2020 Performance & Asset Management Advisory Council Update

Performance & Asset Management Advisory Council

The Honorable Michael J. Rodrigues
Chair
Senate Committee on Ways and Means
State House, Room 212
Boston, MA 02133

The Honorable Aaron Michlewitz
Chair
House Committee on Ways and Means
State House, Room 243
Boston, MA, 02133

December 30, 2020

The Honorable Joseph A. Boncore
Senate Chair
Joint Committee on Transportation
State House, Room 112
Boston, MA 02133

The Honorable William M. Straus
House Chair
Joint Committee on Transportation
State House, Room 134
Boston, MA 02133

Members of the General Court:

On behalf of the Performance and Asset Management Advisory Council, and in compliance with Chapter 46, Section 12 of the Acts of 2013 and as referenced in Chapter 6C, I am once again pleased to report on continued progress by the Massachusetts Department of Transportation (MassDOT) toward integrated asset and performance management processes.

The COVID-19 pandemic is inextricability present in all reviews of 2020, and its impact extends far beyond the topic of this update. However, we can all take pride that the work of planning, designing, constructing, maintaining and operating Massachusetts infrastructure has continued in earnest amidst the challenges this year has presented.

Critical to achievement of our asset management goals is timely design and construction of capital projects. To sustain our capital delivery program, MassDOT adapted design processes to facilitate remote work, support online collaboration and enable virtual stakeholder engagement. Our construction teams worked with the contractor community to ensure personal protective equipment mandates and job site practices met applicable safety protocols. Amidst the crisis, MassDOT had one of the most successful years on record for project delivery, and the construction program continued uninterrupted to deliver transportation improvements that support the Massachusetts economy.

While this work advances the current capital plan, MassDOT is still looking ahead to ensure our transportation system meets the needs of tomorrow. The pandemic has caused traffic volumes and patterns to change as a result of telecommuting and social distancing. We have also seen the reimagining of local roadway space for the public good through the successful Shared Streets program. The pandemic has reminded us of the deep connection between our transportation system and the Commonwealth's vitality, and this reminder will fuel our collective energies as we emerge from the current crisis and refocus on the work to improve our transportation system.

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In previous year's updates we have highlighted the needs of the state-owned, non-interstate roadway network. These roads connect us to school, work, friends, families, and commerce whether on foot, bike, car or transit. When MassDOT approaches a non-interstate paving project, the full use of the roadway is considered Condition of non-interstate roadways were on a precipitous decline in the middle of the last decade, when the need was recognized by the and additional funds were made available in SFY 2019. This investment has manifested itself in improved conditions, though continued investment is necessary to maintain steady progress.

Substantial needs remain for the Massachusetts bridge inventory. The Accelerated Bridge Program (ABP) marshalled significant investment to repair and replace structures across the Commonwealth, though ABP's gains are projected to be lost by mid-decade at the present investment level. Massachusetts is 4th worst in the nation for the percentage of poor bridges (by area). The inability to program sufficient bridge projects and limited funding for bridge preservation are inhibiting meaningful progress toward condition targets to address the current backlog and stem further deterioration. Additional bridge investment is needed to address the clear needs to core transportation infrastructure.

2021 will bring the next Triennial Inspection of the Metropolitan Highway System (MHS). Every three years a consultant provides the department with an independent assessment of the MHS tunnels, roadways, bridges and facilities, which in turn guides investment of toll proceeds for capital investment. The previous report (2019) highlighted the need to advance rehabilitation projects for the Sumner, Central Artery North Area (CANA) and Prudential tunnels, and bridge projects for the I90/95 Interchange and Boston Extension of the I90.

Among these definitive state of good repair needs, MassDOT is also cognizant of the looming threat that climate change poses to long term infrastructure sustainability. The MassDOT Office of Transportation Planning is studying the risk of extreme weather to infrastructure and will quantify costs associated with the impacts. This work is critical to informed investments in resilient infrastructure.

In closing, MassDOT has continued to manage today and plan for tomorrow's infrastructure needs. Substantial state of good repairs needs remain and investment is necessary to preserve our current infrastructure so that it may continue to serve the Commonwealth in a resilient and sustainable future.

I hope the attached update is informative for your important work. The Council looks forward to remaining a resource for MassDOT, local governments, and the Legislature in the upcoming year.

