PARE PROJECT NO. 05087.00-001

BICYCLE AND PEDESTRIAN FACILITIES STUDY & DEVELOPMENT

POPPASQUASH ROAD PEDESTRIAN AND BICYCLE FACILITY

Bristol, RI

FINAL DESIGN REPORT
JANUARY 2008

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SECTION 1

OVERVIEW

The Town of Bristol submitted a project proposal form to the Rhode Island State Planning Council as part of the Fiscal Year (FY) 2003-2005 Transportation Improvement Program (TIP). The project proposal described that a pedestrian and bicycle facility along Poppasquash Road, with connections to the East Bay Bike Path (EBBP) and Colt State Park, be studied for consideration of design. Included in the same TIP, the Town requested that Poppasquash Road be included in the re-surfacing (1R) program. Implementation of any recommendations in this report should be investigated for the 1R program.

Both requests were approved by the Transportation Advisory Committee (TAC) and included in the FY 2003-2005 TIP. The Rhode Island Department of Transportation (RIDOT) hired Pare Corporation (PARE) for consultant services for the study and development phase of this pedestrian and bicycle facility. In a meeting attended by PARE and RIDOT representatives in October, 2005, RIDOT determined that the program for re-surfacing Poppasquash Road will be delayed until this pedestrian and bicycle facility report is received and reviewed for consideration of including the recommended improvements in the 1R program. As part of the TIP request for the resurfacing of Poppasquash Road, the Town requested that the walls along the road be repaired; in particular the wall located approximately 850 feet west of Hope Street on the Mill Pond side of Poppasquash Road. In response to that request, the RIDOT Maintenance Section constructed emergency wall repairs in January 2006. This emergency wall repair corrected two sections of wall that had failed above the road elevation. PARE has also been informed that Bristol Marine is proposing to install a sewer line to connect Bristol Marine to Hope Street along Poppasquash Road. This does not appear to impact the Bike Facility but coordination of the two projects should be considered.

Poppasquash Road in the study area is approximately 3,200 feet long, extending from Hope Street to the entrance of Colt State Park (see Figure 1, Overall Site Plan). The overall study area, bordered by Bristol Harbor and Mill Pond, is located within a mixed use of residential neighborhoods, historical districts and waterfront, recreational facilities, a cemetery, open water and wetland sites in a suburban setting. Poppasquash Road is located at the head of Bristol Harbor. A culvert crosses Poppasquash Road, connecting Mill Pond to Bristol Harbor. Mill Pond is marked with a Coastal Resources Management Council (CMRC) coastal access sign. The EBBP and the Colt State Park

BRISTOL TOWN BEACH

COLT STATE PARK

ASYLUM ROAD

HARBOR VIEW AVE

HOPE STREET

114

PARK RD.

POPPASQUASH ROAD

MILL POND

WALL C.

WALL A.

JOGGERS PARKING LOT

MILL GUT

EXISTING CULVERTS

WALL D.

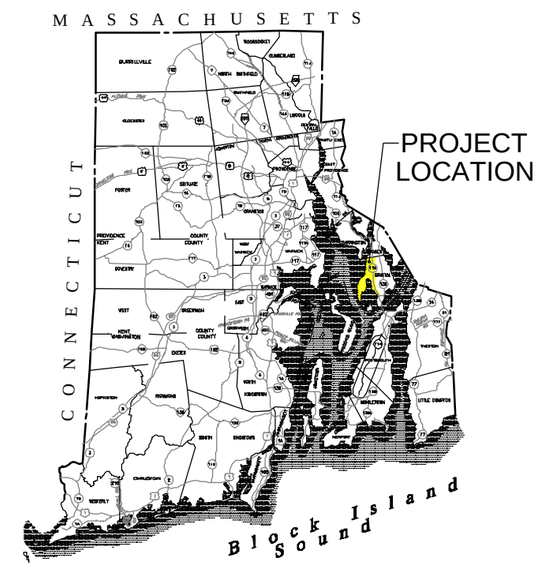
WINDMILL POINT CONDOS

WALL B.

COGGESHALL FARM

BRISTOL HARBOR

BRISTOL MARINE



LOCATION MAP
Not To Scale

LEGEND

- EXISTING COLT STATE PARK BIKE PATH
- EXISTING EAST BAY BIKE PATH
- POPPASQUASH ROAD (SEGMENT 1)
- POPPASQUASH ROAD (SEGMENT 2)
- POPPASQUASH ROAD (SEGMENT 3)
- POPPASQUASH ROAD (SEGMENT 4)
- TYPICAL WALL ALONG ROADWAY

350' 0 350' 700' 1400'

1"=700'

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ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD BICYCLE FACILITY
Bristol, Rhode Island

OVERALL SITE PLAN

FIGURE 1

Bike Route is located on opposite ends of this study area on Poppasquash Road. Just west of the EBBP, abutting the east side of the Windmill Point Condominiums, there is an existing pull-off area that is currently used as a place for travelers to stop along Poppasquash Road and enjoy the scenic views. Another pull-off parking area and public right-of-way is located at the culvert west of the condominiums. This location is a popular location for fisherman. Both areas accommodate parking of approximately four vehicles.

The Rhode Island Public Transportation Authority (RIPTA) has a bus route along Hope Street (Route 114) in Bristol, which begins in Providence and ends in Newport. The bus route gives an alternate mode of transportation for residents and tourists who desire to travel through downtown Bristol to reach such destinations as Colt State Park, Independence Park, the downtown historic district and the downtown waterfront.

Poppasquash Road is a State Owned and maintained roadway from Hope Street (RI 114) to Colt Drive. Technical Paper No. 155 does not classify Poppasquash Road. The posted speed limit on Poppasquash Road is 25 miles per hour. On the *"Guide To Cycling in the Ocean State 2003"* map that is prepared and distributed by RIDOT the roadway classification for bicycle travel on Poppasquash Road is labeled as a Most Suitable Road. RIDOT defines these Most Suitable Roads as roads on which bicyclists will generally find adequate shoulders.

The only routes into Bristol from the north are Routes 136 and 114. From the south, only Route 136/ 114 via the Mount Hope Bridge serves the town. There is no east – west transportation route into Bristol, except the Prudence Island Ferry that docks in Bristol Harbor. Route 114 (Hope Street) has been designated as a Scenic Roadway under the State's Scenic Roadway Program. Downtown Bristol is approximately one half mile south from the intersection of Poppasquash Road with Hope Street.

This local road serves as the primary access and egress for the Poppasquash peninsula bounded by tidal waters both on the north side and the south side. On the south side of Poppasquash Road, a wet stone masonry retaining wall supports the roadway and a concrete seawall shelters the vehicles from the Bristol Harbor. Riprap at the base of the wall provides protection from tidal impacts. Each of the walls and riprap areas are closely evaluated and recommended improvements are presented in Section 8: Structural Assessment.

The proposed pedestrian and bike facility encounters a culvert along its route spanning over Bristol Harbor at the Mill Pond Inlet. The culvert was built in the first half of the 20th century. The walls of the culvert are made of stone. The bridge is narrow and offers no shoulder. The Structural Assessment section of this report has investigated this existing culvert on Poppasquash Road and recommendations have been made to improve the safety for pedestrians, bicyclists and motorists.

An additional wet stone masonry wall is located on the western side of Bristol Harbor, south of the entrance to Colt State Park. Similar to the other walls evaluated, this wall supports the roadway. A culvert located near the northern end of the wall provides an opening to Bristol Harbor from a small pond area. This wall and culvert were evaluated, and recommendations for improvement are discussed in the Structural Assessment section. Repairs to the roadway and walls will improve the safety of this road, which is currently used by residents, businesses, and tourists in the area.

This report was a combined effort by the PARE team, RIDOT, local Town officials, and business and property owners. Relevant and available data, reports, and mappings were obtained from State, Town, and local agencies and organizations. Site visits were conducted and the existing conditions documented, tabulated, and organized.

Public comment received at a public meeting held on February 17, 2006 and attended by PARE, RIDOT, and Town officials regarding the proposed pedestrian and bicycle facility generally opposes its construction. Some of the cited reasons include: the unsafe condition of the road; disruption of the natural habitat for plants and wildlife; the creation of additional traffic; this would duplicate the existing entrance to Colt State Park with the East Bay Bike Path and Asylum Road; and the road is already heavily traveled and motorists currently must compete with pedestrians for space. A positive cited comment from the public meeting is that it would be nice to be able to walk from the Windmill Point Condos to Hope Street.

To further highlight details of the existing conditions for the pedestrian and bicycle facility, the project has been divided into four segment sections as shown on Figure 2, the Segment Location Plan.

BRISTOL TOWN BEACH

COLT STATE PARK

ASYLUM ROAD

HARBOR VIEW AVE.

114

HOPE STREET

PARK RD.

POPPASQUASH ROAD

MILL POND

SEGMENT 4

SEGMENTS 1-3

MILL GUT

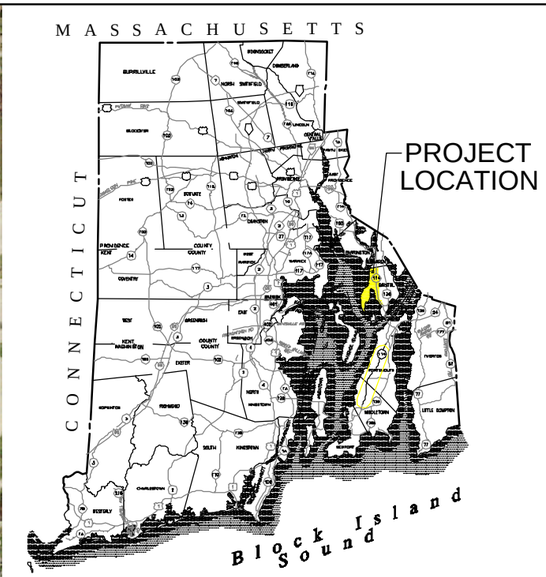
JOGGERS PARKING LOT

WINDMILL POINT CONDOS

COGGESHALL FARM

BRISTOL HARBOR

BRISTOL MARINE



LOCATION MAP
Not To Scale

LEGEND

- EXISTING COLT STATE PARK BIKE PATH
- EXISTING EAST BAY BIKE PATH
- POPPASQUASH ROAD (SEGMENT 1)
- POPPASQUASH ROAD (SEGMENT 2)
- POPPASQUASH ROAD (SEGMENT 3)
- POPPASQUASH ROAD (SEGMENT 4)

350' 0 350' 700' 1400'

1"=700'

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ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island

SEGMENT LOCATION PLAN

FIGURE 2

BARRINGTON

WARREN

WARREN

BRISTOL

114

136

NARRAGANSETT BAY

REYNOLDS HOUSE

BENJAMIN CHURCH HOUSE

MILL POND

POPPASQUASH FARMS HISTORIC DISRICT

BRISTOL HARBOR

FORMER BRISTOL COUNTY JAIL

YMCA ANNEX/ BRISTOL CUSTOMS/ POST OFFICE

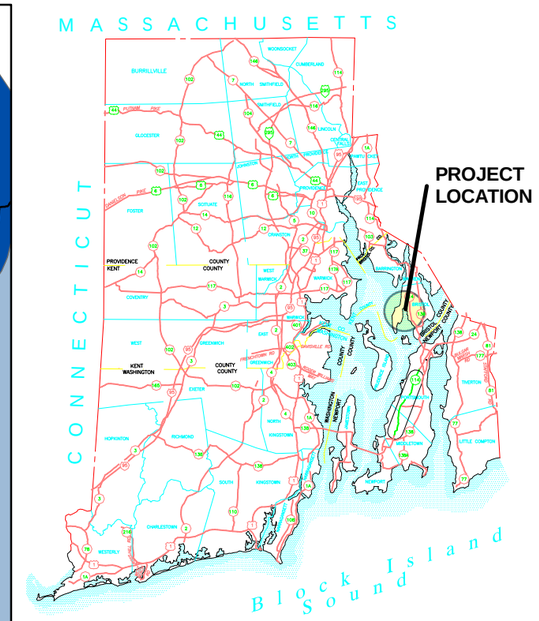
MOUNT HOPE FARM

BRISTOL WATERFRONT HISTORIC DISTRICT

BRISTOL COUNTY COURT

MOUNT HOPE BAY

NOT TO SCALE



LOCATION MAP

NOT TO SCALE

LEGEND

- HISTORIC DISTRICT
- HISTORIC SITE
- POPPASQUASH ROAD

RIGIS

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BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD BIKE FACILITY

BRISTOL

RHODE ISLAND

HISTORICAL SITES AND DISTRICTS PLAN

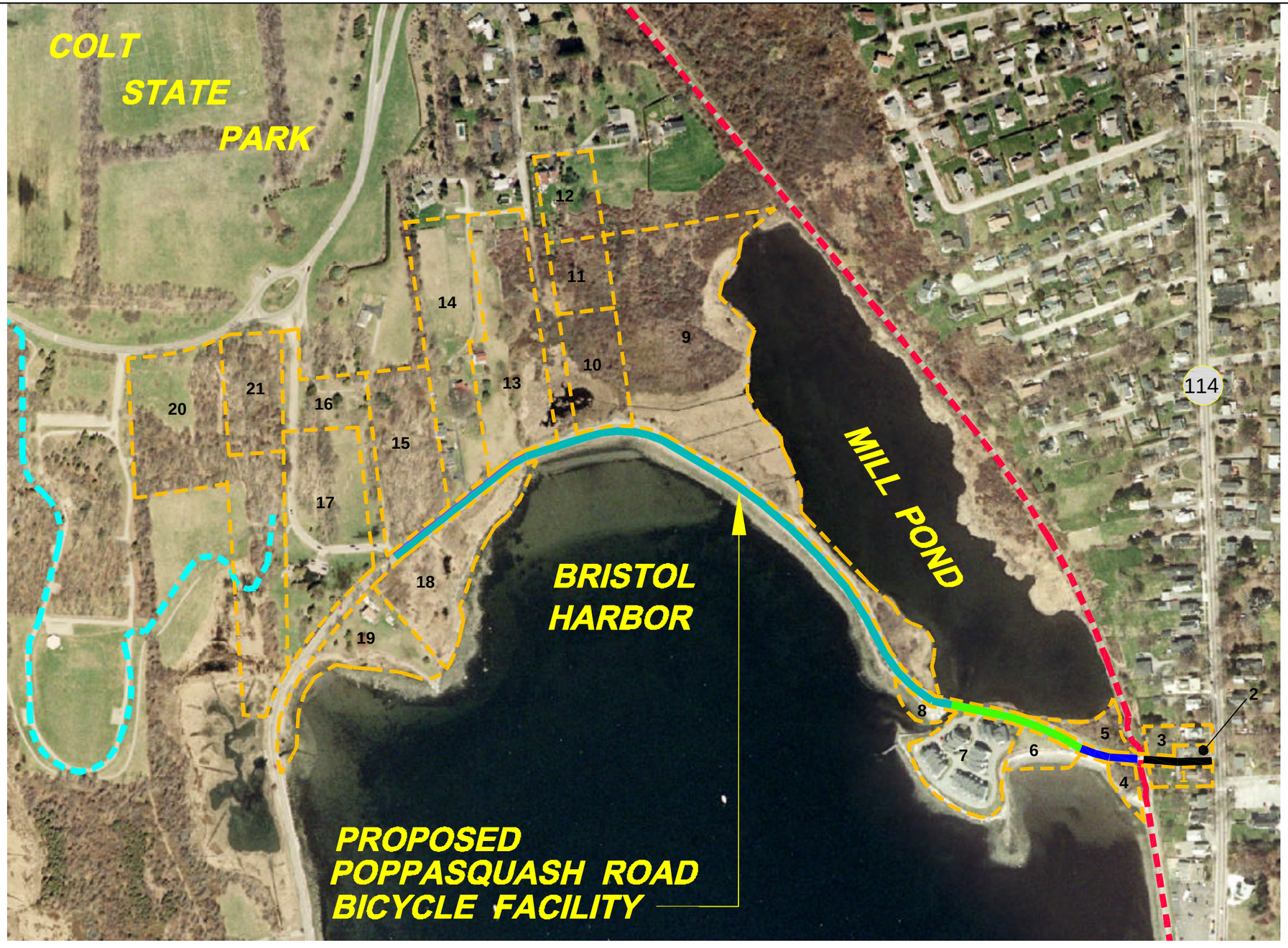
FIGURE 3

Pertinent criteria such as roadway widths, intersections, wetlands, adjacent properties, and other facilities were examined, with the pedestrian and bicyclists needs in mind, to develop and evaluate the alignments for the pedestrian and bicycle facility. Design challenges included minimizing the impacts on the existing roadway and the environment, providing safety to pedestrians and bicyclists, and consideration of the improvement costs. Consequently, included in this study is the assessment of the environmental impacts, the impacts to the existing conditions, analysis and design of public access areas, relocation of utility poles, identification of historic preservation opportunities, identification of public concern and an opinion of probable cost. Figure 3, Historical Sites and Districts Plan, depicts the historic sites and districts in the vicinity of Poppasquash Road. Additionally, the need for potential right-of-way acquisitions and easements was identified.
Subsequently, after review of all the available information, the most appropriate design has been identified, presented, and recommended.

