Low-Cost Improvements to Express-Highway Bottleneck Locations

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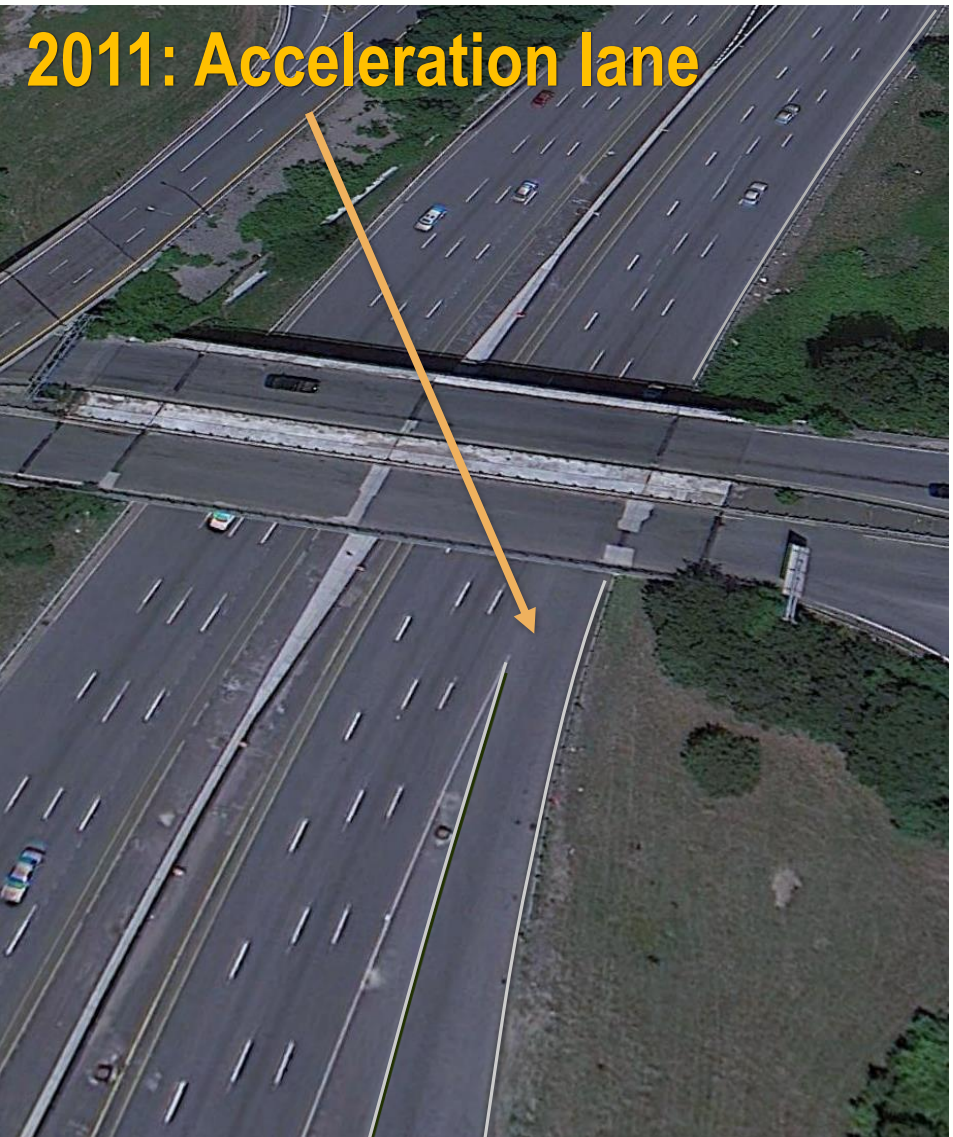
Background

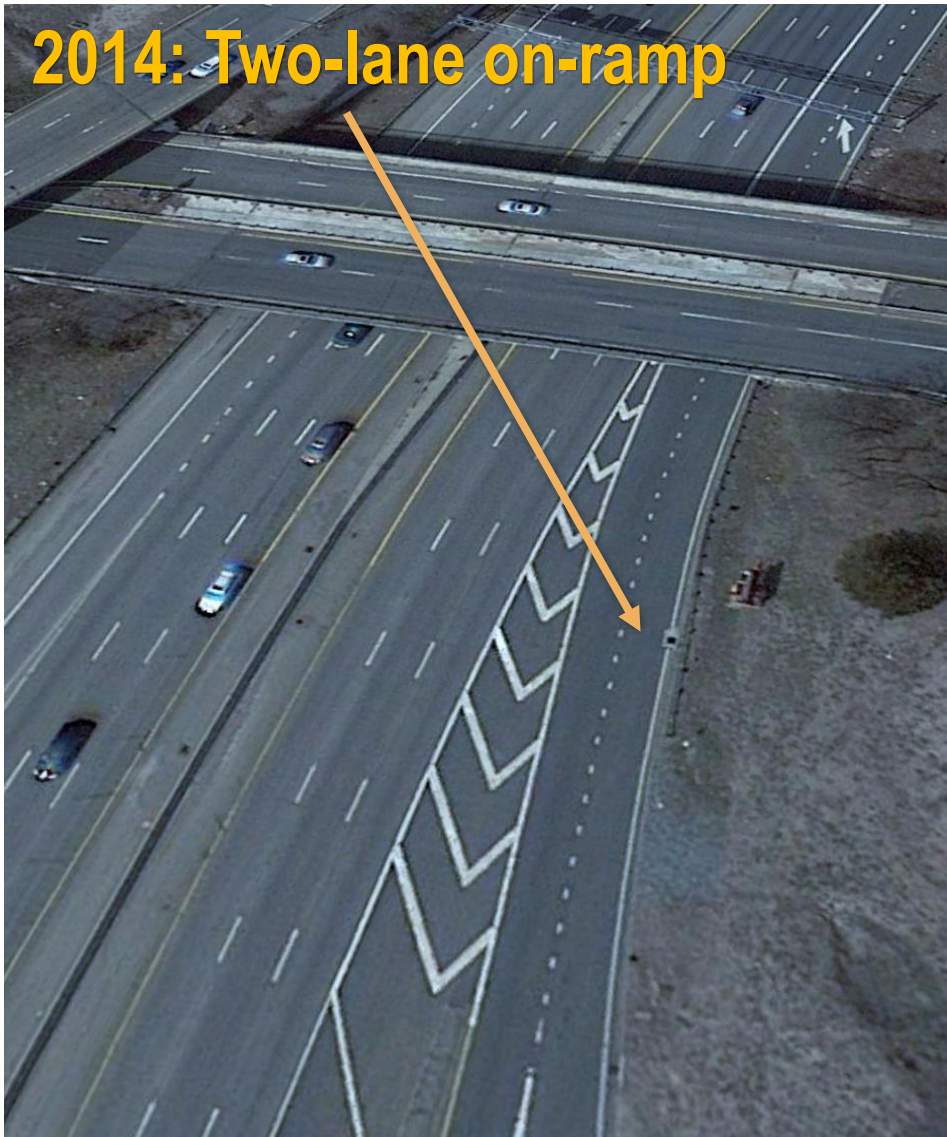
- In 2010, FHWA Massachusetts Division recommended that the MPO address bottlenecks in future studies.
- There is a significant opportunity for the application of low-cost solutions to reduce congestion at bottlenecks.
- MPO staff conducted five bottleneck studies and many of the recommendations have been implemented.

FHWA = Federal Highway Administration.

