

4 Affected Environment, Environmental Consequences, and Mitigation

4.16 Cultural Resources

4.16.1 Introduction

This section considers the potential effects of the No Build Alternative and the Build Alternative on architectural and archaeological historic properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP). Historic architectural properties refer to aboveground historic resources, including buildings, structures, objects, sites, and districts of historical importance. Archaeological resources are subsurface physical remains of pre-contact (prehistoric, or the remains of Indigenous American societies) or post-contact (historical, between Native Americans and Europeans) activities.

Where the [Federal Highway Administration \(FHWA\)](#) has determined that the Build Alternative would result in unavoidable adverse effects to any historic properties, this section also identifies mitigation measures that will be implemented to resolve those [adverse](#) effects.

This section is supported by additional information in **Appendix 4.16, Cultural Resources Technical Report**, which includes [the Section 106 Programmatic Agreement and supporting documentation \(Attachment 1, Appendices A through J\)](#), [documentation of consultation with Consulting Parties \(Attachment 2\)](#), and [Massachusetts Historical Commission Inventory Forms \(Attachment 3\)](#).

4.16.1.1 Regulatory Context

Section 106 of the National Historic Preservation Act (Section 106) (54 United States Code [USC] [306108](#)) requires a federal agency with direct or indirect jurisdiction over a proposed federal or federally assisted undertaking (project) or with licensing or permitting authority, to:

“take into account the effects of the undertaking on historic properties, which includes any prehistoric or historic district, site, building, structure, or object that is included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior.”

Section 106 implementing regulations (36 Code of Federal Regulations [CFR] 800) require that a project’s Lead Federal Agency consult with the State Historic Preservation Officer (SHPO) to:

1. Initiate the Section 106 process.
2. Identify historic properties within the Area of Potential Effects (APE), defined as “the geographic

area(s) within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties.”¹

3. Assess adverse effects to historic properties within the APE
4. Resolve any adverse effects on historic properties within the APE.

The Section 106 regulations prescribe a consultation process, involving SHPO, the Advisory Council on Historic Preservation (ACHP), federally recognized Indian Tribes/Tribal Historic Preservation Officers (THPO), local governments, and the public, that the Lead Federal Agency must follow to “avoid, minimize, or mitigate” adverse effects to historic properties that might be caused by the project.

Refer to **Appendix 4.16, Cultural Resources Technical Report**, for additional federal and state regulations and guidance used for this assessment.

4.16.1.2 Methodology

Identifying Consulting Parties

The Federal Highway Administration (FHWA) initiated the Section 106 process with SHPO in March 2023. In addition to SHPO, FHWA and MassDOT identified the following Consulting Parties in **Table 4.16-1.Consulting Parties** are to provide advice and guidance during the Section 106 process.

Table 4.16-1. Consulting Parties

Consulting Party	Agency/Organization Type
THPO of the Wampanoag Tribe of Gay Head (Aquinnah)	Tribal Historic Preservation Officer
THPO of the Mashpee Wampanoag Tribe	Tribal Historic Preservation Officer
THPO of the Narragansett Indian Tribe	Tribal Historic Preservation Officer
Chairperson of the Herring Pond Wampanoag Tribe	State Tribal Representative
Executive Director of the Massachusetts Commission on Indian Affairs	State Agency
Massachusetts Board of Underwater Archaeological Resources	State Agency
Massachusetts Executive Office of Energy and Environmental Affairs	State Agency

¹ [Section 106 Tutorial: Key Terms.](#)

https://www.environment.fhwa.dot.gov/env_topics/section_106_tutorial/keyterms.aspx

Consulting Party	Agency/Organization Type
Bourne Historical Commission	Local Government
Sandwich Historical Commission	Local Government
Cape Cod Commission	Regional Planning Agency
U.S. Army Corps of Engineers	Federal Agency
National Trust for Historic Preservation	National Organization
Advisory Council on Historic Preservation	Federal Agency

On January 23, 2024, FHWA formally initiated the consultation process with Consulting Parties. On July 17, 2025, ACHP notified FHWA that based upon information that was provided regarding the potential adverse effects on the NRHP-eligible Sagamore and Bourne Bridges, the Program did not meet its criteria for involvement in reviewing individual Section 106 cases. Therefore, ACHP determined that its participation in the consultation to resolve adverse effects would not be needed (Appendix 4.16, Attachment 1, Appendix G). FHWA and MassDOT have continued to inform ACHP of the Program's consultation process, including meetings and follow-up correspondence. Pursuant to Section 800.6(b)(1)(iv), a copy of the executed Programmatic Agreement and supporting documentation has been filed with ACHP, completing the requirements of Section 106.

Defining Areas of Potential Effects

MassDOT defined APEs in consultation with the Massachusetts Historical Commission (MHC), the state agency designated as SHPO. Separate APEs (Construction APEs) were identified to assess effects upon historic properties due to the construction of each replacement bridge, including construction or demolition activities, approach highway realignment, interchange reconstruction, construction of new bicycle and pedestrian accommodations, establishment of temporary construction staging or laydown areas, and right-of-way acquisitions. These Construction APEs match the boundaries of the Sagamore and Bourne Project Limits. MassDOT identified a single, more expansive APE (Viewshed APE) to assess potential viewshed effects due to the replacement bridges. The Viewshed APE was established using Geographic Information System (GIS) mapping and Light Detection and Ranging (LiDAR) data, which considered topography and the influence of trees and buildings within the landscape, to identify where the existing and replacement bridges would be visible.

SHPO concurred with the APEs on July 7, 2023. FHWA and MassDOT presented the APEs to the Section 106 Consulting Parties on January 22, 2024. None of the Consulting Parties objected to the geographical limits established for the APEs.

As a result of further development of preliminary design and mitigation for impacts to park and recreation areas, the Construction APEs were revised in late 2025. The Viewshed APE did not change. FHWA and MassDOT presented the revised Construction APEs to the Section 106 Consulting Parties on January 14, 2026. None of the Consulting Parties objected to the revised geographical limits of the

Construction APEs. Section 4.16.2 presents the Construction APEs and the Viewshed APE for the Sagamore and Bourne Bridges based on the further development of preliminary design, including mitigation areas.

Identifying and Evaluating Historic Properties

MassDOT's identification and evaluation of historic properties within the Construction and Viewshed APEs focused on the NRHP criteria of eligibility, as defined by the [National Register Criteria for Evaluation \(36 CFR 60.4\)](#).

