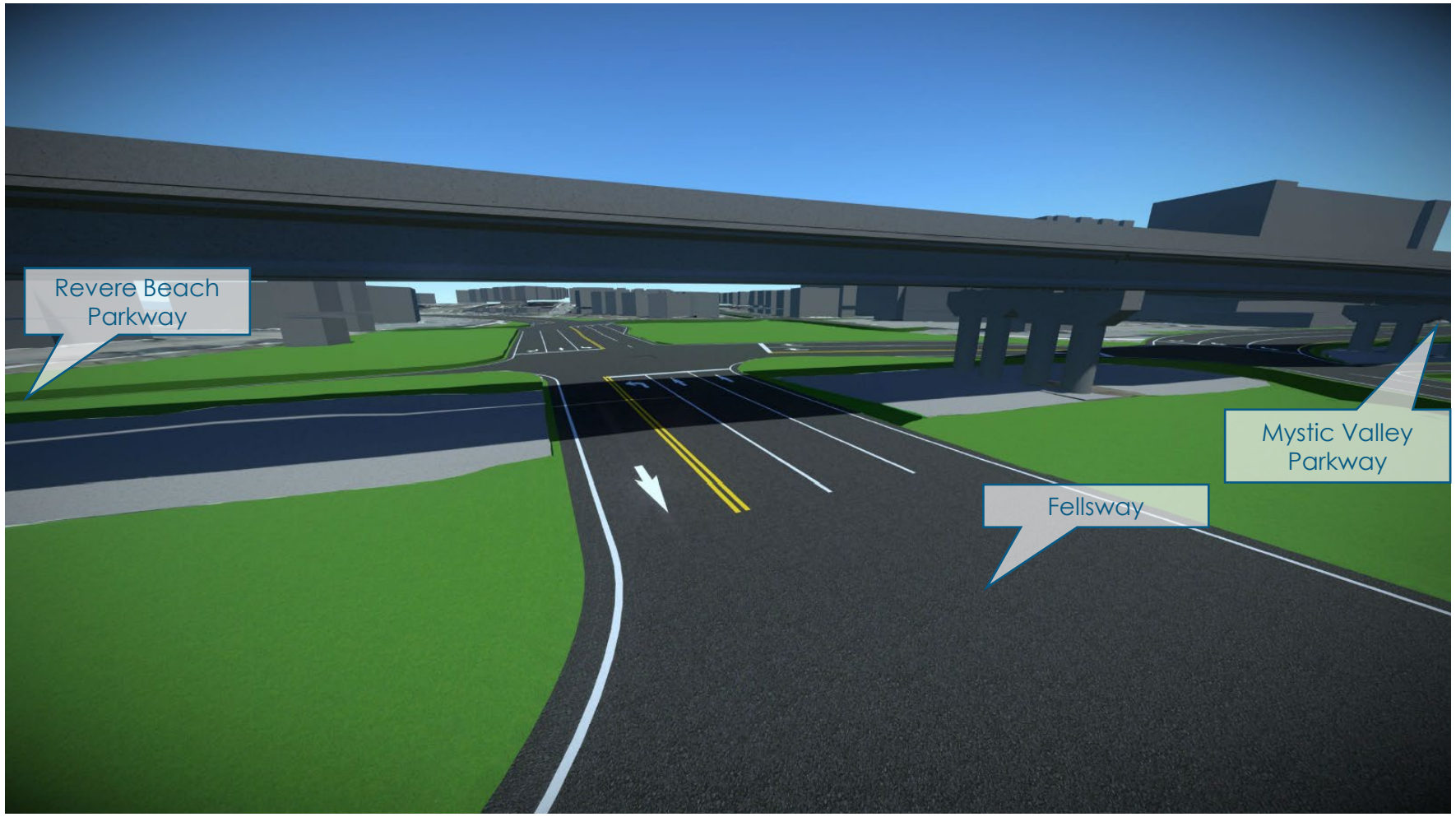
Cost: $35.7 M

Long-Term Alternative: Grade-Separated

Grade-Separated Single Quadrant

Cost: $176.9 M

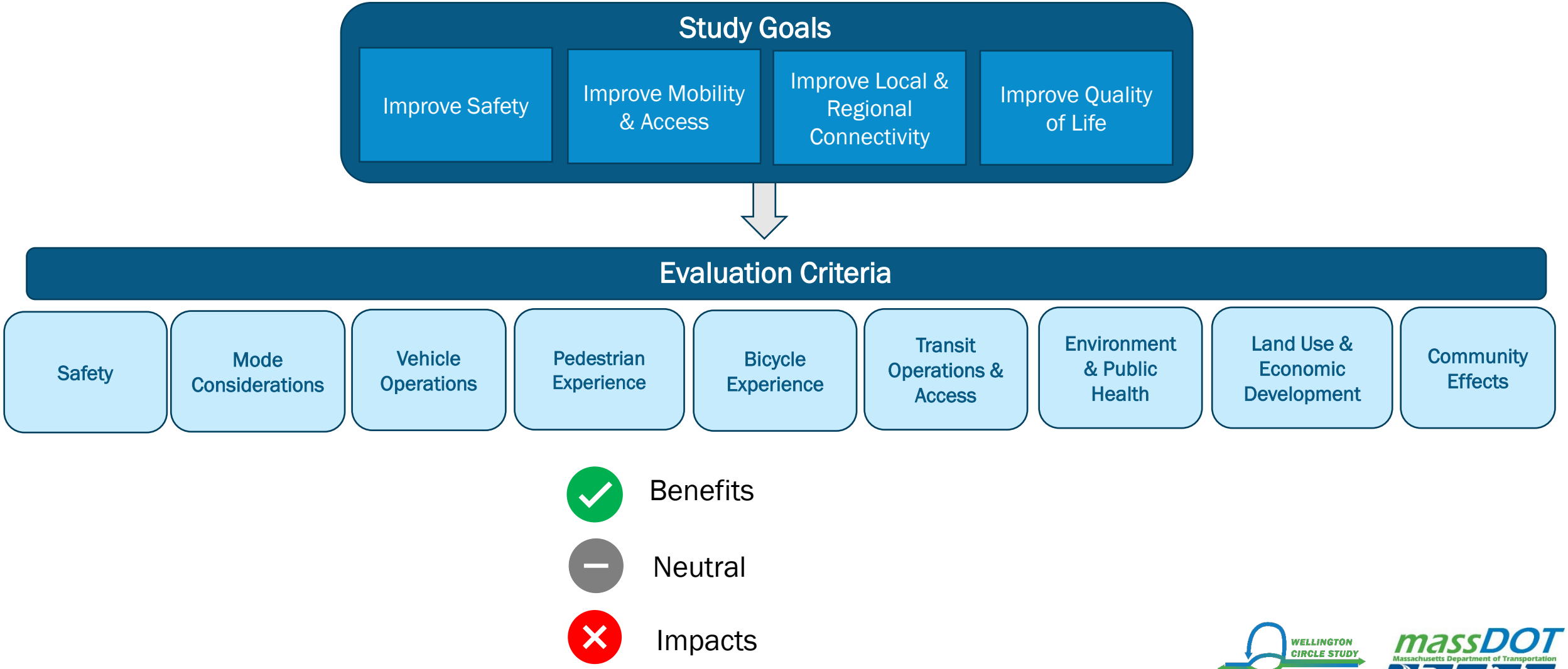
Grade-Separated Single Quadrant



Looking south

ALTERNATIVES EVALUATION

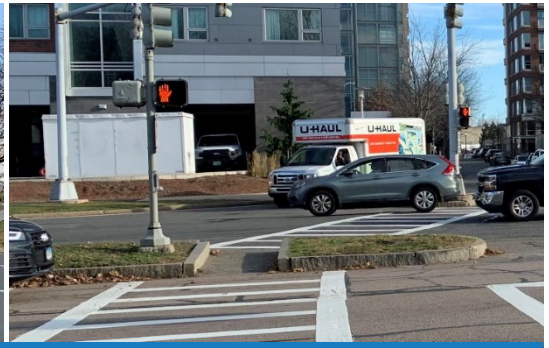
Evaluation Criteria Framework



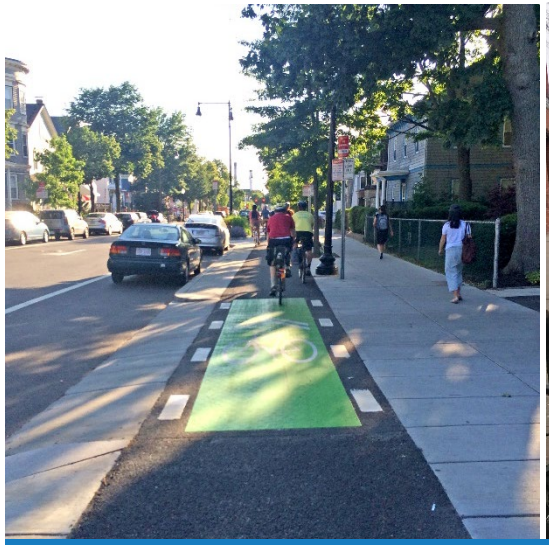
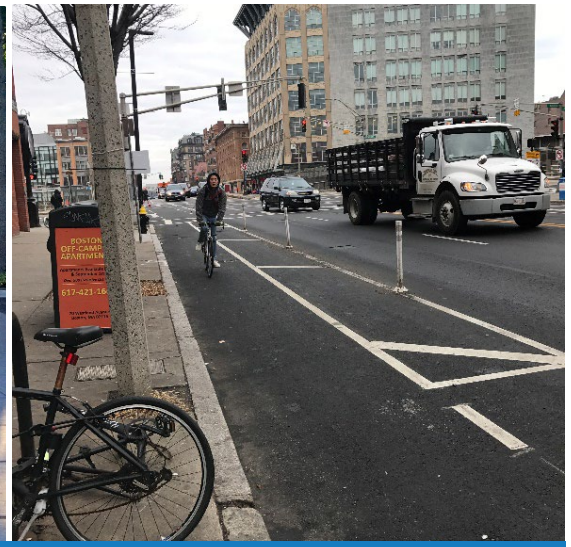
Improve Safety

Safety – Key Design Elements

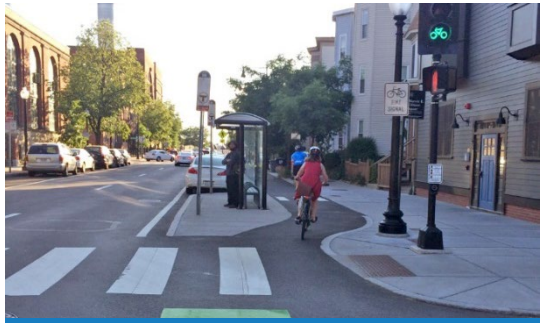


Wider pedestrian facilities, enhanced crossings, protected pedestrian phasing

Protected/buffered bike lanes to reduce conflict points



Accessible bus stops with multimodal connections

Safety – Crashes
All Long-Term Alternatives

- Fewer lanes reduce the need for multiple-lane changes and the associated potential for sideswipe crashes
- Prohibition of left turns reduces number of conflict points
- Simplified roadway geometry reduces potential for driver confusion
- Reduced corner and turn radii encourage lower vehicle speeds, reducing expected crash severity

Safety – Pedestrian & Bicycle
All Long-Term Alternatives

- Add separated bicycle facilities
- Maintain protected crossings for crosswalks and bike crossings, with one exception
- Provide additional signalized crossing opportunities for pedestrians
- For at-grade roadways, lane reductions and elimination of unsignalized slip lanes reduces “highway” nature, potentially reducing vehicle speeds

Safety – Summary

- All build alternatives expected to reduce crashes relative to existing conditions
- Short/medium-term improvements expected to result in minor reduction in crashes
- Among build alternatives, grade-separated results in fewer conflict points than at-grade alternatives

