

**MassDOT Highway Division**  
**Design and Review Services for Highway and Bridge**  
**Projects, Statewide – Contract No. 115770**  
**Assignment 17**  
**Cape Cod Canal Bridges Program (608020)**

October 16, 2024



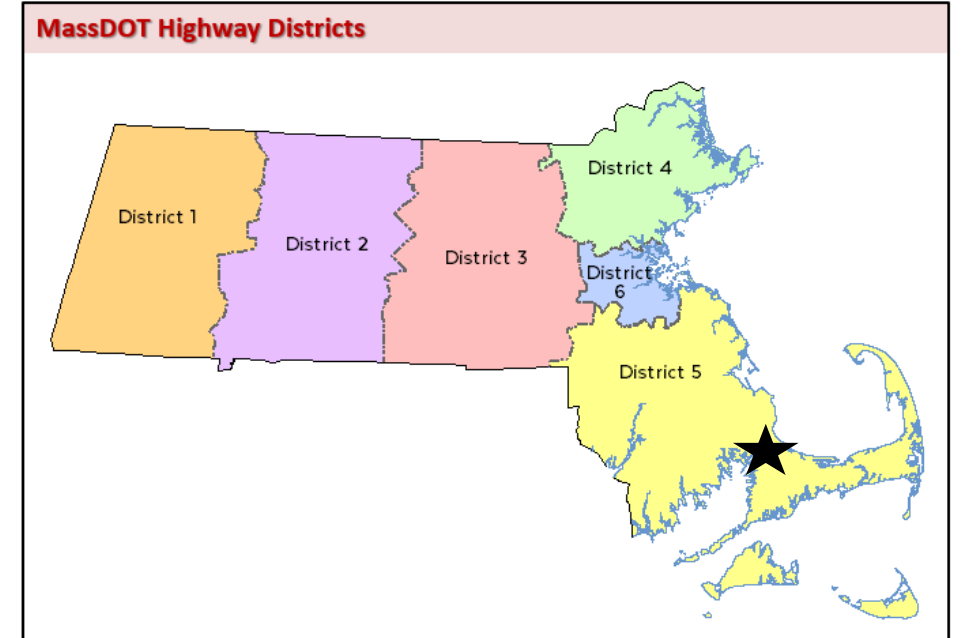
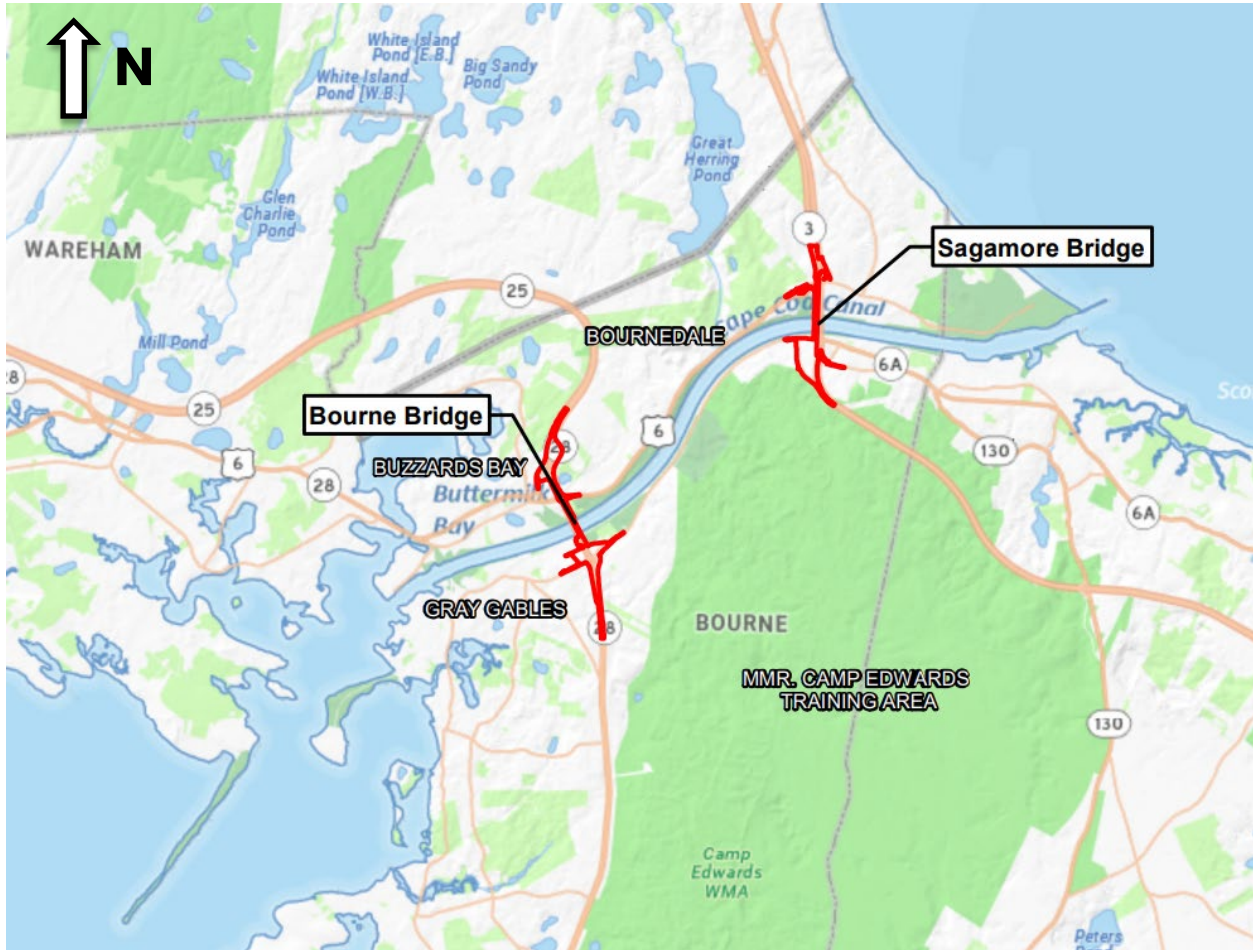
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# Project Location