Property owner information was obtained from Assessor's Maps. There are approximately eighteen parcels of land impacted by the pedestrian and bicycle facility. Figure 4, the Property Owners, shows the properties and associated property owners in the area of the proposed pedestrian and bicycle facility.

This study has also looked at landscaping schemes, including scenic overlooks combined with soft and hardscape items which will be examined for installation at the most viable and aesthetic locations along Poppasquash Road. A Visual Assessment of each segment has evaluated the existing conditions and examined landscape options for Poppasquash Road. Landscape amenities could include lighting, landscaping, benches, signage, bicycle racks, trash receptacles, and revamping the existing overlooks identified in Segments 2 and 4.

In addition to the information gathered in the field, a crash analysis for Poppasquash Road has been included. Crash reports for 2002-2004 were received from the RIDOT Electronic Accident Reporting System (EARS). Information regarding the type of crash, location of crash, injury and fatality information, roadway surface condition, and the time of day or night of the crash can be determined from crash reports. A spot speed study conducted in the vicinity of the Town owned overlook show 85th percentile speeds of 33 miles per hour for eastbound traffic and 30 miles per hour for westbound traffic. The posted speed limit in this area is 25 MPH.



PLAN DESIGNATION	PLAT / LOT	OWNER
1	5/14	Elizabeth Wheeler & Anthony Braid
2	5/12	Life Estate: Gilda M. Deleo
3	5/13	Claude & Patriza Curran
4	5/29	Elizabeth Wheeler
5	5/28	Town of Bristol
6	187/40	Town of Bristol
7	187/39	Windmill Point Condos
8	187/141	Town of Bristol
9	186/29	Department of Natural Resources
10	129/11	Life Estate: Tatrocinia Pires
11	129/18	State of R.I. DEM
12	129/13	Life Estate: Tatrocinia Pires
13	130/2	W. Lincoln Massop Jr & Others
14	130/3	Mary L. Lussier & James P. Yess
15	130/4	Department of Natural Resources
16	130/ROW	Town of Bristol
17	130/5	Department of Natural Resources
18	130/10	Charlotte C. Plaster Church
19	130/1	Trustee: Paul M. Sanroma
20	130/6	Department of Natural Resources
21	130/7	Department of Natural Resources

LEGEND

- EXISTING COLT STATE PARK BIKE PATH
- EXISTING EAST BAY BIKE PATH
- POPPASQUASH ROAD (SEGMENT 1)
- POPPASQUASH ROAD (SEGMENT 2)
- POPPASQUASH ROAD (SEGMENT 3)
- POPPASQUASH ROAD (SEGMENT 4)
- PROPERTY LINES (APPROX.)

150' 0 175' 350' 700'

1"=350'±

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ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island

PROPERTY OWNERS

FIGURE 4

Recommendations identified in RIDOT's May 3, 2006 *"Bike Route Signing: Statewide, Rhode Island"* pertaining to on-road signing, facilities listing, and destination signage have been implemented through RIDOT's recently established and instituted Design Policy Memo (DPM) Number 920.06 – titled Bicycle Routes & Share the Road Signs, dated 1/18/05 with Attachment: Bicycle Route Suitability Report, Revision 2, dated 7/26/06, (see Document 1). It specifically addresses setting standards for the signing of roadways as bike routes throughout the State. Item number 5 in Section 920.06.05.01 of the DPM, titled Bicycle Route Sign Criteria, refers to a "Bicycle Route Suitability Recommendation Report". This report contains 24 items that are investigated and documented in a formal setting. The report is provided to RIDOT for review by various departments for consideration of signing a road as a Signed Shared Roadway. This information is to be evaluated prior to providing an opinion on the posting of bike route signs on the subject road. This DPM has become an integral part of this report in the evaluation and consideration of the four roads for bike route signing.

The alternatives were evaluated for their viability as individual segments as well as continuous sequences. The following text is organized according to the areas covered by each of the four segments. The segments, as indicated on the included maps, are described, with their existing conditions evaluated and constraints identified as they relate to the location of the pedestrian and bicycle facility. Each roadway's evaluation was reviewed against the 1999 AASHTO "*Guide for the Development of Bicycle Facilities"* and a recommended Poppasquash Road pedestrian and bicycle facility is described in detail in the Conclusions section of the report.

The continuation of an alternate mode of transportation would be provided by the creation of the proposed pedestrian and bike facility. Currently residents, bicyclists, and pedestrians use Poppasquash Road as a way to travel to Hope Street and an alternate travel route to Colt State Park. It would provide safe mobility to the population that travels the road currently. In addition, it would provide a connection from the Colt State Park Jogger's entrance to the EBBP and to Downtown Bristol.

Supporting Documentation

In the Comprehensive Plan 5-Year Update the following goals and policies included in Chapter 5 Section E are addressed as a result of this study:

Circulation Element

Other projects in Bristol that are in the Transportation Improvement Program include:

- Study of an East Bay Bike Path/Colt State Park connector (currently being studied)
- Poppasquash Road Bike and Pedestrian path (preliminary evaluation – no commitment to funding)

Statement of Goals and Policies Open Space Element

Goal 1 *Increase Bristolians' ability to travel about town with ease.*

Goal 2 *Alleviate congestion caused by regional traffic patterns.*

Goal3 *Support economic development through a well planned transportation system.*

This proposed pedestrian and bicycle facility project supports local and state goals and plans. In the Comprehensive Plan 5-Year Update the following goals and objectives listed in Chapter 5, Section F are met in regards to this study:

Statement of Goals and Policies Open Space Element

Goal 1 *Create recreation programs and facilities to serve the full range of Bristolians.*

Goal 2 *Maximize Bristolians' ability to gain access to, and enjoy, the waterfront and the bays that surround the town.*

Goal 3 *Increase and improve land area reserved for recreation, conservation, and open space.*

Recommended Acquisitions and Site Developments

Town-wide Greenbelt and Path System

The town will maximize this benefit by creating connections to the Bike Path.

f. East/west connections between eastern neighborhoods and the Silver Creek link, and between Mount Hope and the historic Downtown and Waterfront.

Neighborhood Facilities

Poppasquash State Park Planning Areas

OSR33. Work with the State to continue the Path system through the State Park areas. Continue with a link to Usher's Cove.

SECTION 2

CRITERIA

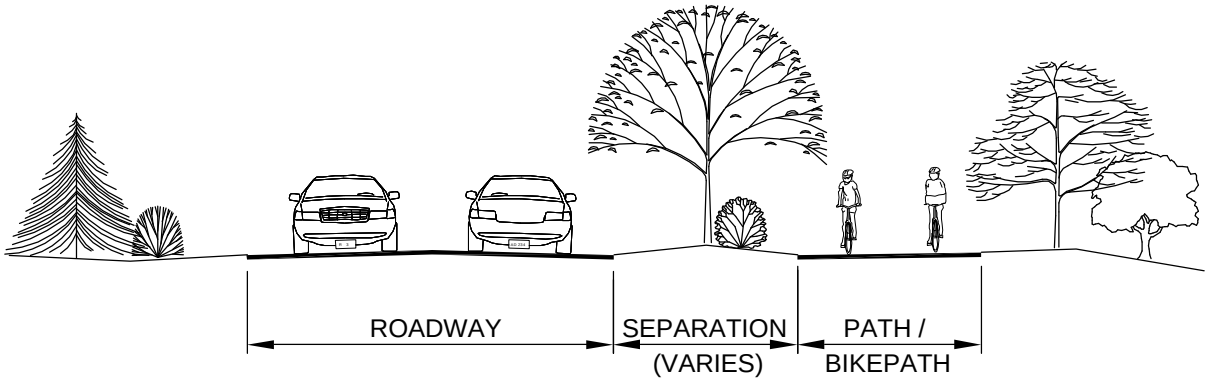
The 1999 American Association of State Highway and Transportation Officials (AASHTO) "*Guide for the Development of Bicycle Facilities"* defines three bicycle user types that are a helpful guide in assisting highway designers in determining the impact of different facility types and roadway conditions on bicyclists:

- Group A – Advanced Bicyclists: These are experienced riders who can operate under most traffic conditions. They are typically comfortable riding with motor vehicle traffic; however they need sufficient operating space on the traveled way or shoulder to eliminate the need for either them or a passing vehicle to shift position.
- Group B – Basic Bicyclists: These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Thus, basic riders are comfortable riding on neighborhood streets and Shared Use Paths and prefer designated facilities such as Bike Lanes or wide shoulder lanes on busier streets.
- Group C – Children: These bicyclists ride on their own or with their parents. Residential streets with low motor vehicle speeds, linked with Shared Use Paths and busier streets with well-defined pavement markings between bicycles and vehicles, can accommodate children without encouraging them to ride in the travel lane of major arterials.

Bikeway classification is based on AASHTO's description of each of the four bike facility types as explained below. Figure 5, Bike Facility Class, illustrates three of these types. The recommended bicycle facility is based on several factors including the ability of the users, specific corridor conditions, existing roadway conditions, and associated costs necessary to upgrade the roadway to an acceptable bicycle facility.

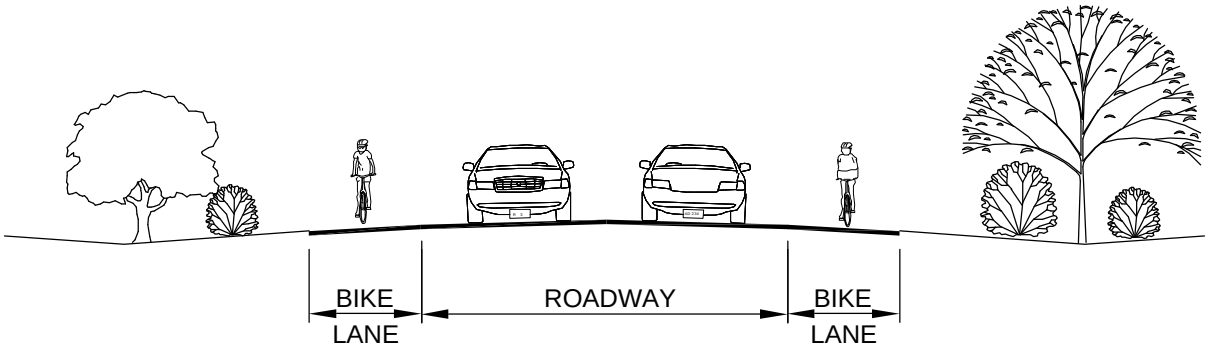
<u>Shared Use Path:</u>

Shared Use Paths should be thought of as a complementary system of off-road transportation routes for bicyclists and others that serve as a necessary extension to the roadway network. Most Shared Use Paths are facilities on exclusive right-of-way, are designed off-road, and are physically separated from motor vehicle traffic. Shared Use Paths can be located along rivers, ocean fronts, canals, abandoned or active railroad and utility right-of-way, limited access freeways, within college campuses or within and between parks. Shared Use Paths are designed to work with the on-road bicycle facilities to provide the greatest opportunities to bicyclists and pedestrians. For Shared Use



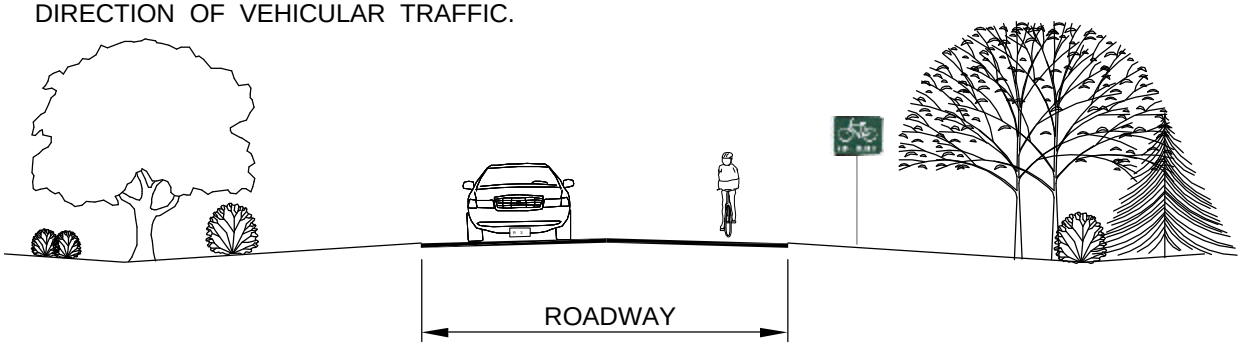
SHARED USE PATH / BIKE PATH - CLASS I

A BIKEWAY PHYSICALLY SEPARATED FROM MOTORIZED VEHICLUAR TRAFFIC BY AN OPEN SPACE OR BARRIER WITHIN THE HIGHWAY RIGHT - OF - WAY OR WITHIN AN INDEPENDENT RIGHT - OF - WAY. THESE PATHS WILL ALSO BE USED BY PEDESTRIANS, SKATERS, WHEELCHAIRS, JOGGERS AND OTHER NON - MOTORIZED USERS.



BIKE LANE - CLASS II

A PORTION OF A ROADWAY WHICH HAS BEEN DESIGNATED BY STRIPING, SIGNING, AND PAVEMENT MARKINGS FOR THE PREFERENTIAL OR EXCLUSIVE USE OF BICYCLISTS. BIKE LANES ARE ONE - WAY DIRECTIONAL TRAVEL LANES, CORRESPONDING WITH THE DIRECTION OF VEHICULAR TRAFFIC.



SIGNED SHARED ROADWAY / SIGNED BIKE ROUTE - CLASS III

A SHARED ROADWAY WHICH HAS BEEN DESIGNATED BY SIGNING AS A PREFERRED ROUTE FOR BICYCLE USE. THE SHARED ROADWAY, WHICH IS OPEN TO BOTH BICYCLE AND MOTOR VEHICLE TRAVEL, MAY BE WITH OR WITHOUT PAVED SHOULDERS AND / OR CURBING. BICYCLISTS TRAVEL IN THE SAME DIRECTION AS VEHICLES SHARING THE SAME SIDE OF THE ROADWAY.

Not To Scale

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PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
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BICYCLE AND PEDESTRIAN FACILITIES STUDY AND DEVELOPMENT

NORTHWEST REGIONAL (NWR) BIKE FACILITY

BIKE FACILITY CLASS

FIGURE 5

Paths to be successful, it is very important to provide users with connections to the roadway network as well as vehicle parking facilities for the casual or family user. A critical component of Shared Use Paths are the transitions to and from the roadway network.

