



Cape Cod Bridges Program

Bourne, Massachusetts

Draft Environmental Impact Statement, Executive Summary

SUBMITTED TO:

Federal Highway Administration
Massachusetts Division
220 Binney Street, 9th Floor
Cambridge, MA 02142

PROPONENT:

The Massachusetts Department of
Transportation
Highway Division
10 Park Plaza
Boston, MA 02116

Submitted October 2025

massDOT
Massachusetts Department of Transportation

Table of Contents

1	Introduction	ES-1
2	What is the Cape Cod Bridges Program?.....	ES-1
3	Who is leading the NEPA review for the Program?	ES-3
4	How have the public and agencies been involved?	ES-3
	Public Outreach and Engagement	ES-3
	Cooperating Agencies	ES-4
	Advisory Group	ES-5
5	What is the format of the DEIS?	ES-5
6	What prior studies were used to inform the planning and development of the DEIS?	ES-6
	USACE Cape Cod Canal Highway Bridges Major Rehabilitation Evaluation	ES-6
	MassDOT Cape Cod Canal Transportation Study.....	ES-7
	Memorandum of Understanding between the USACE and MassDOT regarding Sagamore and Bourne Bridges.....	ES-7
7	What is the purpose and need for the Program?	ES-8
8	What alternatives are evaluated in detail in the DEIS?	ES-9
	No Build Alternative	ES-9
	Build Alternative	ES-10
9	What are the construction plan and schedule for the Build Alternative?.....	ES-13
	Construction Plan.....	ES-13
	Construction Schedule	ES-15
10	What are the potential effects of the Build Alternative and how will adverse effects be mitigated?	ES-15
11	What are the effects of the Build Alternative on Section 4(f) properties?.....	ES-28
12	What authorizations, permits, and approvals will be required?	ES-29
13	What are the next steps in the NEPA process?	ES-31

Figures

Figure ES-1. Bridge Locations and Project Limits ES-2

Figure ES-2. Proposed Bridge Construction Sequencing Approach ES-14

Tables

Table ES-1. Cape Cod Bridges Program Build Alternative..... ES-10

Table ES-2. Summary of Potential Operational Effects and Mitigation..... ES-16

Table ES-3. Summary of Temporary Construction Effects and Mitigation ES-24

Table ES-4. Summary of Effects, Uses, and Proposed Section 4(f) Approval Option ES-28

Table ES-5. List of Required Federal and State Authorizations, Permits, and Approvals ES-29

Exhibits

Exhibit ES-1. Proposed Replacement Bridge: Cape Cod Canal Viewpoint ES-12

Exhibit ES-2. Proposed Replacement Bridge: Driver Viewpoint ES-12

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
DEIS	Draft Environmental Impact Statement
FHWA	Federal Highway Administration
MassDOT	Massachusetts Department of Transportation
MRER/EA	Major Rehabilitation Evaluation Report/Environmental Assessment
NEPA	National Environmental Policy Act
NOI	Notice of Intent
Program	Cape Cod Bridges Program
USACE	U.S. Army Corps of Engineers

1 Introduction

This Executive Summary provides an overview of the Draft Environmental Impact Statement (DEIS) for the Cape Cod Bridges Program (Program). The purpose of the DEIS is to analyze and disclose the anticipated social, economic, and environmental effects of the Program under the National Environmental Policy Act (NEPA). The Executive Summary is not intended to be a substitute for the DEIS. Refer to the DEIS and its appendices for additional information.

2 What is the Cape Cod Bridges Program?

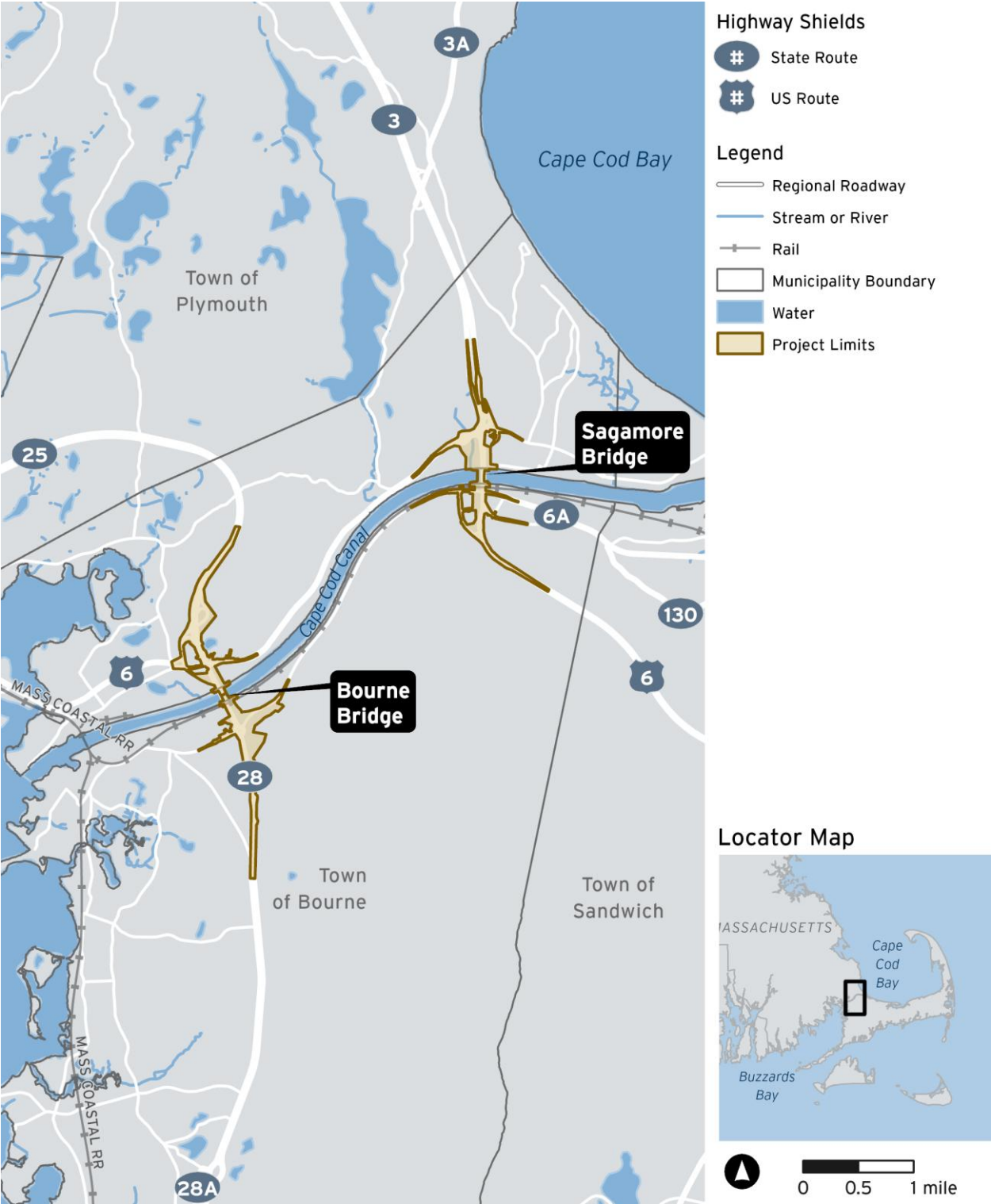
The Cape Cod Bridges Program, proposed by the Massachusetts Department of Transportation (MassDOT) and the Federal Highway Administration (FHWA), in partnership with the U.S. Army Corps of Engineers (USACE), would replace the Sagamore and Bourne Bridges in the town of Bourne, Barnstable County, Massachusetts. Sagamore Bridge carries U.S. Route 6 across Cape Cod Canal, the Massachusetts Coastal Railroad, and Sandwich Road. Bourne Bridge, which is approximately 3.5 miles west of Sagamore Bridge, carries State Route 28 across Cape Cod Canal, Sandwich Road, and the Massachusetts Coastal Railroad.

