Traffic and Congestion Initiatives Update

massDOT
Massachusetts Department of Transportation
Highway Division

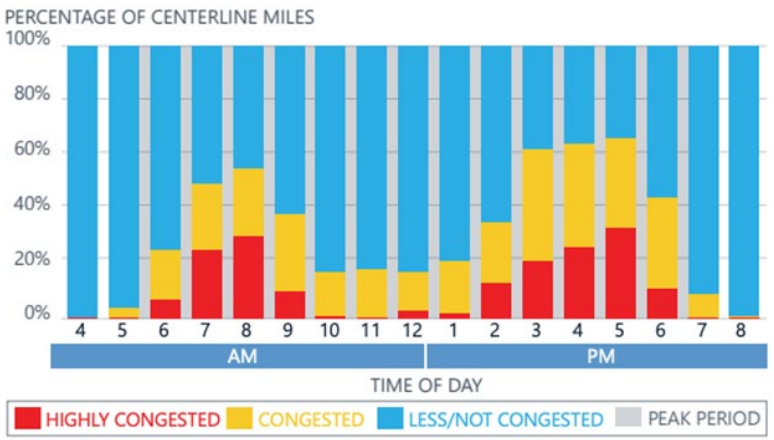
November 23, 2020

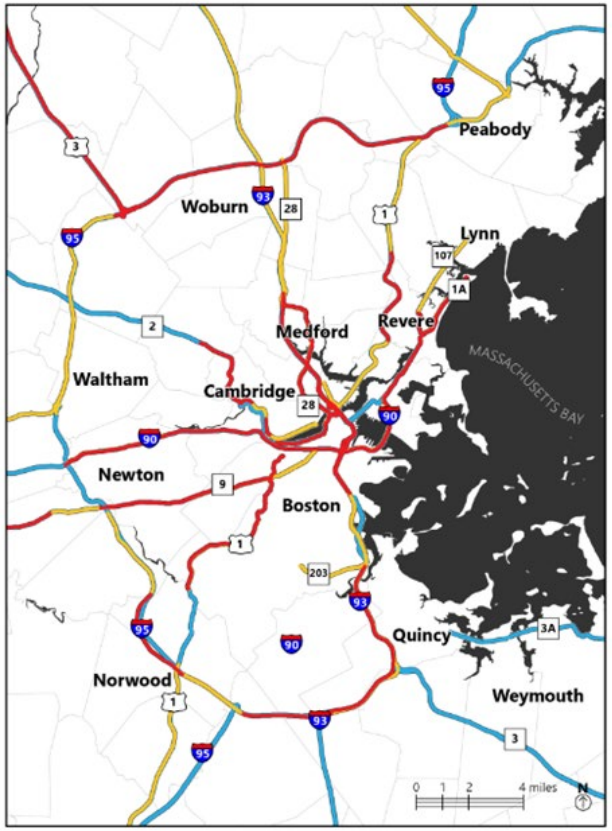
AGENDA

What We Knew in August 2019: The Congestion Report

- Congestion Report released in August 2019
- At the time, key findings included:
  - Tackling congestion is critical and complicated
  - Congestion is bad because the economy is good.
  - Congestion occurs throughout the Commonwealth and intensifies approaching Greater Boston.
  - Many roadways are now congested outside of peak periods.
  - Many commuting corridors have become unreliable.

Percent of Congestion on Study Roadway miles,
Boston Region inside Route 128





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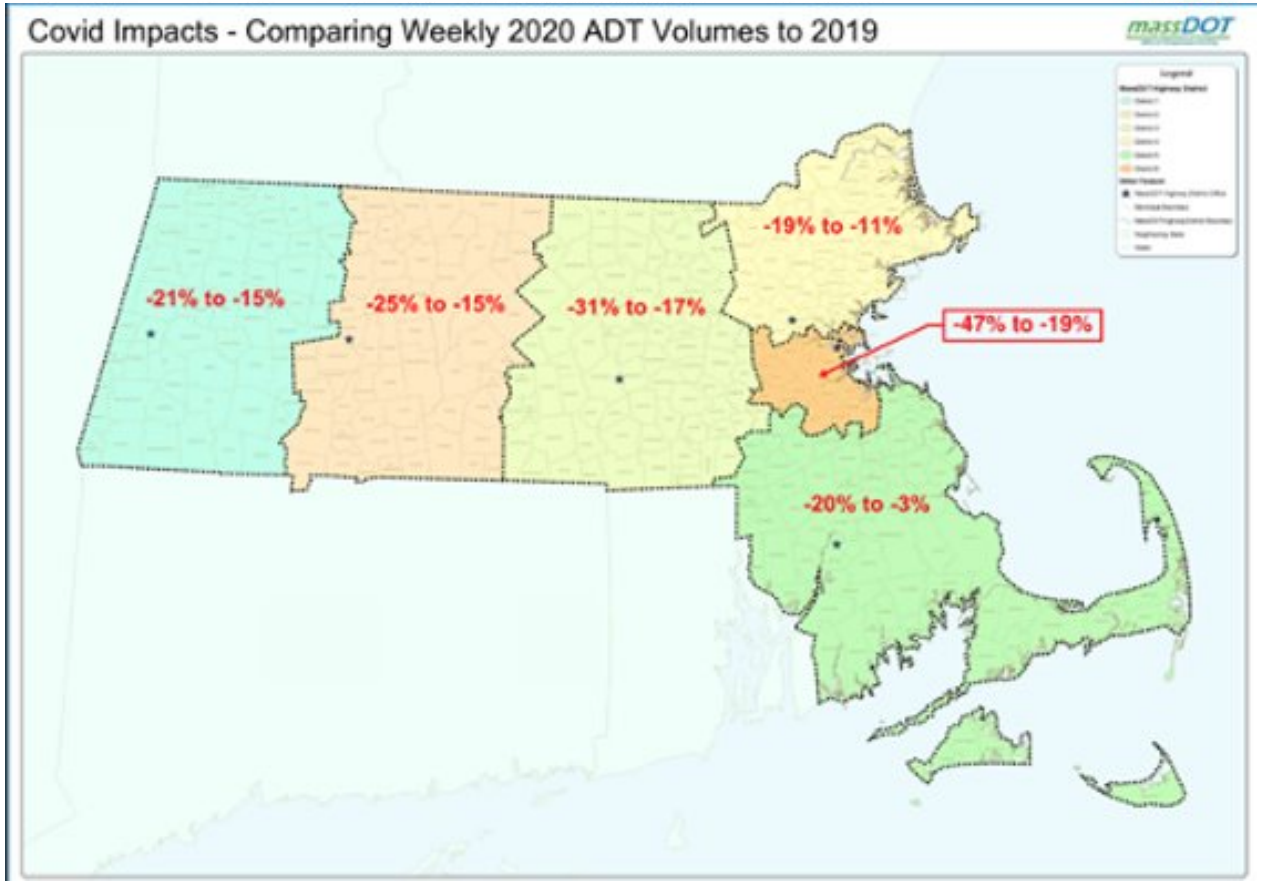
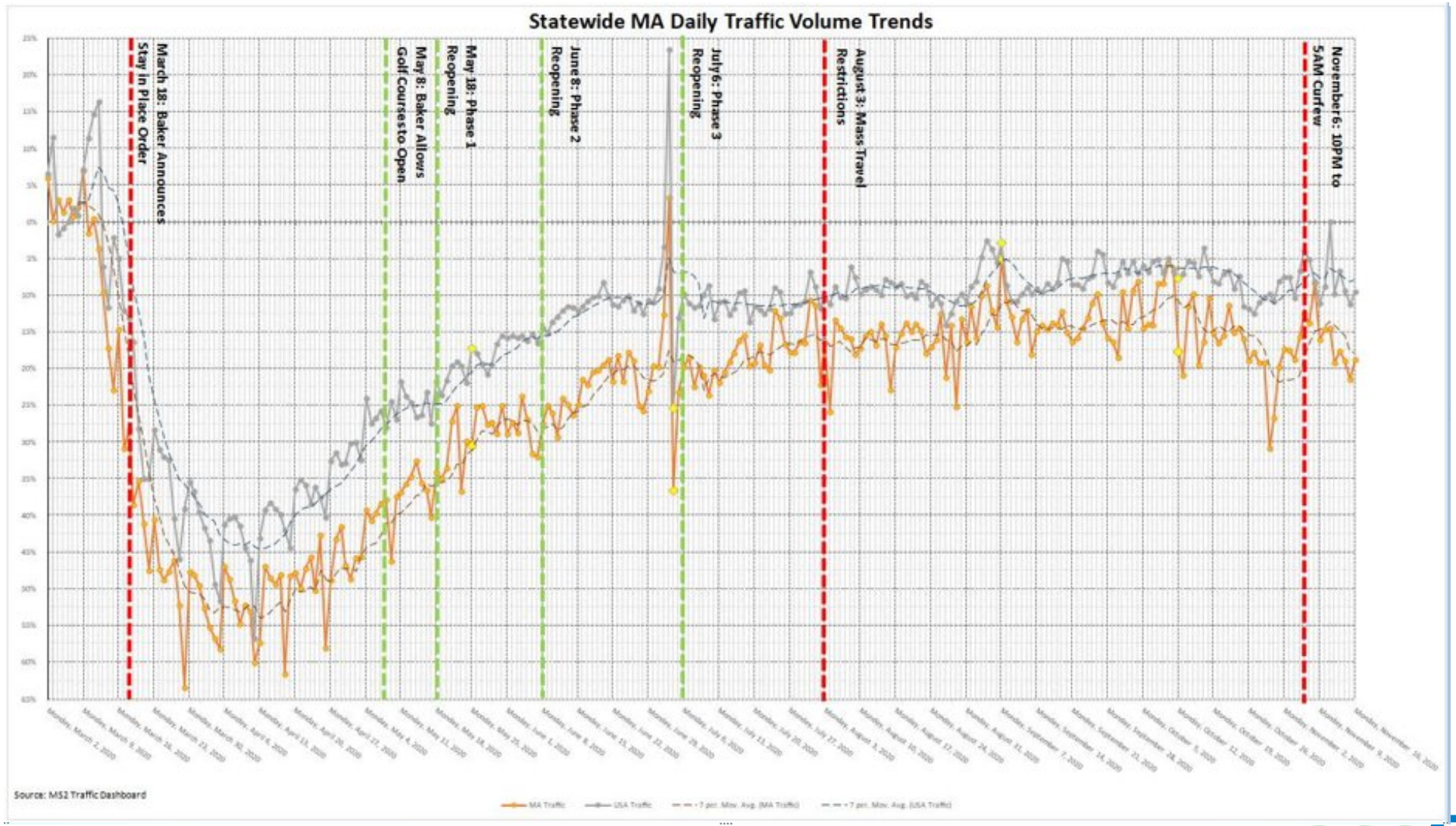
What We Know Now: COVID-19 has changed 2020 travel patterns