Study Achievements

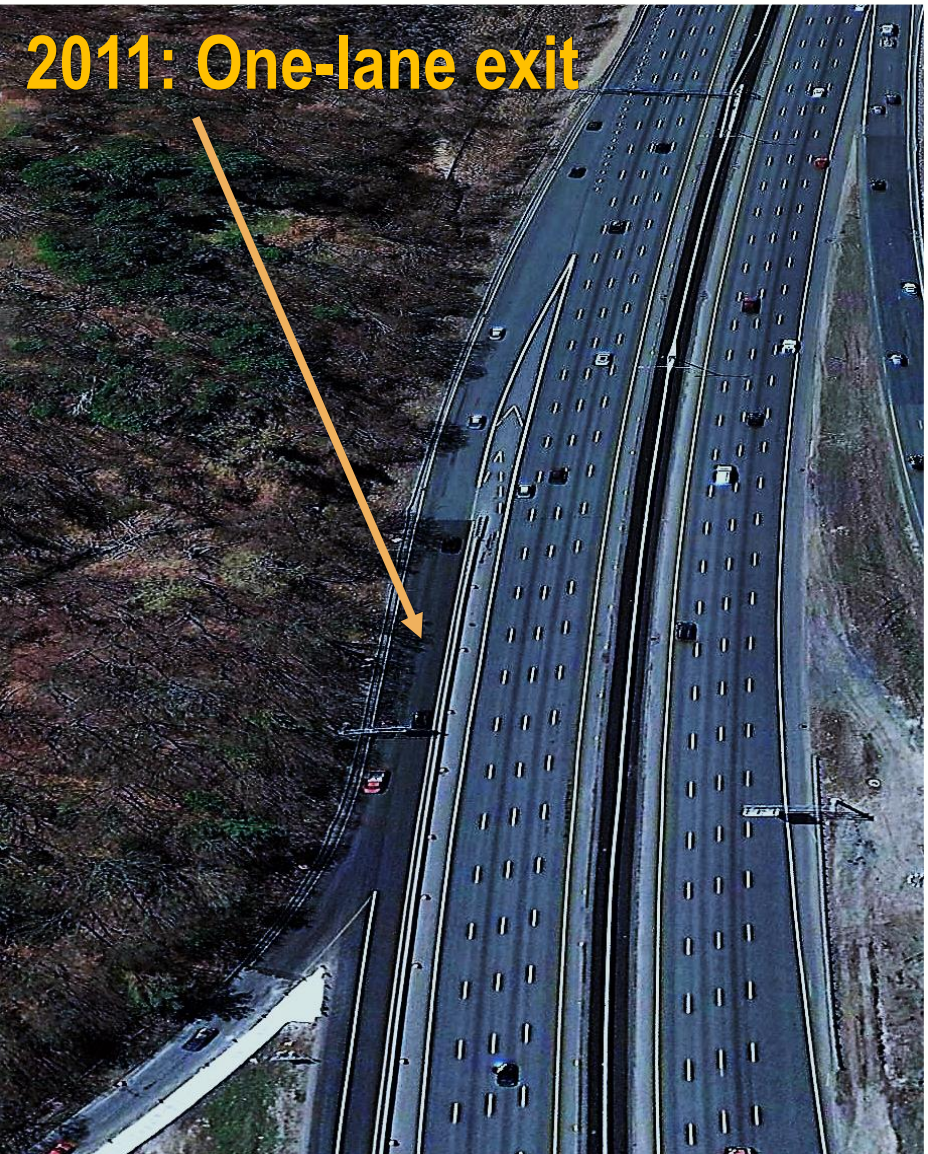
Interstate 95 northbound on-ramp from Interstate 90 in Weston