## Cape Cod Bridges Program – Town of Bourne

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# Overview

## Cape Cod Bridges Program – Purpose and Scope

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### Program Purpose

- The purpose of the Cape Cod Bridges Program is to improve cross-canal mobility and accessibility between Cape Cod and mainland Massachusetts for all road users and to address the increasing maintenance needs and functional obsolescence of the aging Cape Cod Canal highway bridges.

### Program Scope

- Replacement of the Bourne and Sagamore Bridges
- Improvements to the bridge approach roadways
- Multimodal improvements including Shared Use Paths

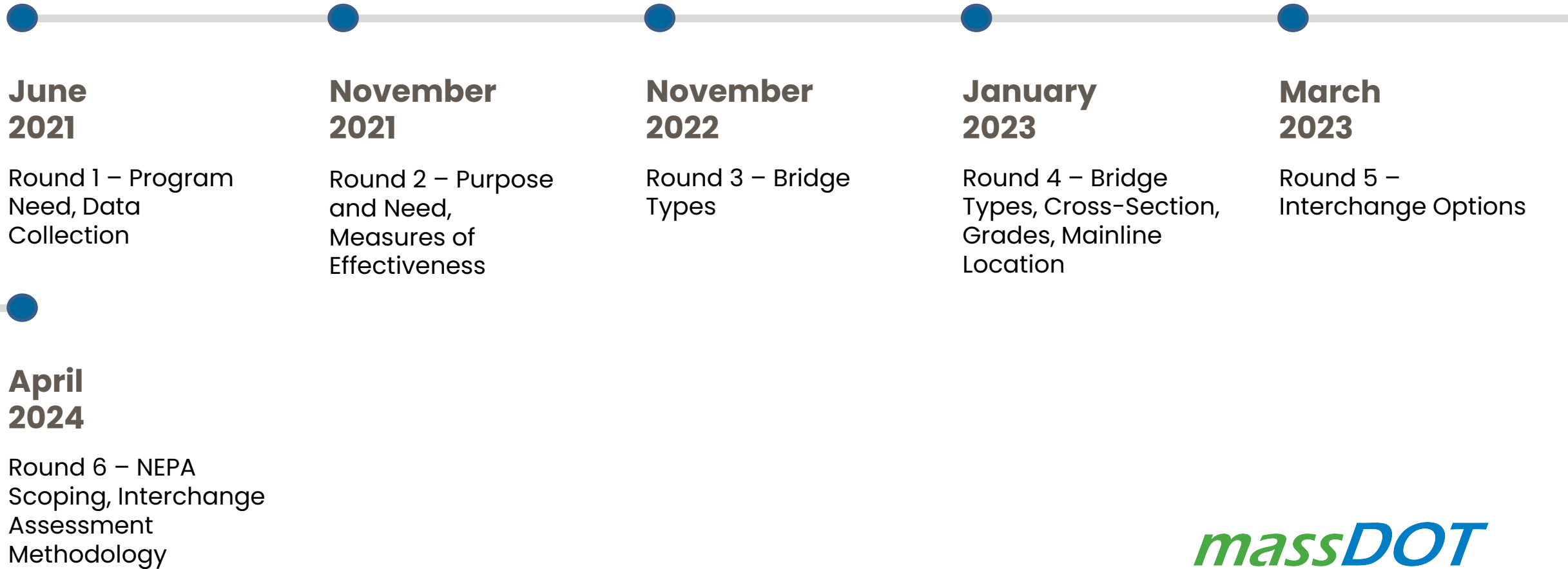
### Estimated Program Cost

- \$4.5 Billion

