

# DRAFT

# Coastal Route Bikeway

## Phase 1

### Feasibility Study

---

PREPARED FOR

Town of Charlestown  
4540 South County Trail  
Charlestown, RI, 02813  
401.364.1200

PREPARED BY



1 Cedar Street  
Suite 400  
Providence, RI 02903  
401.272.8100

November 5, 2018



# Table of Contents

<b>1</b>	<b>Project Background and Description .....</b>	<b>1</b>
	Project Area Boundaries .....	2
	Project Area General Land Uses .....	2
<b>2</b>	<b>Design Policy Related to Bicycle and Pedestrian Accommodation.....</b>	<b>3</b>
	Transportation 2037: Rhode Island Long Range Transportation Plan (2012, updated 2017) .....	3
	Definition of Bikeway Types .....	3
	Shared Lane Bikeway.....	3
	Marked Shared Lane Bikeway.....	4
	Paved Shoulder.....	4
	Bicycle Lane.....	4
	Shared-Use Path .....	5
	Boardwalk Path.....	5
	Design Criteria .....	5
<b>3</b>	<b>Options Studied.....</b>	<b>6</b>
	Universal 1: Ninigret Park Shared-Use Path Connector .....	6
	Universal 2: King Tom Pond Shared-Use Path.....	6
	Universal-3: Matunuck Schoolhouse Road Bicycle Lanes .....	6
	Option A – Shared-Use Path along US-1 Alignment .....	7
	Option B – Old Post Road Bicycle Lanes .....	10
	Option C – Old Post Road Shared-Use Path .....	11
	New Traffic Signal and Roadway Realignment/Interchange Reconstruction at Narrow Lane / US-1.....	11
<b>4</b>	<b>Preliminary Cost Estimates.....</b>	<b>11</b>
	Cost Estimate Assumptions .....	12
	Option B Cost for Route 1A North of Ninigret Park.....	12
<b>5</b>	<b>Project Alternatives Impacts .....</b>	<b>13</b>
	General Applicable Environmental Guidance.....	13
	Relocation and Right-of-Way Impacts.....	14
	Considerations Relating to Pedestrians and Bicyclists.....	15
	Air Quality Impacts.....	16
	Noise Impacts.....	17
	Water Quality Impacts .....	17
	Impacts to National Wetlands Inventory Wetlands .....	17
	Floodplain Impacts.....	18

Coastal Impacts .....	18
Impacts to Threatened / Endangered Species or Habitat .....	19
National Register Districts or Property .....	19
Impacts to Hazardous Waste Sites .....	20
Construction Impacts .....	20
Visual Impacts .....	21
Public Utilities .....	21
Public Facilities and Public Facilities Connections .....	21
Environmental Justice .....	22
Construction Cost .....	22
Operations and Maintenance Costs .....	22
<b>6 Conclusion .....</b>	<b>23</b>
<b>Appendices .....</b>	
Appendix A – Corridor Maps .....	1
Appendix B – Options Impact Matrix .....	2
Appendix C – Site Photos .....	3

List of Tables

Table No.	Description	Page
Table 1	Order of Magnitude Costs for Coastal Route Bikeway, Phase 1 Options.....	12

DRAFT

## List of Figures

Figure No.	Description	Page
Figure 1	Coastal Route Bikeway Options Overview Map .....	8

DRAFT

## List of Photos

Photo No.	Description	Page
Photo 1	Ninigret Park Access .....	4
Photo 2	Charlestown Police Department.....	4
Photo 3	US-1 Corridor .....	5
Photo 4	Route 1A North of Ninigret Park.....	5
Photo 5	Route 1A West of King Tom Pond.....	6
Photo 6	US-1 North of King Tom Pond.....	6
Photo 7	US-1 at Cross Mills Road .....	7
Photo 8	US-1 West of Falcone Lane .....	7
Photo 9	US-1 at Narrow Lane.....	8
Photo 10	Route 1A East of King Tom Pond .....	8
Photo 11	Route 1A East of Cross Mills Road .....	9
Photo 12	Route 1A West of Falcone Lane.....	9
Photo 13	Route 1A West of Narrow Lane .....	10
Photo 14	RIDOT Maintenance Lot 1.....	10
Photo 15	RIDOT Maintenance Lot 2.....	11
Photo 16	RIDOT Maintenance Lot 3.....	11
Photo 17	Falcone Property.....	12
Photo 18	Matunuck Schoolhouse Road .....	12



## Project Background and Description

Vanesse Hangen Brustlin (VHB) has reviewed the feasibility and cost of constructing a bikeway of various types connecting Ninigret Park to the Charlestown town center, known as the Coastal Route Bikeway.

This is the latest in a series of investigations of possible bicycle connections in the area. In 2007, a schematic bicycle route was mapped in the same general area. In 1999 under contract to the Rhode Island Department of Transportation (RIDOT), VHB evaluated the feasibility of a continuous east-west bikeway connecting the Towns of Westerly, Charlestown and South Kingstown.

This Feasibility Report includes existing conditions, feasible alternatives, impacts, estimated construction costs, and anticipated permitting actions associated with the design and construction of a two shared-use path (SUP) alternatives and one bicycle lane alternative connecting existing SUPs in Ninigret Park with the Charlestown Town Center. One of these SUP alternatives follows a corridor indicated by the Charlestown Parks & Recreation Commission Bicycle Committee that emerged from the 2007 schematic bicycle route.

Completion of this Feasibility Report is the initial step in enabling the Town Council to determine the options moving forward to secure design and construction funding for the Coastal Route Bikeway. It serves as the basis to apply for funding through the Rhode Island Statewide Transportation Improvement Program (TIP) and other funding sources.



## Project Area Boundaries

The Project Area consists of a corridor from Ninigret Park northward to the US-1 highway corridor, then progressing eastward along the corridor US-1 and Route 1A corridors toward the U.S. Post Office at 3970 Old Post Road. A section of the Project Area diverges from Route 1A easterly along Matunuck Schoolhouse Road to the South Kingstown town line.

## Project Area General Land Uses

A former U.S. Navy auxiliary airfield is now the site of Ninigret Park. This area is a combination of coastal habitat, new park uses such as trails, ball courts and playgrounds, and historic remnants of the earlier airfield use (tarmac, runways). A series of SUPs were constructed in the park in 2016.

To the north, Old Post Road (Route 1A) divides Ninigret Park from property owned by the Charlestown Police Station and Charlestown Ambulance Rescue Service (a private company). The area just to the northeast of these properties is dominated by the large South County Sand and Gravel quarry, which is in active and regular use. Most parcels around the quarry are vacant residential parcels.

The US-1 corridor lies to the north of the police station and quarry properties and includes an easement for a National Grid electric transmission line. Several residential properties and the South Shore Center medical facility lie to the east of the quarry. Old Post Road is otherwise generally bordered by residential properties northward from Ninigret Park until it intersects with US-1, except for the Umbrella Factory property, which is a mixed-use property.

Old Post Road conjoins US-1 as it wraps around the north side of King Tom Pond – a small impounded water body. To the east of the pond, properties along the US-1 and Route 1A corridors are a variety of commercial, mixed use and residential uses.