Sagamore and Bourne Bridges are federally owned and operated and maintained by the USACE as part of the Cape Cod Canal Federal Navigation Project. Cape Cod Canal separates Cape Cod from mainland Massachusetts, with the Sagamore and Bourne Bridges being the only ways for car travel on and off Cape Cod. As the only roadway connections between Cape Cod and the mainland, the bridges are critical assets for the economy of the Cape Cod region and serve as essential routes for daily commuting, truck freight distribution, tourism, and hurricane evacuation off Cape Cod and the Islands (including Martha's Vineyard, Nantucket, and Elizabeth Islands). Both bridges, built between 1933 and 1935, are in deteriorated condition and functionally obsolete as they do not meet current design standards.

Sagamore and Bourne Bridges are the only roadway connections between the mainland and the Cape Cod peninsula, serving 230,000 year-round residents of Barnstable County and millions of annual visitors to the Cape Cod region.

The Program proposes replacing the existing Sagamore and Bourne Bridges with new bridges built to modern design standards, constructing separated pedestrian and bicycle accommodations along the replacement bridges with connections to the local roadway network, and reconfiguring the highway approach networks north and south of Cape Cod Canal to align with the replacement bridges. The Program would be delivered in two phases, with the Sagamore Bridge Project as Phase 1 and the Bourne Bridge Project as Phase 2. [Figure ES-1](#) depicts the approximate Project Limits at Sagamore and Bourne Bridges.

Figure ES-1. Bridge Locations and Project Limits



Source: Massachusetts Department of Transportation, 2025

3 Who is leading the NEPA review for the Program?

FHWA is the Lead Federal Agency for the Program under NEPA based on funding participation through the U.S. Department of Transportation. NEPA requires federal agencies to consider the environmental effects of their proposed actions on the human and natural environment, document these analyses, and make the information available to the public for review and comment before implementing those actions. FHWA determined that the Program is an action that is likely to have a significant impact on the environment, thereby requiring preparation of an EIS under NEPA.

MassDOT, as the recipient of federal funds through the U.S. Department of Transportation, is the local Project Sponsor and Joint Lead Agency with FHWA under NEPA. FHWA, in coordination with MassDOT, issued a Notice of Intent (NOI) to prepare an EIS for the Program in the *Federal Register* on February 29, 2024. As Lead Agencies, FHWA and MassDOT share responsibility for managing the NEPA process, including public involvement, agency coordination, and EIS preparation.

FHWA is the Lead Federal Agency and MassDOT is the local Project Sponsor and Joint Lead Agency under NEPA.



4 How have the public and agencies been involved?

FHWA and MassDOT developed a Public Involvement Plan and an Agency Coordination Plan to guide public and agency outreach and involvement throughout the Program's ongoing NEPA and design development process.

Public Outreach and Engagement

MassDOT uses multiple communication tools and resources to inform the public about the Program and to gather feedback, including (but not limited to) a Program website, a stakeholder database (managed through the Public Involvement Management Application), and social media. The website has been visited over 75,000 times by more than 50,000 different users. The database includes over 5,600 stakeholders.

MassDOT held five rounds of public information meetings between June 2021 and May 2023 to present Program updates, highlight key milestones, and offer the public the opportunity to provide input and feedback on various aspects of the Program, including the preliminary purpose and need; draft measures of effectiveness criteria; analysis of bridge types, deck configurations, mainline alignment locations; and highway interchange approach options under consideration for the replacement bridges.

FHWA initiated the formal NEPA public scoping process for the Program upon publication of an NOI to prepare an EIS in the *Federal Register* on February 29, 2024. The NOI was accompanied by a Supplementary NOI document, which provided additional information on the Program’s purpose and need; alternatives the EIS will consider; expected impacts on the human, natural, and built environments; and a proposed high-level schedule for the decision-making process. The NOI requested public and agency comments regarding the Program’s purpose and need, study alternatives and impacts, and the identification of any relevant information, studies, or analyses of any kind concerning impacts to the quality of the human and natural environment.

MassDOT hosted a virtual public meeting and an in-person open house in the town of Bourne, prior to completing the EIS scoping on May 31, 2024. The virtual public meeting was held on April 25, 2024, where MassDOT provided information on the Program status, funding, scoping of the EIS, and next steps in the NEPA process. Additionally, the virtual public meeting included an opportunity for public comments, questions, and responses. The Open House was held on May 13, 2024, where MassDOT provided an opportunity for the public to review and discuss the design plans developed to date and provide oral and written comments. MassDOT presented its recommended Build Alternative, including the preferred interchange approach options at each replacement bridge crossing, during an in-person open house event in the town of Bourne on November 18, 2024.

Coordination with other agencies also included consideration of related infrastructure needs proposed within and in proximity to the geographic area, such as the relocation of gas pipelines located on the existing bridges. This relocation effort is being reviewed independently under the Federal Energy Regulatory Commission’s NEPA process and is expected to occur prior to any major bridge construction activities.

FHWA and MassDOT have received a range of input from the agencies and the public throughout the development of the Program. No major areas of controversy or unresolved agency issues have been identified during the NEPA process to date. Public and agency feedback has informed key aspects of the Preferred Alternative’s design, including bridge aesthetics, interchange configurations, and multimodal connections. A more detailed summary of public and agency feedback is provided in **Chapter 6, Section 6.4.**

Cooperating Agencies

FHWA invited federal and state agencies having jurisdiction by law (via permitting or other regulatory authority) to be Cooperating Agencies in the development of the EIS for the Program. The Cooperating Agencies include:

- U.S Army Corps of Engineers
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- State Historic Preservation Officer of the Massachusetts Historical Commission
- Massachusetts Executive Office of Energy and Environmental Affairs

- Massachusetts Department of Environmental Protection
- Massachusetts Department of Fish and Game
- Massachusetts Office of Coastal Zone Management

To date, FHWA and MassDOT have hosted six meetings with the Cooperating Agencies. These meetings were to ensure timely participation and agreement from the Cooperating Agencies at important checkpoints in the EIS process, including the Program’s purpose and need, alternatives to be carried forward in the DEIS, permitting schedule, impact assessment methodologies, Preferred Alternative, and preliminary mitigation.