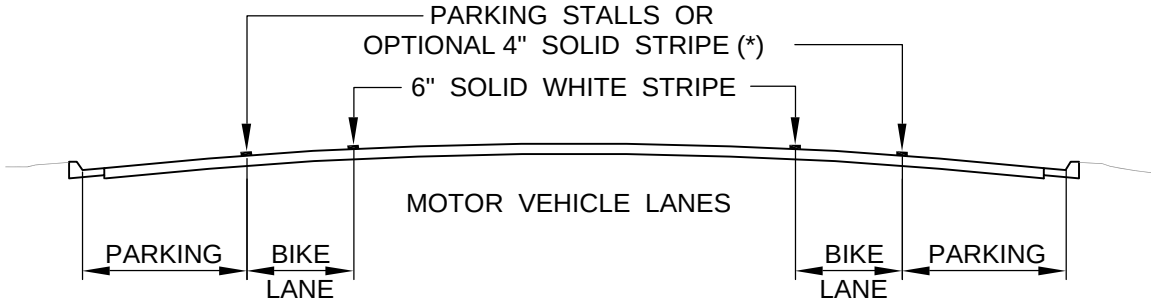
Bike Lane:

A Bike Lane is a portion of roadway that has been designated with striping, signing, and pavement markings for preferred or exclusive use by bicyclists. Bike Lanes should always be one-way, carrying bicyclists in the same direction as the adjacent travel lane and on the right side of the road. Minimum motor vehicle travel lane width is the same as for that of the Shared Roadway, 12 feet minimum, 14 feet desirable. Widths greater than 14 feet may encourage the undesirable operation of two motor vehicles in one lane and therefore is not recommended. In areas where 15 feet or more of pavement width exists, striping of lanes for bikes or shoulders should be considered. Width requirements for Bike Lanes vary according to roadway conditions. Bike Lanes may have a minimum width of 4 feet, where the area beyond the paved shoulder can provide additional maneuvering width. A width of 5 feet or greater is preferred where truck traffic is present or where motor vehicle speeds exceed 50 MPH. Where parking is permitted, the Bike Lane should be placed between the parking area and the travel lane and have a minimum width of 5 feet. A Bike Lane should be delineated from motor vehicle travel lanes with a 6-inch solid white line. Figure 6, Typical Bike Lane Cross Sections, is the standard provided by AASHTO for the delineation and designations of Bike Lanes for different situations.

Signed Shared Roadway:

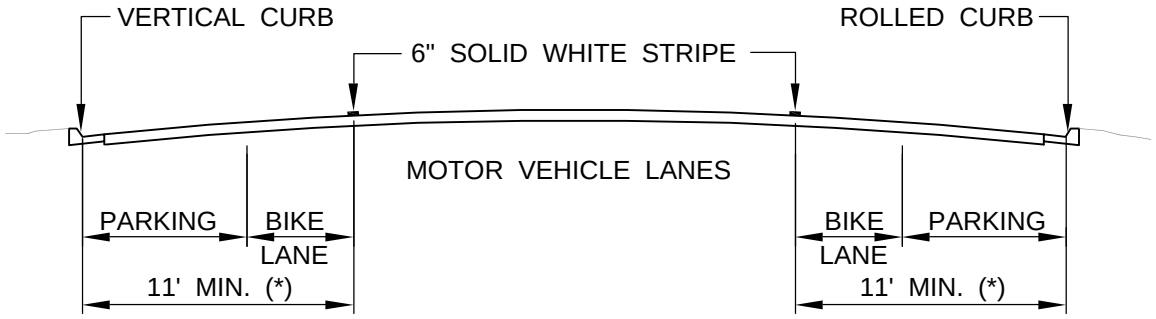
Signed Shared Roadways are those roads that have been identified by signing only as preferred bike routes through high demand corridors. Certain criteria must be considered prior to signing a Signed Shared Roadway. These include, but are not limited to, the removal or restriction of on-street parking, smooth riding surface, regularly maintained roadways that meet the needs of bicyclists, and have wide shoulders.

A Signed Shared Roadway should have particular advantages for bicyclists over alternative routes. According to AASHTO, Signed Shared Roadways should provide through and direct travel, connect to other bicycle facilities, and give priority to bicyclists. Signing also advises motorists that bicycles are present.



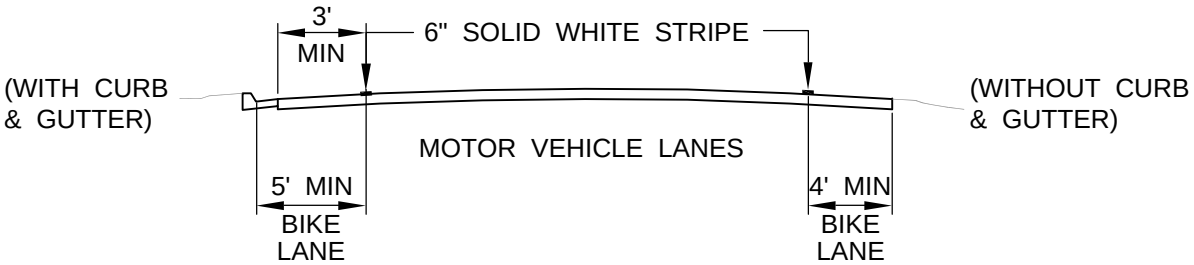
ON STREET PARKING

*THE OPTIONAL SOLID WHITE STRIPE MAY BE ADVISABLE WHERE STALLS ARE NECESSARY (BECAUSE PARKING IS LIGHT) BUT THERE IS CONCERN THAT MOTORISTS MAY MISCONSTRUE THE BIKE LANE TO BE A TRAFFIC LANE.

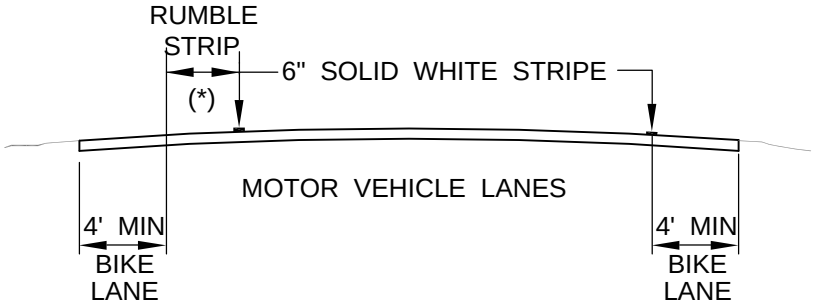


PARKING PERMITTED WITHOUT PARKING STRIPE OR STALL

* 13 ' IS RECOMMENDED WHERE THERE IS SUBSTANTIAL PARKING OR TURNOVER OF PARKED CARS IN HIGH (e.g. COMMERCIAL) AREAS.



PARKING PROHIBITED



TYPICAL ROADWAY IN OUTLYING AREAS PARKING PROTECTED

*IF RUMBLE STRIPS EXIST THERE SHOULD BE 4' MINIMUM FROM THE RUMBLE STRIPS TO THE OUTSIDE EDGE OF THE SHOULDER

Not To Scale

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

N W E S

BICYCLE AND PEDESTRIAN FACILITIES
STUDY AND DEVELOPMENT
NORTHWEST REGIONAL (NWR)
BIKE FACILITY
TYPICAL BIKE LANE
CROSS SECTIONS

FIGURE 6

According to AASHTO, "width is the most critical variable affecting the ability of a roadway to accommodate bicycle traffic. In order for bicycles and motor vehicles to share the use of a roadway without compromising the level of service and safety for either, the facility should provide sufficient paved width to accommodate both modes." AASHTO recommended paved widths vary with the roadway conditions. Like that of a "Shared Roadway," minimum lane width of 12 feet is required but 14 feet is desirable to accommodate both bicyclists and motorists. These minimum useable lane widths provide maneuvering room for drivers exiting from or in areas with limited sight distances.

Signed Shared Roadways should be signed approximately every ¼ mile and at signalized intersections with both guide and supplemental signs. Also, directional signs are to be placed at every turn to both mark the road and to confirm that the rider has made the correct turn. Bicycle warning signs should be installed to warn bicyclists of conditions not readily apparent, such as "HILL" or "CURVE", along the route. Roadways that do not meet the criteria for a Signed Shared Roadway should not be signed as such. However, destination signs may be posted if the roadway leads to a logical destination such as a park, school, or municipal offices. Crossing signs and crosswalks can be proposed at locations where it is necessary to cross the road to access Signed Shared Roadways, Shared Use Paths, or other destinations.

AASHTO provides the following reasons for designating a road as a Signed Shared Roadway:

Signed Shared Roadways are those that have been identified by signing as preferred bike routes. There are several reasons for designating signed bike routes:

a. The route provides continuity to other bicycle facilities such as bike lanes and shared use paths.

b. The road is a common route for bicyclists through a high demand corridor.

c. In rural areas, the route is preferred for bicycling due to low motor vehicle traffic volume or paved shoulder availability.

d. *The route extends along local neighborhood streets and collectors that lead to an internal neighborhood destination such as a park, church, school or commercial district.*

Signing also advises motorists that bicycles are present. Once a route has been signed it means that the responsible agencies have taken action to ensure these routes are suitable as shared routes for both the bicyclist and motorist and that they will be maintained regularly. Maintenance of the route will be at a higher standard than that of other comparable streets (e.g. more frequent street sweeping, tree trimming and removal of edge of road obstructions). The agency or municipality is ultimately

responsible for prioritizing a recurring maintenance schedule for this roadway that has been designated as a Signed Shared Roadway, or Bike Route.

RIDOT recently established and instituted Design Policy Memo (DPM) Number 920.06 titled Bicycle Routes & Share the Road Signs, dated 05/26/04, revised 7/26/06. It specifically addresses setting standards for the signing of roadways as bike routes throughout the State. Its description states, *"this DPM serves as general technical guidance for the signing of state and local roadways as bike routes that are constructed utilizing federal and state funds. The intent of this DPM is to sign such roadways as an aid to navigation for experienced and /or commuter cyclists in determining those roadways that may be designated as bike routes, utilizing the parameters of sound engineering judgment by considering a given roadways posted speed limit, Average Annual Daily Traffic (AADT) Volume, minimum useable width in feet and other factors. This DPM is not intended to indicate the relative safety of the roadways that are signed as bike routes."*

The *"Manual of Uniform Traffic Control Devices for Streets and Highways, 2003 Edition"* (MUTCD) provides sign and pavement markings standards. In contrast, RIDOT specifies that *"all signs on state roadways must conform to the Manual on Uniform Traffic Control Devices (*MUTCD*) D11-1 (Bike Route) sign, to be typically placed at .5 mile intervals"* in item number 4 of the DPM.

<u>Shared Roadways:</u>

A Shared Roadway facility has no bikeway classification or designation. This facility is not shown on Figure 5 since this is any roadway that does not prohibit bicycle traffic. According to AASHTO, different types of roadway conditions can result in a Shared Roadway designation. One condition is that the existing street system is currently being used for efficient bicycle travel without signing and striping. A second condition is that the existing roadway is not deemed suitable for bicycle travel and, therefore, bicycle travel should not be encouraged by designating the Signed Shared Roadway by means of signing and/or marking as an approved bikeway. Another condition that could lead to a Shared Roadway classification is that the roadway is not considered a high demand bicycle corridor and as such the road should not be designated as another bikeway classification, regardless of roadway conditions. On roadways without designated bikeways, a minimum lane width of 12 feet, 14 feet desirable, can best accommodate both the bicyclist and motorist.

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

BICYCLE ROUTE SUITABILITY REPORT

PROJECT: _____

CONSULTANT: _____ REVIEW DATE: _____

ROUTE NAME & NUMBER: _____ CITY/TOWN:

ROADWAY LIMITS: _____

Technical Paper No. 155 Roadway Classification _____

"Guide to Cycling in the Ocean State 2003" Roadway Designation _____

The State Highway noted above is being considered for signage as a "Signed Shared Roadway" in accordance with the criteria set forth in RIDOT DPM No. 920.06. The following information is to be provided to the Deputy Chief Engineer of the Design Section for consideration:

ITEM NO.	DESCRIPTION		COMMENTS NO. (SEE ENDNOTES)
1	Posted Speed Limit		
2	85th Percentile Speed (Radar speed study)		
3	Average Annual Daily Traffic (AADT) Volume		
4	Percent Truck Traffic Volume		
5	Number of Travel Lanes		
6	Width of Travel Lanes		
7	Width of Shoulders		
8	Delineation of Centerline & Shoulders		
9	Sidewalk		
10	Curbing		
11	On-Street Parking		
12	Frequency of Curb Cuts	Moderate	

ITEM NO.	DESCRIPTION			COMMENTS NO. (SEE ENDNOTES)
		Heavy		
		Commercial		
		Residential		
13	Horizontal Alignment Constraints			
14	Vertical Alignment Constraints			
15	Intersections & Corresponding Stopping Sight Distances			
16	Stop Controls Along Roadway			
17	General Roadway Conditions	Surface		
		Potholes		
		Cracking		
		Catch Basin Types		
		Sand & Debris		
18	Are all grates bicycle-safe? (If no, please indicate which ones)	Yes: _____	No: _____	
18A	Total Number of Grates: _____			
18B	Location of Grates (list): _____			
19	Off-Road Obstacles	Mailboxes, signs		
		Poles		
		Outcrops		
		Hanging Limbs		
20	Facilities List on Roadway	Parks		
		Schools		
		Recreational Fields		
		Historical Districts		

ITEM NO.	DESCRIPTION		COMMENTS NO. (SEE ENDNOTES)
		Commercial Establishments	
21	Expected Bike User Type	A – Advanced	
		B – Basic	
		C – Children	
22	Location of nearest Bike Route/Path as potential link		
23	Additional Observations		
24	Accident History (Provide Crash Data for the previous three years according to type, location, injury, roadway surface and time		

COMMENTS
(Expand/Delete as needed)

Based on the information contained in the above "Bicycle Route Suitability Report", the reviewing engineer:

Recommends ( )

Does not recommend ( )

designation of this roadway as a Rhode Island Bicycle Route

Reviewing Engineer:	Date:
Approved Deputy Chief Engineer:	Date:
Approved Chief Engineer:	Date:

SECTION 3

SEGMENT 1

Description:

The study area for this approximate 215-foot segment begins at the unsignalized, stop controlled intersection of Hope Street and Poppasquash Road and terminates at the EBBP. Figure 7, Segments 1-3, shows the approximate segment limits.

Existing Conditions:

The completed Design Policy Memo (DPM) summarizes existing conditions, documenting information for a review of this segment as it pertains to signing the road as a Signed Shared Bike Route. This DPM is included in Appendix A. The DPM must be approved by RIDOT to allow for signing of the road as a Signed Shared Roadway.

Photo 1: Approach to Hope Street

This section of Poppasquash Road has two 10-foot travel lanes with 1-foot shoulders on either side. The centerline and shoulders are striped, and there are no sidewalks or curbing. At the intersection there are no crosswalks across Poppasquash Road or Hope Street. Existing property lines are coincident with the edge of Poppasquash Road near the intersection of Hope Street (See Photo 1). There is a striped crosswalk across Poppasquash Road at the EBBP. On the westbound approach to the EBBP there are two bicycle warning signs and on the eastbound approach there is one bicycle warning sign (See Photos 2 and 3).

Sight distance measurements taken at the EBBP show a sight distance of approximately 480 feet to the west and to the intersection to the east. These measurements are adequate for design speeds of 50 miles per hour.

Scale: 1"= 150'±

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

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BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD BICYCLE FACILITY
Bristol, Rhode Island
SEGMENTS 1 -3

FIGURE 7

The general road condition is good with minor cracking along the edge of pavement. Cracking is moderate at the crosswalk location. Utility poles are located approximately three feet off the edge of pavement along the southern edge of the roadway. Sand has accumulated along the edge of roadway throughout this segment.