The land on which the proposed facility would be situated is a combination of public and private land. The primary land uses of public land potentially affected are for public recreation (Ninigret Park) and transportation (US-1, Route 1A and Matunuck Schoolhouse Road corridors). For private land, primary land uses include commercial and residential properties, including some vacant residential lots. Several large public properties are situated adjacent to Cross Mills Road, including a RIDOT maintenance yard and the Cross Mills Public Library. Another large wooded area near the intersection of Cross Mills Road and US-1 is owned by the Charlestown Land Trust.

East of the Cross Mills area, the Town owns the large Great Cedar Swamp parcel, a wetland situated between Route 1A and US-1. BOATS Marine Center is located to the east of the swamp adjacent to US-1, with access via an unpaved drive to Falcone Lane. A large parcel marked for potential development is located to the east of the marine repair center, next to Falcone Lane. Along Route 1A in this area, the same general pattern continues of a mix of residential and commercial properties. The Cross Mills Fire Station is also located along this stretch.

Several important community destinations are located to the east of Falcone lane, including a bank, supermarket, drug store and post office.

## Design Policy Related to Bicycle and Pedestrian Accommodation

The US Department of Transportation (USDOT) policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. The USDOT policy states that every transportation agency (including state departments of transportation) has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Owing to the numerous individual and community benefits that walking and bicycling provide – including improved health, safety, environmental outcomes and quality of life – transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

### Transportation 2037: Rhode Island Long Range Transportation Plan (2012, updated 2017)

The state's Long Range Transportation Plan (LRTP)<sup>1</sup> is the state guide plan element for surface transportation. It provides a framework for coordination among various modes of transportation and serves as a means to advance projects to the Transportation Improvement Program (or TIP). It also sets policy to help guide public and private decision-making involving transportation.

For bicycling and walking, the current LRTP recommends a growing network of bicycling and walking paths, and that continued expansion in this network is a strategic investment in the state's future that will provide transportation options and enhance the attractiveness of the state. The LRTP further recommends that pedestrian and bicycle travel be consistently mainstreamed into transportation project and community planning and design.

### Definition of Bikeway Types

The following types of bikeways were considered during the preparation of this memo. These definitions originate with the *Guide for the Development of Bicycle Facilities*.<sup>2</sup>

#### Shared Lane Bikeway

Shared lane bikeways are best used on minor local neighborhood streets with low speeds and low traffic volumes, where bicycles can share the road with motorized traffic without

<sup>1</sup> Rhode Island Department of Administration. 2017. *Transportation 2037: Long Range Transportation Plan. State Guide Plan Element 611, Report #116*. Statewide Planning Program. December 2012, updated December 2017. URL: <http://www.planning.ri.gov/documents/trans/2017/LRTP-37.pdf>

<sup>2</sup> American Association of State Highway and Transportation Officials (AASHTO). 2012. *Guide for the Development of Bicycle Facilities, Fourth Edition*.

special provisions. Generally, the speed differential between motorists and bicyclists is 15 mph or less and motor vehicle speeds overall are 30 mph or less. Traffic volumes on a candidate roadway are typically less than approximately 1,000 vehicles per day. Shoulders intended for bicycle use should be at least four feet wide.



Marked Shared Land

### Marked Shared Lane Bikeway

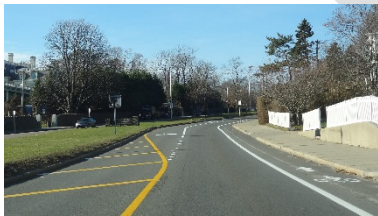
Marked shared lane bikeways differ from shared lane bikeways in that they employ a shared lane marking symbol on the pavement surface. The markings are intended to alert motorists to the presence and position of bicyclists on the road, and to help guide bicyclists toward a safe position on the road. These are best used on local collector or minor arterial streets with narrow travel lanes, where bicycle lanes are not feasible due to narrow lanes, space constraints and right-of-way limitations. Traffic volumes can be variable, but the motor vehicle speed limit should be 35 mph or less.



Paved Shoulder

### Paved Shoulder

Paved shoulders are adjacent to roadway travel lanes, delineated by a longitudinal pavement marking (the travel lane edge line). Paved shoulder bikeways are best used on rural roadways that connect town centers or other attractions but can also be used in more urban areas. Paved shoulders can also be used by pedestrians.



Bicycle Lane

### Bicycle Lane

A bicycle lane is a portion of the roadway designated for the preferential or exclusive use of bicyclists using pavement markings and sometimes signs. Bicycle lanes can be used on a wide variety of streets to provide bicycle connectivity. As an exclusive or preferential space for bicycles is provided, vehicle volume is generally less important than the speed differential between adjacent motor vehicles and bicycles in choosing to employ a bicycle lane.



Shared-Use Path (Sidepath)

### Shared-Use Path

A Shared-Use Path (SUP) can either be adjacent to a roadway right-of-way (where it is commonly known as a sidepath) or on an independent alignment. When adjacent to a roadway, an SUP is a non-motorized facility outside of the traveled roadway and physically separated from motorized vehicular traffic by a buffer zone or barrier.



Shared-Use Path (Independent Alignment)

SUPs on independent alignments are typically a minimum of ten feet wide with two-foot cleared shoulder areas. SUPs are used by bicycles, pedestrians and other users such as skateboarders, wheelchair users, runners and others.



Boardwalk Path

### Boardwalk Path

A Boardwalk Path is a type of SUP elevated above wetland areas to decrease impact to sensitive habitats. These paths are built to the width necessary for comfortable two-way travel.

## Design Criteria

The intention of this feasibility analysis is to review options to create a bicycle and pedestrian connection between Ninigret Park and the village center area near Old Post Road and Falcone Lane. The criteria for the design of options listed below are based on standard engineering practice and the successful application of regulatory standards and guidelines. The primary references for the project criteria include:

- The Americans with Disabilities Act (ADA) Design Guidelines for Shared-Use Paths.
- The American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development and Bicycle Facilities*, 4<sup>th</sup> Edition. 2012.
- AASHTO *Policy on Geometric Design of Highways and Streets*. 2011. Also known as the AASHTO Green Book.
- The *Manual on Uniform Traffic Control Devices* (MUTCD), 2009 editions with revisions and applicable interim approvals.
- Any related RIDOT engineering directives.

## Options Studied

Three alternatives for the Coastal Route Bikeway have been developed for consideration. The alternative treatments and alignments are described below, from west to east (see Figure 1). Please note that all option maps are included at the end of this document due to their length.

In addition, three *universal* elements have been developed – these would all be included with any of the three options listed below to ensure connectivity from Ninigret Park to the town line with South Kingstown. Universal elements are described below.

### Universal 1: Ninigret Park Shared-Use Path Connector

All options would connect to a proposed SUP linking Route 1A to existing SUPs inside Ninigret Park. This path would be approximately 1,500 feet long and would have a cross section of approximately 20 feet (10-foot SUP and 5-foot cleared/graded shoulders on each side).

### Universal 2: King Tom Pond Shared-Use Path

All options would connect to a proposed SUP on the east/south side of Route 1A as it intersects US-1 around the north end of King Tom Pond. This path is approximately 1,950 feet long and would consist of a shared-use path in the sidepath configuration.