Improve Mobility & Access

Improve Local & Regional Connectivity

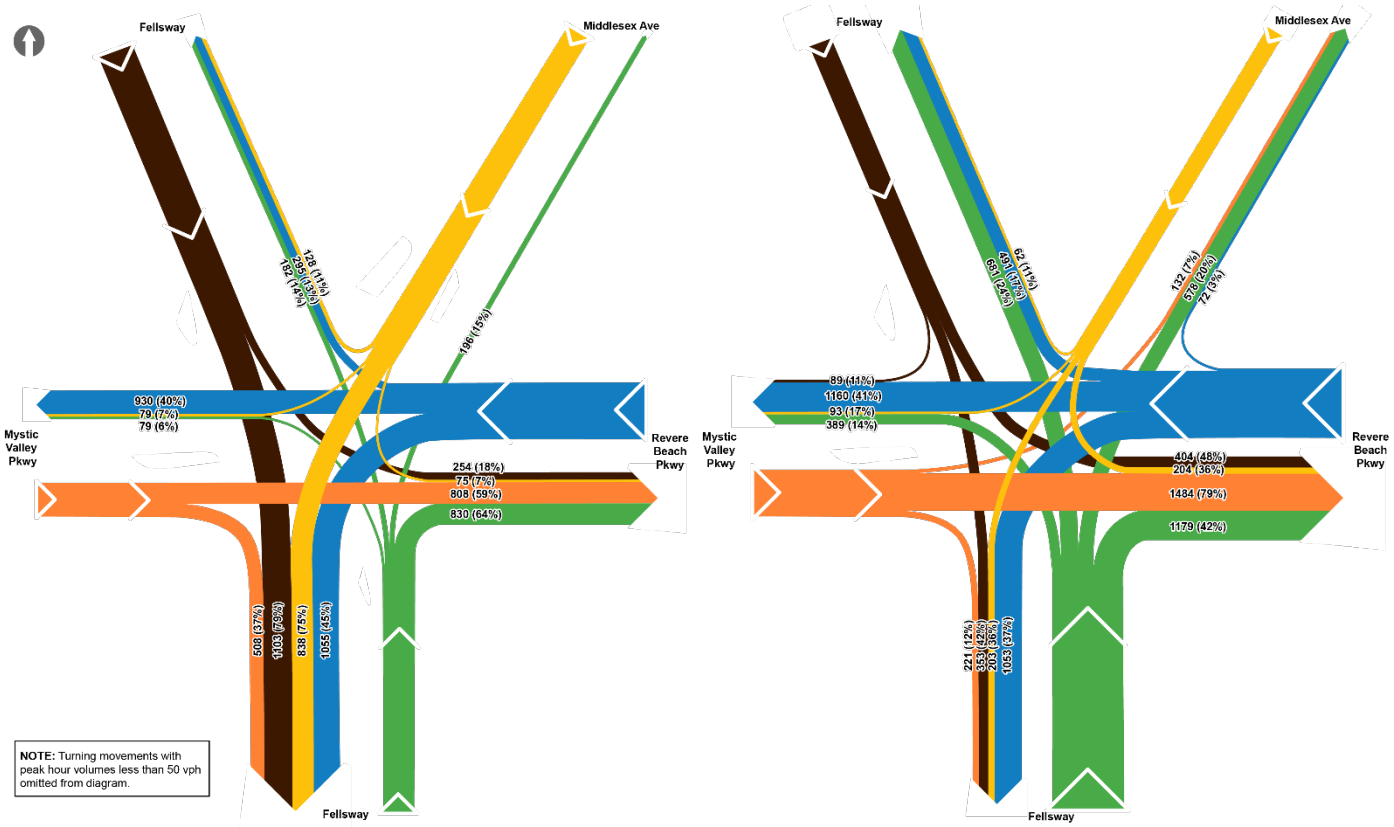
Mode Considerations

	Drive	Transit	Walking	Biking
Short/Medium-Term	Neutral	Neutral	Benefits	Neutral
Long-Term At-Grade	Impacts	Neutral	Benefits	Benefits
Long-Term At-Grade Transit Enhanced	Impacts	Benefits	Benefits	Benefits
Long-Term Grade-Separated	Benefits	Neutral	Neutral	Benefits

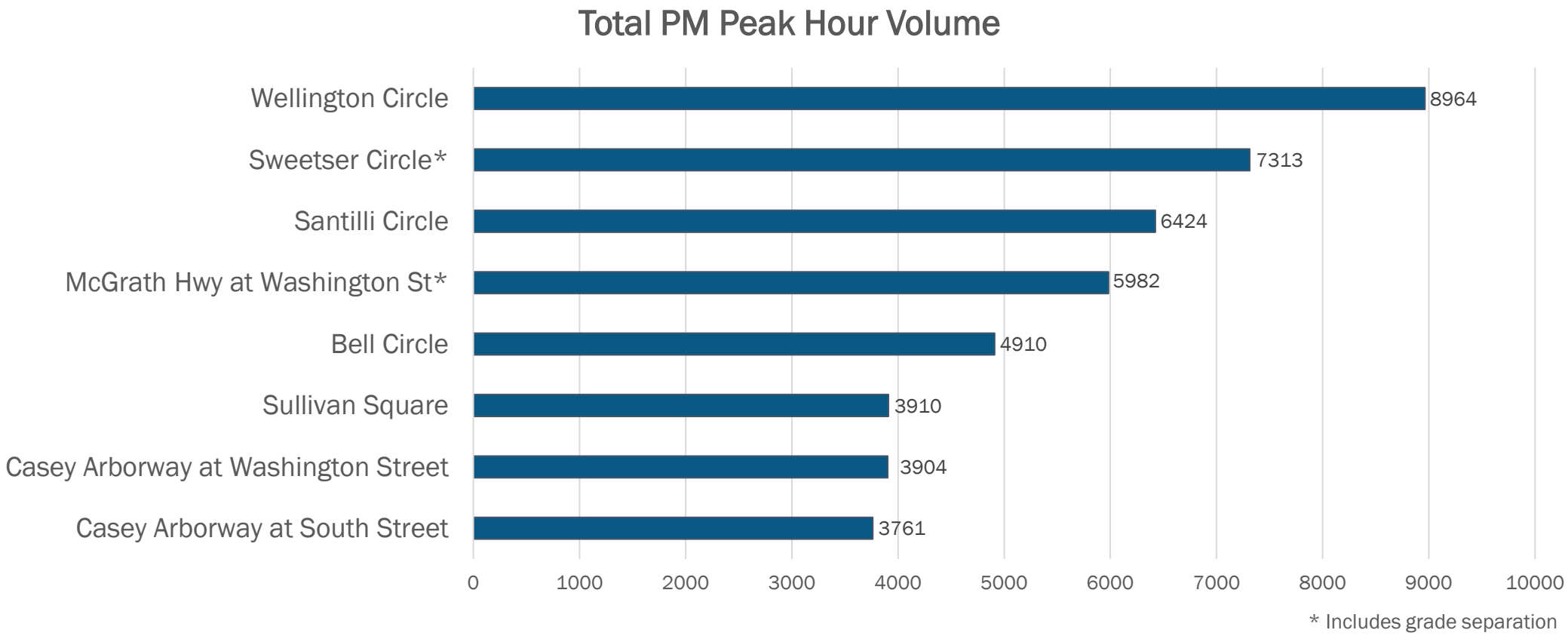
- Benefits
- Neutral
- Impacts

Existing Vehicle Volumes – Peak Hours Comparison

- Key takeaways:
  - Dominant pattern between south and east
  - Highest overall volume on Revere Beach Parkway east of Circle
  - Typical commuter patterns not seen on east/west roadways



High-Volume Intersections Comparison

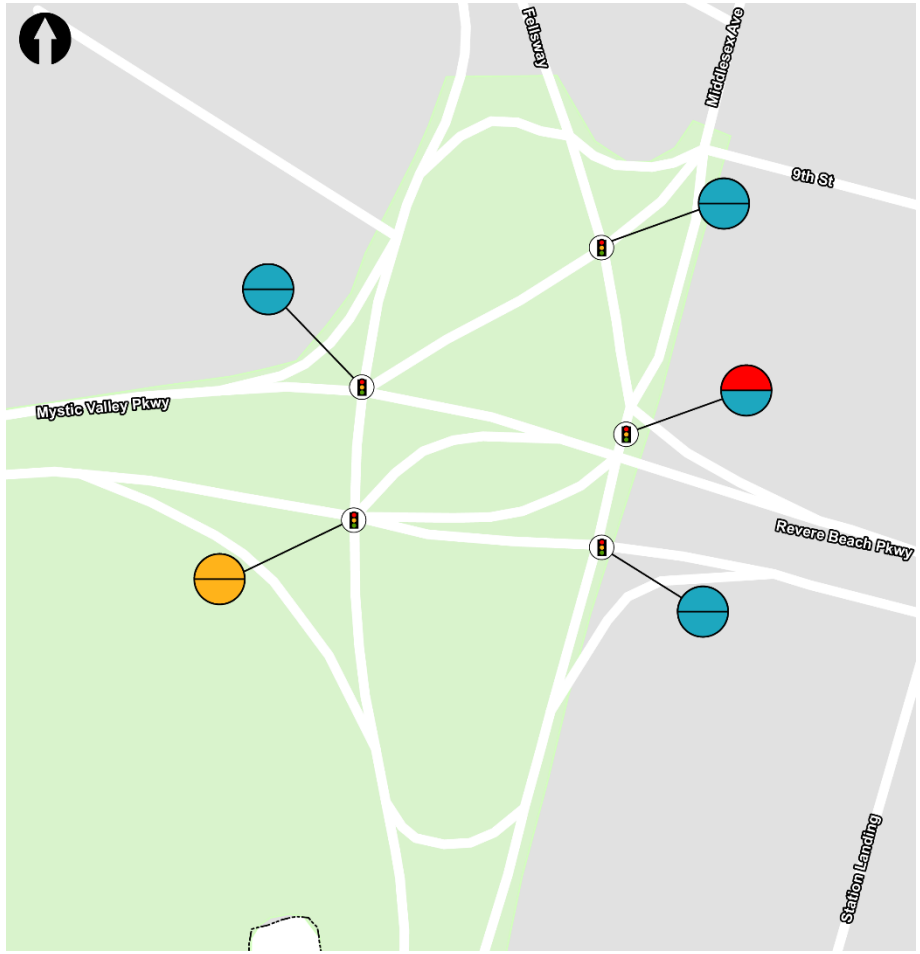


Based on a review of comparable complex, urban intersections, Wellington Circle has the highest vehicle volumes.

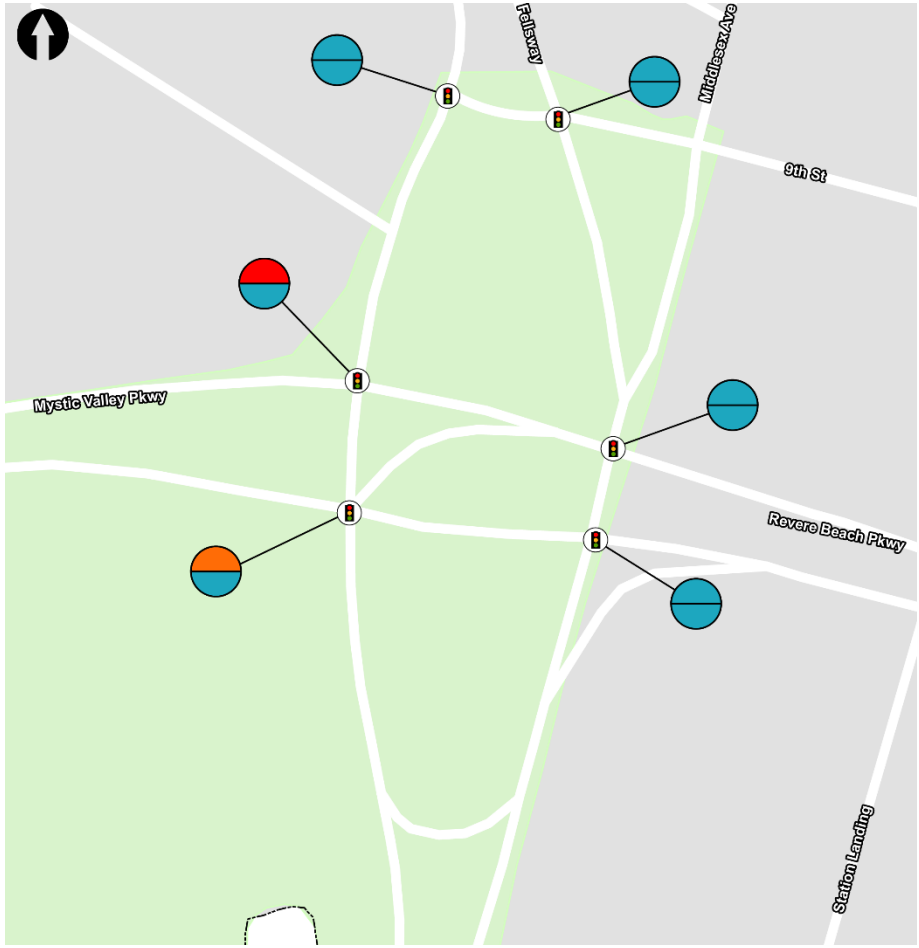
Operations Summary

- Existing Circle maximizes vehicle lanes
- Alternatives simplify geometry, resulting in easier wayfinding
- At-grade alternatives vehicle capacity reduced due to fewer lanes
- All alternatives significantly enhance pedestrian and bike experience