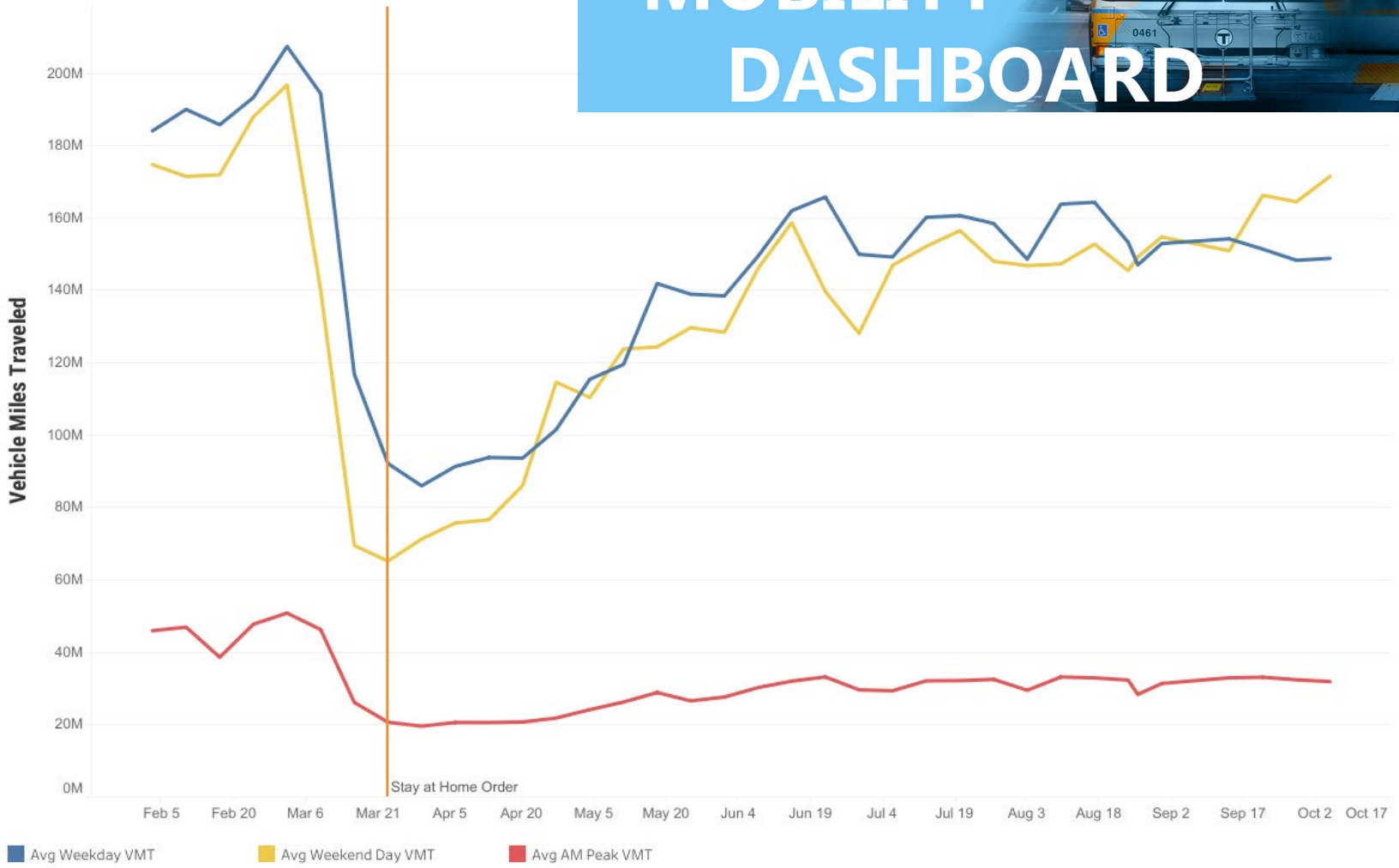
- Today, traffic increased weekly since peak COVID-19 impacts from April 2020 to August 2020 then leveled off
- Travel is not returning equally along all roads
  - Geographic spread of trips and time-of-day/peak periods have been changing
  - Peak periods have shown differences based on geographic location – some areas peak earlier and dissipate earlier, some are same or greater than Pre-COVID
  - More traffic on corridors used for recreation on the weekends, SE Expressway and Tobin
  - Average Daily Travel on Metropolitan Highway System facilities: I-90, S/C and TWT Tunnels still ~50% below 2019 levels.