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Respectfully Submitted,

Patricia Leavenworth, P.E., Chair

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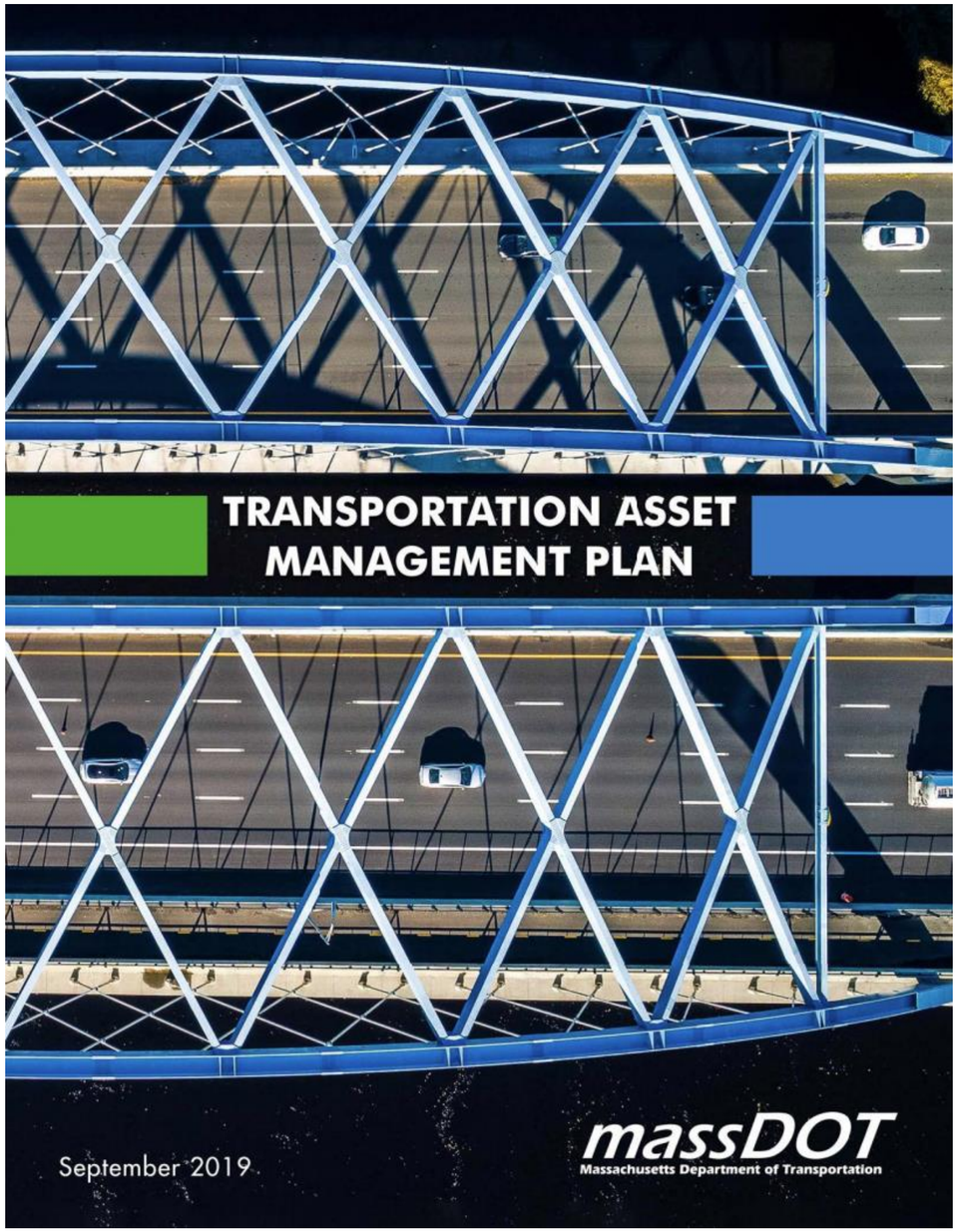
2020 Update

- Update on Federal Asset Management Compliance
- Expanding Asset Management
- Building for a Resilient Future
- Metropolitan Highway System
- Pavement Condition
- Bridge Conditions
- The year Ahead
- Key Terms and Definitions



MassDOT TAMP 2020 Consistency Review

The **MassDOT Transportation Asset Management Plan (TAMP)** was certified by Federal Highway in 2019, and functions as a key input to the MassDOT Capital Plan by informing the MassDOT Bridge and Pavement Programs investment strategies.

In July, FHWA conducted an annual consistency review and confirmed **MassDOT has implemented the TAMP consistent with federal requirements.**

MassDOT will submit an update to the TAMP for 2022.