Advisory Group

As part of its agency and public outreach process, MassDOT assembled an Advisory Group that comprises elected officials, local and regional organizations, and other stakeholder interest groups. The Advisory Group provides a platform for MassDOT to communicate with key stakeholders and gather community feedback during the Program development process. To date, MassDOT has hosted six meetings with the Advisory Group. Input and concerns provided by the Advisory Group have been used to inform MassDOT’s decisions throughout Program development.

5 What is the format of the DEIS?

The DEIS is organized into nine chapters, which are supplemented by technical reports and materials, as follows:

- **Chapter 1, Introduction**, provides background information and context for the Program, including the history of Cape Cod Canal and its bridge crossings, past planning studies and decisions that were foundational to Program development and the DEIS, and descriptions of the existing Sagamore and Bourne Bridges and their supporting roadway network. Chapter 1 is supplemented by **Appendix 1**.
- **Chapter 2, Purpose and Need**, explains why the Program is being undertaken and what problems or unsatisfactory conditions it intends to address or improve.
- **Chapter 3, Proposed Action and Alternatives**, describes the alternatives that are retained for detailed study in the DEIS, including identification of a Preferred Alternative. It also identifies other alternatives that were considered but dismissed from further evaluation, including reasons for dismissal. Chapter 3 is supplemented by **Appendices 3.1 and 3.2**.
- **Chapter 4, Affected Environment, Environmental Consequences, and Mitigation**, describes elements of the natural, social, and economic environments that may be affected by the alternatives; the anticipated effects of the alternatives on these environments; and measures to avoid, minimize, and mitigate adverse effects, where applicable. Chapter 4 is supplemented by technical reports for individual sections, as appropriate.

- **Chapter 5, Draft Section 4(f) Evaluation**, discusses the potential effects of the Build Alternative on significant public parks, recreational areas, and historic properties in compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966. Chapter 5 is supplemented by **Appendices 5.1 through 5.3**.
- **Chapter 6, Agency Coordination and Public Involvement**, summarizes agency coordination and public involvement activities conducted by FHWA and MassDOT leading up to and during the NEPA review process. Chapter 6 is supplemented by **Appendices 6.1 and 6.2**.
- **Chapter 7, Authorizations, Permits, and Approvals**, identifies federal authorizations and state permits and approvals that are required for the Program prior to construction.
- **Chapter 8, Distribution List**, identifies the agencies, organizations, and individuals who received the DEIS for review and comment.
- **Chapter 9, List of Preparers**, identifies the organizations and individuals responsible for preparing the DEIS.

6 What prior studies were used to inform the planning and development of the DEIS?

The DEIS for the Program builds upon two foundational studies, including the USACE’s Cape Cod Canal Highway Bridges Major Rehabilitation Evaluation and MassDOT’s Cape Cod Canal Transportation Study.

Based on extensive interagency collaboration throughout the development of these foundational studies, USACE and MassDOT developed and refined a Memorandum of Understanding regarding the Sagamore and Bourne Bridges and their highway approaches infrastructure. An overview of these studies and the Memorandum is provided in the following sections.

USACE Cape Cod Canal Highway Bridges Major Rehabilitation Evaluation

In 2016, the USACE began a multi-year study to assess the existing condition of the Sagamore and Bourne highway bridges and determine whether major rehabilitation or replacement of either or both bridges would provide the most reliable, financially responsible solution for future access across Cape Cod Canal.

The USACE considered different alternatives during the early stages of the study to address the deteriorating condition of the bridges. These alternatives included:

- Maintenance and repair of both bridges (No Action)
- Major rehabilitation for both bridges
- Replacement of one or both bridges with four lanes each

- Replacement of one or both bridges with four through-traffic lanes and two acceleration/ deceleration lanes each
- Replacement of both bridges with a single bridge
- Construction of a new third highway bridge by others
- Replacement of one or both bridges with a tunnel(s)
- Replacement of one or both bridges with low level draw spans or causeways
- Deauthorization and closure of the canal

The study led to the publication of a Major Rehabilitation Evaluation Report (MRER) and an Environmental Assessment (EA) under NEPA by the USACE in March 2020. FHWA and MassDOT participated as Cooperating Agencies in the development of the reports. The MRER/EA concluded that replacement of the Sagamore and Bourne highway bridges with new bridges (each with four through travel lanes and two auxiliary lanes), built to modern highway design standards, is the most reliable, financially responsible solution for the future. In March 2022, pursuant to NEPA, the USACE formally issued a Finding of No Significant Impact for the MRER/EA to replace the Sagamore and Bourne highway bridges.

MassDOT Cape Cod Canal Transportation Study

In 2015, the MassDOT began a multi-year study to assess mobility needs in the Cape Cod Canal area. The study recommended:

- Targeted upgrades to local intersections and implementation of Transportation System Management measures
- Major roadway improvements at Belmont Circle, Bourne Rotary, and Route 6 Exit 1C (now Exit 55)
- Bicycle, pedestrian, and multimodal enhancements
- Reconstruction of approach roadways to the Sagamore and Bourne Bridges

The study also considered two public-private partnership (P3) alternatives for a new highway connection from Route 25 to Route 6, including a new bridge crossing of the Cape Cod Canal and a new highway connection from Route 25 to Route 3. These alternatives were dismissed due to potential impacts on residential areas, environmental resources, and sensitive tribal lands. The final study was published by MassDOT in October 2019.

Memorandum of Understanding between the USACE and MassDOT regarding Sagamore and Bourne Bridges

The USACE and MassDOT established a Memorandum of Understanding regarding Sagamore and Bourne Bridges and their highway approach infrastructure. Initially developed in June 2018, the Memorandum was updated in July 2020 and again in March 2024. It states that the USACE will

continue to own, operate, and maintain the existing Sagamore and Bourne Bridges until MassDOT demolishes them. MassDOT will serve as the lead project delivery agency with responsibility to construct and subsequently own, operate, and maintain the completed bridges and approaches as part of the state highway network.

7 What is the purpose and need for the Program?

Based upon the analysis and findings of the foundational documents, and in coordination with FHWA, Cooperating Agencies, and the public, MassDOT developed the Program's Purpose and Need Statement. The "purpose" of the 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 Sagamore and Bourne Bridges.

The following "needs" summarize the transportation problems or unsatisfactory conditions the Program intends to address or improve:



Address the deteriorating condition and escalating maintenance demands of the bridges.

The Sagamore and Bourne Bridges, both serving traffic since 1935, have deteriorated over time and are now beyond their functional service lives. Both bridges require frequent and costly maintenance by the USACE due to their age, heavy traffic demands, and setting within the corrosive saltwater environment of Cape Cod Canal. Routine maintenance activities require lane closures, which typically restrict traffic to one lane in each direction for extended periods of time. These lane closures result in heavy backups for travelers waiting to cross the bridges, with traffic queues extending for several miles along the highway approaches and local roadways.



Address the substandard roadway design of the bridges and their immediate approaches.