Vehicle Operations



Existing (2020)

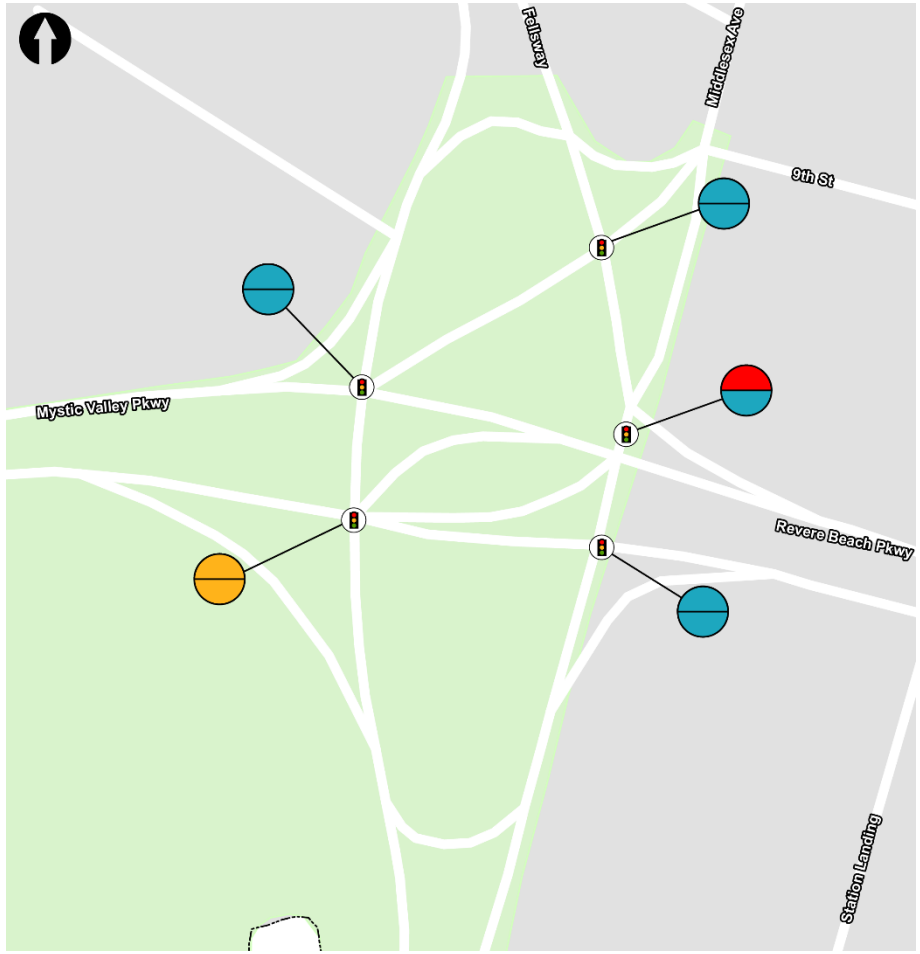


Short-Term Option A (2020)

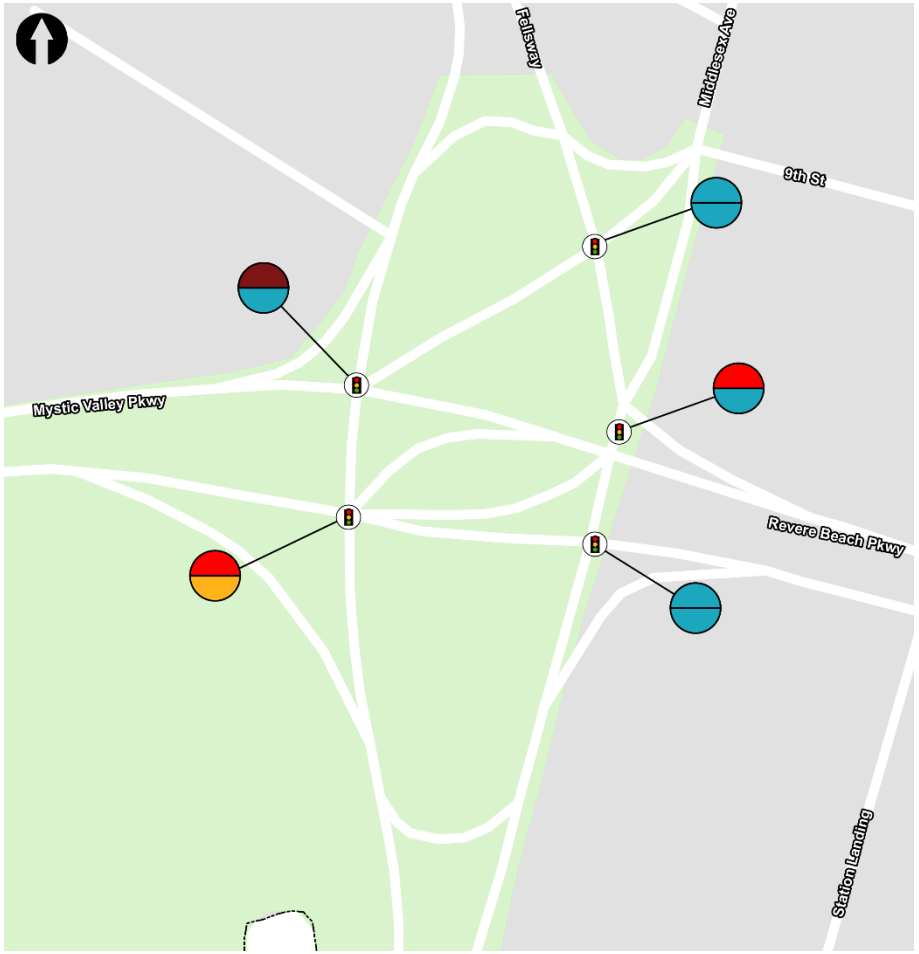
Level of Service (LOS) Rating

- A - D
- E
- F, no movements over capacity
- F, <50% movements over capacity
- F, ≥50% movements over capacity
- AM / PM
- Signalized Study Area Intersection

Vehicle Operations



Existing (2020)

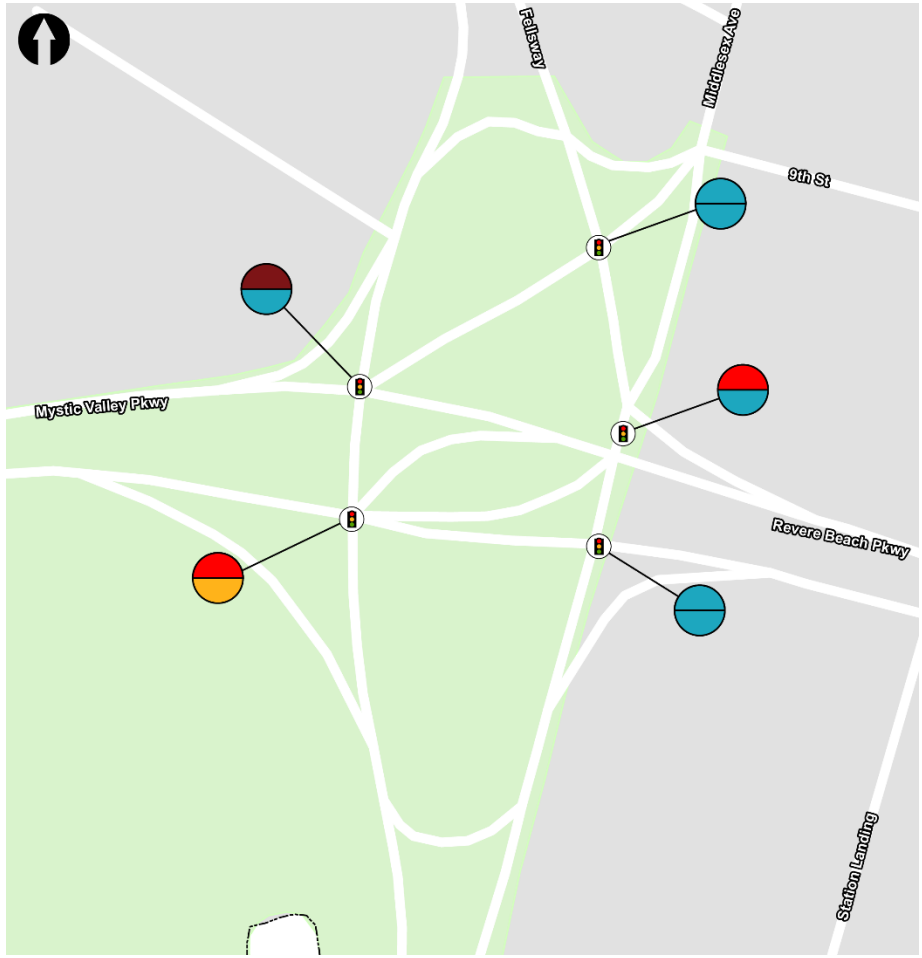


No Build (2040)

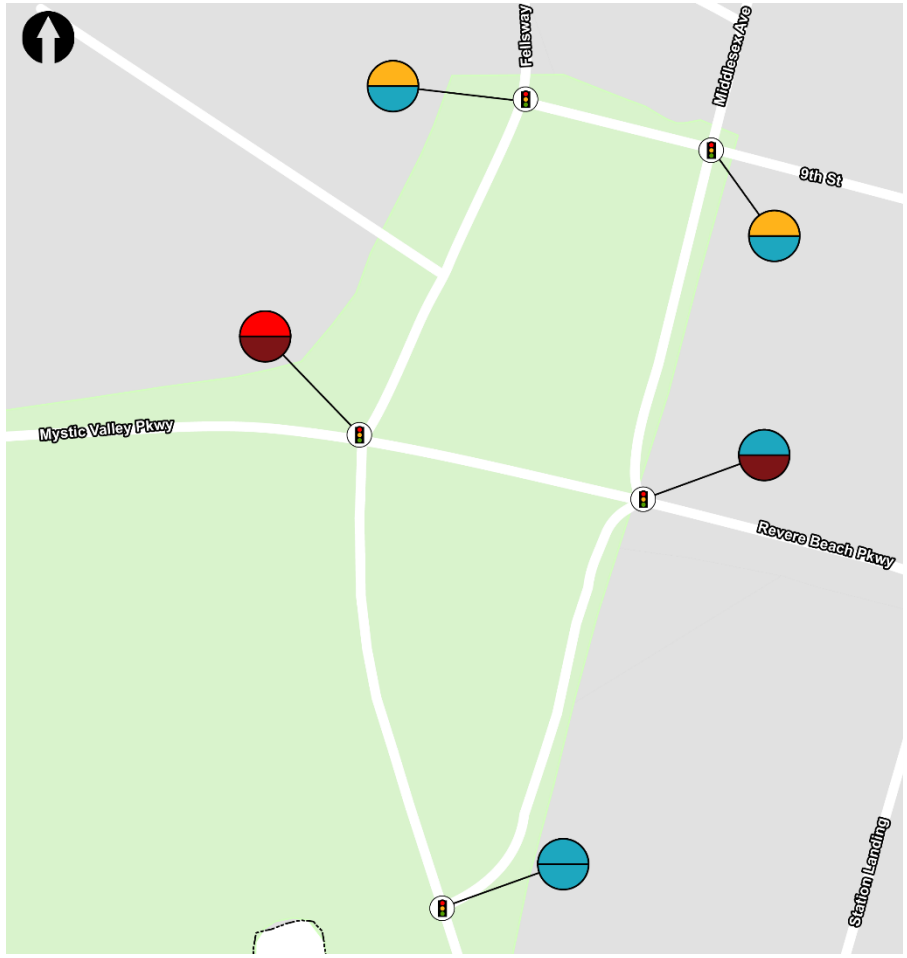
Level of Service (LOS) Rating

- A - D
- E
- F, no movements over capacity
- F, <50% movements over capacity
- F, ≥50% movements over capacity
- AM / PM
- Signalized Study Area Intersection

Vehicle Operations



No Build (2040)