To identify historic architectural properties in the Construction and Viewshed APEs, MassDOT reviewed its Historic Bridge Inventory Files, [the Massachusetts Historical Commission's Inventory of Historic and Archaeological Assets of the Commonwealth](#) (MHC Inventory), which is [provided](#) online [as the](#) Massachusetts Cultural Resources Information System (MACRIS),² and other state, regional, and local resources. Additionally, in 2023, MassDOT conducted a Reconnaissance Level Architectural Resources Survey within the Construction and Viewshed APEs to identify historic architectural properties that could be temporarily and/or permanently affected by the Build Alternative based on preliminary plans. In its field walkover, MassDOT identified architectural properties that would be at least 40 years old as of 2027 (the construction start date) that were not previously evaluated for NRHP eligibility or included in the MHC Inventory, but which could meet the NRHP criteria of eligibility based on the National Register Criteria for Evaluation. Based on the criteria, MassDOT then prepared NRHP Inventory (Determinations of Eligibility) Forms for those properties for SHPO's review.

MassDOT conducted a search of MACRIS to identify previously recorded archaeological sites and reviewed reports of cultural resource management investigations in the Cape Cod Bridges Program (Program) APEs. MassDOT conducted an Archaeological Reconnaissance Survey (Archaeological Sensitivity Assessment) in fall 2023 to identify known and potential pre-contact and post-contact archaeological sites within the Construction APEs, to assess the archaeological sensitivity of the Construction APEs, and to make recommendations for the protection of cultural resources or additional investigations. MassDOT used the information collected during the archival research and walkover survey to develop a predictive model for archaeological sensitivity, with rankings of low, moderate, or high archaeological sensitivity. Based on the results of the predictive model, MassDOT identified areas where further archaeological testing would be warranted.

Throughout preliminary design development, MassDOT continued to identify and evaluate existing historic properties within the Construction and Viewshed APEs and assess areas for archaeological sensitivity. Additionally, MassDOT conducted surveys of the proposed park and recreation mitigation areas located within USACE-managed property in the Sagamore North and Bourne South Quadrants to assess their archaeological sensitivity.

MassDOT continued consultation with SHPO and Consulting Parties through design development. In coordination with FHWA, MassDOT held a Consulting Parties meeting on January 14, 2026. FHWA and MassDOT provided updates on project design and the environmental review process, reviewed the

² <https://mhc-macris.net/>

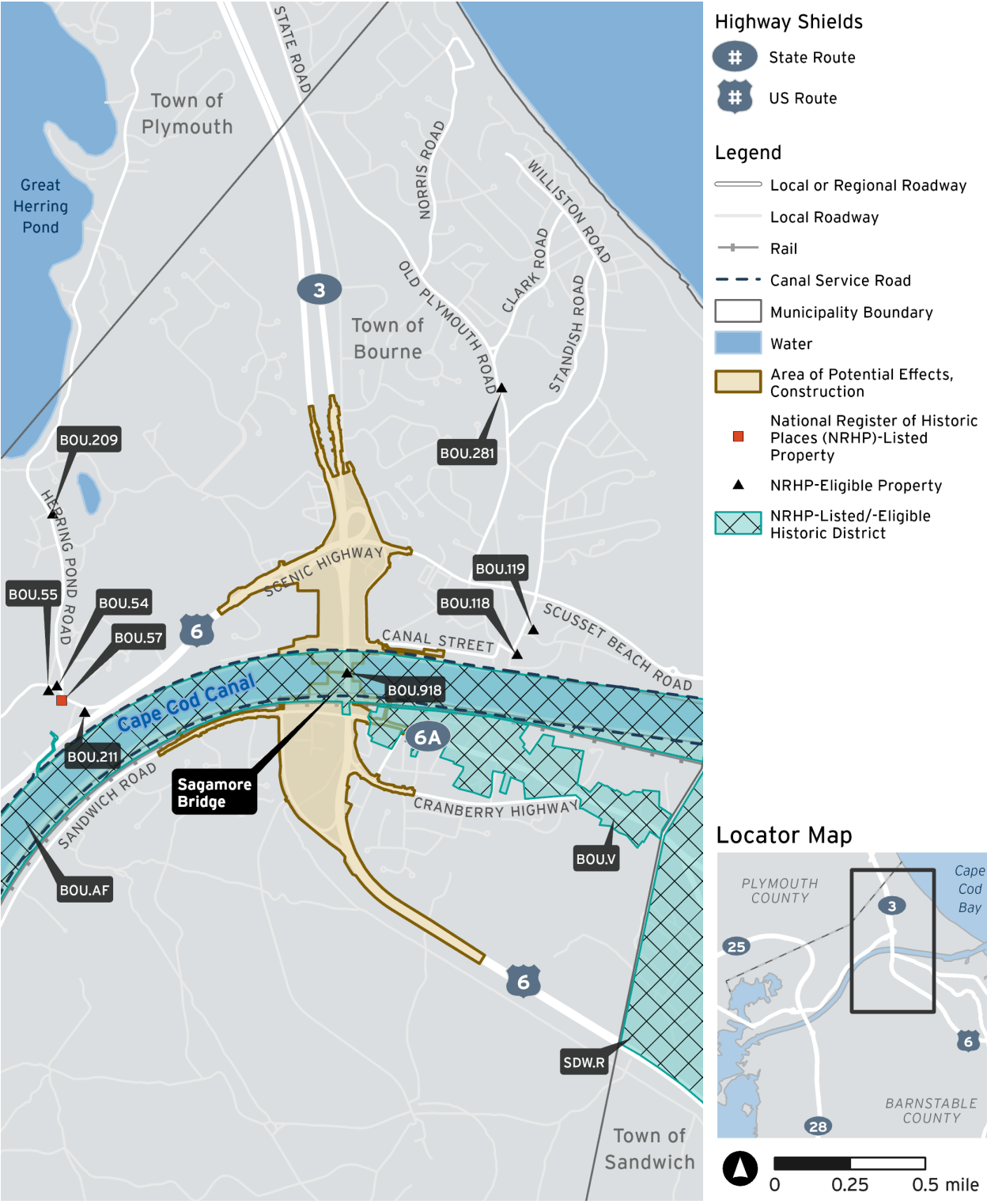
bridge design development conducted in coordination with the public, discussed the results of the archaeological survey, and reviewed the proposed Final Programmatic Agreement, including measures to mitigate adverse effects. Additionally, MassDOT solicited input from the Consulting Parties on the scope of the mitigation measures. Following the meeting, MassDOT provided the meeting presentation to the Consulting Parties.