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Pictured: MassDOT culvert replacement project in Williamstown

Expanding Asset Management

MassDOT has made significant progress on a **comprehensive culvert management program**

5600+ state-owned culverts have been located geo-spatially and initial Inspections are underway in advance of pavement resurfacing projects. A working group has identified best-practice repair procedures to assist in maintenance project development.

The MassDOT Environmental Section has assessed structure vulnerability of flooding based on stream flow and existing structure size.

These activities will support full life-cycle management processes for this important asset class.

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Planning for Resiliency

Coastal and Inland flooding are recognized as long-term risks to state-owned infrastructure.

MassDOT Office of Transportation Planning is leading a study to identify **MassDOT transportation assets at risk to inland flooding.**

The Study will estimate the “do nothing costs” of retaining vulnerable NHS roads, bridges and large culverts in their current state based on relationships drawn from anticipated flood depths, asset damage, repair costs, and loss of service.

The results of this study will help guide resiliency investments within the MassDOT Capital Plan

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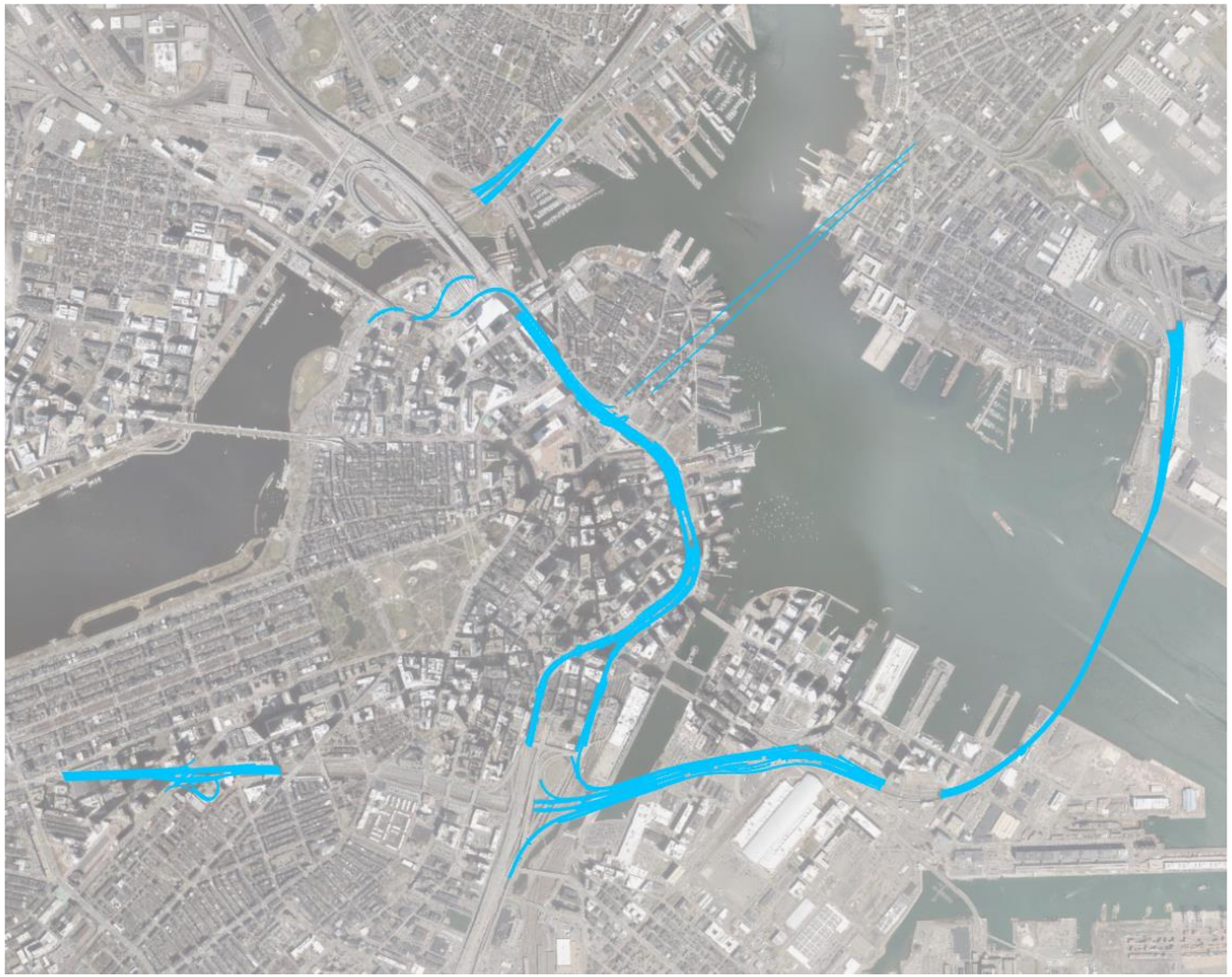