What We Know in Fall 2020: Traffic has been coming back



What we're seeing: Easier weekday mornings, busy weekends

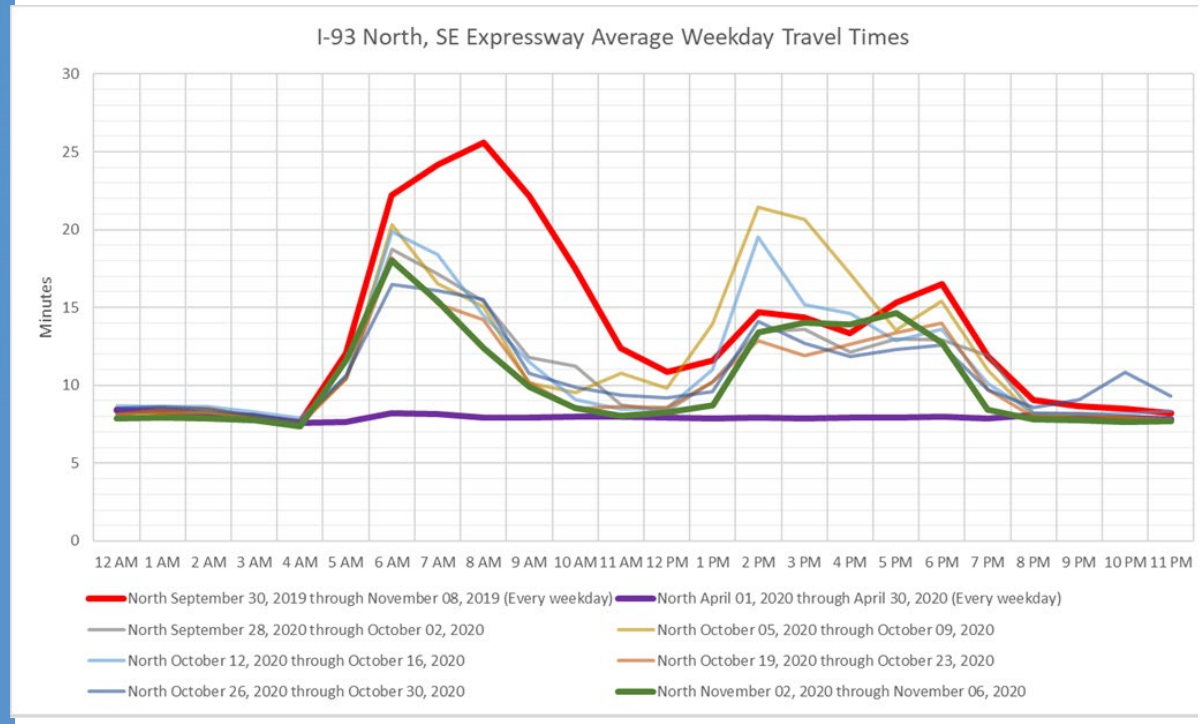


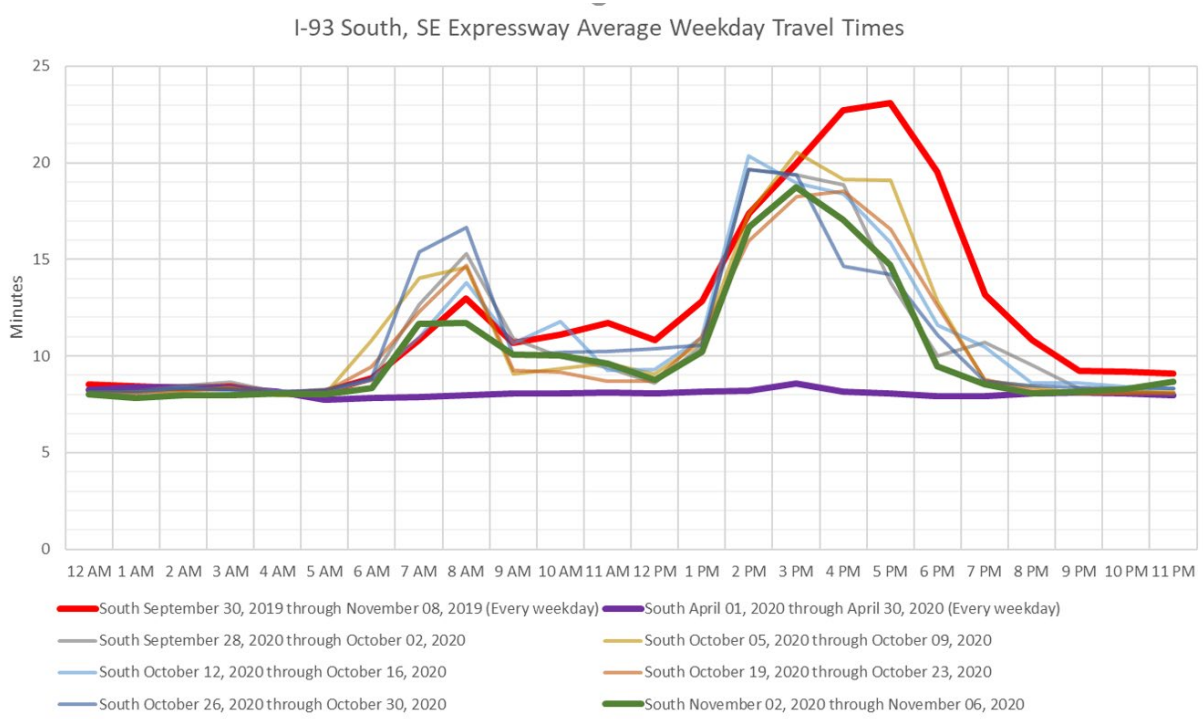
https://mobility-massdot.hub.arcgis.com

During the week of Monday, October 12th to Sunday, October 18th, 2020, statewide daily traffic volumes were about 21% to 9% lower than the corresponding 2019 traffic volumes.

What We Know Now: Peaks are shorter & less steep

Traffic on the Southeast Expressway, Average Weekday





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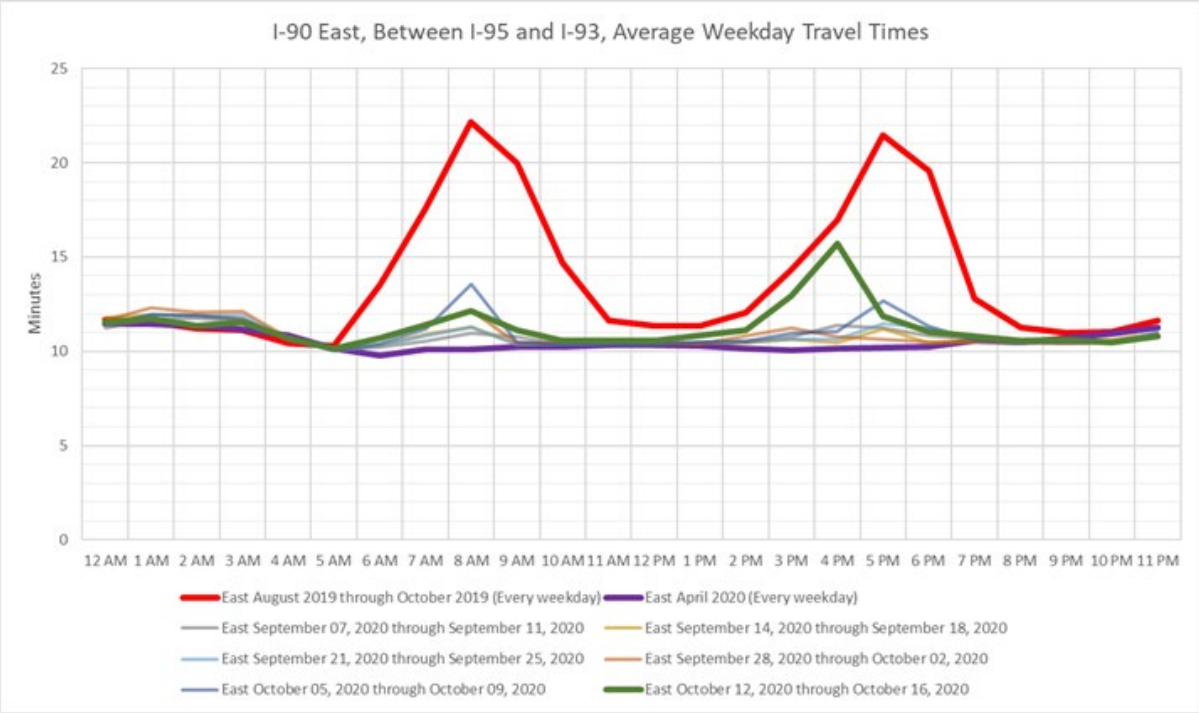
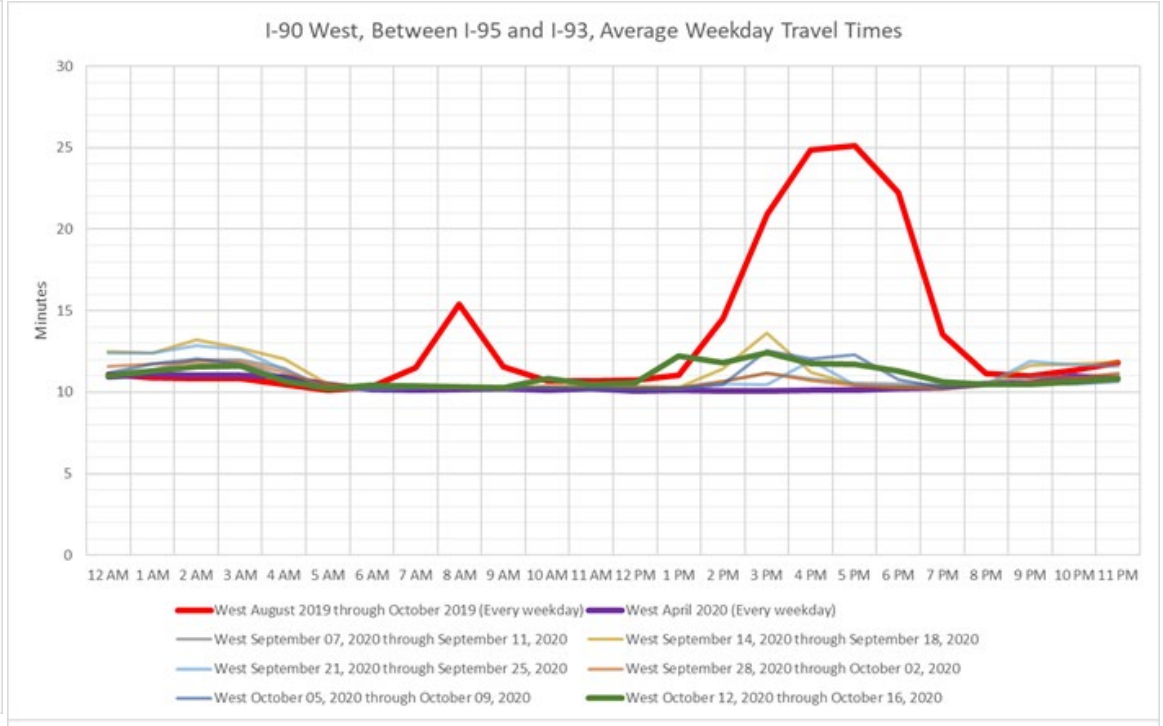
What We Know Now: Traffic volumes & patterns vary