# Overview

## Cape Cod Bridges Program – Major Milestones

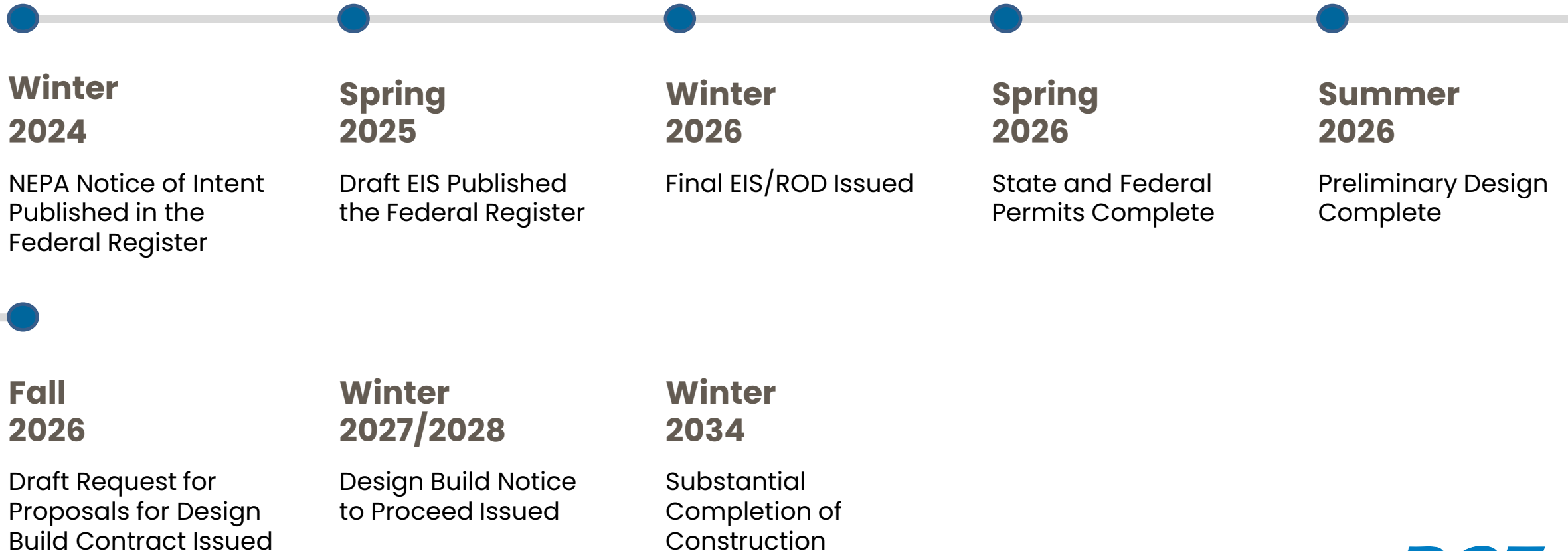
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# Overview

## Cape Cod Bridges Program – Major Milestones

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# Procurement

## Cape Cod Bridges Program – Program Management and Project Development Procurement Process

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- Qualification Based Selection Process
- Request for Proposals sent to Shortlisted Firms on July 29, 2019
- Written proposals received on September 2, 2019
- Two rounds of oral interviews
- HNTB Team selected on November 1, 2019. On December 12, 2019, a Notice to Proceed was issued to HNTB Corporation under Contract 115770.