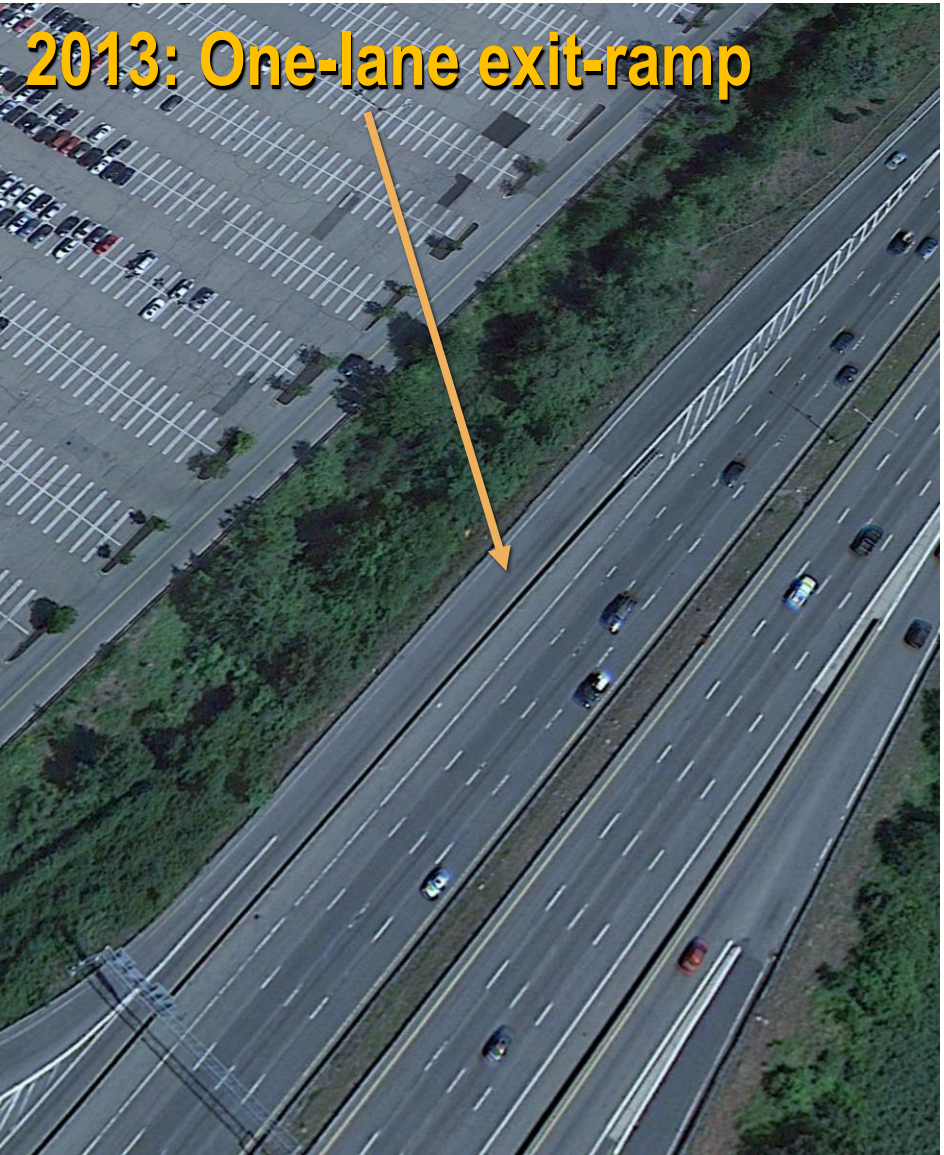
Study Achievements

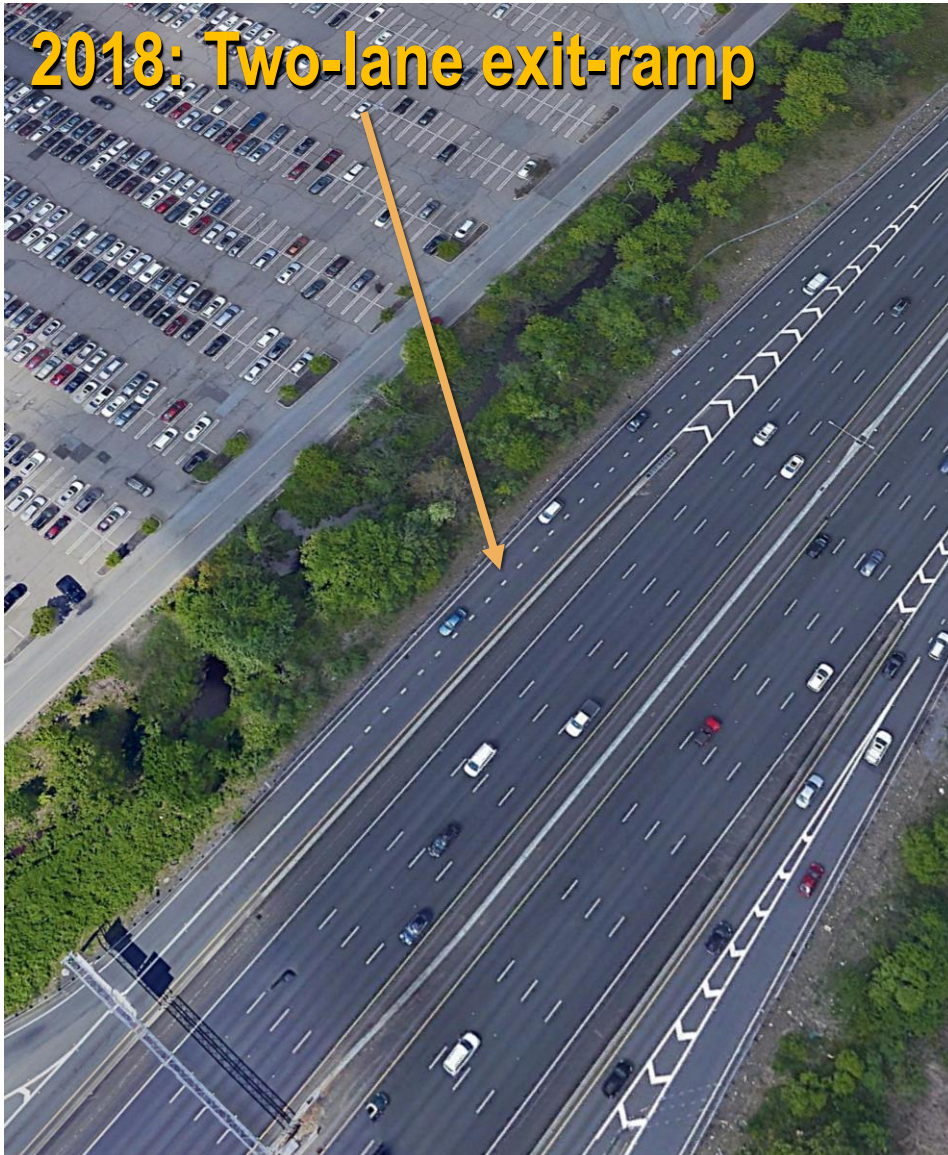
Interstate 95 northbound exit-ramp to Route 3 in Burlington



Study Achievements

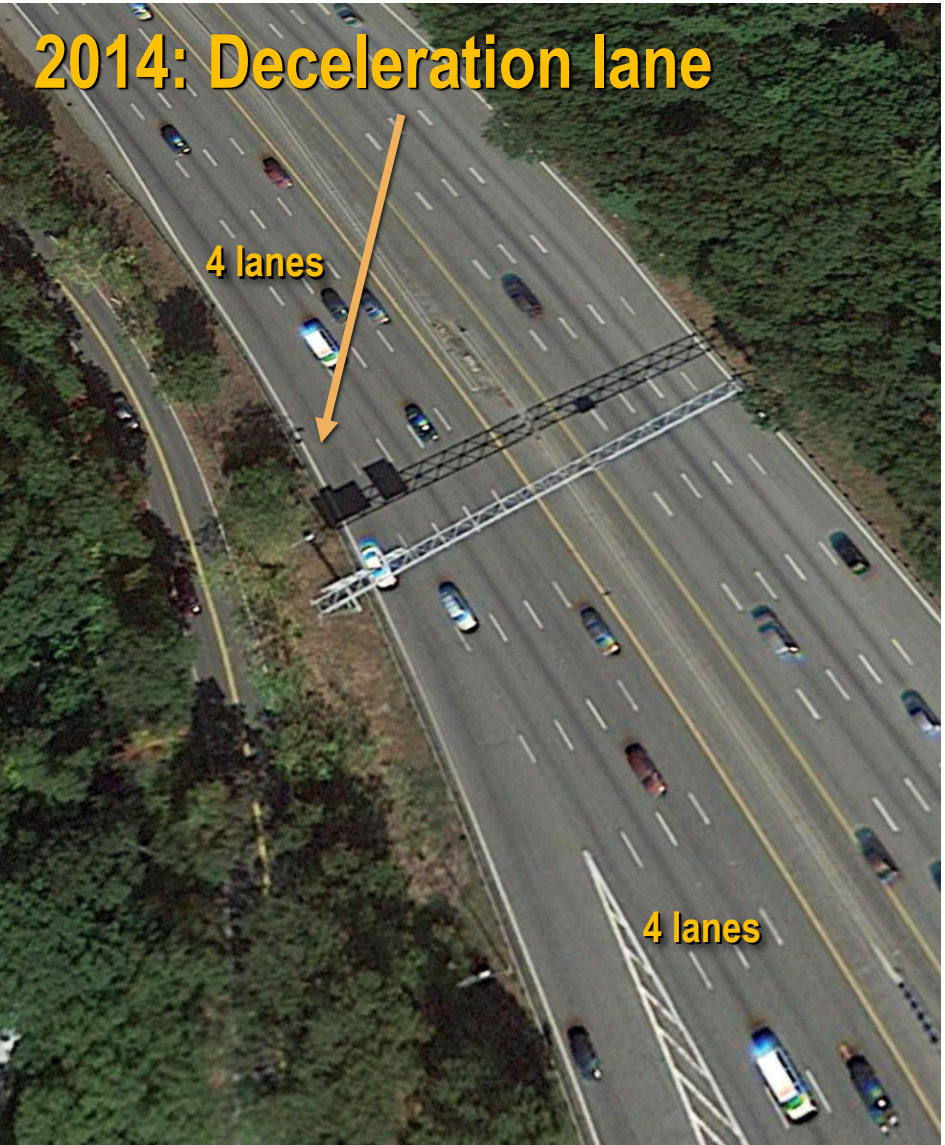
Interstate 95 southbound exit ramp to Route 3 in Burlington