Traffic on the Massachusetts Turnpike, Average Weekday





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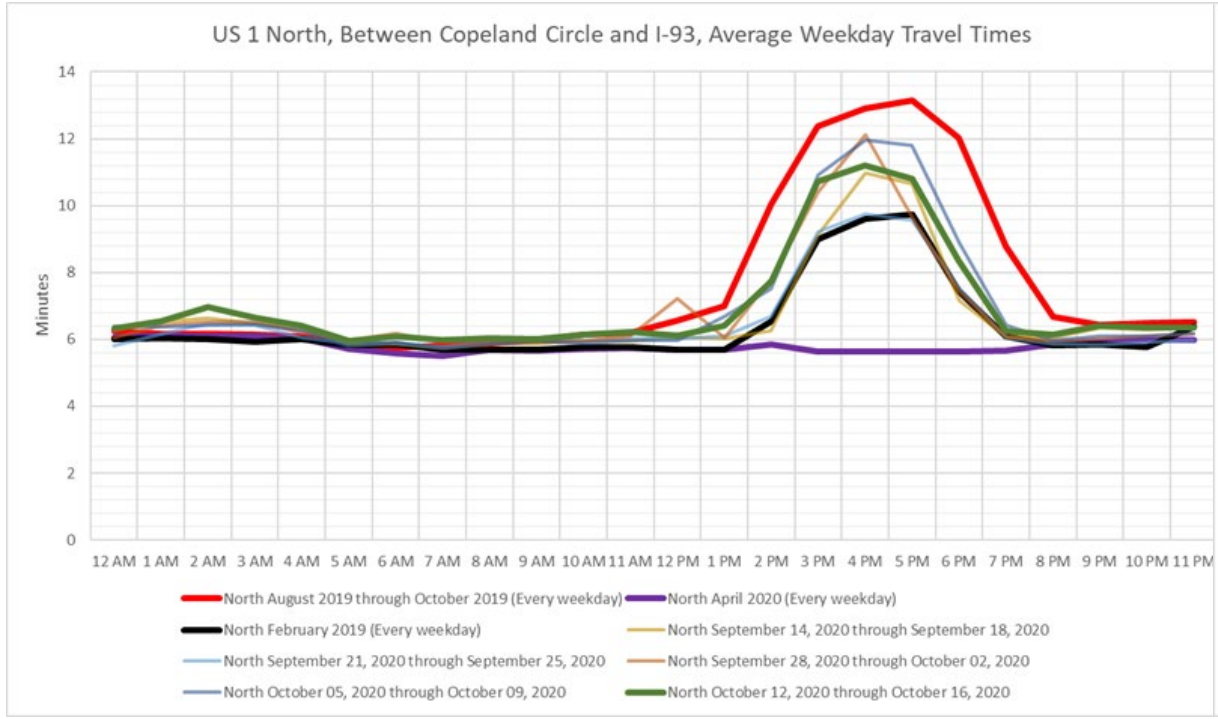
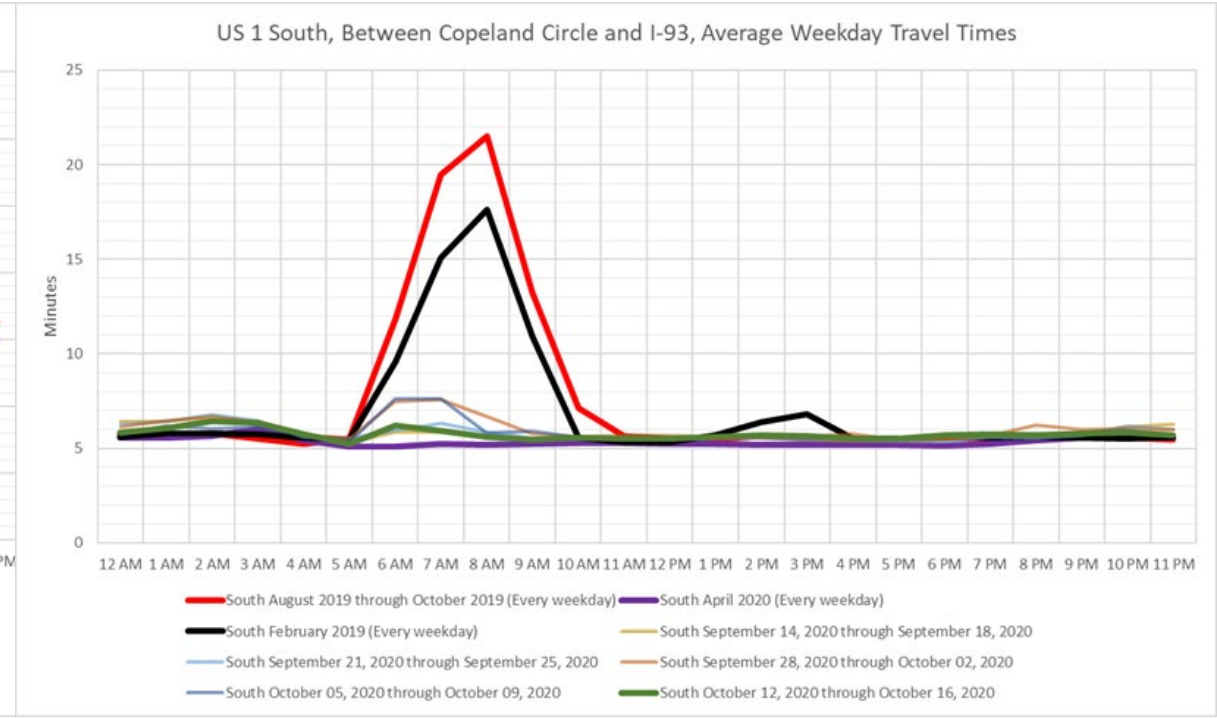
What We Know Now: In some corridors congestion is less

Traffic on Route 1, Average Weekday





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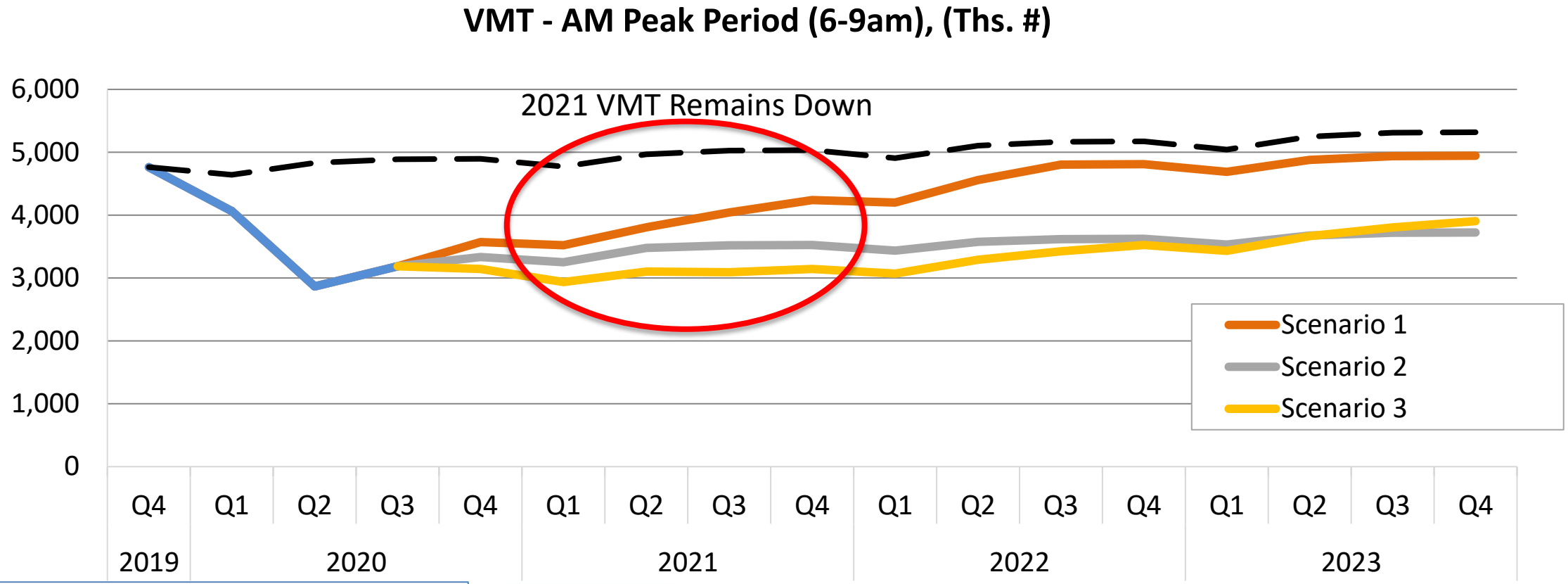
What We Don't Know: The Future of Travel

- Average daily traffic volumes are generally still below 2019 levels although peak period traffic for a few major roadways shows that congestion has returned to (or above) 2019 levels during the peak periods.
- Transit ridership is still down, many people are still working from home, and traffic on the roadways may not be from the same drivers as before COVID (if people who usually use transit have shifted to driving).
  - People may not feel comfortable taking public transit and may prefer driving
  - When Work from Home strategies are relaxed in the future, we do not know how many commuters will return to the road and how many will telecommute more than they did before COVID
  - Other trips taken by WFH telecommuters may add volume at different times of day

- But in some "futures" traffic congestion may remain lower or may vary with some corridors returning to congestion and others not
- Scenario planning can help us think about multiple possible futures

Scenario results: Vehicle Miles Travelled



DRIVERS FOR SCENARIO PLANNING:

COVID
- Infection Abatement

THE ECONOMY
- Employment by Industry
- Number of Households

TRAVEL BEHAVIORS
- Vehicle Miles Traveled
- Teleworkers by Industry
- Telework Days per Week

Scenario 1

Economic, demographic, and mobility patterns gradually return to mostly pre-COVID-19 conditions with slight increases in the number of teleworkers

Scenario 2

Travel patterns diverge from economic recovery as consumers and employees adopt to a new normal, especially in light of new and emerging remote meeting and e-commerce technologies

Scenario 3

The economic impacts of COVID-19 have depressed travel and mobility, especially on the MBTA, and telecommuting is standard practice for the foreseeable future