4.16.2 Affected Environment

4.16.2.1 Historic Architectural Properties within the Construction APEs

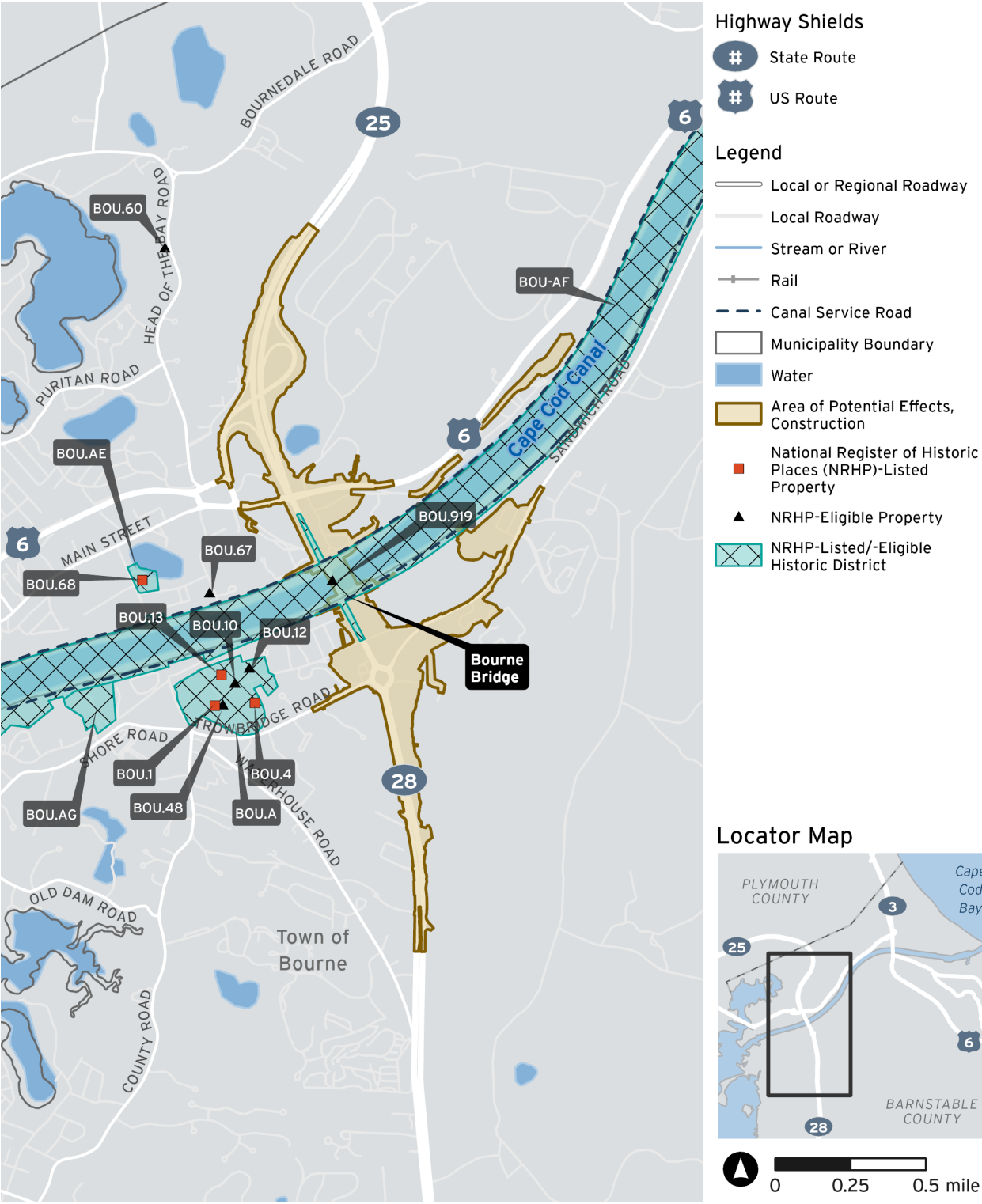
Figure 4.16-1 presents the revised Sagamore Bridge Construction APE, and **Figure 4.16-2** presents the revised Bourne Bridge Construction APE. Both figures were updated with the refined Project Limits. Sagamore Bridge, Bourne Bridge, the Cape Cod Canal Historic District, and South Sagamore Area are the historic architectural properties/areas identified within the Construction APEs that are eligible for listing in the NRHP. No NRHP-listed properties were identified within the Construction APEs.

Figure 4.16-1. Construction Area of Potential Effects (Sagamore Bridge)



Source: Massachusetts Department of Transportation, 2025

Figure 4.16-2. Construction Area of Potential Effects (Bourne Bridge)



Source: Massachusetts Department of Transportation, 2025

Sagamore Bridge

Sagamore Bridge is a three-span, 1,408-foot-long steel riveted Warren continuous truss bridge that carries U.S. Route 6 across Cape Cod Canal, Sandwich Road, and the Massachusetts Coastal Railroad. It was funded under the National Industrial Recovery Act of 1933 and constructed between 1933 and 1935 by the American Bridge Company through the Depression-era Public Works Administration.

According to the original U.S. Army Corps of Engineers (USACE) design drawings, Sagamore Bridge is comprised of three continuous spans with span lengths of 396 feet, 616 feet, and 396 feet. The arched 616-foot-long center span over Cape Cod Canal is supported by two granite-stone-facing concrete piers on each side of the canal. There are hollow abutments at either end of the bridge that are approximately 220 feet long; these are vaulted and consist of concrete T-beams.³ Sagamore Bridge was determined individually eligible for listing in the NRHP at the state level under Criteria A and C on March 6, 1991. In identifying its NRHP Significance Criteria, MACRIS notes that the continuing “swinging” truss represents an unusual or unique style, the design provides a valuable contribution to bridge technology, the bridge retains its integrity, the builder is known and important, and the bridge is historically important to the area. Additionally, the bridge is a contributing resource to the NRHP-eligible Cape Cod Canal Historic District.

Sagamore Bridge is an exceptional example of the continuous arched through truss type—a rare bridge type in Massachusetts. The center span crossing Cape Cod Canal consists of deck truss side spans transitioning into an arched through truss with a “swinging” deck suspended from the lower chord of the arch by 44 suspension cables. The bridge has concrete open-web column piers and concrete abutments with stylized Art Deco pylons. The continuous arched through truss span is a particularly graceful example of this form, which has been perfected by nationally acclaimed engineers Fay, Spofford and Thorndike. The main arched span has a cleaner, boxed appearance to the built-up, riveted truss members since flat plates were applied to the outward faces of the beams and the connecting angles were turned inward. The bridge is further distinguished by its well-detailed Art Deco architectural elements, including the massive Art Deco pylons set at the abutments to provide a gateway to the bridge.