Pictured: Metropolitan Highway System Tunnels

The Metropolitan Highway System

The Metropolitan Highway System consists of the **Tobin Bridge, the Central Artery, the three Harbor Tunnels, and I90 Turnpike inside of I95**. The unique combination of infrastructure, of varying types and vintage, are integral to mobility within the major metropolitan area. MHS Capital investments are primarily financed through toll revenues.

Every three years, MassDOT commissions an independent inspection of the MHS (MHS Triennial report). The latest report, submitted in 2019, identified a **need for $1.63 Billion investment to bring the MHS to a state of good repair over the next ten years**.

In recognition of this need, the **SFY 2020-2024 CIP programmed $816 Million to the MHS**. The plan included rehabilitations of the Sumner, Central Artery North Area (CANA) and Prudential Tunnels, as well as other priority projects identified by the Triennial Inspection.

The MHS project portfolio will be revisited during planning of the 2022-2026 MassDOT CIP in the New Year. The new plan will be constrained by reduced toll revenues in the near term and will also need to consider other priority MHS projects.

The 2021 MHS Triennial Inspection is underway and findings are anticipated in September 2021.

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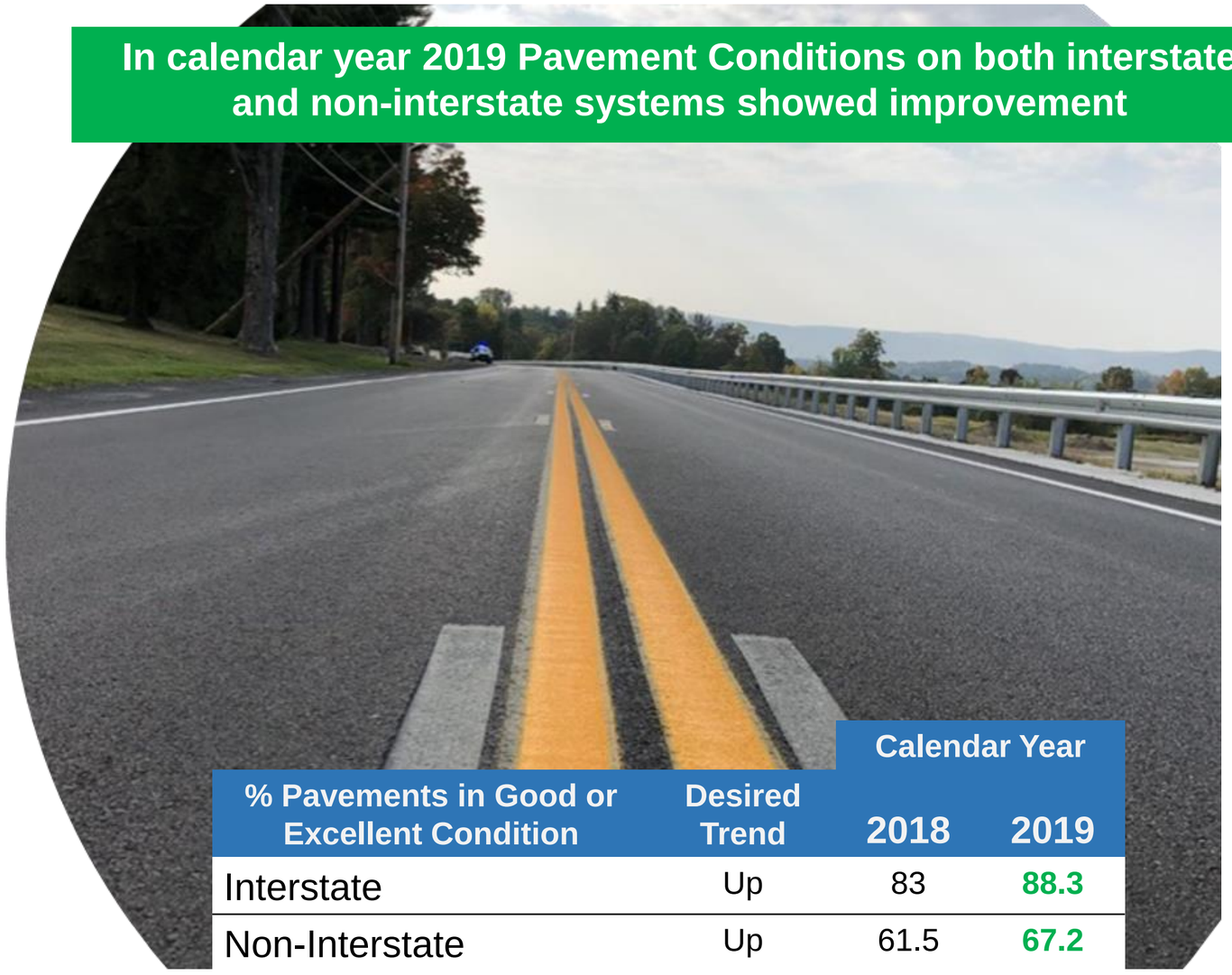
In calendar year 2019 Pavement Conditions on both interstate and non-interstate systems showed improvement