Photo 2: Westbound approach to EBBP

Photo 3: Eastbound approach to EBBP

An analysis of the reported crashes for three years, including 2002, 2003 and 2004 indicated twenty-six crashes in this segment. Additionally, it is important to note that there was a fatality along this section of roadway that occurred just prior to the period for which information was obtained. This fatality involved a motorist hitting a bicyclist. Of the crashes from 2002 to the end of 2004, there were seven single vehicle crashes, four of which involved running off the road or losing control. One involved hitting a deer; one involved hitting a bicyclist, and one involved hitting the wall. Twenty-four accidents were referenced at the intersection of Hope Street and Poppasquash Road, seventeen of which occurred on Hope Street. There were seventeen multi-vehicle crashes. Of the reported crashes from 2002 through the end of 2004 resulting in injury, there were no fatalities. Adverse roadway surface conditions were a factor in three crashes. This data has been tabulated in Appendix C.

<u>Visual Assessment:</u>

Hope Street (Route 114) is a busy route for vehicles traveling from Warren to Newport. The character of the road is diverse ranging from downtown congestion to rural and residential settings. At the intersection of Poppasquash Road, the character is urban/residential. Single family homes line the street with sidewalks on both sides of Hope Street. The two houses that are located on the corner of Hope Street and Poppasquash Road are the 'buffer' between the bicycle path and Hope Street.

The pavement width is narrow with essentially no shoulders on either side of the roadway. Pedestrians and bicyclists are forced to share the road or step off into grassed areas to avoid traffic. As seen in the photo, oversized vehicles dominate the roadway when passing through the area (See Photo 4). Bike path signage is partially obscured by vegetation.

Photo 4: Narrow lanes along Poppasquash Road

<u>Alternatives:</u>

Alternative A:

The first alternative for this segment of Poppasquash Road is the design and construction of a 4-foot sidewalk with curbing on the north side of the road. The sidewalk would allow for an off-road connection to the EBBP from Hope Street. This is the area where the fatality was reported. The existing roadway limits access to the EBBP from Hope Street, and constructing the sidewalk would provide this connection for pedestrians and bicyclists. Right-of-way issues limit opportunities for sidewalk on both sides of the road.

With the connection from Hope Street to the EBBP, it is advised that the Town provide regular maintenance of the sidewalk to ensure that it continues to be an acceptable route for pedestrians and bicyclists. Regular maintenance includes sweeping to prevent accumulation of sand and debris, removing obstructions along the sidewalk, and trimming trees. Immediate improvements should include the trimming of all overhanging tree limbs. Specifically, overgrown bushes at the EBBP obstruct sight distances for both path users and motorists. Maintenance of the East Bay Bike Path (EBBP) would be the responsibility of the Rhode Island Department of Environmental Management (RIDEM). It is anticipated that this alternative may require permits from Coastal Resources Management Council (CRMC) and the Rhode Island Department of Environmental Management (RIDEM).

A preliminary opinion of probable construction costs for this segment is approximately $23,900.00. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this segment is provided in Appendix B.

Alternative B:

The second alternative is that this segment of Poppasquash Road be designated a Signed Shared Roadway. Designation of this roadway would allow for a connection to the EBBP from Hope Street. The existing constricted travel lanes and the narrow shoulders limit accessing the EBBP from Hope Street. Improving this segment would provide this connection for pedestrians and bicyclists. Right-of-way issues limit opportunities for a Shared Use Path on this segment. Improvements to the road necessary for this designation are as follows according to AASHTO and the State DPM:

- Increase roadway width from 22 feet to a minimum of 30 feet throughout
- Repair cracks and potholes along the entire length of road

With this segment of Poppasquash Road designated as a Signed Shared Roadway, it is advised that the State provide regular maintenance of the roadway to ensure that it continues to be an acceptable route for the bicyclists. Regular maintenance includes sweeping the pavement to prevent accumulation of sand and debris, removing edge of pavement obstructions, and trimming trees. Immediate improvements should include the trimming of all overhanging tree limbs. Specifically, overgrown bushes at the EBBP obstruct sight distances for both path users and motorists. This improvement would improve any sight distance constraints around curves as well as provide additional recovery and maneuvering area along the side of the road for both bicyclists and drivers should they encounter a potential conflict.

A preliminary opinion of probable construction costs for this segment is approximately $24,000.00. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this segment is provided in Appendix B.

Alternative C:

The third alternative for this segment of Poppasquash Road is to remain a Shared Roadway. This do-nothing alternative means the road would have no bikeway classification or designation. The existing roadway does not meet standards to encourage additional bicycle travel by signing it as Signed Shared Roadway. Repaving this road will improve the ride ability for motorists, pedestrians, and bicyclists that currently use this road. Right-of-way issues limit opportunities for a sidewalk or a Shared Use Path on this segment.

Recommendations:

Based on the above, PARE recommends Alternative A, construction of a 4-foot sidewalk on the north side of Poppasquash Road for the entire length of this segment of Poppasquash Road. Constructing the sidewalk will provide an off-road connection from Hope Street to the EBBP.

PARE recommends tree trimming and clearing of vegetation at the EBBP. Proper maintenance of the tree line and vegetation along Poppasquash Road will improve sight distance at the EBBP.

SECTION 4

SEGMENT 2

Description:

The area studied for this approximate 290-foot segment begins at the EBBP. It continues along Poppasquash Road until the end of the overlook. Figure 7, Segments 1-3, shows the approximate segment limits.

Existing Conditions:

The completed Design Policy Memo (DPM) summarizes existing conditions, documenting information for a review of this segment as it pertains to signing the road as a Signed Shared Bike Route. This DPM is included in Appendix A. The DPM must be approved by RIDOT to allow for signing of the road as a Signed Shared Roadway.

Photo 5: Segment 2

In this segment, Poppasquash Road has an approximate 9-foot westbound travel lane, an approximate 8-foot eastbound travel lane, and shoulder widths that vary from 0 to 1 foot (See Photo 5). The centerline and shoulders are striped, and there are no sidewalks or curbing. There is minor cracking along the edge of the roadway. A horizontal curve on the westbound approach of the existing overlook creates a limited site distance from the EBBP.

The eastern pull off area is a triangular piece of property that is owned by the Town of Bristol. It appears to be used as a parking area for vehicles. Figure 4, Property Owners, shows the property lines and owners on this segment of Poppasquash Road.

The utility poles in this segment continue on the southern side of the road and are located approximately 3 feet off the edge of the pavement. Significant erosion is evident along the edge of the roadway, especially prominent before the beginning of Wall B on the south side of Poppasquash

Road. Wall B begins at the harbor and ends prior to the eastern pull off. This wall is discussed in detail in Section 7: Structural Assessment.

Runoff from the road has created it's own waterway adding to the significant erosion. A Type D catch basin on the north side of the road presents a hazard for pedestrians and bicyclists (See Photo 6).

Photo 6: Type D Catch Basin at the edge of the roadway

Visual Assessment:

As stated earlier, this segment begins at the crossroads of Poppasquash Road and the EBBP. Crosswalk striping and signage warns motorists of the crossing. The striping has faded. It was observed that motorists slowed down when approaching the intersection even if no pedestrians or cyclists were in view. A small boulder on one corner of the intersection further defines and protects the path from encroachment of vehicles. Utility poles continue along the southern side of the road

Photo 7: Stone wall on south side of Poppasquash Road

Photo 8: Boulder at drainage structure

set just a few feet from the edge of pavement. The roadway takes a sharp right turn beyond the bike path intersection and a stone wall protects motorists from driving off the road if traveling at excessive speeds (See Photo 7).

Along the inside corner approach to the turn, a large boulder has been placed to protect a drainage structure that sits above grade (See Photo 8). Tangled masses of shrubs lie beyond the edge of pavement with a grassed area adjacent to the pavement. Windmill Point Condominiums dominate

the view immediately ahead. The end of the stone wall along the south side marks the end of Segment Two.

Alternatives:

Alternative A:

The first alternative considers the design and construction of a 10-foot wide bituminous Shared Use Path similar to the EBBP. This new Shared Use Path would be located along the north side of Poppasquash Road, approximately 2 feet to the north of the proposed edge of pavement and would connect to the EBBP. As indicated on Figure 4, Property Owners, the Town of Bristol owns the property at the site of the proposed Shared Use Path. The construction for the Shared Use Path would be in a wooded and wet area abutting the Mill Pond. Necessary wetland and other associated permits required to perform work in this area would be required from the Coastal Resource Management Council (CRMC) and other state and federal agencies as discussed in detail in Section 8: Environmental Permitting. Further coordination between the Town, RIDOT, and RIDEM would be required to determine the feasibility of maintaining this segment once improved. At the end of the path a crosswalk is proposed to the eastern overlook area. The path in this part of the segment would provide an off-road connection from the EBBP to the proposed Overlook Area (See Photo 9).

Photo 9: Proposed area for Shared Use Path

The proposed overlook is located on the south side of Poppasquash Road at the eastern pull off, providing a scenic view of the Bristol Harbor. The overlook would provide an area where pedestrians and bicyclists could stop and enjoy the natural scenes of Bristol Harbor. A sidewalk is proposed along the south side of the roadway, connecting to the existing concrete sidewalk at the Windmill Condominiums, and providing residents easy access to the scenic overlook.

One Scenic Overlook destination sign is proposed south of the Overlook. A perspective sketch and overall plan of the proposed Overlook Area for Alternative A are provided at the end of this section and the location of the Overlook Area is shown on Figure 7, Segments 1-3.

A necessary improvement to the road for this segment is to replace the existing drainage structure with a catch basin. It is recommended that this improvement be included in the RIDOT 1R Improvement Project.

With the installation of this Shared Use Path, it is advised that the Town provide regular maintenance of the path to ensure that it continues to be an acceptable route for the bicyclists. Regular maintenance includes sweeping the pavement to prevent accumulation of sand and debris, and trimming trees to avoid any obstructions along the path.

A preliminary opinion of probable construction costs for this segment is approximately $63,700.00. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this segment is provided in Appendix B at the end of this report.

Alternative B:

The second alternative considers that Poppasquash Road in this segment be designated as a Signed Shared Roadway. Designation of this roadway would allow for a connection on both sides of the road from the EBBP to the proposed scenic overlook. At the end of Wall B on the south side of Poppasquash Road a crosswalk is proposed. The crosswalk provides a designated crossing for pedestrians and bicyclists to access the proposed Overlook Area.

One Scenic Overlook destination sign is proposed south of the Overlook. A perspective sketch and overall plan of the proposed Overlook Area for this alternative are provided at the end of this section and the location of the Overlook Area is shown on Figure 7, Segments 1-3.

Improvements to the road necessary for this designation are as follows:

- Increase roadway width to a minimum of 30 feet throughout
- Repair cracks and potholes along the entire length of road
- Replace the existing drainage structure with a catch basin

With this segment of Poppasquash Road designated as a Signed Shared Roadway, it is advised that the State provide regular maintenance of the roadway to ensure that it continues to be an acceptable

route for the bicyclists. Regular maintenance includes sweeping the pavement to prevent accumulation of sand and debris, removing edge of pavement obstructions, and trimming trees.

A preliminary opinion of probable construction costs for this segment is approximately $63,200.00. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this area is provided in Appendix B at the end of this report.

Alternative C:

The third alternative considers that Poppasquash Road in this segment remain a Shared Roadway. This do-nothing alternative means the road would have no bikeway classification or designation. The existing roadway does not meet standards to encourage additional bicycle travel by signing it as Signed Shared Roadway. Repaving this road will improve the ride ability for motorists, pedestrians, and bicyclists that currently use this road.

The landscaping at the proposed Overlook Area in the first two alternatives will eliminate an existing location for off road parking for vehicles. Due to insufficient site distance to the west at the existing eastern pull off, parking is not recommended in the design of the proposed Overlook Area.

The opinion of probable cost for landscaping the proposed Overlook Area is approximately $21,000.00. A breakdown for the associated landscaping items and costs to build the proposed Overlook Area in this segment is provided in Appendix B at the end of this report.

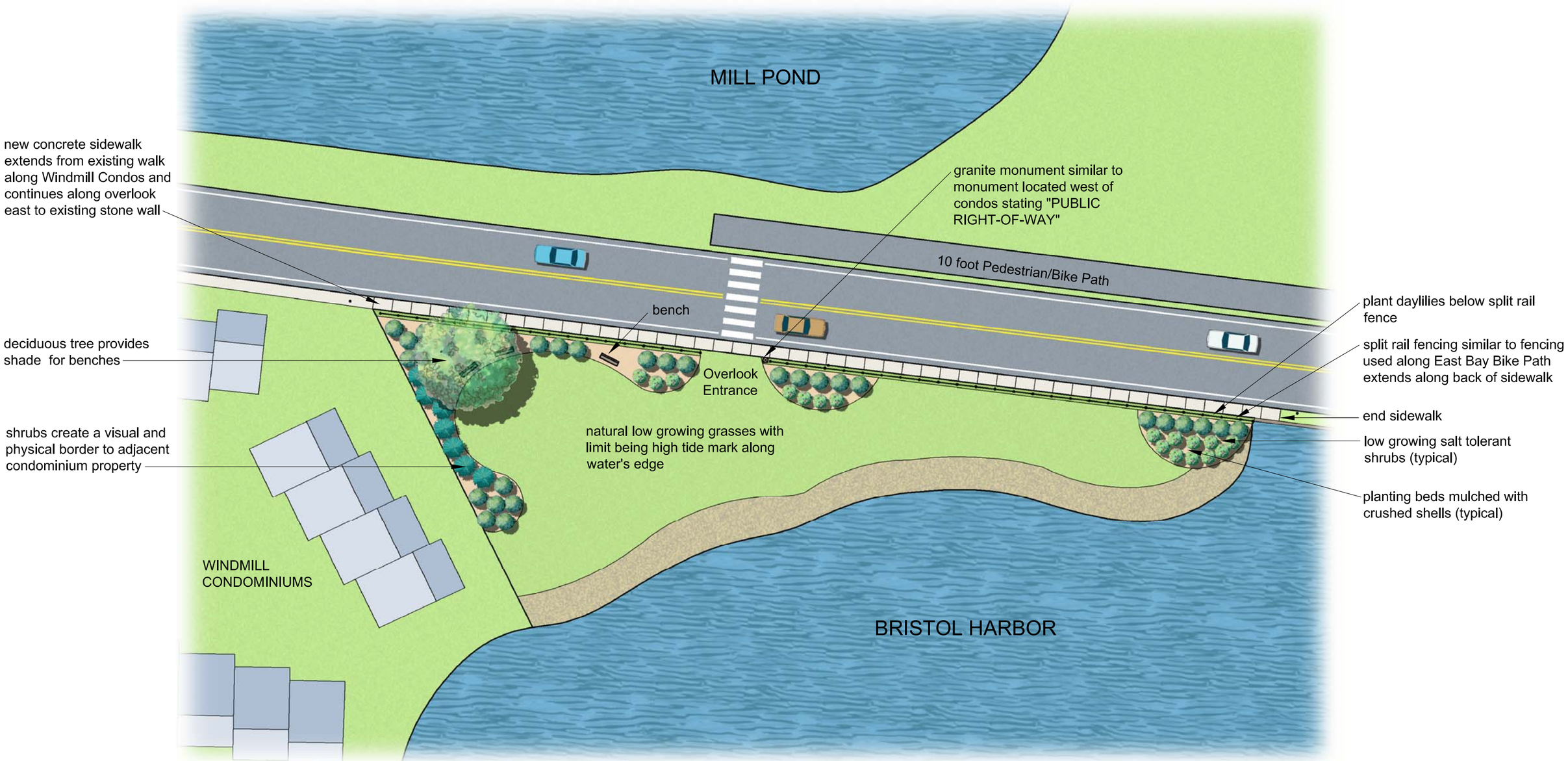
Recommendations:

Based on the above, PARE recommends Alternative A for this segment of Poppasquash Road. A Shared Use Path will provide a safe off-road connection from the EBBP to the proposed Overlook Area.