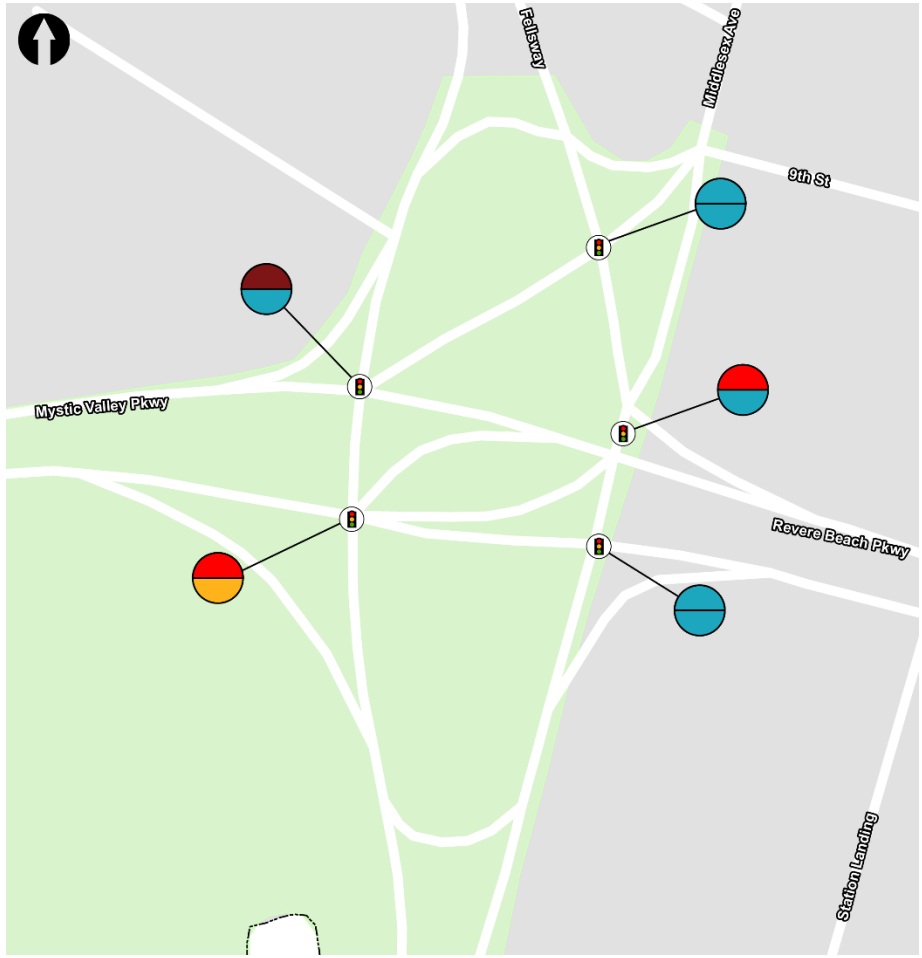


At-Grade Square (2040)

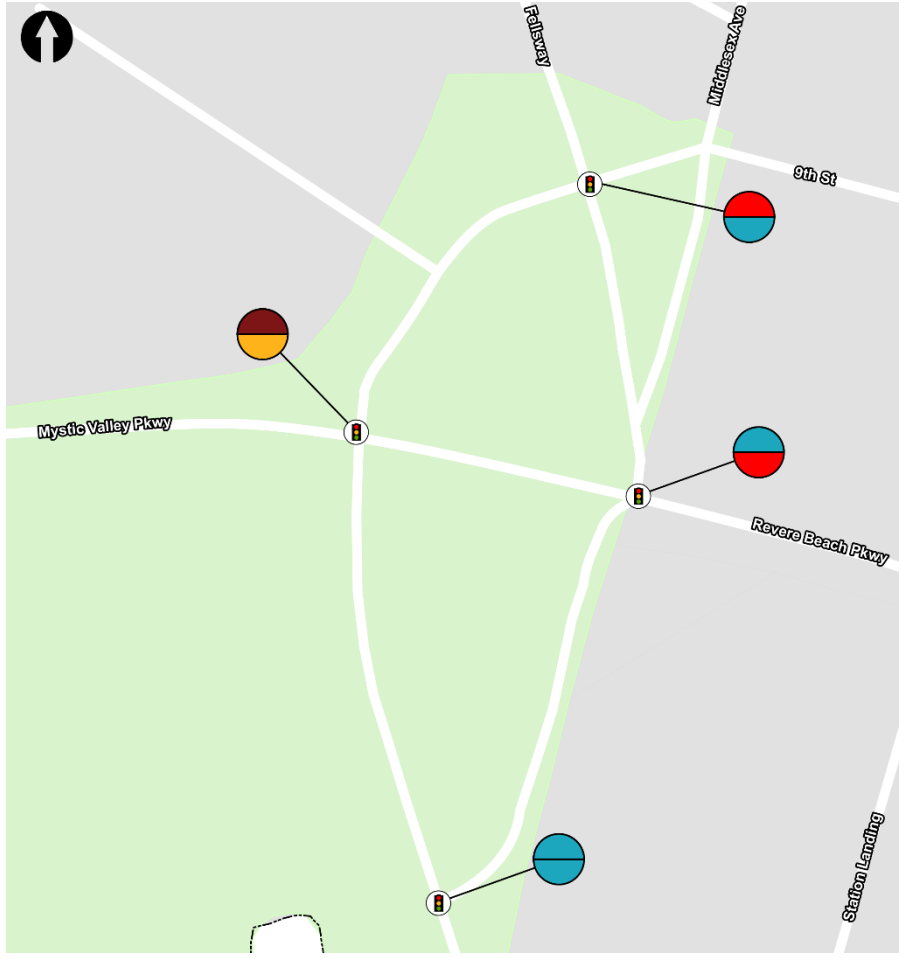
Level of Service (LOS) Rating

- A - D
- E
- F, no movements over capacity
- F, <50% movements over capacity
- F, ≥50% movements over capacity
- AM / PM
- Signalized Study Area Intersection

Vehicle Operations



No Build (2040)

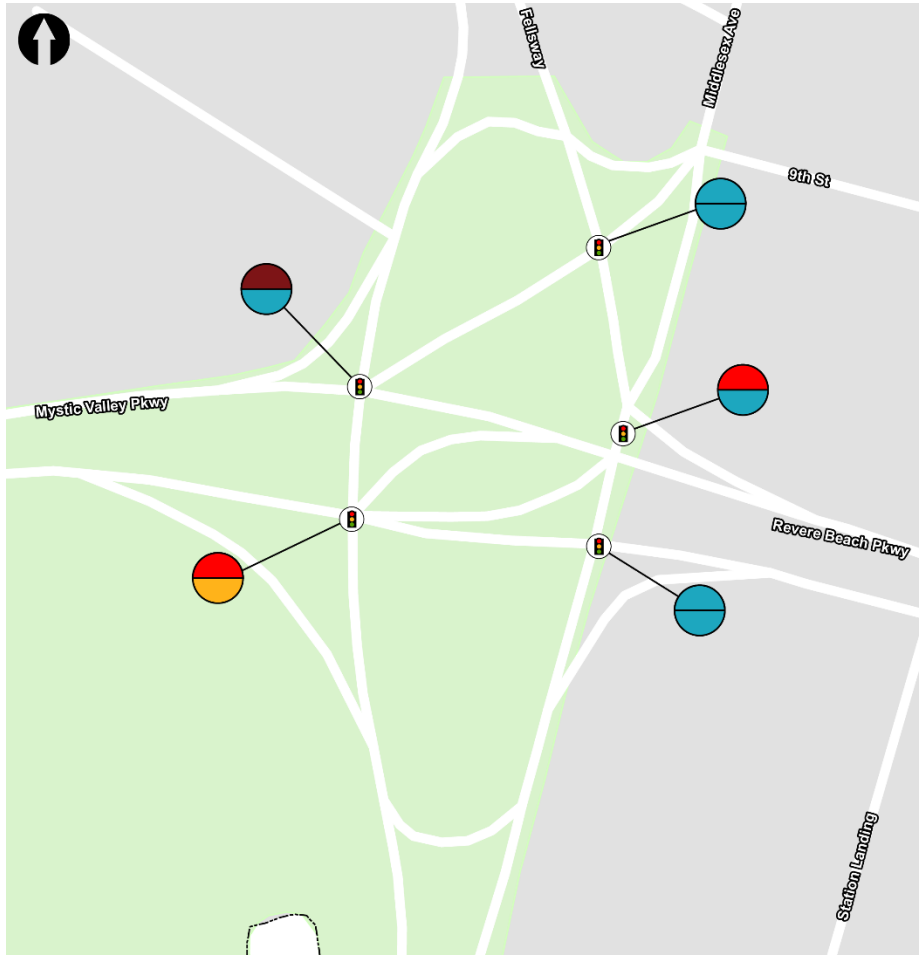


At-Grade Triangle
w/ Transit Enhancements (2040)

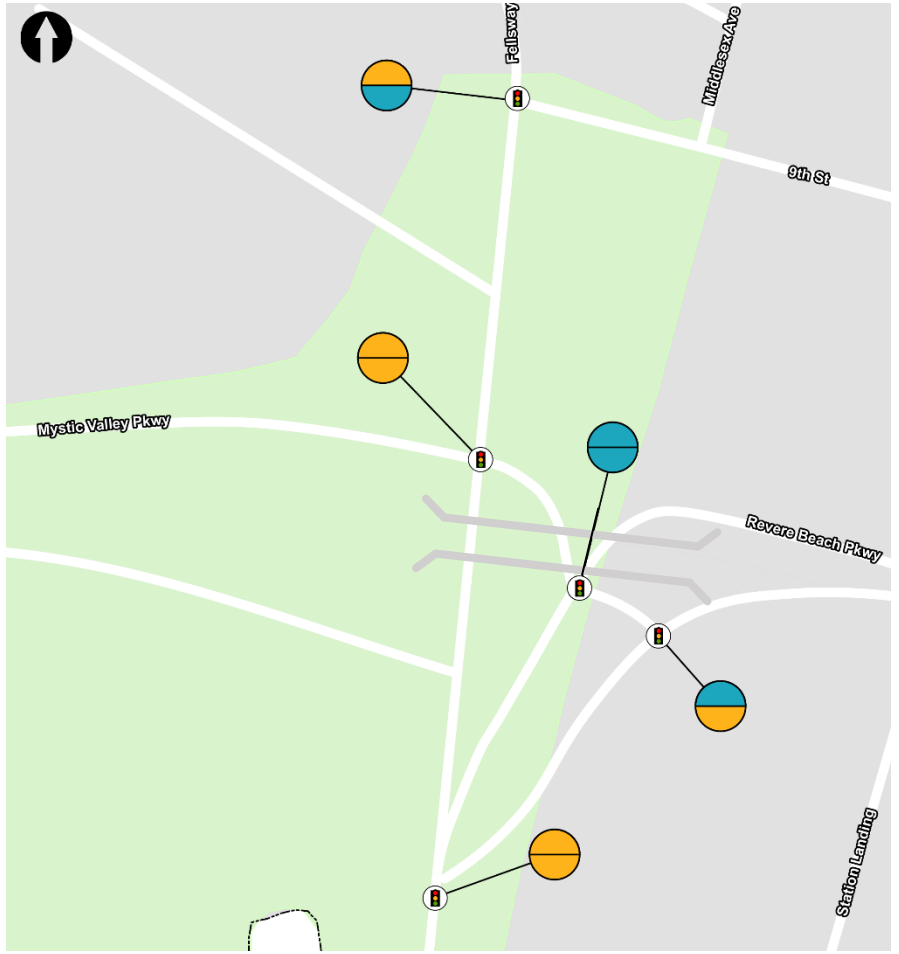
Level of Service (LOS) Rating

- A - D
- E
- F, no movements over capacity
- F, <50% movements over capacity
- F, ≥50% movements over capacity
- AM / PM
- Signalized Study Area Intersection

Vehicle Operations



No Build (2040)



Grade-Separated (2040)
(surface roads only)

Level of Service (LOS) Rating

- A - D
- E
- F, no movements over capacity
- F, <50% movements over capacity
- F, ≥50% movements over capacity
- AM / PM
- Signalized Study Area Intersection

Vehicle Operations – Summary

- **Short/medium-term alternatives:** Reduce capacity for some movements while improving overall flow
  - Option A may result in major delay increases for eastbound and westbound right-turn movements during peak periods
- **Long-term at-grade alternatives:** Overall reduction in vehicle capacity
- **Long-term grade-separated alternative**: Slight increase to overall vehicle capacity
  - Grade separation results predominantly in increased capacity for eastbound and westbound through movements, not the heavier south ↔ east traffic flow

