2024 Highway Asset Management Update

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MASSDOT HIGHWAY DIVISION
2024 Asset Management Update

BRIDGES

WHY INVEST IN BRIDGES

The Massachusetts Bridge Inventory provides the **vital connections** which **make daily life possible**

Bridges **span natural features** (**waterways and valleys**) as well as **infrastructure** (**roadways and railroads**)

Nearly all **private trips** and **freight** **pass over or under a bridge**

Poor condition bridges **cost more to own** and when **deemed to be unsafe** are **weight-restricted or closed**

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ACTIVITIES

MassDOT uses **life cycle planning** which helps us predict and identify problems early before they become expensive or create a potential safety hazard.

To do that, we:

- **Inspect** every piece of every bridge at least once every two years.
- Quickly **resolve problems** found during inspections to ensure they don't get worse.
- Conduct **routine maintenance and preservation** on our bridges, such as painting, to make them last longer.
- Plan when to **rehabilitate** a bridge by making more substantial repairs, or when to **replace** the bridge entirely.

INVENTORY

MassDOT owns **3,495** out of 5,268 bridges in the **Commonwealth**

MassDOT owns **2,220** out of 2,298 bridges on the **National Highway System (NHS)**

The remainder of the inventory is owned by municipalities, with a small number owned by other public entities, including the Federal Government, as well as by private entities such as railroads.

PERFORMANCE

The Massachusetts bridge inventory is the oldest in the nation and **is third-worst nationally in terms of poor bridge area on the National Highway System (NHS).**

Massachusetts currently has 12.3% of its NHS bridge area in poor condition. When this value exceeds 10%, FHWA requires MassDOT to provide a minimum obligation of Federal funds each year to achieving the benchmark.

MassDOT's goal is to have no more than 8% of bridges in poor condition.

MassDOT does not allow any unsafe bridges to remain in service. Bridges in poor condition may be repaired, weight-restricted, shored with temporary supports, or closed to traffic.

In the past decade, Massachusetts has seen:

- A 27% increase in bridge closures
- A 134% increase in bridge shorings
- A 4% increase in weight postings

Approximately 50% of state maintenance expenditures are on reactive bridge repairs.

BRIDGE PROGRAM

PERFORMANCE

Over the past 10 years, MassDOT has accrued an average of over $1 billion per year in bridge backlog.

To reach a state-of-good-repair MassDOT must replace and rehabilitate at a pace that outpace deterioration, with a continuing emphasis on preservation.

Massachusetts is a national leader in bridge construction. Between 2008 and 2017, the Accelerated Bridge Program (ABP) provided $3 billion to pilot and mainstream innovative design, procurement, and construction methodologies that have since been adopted nationally.

The Bipartisan Infrastructure Law and State-level Next Generation Bridge Financing Program have provided $2.8 billion for this decade. **Accounting for rising prices, this will accomplish far less than the $3 billion in the ABP.**

MassDOT has implemented a two-part strategy for BIL and Next-Gen Bridge funds:

- High-priority bridge replacements and rehabilitations to reduce the backlog of poor bridges
- Expanded preservation program to prevent bridges from falling into poor condition

With current construction costs, MassDOT requires a sustained $1 billion annual bridge program for 7-10 years.

AGENCY GOALS

- [x] Safety
- [x] Reliability
- [ ] Supporting Clean Transportation
- [ ] Destination Connectivity
- [x] Resiliency
- [ ] Travel Experience

PROJECTS

In **Newton and Weston**, MassDOT is replacing 8 bridges at the I-90/I-95 interchange, including the Turnpike's crossing of the Charles River. MassDOT identified these bridges as reaching the end of their useful life or as needing rehabilitation to extend it.

Of the 8 bridges, 5 will be replaced, 1 will be rehabilitated, and 2 will have their superstructure replaced. Though primarily a bridge project, the project will make the interchange safer by extending the distance available to merge and eliminating conflicting traffic movements at multiple locations.

In **New Bedford and Fairhaven,** MassDOT **does not have the resources to reconstruct** the movable span "swinging bridge" that carries US-6 across the Acushnet River. Opened in 1903, the bridge has become functionally obsolete, with long opening times that delay travel and a low clearance that requires frequent opening.