The Universal 2 SUP begins approximately 300 feet south of the US-1 access ramps along the southern side of Route 1A. It would follow an alignment around the northern side of King Tom Pond. The ground slopes southward toward the pond at its northern extent and may dictate that the path be narrowed to avoid extensive grading or need for a retaining wall. Following past the northerly end of King Tom Pond, the SUP would continue easterly along the southern side of Route 1A for approximately 450 feet past the exit ramp/entrance ramp convergence at US-1.

### Universal-3: Matunuck Schoolhouse Road Bicycle Lanes

All options would connect to proposed bicycle lanes on Matunuck Schoolhouse Road. Installation of bicycle lanes would require widening of the road by approximately 4 feet on each side, to provide 5-foot bicycle lanes alongside 10-foot travel lanes. These lanes would be continued eastward to the South Kingstown town line, a distance of approximately 3,950 feet.

Note that South Kingstown has indicated a preference that a bikeway on Matunuck Schoolhouse Road consist of an on-road connection as opposed to an SUP. In the Matunuck Village Plan Report (2015), South Kingstown indicated that Matunuck Schoolhouse Road be designated as a signed-shared roadway.<sup>3</sup> Note that a portion of Matunuck Schoolhouse

<sup>3</sup> Town of South Kingstown. 2015. *Matunuck Village Plan Report (October 2015)*. URL: <http://www.southkingstownri.com/DocumentCenter/View/974/Matunuck-Village-Plan-Report-PDF?bidId=>. Accessed 9/5/18.



Road between Narrow Lane and Charlestown Beach Road is designated a hurricane evacuation route. Any changes to this road should be coordinated with state and local emergency management agencies.

## Option A – Shared-Use Path along US-1 Alignment

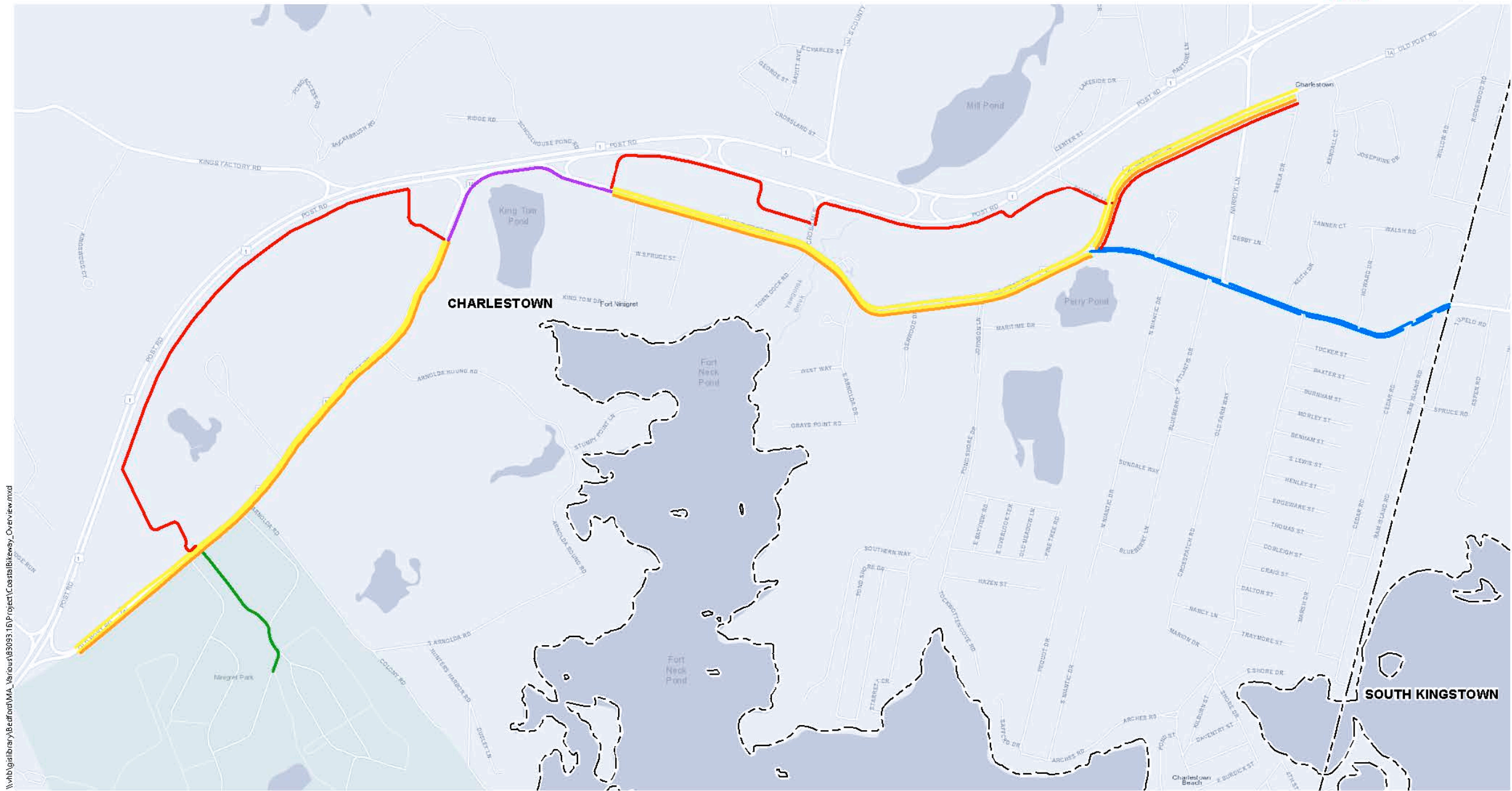
Option A is a primarily an SUP generally following the US-1 corridor. At its western end, the Option A SUP connects to the Universal 1 SUP (see description below) leading into Ninigret Park. A signed and marked crossing would be established to cross Route 1A near the entrance to the Charlestown Ambulance Rescue Service. The Option A SUP would consist of a 10-foot path bordered by a 5-foot cleared and graded shoulders on each side. This is considered the *SUP configuration* and will be referenced elsewhere in the options descriptions. The SUP would follow a northerly direction around the Ambulance Rescue Service property, cross a strip of land owned by South County Sand and Gravel and enter Charlestown Police Station property.

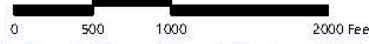


The SUP would continue northward toward US-1 along the police station property line. The SUP would turn easterly to follow a National Grid Easement along US-1 and the property line of South County Sand and Gravel. Approaching the exit from eastbound US-1 to Route 1A near King Tom Pond, the SUP would turn southerly through the western portion of the Gateway Healthcare parcel to access a strip of land owned by South County Sand and Gravel, then following this strip to Route 1A. Another signed and marked crossing would allow the path the traverse Route 1A to its eastern side.