% Pavements in Good or Excellent Condition	Desired Trend	Calendar Year 2018	Calendar Year 2019
Interstate	Up	83	**88.3**
Non-Interstate	Up	61.5	**67.2**

MassDOT Pavement

Non-interstate roadways connect us to school, work, friends, families, and commerce while on foot, bike, car or transit. Previously, non-interstate pavement condition was on a downward condition trend and in response an increased investment was made which is beginning to show results, and not at the expense of interstate performance.

In SFY 2020, through increased funding within the CIP, Highway was able to preserve or rehabilitate state-owned non-interstate pavement on roadways in over 25 communities

Sustained investment in the non-interstate system, as proposed in the Transportation Bond Bill filed by the Administration, is needed to ensure this important network remains safe and reliable for all modes.

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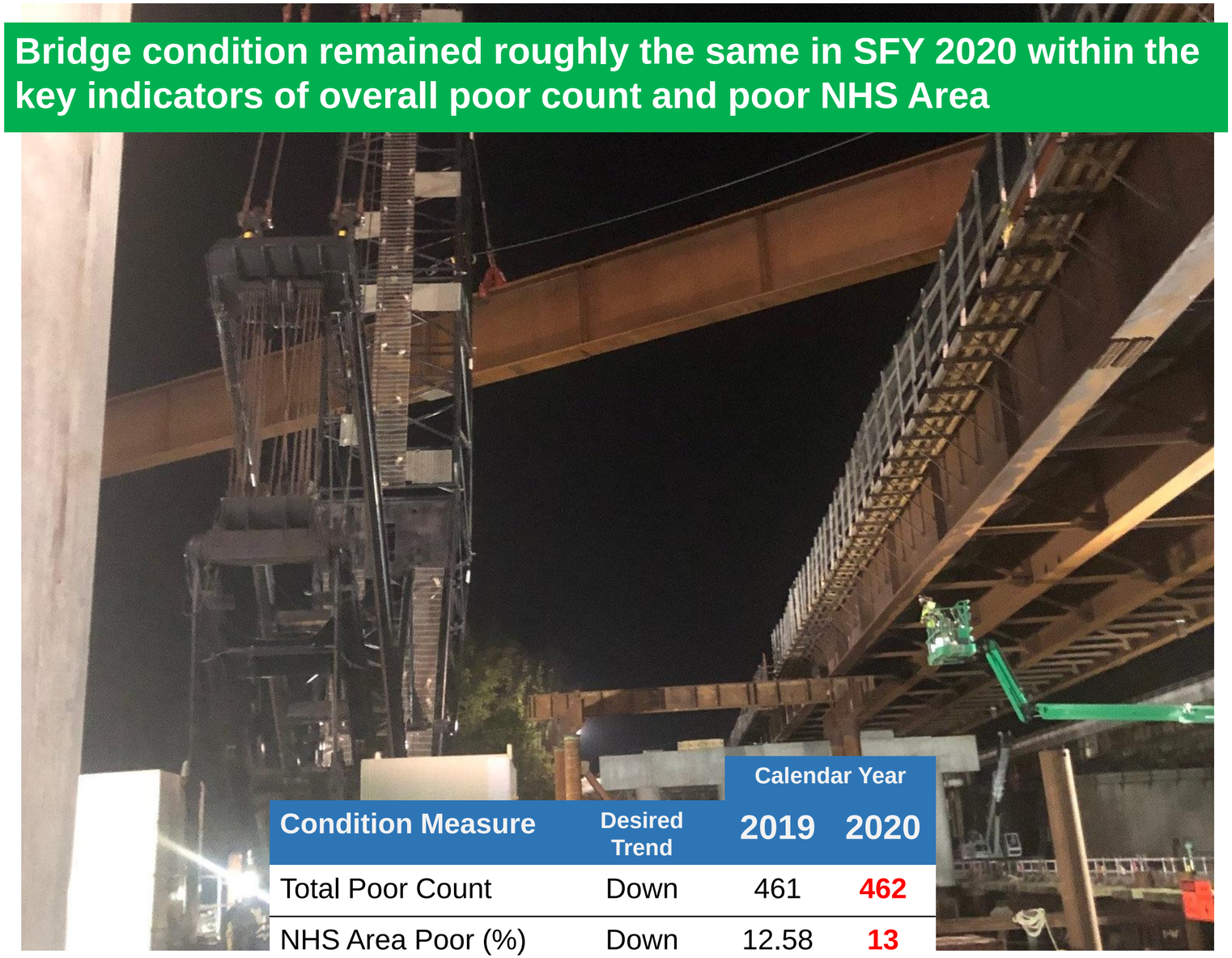
Bridge condition remained roughly the same in SFY 2020 within the key indicators of overall poor count and poor NHS Area