The 1930s-era Sagamore and Bourne Bridges do not meet current MassDOT bridge and highway design standards for key characteristics, such as travel lane widths, median barrier separation, shoulder widths, and roadway grades. The 10-foot-wide travel lanes on the bridges are narrower than the standard 12-foot-wide lanes typically used on highways. The bridges lack physical separation between opposing traffic lanes and shoulders to provide emergency vehicle access and refuge for vehicle breakdowns or crashes. The roadway grades along the approaches to the bridges, up to 6% in some sections, are steeper than the 4% to 5% maximum grade typical for limited access highways.



Improve traffic operations.

The Sagamore and Bourne Bridges were designed to handle considerably less traffic volumes than they do today. High traffic volumes and substandard features of the bridges (narrow travel lanes, lack of shoulders, and steep grades) result in poor traffic operations, congestion, and high crash rates. According to traffic analyses for the base year 2019 condition, the bridges and their highway approaches operate at unacceptable levels (traffic volumes are at or exceed the capacity of the roadway) in the morning and afternoon peak travel periods.

during the fall weekday off-peak tourist season. With projected growth in traffic volumes in future years, operating conditions are expected to worsen over time.



Improve accommodations for pedestrians and bicyclists.

The Sagamore and Bourne Bridges provide a single raised sidewalk with grades of up to 6%, which do not comply with current Americans with Disabilities Act (ADA) accessibility standards. There are no dedicated accommodations for bicycle travel on the bridges. The lack of shoulder or physical separation between the roadway and sidewalks along the bridges poses safety risks for non-motorized bridge users. Also, gaps exist in the current sidewalk and bicycle network surrounding the bridges.

8 What alternatives are evaluated in detail in the DEIS?

Using the Cape Cod Canal Transportation Study and the USACE's MRER/EA as the foundational planning documents, FHWA and MassDOT screened the initial alternatives presented in the MRER/EA. This screening analysis confirmed the USACE's recommendation to replace the highway bridges with new bridges built to modern highway design standards.

FHWA and MassDOT determined that replacing both existing highway bridges with new bridges (each with four through travel lanes and two auxiliary lanes) that comply with modern highway design standards is the only reasonable Build Alternative for further consideration in the DEIS. This determination is consistent with the USACE MRER/EA alternatives evaluation.

Two alternatives are evaluated in the DEIS: a No Build Alternative and a Build Alternative. Although the No Build Alternative would not meet the Program's purpose and need, it was retained as a baseline against which the effects and benefits of the Build Alternative can be compared.

No Build Alternative

The No Build Alternative would leave the existing Sagamore and Bourne Bridges in their current alignment and roadway configuration of four 10-foot-wide travel lanes (two in each direction), with one 6-foot-wide sidewalk and a 2-foot-wide safety curb. The USACE would continue operation and maintenance of each bridge and make any repairs needed to maintain safety (fix-as-fails). There would not be any major rehabilitation or replacement of major bridge components, nor any roadway improvements that are proposed for the Build Alternative. The No Build Alternative would include recently completed and proposed transportation improvement projects identified in the Federal Fiscal Year 2025-2029 Transportation Improvement Program for the Cape Cod Metropolitan Planning Organization.

Build Alternative

To develop the Build Alternative for detailed study in the DEIS, FHWA and MassDOT conducted engineering assessments on multiple bridge and highway design parameters. MassDOT's evaluations consisted of qualitative and quantitative analyses of Program design parameters relative to the Program's purpose and need, engineering and design criteria, and other factors, including environmental effects, public safety, and cost.

Table ES-1 summarizes the Build Alternative based on preferred bridge design parameters and highway interchange approach options. The Build Alternative—incorporating the preferred bridge design options and the preferred highway interchange approach options—is identified as the Preferred Alternative, as it would fully meet the Program's needs. However, FHWA and MassDOT will finalize a decision on the Preferred Alternative only after reviewing environmental impacts and considering public and agency feedback on the DEIS. Representative renderings of the proposed twin tied-arch bridges are presented in **Exhibit ES-1** and **Exhibit ES-2**.

Table ES-1. Cape Cod Bridges Program Build Alternative

Program Element/ Program Design Parameter	Description of Program
Highway Bridges	Replacement of both highway bridges with new bridges with four through-traffic lanes and two auxiliary lanes (in-kind bridge replacement) (updated to comply with federal and state highway and design safety standards).
Highway Bridge Cross-Section and Shared-Use Path	- Each replacement highway bridge would provide four 12-foot-wide through-travel lanes (two in each direction), two 12-foot-wide entrance/exit (auxiliary) lanes, a 4-foot-wide left shoulder, and a 10-foot-wide right shoulder. Right and left barriers would be offset an additional 2 feet beyond the limits of the shoulders. - Each crossing location would include one bidirectional pedestrian and bicycle shared-use path, separated from vehicular traffic by the shoulder and barrier. The usable width of the shared-use path would be 14 feet wide on the bridge main spans, 20 feet wide on the interchange approaches, and 12 feet wide on the connecting roadways.
Bridge Vertical and Horizontal Clearances	- The replacement bridges would maintain the existing vertical clearance of 135 feet above mean high water and account for 3.3 feet of fluctuations in relative sea level, for a total vertical clearance of 138.3 feet above mean high water. - The replacement bridges would provide a minimum of 500 feet of horizontal channel width consistent with the existing authorized navigational channel width.
Main Span Length and Bridge Pier Location	The replacement bridges would have a main span length of approximately 700 feet, which would locate the bridge piers at the waterline adjacent to the service road (shoreline piers) into the riprap slope but above the low tide line.

Program Element/ Program Design Parameter	Description of Program
Bridge Deck Configuration	Each bridge (Sagamore and Bourne) would have two separate decks (twin structures).
Mainline Alignment	The mainline alignment locations at both bridges would be offline inboard. Both spans of the replacement highway bridges would be outside the footprint of the existing bridge, approximately 10 feet apart and parallel to each other (offline), and on the side of Cape Cod Canal between the existing bridges (inboard). The replacement main spans at the Sagamore crossing would be west of the existing Sagamore Bridge toward Buzzards Bay. The replacement main spans at the Bourne crossing would be east of the existing Bourne Bridge toward Cape Cod Bay.
Bridge Type	The replacement bridges would be twin tied-arch bridges with delta frames supporting an approximate 600-foot arch and 700-foot mainline span.
Interchange Approach Network	Interchange approach improvements at each bridge would be as follows: • Sagamore Bridge Crossing: Direct connection to State Road in the Sagamore North quadrant and westbound on-ramp under U.S. Route 6 with Cranberry Highway Extension and Sandwich Road Connector in the Sagamore South quadrant • Bourne Bridge Crossing: Directional interchange in the Bourne North quadrant and a diamond interchange in the Bourne South quadrant.