The Universal 2 SUP (see Universal 2 description below) would turn northerly to follow Route 1A northbound to the northern side of King Tom Pond and would consist of a 10-foot-wide path, 3-foot clear zone to the property (eastern) side and 5-foot buffer strip next to the road. This is considered the *sidepath configuration* and will be referenced elsewhere in the options descriptions. Approaching US-1 and the northern side of King Tom Pond, the ground slopes southward toward the pond, and may dictate that the path be narrowed to avoid extensive grading or need for a retaining wall. Following past the northerly end of King Tom Pond, the SUP would continue easterly along the southern side of Route 1A for approximately 450 feet past the exit ramp/entrance ramp convergence at US-1. The SUP here would again be in the sidepath configuration.


Along the property line next to the entrance driveway to Charlestown Wine & Spirits, the SUP would turn northward and cross Route 1A with appropriate markings and signage. The SUP (SUP configuration) would continue through two parcels to the US-1 corridor, turning


Figure 1 Coastal Route Bikeway Options Overview Map





- 
-  Option A: Shared Use Path along US-1


 Option B: Route 1A Bike Lanes

 Option C: Shared Use Path Along Route 1A

 Universal - 1: Shared-Use Path Connection to Existing Ninigret Park Paths

 Universal-2: Shared Use Path Around King Tom Pond

 Universal-3: Matunuck Schoolhouse Road Bike Lanes

 Town Boundaries

Proposed Coastal Bikeway: Phase 1 | Charlestown, Rhode Island

Overview Map

Source Info:VHB, RGIS

then easterly. It would stay on this easterly course to the RIDOT maintenance facility at Cross Mills Road. The SUP would turn southward at the western side of the RIDOT parcel, descending the grade from the western side of the parcel to pass by the south side of the existing maintenance building before reaching Cross Mills Road. Due to the steep slopes, it may be necessary for a retaining wall to be constructed in this area, and the pathway may need to narrow depending on site constraints.

The SUP would then cross Cross Mills Road with enhanced markings and signage before turning northward (in sidepath configuration) and re-joining the US-1 corridor. The Cross Mills Road crossing is approximately 160 feet south of the end of the exit curve from eastbound US-1 to southbound Cross Mills Road. This is less than the recommended stopping sight distance (SSD) at this location. The Federal Highway Administration (FHWA) defines SSD as "the distance needed for drivers to see an object on the roadway ahead and bring their vehicles to safe stop before colliding with the object."<sup>4</sup> SSD is based a variety of factors, including speed, pavement condition, horizontal and vertical road alignment and assumed average driver reaction time.

It is assumed that motor vehicles exit US-1 and join Cross Mills Road at a speed of 40 mph. The SSD for this 40 mph is 305 feet. To achieve that distance, the crossing would need to be located further south at the Route 1A intersection. It is highly likely that path users would choose to cut across Cross Mills Road near US-1 rather than travel down to Route 1A and then continue back up the same road toward US-1 on the other side. Therefore, the crossing was advanced to the southern end of the RIDOT property – 160 feet from the US-1 exit. To ensure that this crossing is visible to motorists exiting US-1, VHB recommends an enhanced crossing and appropriate levels of signage be implemented at this crossing. An enhanced crossing would consist of high-visibility crosswalk markings, warning signs, and a rectangular rapid flashing beacon (RRFB) to raise awareness of the crossing.

After crossing Cross Mills and re-joining the US-1 corridor, the SUP would continue easterly past the marine repair facility adjacent to US-1 before turning southward into the Falcone parcel and generally following the existing unpaved access drive easterly toward Falcone Lane (SUP configuration). The SUP would then turn southerly, following Falcone Lane to the intersection with Route 1A (sidepath configuration).

The available undeveloped space behind the curb along Falcone Lane is significantly limited at Kingstown Pizza, and it would be anticipated that right-of-way would impact the majority of existing parking spaces at this business and that additional land would need to be acquired to relocate this parking.

The SUP would cross the southern leg of the Falcone Lane-Route 1A intersection with appropriate markings and signage, and then continue both southward and northward along Route 1A to Matunuck-Schoolhouse Road and to the U.S. Post Office (sidepath configuration). A designated crossing with appropriate signage and pavement markings at the easterly leg of the Route 1-A/Matunuck-Schoolhouse Road intersection would facilitate

---

<sup>4</sup> U.S. Department of Transportation. 2014. "Stopping Sight Distance." Federal Highway Administration. URL: [https://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3\\_stopdistance.cfm](https://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_stopdistance.cfm). Accessed 9/5/18.



the connection between the Option A SUP and bicycle lanes as proposed for Matunuck-Schoolhouse Road (see Universal 3 description below).

## Option B – Old Post Road Bicycle Lanes

Option B is intended to take advantage of the scheduled 2020-2021 repaving of a portion of Route 1A north of Ninigret Park planned in the Statewide Transportation Improvement Program (TIP). This option consists of widening Route 1A slightly to install bicycle lanes.

Option B would connect to existing Ninigret Park paths via the Universal 1 SUP (see Universal 1 description below). The bicycle lane would link east and west from where the Universal 1 SUP would intersect Route 1A. The westward link is included for the length of the re-paving, to provide the possibility for future connectivity to the west. A crossing with appropriate markings and signage would be provided at the proposed Universal 1 SUP intersection with Route 1A to facilitate bicyclists and pedestrians make a left turn into the park.

Adding bicycle lanes would necessitate a widening of existing pavements approximately 4 feet on each side of the road, based on Route 1A currently having 1-foot paved shoulders. The amount of actual paved shoulder is variable along Route 1A and would need to be field verified by a more rigorous survey. This widening would allow for 10-foot travel lanes alongside 5-foot bicycle lanes.

The bicycle lanes would continue on both sides of the road toward the east near the vicinity of King Tom Pond, linking to the Universal 2 SUP (see Universal 2 description below). A crossing with appropriate signage and pavement markings would be provided approximately 300 feet south of the US-1 access ramps to facilitate the transition from the westbound SUP to the westbound bicycle lane.

The Universal 2 SUP would continue around King Tom Pond and Route 1A (see Universal 2 description below).

Approximately 450 feet east of the US-1 access ramps (just east of the Charlestown Wine & Spirits access driveway), a crossing would be provided with appropriate pavement markings and signage. Again, the purpose is to facilitate access from the proposed westbound bicycle lane on Route 1A to the shared-use path on the south side of Route 1A.

Bicycle lanes would be installed on Route 1A in both directions between this crossing and Sheila Drive, adjacent to the U.S. Post Office. This would intersect the proposed bicycle lanes on Matunuck Schoolhouse Road (see Universal 3 description below).

The proposed minimum width for the proposed bicycle lanes in all areas is five feet. Some sections of Route 1A are already wide enough to accommodate a bicycle lane of this width with simple striping/markings, but there are portions that are narrower and where the roadway would need to be widened, and where embankments near the roadway would need to be cut back and stabilized.

Where bicycle lanes would cross road intersections, they would be marked with lane extension lines to highlight the conflict zone in the intersection.

## Option C – Old Post Road Shared-Use Path

Option C is an SUP on the south side of Route 1A. It is intended to provide the comfort of a shared-use path and the connectivity of a route along Route 1A.

Option C would connect to Ninigret Park paths via the Universal 1 SUP (see description below). The SUP would link east and west from where the Ninigret Park path would meet Route 1A. The westward link westward is included for possible future connectivity to the west. The Option C SUP would be in sidepath configuration.