MassDOT has conceptualized a vertical lift bridge that will, among other advantages, facilitate New Bedford's role as a wind power hub.

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2024 Asset Management Update

PAVEMENT

WHY INVEST IN PAVEMENT

MassDOT **owns, inspects, and maintains roadways** central to the **movement of people and goods**

MassDOT's **roads are used** by **cars, trucks, buses, bicycles** and **pedestrians**

Well maintained pavements are **safer, reduce vehicle operating costs, directly support the economy,** and **are less costly** in the long term

ACTIVITIES

MassDOT manages the condition of nearly 75% of the National Highway System (NHS) in Massachusetts through the Interstate and Non-Interstate Pavement Programs.

Not only do these projects primarily target pavement conditions, but also incorporate guardrail repairs, stormwater improvements, vegetation maintenances, pavement marking upgrades, and the maintenance of existing bicycle and pedestrian accommodations.

State Fiscal Year 2025 also marks the fourth year of the Municipal Pavement Program, with 76 projects completed to-date in communities across the Commonwealth and well over 300 lane-miles preserved.

INVENTORY

MassDOT owns **9,526** out of 76,829 lane-miles of **public roads**

MassDOT owns **7,369** out of 10,713 lane-miles of the **National Highway System**

MassDOT owns **all 3,204** lane-miles of **Interstate**

Nearly all the remainder is owned by municipalities.

NEED

The Interstate and Non-Interstate portions of the road network are treated as two separate networks when tracking pavement condition.

Interstates (2024)

82.2% in good condition, down from 90.7% in 2021. **MassDOT's goal is 95%.**

2.5% in poor condition, up from 1.2% in 2021. **MassDOT's goal is less than 1%.**

Non-Interstates (2024)

65.2% in good condition, down from 70.2% in 2021. **MassDOT's goal is 75%.**

13.1% in poor condition, up from 9.9% in 2021. **MassDOT's goal is less than 5%.**

Pavement program budgets have not kept pace with increased construction costs. We have successfully utilized lower-cost treatments to maximize efficacy of current funds, but a growing backlog of roadway deterioration is anticipated should funding levels remain static.

An increase of 25% ($50 million annually) over the 2025-2029 CIP would achieve MassDOT's goals for pavement condition.

AGENCY GOALS

- [x] Safety
- [x] Reliability
- [ ] Supporting Clean Transportation
- [x] Destination Connectivity
- [ ] Resiliency
- [x] Travel Experience

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2024 Asset Management Update

INTERSECTIONS

WHY INVEST IN AN INTERSECTION IMPROVEMENTS PROGRAM

MassDOT's primary concern at intersections is **eliminating** fatalities and serious injuries

The majority of the **top crash locations** in Massachusetts are **at intersections**

Many Massachusetts **intersections** have **outdated designs** and **operate inefficiently**

New, innovative **intersection designs** can **improve safety** and **efficiency for all users**

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ACTIVITIES

MassDOT's FIRST PRIORITY in addressing intersections is SAFETY.

The Top 200 Crash Cluster list is updated annually to identify intersections with the greatest safety needs.

We conduct Roadway Safety Audits at high-crash intersections to identify potential safety issues and opportunities for safety improvements.

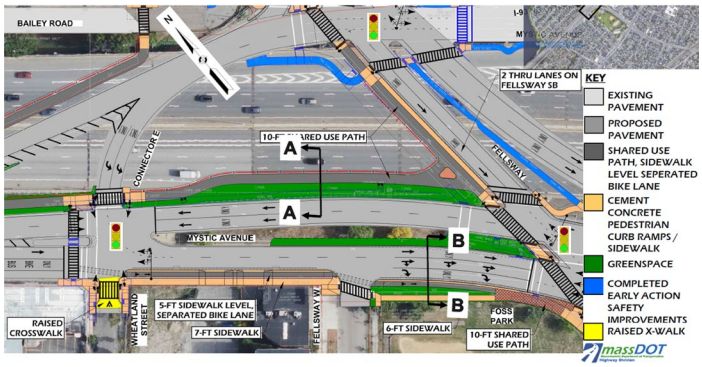
Top 200 locations are evaluated annually to ensure that improvements are made to the highest priority intersections.