Pedestrian Connectivity

Short/Medium-Term Alternatives

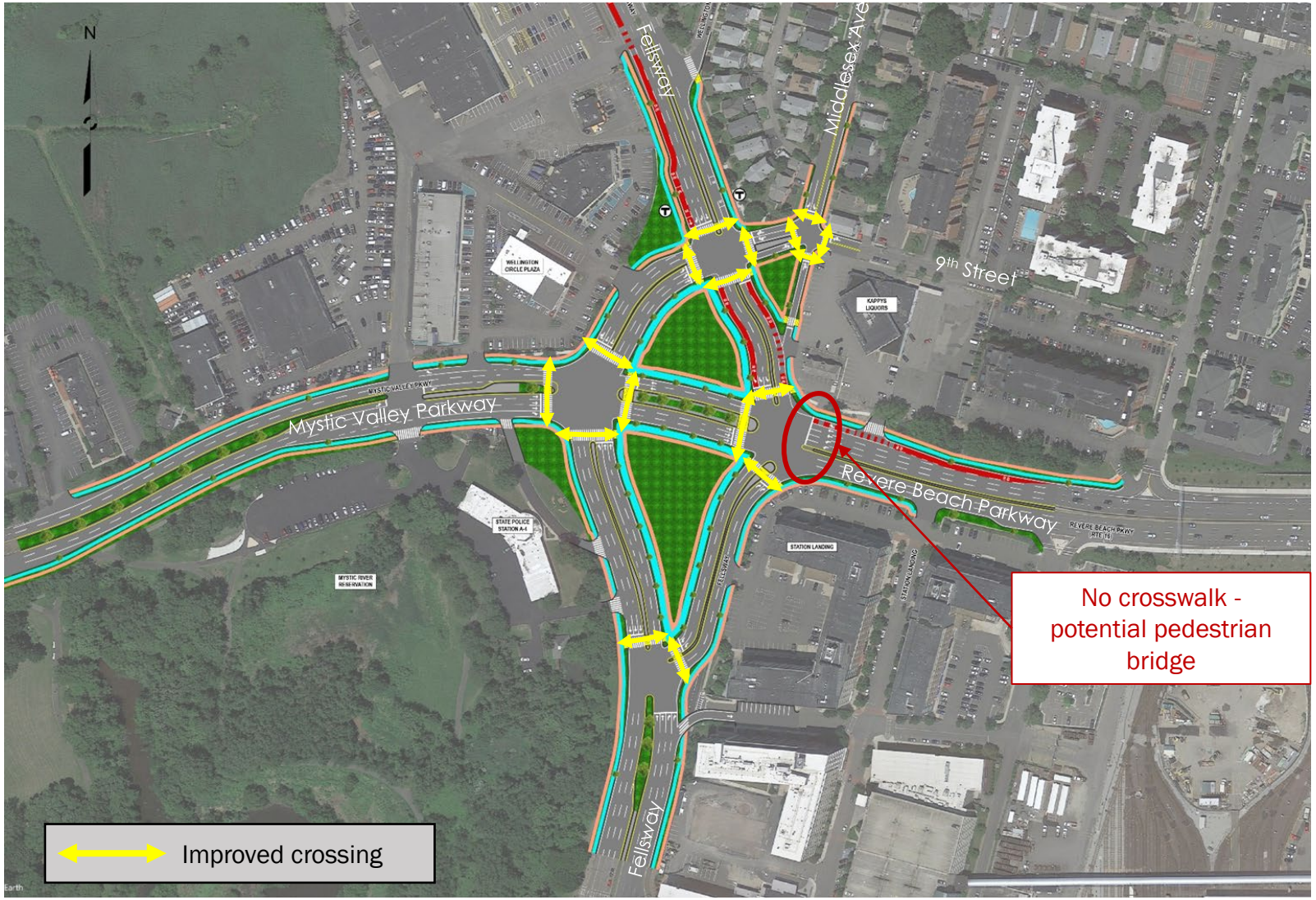
- Improved crossings along desire lines

Pedestrian Connectivity

Long-Term At-Grade Alternative - Square

- Improved crossings along desire lines

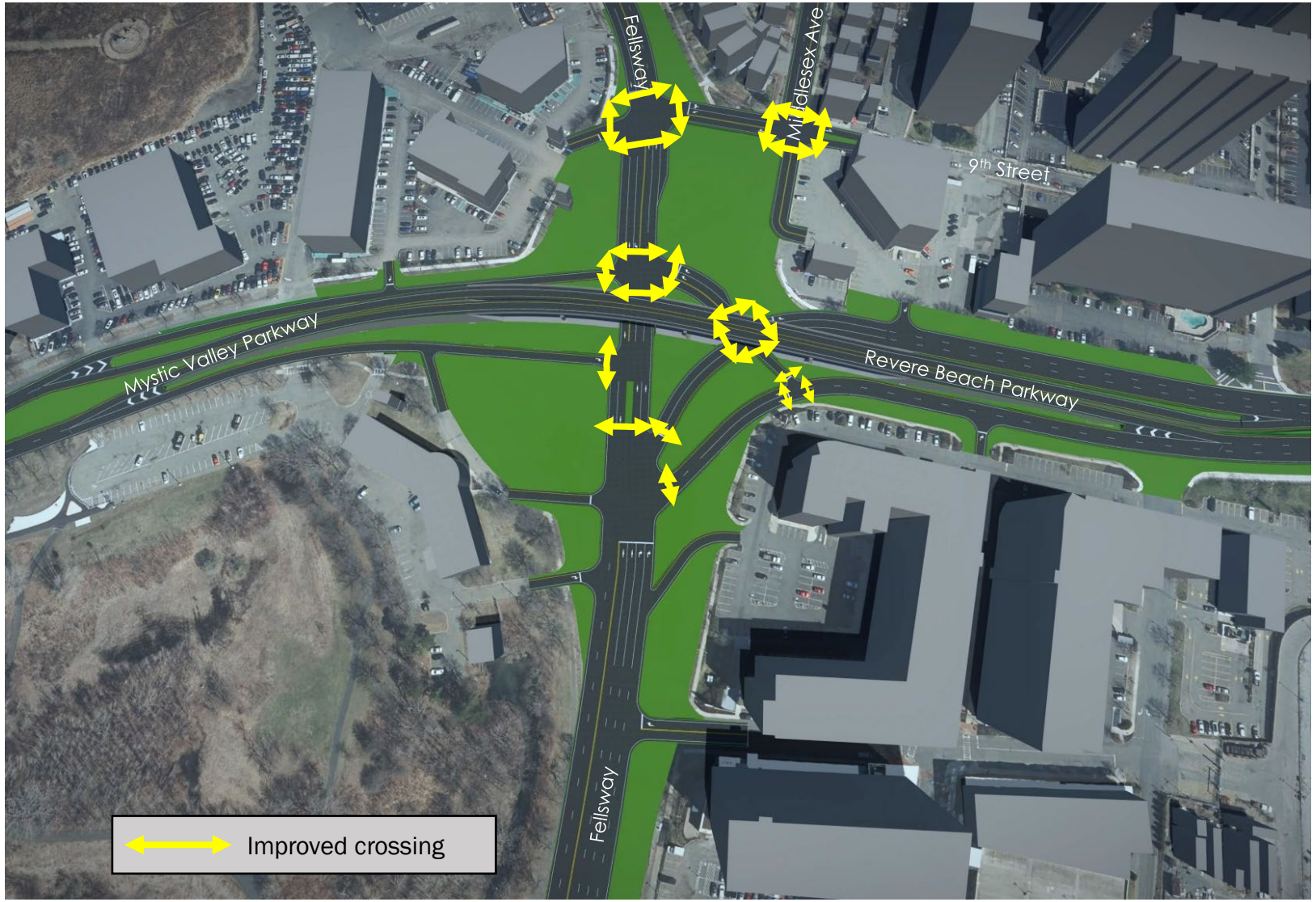
At-Grade Alternative: Dual Quadrant



Long-Term At-Grade Alternative – Triangle/Transit Enhanced

- Improved crossings along desire lines

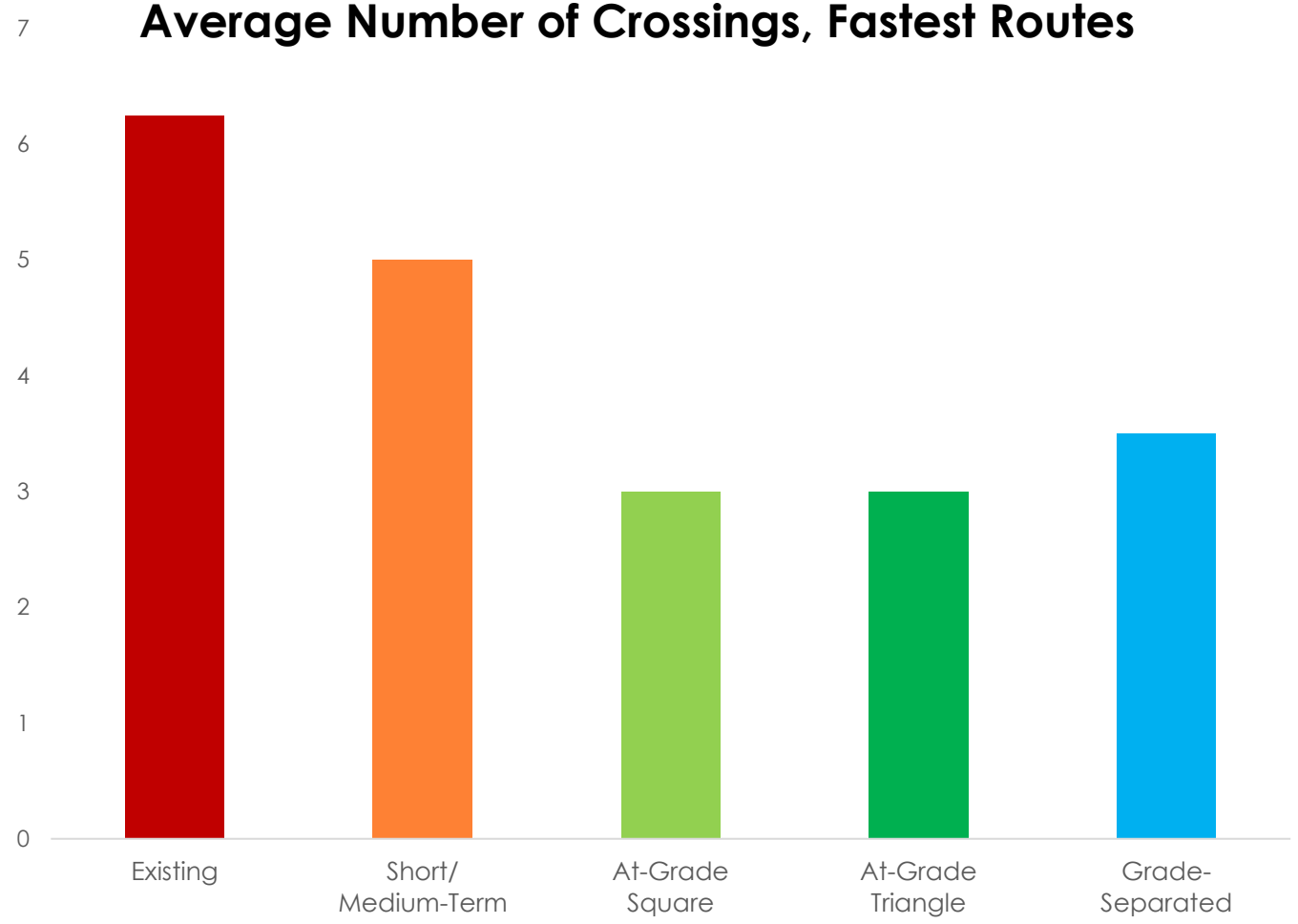
Pedestrian Connectivity



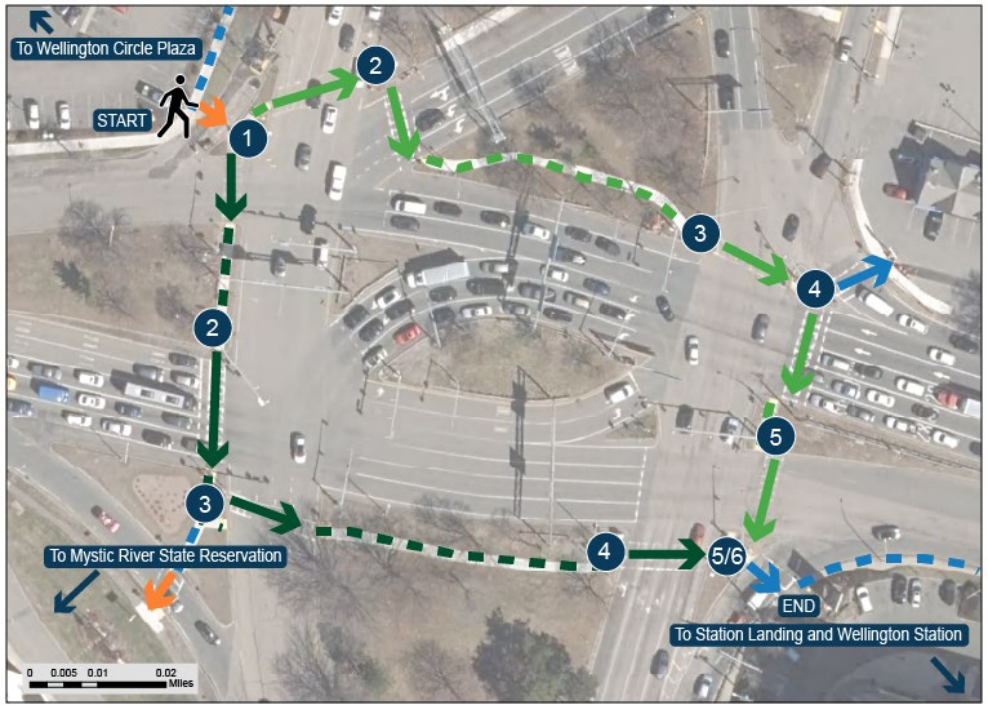
Long-Term Grade- Separated Alternative

- Improved crossings along desire lines

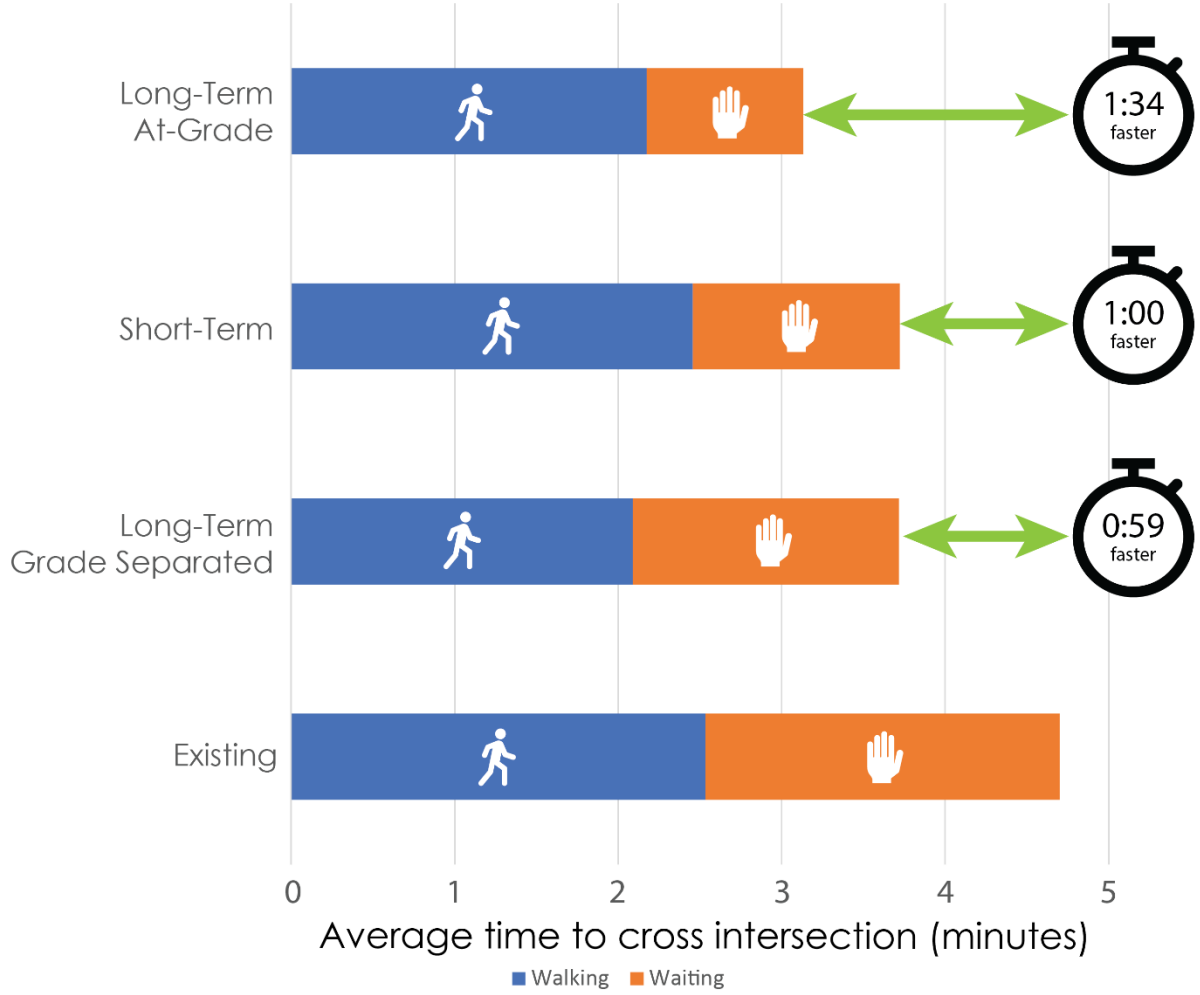