To the east, the SUP would follow the southern side of Route 1A toward King Tom Pond, connecting around the pond via the Universal 2 SUP. The SUP would then continue easterly along the southern side of Route 1A toward Cross Mills Road, Matunuck Schoolhouse Road and would end at Sheila Drive near the U.S. Post Office

Crossings with appropriate pavement markings and signage would be included for crossings at all intersections. The Matunuck Schoolhouse Road crossing would also facilitate movement from the proposed eastbound bicycle lane (see Universal 3 description) to the westbound Option C SUP on Route 1A.

The sidepath configuration for Option C would be 18-feet-wide. There are locations where there appears to be room adjacent to Route 1A to provide such a facility with few or minimal impacts, but there are also areas where the available space is significantly less than 18 feet. In these areas, provisions can be made to narrow the path, the buffer zone, or both to the degree possible. If space is still inadequate, then it would be necessary to remove trees or relocate impediments such as stone walls and utility poles.

## New Traffic Signal and Roadway Realignment/Interchange Reconstruction at Narrow Lane / US-1

VHB was asked to review potential crossings of US-1. Several locations were investigated, but it was determined that the intersection of Narrow Lane and US-1 might be the most useful as a potential crossing, and that this crossing should be at-grade. A new traffic signal and realignment of the roadway would be required at this location. Only outline cost estimation is included. A preliminary design and detailed impact analysis will be required to refine this cost.

## Preliminary Cost Estimates

The following cost estimates are Rough Order of Magnitude (ROM) estimates. ROM estimates are provided for early-stage project planning purposes when exact details of project options are not yet known. ROM estimates often use a significant contingency percentage to ensure that all potential costs are captured. These can be used with other anticipated impacts as outlined in the impact matrix to assist decision-makers in selecting a preferred option to progress to later design stages. In later-stage design, cost estimates would be refined, and the contingency cost would sharply decrease.

## Cost Estimate Assumptions

For this cost estimate process, the following assumptions have been made:

- The estimate does not include costs for survey, design, right-of-way acquisition, permitting, safety beacon systems, retaining walls, traffic studies and utility modifications.
- Per-foot costs have been calculated based on RIDOT's Weighted Average Unit Pricing from similar construction contracts in Rhode Island.
- Contingency is calculated as 40 percent for an SUP on a new alignment and 60 percent both for road widening/bicycle lane installation and for a side path alongside a roadway with stone wall relocation.

**Table 1 Order of Magnitude Costs for Coastal Route Bikeway, Phase 1 Options**

Option	Cost/Linear Foot	Length (Feet)	Option Cost	Cost Inc. Universals
Option A: SUP along US-1 Corridor	\$101	15,277	\$1,518,600	\$5,999,200
Option A: Sidepath sections (Cross Mills, Falcone Lane, Route 1A)	\$587	3,258	\$1,912,000	-
Option B: Bicycle lanes along Route 1A	\$212	14,000	\$2,968,000	\$5,536,600
Option C: SUP along Route 1A	\$587	13,936	\$8,180,000	\$10,748,600
Universal-1: SUP connecting to Ninigret Park	\$101	1,587	\$160,000	-
Universal-2: SUP at King Tom Pond	\$587	2,167	\$1,641,600	-
Universal-3: Bicycle lanes on Matunuck Schoolhouse Road	\$212	3,619	\$767,228	-
Universal Sub-Total	n/a	n/a	\$2,568,600	-
New Traffic Signal and Realignment at Narrow Lane / US-1	n/a	n/a	\$2-3,000,000	-

## Option B Cost for Route 1A North of Ninigret Park

The segment of Route 1A north of Ninigret Road will be resurfaced through the Statewide Transportation Improvement Program. This cost of widening Route 1A for bicycle lanes does not include the cost of resurfacing the existing roadway. It would be prudent to consider widening the roadway in advance of the resurfacing, and some cost savings for this section of the road may result. Costs for this segment are currently estimated the same as for other sections of Route 1A where resurfacing would not occur (west of King Tom Pond).

## Project Alternatives Impacts

This section describes the anticipated environmental impacts of the three options proposed earlier in this Feasibility Report, and other criteria for evaluation, including:

- Relocation impacts and right-of-way acquisition;
- Considerations relating to pedestrians and bicyclists;
- Air quality impacts;
- Noise impacts;
- Water quality impacts;
- Impacts to National Wetlands Inventory wetlands;
- Floodplain impacts;
- Coastal impacts;
- Impacts to Threatened/endangered species and habitat;
- Impacts to National Register Historic District and Property;
- Impacts to hazardous waste sites;
- Construction impacts;
- Visual impacts;
- Impacts to public utilities;
- Public facilities connections;
- Environmental justice impacts;
- Construction costs; and
- Operations and maintenance costs.

Note that for each assessment category below, anticipated impacts are listed for all options, including universal elements. Impacts associated with universal elements would *also* pertain to all the three primary options. For instance, were Option A to be the alternative to move forward, it also includes any anticipated impacts associated with Universal 1, 2 and 3 (unless the project proponent were to specifically exclude any of these universal elements from future design).

## General Applicable Environmental Guidance

This Feasibility Report was developed using data provided by the Rhode Island Geographic Information System (RIGIS), managed by the Rhode Island Statewide Planning Program. The RIGIS data is a compilation of information acquired from a broad base of public and private agencies and serves as a useful tool for the purposes of planning and assessing potential suitability of land use and development. Some of the data is supplied to RIGIS by the Town

of Charlestown. The findings below are useful for identifying stakeholders and anticipating permitting requirements for the proposed options. Further research, field verification and field survey will be needed to verify the findings of this report before proceeding to final design.

### Relocation and Right-of-Way Impacts

Relocation and right-of-way impacts include moving features such as utility poles and stone walls and may entail removal of trees and other vegetation within the right-of-way. These impacts also include the acquisition of property for use as a part of the public right-of-way.

Generally, construction of SUPs results in an increase in values of nearby properties as documented in numerous studies.<sup>5</sup> Option A and Option C both include long stretches of SUPs.

All ROW acquisitions must comply with State and Federal regulations regarding the public acquisition of private property.

Note that the area of land acquisition for each option is based on GIS parcel data that would need to be further investigated with appropriate property line survey and title research. The existing GIS parcel data used for this calculation of ROW impacts cannot be considered sufficient for property line surveys. The land acquisition area is considered an estimate only.

#### Option A

This alternative will require the acquisition of approximately 108,884 square feet of land from 37 privately-owned parcels.

Co-location with a powerline easement will also require coordination with National Grid.

As currently aligned at Falcone Lane, the SUP will impact a commercial parking area which would eliminate the majority of existing parking for the adjacent business. The impact of this lost parking would need to be mitigated.

#### Option B

The bicycle lanes would be constructed within the existing Route 1A ROW however, relocations of some utility poles will be required, and some vegetation/trees will need to be removed. Embankments near the shoulder of the road will need to be cut back and stabilized with new retaining walls to provide adequate width for the bicycle lanes. Temporary construction access will be required to accomplish this work. Permanent utility easements may also be required.