Sagamore Bridge is included in the MHC Inventory as BOU.918. The MHC Inventory Form notes that in a national competition for the most beautiful steel bridges erected each year, [Sagamore Bridge was awarded an Honorable Mention – Class A – 1935 Award from the American Institute of Steel Construction](#) for its graceful design.⁴

Bourne Bridge

Bourne Bridge is a seven-span, 2,384-foot-long steel riveted Warren continuous truss bridge that carries State Route 28 over Cape Cod Canal, Sandwich Road, and the Massachusetts Coastal Railroad. Like Sagamore Bridge, Bourne Bridge was funded under the National Industrial Recovery Act of 1933

³ Massachusetts Department of Transportation, Bridge Type Selection Worksheet, Bridge No. B-17-005, Sagamore Bridge Arch/Delta Spans, April 2025. Draft.

⁴ <https://mhc-macris.net/details?mhcid=BOU.918>

and constructed between 1933 and 1934 by the American Bridge Company through the Depression-era Public Works Administration.

According to the original 1934 USACE design drawings, Bourne Bridge is comprised of two simple spans with spans lengths of 242 feet and 274.5 feet; three continuous spans with span lengths of 398.5 feet, 616 feet, and 398.5 feet; and two simple spans with span lengths of 244.5 feet and 210 feet. The arched 616-foot-long center span over Cape Cod Canal is supported by two granite-stone facing concrete piers on each side of the channel. There are hollow abutments at either end of the bridge that are approximately 150 feet long.⁵ Like Sagamore Bridge, the main span crossing Cape Cod Canal consists of deck truss side spans transitioning into an arched through truss with a “swinging” deck suspended from the lower chord of the arch by 44 suspension cables. The approach spans flanking the main span are deck truss spans, leading into the deck truss approach spans. The superstructure is supported by six reinforced open-web concrete column piers and reinforced concrete abutments with stylized Art Deco pylons.

Along with Sagamore Bridge, Bourne Bridge was determined individually eligible for listing in the NRHP at the state level under Criteria A and C on March 6, 1991, and it is a contributing resource to the NRHP-eligible Cape Cod Canal Historic District. Nearly identical to Sagamore Bridge, Bourne Bridge is an exceptional example of the continuous arched through truss type designed by Fay, Spofford and Thorndike. Like Sagamore Bridge, in identifying its NRHP Significance Criteria, MACRIS notes that the continuing “swinging” truss represents an unusual or unique style, the design provides a valuable contribution to bridge technology, the bridge retains its integrity, the builder is known and important, and the bridge is historically important to the area.

Bourne Bridge is included in the MHC Inventory as BOU.919. The MHC Inventory Form notes that [Bourne Bridge was awarded the First Place – Class A – 1934 and is included in American Institute of Steel Construction’s Prize Bridges 1928-1938.](#)⁶

Cape Cod Canal Historic District

Explorations into the concept of a canal to encourage commerce among European colonists and Indigenous tribes date to the early 1600s.⁷ After several failed attempts to dig the canal in the late 18th century, Cape Cod Canal was constructed by the privately owned Boston, Cape Cod and New York Canal Company from 1909 to 1914. The U.S. government acquired Cape Cod Canal in 1928 and implemented a widening and improvement program from 1933 to 1940, which included construction of the highway bridges and the NRHP-eligible Buzzards Bay Vertical Lift Railroad Bridge,⁸ [and charged USACE with the responsibility to manage and operate the waterway, the three bridges, and other](#)

⁵ Massachusetts Department of Transportation, Bridge Type Selection Worksheet, Bridge No. B-17-004, Bourne Bridge Arch/Delta Spans, May 2025. Draft.

⁶ <https://mhc-macris.net/details?mhcid=BOU.919>

⁷ [Massachusetts Cultural Resource Information System. Historic Area Detail: BOU.AF.](#) <https://mhc-macris.net/details?mhcid=BOU.AF>

⁸ [Massachusetts Historical Commission, Massachusetts Cultural Resource Information System.](#) <https://mhc-macris.net/details?mhcid=BOU.901>

[water features as the Cape Cod Canal Federal Navigation Project \(FNP\)](#). Cape Cod Canal has been recognized as a masterful effort of engineering and for the significant effect it had on both the surrounding communities and on maritime transportation and economic development in New England. Additionally, the canal had an important role in coastal defense during World War II.

[The Cape Cod Canal Historic District, included in the MHC Inventory as BOU.AF in the town of Bourne, includes the waterway and historic buildings and structures associated with the construction and operation of Cape Cod Canal that are currently managed and operated by USACE. It has been determined eligible for listing in the NRHP as a historic district under Criteria A and C.⁹](#)

South Sagamore Area

[The South Sagamore Area is an approximate 55-acre linear area along Sandwich Road just east of Sagamore Bridge extending from Adams Street \(including the property on Sandwich Road directly west of Adams Street\) east to the Sandwich town line. The residential, ecclesiastical, and institutional structures in the densely developed area were constructed from the eighteenth through the twentieth centuries. The South Sagamore Area is included in the MHC Inventory as BOU.V; it includes 27 properties, some with multiple structures, that are contributing resources, including eight properties determined to be potentially individually eligible for inclusion in the NRHP.¹⁰ FHWA has determined that the South Sagamore Area is eligible for listing in the NRHP.](#)

4.16.2.2 Other Architectural Properties within and Adjacent to the Construction Area of Potential Effects

MassDOT evaluated architectural properties and areas within or immediately adjacent to the Sagamore Bridge and Bourne Bridge Construction APEs that are more than 40 years old and were not previously included in the MHC Inventory. Of the three individual structures and two areas that MassDOT evaluated in the Sagamore Bridge Construction APE, none were determined eligible for the NRHP. MassDOT evaluated one historic area within the Bourne Bridge Construction APE and determined it was not eligible for the NRHP. Additionally, MassDOT determined that one previously inventoried area in the Bourne Bridge Construction APE was not NRHP eligible, and that one previously inventoried property no longer exists. **Appendix 4.16, Cultural Resources Technical Report**, provides additional details, including the properties' NRHP Eligibility Forms ([Attachment 3](#)) and [SHPO](#) coordination ([Attachment 1, Appendix F](#)).