Condition Measure	Desired Trend	Calendar Year 2019	Calendar Year 2020
Total Poor Count	Down	461	**462**
NHS Area Poor (%)	Down	12.58	**13**

Current Bridge Conditions

In 2008, the Accelerated Bridge Program (ABP) brought increased investment to Massachusetts bridges when conditions were forecasted to significantly decline. With substantial completion of the program in 2016, and resumption of previous bridge investment levels, significant needs remain and the gains of the ABP are in jeopardy.

Massachusetts is currently 4th in the nation for highest percentage of poor bridges (by area). As a result of the high proportion of structures in poor condition, MassDOT is required to commit a set portion of federal funds each year to National Highway System (NHS) bridges, thus limiting flexibility in the use of federal funds.

The 2019 TAMP forecasts further decline in bridge condition at current investment levels, with pre-ABP levels expected to be reached by mid-decade.

Authorization of additional Grant Anticipation Notes (GANS), as proposed in the Transportation Bond Bill filed by the Administration, would support increased bridge investments.

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NHS Bridge Condition in practical terms

Total Area of NHS Bridges	**29,523,128 SF**	**=**	**512 Football Fields**

MA Area in Poor Condition	68 Football Fields
MA 10% Poor Area Federal Threshold	51 Football Fields
Gap to Threshold	17 Football Fields
Area currently in construction	12 Football Fields
Ave. Annual Growth of Poor Area	5 Football Fields / Year
Average NHS Bridge Size	1/3 Football Field