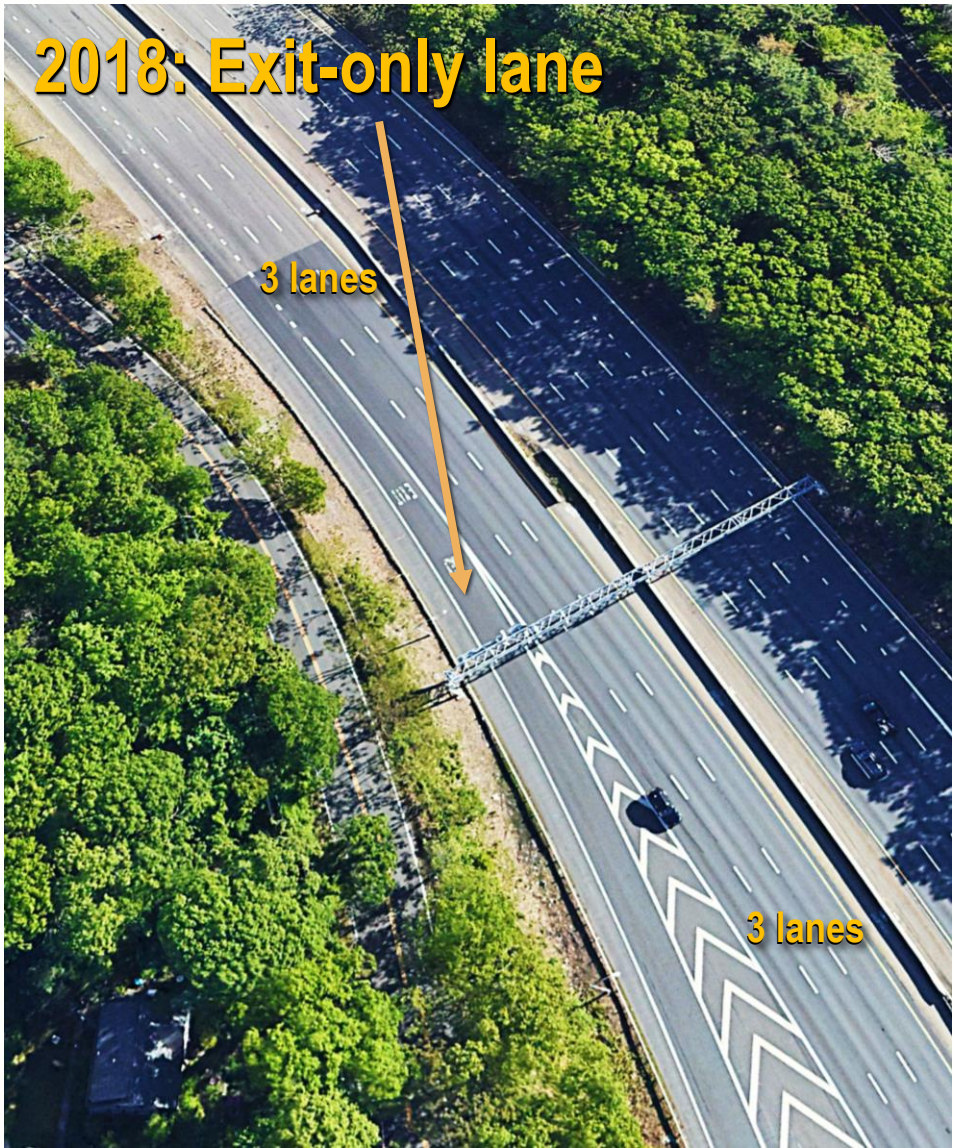




Study Achievements

Interstate 95 southbound exit ramp to Interstate 90 in Weston





Study Process

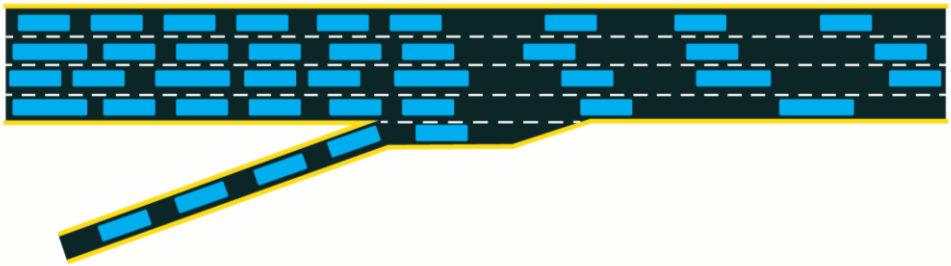
- Inventory of candidate locations
- Screen candidate locations
- Collect data for analysis
- Develop and evaluate low-cost improvements
- Obtain feedback from MassDOT Highway Division
- Produce final report

FHWA = Federal Highway Administration.