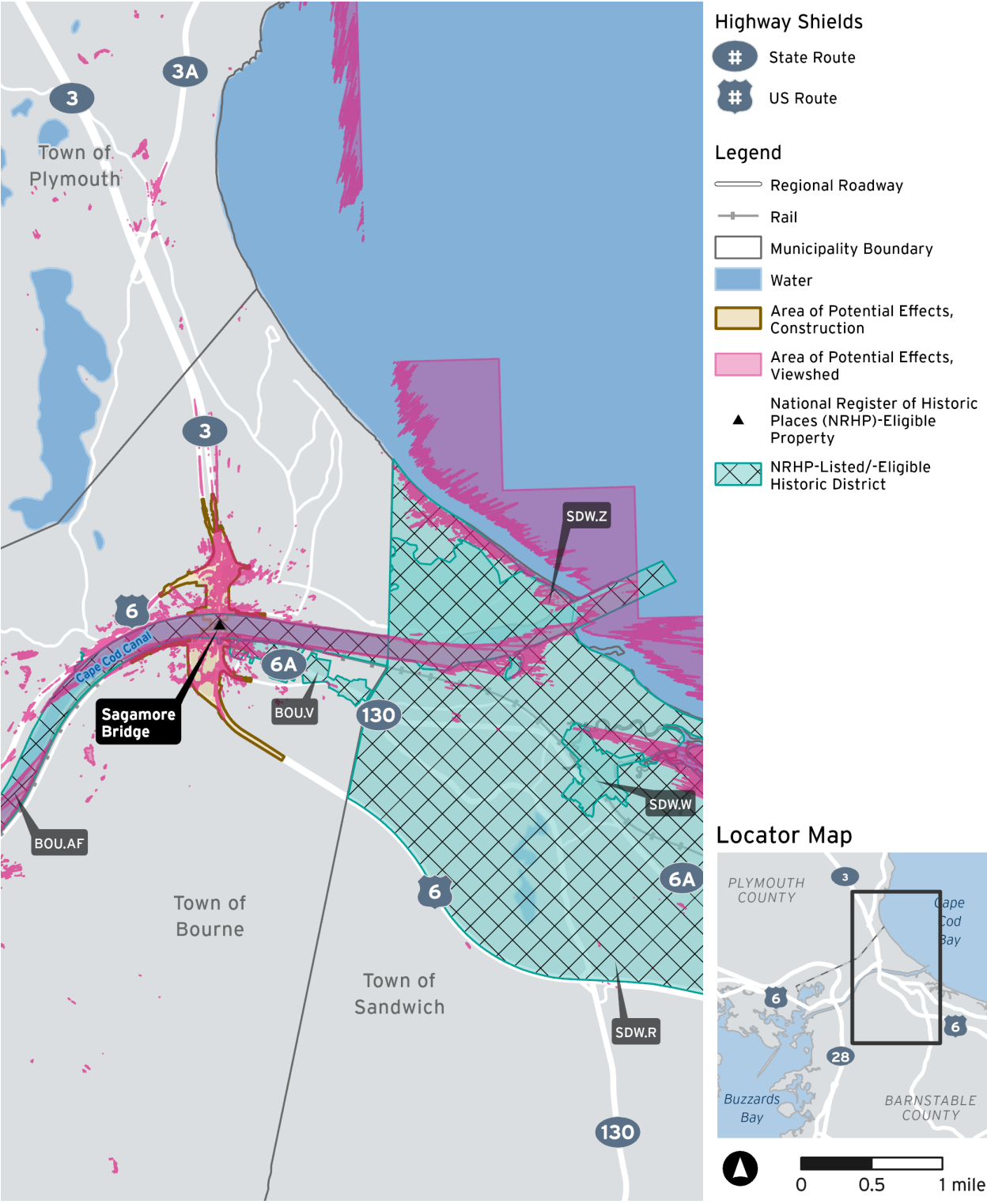
4.16.2.3 Historic Architectural Properties within the Viewshed Area of Potential Effects

Figure 4.16-3 and **Figure 4.16-4** present the Viewshed APE, which includes the viewsheds for the Sagamore and Bourne Bridges, respectively.

⁹ The U. S. Army Corps of Engineers (USACE) issued a formal determination that the Bourne Bridge, the Sagamore Bridge, and the Cape Cod Canal Historic District are eligible for listing in the NRHP as part of a Programmatic Agreement with SHPO, related to USACE's MRER/EA and Finding of No Significant Impact (FONSI) for the Cape Cod Canal Highway Bridges. USACE signed and fully executed the Programmatic Agreement on March 11, 2022.

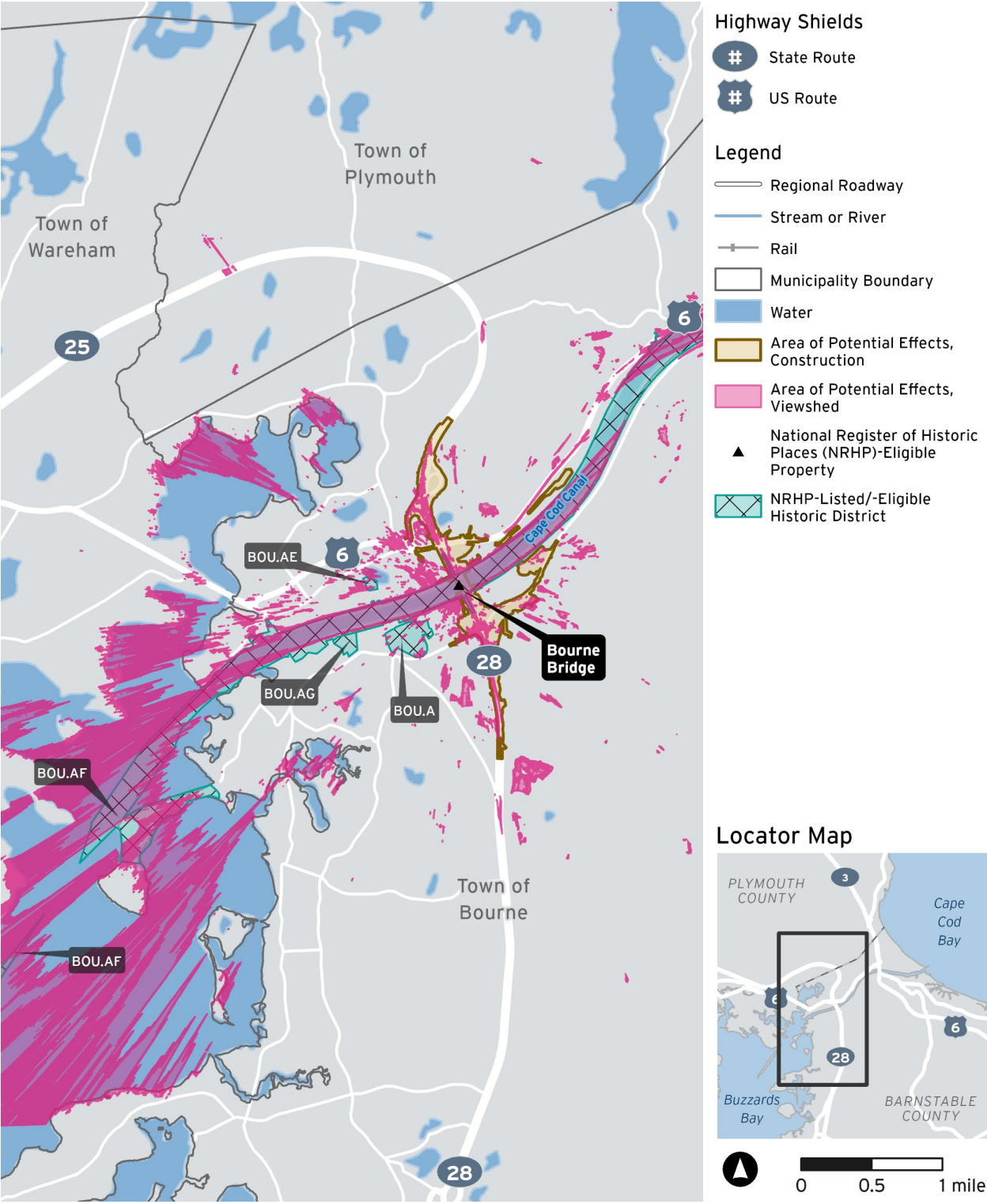
¹⁰ <https://mhc-macris.net/details?mhcid=bou.v>