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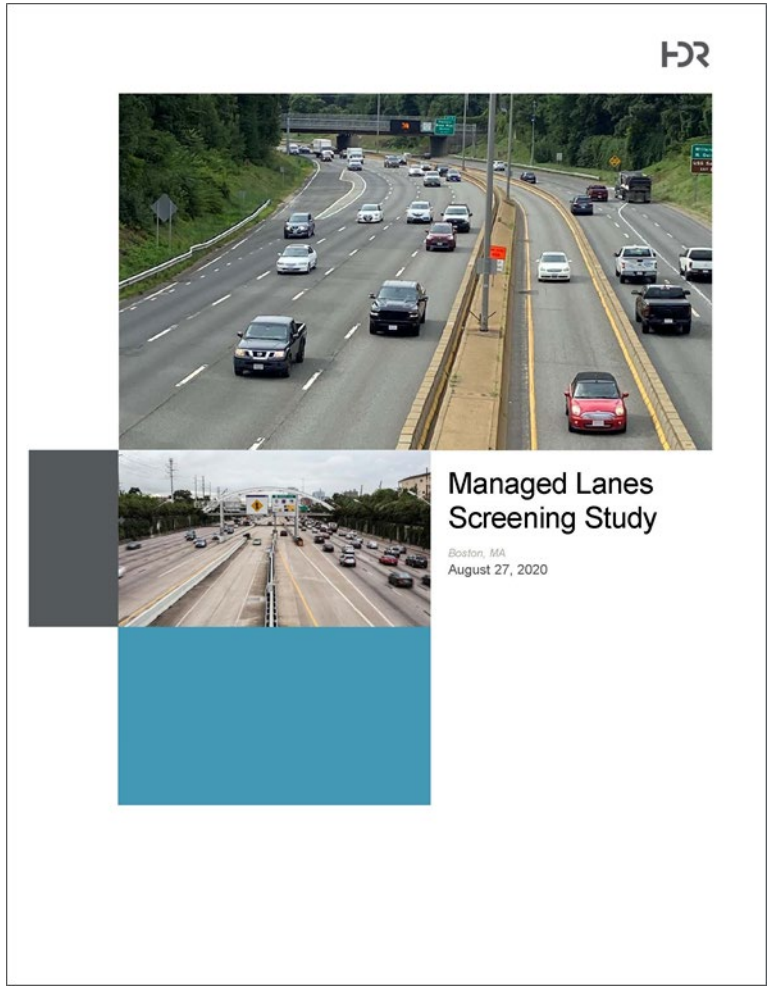
Congestion Initiatives: What happens next?

- Restore I-93 North HOV/Carpool lane
- Release Managed Lanes Screening Study and lay out next steps for selection of corridors on which to pursue further studies and/or pilots
- Finalize Tobin Bridge Bus Lane Pilot
- Complete planning work for I-93 SB Bus on Shoulder (BOS) to construct state's first BOS facility
- Complete Managed Lanes Equity White Paper
- Complete Shared Travel Network (STN) Study



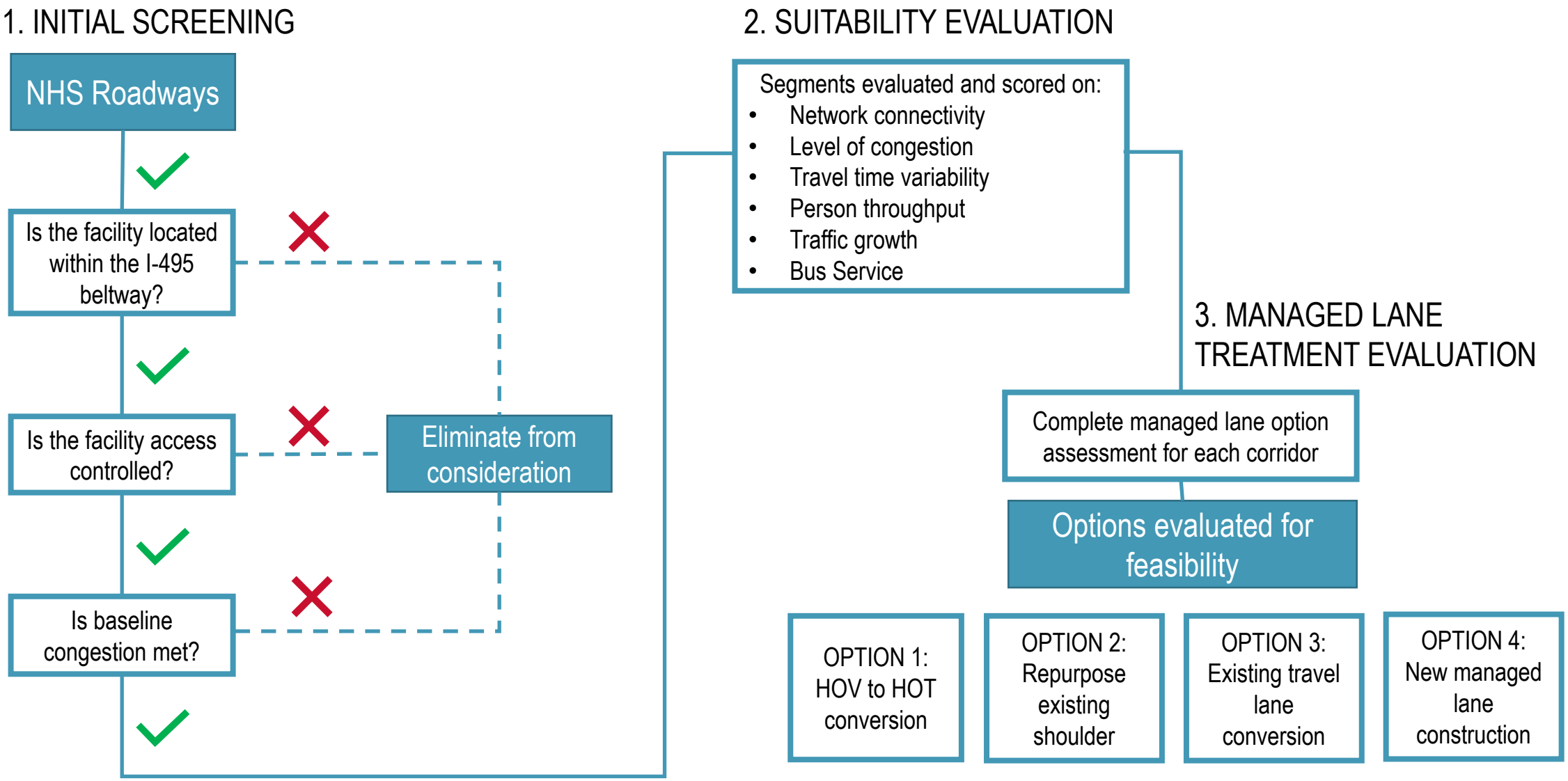
Congestion Initiatives: Restore I-93 SB HOV/Carpool Lane

- Existing Carpool Lane on I-93 SB restored to authorized vehicles only on Monday, Nov 23, 2020
- Lane opened to general traffic as mitigation for ongoing construction related to the Chelsea Curves Construction Project

What Is a Managed Lane?

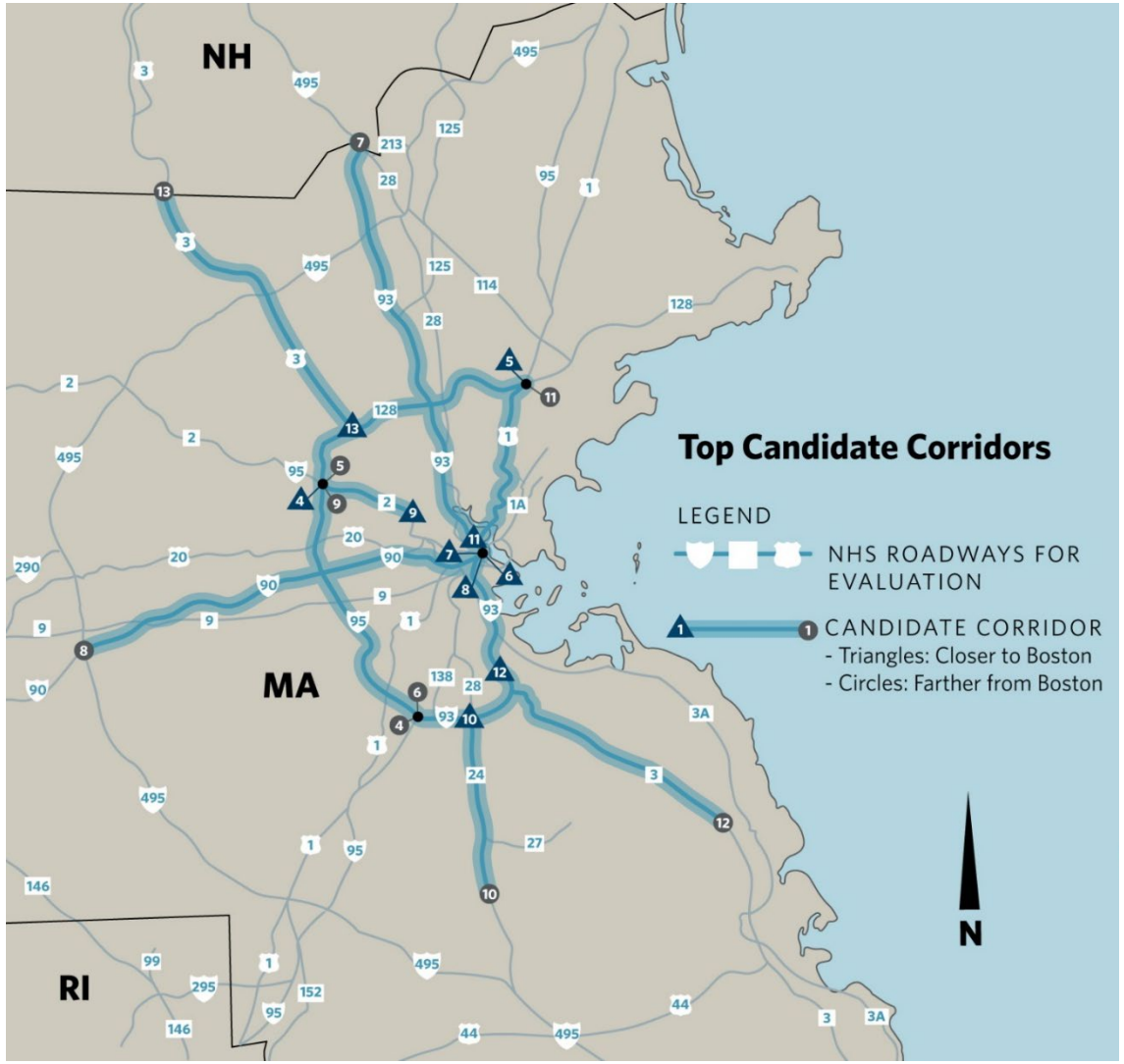
- Managed lanes are defined by the Federal Highway Administration (FHWA) as highway facilities or a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions
- The Congestion in the Commonwealth report found that a "growing body of evidence suggests that dynamically priced lanes, in locations with parallel and free general travel lanes, can provide a real option for those willing and able to pay more to avoid congestion while simultaneously improving the performance of the entire corridor including the non-tolled lanes"
- This "screening study" examined the potential use of four types of managed lane treatments in specific corridors in Massachusetts:
  - Conversion of existing High Occupancy Vehicle (HOV) lanes to High Occupancy Toll (HOT) lanes
  - Repurposing shoulder (e.g. for "bus on shoulder")
  - Conversion of a General Purpose Lane (GPL) to a managed lane
  - Construction of a new, additional managed lane