Typical Bottleneck Conditions

High Volume Merge

Direction of Flow

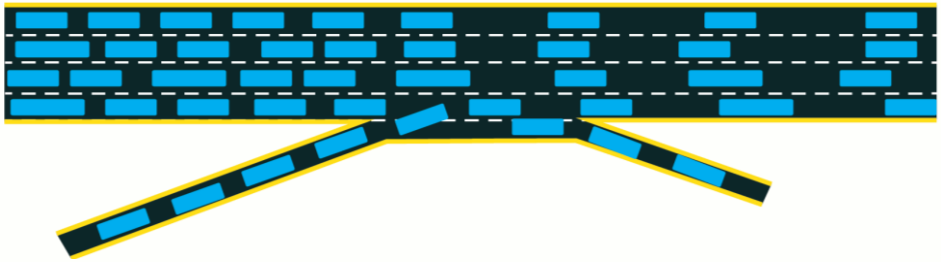


Lane Reduction

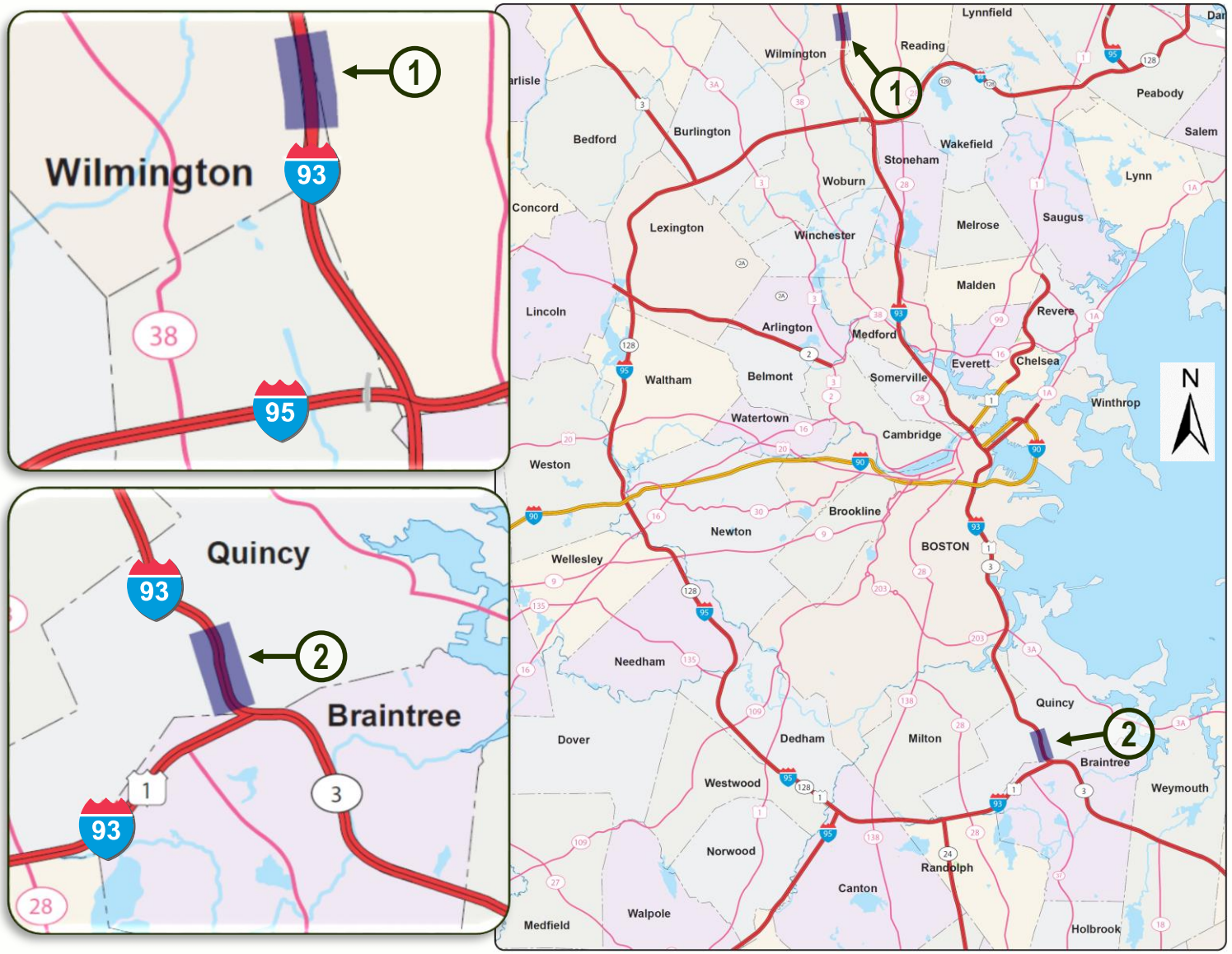
Direction of Flow

Short Weave

Direction of Flow

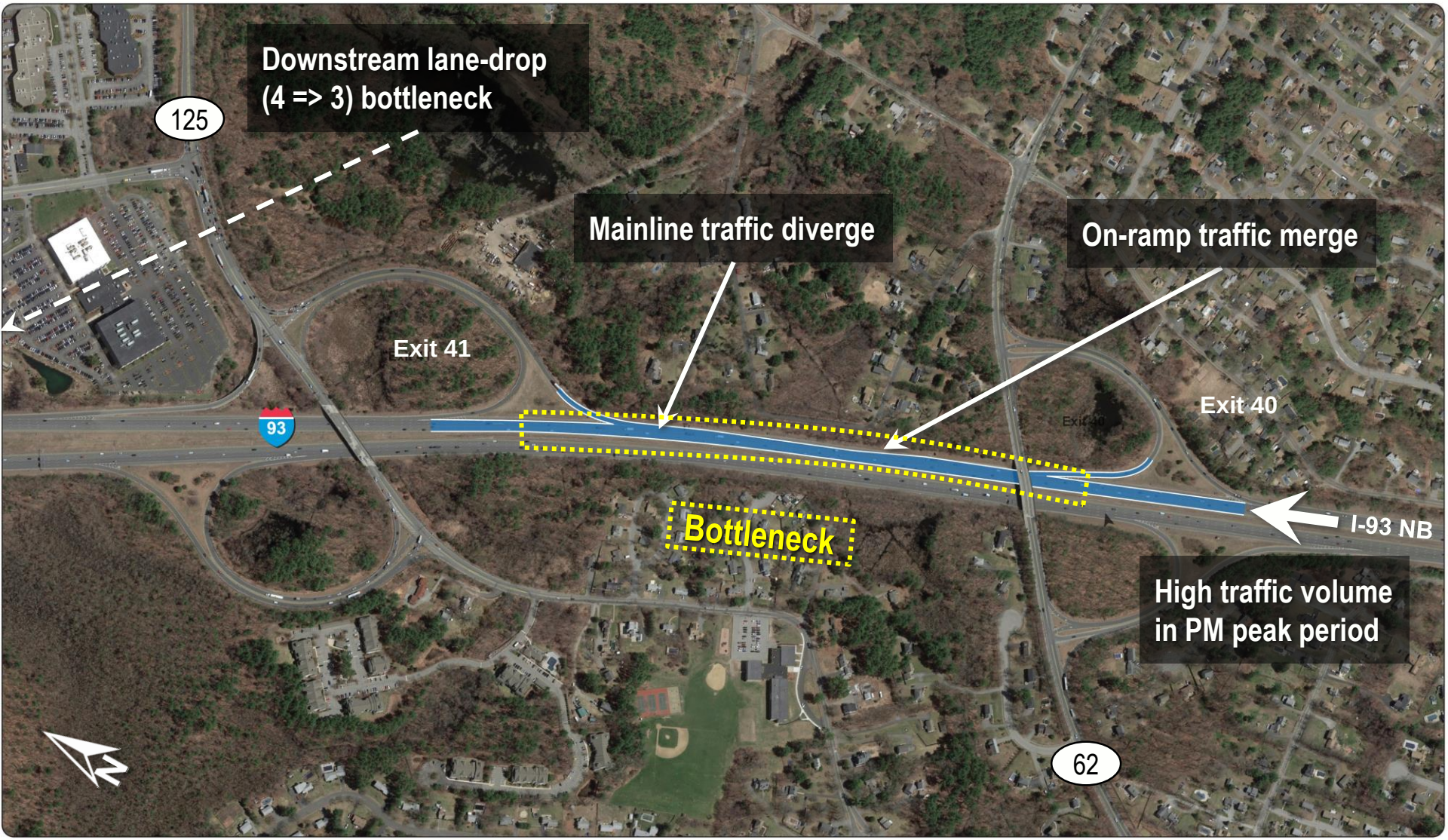


Study Locations

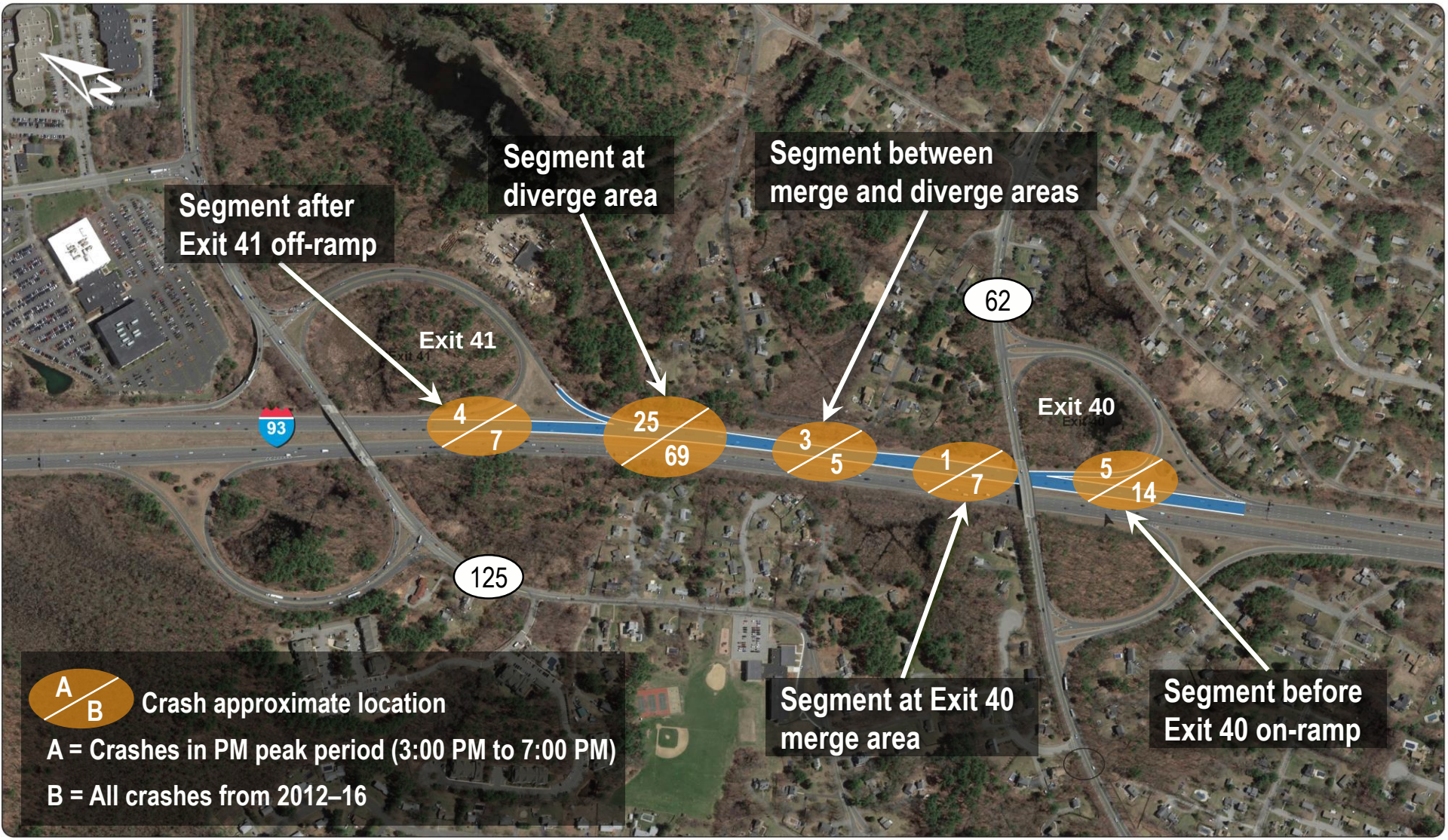


Location 1:
Interstate 93 northbound between Exits 40 and 41 in Wilmington

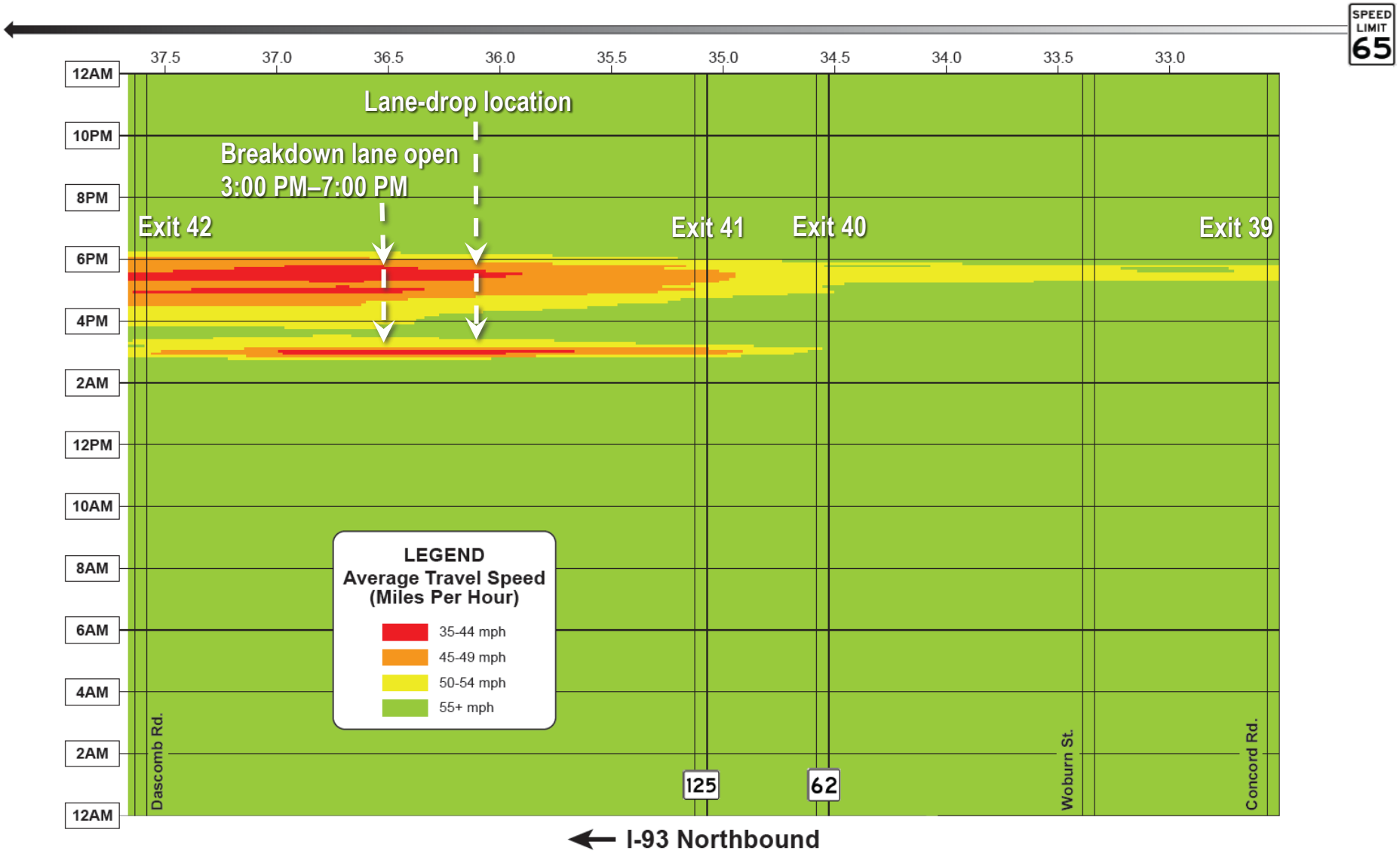
Causes


Downstream lane-drop
(4 => 3) bottleneck
125
Mainline traffic diverge
On-ramp traffic merge
Exit 41
93
Exit 40
Bottleneck
I-93 NB
High traffic volume
in PM peak period
62

Crashes (2012–16)



Travel Speeds



I-93 = Interstate 93.

PM Traffic Conditions

Improvement: Auxiliary Lane

Next Steps: Further Study of Downstream Bottleneck

Location 2:
I-93 Southbound Segment at the End of the HOV Zipper Lane in Quincy and Braintree