Figure 4.16-3. Viewshed Area of Potential Effects (Sagamore Bridge)



Source: Massachusetts Department of Transportation, 2025

Figure 4.16-4. Viewshed Area of Potential Effects (Bourne Bridge)



Source: Massachusetts Department of Transportation, 2025

Table 4.16-2 identifies NRHP-listed and NRHP-eligible historic architectural properties, including structures and historic areas, within the Viewshed APE of the Sagamore and/or Bourne Bridge.

Table 4.16-2. Historic Architectural Properties within the Viewshed Area of Potential Effects (Sagamore and Bourne Bridges)

Historic Properties/ Area	Address	Massachusetts Historical Commission Inventory Number	Bridge Viewshed	Protection
Cape Cod Canal Historic District	Cape Cod Canal	BOU.AF (town of Bourne),	Sagamore & Bourne Bridges	National Register of Historic Places (NRHP)- eligible
South Sagamore Area	Sandwich Road area/Sagamore Village	BOU.V	Sagamore Bridge	NRHP-eligible
Bournedale Village School	29 Herring Pond Road	BOU.57	Sagamore Bridge	NRHP-listed
Mason White-Battles House	6 Bournedale Road	BOU.54	Sagamore Bridge	NRHP-eligible
Wilson D. Bent House	9 Bournedale Road	BOU.55	Sagamore Bridge	NRHP-eligible
Josiah Ellis House	166 Herring Pond Road	BOU.209	Sagamore Bridge	NRHP-eligible
Nathan Bourne Ellis House	854 Scenic Highway	BOU.211	Sagamore Bridge	NRHP-eligible
Swift Memorial Methodist Episcopal Church	10 Williston Road	BOU.118	Sagamore Bridge	NRHP-eligible
Sagamore Grammar School	30 Williston Road	BOU.119	Sagamore Bridge	NRHP-eligible
Capt. William Crowell Gibbs House	252 Old Plymouth Road	BOU.281	Sagamore Bridge	NRHP-eligible
Keene Street-Sandwich Road Area	Keene Street-Sandwich Road area/Bourne Village	BOU.A	Bourne Bridge	NRHP-eligible
Aptucxet Trading Post Museum Historic District	6 Aptucxet Road	BOU.AG	Bourne Bridge	NRHP-listed
George I. Briggs House	22 Sandwich Road	BOU.1	Bourne Bridge	NRHP-listed

Historic Properties/ Area	Address	Massachusetts Historical Commission Inventory Number	Bridge Viewshed	Protection
Bourne High School	85 Cotuit Road	BOU.4	Bourne Bridge	NRHP-listed
Jonathan Bourne Public Library	30 Keene Street	BOU.13	Bourne Bridge	NRHP-listed
Bourne Town Hall	24 Perry Avenue	BOU.68	Bourne Bridge	NRHP-listed
Albert R. Eldridge House	43 Sandwich Road	BOU.10	Bourne Bridge	NRHP-eligible
Moses Calvin Waterhouse House	59 Keene Street	BOU.12	Bourne Bridge	NRHP-eligible
Alonzo E. Booth Blacksmith Shop	22 Sandwich Road	BOU.48	Bourne Bridge	NRHP-eligible
Gibbs House	291 Head of the Bay Road	BOU.60	Bourne Bridge	NRHP-eligible
Abram F. Swift House	37 Old Bridge Road	BOU.67	Bourne Bridge	NRHP-eligible

4.16.2.4 Archaeological Resources Within and Near the Construction Area of Potential Effects

The MHC Inventory files indicate that there are nine recorded archaeological sites within and near the Sagamore Bridge Construction APE and 15 recorded archaeological sites within and near the Bourne Bridge Construction APE. Prior to the construction of Cape Cod Canal, the areas around the Sagamore and Bourne Bridges had high archaeological sensitivity, based on the presence of known Native American and early European settlements in proximity to the Monument and Scusset Rivers. However, construction of the canal resulted in large-scale disturbances that most likely destroyed any sites near the rivers. Further, investigations conducted by USACE in 1994, and subsequent investigations indicate that most of the areas immediately adjacent to the existing bridges have been disturbed by bridge construction.

Based on the results of its 2023 Archaeological Reconnaissance Survey, MassDOT determined that much of the surveyed landscape has low archaeological sensitivity for intact archaeological resources due to disturbances caused by previous canal, roadway, bridge, railroad, utility, and drainage construction and residential and commercial development. In the segments of the surveyed area where prior disturbance is evident, no further archaeological investigations are recommended.

MassDOT conducted an intensive (locational) archaeological survey in the following five locations within the Construction APEs with intact soils to assess their sensitivity:

- Sagamore Bridge South Interchange, wooded terrace west of the Market Basket parking lot

- Bourne Bridge North Interchange, north of Nightingale Pond
- Bourne Bridge North Interchange, east of Nightingale Pond
- Bourne Bridge South Interchange, low ridge off Sandwich Road east of the interchange
- Bourne Bridge South Interchange, south of the interchange along proposed State Route 28 northbound

No significant archaeological resources were identified during the locational survey. Further, MassDOT determined that one previously recorded site and three new pre-contact spots within the Bourne Bridge Construction APE are not eligible for listing in the NRHP. MassDOT received concurrence from SHPO on its level of investigation and findings on January 14, 2025 (provided in **Appendix 4.16, Cultural Resources Technical Report, Attachment 1, Appendix F**). No other comments were received from Consulting Parties on the Reconnaissance Survey or the results of the intensive archaeological survey.