	Football Fields
Tobin Bridge	4.47
Chelsea Viaduct	2.60
Allston Viaduct	5.1

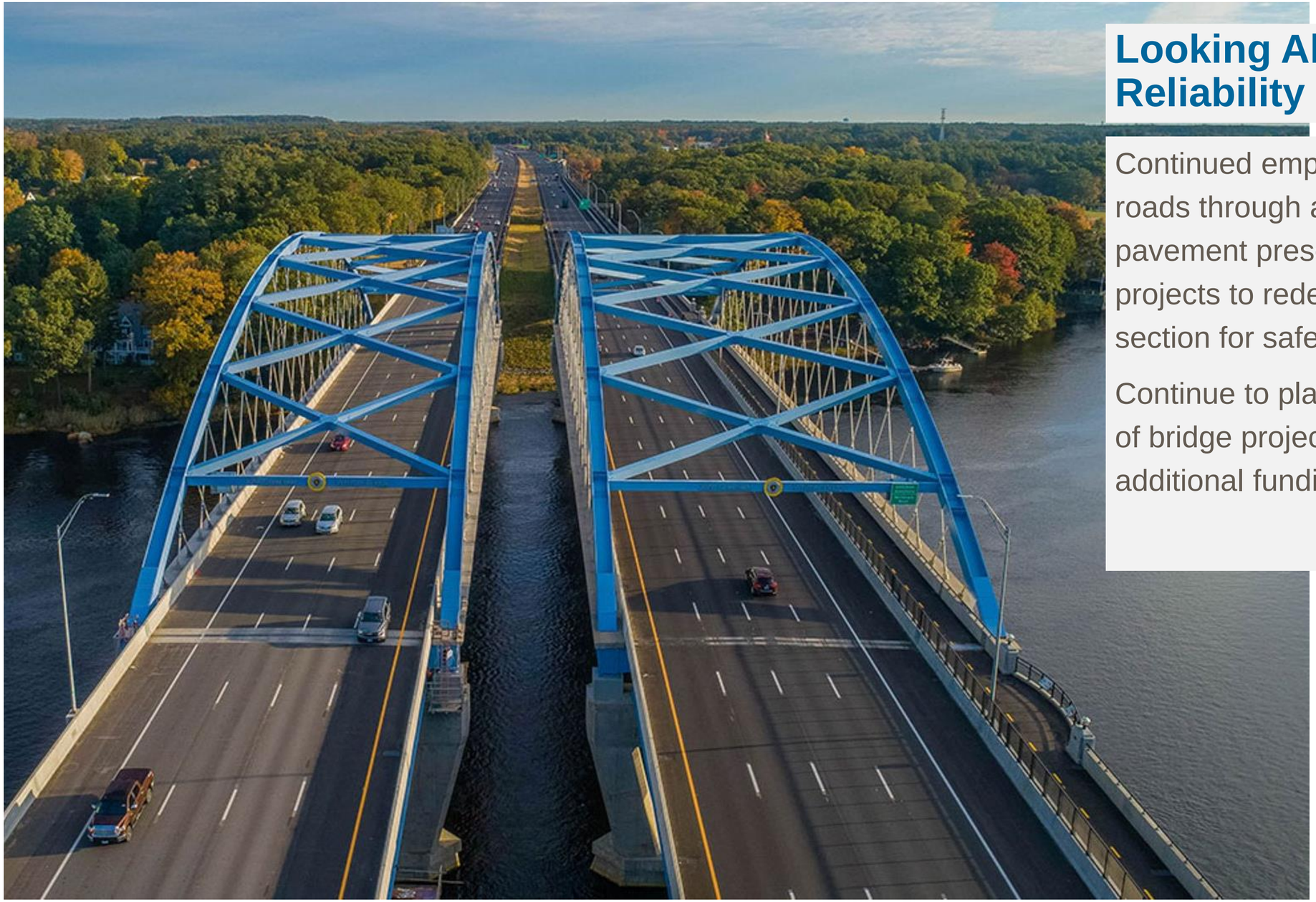
Authorization of additional Bridge Program funding in the transportation bond bill is necessary to achieve bridge condition targets

NHS Bridge Condition

Federal Highway has instituted a bridge performance measure for the National Highway System (NHS) which considers bridge condition in terms of the size of a state's bridge inventory. Size is based on bridge area, as calculated by the bridge riding surface. **This measure highlights the outsized influence large structures can have on performance and needs.**

13% of MA NHS Bridges are in poor condition, and states in excess of 10% are required to commit a set portion of federal funds to NHS bridges as a penalty which limits flexibility in the use of federal funds.

Authorization of additional Grant Anticipation Notes (GANS), as proposed in the Transportation Bond Bill filed by the Administration, would support movement towards condition targets and out of the FHWA penalty status