We conduct Intersection Control Evaluations (ICEs) to ensure safety as one of the key factors in intersection control decisions, resulting in safer, more cost-effective solutions.

INVESTMENT

In this year's Capital Investment Plan, **MassDOT will spend $326 million on the Intersection Improvements program – this only allows for the full reconstruction of 15 intersections.**

PROFILE



In **Somerville**, we are improving a roadway system with two Top 200 intersections (#142 and #154), both of which are crash clusters specifically for bicycles and pedestrians.

To do this, we are removing excessive travel lanes, adding bike lanes and pedestrian facilities, and redoing signals.

AGENCY GOALS

- [x] Safety
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- [ ] Resiliency
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2024 Asset Management Update

MEGA PROJECTS

WHY INVEST IN MEGA PROJECTS

Much of Massachusetts' highway infrastructure was **designed and built** in a **different era**

Thinking big and **comprehensive** allows MassDOT to be truly **transformative in communities**

MassDOT cannot build its way out of congestion, but it can make **key chokepoints more efficient and safe**

Placing a dedicated focus on **Mega Projects** ensures that **generational projects are advanced**

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INVESTMENT

Mega Projects are generational investments with an impact that is felt across the Commonwealth.

Currently unfunded Mega Projects include:

Tobin Bridge Replacement
($3 billion)

Storrow Drive Tunnel
($1 billion)

I-91 Springfield Viaduct
($1.5 billion)

93/95 Canton Interchange
($0.5 billion)

93/95 Woburn Interchange
($1 billion)

Concord Rotary
($0.5 billion)

TOBIN BRIDGE REPLACEMENT

The Tobin Bridge carries US-1 over the Mystic River, directly connects **Boston and Chelsea**, and provides connectivity to the regional transportation network, including key MBTA bus routes. It is regularly congested in peak periods and operates at or near capacity.

In order to be ready when the time comes for the structure's replacement, we have initiated a strategic planning study that will recommend what type of structure should replace it.

The study will include robust public engagement and an initial environmental assessment and consideration of navigable waterways and port areas.

AGENCY GOALS

- [x] Safety
- [x] Reliability
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- [x] Resiliency
- [x] Travel Experience

93/95 WOBURN

In **Woburn**, the I-93/I-95 Interchange is a heavily-congested, high-volume bottleneck. Built as a cloverleaf, it has insufficient acceleration and deceleration lanes, a layout that encourages weaving and decreases safety.

MassDOT has studied augmenting or replacing the cloverleaf with a safer and more efficient modern concept. We are investing in targeted improvements in the meantime.

SPRINGFIELD VIADUCT

In **Springfield**, the I-91 Viaduct sits between Downtown Springfield and the Connecticut River. MassDOT replaced the viaduct's deck in the past decade, but the structure beneath remains in poor condition and is costly to maintain.

MassDOT commissioned the I-91 Viaduct Study, which recommended substantial rehabilitation of the superstructure and substructure of the viaduct, as well as substantial traffic and safety improvements for the "Longmeadow Curve."

93/95 CANTON

In **Canton, Westwood, and Dedham**, the I-93/I-95 Interchange and adjacent infrastructure is congested and operationally deficient. Intended to be a complete cloverleaf with the unbuilt Southwest Expressway, the tightly-curved and sloping ramp that carries the mainline of I-95 northbound congests traffic and is a safety hazard.

MassDOT has studied replacing the incomplete cloverleaf with a safer and more efficient concept.

CONCORD ROTARY

In **Concord**, Route 2 uses an inefficient and unsafe high-speed rotary concept to connect with West Concord, Acton, and Massachusetts Correctional Institution Concord. The Rotary is a bottleneck and a source of daily congestion.

The recent announcement of the closure of MCI Concord and the potential for redeveloping that property have reinvigorated efforts to replace the Rotary with a safer and more efficient modern concept, which may involve grade separation.