MassDOT's professional archaeologist reviewed the revised Project Limits of the proposed park and recreation mitigation areas, located within USACE-managed Cape Cod Canal FNP in the Sagamore North and Bourne South quadrants, to assess the archaeological sensitivity of those mitigation areas. The MassDOT Archaeologist determined that the Sagamore North and Bourne South quadrants were previously assessed as having low sensitivity as part of the Archaeological Reconnaissance Survey in 2023. Therefore, MassDOT concluded that no further archaeological assessment or survey of the proposed mitigation areas was required.

4.16.3 No Build Alternative

The No Build Alternative would involve continued operation of the NRHP-eligible Sagamore and Bourne Bridges. In the No Build Alternative, which is consistent with the No Action Alternative identified in USACE's Major Rehabilitation Evaluation Report/Environmental Assessment, major rehabilitation efforts would not be conducted, and components of the structures would be repaired and critical elements replaced as they deteriorate and before they fail. It is anticipated that there would be no effects on the bridges or other historic architectural properties, as there would be no change in appearance or location of the bridges.¹¹

In the No Build Alternative, MassDOT would comply with Section 106 and Massachusetts-related historic regulations as needed to maintain the highway interchange approach networks at the two bridges and implement the Transportation Improvement Program projects (identified in **Chapter 3, Proposed Action and Alternatives**).

¹¹ [Cape Cod Canal Bridges Major Rehabilitation Study](https://www.nae.usace.army.mil/Missions/Projects-Topics/Cape-Cod-Canal-Bridges-Major-Rehabilitation-Study/). <https://www.nae.usace.army.mil/Missions/Projects-Topics/Cape-Cod-Canal-Bridges-Major-Rehabilitation-Study/>

4.16.4 Build Alternative

4.16.4.1 Effects on Historic Architectural Properties

The following sections identify FHWA and MassDOT determinations of the effect of the Program upon architectural historic properties within the Program APEs, as well as the SHPO's review of and concurrence with those determinations.

Sagamore and Bourne Bridges

The demolition of the Sagamore and Bourne Bridges in the Build Alternative would have an unavoidable adverse effect on each of the individually NRHP-eligible structures in accordance with 36 CFR 800.5(a)(2)(i).

Cape Cod Canal Historic District

The existing Sagamore and Bourne Bridges are contributing resources to the NRHP-eligible Cape Cod Canal Historic District. While the Program proposes to replace these contributing bridge structures, MassDOT, in coordination with FHWA and with input from Consulting Parties and the public, selected a replacement bridge type that is compatible with the defining characteristics of the existing bridges and the historic district as a whole. The replacement bridge type would have a kinship with the existing historic high-level through truss bridges and would provide a similar monumental gateway experience across Cape Cod Canal, thereby minimizing potential effects to the feeling and setting of the historic district. By incorporating a network arch main span across the canal and maintaining the arched bridge profiles like the existing structures, FHWA determined that the proposed replacement bridges—parallel, twin steel tied-arch bridges supported on delta frames—would be compatible with the existing historic through truss bridges in scale and form. Because the proposed Program would replace contributing bridge structures with new bridges that are compatible in scale, form, and visual character, and retain the historic district's defining visual qualities, FHWA determined that the new bridges would result in no adverse effect on the Cape Cod Canal Historic District.

In addition to the replacement highway bridges, the Program would include approach roadways, shared-use paths, drainage structures, and transportation-related infrastructure within the Cape Cod Canal FNP lands bordering Cape Cod Canal to the north and south, requiring temporary occupancy of the Cape Cod Canal FNP and permanent easements from USACE. Following construction completion, disturbed areas would be revegetated, temporary occupancy areas would be restored to conditions equal to or better than those existing prior to the Program, and an extensive landscaping program would be implemented to soften the visual appearance of the new infrastructure. Further, mitigation for permanent easements would be consistent with the mitigation proposed in the Programmatic Agreement.

On June 22, 2026, SHPO concurred with FHWA's determination that the Program, including the replacement bridges and associated transportation infrastructure improvements, would result in no adverse effect on the NRHP-eligible Cape Cod Canal Historic District.

South Sagamore Area

MassDOT is proposing the following work within the NRHP-eligible South Sagamore Area, which includes the MHC-inventoried Keith Car Company (Canal View) Apartments at 860 Sandwich Road,¹² a contributing resource to the historic district:

- Construction of a shared-use path along the northerly side of Sandwich Road within the State highway layout, originating west of the historic district and proceeding east to Keith Field Recreation Area (861 Sandwich Road), a non-contributing property.
- Construction of an approximate 300-foot-long shared-use path along the westerly and northerly boundaries of Keith Field Recreation Area to south Canal Service Road.
- Construction of a sidewalk on the southerly side of Sandwich Road from U.S. Route 6 east to the existing sidewalk in front of the Keith Car Company Apartments.
- Reconstruction of the existing sidewalk.

MassDOT also would require fee takings, permanent utility easements, and temporary occupancy of land on the parcel occupied by the Keith Car Company Apartments for the proposed work and installation of highway lighting and signage.

To avoid an adverse effect on the South Sagamore Area, MassDOT would protect existing mature trees in front of the Keith Car Company Apartments during sidewalk reconstruction. Upon construction completion, MassDOT would landscape the northerly side of Sandwich Road fronting the Keith Field Recreation Area parcel, and restore temporary occupancy areas to conditions equal to or better than those existing prior to the Program. As a result, FHWA has determined that the Program would not have an adverse effect on the NRHP-eligible South Sagamore Area, including the area's contributing properties. The SHPO concurred with this no adverse effect determination on June 22, 2026.

Historic Properties within the Viewshed APE

FHWA determined that due to their similar arched bridge profiles, the views of the replacement bridges from historic properties would be comparable to current views of the existing bridges. In accordance with 36 CFR 800.5(b), FHWA determined that the replacement bridges would avoid adverse effects on historic architectural properties, including districts and individual structures within the Viewshed APE. The SHPO concurred with this no adverse effect determination on June 22, 2026.

4.16.4.2 Effects on Archaeological Resources

Based on a review of the revised Project Limits, the MassDOT Archaeologist determined that the Sagamore North and Bourne South quadrants' previous assessment of low sensitivity as part of the

¹² <https://mhc-macris.net/details?mhcid=BOU.328>, <https://mhc-macris.net/details?mhcid=bou.329>, <https://mhc-macris.net/details?mhcid=BOU.330>, <https://mhc-macris.net/details?mhcid=BOU.331>

Archaeological Reconnaissance Survey in 2023 remained valid. Therefore, MassDOT concluded that no further archaeological assessment or survey of the proposed mitigation areas was required.