Exhibit ES-1. Proposed Replacement Bridge: Cape Cod Canal Viewpoint



Source: Massachusetts Department of Transportation, 2024

Exhibit ES-2. Proposed Replacement Bridge: Driver Viewpoint



Source: Massachusetts Department of Transportation, 2024

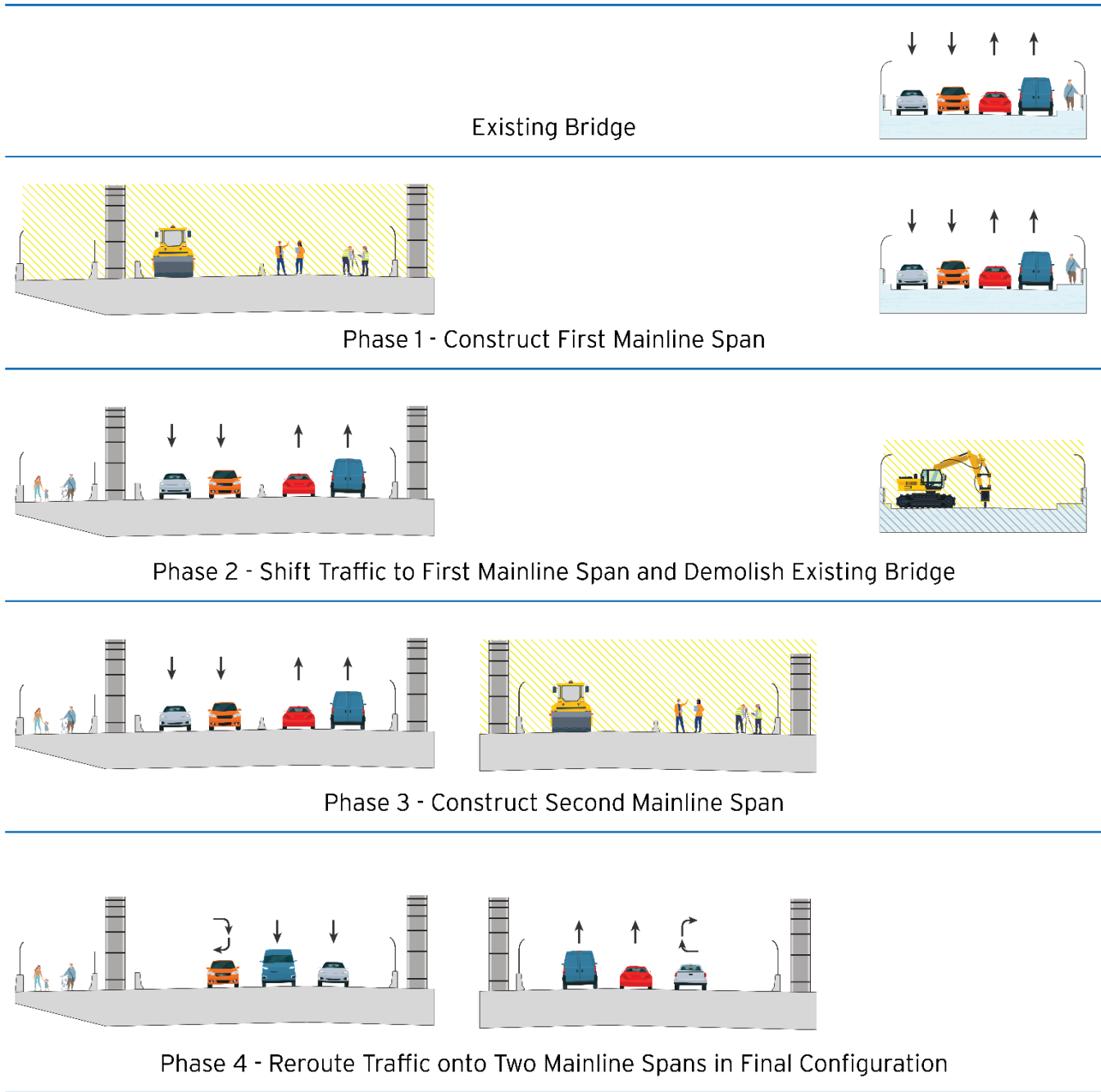
9 What are the construction plan and schedule for the Build Alternative?

Construction Plan

MassDOT proposes to use a “best value” design-build procurement method for the construction of the Program to accelerate project delivery, better control costs and schedule, promote innovation, and reduce overall risk. Design-build is a construction delivery system that combines design and construction services within a single contract and can “fast-track” the overall construction process.

Figure ES-2 presents a simplified schematic of the Program’s bridge construction sequencing approach, illustrating four key phases that apply to both bridges. The replacement bridges would be constructed offline and inboard of the existing highway bridges. Sagamore Bridge would be replaced first followed by Bourne Bridge. At each site, the inboard main span would be constructed first. At the Sagamore Bridge site, this would be the westernmost bridge, which would ultimately carry traffic onto Cape Cod. For the Bourne Bridge site, this would be the easternmost bridge, which would ultimately carry traffic off Cape Cod. After construction of the first new span, all traffic would be shifted onto it so the existing bridge can be demolished, and the second main span can be constructed.

Figure ES-2. Proposed Bridge Construction Sequencing Approach



Source: Massachusetts Department of Transportation, 2024

The Program's construction sequencing approach is a critical element of the design of the highway bridges, interchanges, and surrounding local roadway network. The construction sequencing goals for the Program include the following:

- Remove traffic from the existing bridge as quickly as possible.
- Maintain existing roadway and ramp connections throughout the construction duration.
- Avoid the need for construction detours.
- Reduce or minimize traffic shifts.
- Maintain pedestrian and bicycle connectivity.

Construction Schedule

Following the completion of the NEPA review and receipt of federal and state permits and approvals, anticipated in spring/summer 2026, MassDOT proposes to initiate the Program's design-build procurement and construction process in fall 2026. Construction activities for the replacement Sagamore and Bourne Bridges are expected to occur over eight to ten years, respectively. Construction of the replacement Sagamore Bridge (Phase 1 of the Program) would begin first, followed by the replacement Bourne Bridge (Phase 2 of the Program).

MassDOT was selected to receive federal funding for the Sagamore Bridge Project through the Multimodal Project Discretionary Grant and the Bridge Investment Program administered by the FHWA within the U.S. Department of Transportation. MassDOT and the USACE are actively seeking funding for the Bourne Bridge Project. It is anticipated that Bourne Bridge construction would start one year after the start of Sagamore Bridge construction. However, the timing of construction sequencing depends on funding.

10 What are the potential effects of the Build Alternative and how will adverse effects be mitigated?

Table ES-2 summarizes the potential long-term effects of the Build Alternative relative to environmental resources and topics evaluated in the DEIS, compared to the No Build Alternative.

Table ES-3 summarizes the effects of temporary construction-related activities for the Build Alternative. Anticipated measures to mitigate the potential for adverse effects of the Build Alternative are included in both tables, as needed.