#### Option C

This alternative will require the acquisition of an estimated 37,400 square feet of land from 52 parcels. The relocation of existing stone walls will be required at the edge of the roadway,

<sup>5</sup> Various Authors. Refer to <https://brucefreemanrailtrail.org/rail-trail-resources/rail-trail-studies/>.

and some utility poles will require relocation. Some trees will also need to be removed. Embankments would need to be cut back and stabilized with new retaining walls.

### **Universal 1**

The alignment for Universal 1 is entirely publicly-owned, so no ROW impacts are anticipated.

### **Universal 2**

Minor ROW actions would be required to acquire land around King Tom Pond, including the acquisition of an estimated 3,700 square feet of land from 6 parcels. This alternative will also require removal/relocation of existing stone walls and removal of some trees. Some utility poles and/or signs at the US-1 access ramps may need to be relocated.

### **Universal 3**

The bicycle lanes would be permanently constructed within the existing Matunuck Schoolhouse Road ROW. Relocations of utility poles may be required, and some vegetation/trees may need to be removed. Embankments near the shoulder of the road may need to be cut back and stabilized with new retaining walls to provide adequate width for the bicycle lanes. Only temporary construction ROW access is anticipated.

## **Considerations Relating to Pedestrians and Bicyclists**

There are no sidewalks or bicycle facilities in the study area, aside from those located in Ninigret Park, thus provision of either of the three options is likely to improve the general accessibility for walking and biking in the study area, and to improve non-motorized access to destinations such as Ninigret Park.

### **Option A**

A shared-use path is the comfortable option for bicyclists and pedestrians. The short sight distance crossing at Cross Mills Road would require an advance warning beacon.

### **Option B**

Bicycle lanes can provide some reduction of vehicle speeds and traffic calming by visually narrowing the roadway. Bicycle lanes can also provide some additional space for pedestrians along roadways without sidewalks, however they are less comfortable than SUP's for some users. Option B provides direct access to destinations along Route 1A and provides some separation between bicycles and motor vehicles.

### **Option C**

A shared-use path is a comfortable option for bicyclists and pedestrians. Option C provides direct access to destinations along Route 1A. While this option provides separation from motor vehicle traffic along Route 1A, bicyclists and pedestrians would cross numerous minor roads and driveways – these are all potential conflict points.

### Universal 1

This would be a high-comfort facility for bicyclists and pedestrians.

### Universal 2

This would be a high-comfort facility for bicyclists and pedestrians.

### Universal 3

This provides direct access to destinations along Matunuck Schoolhouse Road and provides some separation of bicyclists from motor vehicles. Bicycle lanes can also provide some additional space for pedestrians along roadways without sidewalks.

## Air Quality Impacts

The entire state of Rhode Island has been classified as a *moderate* nonattainment area for ozone. A nonattainment area is an area where the air quality has measured pollution levels above the National Ambient Air Quality Standards (NAAQS).

The Project does not involve any action that will increase traffic volumes in this area. The construction of any option will likely increase bicycle and pedestrian traffic in the study area, ideally reducing people's reliance on motor vehicles and ultimately reducing road congestion in this area. The combination of potential reduction in traffic volumes and reduced congestion should result in improved air quality. Accordingly, the project has no potential to cause new violations of the NAAQS.

Air quality in the study area would not be substantially affected by project construction because of the temporary nature of bikeway construction. Emissions from the operation of construction machinery (nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter) are short-term and not generally considered substantial. It should also be noted that construction machinery has an obligation for compliance with Air Quality Regulation No. 45, Rhode Island Diesel Engine Anti-Idling Program.

Mitigating fugitive dust emissions from construction involves minimizing or eliminating its generation. Mitigation measures that will be used for construction include wetting and stabilization to suppress dust generation, cleaning paved roadways, and scheduling construction to minimize the amount and duration of exposed earth. Fugitive dust generated during the construction phase of the project will be suppressed through the application of water or other appropriate methods.

Ongoing air quality impacts would be associated only with intermittent vehicle exhaust and dust associated with regular maintenance activities.

An air quality analysis has not been performed as part of this feasibility study nor is it deemed to be needed.

In general Option A, Universal 1 and Universal 2 air quality impacts could be marginally less than other project elements as these would take place along alignments generally away from areas where people congregate.

## Noise Impacts

The project is not expected to significantly increase traffic volumes nor vehicle speeds and resultant noise. As a result, there should be no noticeable change in existing sound levels.

Construction activities would result in a moderate but temporary noise impact to sensitive receptors (medical center, childcare center, senior housing facility) at various locations adjacent to proposed construction. Noise levels would vary depending on the type and number of pieces of equipment active at any one time. Noise impacts during construction can be mitigated by limiting the construction time periods.

## Water Quality Impacts

Groundwater in the study area is identified by the Rhode Island Department of Environmental Management (RIDEM) Office of Water Resources as GA groundwater (RIDEM, 2010). GA groundwater is considered potable without treatment. The three Options and all Universal elements cross areas with groundwater classified as GA. There are no public wells or community wellhead protection areas near the option corridors. The bikeway would not involve groundwater withdrawals and will not significantly affect groundwater recharge.

The Options and Universal elements would not cross any water types defined by the Rhode Island Coastal Resource Management Council (CRMC).

The design of any Option and Universal elements would need to incorporate appropriate best management practices for treatment of stormwater runoff in accordance with the Rhode Island Stormwater Design and Installation Standards Manual (RIDEM 2010). During construction, sedimentation and erosion controls will be utilized to prevent turbid discharges into the tributaries and ponds. Facilities and procedures typically included in RIDOT construction contracts will be utilized to protect water quality during the construction phase.

## Impacts to National Wetlands Inventory Wetlands

Wetlands and watercourses in the project area are subject to regulation under the Rhode Island Freshwater Wetland Act (Act) and are subject to federal jurisdiction under Section 404 of the Clean Water Act administered by the U.S. Army Corps of Engineers (USACE). The Act extends its jurisdiction beyond the resource area limits regulated by the USACE to dimensional setback from certain classes of wetland (50-foot Perimeter Wetland) and flowing bodies of water dependent on size (100-foot and 200-foot Riverbank Wetland).

There would be no direct impacts to any national wetlands inventory wetlands, however each Option would cross portions of the 50-foot wetland buffer zone and riverbank wetland 100-foot buffer zone. The Universal 2 alignment would also cross this riverbank wetland buffer zone.

Option A would have the largest potential impact to these wetland/riparian buffer areas (a combined 33,162 SF, versus 8,187 SF for Option B and 9,095 for Option C. Most of these potential impacts are associated with King Tom Pond Stream and King Tom Pond and the wetlands and streams associated with White Cedar Swamp.



A Freshwater Wetlands application to construct off-road shared-use path within wetlands would need to demonstrate that the project is not random, unnecessary or undesirable, and does not result in avoidable wetland impacts.

## Floodplain Impacts

Portions of the study Options would fall within Special Flood Hazard Areas as indicated on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Mapping (FIRM) for the Town of Charlestown, RI (Community Panel Numbers 44009C0168J, 44009C0169J, 44009Co188J; Maps effective October 16, 2013). Special flood hazard areas include Zones A and AE. An additional Zone X is shown on these panels.