Location 2

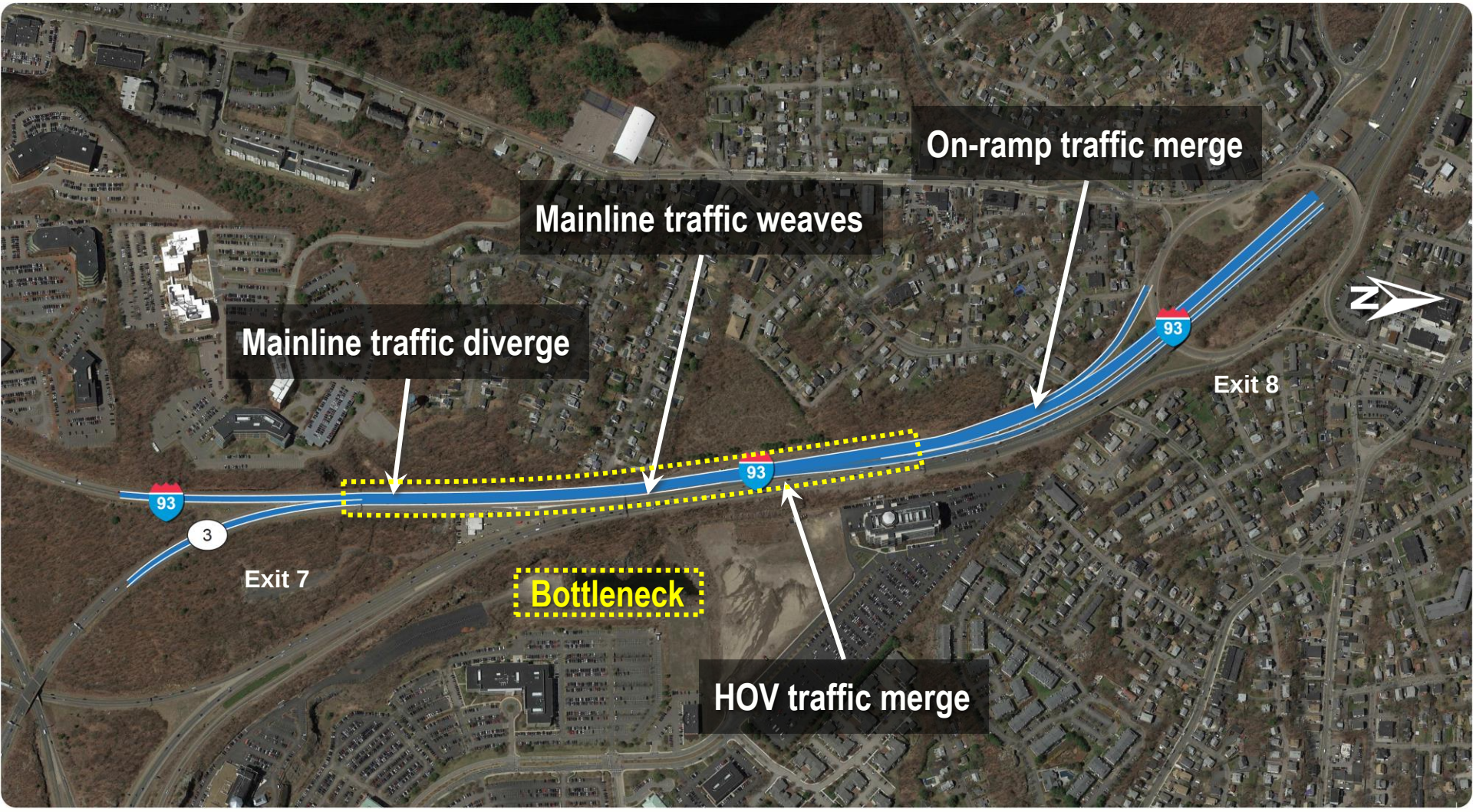

LEFT
EXIT 7
SOUTH
3
Cape Cod
½ MILE
SOUTH
93
1
TO
95
Providence RI

PM HOV Zipper Lane Exit

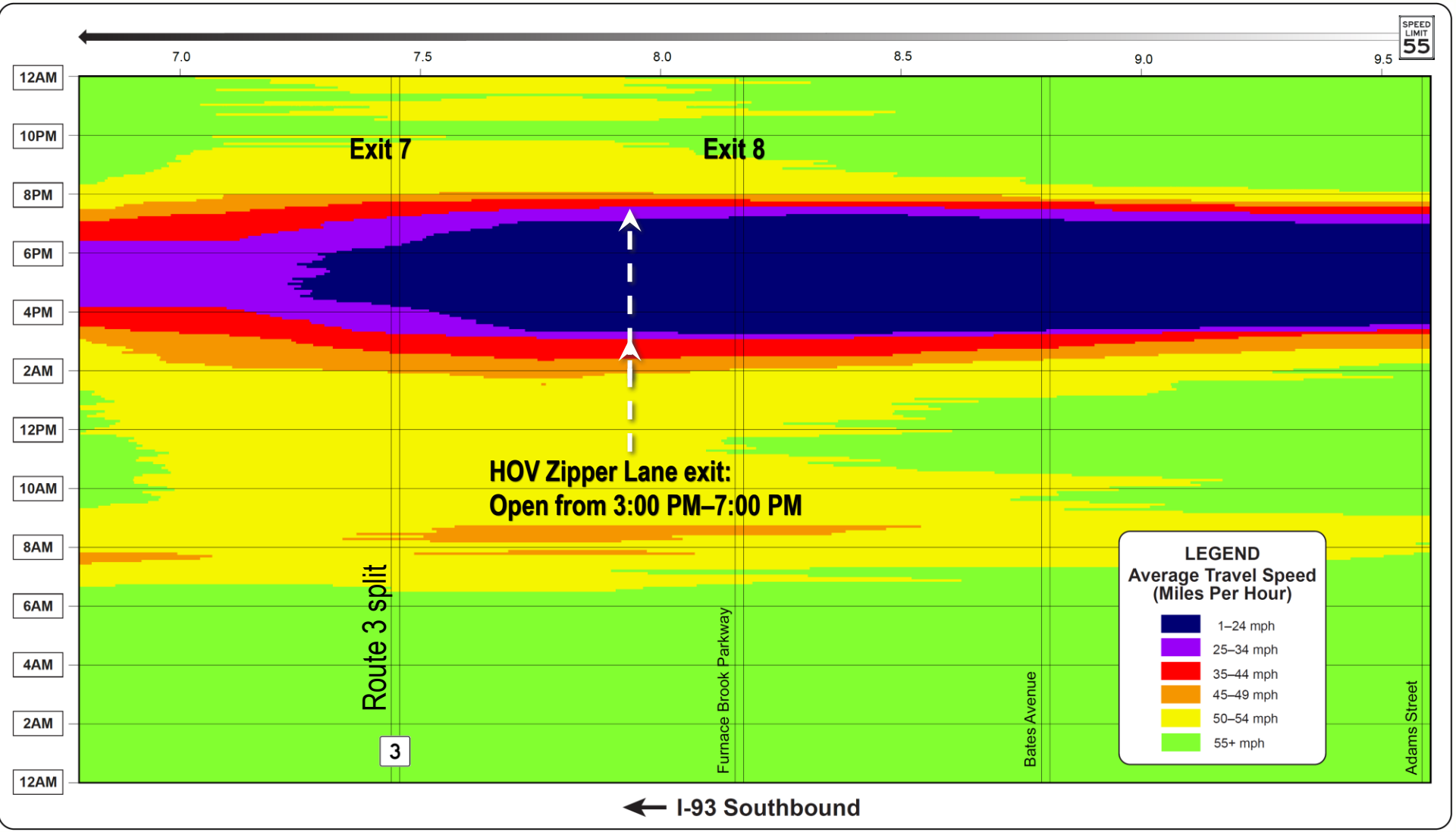
HOV = high-occupancy vehicle.

Source: MassDOT.

Causes


On-ramp traffic merge
Mainline traffic weaves
Mainline traffic diverge
93
93
93
3
Exit 7
Exit 8
Bottleneck
HOV traffic merge
N