PARE recommends landscaping the proposed Overlook Area to provide a more scenic view of the Bristol Harbor. This elimination of parking will also improve safety for motorists. Providing a walkable route from the bike path will continue to encourage safe public use.

Recommended immediate improvements for all alternatives include the trimming of the overhanging tree limbs. These improvements would improve any sight distance constraints around

curves as well as provide additional recovery and maneuvering area along the side of the road for both bicyclists and drivers should they encounter a potential conflict.



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PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

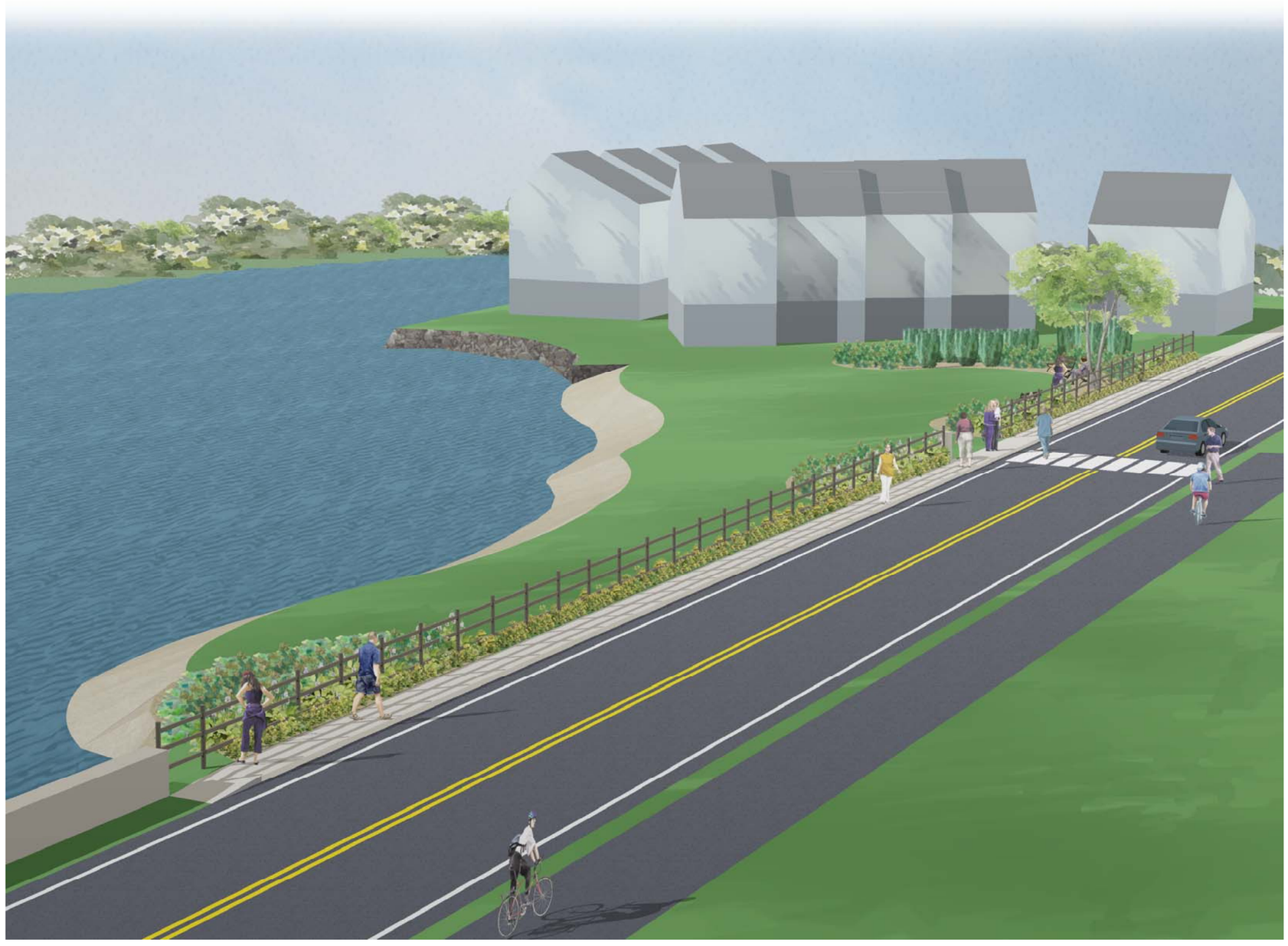
N W E S

BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island

OVERLOOK AREA (Alternative A)

LANDSCAPE ARCHITECT:
DIANE C.
SOULE & ASSOCIATES, ASLA
LANDSCAPE ARCHITECTURE • GRAPHICS • DESIGN
Smithfield, Rhode Island 401.231.0736 e-mail: DCSA@COX.NET



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8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

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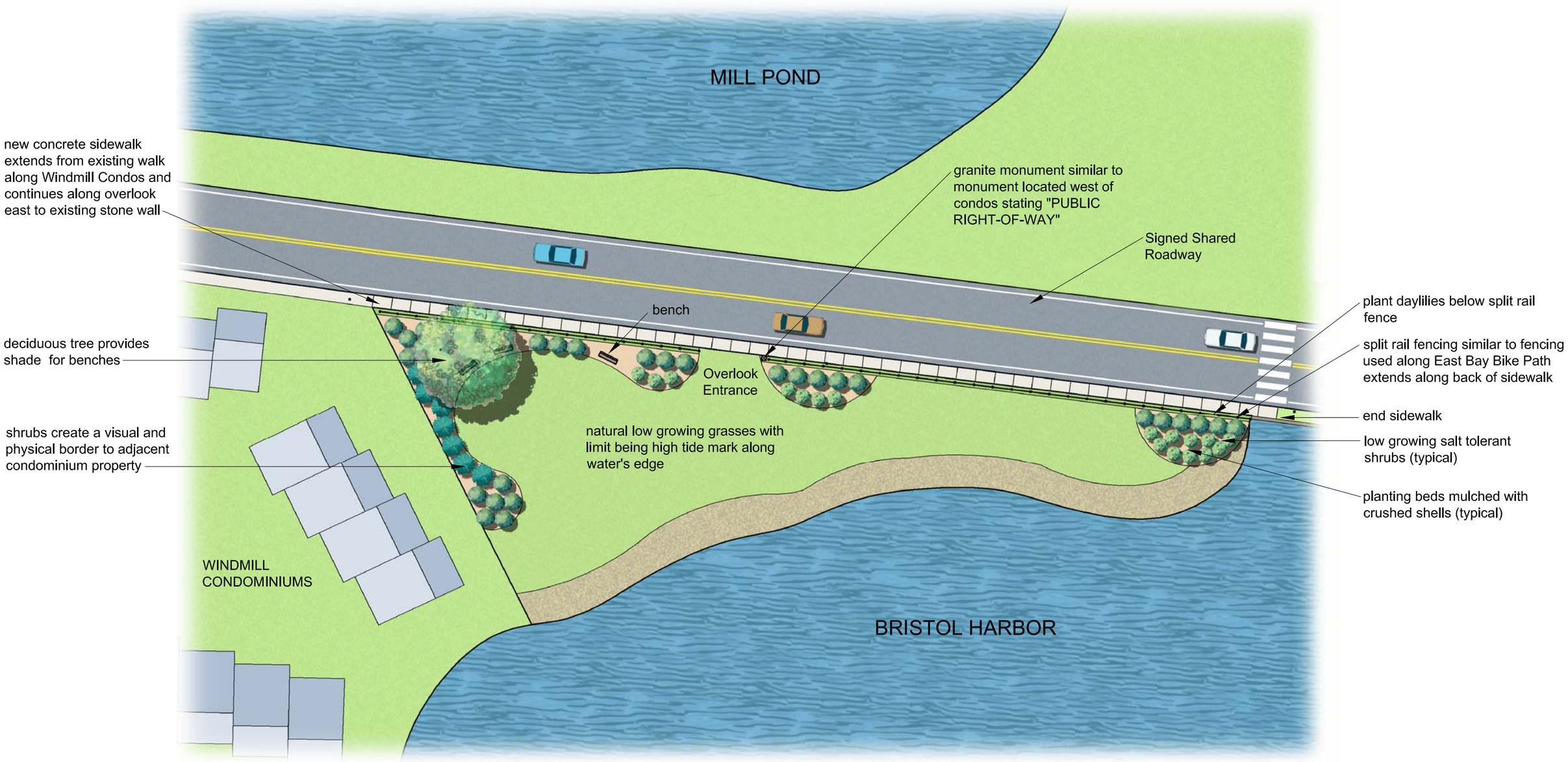
BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island
OVERLOOK AREA (Alternative A)

LANDSCAPE ARCHITECT:
DIANE C.
SOULE & ASSOCIATES, ASLA
LANDSCAPE ARCHITECTURE • GRAPHICS • DESIGN
Smithfield, Rhode Island 401.231.0736 e-mail: DCSA@COX.NET



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PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

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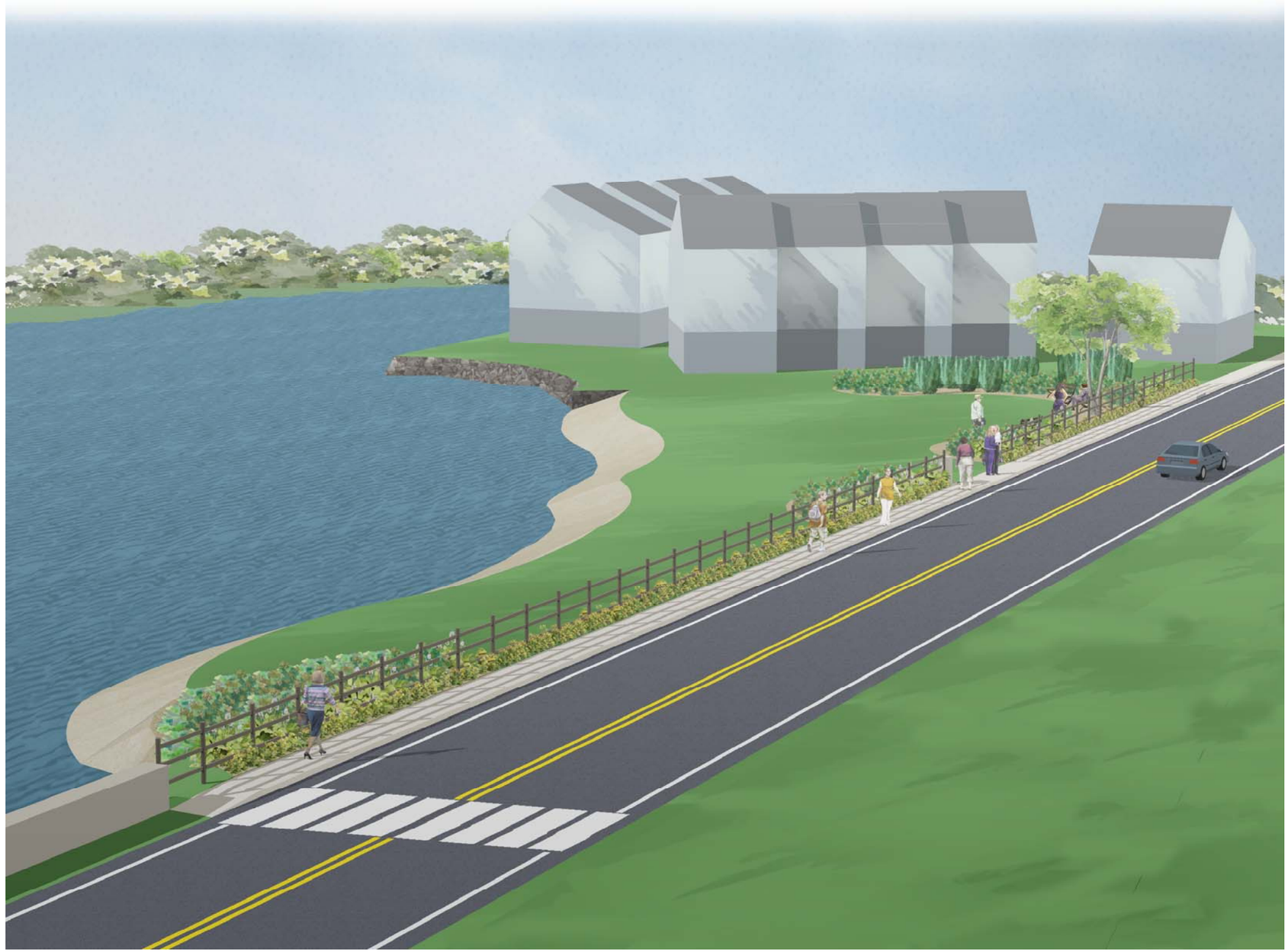
BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island

OVERLOOK AREA (Alternative B)

LANDSCAPE ARCHITECT:
DIANE C.
SOULE & ASSOCIATES, ASLA
LANDSCAPE ARCHITECTURE • GRAPHICS • DESIGN
Smithfield, Rhode Island 401.231.0736 e-mail: DCSA@COX.NET



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8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

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BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island

OVERLOOK AREA (Alternative B)

LANDSCAPE ARCHITECT:
DIANE C.
SOULE & ASSOCIATES, ASLA
LANDSCAPE ARCHITECTURE • GRAPHICS • DESIGN
Smithfield, Rhode Island 401.231.0736 e-mail: DCSA@COX.NET

SECTION 5

SEGMENT 3

Description:

The area studied for this approximate 360-foot segment begins at the end of the overlook and terminates at the culvert that runs over the Mill Pond Inlet. Figure 7, Segments 1-3, shows the approximate segment limits.

Existing Conditions:

The completed Design Policy Memo (DPM) summarizes existing conditions, documenting information for a review of this segment as it pertains to signing the road as a Signed Shared Bike Route. This DPM is included in Appendix A. The DPM must be approved by RIDOT to allow for signing of the road as a Signed Shared Roadway.

Poppasquash Road has two 10-foot wide travel lanes in this segment. Shoulder width varies between 1 and 2 feet. The centerline and shoulders are striped, and there are no sidewalks. However the existing concrete curb on both sides of Poppasquash Road at the culvert location is very deteriorated (See Photo 10). The road surface is in fair condition, with moderate cracking in

Photo 10: End of Segment 3 at the culvert

Photo 11: Culvert and entrance to Windmill Point Condominiums

the roadway. Along the edge of pavement, the erosion is significant in areas and sand lines the edge of the road. A 4-foot wide concrete sidewalk runs along the front of the Windmill Point Condominiums prior to its entrance (See Photo 11). Utility poles are located approximately 3-feet from the edge of the roadway, alternating sides in front of the condo property.

A concrete headwall is adjacent to south side of the culvert and a stonewall runs along the north side of the roadway including the culvert. The culvert area provides scenic views of both Mill Pond and the Bristol Harbor. The entrance to the Windmill Point Condominiums is adjacent to the culvert on Poppasquash Road. At the culvert there are Type D catch basins on both sides of the road that are deteriorated and not bike safe. Section 7: Structural Assessment, specifically addresses the existing condition of the walls and the culvert in this segment.

Visual Assessment:

This segment begins at the end of the stone wall along the south side of Poppasquash Road. Here the land mass opens and extends south forming a natural "beach area" (See Photo 12). Portions of

Photo 12: Natural "beach area"

Photo 13: Water at the edge of road

the land between the water's edge and the roadway are grassed and graveled. A lack of sufficient drainage is evidenced by puddling at the edge of pavement (See Photo 13).

A row of short wooden bollards separates the Windmill Point Condominium property from the proposed overlook parcel (See Photo 14). Signage on the condominium property warns against trespassing (See Photo 15).

Photo 14: Bollards at the condominiums

Photo 15: Trespassing sign on condominium property

Along the frontage of the condominium property from the eastern edge beginning at the bollards, a concrete sidewalk exists along the edge of the road. It terminates at the entrance to the condos. A utility pole is located in the sidewalk making it inaccessible to wheelchairs (See Photo 16).