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2024 Asset Management Update

FACILITIES

WHY INVEST IN A HIGHWAY FACILITIES PROGRAM

MassDOT's **highway facilities** enable work (e.g., maintenance, snow and ice activities) on all our critical assets

Many of our **depots and administration buildings are antiquated** and **in need of repair or replacement**

MassDOT has transitioned to **hybrid work** and has **employees spread across the Commonwealth**

MassDOT is seeking to **upgrade facilities** to **allow more types of staff to work from more locations**

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INVESTMENT

In this year's Capital Investment Plan, **MassDOT will spend $38 million per year on the Highway Facilities Program.**

Types of facilities addressed will include:

- Administration buildings
- Salt sheds
- Maintenance depots
- Materials research lab for pavement

We estimate an unfunded need of $700 million to fully modernize all these facilities.

PROJECTS

MassDOT has budgeted funding in the 2025-2029 Capital Investment Plan to replace two of its six District administration buildings:

DISTRICT 4 District 4 in Arlington

DISTRICT 5 District 5 in Taunton

These buildings would follow the example of the District 3 administration building in Worcester, completed in 2022. They will provide more comfortable, energy efficient, and technologically up-to-date workspaces for a wide range of MassDOT staff, as well as modern garage space for segments of our maintenance fleet.

We are also planning to invest in our District 1 administration building in Lenox and our District 2 administration building in Northampton.

AGENCY GOALS

- Safety
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MASSDOT HIGHWAY DIVISION
2024 Asset Management Update

ELECTRIFICATION

WHY INVEST IN FLEET ELECTRIFICATION

Massachusetts has mandated that **100% of new passenger vehicles sold** must be **zero-emission by 2035**

37% of Massachusetts emissions are estimated to be **from transportation**

MassDOT has the **largest fleet of vehicles** of **any state agency**

MassDOT has an **obligation to be a trailblazer** in **reducing and eliminating emissions**

NEED

Replacing the Highway Division's light vehicle fleet (cars and pickup trucks) with electric vehicles will cost MassDOT **approximately $150 million.**

MassDOT owns 1,400 cars and pickup trucks.

Following our current replacement plan, **we estimate $25 million in vehicle expenses beyond the current budget**.

An electric vehicle costs $18,000 more than a gasoline-powered equivalent.

MassDOT has 125 depots where vehicles are based. Charging infrastructure would cost approximately **$1 million per depot**.

We are studying how our vehicles are used to make sure we electrify efficiently.

CHALLENGES

Electric vehicles are a new product, and options are limited for MassDOT.

- Small but growing number of cars and pickups
- No viable large trucks
- No viable snow and ice equipment

Infrastructure needs to be built entirely from scratch at each of 125 depots – this includes not only chargers, but also strengthening electrical supply to the sites.

MassDOT must train or acquire staff to maintain electric vehicles, a new technology generally for which expert mechanics are few.

MassDOT deploys vehicles in response to emergencies or unplanned events – challenging to ensure vehicles are charged when needed.

AGENCY GOALS

- [ ] Safety
- [ ] Reliability
- [x] Supporting Clean Transportation
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- [x] Resiliency
- [ ] Travel Experience

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MASSDOT HIGHWAY DIVISION
2024 Asset Management Update

MUNICIPAL INFRASTRUCTURE

WHY INVEST IN MUNICIPAL INFRASTRUCTURE

Municipalities **own 75% of public road mileage** in Massachusetts, including **26% of the NHS**

Municipalities **own 31% of bridges** in Massachusetts and **10% of the total bridge deck area**

There is **$1B of unfunded Municipally-initiated projects** in the **MassDOT project management system**

Municipalities are a **key partner** in **ensuring a safe, efficient transportation network** for all users

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FORMULA FUNDS

MassDOT administers the Chapter 90 Program, which provides an annual funding source to municipalities for transportation infrastructure investments. Created in the 1970s, the program dollars are distributed to each community via a formula of mileage, population, and employment. The program's broad eligibility criteria allow communities to assess their own unique transportation needs and investment program dollars accordingly. For many municipalities, Chapter 90 is the primary source of funding for transportation improvements.

The program has historically been funded at **$200 million per year**, with additional funding provided through supplemental programs. For example, the Fair Share Act of 2023 provided **$100 million in supplemental funding** to be spent in accordance with the Chapter 90 Program guidelines.