Zone A is defined as areas subject to inundation by the one percent annual chance flood event using approximate methodologies. Zone AE is defined as Special Flood Hazard areas inundated by the one percent annual chance flood with detailed methods and base flood elevations. Zone X is defined as a 0.2 percent annual chance flood hazard

Within the study area, Option A and Universal 2 would cross a swath of Zone A designated area associated with King Tom Pond Stream and King Tom Pond. In the Cross Mills area, Options B and C would cross a small section of land designated Zone AE with a Base Flood Elevation of 12 feet. Zone X is throughout the area of White Cedar Swamp, including the Cross Mills Public Library, the central reserve north of Cross Mills Road between the US-1 travel lanes, and areas north and south of US-1 and Route 1A. All options would cross portions of Zone X, which is not quantified as a floodplain impact.

Option A would have the largest potential impact to floodplain areas, potentially affecting 26,352 SF, versus 164 SF for Option B and 1,096 for Option C.

Significant flood storage loss is not anticipated as a result of construction activities of any option or universal element. However, the preferred alternative will need to be designed in compliance with applicable local, state and federal regulations pertaining to protection of floodplain.

## Coastal Impacts

The proposed project would be situated proximate to tidal waters. Tidal waters, the coastal feature abutting tidal waters and the area of land within 200-feet of the landward limit of the coastal feature are subject to the regulation of the CRMC. CRMC is also the federally-designated Coastal Zone Management (CZM) authority for the State of Rhode Island.

For the Charlestown Area, the limit of CRMC jurisdiction is US-1, not the 200-foot landward limit. Thus, all Options and Universal elements are within CRMC jurisdiction areas. The corridors under review are not in tidal waters or the 200-foot landward limit but would cross perennial streams and wetlands that discharge into tidal waters. It is expected that a Request for Determination of Jurisdiction will be required to verify if CRMC would regulate the proposed project. If CRMC does regulate, an Assent will be required.

## Impacts to Threatened / Endangered Species or Habitat

The United States Fish and Wildlife Service (USFWS) website was used to access the FWS Natural Resources of Concern database regarding the presence of federal-listed threatened or endangered plant or animal species in the Project area. USFWS records indicate the potential to affect a population of Red Knot (*Calidris canutus rufa*, a type of sandpiper shore bird) and Northern Long-Eared Bat (*Myotis septentrionalis*).

The Red Knot is listed as a threatened species wherever found. This migratory bird is known to overwinter in South America, throughout the Caribbean and along the U.S. coastline from Texas to North Carolina, and breeds in the tundra of the Canadian Arctic. Red Knots eat small clams, mussels, snails and other invertebrates. The bikeway is not anticipated to affect the Red Knot given its distance from the shore.

The Northern Long-Eared Bat is listed as threatened wherever found. This medium-sized bat is found across the eastern U.S. and all Canadian provinces from the Atlantic coast west to the southern Northwest Territories and eastern British Columbia. This bat is threatened predominantly by white-nose syndrome, a fungal disease known to affect bats. During summer, they roost singly or in colonies underneath bark, in cavities or crevices of both live and dead trees, eating a variety of insects caught in flight or on vegetation in the understory of forested areas. The bikeway may affect populations of Long-Eared Bat through removal of trees. All options may involve removal of some trees, with the possible number of removals greatest with Option A.

The Rhode Island Natural Heritage Program (RINHP) database hosted on the RIDEM Environmental Resource Mapping website identifies a Natural Heritage Area in the Matunuck Schoolhouse Road area. The species listed with this area is the Grasshopper Sparrow (*Ammodramus savannarum*). This small bird lives in grasslands, hayfields and prairies, breeding in dry fields and prairies, particularly those with tall grass and weeds and scattered shrubs. Grasshopper sparrows forage on the ground while hopping or running, eating items from the soil or from plant stems. The bikeway has the potential to disturb this species where it interacts with grassland areas. Only the Universal 3 alignment is shown to pass through the identified Natural Heritage Area polygon, however, and would consist of work only along the roadside to widen Matunuck Schoolhouse Road for bicycle lanes. This activity would have limited interaction with grassy areas outside the immediate vicinity of the roadway.

## National Register Districts or Property

The Coastal Route Bikeway Phase 1 Project must comply with Section 106 of the National Historic Preservation Act of 1966, as amended; and Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 USC 303). If the project is placed on the state transportation improvement plan, the Federal Highway Administration (FHWA), would be the lead federal agency for the project, and would be responsible for evaluating properties identified through the survey in accordance with 36 CFR 800.4(c).

If identified historic and cultural resources are determined to be significant and eligible for listing in the National Register, the FHWA and RIDOT shall consult with the Rhode Island

Historic Preservation & Heritage Commission which serves as State Historic Preservation Office (SHPO) to determine where any project effects can be prudently or feasibly avoided, minimized, or mitigated pursuant to the procedures in 336 CFR.800.5 (e) and 800.9.

Only Option C is anticipated to potentially affect historic property. This option would cross the edge of two historic cemeteries – the Nathan Kenyon Lot (east side of Old Post Road north of Arnolda Round Road) and the Peleg Cross Lot (south side of Old Post Road between Fort Ninigret Road and Town Dock Road). It appears that no impact is likely at the Peleg Cross Lot. At the Nathan Kenyon Lot, the cemetery is immediately adjacent to the roadway. Option C would require the removal of trees near the cemetery wall and likely removal/relocation of the cemetery wall. It is unknown if any gravesites would be within the impacted area behind the wall, but it is possible that gravesites could be affected. Any excavation within 25 feet of a cemetery or alteration must follow Rhode Island General Laws § 23-18-11, 23-18-11.1 and 23-15-11.2.

Several other historic sites or historic candidate sites are in the vicinity of the Option alignments but were determined to be outside of the studied right-of-way. This includes several other historic cemeteries (Church Perry Lot, Cross Mills Lot, General Stanton Lot, Asa Church Lot), District Schoolhouse #2 (site of Charlestown Wine & Spirits Shop), the General Stanton Inn and Coronation Rock.

### Impacts to Hazardous Waste Sites

VHB performed a review of known hazardous waste sites available from Rhode Island GIS data. A RIDEM investigation and remediation site was identified at 4160 Old Post Road (site remediation SR-05-0125). This site is listed as inactive.

Options A and C would cross the lot on which this investigation and remediation is indicated, both. Further investigation is needed to understand the nature of this identified hazardous site and whether construction of a side path as included at this location for Options A and C would have affect any hazardous materials.

### Construction Impacts

Construction of the project will result in temporary disruption of access to the work area for all options. Traffic access to area businesses, residential areas and recreational areas will be maintained throughout construction.

Temporary construction activities would include vegetation clearance, grubbing, grading, construction of the pathway or road shoulder/bicycle lane and associated features such as signage and surface pavement markings. Option A construction would generally take place away from where people congregate, and so impacts may be relatively less. Option C would involve a larger scale construction along Old Post Road, and so is considered to have relatively the most potential impact.

All project roadways will remain open during construction. A traffic management plan approved by local officials and RIDOT to maintain traffic on the project area roadways will be incorporated into the construction project. Option A would have the least amount of construction adjacent to local roadways, and so is considered to have relatively the least

anticipated impact to traffic. Options B and C would both take place primarily along Route 1A, and temporary traffic control would be required throughout construction of both.