Table ES-2. Summary of Potential Operational Effects and Mitigation

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Transportation, Traffic, and Safety (Section 4.2)	Increased vehicle hours traveled and delays under the 2050 No Build Condition compared to the 2019 Base Year Condition during the fall weekday afternoon peak hour	Reduced vehicle hours traveled, delays, and congestion under the 2050 Build Condition compared to the 2019 Base Year and 2050 No Build Conditions during the fall weekday afternoon peak hour	Beneficial Effect – No mitigation anticipated
	Continued decline in safety conditions due to increased traffic volumes, delays, and congestion, and the continuation of substandard bridge and approach roadway features	Reduction in predicted crashes on the bridges by up to 48%, based on evaluation of safety performance metrics and crash modification factors associated with proposed improvements	Beneficial Effect – No mitigation anticipated
	No changes to railroad facilities or operations	Displacement and relocation of Bourne Station along the Cape Main Line Corridor, due to the construction and operation of Bourne Bridge	No long-term mitigation required; refer to Table ES-3 for construction period mitigation
	Longer response times for law enforcement and emergency response vehicles due to increased congestion and inadequate roadway conditions	- Improved public safety and security through reduced delays and improved travel-time reliability for emergency vehicle service and operations - Provision of additional service redundancy in case of an emergency evacuation or a compromising event impacting a single bridge structure	Beneficial Effect – No mitigation anticipated

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Pedestrian and Bicycle Facilities (Section 4.3)	Continuation of ongoing safety and mobility problems due to poor conditions on the bridges and lack of connectivity between the bridges and the surrounding road network, including the Canal Service Roads	Improved pedestrian and bicycle facilities within the Project Limits on the new bridges with connections to new shared-use paths and pedestrian and bicycle accommodations adjacent to the local roadways	Beneficial Effect – No mitigation anticipated
Maritime Transportation, Traffic, and Safety (Section 4.4)	Reduced capacity to accommodate the largest vessels using the canal over time, no improvement in navigation safety, potential adverse effect to navigation due to channel closures required by bridge maintenance activities	- Improved navigability and navigational safety due to an effective increase in horizontal clearance - No effect to maximum vessel class types and sizes currently using the canal	Beneficial Effect – No mitigation anticipated
Socioeconomics (Section 4.5)	Anticipated adverse effects to worker productivity, local business employment, tourism, and freight costs due to worsening traffic congestion and future traffic delays associated with continued maintenance of the bridges	Increased economic output, value added, jobs, and labor income due to travel time savings and improved mobility and accessibility	Beneficial Effect – No mitigation anticipated

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Land Use, Zoning, and Community Cohesion (Section 4.6)	- No changes to land use or development patterns - No advancement of local and regional land use policies and plans related to conservation land, open spaces, and green corridors	Approximately 306 acres of land alteration, including: - Approximately 51-acre increase in impervious area for new roadways and shared-use path areas to allow for temporary roadways, permanent roadways, and shared-use path installation - Approximately 132 acres of tree clearing	- Development of a stormwater management system that uses low-impact green infrastructure, such as rain gardens and infiltration basins, and improves the treatment and quality of stormwater runoff - Implementation of landscaping plan for over 200 acres, consisting of landscape restoration and reforestation; street tree, buffer, and roundabout planting; and lawn re-seeding
	Worsening traffic congestion and the lack of pedestrian and bicycle connectivity within the Study Areas would result in reduced community connectivity and diminished access to recreational opportunities, leisure activities, cultural events, and historical sites, hindering community cohesion in the town of Bourne	- New alignment and areas needed for construction staging and the demolition of the existing bridges and interchange improvements would result in unavoidable temporary and permanent property effects - Improved access, mobility, and connectivity within the Study Areas would strengthen community cohesion and provide quality of life benefits for surrounding neighborhoods	Provision of a buffer area to separate residential areas from the transportation land uses

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Community Facilities (Section 4.7)	Projected traffic growth within the Study Areas would increase congestion and continue to hamper mobility and accessibility to community facilities and services	Improved traffic operations and multimodal accommodations to access community facilities	Beneficial Effect – No mitigation anticipated
Property Acquisition, Displacement, and Relocation (Section 4.8)	No changes to current conditions	Full acquisition of 28 parcels, partial acquisition of 34 parcels, and easements on an additional 114 parcels.	Implementation of property acquisition activities, including relocations, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, 1971, and Massachusetts General Laws, primarily Chapter 79
Wetlands and Floodplains (Section 4.9)	No changes to current conditions	- Approximately 2.5 acres of permanent impact to tidal waters of the U.S. - Approximately 3,100 square feet of permanent impact to non-tidal (inland) vegetated wetlands - Approximately 5,200 cubic feet of flood storage lost within inland floodplain	Compensatory mitigation to replace the loss of floodplain, wetland, and aquatic resource functions per federal and state regulatory requirements
Water Quality and Stormwater (Section 4.10)	- No changes to current conditions - Stormwater runoff would remain largely untreated	Increase of approximately 51 acres of new impervious surface area compared to existing conditions	Design and implementation of stormwater control measures, including infiltration basins and bioretention areas/rain gardens, to comply with the Massachusetts Stormwater Management Standards

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Threatened, Endangered, and Protected Species and Habitats (Section 4.11)	Continued baseline conditions, with the U.S. Army Corps of Engineers (USACE) coordinating protections with federal agencies during bridge and canal maintenance activities	• Loss of suitable summer habitat for northern long-eared bats and tricolored bats due to tree removal • Direct or indirect and temporary or permanent stressors to aquatic resources, including underwater noise, entrapment, changes in water quality/turbidity, benthic disturbance, reduction in fish passage, habitat alteration and/or conversion, and vessel interaction • Loss of existing submerged aquatic vegetation at the Bourne Bridge site	• Incorporation of multiple mitigation measures and best management practices, including time-of-year restrictions, to minimize effects to terrestrial- and aquatic-based resources • Mitigation of submerged aquatic vegetation • Ongoing coordination with the Massachusetts Natural Heritage and Endangered Species Program, including obtaining a Conservation Management Permit as needed
Coastal Zone Consistency (Section 4.12)	Routine bridge maintenance activities and future dredging operations conducted by USACE would be implemented per permit requirements to protect coastal resources	Consistent with the applicable policies of the Massachusetts Coastal Zone Management Program addressing coastal hazards, growth management, habitat, protected areas, public access, and water quality	Implementation of resource-specific mitigation measures to minimize and compensate for unavoidable adverse impacts to coastal resources
Air Quality (Section 4.13)	Increased localized carbon monoxide and regional criteria pollutant emissions due to worsening congestion and delays under 2050 traffic volumes	Reduced localized carbon monoxide and regional criteria pollutant emissions due to improved traffic operations and reduced delays	Beneficial Effect – No mitigation anticipated

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Noise and Vibration (Section 4.14)	A total of 59 noise-sensitive properties are predicted to have traffic noise levels that approach or exceed Federal Highway Administration noise abatement criteria under the 2050 No Build Alternative	A total of 58 noise-sensitive properties are predicted to have traffic noise levels that approach or exceed Federal Highway Administration noise abatement criteria under the 2050 Build Alternative	Based on considerations of social, economic, and environmental factors, noise abatement measures for impacted properties were not found to be feasible and reasonable
Visual Resources (Section 4.15)	• No changes to the visual quality of the bridges • Changes to travelers' viewshed on local and regional roadway networks due to proposed developments	• Views of bridges from Cape Cod Canal and portal entry would be consistent with existing views • Interchange approach network improvements would produce beneficial visual effects due to removal of utility poles, overhead signals and wiring, and reduced pavement • Adverse visual effects due to the loss of residential units, tree clearing, and elevated structures	Incorporation of context-sensitive design elements, compatible bridge design, recreational amenities, landscaping, and aesthetic treatment of bridge abutment and retaining walls
Cultural Resources (Section 4.16)	No changes to the appearance of the bridges or to other architectural historic properties due to the USACE's bridge maintenance and repair program	• Adverse effects due to the removal of National Register-eligible Sagamore and Bourne Bridges • No adverse effects to the Cape Cod Canal Historic District or historic architectural properties within the viewshed area of potential effect	Execution of Section 106 Programmatic Agreement identifying stipulations to mitigate adverse effects