Methodology: Candidate Corridor Selection Process



Resulting Top Candidate Corridors

ROADWAY NAME/SEGMENT		SOUTH OR WEST ENDPOINT	NORTH OR EAST ENDPOINT
I-95/MA-128			
	4	I-93/I-95 (Canton)	MA-2 (Lexington)
	5	MA-2 (Lexington)	I-95/MA-128 (Peabody)
I-93			
	6	I-95/MA-128 (Canton)	I-90 (Boston)
	7	US-1 (Boston)	NH State Line (Methuen)
I-90			
	8	I-495 (Westborough)	MA-1A (Boston)
MA-2			
	9	I-95 (Lexington)	Alewife Brook Pkwy (Cambridge)
MA-24			
	10	MA-27 (Brockton)	I-93 (Randolph)
US-1			
	11	I-93 (Boston)	I-95/MA-128 (Peabody)
MA-3			
	12	MA-139 (Pembroke)	I-93 (Braintree)
US-3			
	13	I-95/MA-128 (Burlington)	NH State Line (Tyngsborough)



Managed Lanes Screening Summary

Corridor	Sub-Segment	South or West Endpoint	North or East Endpoint	HOV to HOT	Repurpose Shoulder	GPL Conversion	New ML Construction
I-95/MA-128 *(Southwest)*	4A	I-93/I-95 (Canton)	MA-9 (Wellesley)		●	◐	◐
	4B	MA-9 (Wellesley)	MA-2 (Lexington)		●	◐	◐
I-95/MA-128 *(Northwest)*	5A	MA-2 (Lexington)	I-93 (Woburn)		●	◐	◐
	5B	I-93 (Woburn)	US-1 (Peabody)		●	◐	◐
I-93 *(South)*	6A	MA-3/I-93 (Braintree)	I-90 (Boston)	●		◐	
	6B	I-93/I-95 (Canton)	MA-3/I-93 (Braintree)		●	◐	●
I-93 *(North)*	7A	I-495 (Andover)	NH SL (Methuen)		●	◐	◐
	7B	I-95/MA-128 (Woburn)	I-495 (Andover)		●	◐	●
	7C	US-1 (Boston)	I-95/MA-128 (Woburn)	●	●	◐	◐

LEGEND

● Feasible - No significant constraints identified; further analysis still required

◐ Potentially Feasible - Significant constraints identified; further analysis required

Suitability Evaluation Scores

10
9
8

Managed Lanes Screening Summary

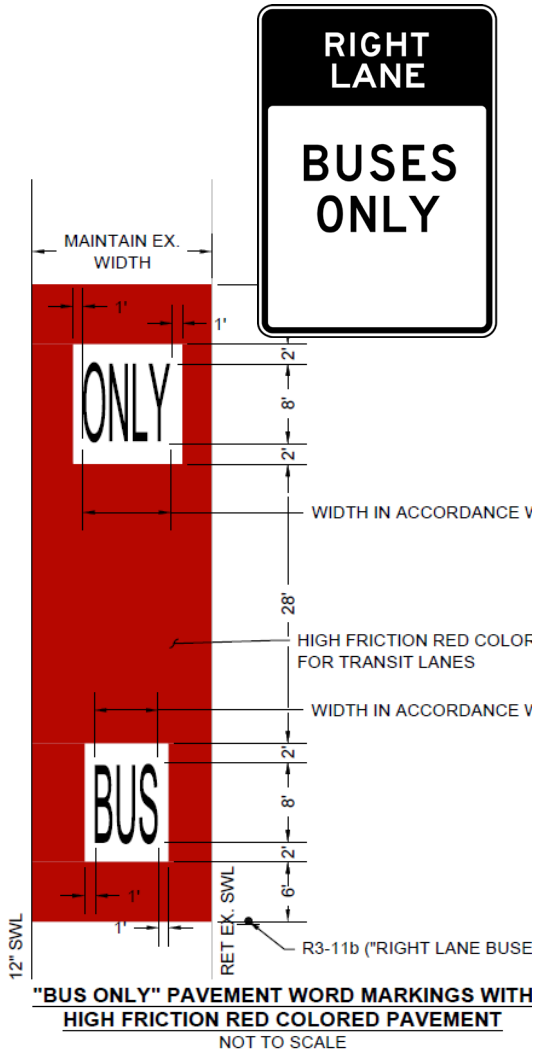
Corridor	Sub-Segment	South or West Endpoint	North or East Endpoint	HOV to HOT	Repurpose Shoulder	GPL Conversion	New ML Construction
I-90	8A	I-495 (Hopkinton)	I-95/MA-128 (Newton)		●	◐	◐
	8B	I-95/MA-128 (Newton)	MA-1A (Boston)			◐	
MA-2	9	I-95/MA-128 (Lexington)	Alewife Brook Pkwy (Cambridge)		●	◐	◐
MA-24	10	MA-27 (Brockton)	I-93 (Randolph)		●	◐	●
US-1	11A	MA-16 (Revere)	I-95/MA-128 (Peabody)				
	11B	I-93 (Boston)	MA-16 (Revere)			◐	
MA-3	12A	MA 139 (Pembroke)	MA-18 (Weymouth)		●		●
	12B	MA-18 (Weymouth)	I-93 (Braintree)		●	◐	◐
US-3	13A	I-95/MA-128 (Burlington)	MA-129 (Chelmsford)		●	◐	●
	13B	MA-129 (Chelmsford)	MA-4 (Chelmsford)		●	◐	●
	13C	MA-4 (Chelmsford)	NH State Line (Tyngborough)		●	◐	●

Not all corridors were deemed feasible for managed lane, but other initiatives are underway

Corridor	Rationale to Remove from Study	Other Congestion Initiatives	Project Status
MA-1A *(Sumner/Callahan Tunnels and Bell Circle)*	Access management, signals, constrained cross section	Suffolk Downs mitigation	Permitting and Design
MA-1A *(north of Bell Circle)*	Access management, signals, at-grade intersections	Lynnway Bus Priority Lane	Potential component of Lynn Transit Action Plan
Route 2 *(west of Lexington)*	Access management, signals	Route 2 Corridor Study	In progress
Route 1 *(north of Peabody)*	Access management, limited recurring congestion		
I-95 *(north of Peabody)*	Limited recurring congestion		
MA-128 *(east of Peabody)*	Limited recurring congestion		

Corridor	Rationale to Remove from Study	Other Congestion Initiatives	Project Status
MA-213	Limited reoccurring congestion		
Lowell Connector	Signal at terminus	Redesigning Lowell Connector and Gorham St Intersection	Conceptual Design
MA-9	Access management, signals	Route 9 Connected Corridor SPaT Project	Pre-Construction
I-495	Scored less than a 6 in the Tier 2 Screening (see Section 4.3)	I-495/I-90 Interchange Reconstruction	Design
		I-495/I-290 Interchange Improvements	Conceptual Design
		I-495 at Rt 3/Lowell Connector Pavement Marking Improvements	Complete