Photo 16: Sidewalk in front of condominium property

Photo 17: Mill Pond

The view just across the roadway to the north is open across Mill Pond. A low stone wall may act to keep vehicles from entering the pond (See Photo 17).

The entrance to Windmill Point Condominiums is attractively landscaped with plantings and signage. At this point the concrete sidewalk ends (See Photo 18).

Photo 18: Entrance to condominiums

Photo 19: View ahead to Bristol Harbor

Within this segment, the roadway curves and bends creating short sight distances. The stonewall along the north side of the road rises to a greater height as the water's edge draws closer to the pavement. At this point, the utility poles cross from the south side of the road to the north. Ahead motorists begin to get a view of Bristol Harbor (See Photo 19).

Standing on the bridge, the view of the channel cut by the water is evident (See Photos 20 and 21).

Photo 20: Culvert and Bristol Harbor

Photo 21: Channel to Bristol Harbor

Alternatives:

Alternative A:

One alternative for this segment is for Poppasquash Road to be signed as a Signed Shared Roadway. To reach the requirements for this classification, the roadway would have to be widened to a minimum of 30 feet for the entire segment length. This would involve extensive reconstruction of the road and the culvert and it would require extensive permitting and property acquisition.

A preliminary opinion of probable construction costs for this segment of roadway to be improved to meet Signed Shared Roadway standards is approximately $43,200.00. This does not include any permitting, property acquisition, or wall or culvert repairs that could be required. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this segment is provided in Appendix B at the end of this report.

Alternative B:

A second alternative is for this segment of Poppasquash Road to remain a Shared Roadway. This do-nothing alternative means the road would have no bikeway classification or designation. The existing roadway does not meet standards to encourage additional bicycle travel by signing it as a Signed Shared Roadway. Repaving this road will improve the ride ability for motorists, pedestrians, and bicyclists that currently use this road.

A necessary improvement to the road for this segment is to replace the existing drainage structures at the culvert with a drop inlet and a catch basin with inlet stone.

Recommendations:

Based on the above, PARE recommends the do-nothing alternative for this segment of Poppasquash Road. Crash analysis findings and the substandard existing roadway conditions such as width and geometric inadequacies, as previously discussed, support this recommendation. With the lack of public support, the improvements necessary for a Signed Shared Roadway does not appear feasible in this segment. Repaving this road will improve the safety for motorists, pedestrians, and bicyclists that currently use this road.

SECTION 6

SEGMENT 4

Description:

The area studied for this approximate 2,320 feet segment begins at the culvert. It is the last segment of the study area and terminates at the entrance of Colt State Park and the Jogger's Parking Lot. Figure 12, Segment 4, shows the approximate segment limits.

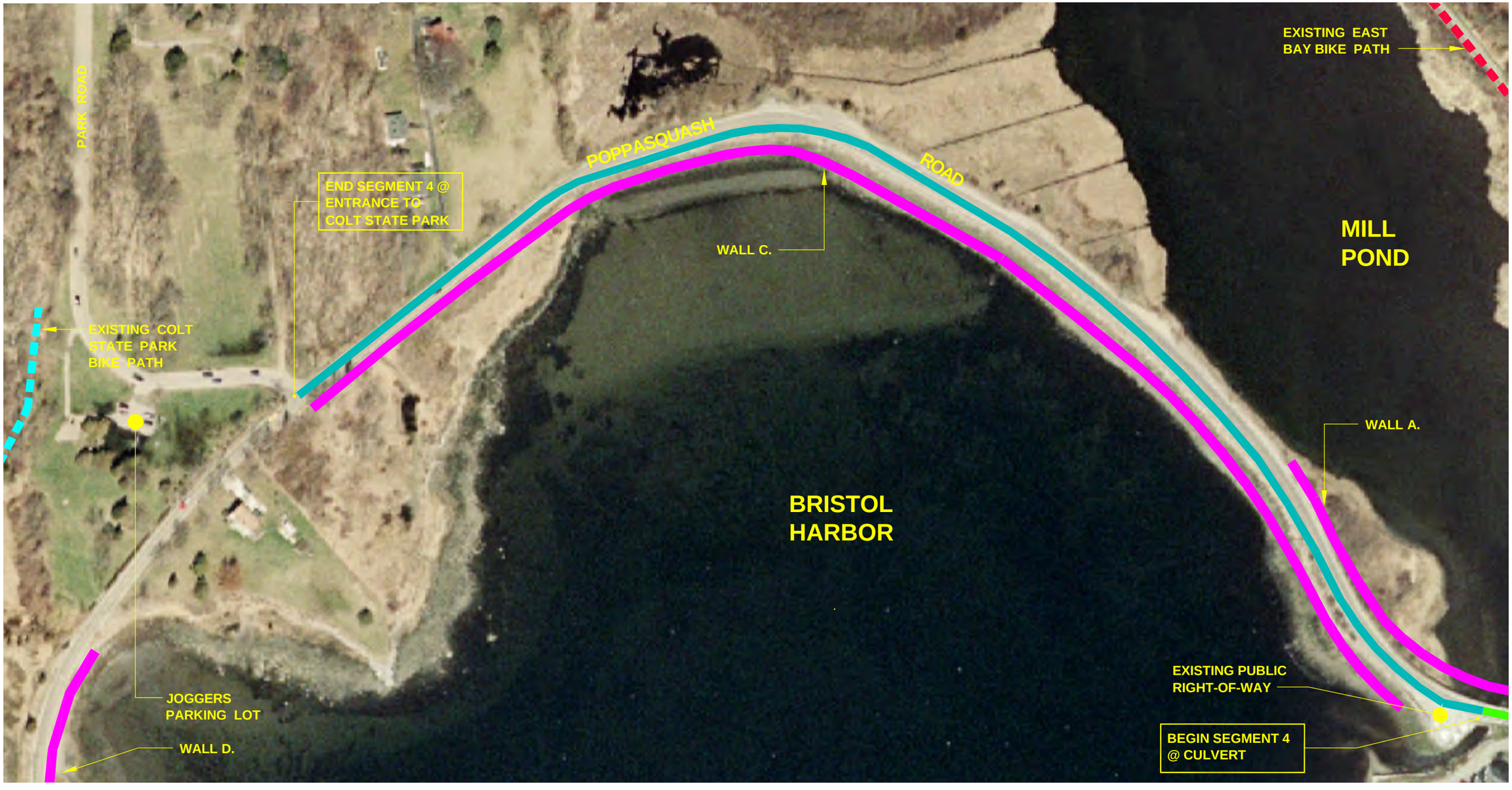
Existing Conditions:

The completed Design Policy Memo (DPM) summarizes existing conditions, documenting information for a review of this segment as it pertains to signing the road as a Signed Shared Bike Route. This DPM is included in Appendix A. The DPM must be approved by RIDOT to allow for signing of the road as a Signed Shared Roadway.

This segment of Poppasquash Road is windy and narrow in many areas. It consists of lanes varying between 8 feet and 15 feet and shoulders varying between 1 feet and 3 feet. The centerline and shoulders are striped and there are no sidewalks or curbing. The utility poles are along the north side of Poppasquash Road and vary from the edge of pavement to approximately 5 feet from the edge of pavement (See Photo 22). The road surface in this segment is poor and the cracking is severe in numerous areas especially along the edge of the travel lanes. Erosion along the edges of pavement is evident along this entire segment. Sand and debris line both sides of the roadway (See Photo 23).

Photo 22: Segment 4

Photo 23: Entrance to Colt State Park



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PARE

PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

BICYCLE AND PEDESTRIAN
STUDY AND DEVELOPMENT

POPPASQUASH ROAD BICYCLE FACILITY
Bristol, Rhode Island

SEGMENT 4

FIGURE 12

Photo 24: Town Right-of-Way (ROW)

The western pull off at the beginning of this segment on the south side of the road offers a place for people to park and fish or enjoy the scenery of the surrounding area (See Photo 24). The Town of Bristol owns this parcel of land in which the Town ROW is located on and can be seen on Figure 4, Property Owners.

Trees, bushes and hanging limbs become an issue at the western end of this segment while nearing the entrance to Colt State Park. Standing water on the roadway is also evident in this area (See Photo 25).

Photo 25: Approach to curve in Segment 4

An analysis of the reported crashes for three years, including 2002, 2003 and 2004 indicated two crashes in this segment. Both crashes were single vehicle crashes that involved running off the road or losing control. There were no adverse roadway surface conditions or injuries in these two crashes. This data has been tabulated in Appendix C.

Visual Assessment:

Photo 26: Granite monument at Town ROW

This segment encompasses the remainder of the study area. At this point, a small landmass just beyond the bridge on the south side of the road allows public access to the water's edge. A granite marker / monument reminds pedestrians and motorists that access is allowable (See Photo 26).

As the roadway snakes between the two bodies of water, protective walls flank both sides of the pavement. The southern wall is a mix of concrete and stone with riprap lining the edge of water (See Photo 27). Openings in the concrete wall allow for storm water to drain to the Harbor. At this point, the view to Bristol Harbor is extensive with a view to the marina in the distance (See Photo 28).

Photo 27: Riprap along concrete wall

Photo 28: View of Bristol Harbor

Photo 29: Shoulders on Poppasquash Road

Photo 30: Poppasquash Road at water's edge

Lack of an adequate shoulder on either side makes it unsafe for pedestrians and bicyclists (See Photo 29). Although not observed during the field inspection, hoof prints of horses were noticed in the soft mud along the shoulder. About mid point along the causeway, the stonewall ends on the northern side, leaving the water's edge exposed (See Photo 30). Beyond the pond a residential community comes into view.

Along this stretch, areas of asphalt have been dumped along the northern edge of the water along the slope. As the roadway leaves the causeway, it turns sharply south. Single-family homes are located to the north of the roadway (See Photo 31).

Photo 31: View across the Harbor

Photo 32: Pathway along the edge of the road

A pathway along the edge of road where there is adequate room for pedestrians to stay safely away from traffic although some choose not to use it (See Photo 32).

Stately older homes and mature vegetation line the roadway as it leaves Bristol Harbor. As seen in Photos 33 and 34 below, the roadway shoulder is narrow and vegetation, utility poles and mailboxes compete for space with pedestrians.

Photo 33: Mailbox along the road

Photo 34: Utility pole near the edge of roadway

Pedestrians have carved a narrow path along the northern edge of the roadway. Large mature trees, expansive lawn and landscaping along with signage mark the entrance to Colt State Park and access to the Jogger's Parking Lot (See Photos 35 and 36).

Photo 35: Entrance to Colt State Park

Photo 36: Colt State Park

<u>Alternatives</u>:

Alternative A:

One alternative for this segment of Poppasquash Road is to be signed as a Signed Shared Roadway. To meet the requirements for this classification, the roadway would have to be widened to a minimum of 30 feet for the entire segment length. This would involve extensive reconstruction of the road and it would require extensive permitting and property acquisition.

A preliminary opinion of probable construction costs for this segment of roadway to be improved to meet Signed Shared Roadway standards is approximately $266,600.00. This does not include any permitting or property acquisition that could be required. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this segment is provided in Appendix B at the end of this report.

Alternative B:

A second alternative for this segment of Poppasquash Road is to remain a Shared Roadway. This do-nothing alternative means the road would have no bikeway classification or designation. The

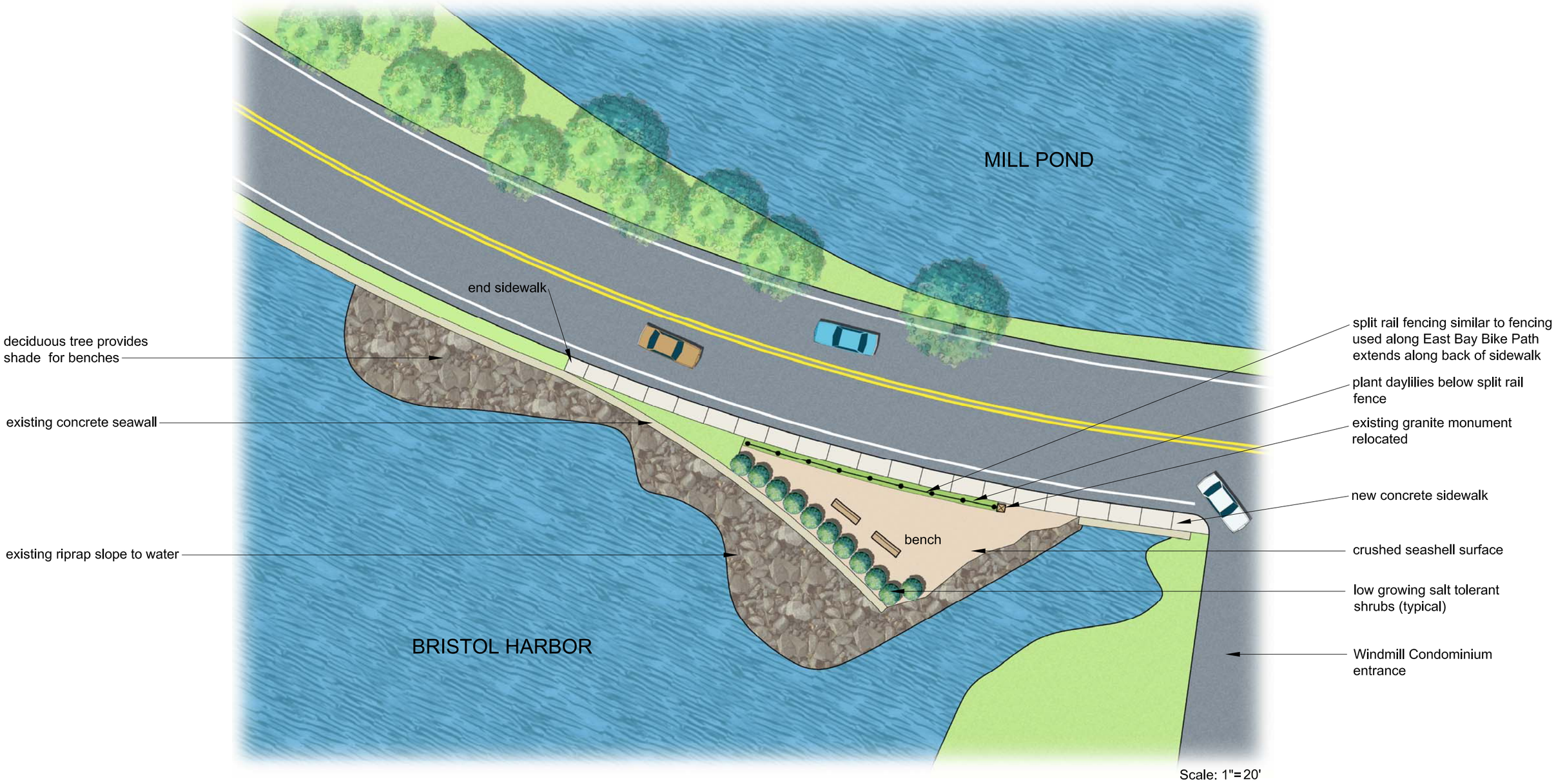
existing roadway does not meet standards to encourage additional bicycle travel by signing it as a Signed Shared Roadway.

The western pull off in this segment offers another opportunity for a landscape design with shrubs, flowers and benches for residents, pedestrians and bicyclists to enjoy. The proposed Fishing Area is located on the south side of Poppasquash Road. The sidewalk from the proposed Overlook Area in Segment 2 and the existing sidewalk in front of the Windmill Condominiums provide a logical connection between the proposed Overlook Area and the proposed Fishing Area. Landscaping this area will eliminate parking but will maintain a place for the public and the fisherman. A perspective sketch and overall plan of the proposed Fishing Area for Segment 4 are provided at the end of this section and the location of the Fishing Area is shown on Figure 12, Segment 4.