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Public Parks, Recreational Facilities, and Open Space (Section 4.17)	• Temporary effects to USACE-leased and -owned recreational areas under or immediately adjacent to bridges due to the USACE's bridge maintenance and repair program • No effects to other parks, recreational facilities, or open space	Parcel acquisitions and permanent easements from Bourne Scenic Park, Bourne, Recreation Area, Sagamore Recreation Area, and Keith Field Recreation Area for the construction and operation of the bridges and roadway improvements	Implementation of measures to minimize harm and mitigate effects to affected parks and recreation areas, developed in coordination with officials with jurisdiction, in accordance with Section 4(f) of the U.S. Department of Transportation Act
Solid and Hazardous Waste Material Management (Section 4.18)	Routine maintenance activities would require the removal of lead-containing paint from both bridges	Reduced likelihood of exposure to or potential contamination from hazardous materials through the removal of existing bridges and off-site disposal of contaminated soils	Adherence to applicable laws and regulations governing the removal, handling, storage, and transport of hazardous materials for any future bridge and roadway maintenance activities
Utilities and Services (Section 4.19)	No long-term effects	Relocation of telecommunications, electrical, water main, and sewer systems	Coordination of utility relocation requirements with utility owners
Public Health (Section 4.20)	• Potential adverse health-related effects due to worsening traffic congestion and delays • Lack of accommodations and network connectivity for pedestrians and bicyclists would not support healthy modes of transportation	Beneficial health-related effects due to improved traffic operations, access for emergency vehicles, pedestrian and bicycle network connectivity, and air quality	Beneficial Effect – No mitigation anticipated

Environmental Resource/Topic (DEIS Section)	No Build Alternative	Build Alternative	Anticipated Mitigation
Adaptation and Resiliency (Section 4.21)	• Vulnerable to progressive bridge collapse due to the lack of redundancy in steel truss design • Continued vulnerability of the bridges to winter weather and extreme wind	• Increased structural redundancy due to replacement network tied-arch bridge types • Potential for icing on bridge cables and members in winter weather • Improved resistance against wind-induced vibrations and deformation due to the replacement network tied-arch bridge types	Implementation of deicing measures for bridge cables in accordance with best management practices
Indirect Effects (Section 4.22)	N/A	• Economic, environmental, and transportation benefits anticipated • No adverse indirect effects expected	No mitigation anticipated

Table ES-3. Summary of Temporary Construction Effects and Mitigation

DEIS Section	Build Alternative	Mitigation
Transportation, Traffic, and Safety (Section 4.2)	- Increased congestion and delays anticipated due to additional construction vehicle trips, work zone interactions, and reduced speeds - Service disruptions to freight and seasonal passenger train operations along Cape Main Line Corridor	- Implementation of construction sequencing to minimize impacts to the traveling public - Preparation and implementation of a Traffic Management Plan addressing truck routes, traffic control and safety measures, and communication protocols with stakeholders - Preparation and implementation of a Rail Operations Coordination Plan addressing temporary service disruptions and communication protocols with rail operators and the public
Pedestrian and Bicycle Facilities (Section 4.3)	Temporary closure of Canal Service Roads within the construction zone	Placement of appropriate signage in advance of closure to guide users along available detour routes
Maritime Transportation, Traffic, and Safety (Section 4.4)	- Potential encroachment into the navigation channel by work vessels - Six short-term closures (3-5 days) of the navigation channel for float-in of the new bridge arches and float-out of the existing bridge arches	Advanced notification of canal closures to mariners, provided in coordination with the U.S. Coast Guard via local maritime publications, social media, local media, and other similar platforms
Wetlands and Floodplains (Section 4.9)	Potential erosion and sedimentation of wetlands and waterbodies due to ground disturbing and demolition activities	Preparation, implementation, and monitoring of a Stormwater Pollution Prevention Plan to prevent erosion and sedimentation effects to wetlands, waterbodies, or other sensitive environmental resources
Water Quality and Stormwater (Section 4.10)	Potential sedimentation of waterbodies due to soil disturbance and runoff, impacting water quality and aquatic habitats	Preparation, implementation, and monitoring of a Stormwater Pollution Prevention Plan to identify and prevent potential sources of pollution from stormwater runoff

DEIS Section	Build Alternative	Mitigation
Threatened, Endangered, and Protected Species and Habitats (Section 4.11)	• Potential acoustic and turbidity effects to marine species • Loss of submerged aquatic vegetation at the Bourne Bridge site	• Confinement of in-water work to approved in-water work windows • Implementation of protocols and best management practices to protect marine species • Development and implementation of a submerged aquatic vegetation mitigation and monitoring plan in coordination with the USACE
Air Quality (Section 4.13)	• Temporary increase in airborne dust from ground-disturbing activities • Temporary increase in air pollutant emissions from the operation of construction-related equipment • Potential generation of airborne lead dust and fumes during bridge demolition	• Use of best management practices, including less polluting equipment, dust control measures, clean fuel in diesel engines, and limit heavy-duty vehicle idling to five minutes or less • Implementation of a lead abatement plan to guide proper removal of bridge components coated with lead-based paint • Monitoring of contractor compliance

DEIS Section	Build Alternative	Mitigation
Noise and Vibration (Section 4.14)	• Intermittent increases in noise levels due to the operation of construction equipment, demolition activities, and pile driving • Potential for ground-borne vibration effects to nearby sensitive receptors from pile driving activities	• Preparation and implementation of a noise control plan to establish procedures for predicting construction noise levels before performing construction activities, including identification of noise reduction measures required to meet the noise level limitations and minimize nuisance noise conditions • Implementation of best management practices, including noise monitoring to document compliance with recommended construction noise limits, and a public outreach program • Massachusetts Department of Transportation Contract Specifications to include provisions for pre-construction surveys, vibration monitoring, adherence to vibration limit thresholds, and equipment restrictions, as necessary
Visual Resources (Section 4.15)	Visual impacts due to staging areas, construction lighting, and vegetation clearing	• Control of fugitive light from portable sources, including directing away from residential areas • Use of plant protection fencing to minimize effects to visual natural resources • Reseeding of disturbed areas and planting with native vegetation to provide long-term stabilization
Cultural Resources (Section 4.16)	Disturbance of areas with low archaeological sensitivity	• Continued monitoring of the need for additional archaeological investigations • Inclusion of a Special Provision in the construction contract for the discovery of unanticipated archaeological remains