Pedestrian Connectivity



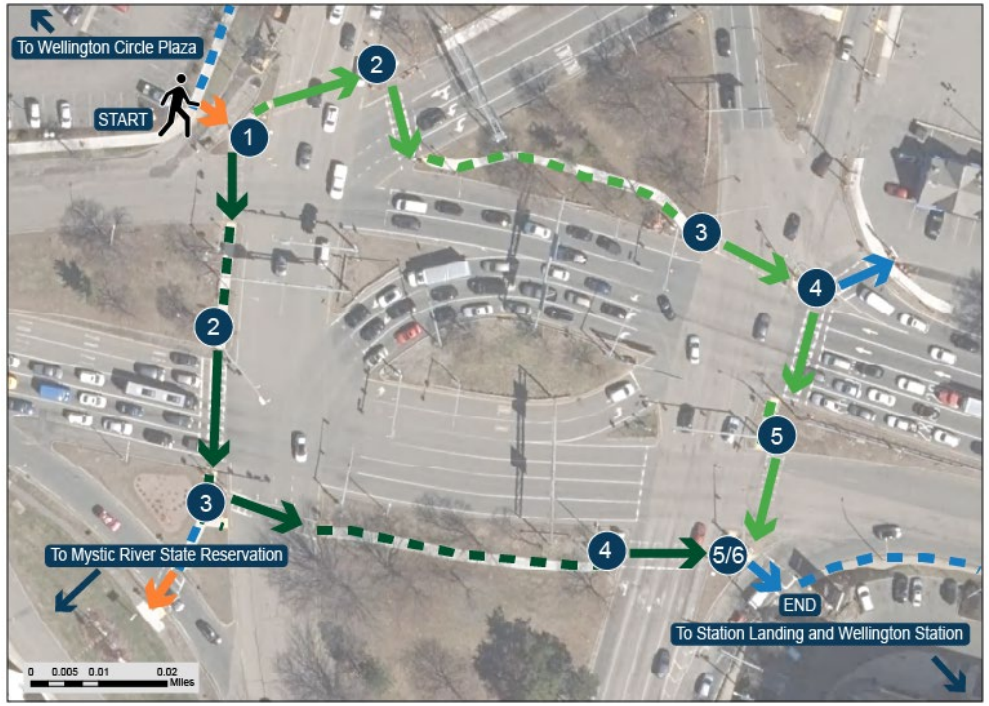
Fewer pedestrian crossings than existing for all alternatives



Pedestrian Travel Time Savings



Faster pedestrian travel times than existing for all alternatives

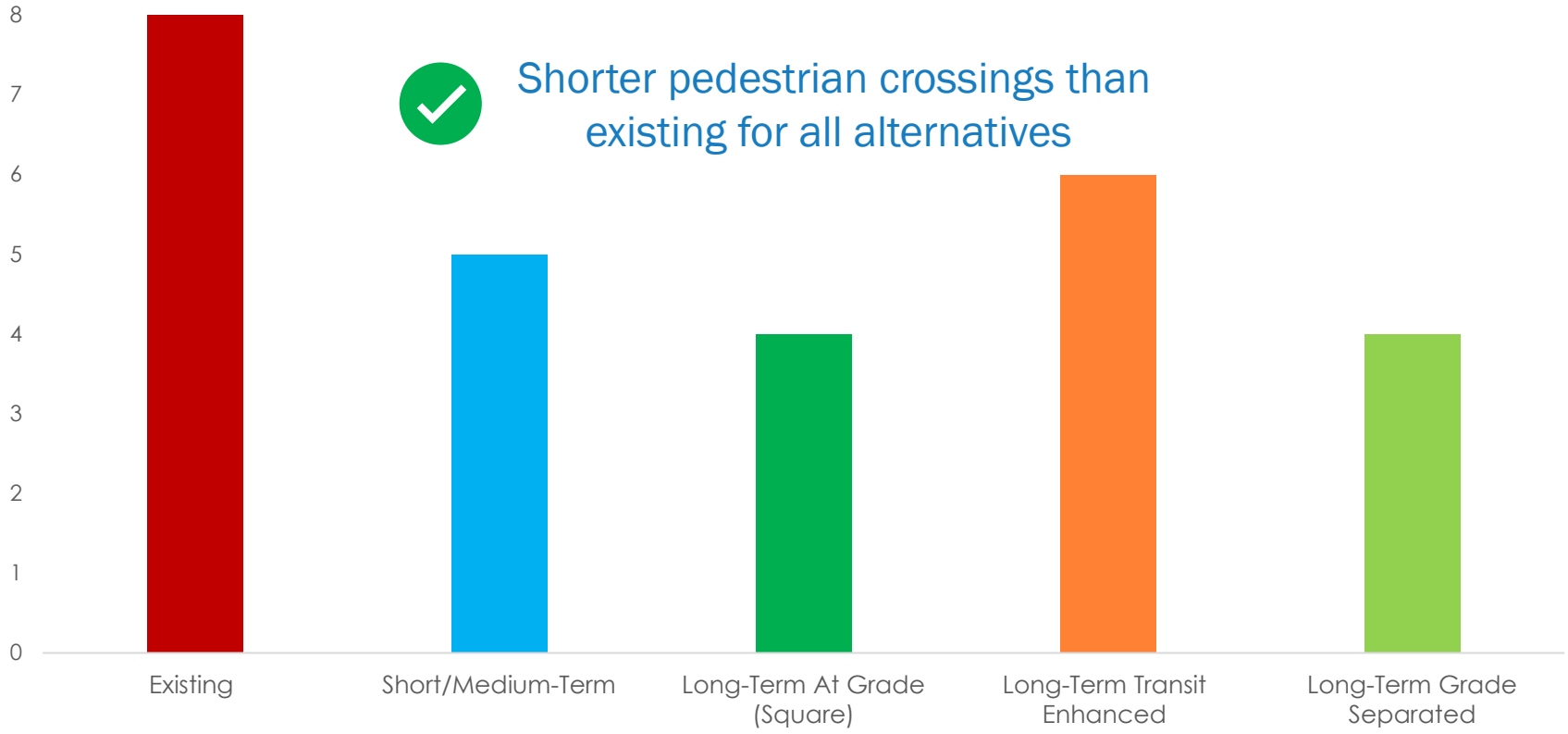


Crossing between northwest and southeast

Walk speed of 4 feet/second

Pedestrian Experience

Number of Pedestrian Crossings >3 lanes without refuge island

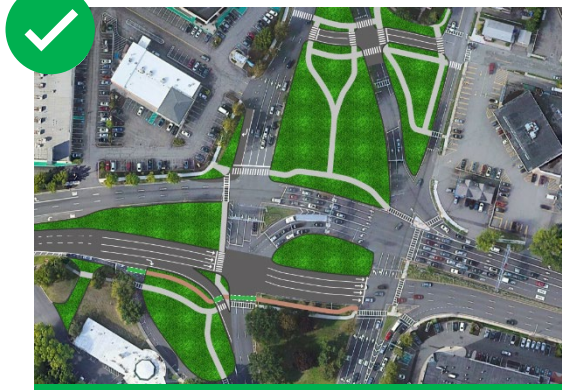


Shorter pedestrian crossings than existing for all alternatives

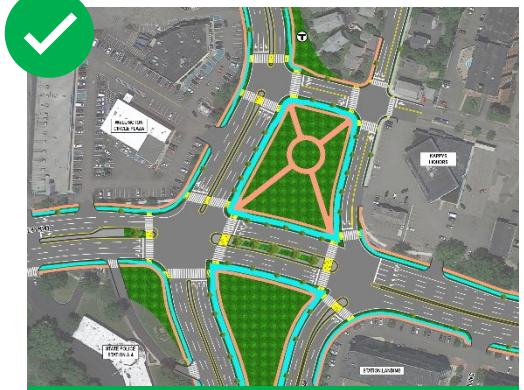
Existing – 8 lane crossing across Fellsway