The opinion of probable cost for the landscaping is approximately $8,200.00. A breakdown of the associated items and costs to build the proposed pedestrian and bicycle facility in this segment is provided in Appendix B at the end of this report.

Recommendations:

Based on the above and with the lack of public support, PARE recommends that this segment of Poppasquash Road remain a Shared Roadway. The existing roadway does not meet standards to encourage additional bicycle travel by signing it as Signed Shared Roadway. For these reasons, it is recommended that the Town focus on the re-surfacing of Poppasquash Road that has been approved for the 1R Re-surfacing Program. Repaving this road will improve the ride ability for motorists, pedestrians, and bicyclists that currently use this road. This program will examine improvements including a smooth new road surface, a defined edge of pavement, and the replacement of the existing riprap along Poppasquash Road. Crash analysis findings and the substandard existing roadway conditions such as width and geometric inadequacies, as previously discussed, support this recommendation.



PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

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BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island
FISHING AREA

LANDSCAPE ARCHITECT:
DIANE C.
SOULE & ASSOCIATES, ASLA
LANDSCAPE ARCHITECTURE • GRAPHICS • DESIGN
Smithfield, Rhode Island 401.231.0736 e-mail: DCSA@COX.NET

PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

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W E
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SECTION 7

STRUCTURAL ASSESSMENT

This section of the study report investigates the existing conditions and alternatives for the rehabilitation/replacement of various structural elements along Poppasquash Road. Four walls and two culverts along Poppasquash Road were designated for investigation (Figure 1, Overall Site plan). The first of the selected walls, Wall A, is situated along the north side of the road, bordering the Mill Pond. This wall begins about 410 feet west of Hope Street and extends parallel to Poppasquash Road for about 950 feet. A second wall, Wall B, runs briefly along the Bristol Harbor side of the road. This wall begins about 310 feet west of Hope Street and continues westward for about 145 feet. The third wall, Wall C, is also situated on the Bristol Harbor side of Poppasquash Road. This wall begins about 995 feet west of Hope Street and continues approximately a third of a mile adjacent to Poppasquash Road. The first culvert is located about 860 feet west of Hope Street and allows water to pass from the Mill Pond to the Bristol Harbor. The last wall within this project, Wall D, is approximately 680 feet in length, beginning approximately 530' southwest of Wall C and running southerly along Poppasquash Road. The second culvert located approximately 300 feet from the beginning of this wall, and provides an opening to Bristol Harbor from a small pond area. The wall terminates prior to the Bristol Marina. Riprap slope protection continues for approximately 550 feet from the end of the wall to the Marina.

Included within this section are descriptions of the existing conditions of each of the structures as well as recommendations for the rehabilitation/replacement of each. No Hydraulic, Geotechnical, or other exploratory investigations have occurred to this point, therefore assumptions have been made regarding the feasibility of some alternatives. No detailed drawings of the walls or culvert were available on file at the RIDOT plan room; therefore, assumptions were made with regard to geometries and construction methods of the structures. Additionally, the limits of this study are within a Historic District and should be coordinated with the State Historic Preservation and Heritage Commission for review of the proposed improvements.

Existing Conditions:

Wall A:

The Wall A is constructed of stone and is located on the north side of Poppasquash Road. The wall follows along a reverse curve section of roadway. There is no sidewalk adjacent to the wall, although there is a narrow, grassy shoulder, approximately 4 to 5 feet wide, between the wall and the roadway.

As stated previously, the wall is approximately 950 feet long and about 18" wide at the top. Over the length of the wall, the exposed face along the roadside ranges from about 10" to about 32", while the exposed face on the Mill Pond side ranges from about 24" to about 68". The condition of the wall is quite varied; some sections appear generally intact while other sections have completely failed (See Photo Key Plan For Wall A, Appendix D).

At the east end, the wall is very low (See Photo 37, Appendix E). The exposed face on the roadside is only 10", which includes a 3" concrete cap. On the pond side, the exposed face is about 25" including the 3" concrete cap. At this end the stonewall shows very thick mortar joints. Some cracking has occurred in the wall and some chipping has occurred on the concrete cap. Gaps exist between the concrete cap pieces and some of the cap pieces are missing. In addition, a substantial amount of vegetation is growing tightly against the wall on the Mill Pond side.

About 62 feet west of the beginning of the wall, on the pond side of the wall, there is significant failure of the wall extending for about 15 feet. At this location the lower half of the wall has failed and collapsed. The top portion of the wall appears to be supported and held together by the substantial amount of mortar between the stones (See Photo 38, Appendix E). The exposed height at this location is approximately 40".

Approximately 5 feet west of this wall failure the concrete cap is discontinued. After the end of the concrete cap, the wall consists of flat stone pieces along the top of the wall (See Photo 39, Appendix E). On the roadside of the wall, there is a significant mortar coating on the stone, however, on the pond side, the wall has an uneven, rubble-stone look and does not display the same amount of mortar. The visible amount of mortar used on this wall face, from this point

westward, is significantly less than at the east end. In addition, the base of the wall, facing the pond, appears to be wider than the first section of wall that had the concrete cap.

Starting just at the end of the concrete cap, and extending about 6 feet westward, there is significant cracking damage at the top of the wall. A large crack is visible from the roadside of the wall where the exposed wall height is approximately 12". The crack extends diagonally downward from the top of the wall to the bottom of the exposed face and then upward again to the top of the wall in a wide "V" shape. At the widest section the crack is about 6" to 8" wide. Along the top of the wall, parts of the flat stone topping are broken and separated from the wall (See Photo 39, Appendix E).

About 15 feet west of this break in the wall, there is a hole through the wall. It appears that stones could have been removed from the wall intentionally. The hole has mortared sides and a smooth appearance. It is anticipated that this opening was intentionally created as a scupper to allow water to flow through the wall from the road (See Photo 40, Appendix E). On the pond side of the wall there is an assortment of loose stones at the base of the wall, possibly stones that were once part of the wall structure (See Photo 41, Appendix E).

About 150 feet west of the hole is a collapsed portion of the wall facing the Mill Pond. The section of wall influenced by this fallen rock is about 8 feet in length and about 12" deep into the wall. This failure is not noticeable from the roadside of the wall. The exposed face on the pond side of the wall at this failure is about 55" and it is about 14" on the roadside (See Photo 42, Appendix E). Approximately 15 feet beyond this point there is another partial collapse of the wall. The bottom half of the wall has lost numerous stones. The result is a void about 18" wide, 24" high and 16" deep (See Photo 43, Appendix E).

Another 20 feet westward, there is a gap in the wall where the two sides of the opening have collapsed into a sort of "V" (See Photo 44, Appendix E). It appears that the opening is per design as the sides of the opening have smooth, mortared faces. The opening is about 6" wide at the top and 14" wide at the bottom. From the roadside of the wall it is evident that the "V" portion of the wall has broken away from the main wall and is slipping toward the pond (Photo 45,

Appendix E). This area appears to be allowing water to pass through the wall acting as a sort of scupper. The grass below the opening shows signs that water collects at that location.

From this point, the wall continues westward without much disturbance until it reaches the culvert opening at about 860 feet from Hope Street. Within this stretch of wall there are a couple places with missing stones but no major damage (See Photo 46, Appendix E). The exposed wall height on the Mill Pond side is about 68" and on the roadside it is about 27" at the east side of the culvert. The wall over the culvert is about 32" tall and appears to be in good condition (The condition of the culvert is discussed in a separate section of this report.). Just to the west of the culvert is a major wall collapse (See Photos 47 & 48, Appendix E). The collapsed area is about 8 feet long, 54" tall, and 12" deep. On the street side of the wall there is a catch basin in line with the wall collapse (Photo 49, Appendix E). The brick from the catch basin can be seen through the stonewall. During a cursory review of the catch basin, it was discovered that the catch basin has no outlet pipe. It appears that the outlet pipe was blocked with concrete. The water, which enters the catch basin overtime, has been draining through the stonewall. It is recommended that a new drop inlet be installed, in place of the catch basin, and a new outfall pipe be connected from the drop inlet to a new catch basin on the south side of the road (See Page 41 of the report).

From the point of this collapse westward to the end of the wall there is very little significant damage visible on the Mill Pond side of the wall. A few locations along this stretch have some missing rocks, yet no major collapses were visible (See Photo 50, Appendix E). Some segments of the wall, on the pond side, are difficult to view thoroughly since they are overgrown with dense trees and shrubbery (See Photo 51, Appendix E). On the roadside of the wall, there are several spots with large cracks in the mortar parge coating on the top and on the side between the stones (See Photos 52 & 53, Appendix E)

<u>Culvert 1:</u>

A cursory field inspection of Culvert 1 was performed to evaluate its structural integrity. To the north of the roadway the exposed culvert is constructed of concrete. This concrete portion of the culvert has undergone significant deterioration and destruction. The Mill Pond side of the culvert has three bays with an 8" deep by 22'-6" long concrete cap beam spanning over the three bays (See Photos 54 & 55, Appendix E). The end walls supporting the cap beam are approximately

12” wide at the top while the wall bottoms have deteriorated to approximately 9-1/2” wide. The bay openings each measure just over 6 feet from inside face to inside face and the vertical clearance is approximately 48”. There are two sets of intermediate piers separating the bays. The two exterior piers were originally 12” wide and 18” thick while the interior piers were originally 12” wide and 12” thick. Both sets of piers have lost significant amounts of concrete over time. The bottom halves of the left and right exterior piers currently taper to widths of 9-1/2” and 8” in width, respectively, and about 11-1/2” in thickness (See Photos 56 & 57, Appendix E). The interior piers have faired somewhat better over the years but they still display significant section loss of concrete. About one third of the left pier has deteriorated to 10” in width and thickness. About half the height of the right pier has deteriorated to about 9” in each direction. All four piers also have significant amounts of exposed rebar, most of which has corroded and broken off. Further interior to the piers is a stone structure that is appears to be the original stone culvert. The openings framed by the stonework of this culvert are very low and did not allow passage through the culvert openings (See Photo 58, Appendix E).

On the south side of the road, the culvert only reveals two bay openings separated by a stone pier. The exposed stone structure appears to be the original stone culvert (See Photo 59, Appendix E). The fact that the concrete culvert exists only to the north side of the road would coincide with the early 1930’s drawings for Poppasquash Road that show that the culvert was expanded only to the Mill Pond side of the roadway. The left and right culvert openings on the south side of the roadway are approximately 72” and 54”, respectively, in horizontal dimensions and the vertical clearance of these openings is approximately 48”. A stone pier in between the openings measured approximately 34” wide (See Photo 60, Appendix E). A 10-foot length of stonewall exists to the left of the 72 inch bay opening (See Photo 61, Appendix E). There is an 11” deep by 18” wide concrete cap beam extending approximately 23’- 4” across the top of the culvert. Sitting above this cap beam is a 49” tall concrete headwall constructed just about the full length of the cap beam. There are stone wingwalls on each side of the culvert. The left wingwall, which is adjacent to a parking area, has a similar 11” deep by 18” wide concrete cap beam across the top. The right wingwall is constructed completely of stone and does not have a concrete cap. The visible stone in the south end of the culvert appears to be in fair condition although there are some missing stones above the right bay opening. The visible stonework from this culvert is very low and did not allow safe passage into the culvert openings. Looking through from the harbor

side of the culvert it appears that some stonework in the middle of the culvert has begun to fall (See Photo 62, Appendix E). The stone appears to be hanging down from the roof of the bay opening. A thorough investigation of the original stone culvert would need to be done in order to determine the exact condition of the stonework inside the bays. In addition, further exploration into the historical importance of this stone culvert would need to be explored.

Wall B:

Wall B is a short segment of stonewall located to the south of Poppasquash Road (See Photo 63, Appendix E). This wall begins about 310 feet west of Hope Street and continues for about 80 feet along the Bristol Harbor side of Poppasquash Road. The wall is a mortared stonewall with a 3" concrete cap the full length and 30" and 24" exposed heights at the east and west ends, respectively. For the most part the wall appears to be in good condition although there is some minor chipping and cracking. One specific spot of note is on the west end of the wall. At this end the cap of the wall is cracked and broken (See Photo 64, Appendix E). No construction drawings were located for this wall. Therefore the geometry and structural makeup, below grade, are unknown.

Wall C:

Wall C begins about 995 feet west of Hope Street, just beyond the culvert, and continues approximately a third of a mile along the Bristol Harbor side of Poppasquash Road (See Photo 65, Appendix E). This stretch of wall is composed of both concrete sections and stone sections. A cursory examination of Wall C revealed that for the most part the wall segments are in fair to good condition. The concrete sections appear to be intact and relatively undamaged (See Photos 66 & 69, Appendix E). The stonewall sections display some areas with cracking and also some intermittent loss of stone (See Photos 67, 71, 75, 76, 77, and 78 Appendix E). The exposed height of the wall is approximately 3 feet above the roadway surface. Existing drawings were located at the RIDOT, titled "February, 1978 Blizzard Storm Damage Repair", that show some repair details to wall locations along the Poppasquash Road. From the details on these drawings it appears that the concrete wall sections and at least some stonewall sections are built on top of a pre-existing stone base. The concrete seawall detail shows that the concrete wall section is connected to the existing stone base by drilled and grouted dowels. The stone seawall detail does not show such a drill and grout connection but instead appears to rely on the mortar connection

between the stone base and the visible stonewall. Aside from the information provided within the repair plans, no other structural information is known with regard to these walls.

Wall D:

Wall D is a stonewall that begins approximately 530 feet southwest of Wall C and runs along the southern/eastern side of Poppasquash Road. The wall abuts Poppasquash Road and retains the pavement structure of the roadway. The wall is approximately 1'-6" wide and varies from approximately 2' to 5' in height on the exposed side of the wall along its length. Towards the southern end, the wall is abutted by the pavement on one side and riprap slope protection towards Bristol Harbor. The majority of the wall is exposed to the tide of Bristol Harbor. A cement wall cap varying in depth from ½" to 2" runs the length of the wall. The size of the stones used to cast the wall vary. There are no weep holes along the length of the wall, however, similar to the other walls, stones have been left out to channel runoff off the road and out towards Bristol Harbor.

Overall, the wall is in fair to poor condition, with two typical types of deterioration. The first type consists of loose or broken wall sections due to the erosion of the binding mortar between the stones. The severity ranges from broken joints to missing stones and is often accompanied by broken caps. The second type of deterioration consists of sections of wall that have fallen and been removed from the roadside. It is likely that heavy weathering contributed to the failure of the wall. Boulders have been put in place of the wall to delineate the edge of road.

Culvert 2:

A cursory inspection of the culvert was performed. No visible signs of settlement or deterioration of the culvert were evident in the pavement of the roadway above the culvert. It should be noted that the cursory inspection was performed from the roadway, the inside of the culvert was not observed. Based on these observations it would appear that there are no active issues with the culvert. It should be noted that the walls on either side of the culvert have failed and are in need of repair. Further failure of these walls may ultimately lead to a wash out of the culvert.

Alternatives:

This section presents the alternatives considered for the wall and culvert repairs along Poppasquash Road. The following sections evaluate alternatives for each of the structures with respect to various criteria.

Wall A - ALTERNATIVE 1

The first alternative for Wall A is a cast-in-place retaining wall to replace the entire existing structure. This alternative would provide a structurally sound wall with a crashworthy railing or parapet along the entire length (See Wall A and Culvert Options, Appendix D). This combination of wall and barrier would conform to RIDOT Standards for crashworthiness. In order to imitate the characteristics of the existing stonewall, the cast-in-place retaining wall could be constructed with an in-laid stone face. This alternative would provide a sound and dependable structural system for both retaining the roadway and protecting traffic. A preliminary opinion of probable construction cost is approximately $2,000,000.00.