Communities have also recently benefited from formula funds provided via the Rural Roadway Program, which authorized **$25 million in funding in 2023** to support the construction and reconstruction of municipal ways. Per the authorizing legislation, these funds were distributed to all communities using a formula based on local road mileage, municipal population, and rurality. Rural communities in particularly often struggle to maintain their infrastructure, and so a program that prioritized funding for rural communities was very well received across the Commonwealth.

STATE DISCRETIONARY GRANTS

MassDOT provides technical assistance and funding for local investments through grant programs. These include:

- Complete Streets
- Municipal Pavement
- Shared Streets and Spaces
- Local Bottleneck Reduction
- Municipal Small Bridge

MassDOT has launched Grant Central, a revolutionary online portal that provides a single, convenient location for all MassDOT Highway Division grant program activities.

AGENCY GOALS

- Safety
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MHS

WHY INVEST IN THE METROPOLITAN HIGHWAY SYSTEM

The Metropolitan Highway System (MHS) includes **I-90** and **I-93 inside of Route 128**

The MHS includes **227 bridges** and tunnels, including those **built during the "Big Dig"**

The MHS network includes almost **250 miles of roadway** critical to **moving people and goods in and through Boston**

The MHS makes **critical connections for commerce**, including **access to Logan Airport**

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INVESTMENT

Approximately two-thirds of the MHS is tolled facilities. **By law, tolls can only be used for the facility on which they are collected.**

In the 2025-2029 CIP, 100 projects are funded with just over **$1 billion** in toll funds over five years. These MHS projects also receive funds from other sources, so these projects represent an investment of **$266 million** per year in MHS infrastructure.

Many of these investments focus on maintaining critical safety systems within the MHS tunnels, such as ventilation, firefighting, pumping, and lighting.

We estimate that we would need $750 million in additional funding to fully modernize the MHS.

PROJECT PROFILE

In **Boston**, MassDOT has begun the task of rehabilitating the Sumner and Callahan Tunnels that connect Downtown Boston with East Boston, Logan Airport, and the North Shore.

We started with the Sumner Tunnel, which carries traffic toward Boston. Using closures in the Summers of 2023 and 2024 to expedite construction, surfaces and systems of this nearly 100-year-old tunnel have been replaced and repaired to meet current design and safety standards. **The project will extend the life of the tunnel for another 75 years at a cost of $160 million.**

The Callahan Tunnel that carries traffic in the opposite direction requires a similar project, but **at this time, MassDOT is unable to fund rehabilitation of the Callahan Tunnel.**

AGENCY GOALS

- Safety
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2024 Asset Management Update

RESILIENCY

WHY INVEST IN THE RESILIENCY IMPROVEMENTS PROGRAM

Massachusetts will increasingly **feel the effects** of **human-caused climate change**

Increased rainfall will place **inland assets at risk**, such as culverts, bridges, and roadways next to rivers

Rising sea levels and **increased storm severity** will put **coastal infrastructure at risk** of flooding

Transportation infrastructure in vulnerable areas often serve as **critical evacuation routes**

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INVESTMENT

Through the 2025-2029 Capital Investment Program (CIP), MassDOT will invest $82 million in a new resiliency program to protect our infrastructure from natural hazards. **Across the whole CIP, more than 60% of the projects will improve resiliency of our assets.**

MassDOT owns nearly 6,000 culverts, of which 1,200 are believed to be vulnerable to extreme weather. **Mitigating these culverts is estimated to cost more than $2 billion**.

There are over 125,000 catch basins for stormwater along state-owned roadways that form part of our drainage system. **MassDOT has identified a $20 million per year funding gap to inspect, clean, and repair this system.** Doing so will improve water quality and make our roadways more resilient to severe storms.

RIP

In 2024, MassDOT Highway has developed its Resilience Improvement Plan (RIP) as required by the Bipartisan Infrastructure Law.

The plan describes completed, ongoing, and future resiliency initiatives at MassDOT, including:

- Conducting climate vulnerability assessments
- Developing adaptation training and guidance
- Enhancing resiliency in screening projects
- Updating design standards for resilience
- Prioritizing resilience improvements
- Creating a Tunnel Flood Mitigation Program
- Updating Emergency Response Plans

The RIP also describes how MassDOT has integrated resiliency into the rest of its planning processes and how it will proceed from here.

AGENCY GOALS

- [x] Safety
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