As the Program's plans develop during the design-build process, MassDOT would continue to consult with ACHP, SHPO, THPOs, and other Section 106 Consulting Parties, as needed. Although the Archaeological Reconnaissance Survey confirmed that much of the surveyed landscape within the Construction APEs has low archaeological sensitivity and the intensive survey did not identify any significant archaeological resources, MassDOT would continue to monitor the need for additional archaeological investigations through final design and construction of the Build Alternative as follows:

1. MassDOT would require the Program's Design-Builder to provide updated plans at the 75% and 100% phases of design and renderings at the 100% phase of design for review and assessment by MassDOT's Archaeologist.
2. If the APE is expanded during construction, MassDOT's Archaeologist would review the expanded APE and determine if further consultation with SHPO, THPOs, and the Section 106 Consulting Parties is needed.

Additionally, MassDOT would include a Discovery of Unanticipated Archaeological and Skeletal Remains Special Provision in the construction contract.

4.16.5 Mitigation

Pursuant to 36 CFR 800.5(a), FHWA prepared a formal Effect Finding under Section 106 of the National Historic Preservation Act of 1966. FHWA submitted the Effect Finding to SHPO, including determinations relative to the NRHP-eligible Sagamore and Bourne Bridges, the NRHP-eligible Cape Cod Canal Historic District, historic architectural properties within the Viewshed Area of Potential Effects (APE), and the NRHP-eligible South Sagamore Area. FHWA determined that the South Sagamore Area (BOU.V), is eligible for listing in the NRHP. SHPO concurred with FHWA's determinations and formal Effect Finding on June 22, 2026.

As directed by 36 CFR 800.5(a), FHWA considered any views concerning the Effect Finding provided by Consulting Parties and the public. SHPO's concurrence with the Effect Finding for the Program is included in **Attachment 1, Programmatic Agreement**.

In accordance with 36 CFR 800.14(b)(2), the Programmatic Agreement was prepared among FHWA – Massachusetts Division, SHPO, the New England District of USACE, and MassDOT. On January 12, 2026, on behalf of FHWA, MassDOT submitted the final draft document to Consulting Parties for review and comment. Additionally, FHWA and MassDOT reviewed the proposed mitigation measures with Consulting Parties during a meeting on January 14, 2026. Comments from Consulting Parties were incorporated into a revised document. FHWA submitted the revised Programmatic Agreement to SHPO, additional Signatory Parties, and Concurring Parties for signatures.

FHWA invited USACE and MassDOT to sign the Programmatic Agreement as Invited Signatories. FHWA invited the Mashpee Wampanoag Tribe, Wampanoag Tribe of Gay Head (Aquinnah), Narragansett Indian Tribe, Herring Pond Wampanoag Tribe, Massachusetts Commission on Indian Affairs, Bourne Historical Commission, Sandwich Historical Commission, Massachusetts Board of Underwater

Archaeological Resources, Cape Cod Commission, and National Trust for Historic Preservation to sign the Programmatic Agreement as Concurring Parties. ACHP was notified of the adverse effect determination and indicated that further participation by ACHP to resolve adverse effects is unnecessary. Accordingly, ACHP has not signed the Programmatic Agreement, pursuant to 36 CFR 800.6(2).

Appendix 4.16, Attachment 1 contains the Programmatic Agreement, which commits FHWA and MassDOT to certain stipulations to mitigate the adverse effects on the NRHP-eligible Sagamore and Bourne Bridges, including (but not limited to) those listed in **Table 4.16-3**.

Table 4.16-3. Programmatic Agreement Mitigation Stipulations

Mitigation Category	Stipulation
Bridge Design and Construction	• Design and construct new, high-level bridges comprising parallel, twin steel tied-arch superstructures supported on delta frames at each crossing. Each new bridge will provide four through-traffic lanes (two lanes in either direction), two auxiliary (acceleration/deceleration) lanes, and a single shared-use path for bicycle and pedestrian use. • Incorporate context-sensitive aesthetic designs to maintain and enhance the settings of the replacement Sagamore and Bourne Bridges within the Cape Cod Canal Historic District.
Historic American Engineering Record	Prepare historic recordation documentation of both bridges for submittal to the Historic American Engineering Record maintained by the National Park Service.
Interpretive Panels	Prepare and fabricate at least one interpretive historic panel for installation at each of the pedestrian overlooks along each bridge. The interpretive panel content would be determined in consultation with the Consulting Parties.
Adaptive Reuse of Bridge Components	• Salvage and transfer the original bridge plaques at both existing bridges to local public entities in consultation with the Consulting Parties. • Investigate the salvage and reuse of steel trusses, granite from piers and abutments, granite sidewalk, and all other existing bridge components for application in the Project areas. Solicit interest from USACE, state agencies, municipalities, and non-profit art and/or historic preservation groups for the transfer and adaptive reuse of select components from the historic bridges for public education, art, historic preservation, or other uses in publicly accessible spaces.
Design-Build	Include the Programmatic Agreement in the Request for Qualifications, Request for Proposals, and construction contracts for both bridge replacement projects.

Mitigation Category	Stipulation
Provisions for the Unanticipated Discovery of Cultural Resources	- Implement Standard Specification, Section 7.23 - Discovery of Unanticipated Archaeological and Skeletal Remains, if, during construction, new archaeological resources are discovered, unanticipated effects of archaeological properties are identified, or evidence of burials or human remains is encountered. - Consult with SHPO, THPOs, and other Consulting Parties to identify the appropriate course of action.

The Programmatic Agreement (**Attachment 1**) includes the following appendices listed in **Table 4.16-4**.

Table 4.16-4. Programmatic Agreement Appendices

Appendix	Title
Appendix A	MHC Inventory Forms and NRHP Eligibility Recommendations for Bourne Bridge (BOU.919) and Sagamore Bridge (BOU.918), March 1991
Appendix B	USACE, New England District, Major Rehabilitation Evaluation Report (MRER), Executive Summary, March 2020
Appendix C	USACE Section 106 Programmatic Agreement for Major Rehabilitation Evaluation Report, March 11, 2022
Appendix D	Memoranda of Understanding between USACE and MassDOT; June 28, 2018; July 7, 2020; March 21, 2024
Appendix E	Area of Potential Effects, Bourne Bridge and Sagamore Bridge
Appendix F	Correspondence with State Historic Preservation Officer/State Archaeologist; June 26, 2023; November 15, 2024; January 14, 2025; March 26, 2025; June 2, 2025
Appendix G	Email Correspondence with the Advisory Council on Historic Preservation, July 17, 2025
Appendix H	Preliminary Bridge Renderings
Appendix I	MassDOT Standard Special Provision, 7.23 Discovery of Unanticipated Archaeological and Skeletal Remains
Appendix J	Contacts

Appendix 4.16, Attachment 2, provides documentation of consultation with Consulting Parties throughout preparation of the Programmatic Agreement.