Congestion Initiatives: Tobin Bus Only Lane



"BUS ONLY" PAVEMENT WORD MARKINGS WITH HIGH FRICTION RED COLORED PAVEMENT
NOT TO SCALE

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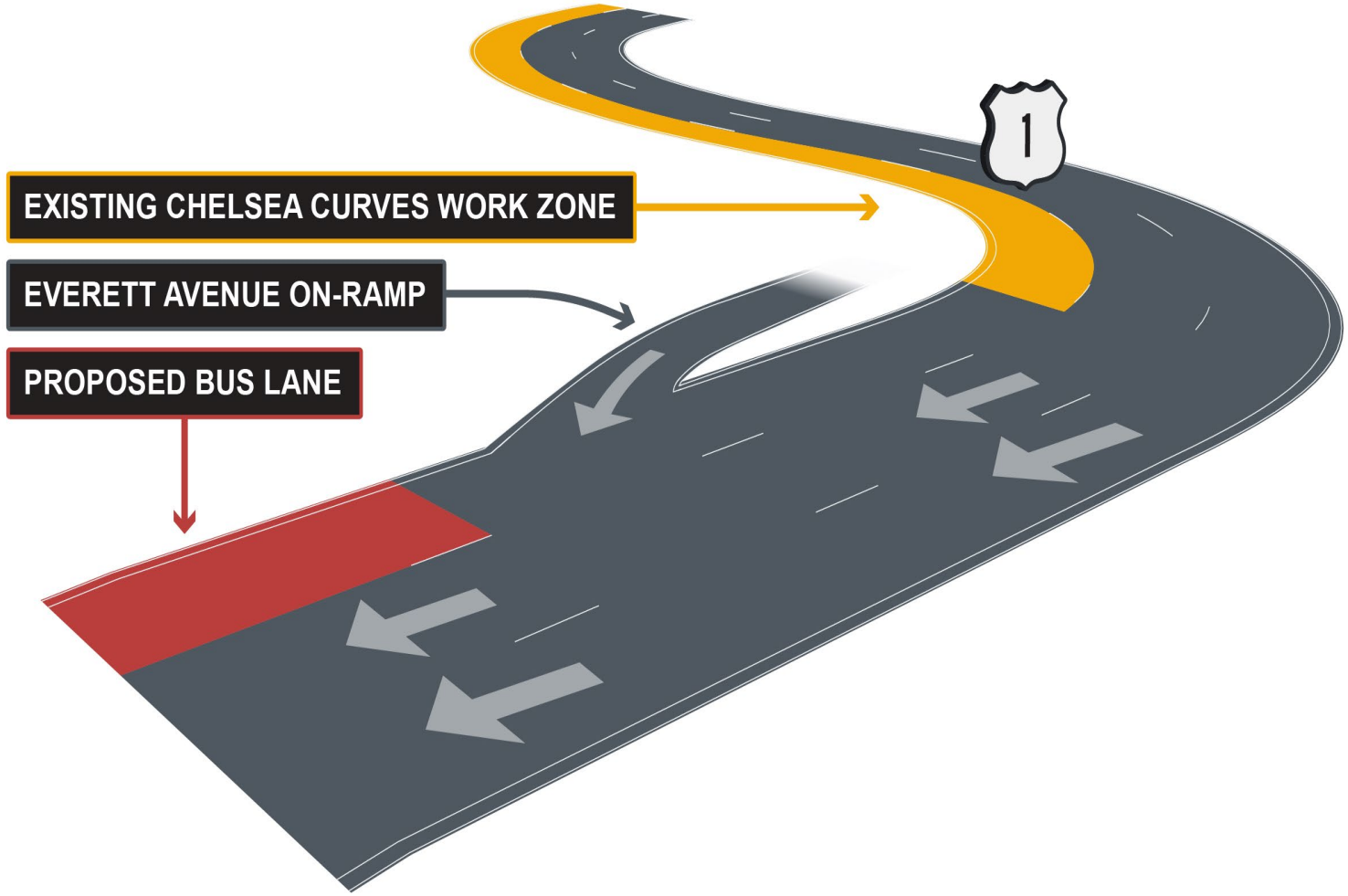
Congestion Initiatives: Tobin Bus Only Lane

- Initially MBTA 111 Bus (SB Only) Everett Ave on-ramp to the tunnel portal.
- Identified MBTA Bus 111 as benefitting from bus priority through our early Rapid Response Bus Lane process:
  - **Durable Ridership:** Top 20 ridership routes after the Governor's state of emergency declaration (MBTA, 2020)
  - **Chronic Delay**: Corridors with high or some chronic delay pre-pandemic (CTPS 2016)
  - **High Social Impact**: Routes with high rates of minority and low-income ridership based on pre-pandemic rider surveys (CTPS 2015-17)
- Implementation by end of year.



Congestion Initiatives: Tobin Bus Only Lane – Bus 111

- Will monitor Tobin Pilot as follows:
- Highway Metrics:
  - Traffic Volumes per lane for Bus Lane/general purpose lanes
  - Travel Times for Bus Lane/general purpose lanes
  - Delay for Bus Lane/general purpose lanes
- Bus 111 Metrics:
  - Travel time and delay improvements
  - Ridership: Total ridership by trip and maximum load by trip
- MassDOT will consider expansion of the bus lane pilot as demand continues and as determined feasible

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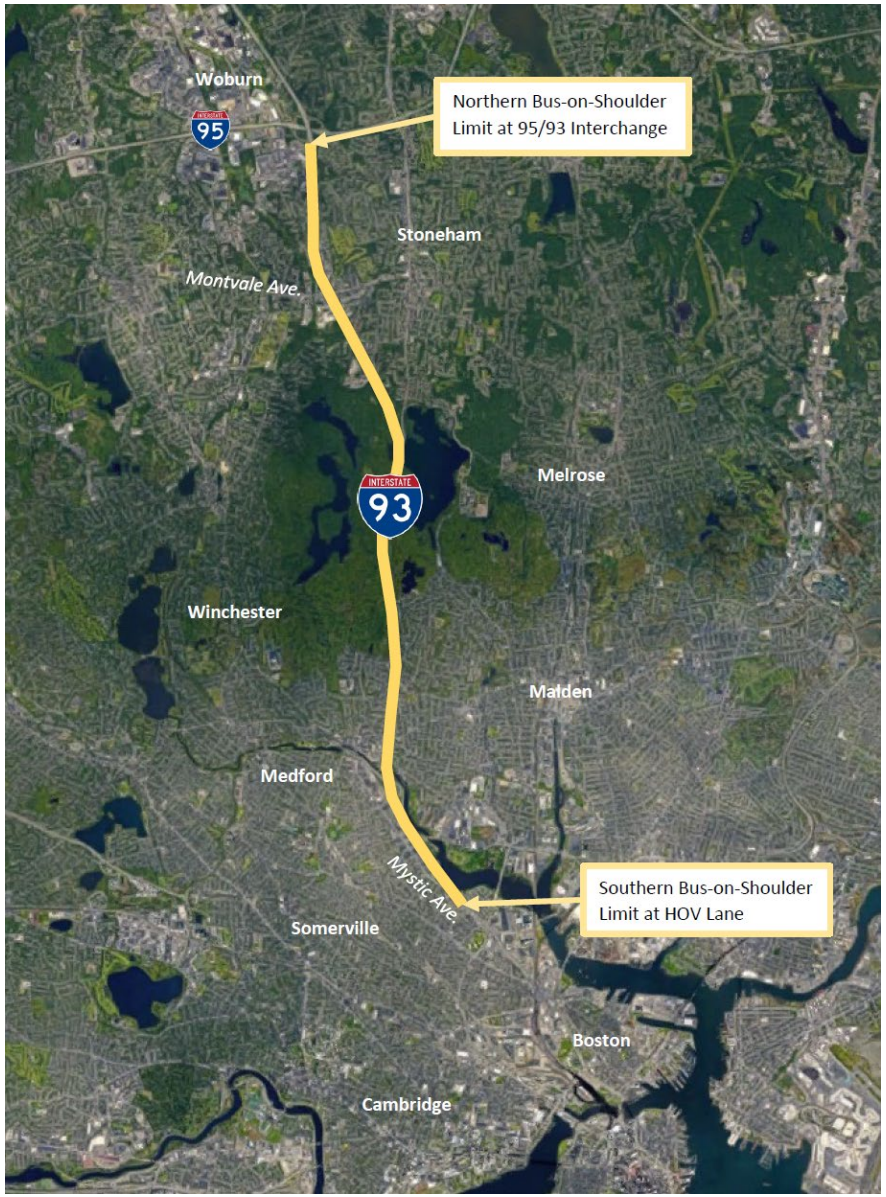
Congestion Initiatives: Bus on Shoulder System (BOSS)



- Highways to pilot Bus-on-Shoulder part-time shoulder use along I-93 SB direction north of Boston
- FHWA approval for 2 year pilot secured
- Operations dependent on GPL speed differentials
- Starting with MBTA and MVRTA buses (MVRTA looking at re-evaluating their service levels on December 31st)
- Will work to incorporate Logan Express and other carriers during Pilot

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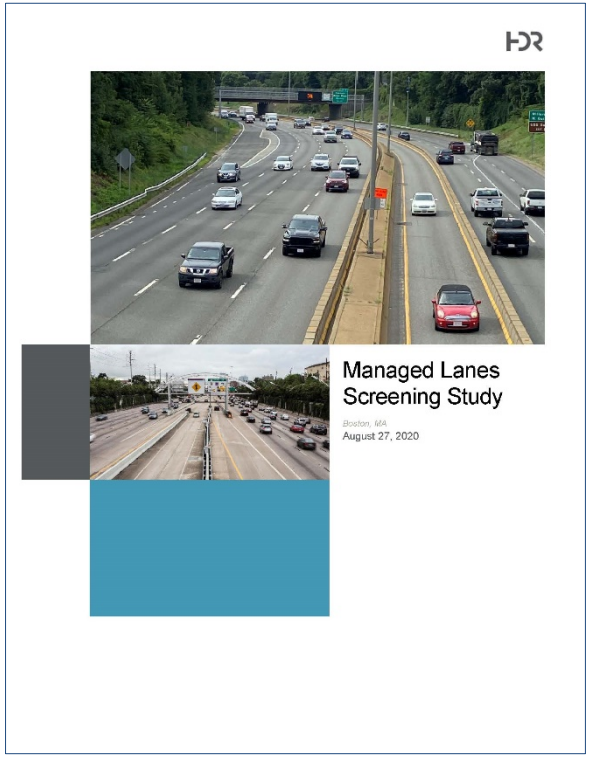
Managed Lanes Next Steps: Equity white paper