Long-Term Alternatives

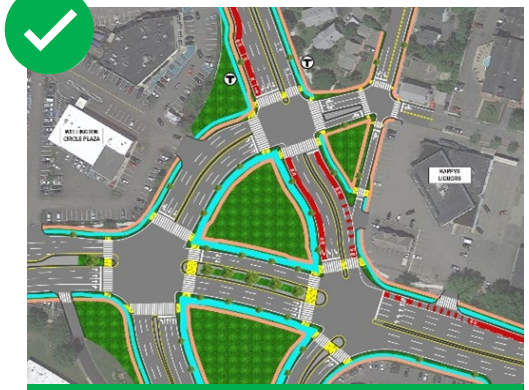
Pedestrian Experience



Combined Short/Medium-Term Concepts

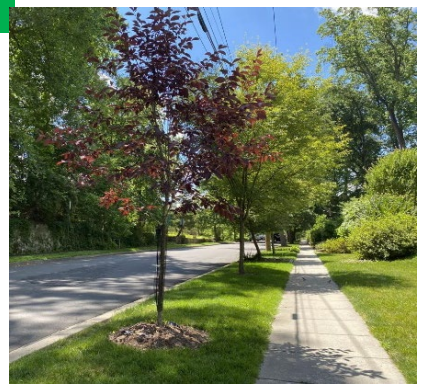


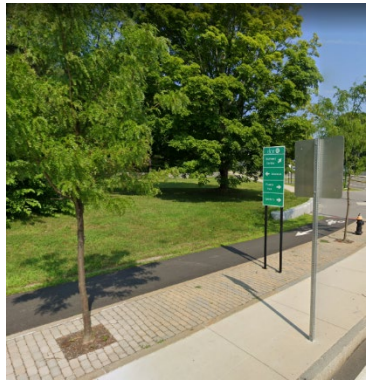
At-Grade Dual Quadrant – Square



At-Grade Dual Quadrant – Transit Enhanced

More opportunity to provide pleasant visual and landscaped surroundings





Grade-Separated Single Quadrant

Elevated roadway creates unpleasant environment for pedestrians

Bicycle Connectivity

Short/Medium-Term Alternative

Slightly better west to east bike connectivity than existing

Legend

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

Wellington Circle

Bicycle Connectivity

Long-Term Alternatives

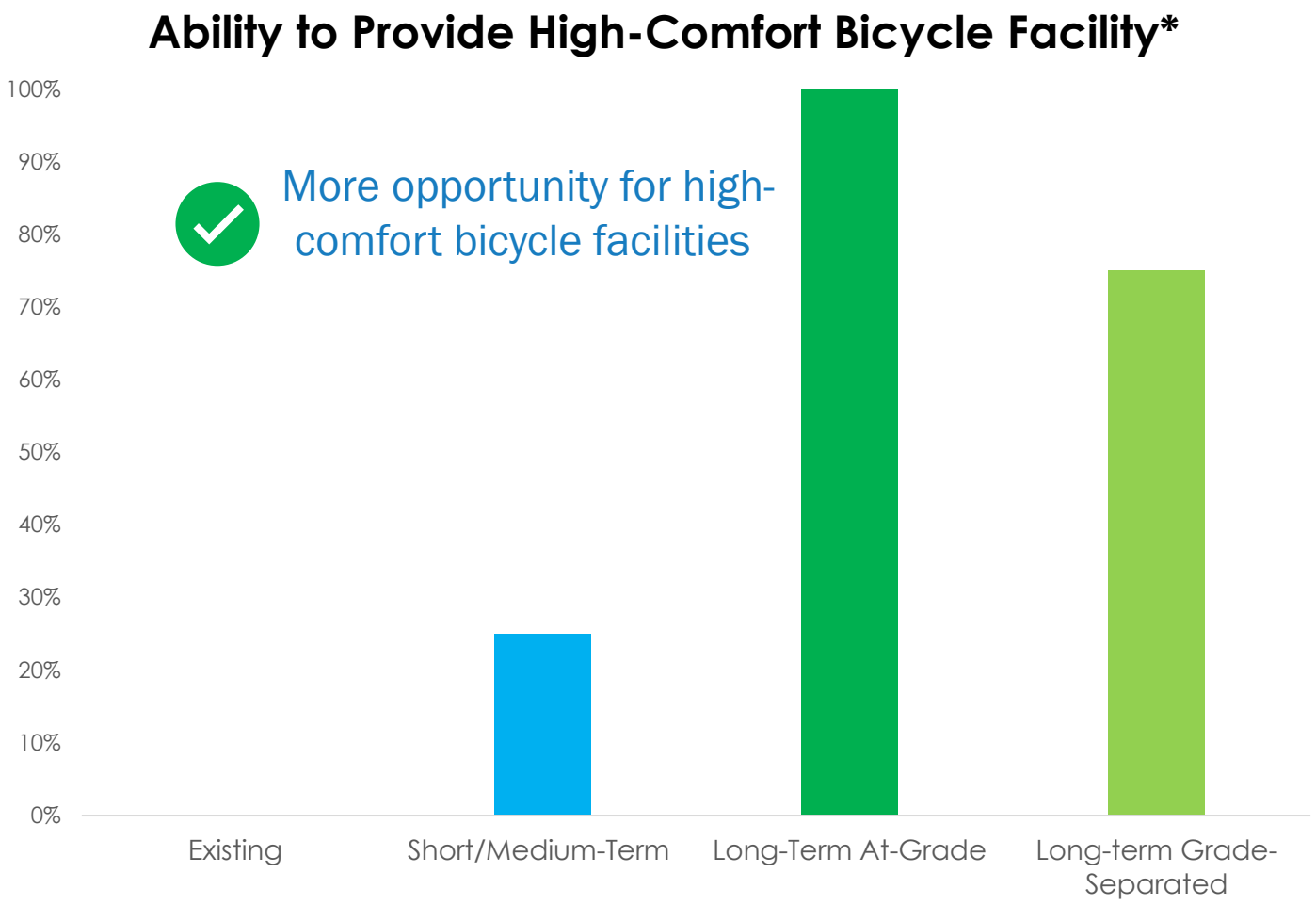
More east/west and north/south bike connectivity than existing

Legend

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

Wellington Circle

Bicycle Experience

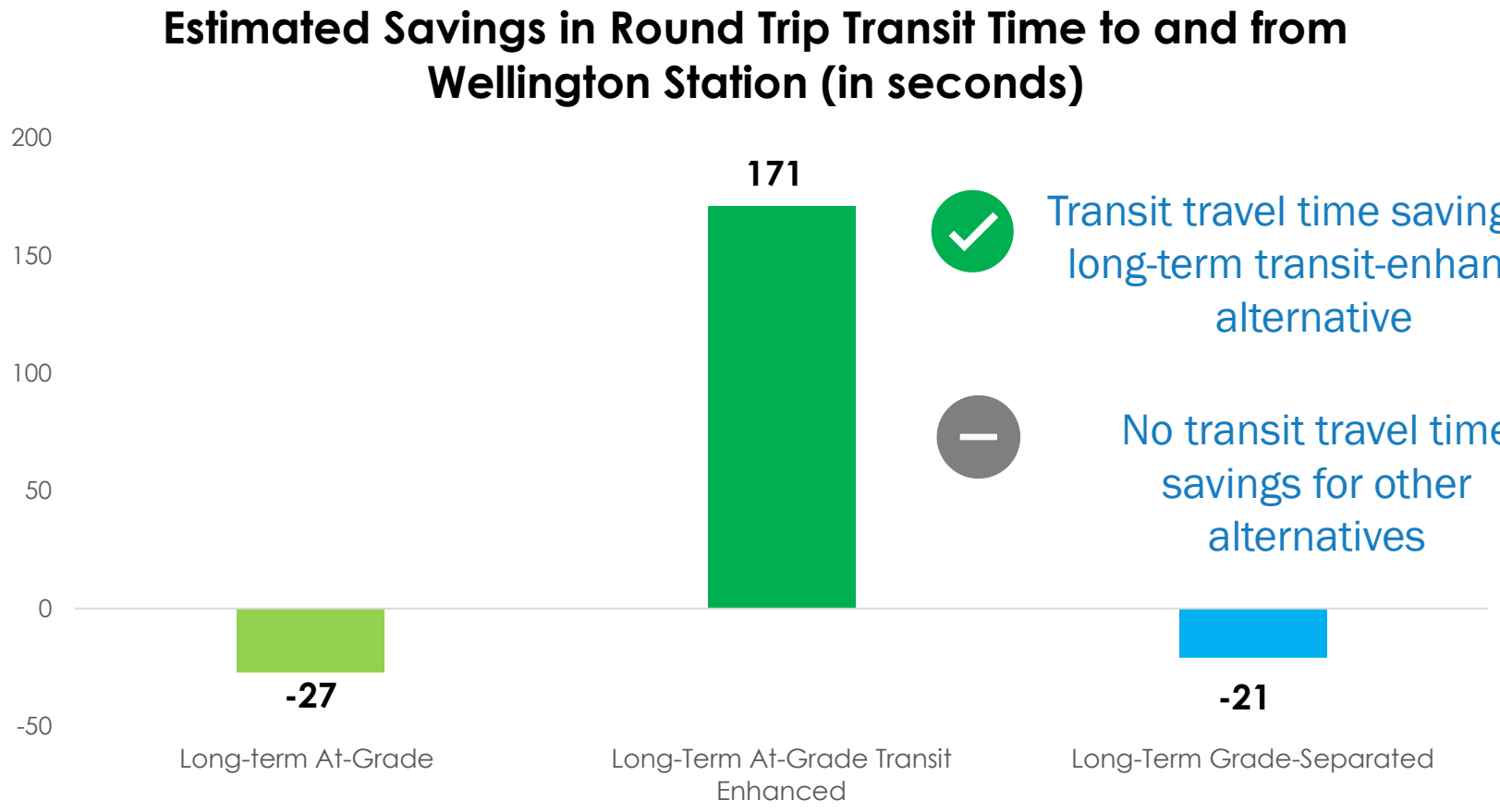


*Approximate percentage of approaches that have ability to provide high comfort bicycle facility

Existing – Biker on sidewalk (no bike lane)

Alternatives (separated bike lanes)

Transit Experience



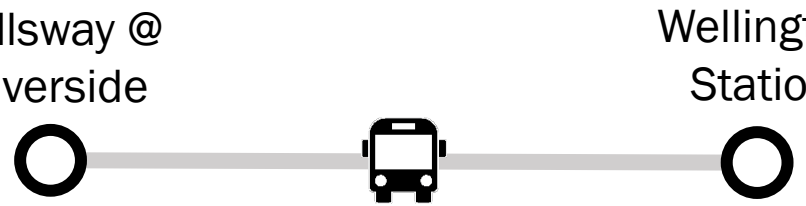
Transit travel time savings for long-term transit-enhanced alternative

No transit travel time savings for other alternatives

Travel time savings are more significant in the inbound direction towards Wellington station, where buses make a left turn between Fellsway and Mystic Valley Parkway

*Time savings apply to points north and west of the intersection of Fellsway with Riverside Avenue

Transit Experience



	Outbound (to Fellsway @ Riverside Avenue)		*Inbound* (to Wellington Station)	
	AM	*PM*	*AM*	*PM*
Existing	←	←	→	→
Short/Medium-Term	Unlikely to differ from baseline			
Long-Term At Grade	←	←	→	→
Long-Term Transit Enhanced Triangle	←	←	→	→
Long-Term Grade Separated	←	←	→	→

Quality of Service

- B – Good for a local service
- C – Typical for a local service
- D – Slow for a local service
- E – Very slow for a local service
- F – Extremely slow

All alternatives are the same or better than existing, with Transit-Enhanced showing the most improvement in QOS

Improve Quality of Life

Environmental

Category	Short/Medium Term	Long-Term At-Grade	Long-Term Grade-Separated
Wetlands	–	–	–
Waterbodies	–	–	–
Chapter 91/Tidelands	–	–	–
Floodplains	–	–	✗
Open Space and Recreational Areas	✓	✓	✗
Hazardous Materials and Sites	–	–	–
Climate Change/Resiliency	✓	✓	✗
Historic and Archaeological Resources	✓	✓	✗