Travel Speeds



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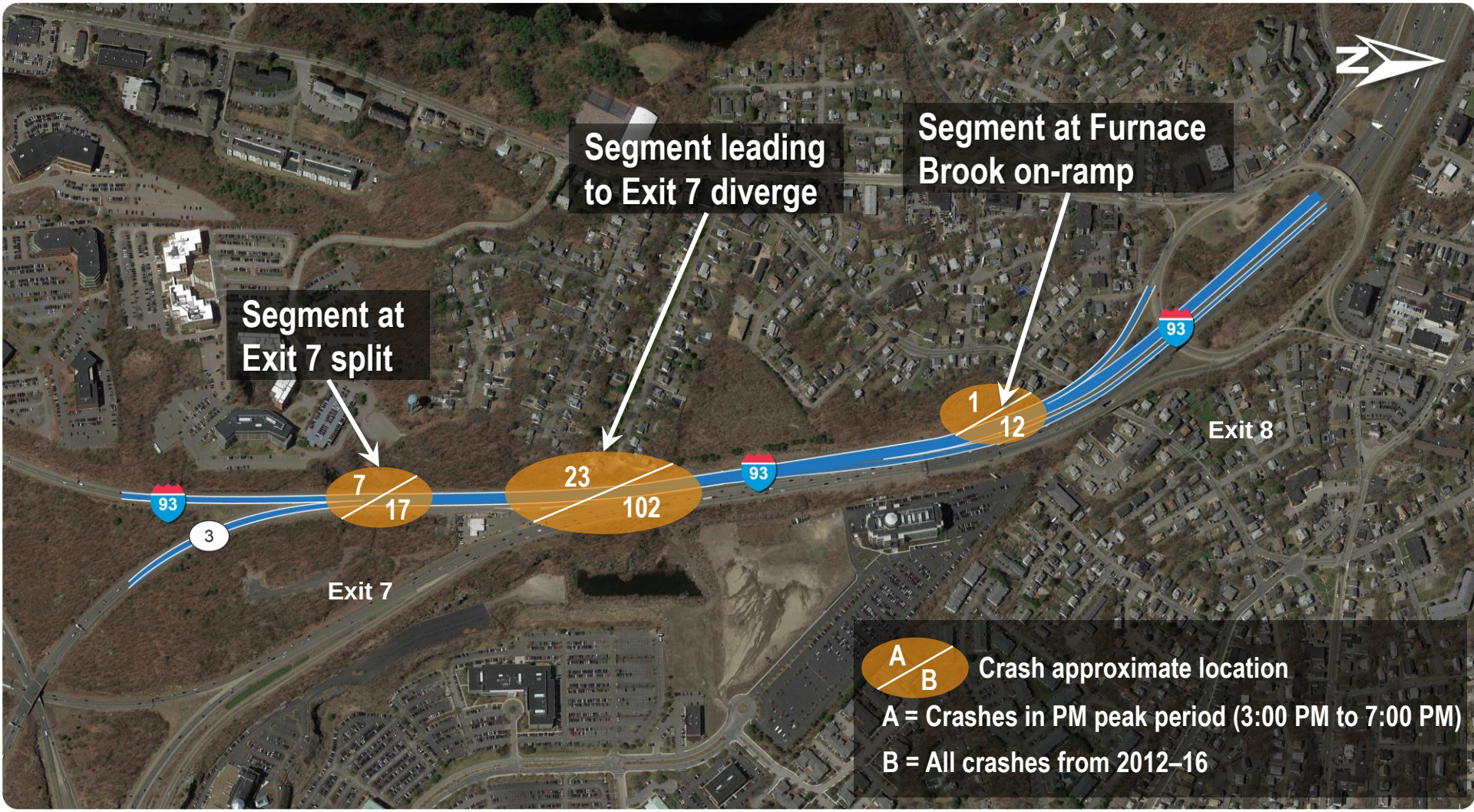
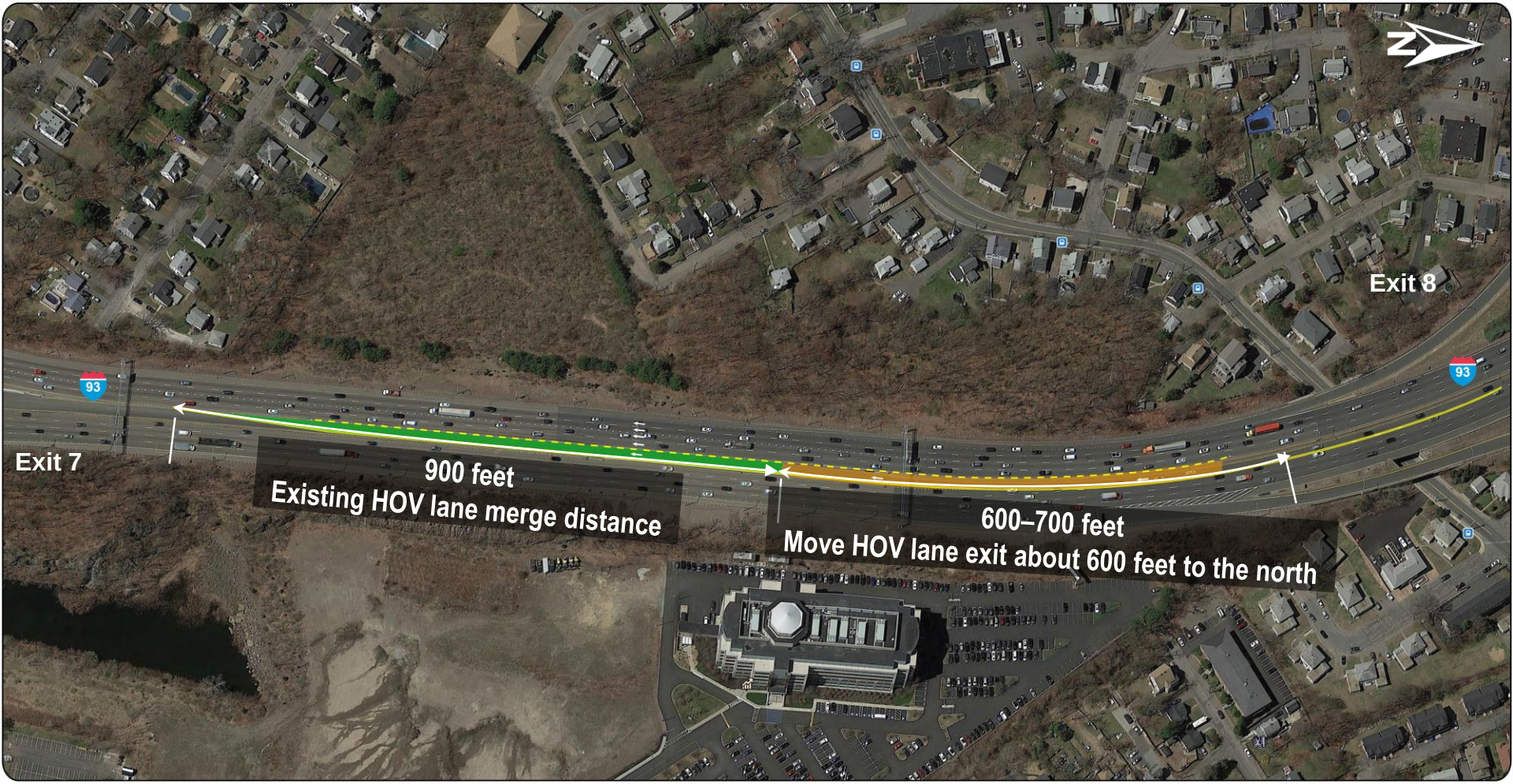
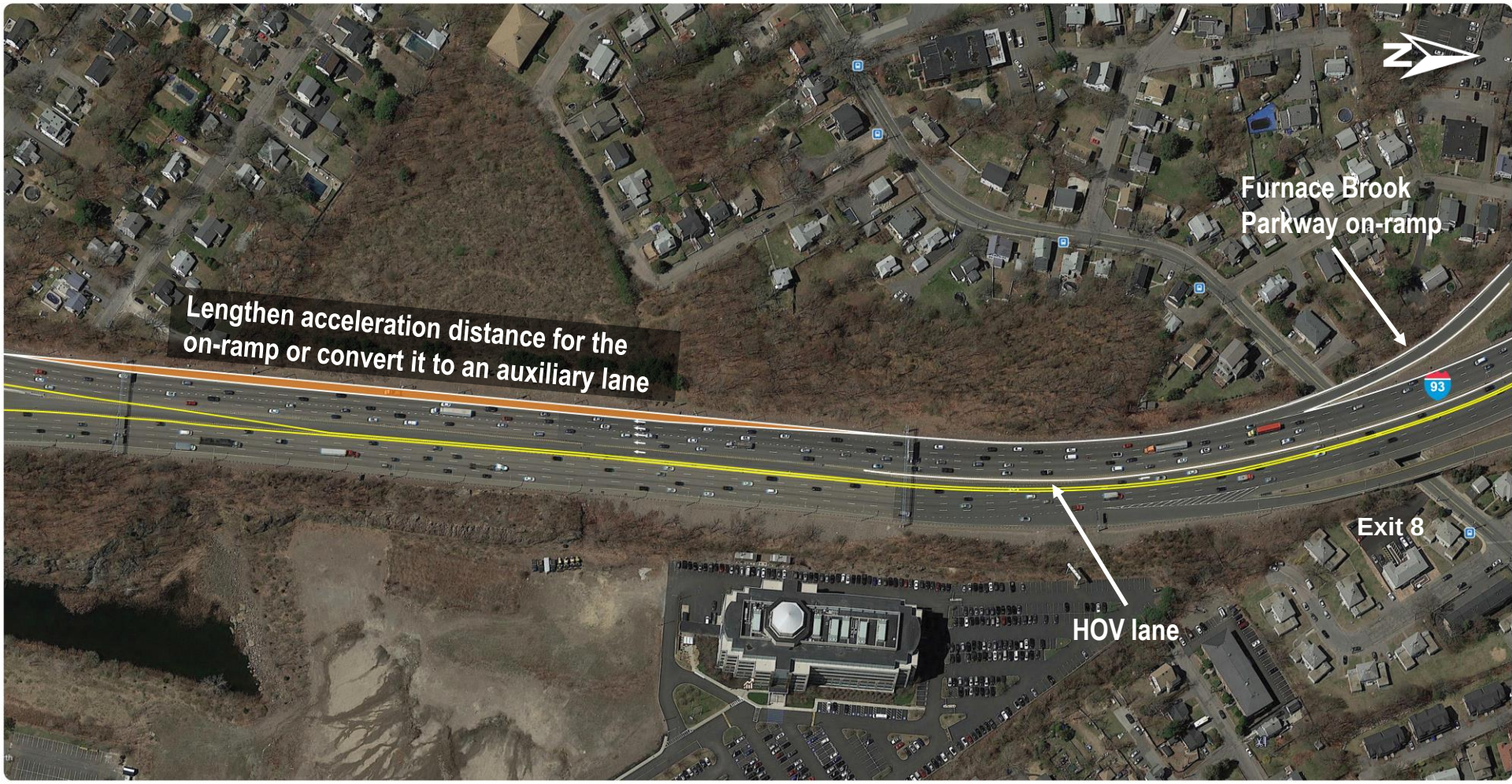


Option 1:
Lengthen HOV Lane Merge Distance



Option 2: Lengthen Acceleration Distance for Furnace Brook Parkway Traffic



Conclusion and Next Steps

- Recommendations align with the MPO goals of improving capacity management and mobility.
- Advance the improvement concepts into projects

Thank you!

Questions, Comments, and Discussion?