- Understanding equity considerations is important to building managed lanes' operational and pricing frameworks
- Literature review and interviews with state DOTs to understand managed lanes treatment options benefits and impacts for different user groups and communities
- Develop and compare different types and definitions of equity
- Develop framework of considerations to guide future project prioritization and design
    - Policy/Investment Considerations
    - Design/Access Considerations
    - Pricing/Operational Considerations
    - Outreach Considerations
    - Mitigation Strategies



Managed Lanes Next Steps: Update Corridor Specific Data

- Compiling and analyzing various data elements for each corridor identified in ML Screening Study as potentially feasible
  - Congestion and reliability data year over year
  - Pre to Post-COVID traffic changes
  - Origin and Destination Patterns for each corridor
  - Transit alternatives along the corridors
  - Investigate “last mile connection” challenges along corridors
  - Integrate existing relevant planning studies and pilot programs currently underway
  - Understanding fundamental differences between tolled and un-tolled corridors and customer base Pre to Post-COVID
  - Evaluate corridors that are not currently tolled as candidates for managed lanes treatment
  - Other considerations: stakeholder outreach, follow-on studies, procurement strategies, design and construction

Shared Travel Network (STN) Study

- The Congestion in the Commonwealth 2019 report recommended that MassDOT **investigate strategies to enhance and maintain a 'shared travel network'** in Massachusetts, with a focus on travel into and out of **Greater Boston**.
- The ultimate goal of building out a shared travel network is to **reduce the number of single-occupancy vehicles** on Massachusetts roadways and thereby reduce travel delays due to congestion, increase roadway passenger throughput and capacity, improve reliability, reduce transportation-related emissions, and increase access to employment and other opportunities.
- The purpose of the present study is to assess the potential for shared travel services (including transit and commuter buses, vanpools, carpools, shuttles, and other travel modes) to connect point origins (a.k.a., park-and-ride lots) with destinations in the Boston Area.
- The project will be managed by the MassDOT's Office of Transportation Planning to ensure coordination with MassDOT's ongoing scoping studies on Bus-on-Shoulder and Managed Lanes as well as the upcoming "Impact of Teleworking on the Commonwealth of Massachusetts' Transportation System Post-COVID-19" and other relevant work.
- The project will study how MassDOT can serve two types of trips:
  - Trips that can be routed through a park-and-ride facility along the Route 128/Interstate 95 or Interstate 495 belts to a destination hub outside of the urban core.
  - Trips that can be routed through park-and-ride facilities to destinations in the urban core on routes that are not currently served by the MBTA (bus or Commuter Rail).
- Expected completion March 2022

Summary

- Continuing congestion-related studies and projects while planning for the future
- Monitoring COVID-related traffic, congestion, and travel pattern data to determine strategies moving forward
- Considering moving from a “regional” approach to congestion to a “corridor” approach to congestion in which we prioritize and commit to exploring solutions for the highest priority “congestion corridors”

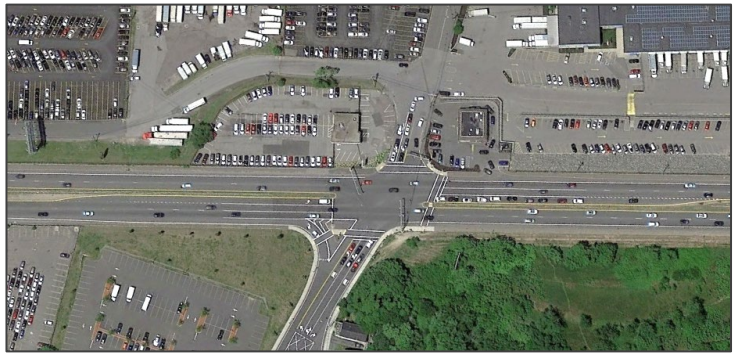
APPENDIX

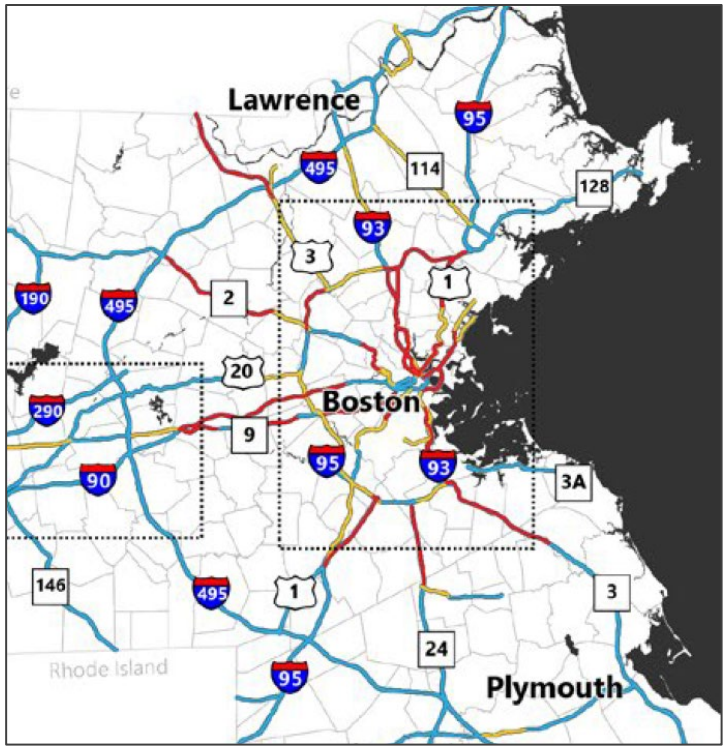
Managed Lanes Tier 1 Initial Screening

- Two major requirements:
  - Access control
  - Baseline congestion

Roadway Name	South or West Endpoint	North or East Endpoint	Inside I-495?	NHS Facility?	Access Controlled?	Baseline Congestion?
I-495	MA-25, Wareham	I-95, Salisbury	Yes	Yes	Yes	Yes
I-95/MA-128	I-495, Mansfield	I-495, Amesbury	Yes	Yes	Yes	Yes
I-93	I-95/MA-128, Canton	NH State Line, Methuen	Yes	Yes	Yes	Yes
I-90	NY State Line, West Stockbridge	MA-1A, Boston	Yes	Yes	Yes	Yes
US-1	I-495, Plainville	I-95/MA-128, Lynnfield	Yes	Yes	Yes	Yes
MA-2	Moore Street, Erving	Memorial Drive, Cambridge	Yes	Yes	Yes	Yes
MA-24	Rhode Island State Line, Fall River	I-93, Randolph	Yes	Yes	Yes	Yes
MA-3	US-6	I-93, Braintree/Quincy	Yes	Yes	Yes	Yes
US-3	I-95/MA-128, Burlington	NH State Line, Tyngsborough	Yes	Yes	Yes	Yes
MA-128	I-95, Peabody	MA-127, Gloucester	Yes	Yes	Yes	No
MA-213	I-93, Methuen	I-495, Methuen	Yes	Yes	Yes	No
Lowell Connector	US-3, Chelmsford	Gorham Street, Lowell	Yes	Yes	Yes	No
MA-1A	I-93, Boston	MA-60, Revere	Yes	Yes	No	
MA-9	US-7, Pittsfield	Copley Square, Boston	Yes	Yes	No	
US-20	I-84, Sturbridge	I-95, Waltham	Yes	Yes	No	
MA-114	I-495, Lawrence	MA-128, Peabody	Yes	Yes	No	
US-44	Rhode Island State Line, Seekonk	MA-3, Plymouth	Yes	Yes	No	
MA-28	Leverett Circle, Boston	I-95/MA-128, Reading	Yes	Yes	No	
MA-125	Industrial Avenue, Haverhill	I-495 Haverhill	Yes	Yes	No	
MA-107	Bell Circle, Revere	Summer Street, Lynn	Yes	Yes	No	
Memorial Drive	Eliot Bridge, Cambridge	Main Street, Cambridge	Yes	Yes	No	
MA-27	MA-24, Brockton	West Street, Whitman	Yes	Yes	No	

MA-1A: Access control/ At-grade intersections not met





MA-128: Baseline congestion not met

Managed Lanes Tier 2 Suitability Screening

Criteria	Segment Limits												
	I-495		I-95	I-95 / MA-128		I-93		I-90	MA-2	MA-24	US-1	MA-3	US-3
	US-3 and MA-213 (Segment 1)	I-290 and I-90 (Segment 2)	I-495 and I-93/I-95 (Segment 3)	I-95/I-93 and MA-2 (Segment 4)	MA-2 and US-1 (Segment 5)	I-95/MA-128 and I-90 (Segment 6)	US-1 and NH State Line (Segment 7)	I-495 and MA-1A (Segment 8)	I-95 to Alewife Brook Pkwy (Segment 9)	MA-27 and I-93 (Segment 10)	I-93 and I-95/MA-128 (Segment 11)	MA-139 and I-93 (Segment 12)	I-95/MA-128 and NH SL (Segment 13)
Network Connectivity	1	2	1	2	2	1	1	1	1	2	1	2	1
Level of Congestion	1	1	2	2	2	2	2	2	2	2	2	2	2
Travel Time Variability	1	1	1	1	2	2	1	1	1	1	1	1	1
Person Throughput	1	1	1	1	1	2	2	2	1	1	2	2	2
Traffic Growth	0	0	2	2	1	1	2	1	1	1	0	0	2
Bus Service	0	0	0	1	1	2	2	2	2	1	2	1	1
Total Score	4	5	7	9	9	10	10	9	8	8	8	8	9

Scoring

More Suitable	2
Adequate	1
Less Suitable	0