### Services Provided to Date

- Project Development Program Management
- Federal Grant Preparation
- Engineering Analysis to Support Key Decisions
- Public Involvement
- Early Environmental Coordination and Documentation



# Amendment to Scope of Services

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## New Scope of Services

- Development of Procurement Documents/Base Technical Concept
- Environmental
- Public Involvement
- Civil Design
- Right of Way
- Geotechnical Design
- Structural Design



# Budget

## Cape Cod Bridges Program – Budget

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### Budget

Expense	Preliminary Engineering	Procurement Phase	Totals
Salary Costs	\$15,397,674.14	\$1,879,831.75	\$17,277,505.89
Indirect Costs (135.38%)	\$20,845,371.25	\$2,544,916.22	\$23,390,287.47
Net Fee (10%)	\$3,624,304.54	\$442,474.80	\$4,066,779.34
Total Limiting Fee	\$39,867,349.93	\$4,867,222.77	\$44,734,572.70
Direct Costs	\$41,065,407.75	\$1,942,545.03	\$43,007,952.78
Maximum Amount	\$80,932,757.68	\$6,809,767.80	\$87,742,525.48
Maximum Obligation			<b>\$87,742,525.48</b>

### Minority Business Enterprises/Women Business Enterprises (M/WBE)

- The M/WBE Goal for Contract 115770 is 14%.
- This Amendment includes eight M/WBE Certified firms representing 14.9% of the work.

\*Direct Costs include Sub-Consultants, Other Services and Expenses

# Request of the MassDOT Board of Directors

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The Proposal was reviewed by engineers in the Major Projects, Bridge, Traffic, Environmental, Highway Design and Right of Way Sections. The final scope and fee proposal reflects comments and discussions that occurred between the Highway Division the consultant team. This final proposal was found to be reasonable and is recommended to be awarded.

## **Request of the MassDOT Board of Directors**

Staff requests that the MassDOT Board of Directors authorize the Secretary of the Massachusetts Department of Transportation, or their designee, to amend Contract 115770 with HNTB Corporation in the amount of \$87,742,525.48, for program management, and engineering services related to the Cape Cod Bridges Program.

# Thank You



# Appendix

# Overview

## Cape Cod Bridges Program – Cost and Schedule

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### Program Cost

- Program costs are based on the P70\* amount from the May 2023, Cost and Schedule Risk Assessment
- Sagamore Bridge Project\*\*      \$2.13 Billion
- Bourne Bridge Project              \$2.37 Billion
- Program Total                        **\$4.50 Billion**

### Program Schedule

- Program to be delivered in two Phases
- Phase 1 – Sagamore Bridge – Design-Build Draft RFP issued in September 2026
- Phase 2 – Bourne Bridge – Design-Build Draft RFP issued in September 2027
- Each phase may be comprised of multiple contract packages
- The Highway Division is exploring potential options for early contracts (utility relocations, test shafts, tree removal, etc.)

\*There is a 70% chance the final cost will be lower than this amount and a 30% it will be higher.