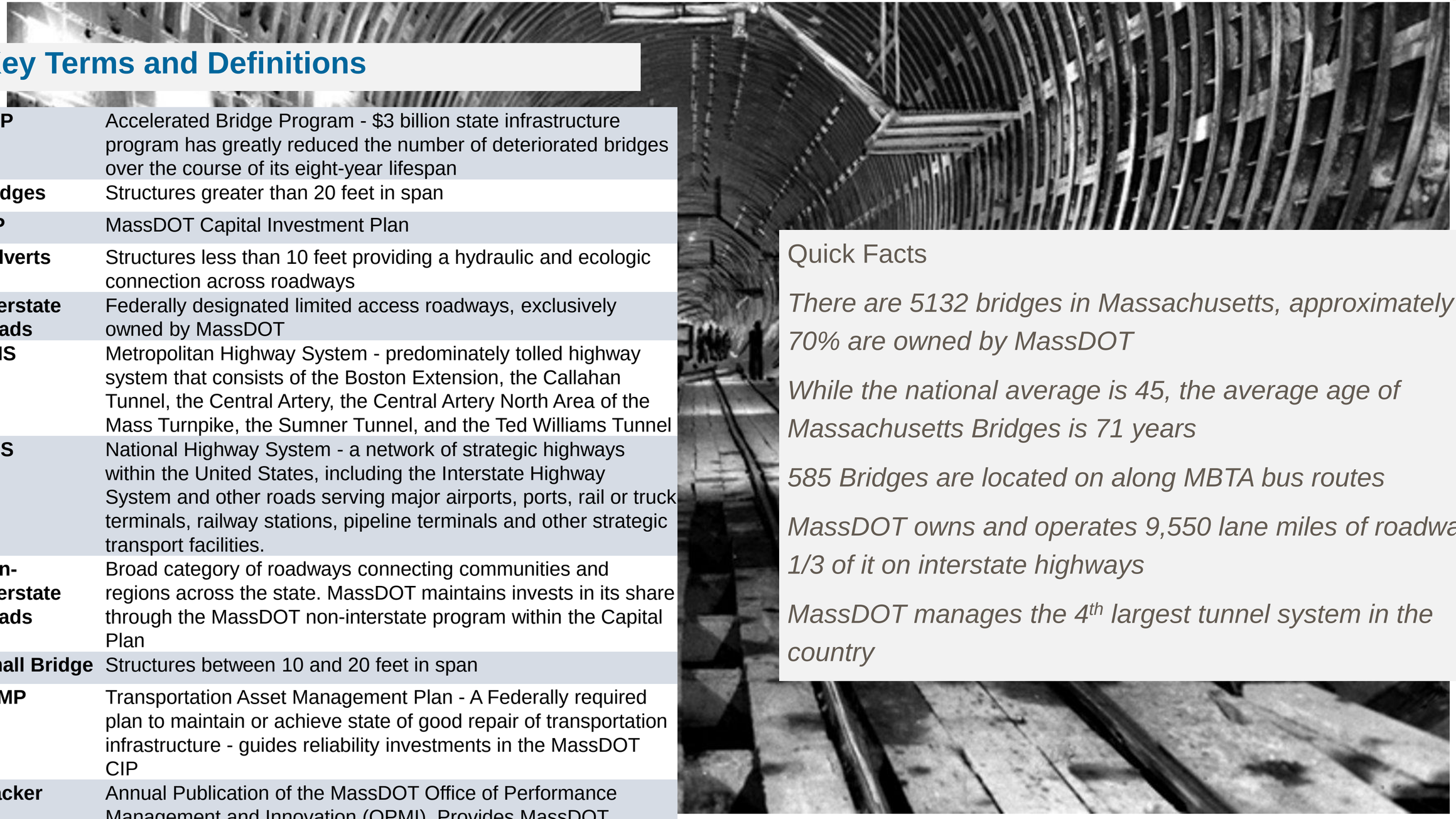
Looking Ahead to Reliability in 2021

Continued emphasis on non-interstate roads through a combination of pavement preservation projects and projects to redefine roadway cross section for safe usage by all modes

Continue to plan and design a portfolio of bridge projects in advance of additional funding

Key Terms and Definitions

ABP	Accelerated Bridge Program - $3 billion state infrastructure program has greatly reduced the number of deteriorated bridges over the course of its eight-year lifespan
Bridges	Structures greater than 20 feet in span
CIP	MassDOT Capital Investment Plan
Culverts	Structures less than 10 feet providing a hydraulic and ecologic connection across roadways
Interstate Roads	Federally designated limited access roadways, exclusively owned by MassDOT
MHS	Metropolitan Highway System - predominately tolled highway system that consists of the Boston Extension, the Callahan Tunnel, the Central Artery, the Central Artery North Area of the Mass Turnpike, the Sumner Tunnel, and the Ted Williams Tunnel
NHS	National Highway System - a network of strategic highways within the United States, including the Interstate Highway System and other roads serving major airports, ports, rail or truck terminals, railway stations, pipeline terminals and other strategic transport facilities.
Non-Interstate Roads	Broad category of roadways connecting communities and regions across the state. MassDOT maintains invests in its share through the MassDOT non-interstate program within the Capital Plan
Small Bridge	Structures between 10 and 20 feet in span
TAMP	Transportation Asset Management Plan - A Federally required plan to maintain or achieve state of good repair of transportation infrastructure - guides reliability investments in the MassDOT CIP
Tracker	Annual Publication of the MassDOT Office of Performance Management and Innovation (OPMI). Provides MassDOT measures, targets and current performance



Quick Facts

There are 5132 bridges in Massachusetts, approximately 70% are owned by MassDOT

While the national average is 45, the average age of Massachusetts Bridges is 71 years

585 Bridges are located on along MBTA bus routes

MassDOT owns and operates 9,550 lane miles of roadways, 1/3 of it on interstate highways

MassDOT manages the 4th largest tunnel system in the country

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