Long-Term Grade Separated Alternative has worse environmental outcomes

✗

At-Grade Alternatives have better environmental outcomes

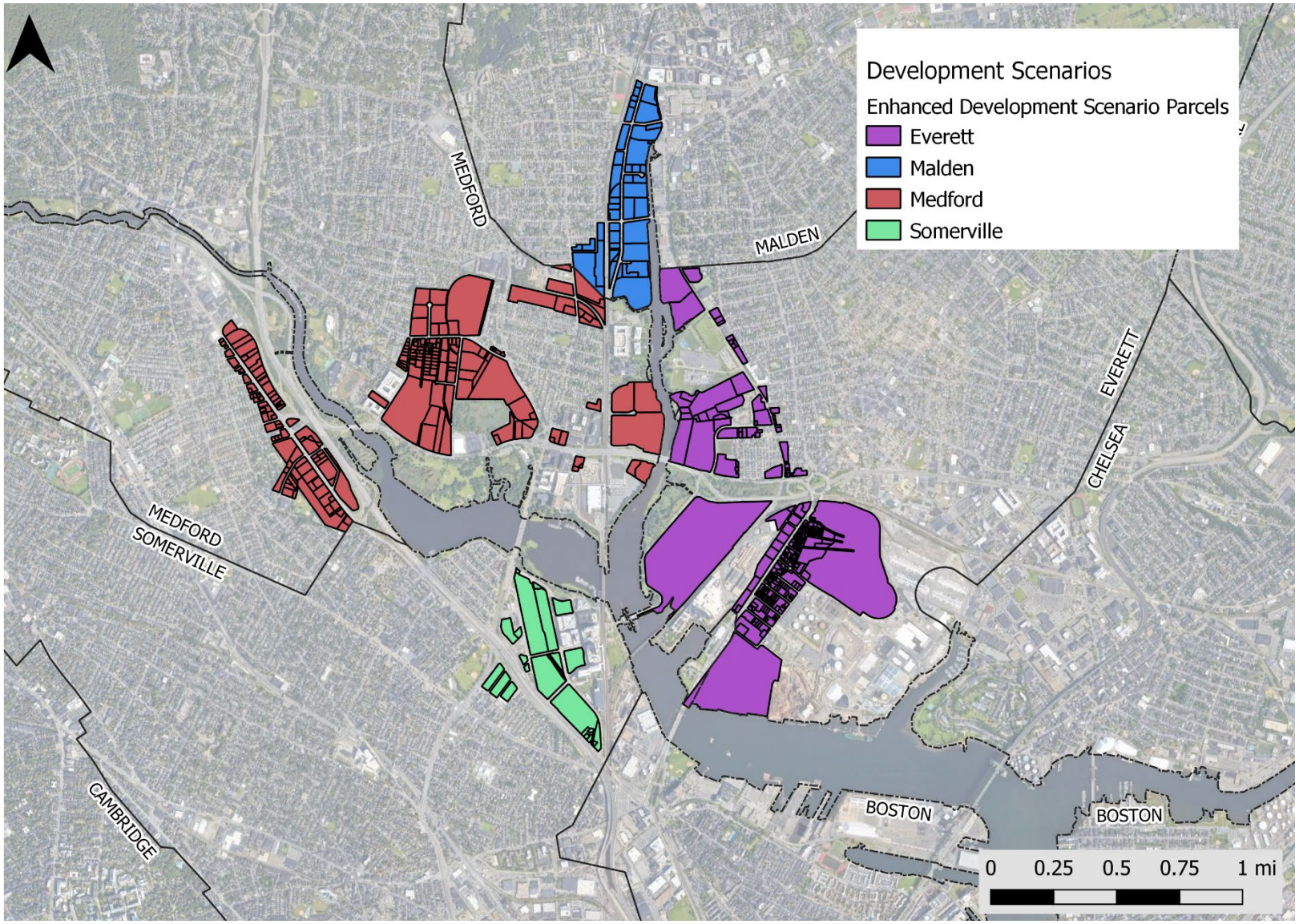
✓

✓ **Benefits** – **Neutral** ✗ **Impacts**

Land Use & Economic Development

	Short/Medium-Term	Long-Term At-Grade	Long-Term At-Grade Transit Enhanced	Long-Term Grade-Separated
Consistency with Medford Master Plan	✓	✓	✓	–
Maintains Access (driveways)	–	–	–	–

Enhanced Development Potential



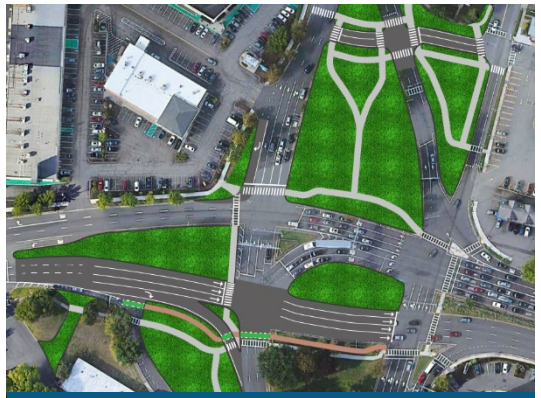
- Reflects communities' consideration of denser, mixed-use development
- Potential to create additional travel demand
- Need to increase travel via alternative modes

Public Health

	Short/Medium-Term	Long-Term At-Grade	Long-Term At-Grade Transit Enhanced	Long-Term Grade-Separated
Air quality*	N/A	✓	✓	✓
Active transportation facilities and connectivity	✓	✓	✓	✓
Safety	✓	✓	✓	✓

*CTPS regional modeling results. Do not include short/medium-term or triangle alternatives. Improvements in air quality attributed to USEPA's national control programs and other standards for fuel efficiency

Community Cohesion



Combined Short/Medium-Term Concepts

At-Grade Dual Quadrant – Square

At-Grade Dual Quadrant – Transit Enhanced

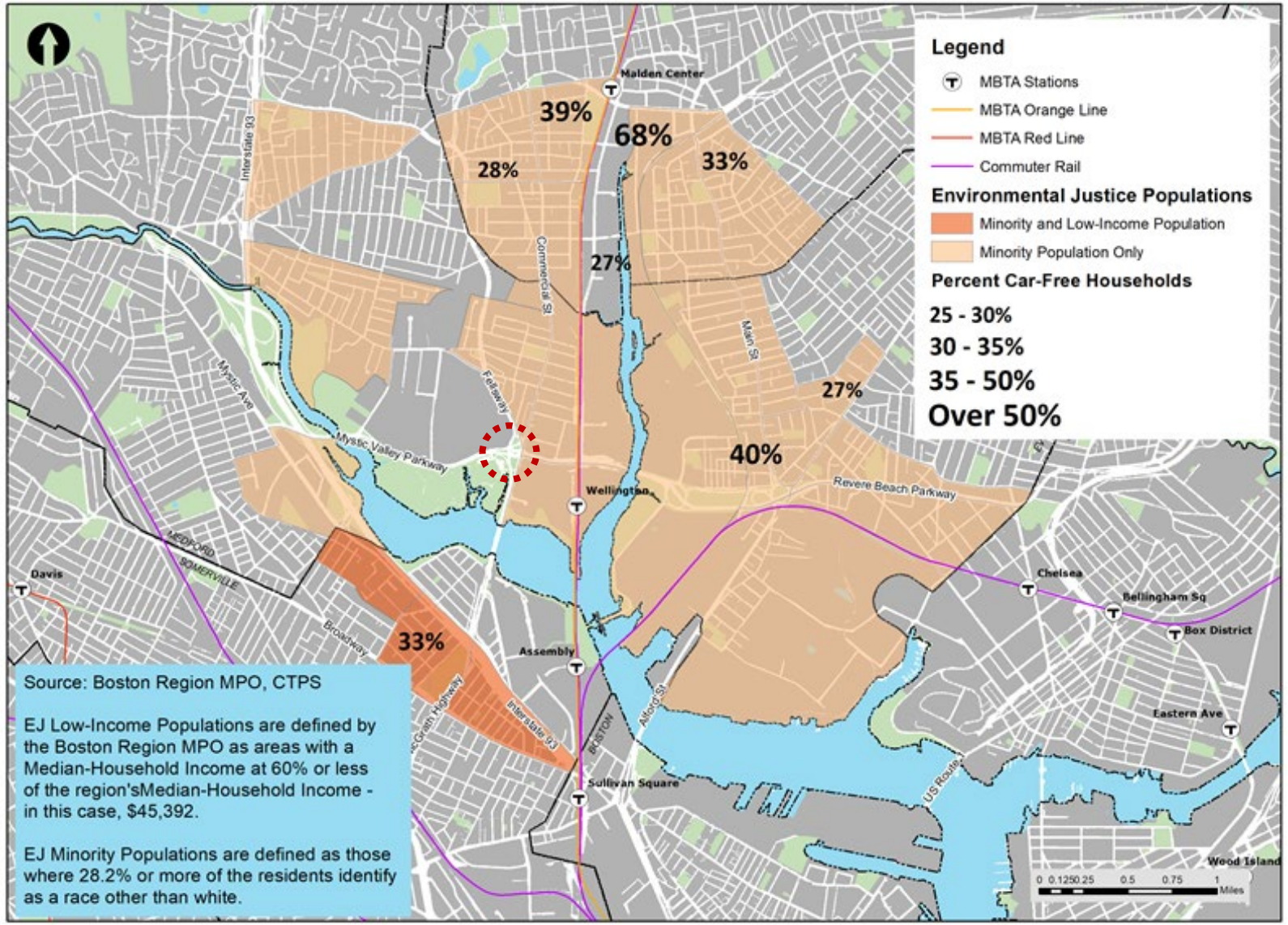
✓ Reduces barriers for people between neighborhoods

Grade-Separated Single Quadrant

Example barrier created by McGrath Highway/McCarthy Overpass in Somerville

− Reduces physical barriers for people, but creates visual barrier between neighborhoods

Environmental Justice



Data based on 2010 U.S. Census and 2010-2014 American Community Survey

- No disproportionate negative impacts
- Benefits car-free, minority, and low-income households by improving multimodal connections to Wellington Circle

14%
Share of Car-Free Households

Wellington Circle

Alternatives Analysis Summary

Evaluation Criteria	Short/Medium Term	Long-Term At-Grade	Long-Term At-Grade Transit Enhanced	Long-Term Grade-Separated
Safety	✓	✓	✓	✓
Vehicle Operations	✗	✗	✗	✓
Pedestrian Experience	✓	✓	✓	–
Bicycle Experience	–	✓	✓	✓
Transit Operations & Access	–	–	✓	–
Environment & Public Health	✓	✓	✓	✗
Land Use & Economic Development	✓	✓	✓	–
Community Cohesion	✓	✓	✓	–
Environmental Justice	✓	✓	✓	✓
Cost Estimate	$6.2 M	$36.7 M	$38.3 M	$176.9 M

✓ Benefits – Neutral ✗ Impacts

WORKING GROUP DISCUSSION

Discussion

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

Combined Short/Medium-Term

At-Grade Dual Quadrant - Square

Grade-Separated Single Quadrant

At-Grade Dual Quadrant – Triangle/Transit Enhanced

Public Comment

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

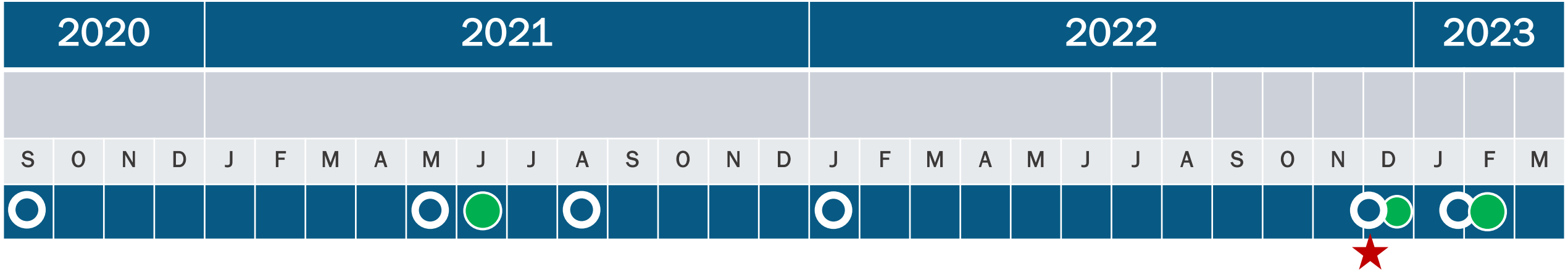
Bottom Panel of Zoom Screen

- 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

- Working Group Input
- Public Meeting
- Develop Recommendations

Next Steps

- Next Public Meeting: December 15, 2022
  - Present alternatives and analysis and solicit feedback
- Next Working Group Meeting: Winter 2023
  - Presentation of Recommendations

More Information:

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

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