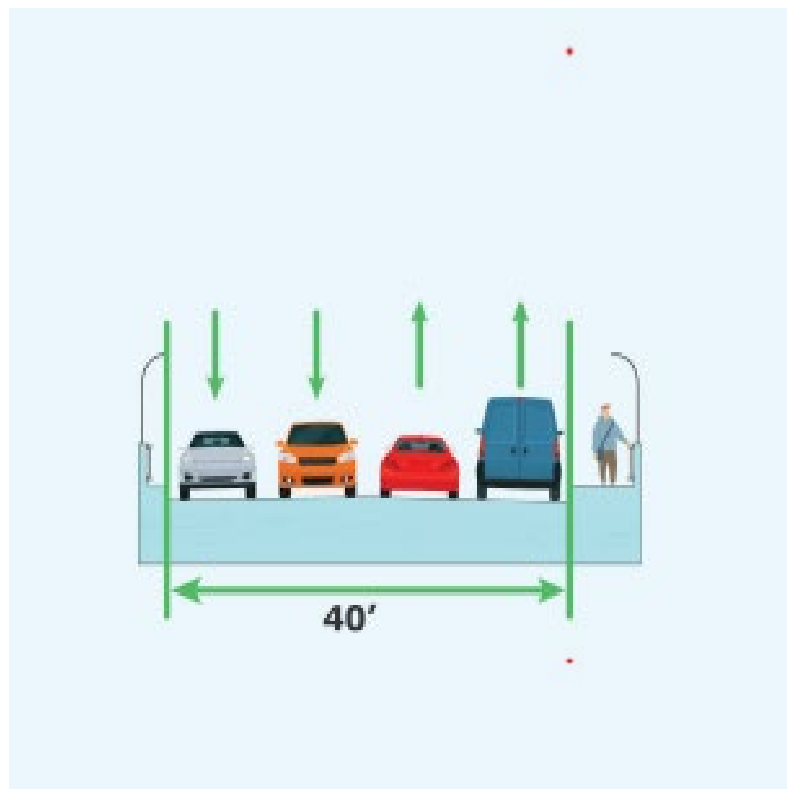
\*\*Includes gas line relocation costs for both bridges, based on Enbridge estimate from April 14, 2022. The Highway Division is currently evaluating more recent scope, cost and schedule information provided by Enbridge.

# Project Scope

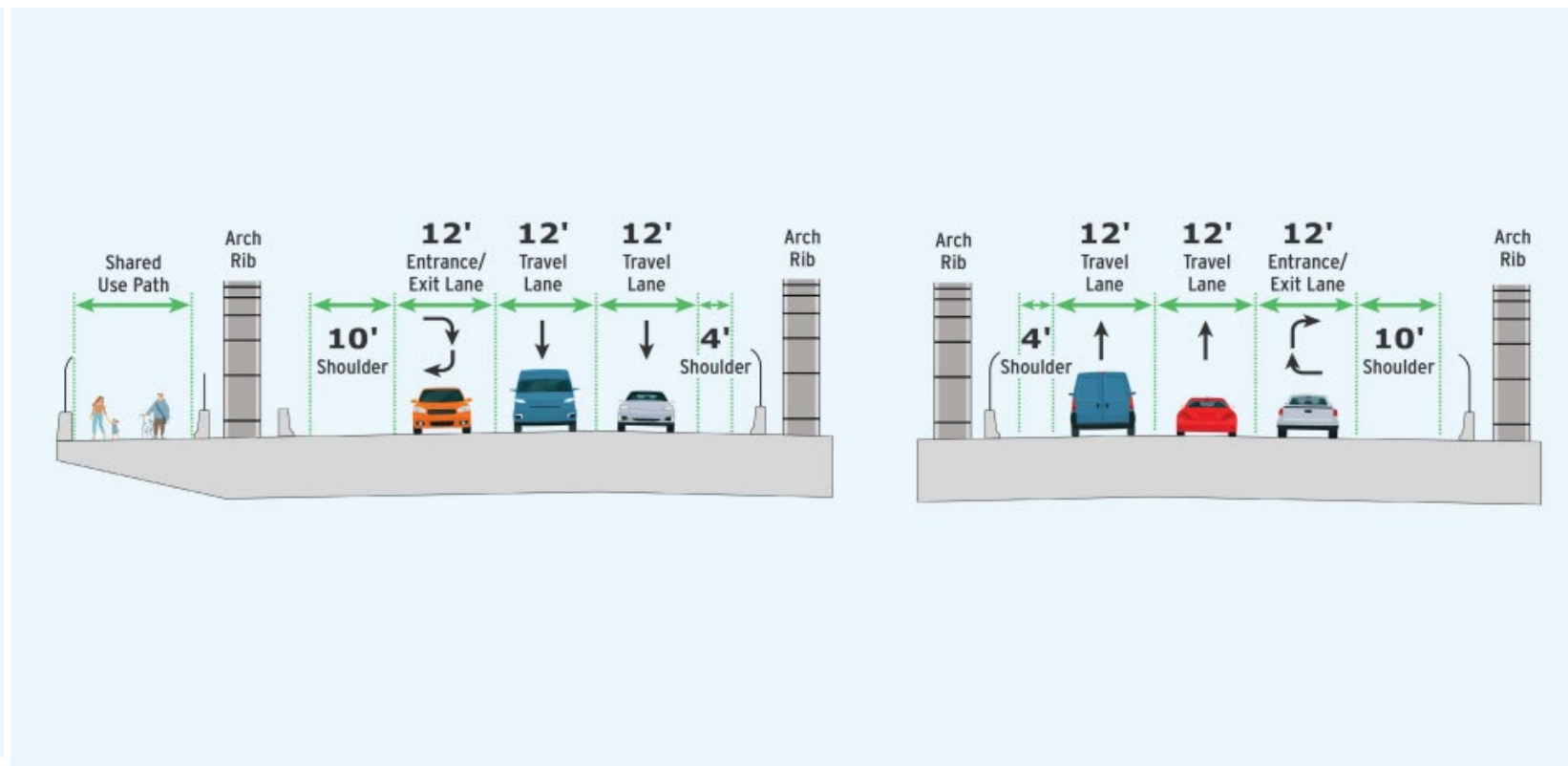
Existing and Proposed Bridge Cross Section (applies to both bridges)