Contractors will be required to adhere to all state and local ordinances regarding construction. Dust control may be required, consisting of water spray and similar methods. Impacts to water quality within the work area will be minimized by the implementation of soil erosion and sedimentation controls. Time of day restrictions may also apply.

### Visual Impacts

Temporary impacts would include construction activity, equipment and materials staged at sites along public roadways. Members of the public would see disturbed landscapes during construction. Staging may be variously quite shielded from public view (portions of Option A) and highly visible (Options B and C).

Permanent visual impacts would include the presence of the paved pathway or shoulder of the roadway, signage and pavements markings, crosswalks and a beacon for one option. Option C would necessitate the removal and relocation of stone walls at many locations. Mature trees would need to be removed for all Options – Option A would involve the largest amount of tree removal, but tree removal for Options B and C would be more acutely visible along Old Post Road. Option B would require relatively less removal of trees or adjustment of embankments than Option C.

### Public Utilities

Utilities encountered in the project study area include overhead pole-mounted electrical transmission lines in an easement adjacent to US-1 and north of the South County Sand and Gravel site, as well as utility poles adjacent to Old Post Road.

It is anticipated that Option A would co-locate with the electrical transmission line easement, although moving any existing transmission poles is not anticipated with co-location. All options would require the relocation of utility poles to provide space at the edge of roadways for side paths or bicycle lanes. Options B and C – located entirely along Old Post Road – would require relocation of a significant number of poles, and Option C would likely require the most relocations as it would require a greater amount of space adjacent to the road.

### Public Facilities and Public Facilities Connections

All options would include a connecting SUP into Ninigret Park, connecting to an existing SUP. Ninigret Park, the site of the former U.S. Naval Auxiliary Landing Field, was partially granted to the Town of Charlestown and partly purchased from the General Services Administration. A portion of the former airfield is now Ninigret National Wildlife Refuge, and the GSA grant and sale require that the future use of the land be consistent with management of the wildlife refuge. Ninigret Park includes a variety of public recreation facilities such as playing courts, pathways, a playground, senior citizen's center, swimming area and observatory. A portion of the vegetated area would need to be cleared to make the SUP connection into Ninigret Park.

All options would include connections to the Charlestown Police Station, Cross Mills Public Library, White Cedar Swamp and U.S. Post Office. Options B and C would also connect to the Charlestown Fire Station. The Universal 3 Element would allow part-way connection to Charlestown Beach Road and thereby Charlestown Beach and Charlestown Breachway.

## Environmental Justice

Charlestown does not have any Environmental Justice Select Population Group Census Tracts, per the State of Rhode Island Transportation Equity Benefits Analysis, 2018-2021. No impacts to Environmental Justice areas are anticipated for any option.

## Construction Cost

Option C would be the most expensive option by a good measure. This is due to the relative cost of constructing a side path in a relatively constrained area. Lengthy portions of existing stone walls would need to be removed and relocated – the single most expensive element of this option.

Initial costs for Options A and B are estimated to be comparable. While Option A is relatively longer, much of its length consists of an SUP built along a new alignment – the most affordable type of infrastructure to build. Nevertheless, sections of Option A would be sidepath, and this would balloon the cost somewhat.

Option B would require the relocation/removal of some stone walls, but substantially less than for Option C.

Certain costs are not included in the estimates, and these should be considered by decision-makers moving forward as they are potentially substantial. These include costs for survey, design, right-of-way acquisition, permitting, traffic studies and utility modifications.

Private property acquisition could significantly increase the costs for Option A and C. It is anticipated that Option B could principally be constructed within the public right-of-way for Route 1A, and thereby avoid the need to acquire private property in most instances.

Also note that with additional survey and design, contingency costs will decrease and expensive estimated factors such as removal/relocation of stone walls can be more closely estimated.

## Operations and Maintenance Costs

All options will require regular maintenance operations such as occasional sweeping and snow clearance. For Option B, this would mainly be an extension of existing activities on Old Post Road. For Options B and C, this would be for a new SUP alignment and may require more maintenance hours and new or additional equipment to perform maintenance activities. In general, SUPs built to appropriate depth and width should be able to be maintained with general light-duty road maintenance vehicles.

Aside from sweeping and plowing, other regular maintenance activities might include pavement re-marking, crack repair and minor resurfacing as needed, and occasional

maintenance of safety beacon infrastructure. Larger scale maintenance (such as resurfacing an SUP) generally occur as part of the Statewide Transportation Improvement Program.

## Conclusion

To be completed following Public Meeting and feedback from public and Charlestown Staff.

DRAFT

## Appendix A – Corridor Maps

DRAFT

# Appendix B – Options Impact Matrix

DRAFT



## Appendix C – Site Photos

DRAFT

**Photo 1**     **Ninigret Park Access**



Park Lane (access to Ninigret Park) looking northwest toward Charlestown Ambulance Rescue Service building.

**Photo 2**     **Charlestown Police Department**



Charlestown Police Department property looking northwest toward US-1 corridor.

**Photo 3** US-1 Corridor



View of US-1 corridor to the northeast, as viewed north of the South County Sand and Gravel site.

**Photo 4** Route 1A North of Ninigret Park



Route 1A (Old Post Road) to the southwest in advance of Park Lane and the driveways to Charlestown Ambulance Rescue and the Charlestown Police Department. Ninigret Park is on the left.



**Photo 5**     **Route 1A West of King Tom Pond**



Route 1A (Old Post Road) to the west of King Tom Pond, looking toward US-1 access ramps.

**Photo 6**     **US-1 North of King Tom Pond**



US-1 corridor looking west. View north of King Tom Pond.



**Photo 7** US-1 at Cross Mills Road



Looking west from Cross Mills Road access ramps.

**Photo 8** US-1 West of Falcone Lane



Looking west. View north of marine repair shop.



**Photo 9** US-1 at Narrow Lane



Looking west from Narrow Lane access ramps.

**Photo 10** Route 1A East of King Tom Pond



Route 1A (Old Post Road) looking east in the vicinity of the Charlestown Wine & Spirits shop.



**Photo 11**    Route 1A East of Cross Mills Road



Route 1A (Old Post Road) looking west in the vicinity of the Cross Mills Public Library.

**Photo 12**    Route 1A West of Falcone Lane



Route 1A (Old Post Road) looking west near Tropic Frost Ice Cream Shop.

**Photo 13**    Route 1A West of Narrow Lane



Route 1A (Old Post Road) looking west near the Charlestown Mini-Super.

**Photo 14**    RIDOT Maintenance Lot 1



View to the east from elevated western side of RIDOT property.



Photo 15 RIDOT Maintenance Lot 2



View to the west to the elevated portion of the lot from the main site structure.

Photo 16 RIDOT Maintenance Lot 3



View to the west from Cross Mills Road.



**Photo 17** Falcone Property



Falcone property looking south, adjacent to Marine Repair Shop.

**Photo 18** Matunuck Schoolhouse Road



Looking to the northwest near the Charlestown Beach Road intersection.