DEIS Section	Build Alternative	Mitigation
Solid and Hazardous Waste Material Management (Section 4.18)	Generation of approximately 179,100 tons of demolition waste	Requirement for segregation and management of demolition waste within the Massachusetts Department of Transportation's Contract Specifications, including: • Adherence to federal and state regulations governing the removal, handling, storage, and transport of hazardous materials • Pre-demolition hazardous building materials surveys and preparation of hazardous waste and safety plans in compliance with applicable regulatory requirements and contract specifications • Monitoring of contractor compliance
Utilities and Services (Section 4.19)	Short-term service disruptions due to utility relocations	Advanced coordination with utility companies, town departments, and property owners to minimize service disruptions and avoid delays
Public Health (Section 4.20)	Potential effects related to demolition and ground-disturbing activities	Adherence to best management practices and compliance with applicable laws and regulations

11 What are the effects of the Build Alternative on Section 4(f) properties?

Section 4(f) of the U.S. Department of Transportation Act of 1966, commonly referred to as Section 4(f), protects publicly owned parks, recreation areas, and wildlife and waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing in the National Register of Historic Places from “use” by transportation projects that receive funding from or require approval by an agency of the U.S. Department of Transportation.

Table ES-4 summarizes the effects of the Build Alternative on Section 4(f) properties and the proposed approval option to comply with Section 4(f), including *de minimis* impact determinations and programmatic Section 4(f) evaluations.

Table ES-4. Summary of Effects, Uses, and Proposed Section 4(f) Approval Option

Section 4(f)-Protected Property	Build Alternative Impacts	Proposed Section 4(f) Compliance Option
Sagamore Bridge	Demolition	Programmatic Section 4(f) Evaluation and Approval for Federal Highway Administration Projects that Necessitate the Use of Historic Bridges (Nationwide Historic Bridges Programmatic Evaluation)
Bourne Bridge	Demolition	Nationwide Historic Bridges Programmatic Evaluation
Cape Cod Canal Historic District	Replacement of Sagamore and Bourne Bridges within the District	<i>De Minimis</i> Impact Determination, based on the “No Adverse Effect” recommendation under Section 106 of the National Historic Preservation Act
Sagamore Recreation Area	Temporary easement during construction and permanent easement for operation and maintenance of the Sagamore Bridge Project	<i>De Minimis</i> Impact Determination
Keith Field Recreation Area	Permanent easement for operation and maintenance of the Sagamore Bridge Project	<i>De Minimis</i> Impact Determination
Bourne Scenic Park	Temporary easement during construction and permanent easement for operation and maintenance of the Bourne Bridge Project	<i>De Minimis</i> Impact Determination

Section 4(f)-Protected Property	Build Alternative Impacts	Proposed Section 4(f) Compliance Option
Bourne Recreation Area	Permanent easement for operation and maintenance of the Bourne Bridge Project	<i>De Minimis</i> Impact Determination
Gallo Ice Arena	Temporary easement during construction and permanent easement for operation and maintenance of the Bourne Bridge Project	<i>De Minimis</i> Impact Determination

FHWA and MassDOT, in coordination with the officials with jurisdiction over the resources, are identifying measures to minimize harm, including mitigation and enhancement measures, to these Section 4(f) protected properties. The agreed-upon measures to minimize harm to Section 4(f) protected parkland, recreational areas, and historic sites will be included in the Final EIS and Record of Decision.

12 What authorizations, permits, and approvals will be required?

Table ES-5 lists the federal authorizations and state permits and approvals that are required prior to implementation of the Program.

Table ES-5. List of Required Federal and State Authorizations, Permits, and Approvals

Authorization, Permit, or Approval	Issuing Agency
Issuance of Combined Final Environmental Impact Statement/Record of Decision under the National Environmental Policy Act	Federal Highway Administration
Finding under Section 4(f) of the U.S. Department of Transportation Act	Federal Highway Administration
Consultation under Section 7 of the Endangered Species Act	• U.S. Fish and Wildlife Service • National Oceanic and Atmospheric Administration/National Marine Fisheries Service
Consultation under the Fish and Wildlife Coordination Act	• U.S. Fish and Wildlife Service • National Oceanic and Atmospheric Administration/National Marine Fisheries Service
Consultation under the Magnuson-Stevens Fishery Conservation and Management Act	National Oceanic and Atmospheric Administration/National Marine Fisheries Service

Authorization, Permit, or Approval	Issuing Agency
• Issuance of Section 408 permission under Section 14 of the Rivers and Harbors Act of 1899 • Issuance of permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act	U.S. Army Corps of Engineers
Issuance of Bridge Permits under the General Bridge Act of 1946	U.S. Coast Guard
Approval of Notice of Proposed Construction or Alteration under Title 14 of the Code of Federal Regulations Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace	Federal Aviation Administration
• Issuance of National Pollutant Discharge Elimination System – Construction General Permit under Section 402 of the Clean Water Act • Issuance of public comments on the Draft and Final Environmental Impact Statement under Section 309 of the Clean Air Act	U.S. Environmental Protection Agency
Issuance of Secretary Certificate on the Final Environmental Impact Report under the Massachusetts Environmental Policy Act	Massachusetts Executive Office of Energy and Environmental Affairs
Consultation under Section 106 of the National Historic Preservation Act	Massachusetts State Historic Preservation Officer
Federal Consistency Review under the Coastal Zone Management Act	Massachusetts Office of Coastal Zone Management
Issuance of Water Quality Certification under the Massachusetts 401 Water Quality Certification Regulations	Massachusetts Department of Environmental Protection
Issuance of a Conservation and Management Permit under the Massachusetts Endangered Species Act	Massachusetts Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program
Issuance of an Order of Conditions under the Massachusetts Wetlands Protection Act	Bourne Conservation Commission

13 What are the next steps in the NEPA process?

FHWA and MassDOT are requesting public comments on this DEIS, which is available for public review at the [Cape Cod Bridges Program website](http://www.mass.gov/cape-bridges) (<http://www.mass.gov/cape-bridges>) and in person at the following locations:

- Jonathan Bourne Library, 19 Sandwich Road, Bourne, MA
- Sandwich Public Library, 142 Main Street, Sandwich, MA
- MassDOT Highway Division, 10 Park Plaza, Boston, MA

FHWA and MassDOT will hold a public hearing(s) during the public comment period to allow elected officials, stakeholders, and the public to provide oral testimony on the DEIS. Advanced notice of the date, time, and location of any public hearing(s) will be provided through the Program website, public notices, and press releases.

Following the public comment period, FHWA intends to issue a combined Final EIS and Record of Decision document, unless FHWA determines there is a need to keep the documents separate. Responses to substantive comments received on the DEIS will be included in the combined Final EIS and Record of Decision document.

FHWA and MassDOT are accepting public comments on the DEIS. Written comments on the DEIS may be submitted via the following methods:

Program Website <https://www.mass.gov/cape-cod-bridges-program>

Mail	Luisa Paiewonsky Director of Mega Projects MassDOT Highway Division 10 Park Plaza Boston, MA 02116	OR	Kenneth Miller Complex Project Manager FHWA Massachusetts Division 220 Binney Street, 9th Floor Cambridge, MA 02142
-------------	---	-----------	---