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## Existing Cross Section



## Proposed Cross Section



Images shown are  
not to scale

# Project Scope

## Bourne Interchanges

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### Bourne North



- Bourne North interchange to include two new direct connection ramps: a southbound off ramp and a northbound on ramp.
- The Bourne Rotary will be reconstructed to a simple diamond interchange.
- Shared Use Path-SUP throughout roadway network, including connections from Bridge to Canal Service Road

### Bourne South

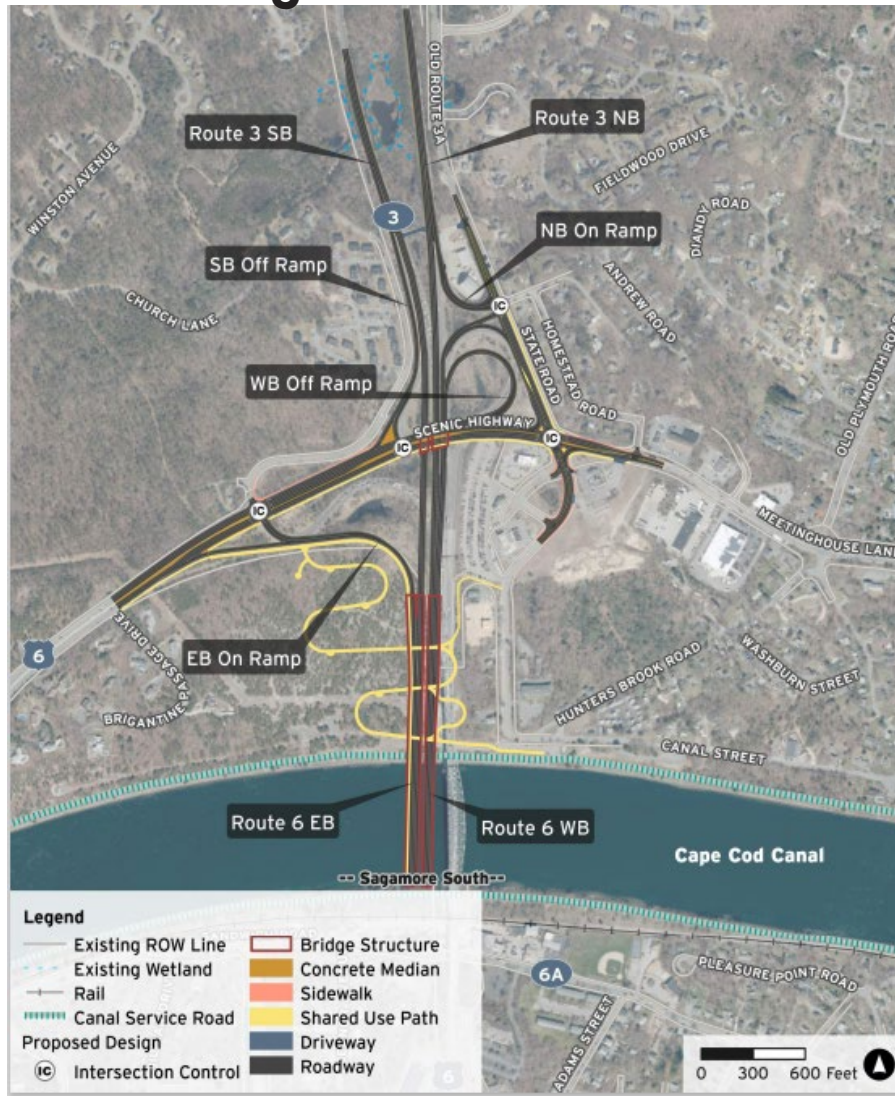


# Project Scope

## Sagamore Interchanges

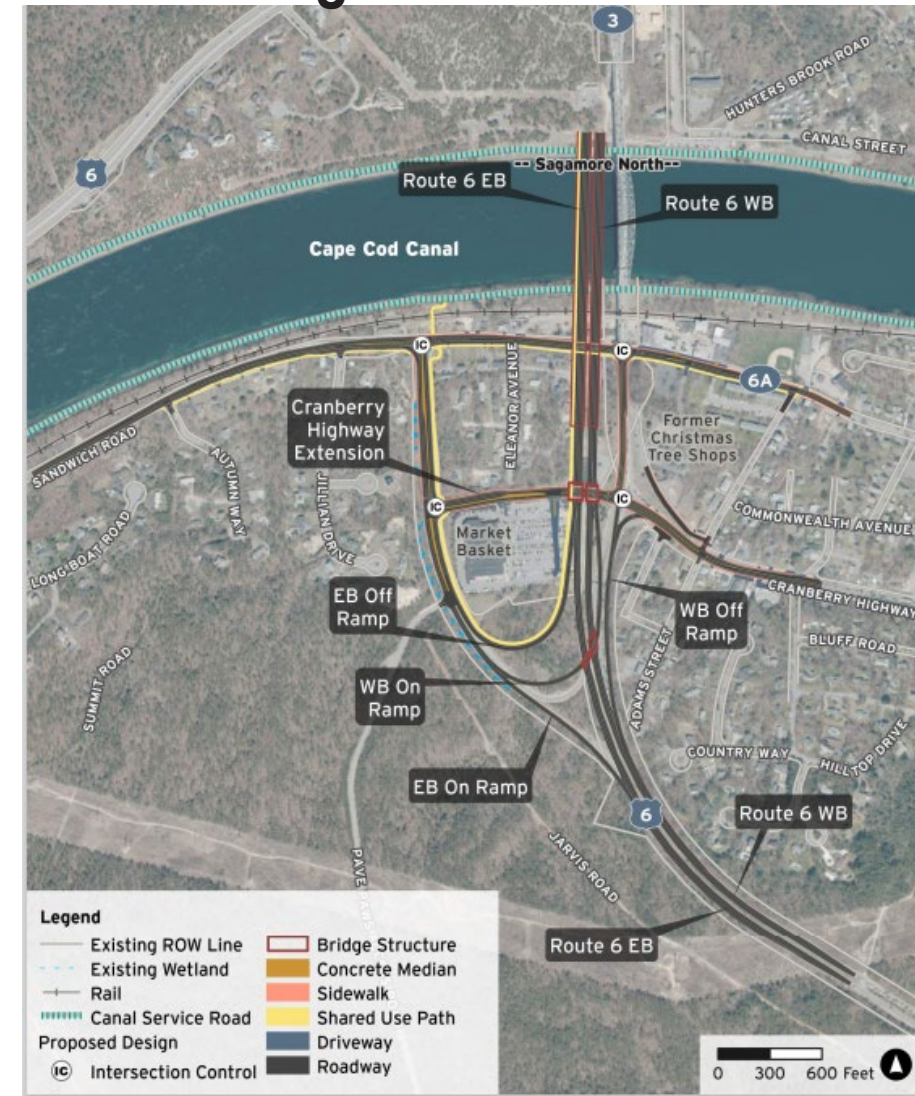
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### Sagamore North



- Sagamore North interchange to include direct connection to State Road
- Sagamore South interchange to include cranberry highway extension and Sandwich Road Connector
- Share Use Path-SUP throughout roadway network, including connections from Bridge to Canal Service Road

### Sagamore South



# Capital Programs Committee Q and A

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**Q1.** Is Sagamore Bridge Replacement going to be the same bridge type or has the design changed?

**A1.** After having conducted several Public Meetings and Advisory group discussions regarding alternative bridge types that would have met the necessary design parameters there is unified support for a Network Tied Arch to replace the existing arch bridges. The network tied arch is similar to the replacement that MassDOT Highway constructed for the Whittier Bridge Replacement over the Merrimack River in Amesbury.

**Q.2** What is the lifespan of the new bridges?

**A2.** The design lifespan of the new bridges is 75 years

**Q3.** Will the vehicular volume be the same?

**A3.** The bridges are being designed to accommodate the same vehicular volumes but with an additional auxiliary lane to account for access and egress turn lanes to and from the bridges for both northbound and southbound travel movements. There will be two bridges constructed each with 2 through travel lanes and 1 auxiliary lane for ramp turning lanes.

**Q4.** Are there any land takings necessary for this project?

**A4.** There will be private property acquisitions required for the project, specifically for the Sagamore Bridge Replacement. The majority of acquisitions and relocations will occur on the Cape side on the westerly side adjacent to the Eleanor Drive and Market Basket plaza properties.

# Capital Programs Committee Q and A (cont.)

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**Q5.** This project is of immense scope. Is an amendment like this typical rather than included in the original proposal?

**A5.** It's not unusual for projects of this size and complexity for MassDOT to amend the original scopes of work once the preliminary investigations and decisions have been made for the range of alternatives, project needs and goals have been refined for the environmental documents, permitting and development of the Base Technical Concept that will be incorporated into the Design Build procurement documents. What is different for this project is the program costs being unusually large at \$4.5B and therefore the preliminary design costs being larger relative to the construction costs.

**Q6.** Was Design/Build project delivery always part of the project?

**A6.** MassDOT has anticipated that the best alternative procurement delivery would be utilizing Design Build for this project and it is consistent with what the Army Corps of Engineers (ACE) had considered early on with the discussions that MassDOT and ACE had when executing the program MOA. Design Build typically is the best method to use to attract industry ingenuity, schedule efficiencies and experience. MassDOT conducted an Industry Day in June 2024 and attracted interested national design and contracting parties and it was clear their recommendation was for MassDOT to employ a design build procurement approach.

# Capital Programs Committee Q and A (cont.)

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**Q7.** While Design/Build is most responsible way to save time on the schedule and the best technical approach, are you concerned about cost escalation?

**A7.** Yes, cost estimating and pricing escalation is a concern for MassDOT and our Federal Highway and ACE leadership which is why in 2023, FHWA conducted a CSRA to evaluate and verify MassDOT's approach to risk based pricing. An independent team of professionals convened by FHWA evaluated the schedule, pricing, risks, and approach to construction and ultimately agreed that the \$4.5B estimate is an accurate reflection of the work involved and probable budget.

**Q8.** By doing the design and permitting work in this phase for the whole program, do you feel confident that it sets the agency up better for pursuing federal funds for Bourne Bridge?

**A8.** Yes we feel this is the best approach, although we did recently receive the news that MassDOT was unsuccessful in its latest grant application for Bourne, we still feel that the feedback we receive from the de-briefings is valuable for the project development procurement documents and future grant application opportunities.

**Q9.** Are you anticipating any other mitigation measures you will employ during construction process besides building the bridges offline as much as possible?

**A9.** Yes, consistent with other major projects that MassDOT Highway has successfully managed and completed recently there will be a complete assessment of potential mitigation items to address local concerns related to traffic management and ensuring that there is access to the bridge during all phases of construction especially during the summer season when there is a significant spike in volumes to and from the Cape. It may influence some of our engineering decisions for the bridges and the traffic interchange concepts.

# Capital Programs Committee Q and A (cont.)

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**Q10.** Any major utilities concern in this area?

**A10.** people, and this is consistent with other recently completed projects that require utility relocations prior to starting work. For this project there is an independent contract running in parallel with our project to relocate high pressure gas transmission lines. In project, there are National Grid gas distribution services, electric and communication services we are coordinating for relocation.

**Q11.** What is the approach for noise mitigation, or will that come up in the process of project development?

**A11.** Yes, consistent with other major projects that MassDOT Highway has successfully managed and completed recently there will be a complete assessment of potential noise, dust, and air quality impacts for the project and it will be included in the environmental documents that are released to the public for comment in the Spring of 2025. It is not only to identify impacts to the people but we are also taking into consideration the aquatic life in the canal and wildlife in the project area. It may influence some of our engineering decisions for bridges and the foundation elements.