Wall A - ALTERNATIVE 2

A second alternative for Wall A would be to cut down the existing wall to below the roadway grade, make repairs to the lower portion, and construct a concrete moment slab with a crash railing or parapet on it above the existing wall. The moment slab and crash tested rail system would provide a structurally sound means for retaining the roadway and protecting traffic along the edge of Poppasquash Road. This combination of the new structural systems with the old wall would not provide a seamless appearance from the Mill Pond Side of the wall. Although the new concrete elements could be faced with in-laid stone, there would be a horizontal joint visible and it is unlikely that the stone would match. A preliminary opinion of probable construction cost is approximately $1,800,000.00.

Wall A - ALTERNATIVE 3

A third alternative for Wall A would be to identify the locations that show damage and take the necessary measures to repair the areas along the wall. This alternative will allow the wall to retain the rustic look that it has now however the wall will not meet the current design standards for traffic loads and seamless railing systems as prescribed in the Rhode Island Bridge Design Manual. A preliminary opinion of probable construction cost is approximately $250,000.00 for the repairs to the structure.

Before final design of any of the alternatives, additional field investigations and data collections will be required. The additional data collection includes subsurface soil investigation and test pits at the existing wall. The subsurface soil investigation will establish the soil conditions for

determining the design parameters of the soil. The test pits will better determine the geometry of the existing wall that will be used in detailing any modifications.

Wall B

A repair course of action for Wall B would be to identify the locations that show damage and take the necessary measures to repair the areas along the wall. Expected repairs would involve replacement of any missing stones, filling of cracks, and concrete repairs to the wall cap. This will allow the wall to retain the same look that it has now and to continue in its current functional use. A preliminary opinion of probable construction cost is approximately $1,000.00.

Wall C

From cursory observations of Wall C it appears that the main function of the wall is to protect the roadway from the bay water rather than to provide a crashworthy barrier for traffic along Poppasquash Road. A repair course of action for Wall C would be to identify the locations along the wall that need to be repaired and then take the necessary measures to fix the damage on each wall segment. Expected repairs would involve replacement of any missing stones and filling of cracks. This alternative will maintain the same basic look of the wall and its current functional use along the roadway edge. A preliminary opinion of probable construction cost is approximately $4,000.00.

Wall D - ALTERNATIVE 1

The first alternative for Wall D is to replace the sections of wall that have been demolished. This alternative would provide continuity of the existing wall to avoid blunt ends. The replacement sections would be detailed according to RIDOT Standard Specifications for a Wet Stone Masonry Wall. A preliminary opinion of probable construction cost for this alternative is approximately $110,000.00.

Wall D - ALTERNATIVE 2

A second alternative for Wall D would be to repair sections of wall that are deteriorated and replace the sections of wall that have been demolished as described in Alternative 1. Repairing the deteriorating sections of wall will help prolong the life of the wall. The existing stones would be mortared back in place. The preliminary opinion of probable construction costs for this alternative is approximately $250,000.00

Other alternatives for Wall D include complete replacement, or a combination of replacement and placement of guardrail at areas where it maybe justified rather than rebuilding a stonewall, however these alternatives were not further pursued at this time due to the considerable cost and environmental permitting implications.

Culvert 1(Wall A) - ALTERNATIVE 1

The first alternative for Culvert 1 is to replace the entire existing structure with a pre-cast concrete, three bay, box culvert (See Figure 15, Appendix D). The existing stone wingwalls on the south side of the culvert would also be replaced by reinforced concrete wingwalls in this alternative. This alternative would provide a continuous, concrete culvert that would have a crashworthy railing or parapet mounted on the pre-cast headwalls and onto the south side wingwalls. This option would provide a sound and dependable structural system for supporting the roadway, protecting traffic and routing the water. A cofferdam structure and temporary water diversion system will be required to retain and re-route the water and allow for a dry construction area. A detour will be necessary during the demolition of the old culvert and installation of the new culvert. The proposed detour would re-route through traffic from Hope Street through the Colt State park entrance roads and back to Poppasquash road west of the culvert. A preliminary opinion of probable construction cost is approximately $450,000.

Culvert 1- ALTERNATIVE 2

A second alternative for Culvert 1 would be to replace the existing culvert with a single span pre-cast concrete bridge structure (See Figure 16, Appendix D). The existing stone wingwalls on the south side of the culvert would also be replaced by reinforced concrete wingwalls in this alternative. This alternative would provide a continuous, concrete bridge that would have a

crashworthy railing mounted onto it and onto the south side wingwalls. This option would provide a sound and dependable structural system for supporting the roadway, protecting traffic and routing the water. A cofferdam structure and temporary water diversion system will again be required to retain and re-route the water and allow for a dry construction area. A detour will be necessary during the demolition of the old culvert and installation of the new bridge. The proposed detour would be the same as described previously, re-routing through traffic from Hope Street through the Colt State park entrance roads and back to Poppasquash road. A preliminary opinion of probable construction cost is approximately $500,000.

Each of the first two alternatives will require further field investigations and data collection before final design. A subsurface soil investigation program will be required to determine the soil design parameters. A hydraulic analysis of the pond/bay flows through the culvert will be required to determine the hydraulic opening and for environmental permitting of the project.

Culvert - ALTERNATIVE 3

A third alternative for Culvert 1 would be to remove the existing concrete portion of the existing culvert, make repairs to the existing stone section and re-construct a replacement concrete culvert section on the north side of Poppasquash Road (See Figure 15, Appendix D). A head wall over the new concrete section would support a crashworthy railing or parapet. The south side of the culvert would have some repairs and would remain aesthetically the same, it would however maintain a non standard parapet. At this time it is anticipated that the work in this alternative could be done while leaving one lane passable on Poppasquash Road in the vicinity of the construction. A preliminary opinion of probable construction cost is approximately $350,000. Before final design further field investigation would need to be performed. This would include an underwater inspection of the stone and concrete portions of the culvert.

As stated previously, further exploration into the historical importance of this stone culvert would need to be explored. The historical status of the culvert could be influential on the determination of how it is refurbished or replaced.

Recommendations:

In this report PARE has developed rehabilitation/replacement alternatives for various structural elements along Poppasquash Road. The following is a breakdown of the Preliminary Opinion of Probable Cost for each of the above outlined alternatives for the walls and culvert.

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

STRUCTURE NAME	PROPOSED REPAIRS	PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS
WALL A		
Alternative 1	Complete replacement of wall and addition of crash tested RIDOT railing.	$ 2,000,000.00
Alternative 2	Replace top portion of entire wall with a moment slab and crash tested RIDOT railing.	$ 1,800,000.00
Alternative 3	Repairs to entire length of wall.	$ 250,000.00
WALL B	Repairs to damaged sections.	$ 1,000.00
WALL C	Repairs and infill sections along length of wall.	$ 4,000.00
WALL D		
Alternative 1	Replacement of demolished wall sections.	$ 110,000.00
Alternative 2	Replacement of demolished wall sections and repairs of deteriorated wall sections.	$ 250,000.00
CULVERT 1		
Alternative 1	Replace entire existing culvert with pre-cast concrete culvert, and add a crash tested RIDOT railing over both ends of the culvert.	$ 450,000.00
Alternative 2	Replace the existing culvert with a single span pre-cast concrete bridge structure, replace existing stone south side wingwalls and add crashworthy railings on north and south sides of road.	$ 500,000.00
Alternative 3	Replace the deteriorated concrete culvert section and repair the existing stone culvert.	$ 350,000.00

PARE has evaluated each of these alternatives with regard to public safety, aesthetic value, and continuity of the repair and the overall cost to benefit relationship. Based on these criteria, PARE has drawn the following conclusions.

- Wall A- Alternative 1, replace the entire wall and mount a crash tested, RIDOT approved, railing along the entire length. This alternative would be an aesthetically appealing, structurally sound wall and railing system that does not depend on the integrity or geometry of the existing stonewall. The Preliminary Opinion of Probable costs for Alternatives 1 and 2 were not so distinct as to warrant pursuing Alternative 2 over Alternative 1. Because the inclusion of a crash tested railing is essential to the safety of the road, PARE does not recommended Alternative 3. PARE believes that the State and Town will be best served in the quality, efficiency and the success of the wall product by focusing funds on complete replacement rather than repair, of the existing wall system. A preliminary opinion of probable construction cost is approximately $2,000,000.00.

- Culvert 1- Alternative 1, replaces the entire existing culvert and the south wingwalls. This alternative mounts a crash tested, RIDOT approved, railing along both sides of the new pre-cast concrete culvert and on the wingwalls. This alternative would be an aesthetically appealing, structurally sound culvert and railing system that does not depend on the integrity or geometry of the existing stone culvert. The Preliminary Opinion of Probable costs for Alternative 2 was 10% less than that of Alternative 1. Because the inclusion of a crash tested railing is essential to the safety of the road, PARE does not recommended Alternative 3. PARE believes that the State and Town will be best served in the quality, efficiency and the success of the culvert product by focusing funds on a complete culvert and wingwall replacement rather than repair of the existing structure. A preliminary opinion of probable construction cost is approximately $450,000.00.

- Wall B – PARE recommends that Wall B be repaired at the locations that show damage. As stated above, the expected repairs would involve replacement of any missing stones, filling of cracks, and concrete repairs to the wall cap. A preliminary opinion of probable construction cost is approximately $1,000.00.

- Wall C – PARE recommends that Wall C be repaired at the locations that show damage. As stated above, the expected repairs would involve replacement of any missing stones and filling of cracks. A preliminary opinion of probable construction cost is approximately $4,000.00.

- Wall D – PARE recommends Alternative 2, replacing the demolished wall sections and repairing/rebuilding the wall sections that are deteriorated. This alternative would provide continuity of the wall to avoid blunt ends and by repairing the sections of wall that are deteriorated, prolonging the overall life of the wall. A preliminary opinion of probable construction cost is approximately $250,000.00.

SECTION 8

ENVIRONMENTAL PERMITTING

Portions of the recommended bike paths/routes along Poppasquash Road involve wetland impacts that will have to be addressed during the design process. Poppasquash Road is within the Coastal Resource Management Council (CRMC) regulatory jurisdiction. CRMC Coastal Resources Management Program requirements will apply to the recommendations outlined in this report. The CRMC would coordinate with the Army Corps of Engineers Programmatic General Permit Program for required federal permits. Final report recommendations include work that involves impacts to the following regulated wetlands: Area within 200-feet of a coastal feature, estuarine emergent wetlands, 100-year floodplain, and tidal waters.

The proposed bike path/route is located within the Upper Bay East Passage watershed. Mill Pond (CRMC Type 1 water – conservation area) is located on the north side of Poppasquash Road and the Bristol Harbor (CRMC Type 5 water – commercial and recreational harbor) is located on the south side. According to the FEMA Flood Insurance Rate Map (44001C 0013F) for Bristol County, RI dated March 5, 1996, the entire proposed bike path/route is located within the 100-year floodplain with an elevation of 18 feet (NGVD 1929). Also according to Rhode Island Geographic Information System (RIGIS), there is mapped habitat of state identified rare species located north of Poppasquash Road and west of Mill Pond.

The proposed project would include wetland impacts as a result of road widening, construction of the 10-foot wide pedestrian/bike path, the proposed scenic overlook with landscaping, the proposed fishing area with landscaping, and the proposed wall and culvert repairs.

The following is a breakdown of potential CRMC jurisdictional wetland impacts within each segment (segments 1 through 4) of the proposed bike path/route.

- Segment 1 includes impacts to areas within 200-feet of coastal features, including rocky unconsolidated/beach shoreline features located south of Poppasquash Road and an estuarine emergent wetland located north of Poppasquash Road. Impacts would include filling, removal and grading necessary for widening of the roadway. Permitting requirements for this segment would involve a CRMC Category A Assent, which does not involve full council review or public hearing.

- Segment 2, Alternative A includes impacts to areas within 200-feet of coastal features associated with rocky unconsolidated/beach shoreline features located south of Poppasquash Road and estuarine emergent wetland and manmade shoreline feature located north of Poppasquash Road, and possible impacts to an estuarine emergent wetland located on the north side of Poppasquash Road. Impacts would include possible storm water runoff, filling, removal and grading necessary for construction of the 10-foot wide pedestrian/bike path and the scenic overlook, and sidewalk construction. Permitting requirements for work within the estuarine emergent wetland should involve a CRMC Category B Assent, which involves a full council review and public hearing.

- Segment 2, Alternative B includes impacts to areas within 200-feet of coastal features associated with a rocky unconsolidated/beach shoreline features located south of Poppasquash Road and an estuarine emergent wetland located north of Poppasquash Road. Impacts would include possible storm water runoff, filling, removal and grading necessary for construction of the scenic overlook, and sidewalk construction. Permitting requirements should involve a CRMC Category A Assent, which does not involve full council review or public hearing.

- Segment 3 includes impacts to areas within 200-feet of coastal features associated with rocky unconsolidated/beach shoreline features and manmade shoreline located north and south of Poppasquash Road, and associated with estuarine emergent wetlands located north of Poppasquash Road, and tidal waters associated with the Mill Pond culvert. Impacts would include possible storm water runoff, filling, removal and grading necessary for construction of the fishing area, and sidewalk construction. Permitting requirements would involve a CRMC Category A Assent, which does not involve full council review or public hearing. The proposed culvert repairs would be considered maintenance activities and a Certification of Maintenance from CRMC would be required.

- The proposed wall repairs in Segment 4 should be considered maintenance activities and a Certification of Maintenance from CRMC would be required.

SECTION 9

CONCLUSION

It is recommended that Segments 1 and 2 be the focus of a proposed pedestrian and bicycle facility with repairs to the walls along Poppasquash Road. Segments 3 and 4 present environmental and constructability challenges whose costs outweigh the benefits.

For both segments 1 and 2, alternative A is recommend. Alternative A for Segment 1, a 4-foot wide sidewalk on the north side of Poppasquash Road, offers an off-road connection from Hope Street to the East Bay Bike Path (EBBP). This alternative provides improved access over existing conditions while remaining within the existing right-of-way. The anticipated cost for these improvements is approximately $15,900.00.

Alternative A for Segment 2 provides a Shared Use Path on the north side of Poppasquash Road allowing for a connection from the EBBP to the proposed Overlook Area. A crosswalk located at the end of the Shared Use Path would bring pedestrians and bicyclists to the south side of Poppasquash Road and the Overlook Area. The anticipated cost for these improvements is approximately $36,800.00.

The Overlook Area and Fishing Area are recommended to be landscaped with trees, shrubs and grass, to provide pedestrians, bicyclists and residents a place to stop and enjoy the scenic views of Bristol Harbor and Mill Pond. Turning these areas into scenic overlooks will eliminate any parking in this area but allow access for pedestrians and bicyclists. Fisherman would still be allowed access although alternative parking areas would be necessary for current users. The anticipated cost for the landscaping improvements is approximately $29,200.00.

For the structural elements along Poppasquash Road, PARE recommends alternative 1 for Wall A and alternative 2 for the Culvert. For both Wall B and C, it is recommended that repairs be made at the locations that show damage. The anticipated cost for the walls and culvert improvements is approximately $2,505,000.00.

Because the Overlook Area and Fishing Area are located on Town property, the Town will be responsible for their maintenance. Routine maintenance and upkeep of Poppasquash Road, such as

sweeping, drainage, and sediment and erosion controls, would likely remain the responsibility of the State.

The do-nothing alternative was chosen for Segments 3 and 4 because of the extensive road reconstruction and realignment and the associated permitting issues that would be required for a Shared Use Path or on-road facility on this portion of Poppasquash Road. The environmental impacts of roadway widening and realignment in this environmentally sensitive area would prove more harmful and costly than the 1R improvements to the roadway.

The proposed recommendations for all four segments are provided in the table below.

Segment 1	Segment 2	Segment 3	Segment 4
Selected Alternative:			
4-foot Sidewalk	Shared Use Path	Share the Road	Share the Road
Improvements:			
1. Construction of a 4-foot sidewalk on north side of road	1. Construction of a 10-foot bituminous path	1. Tree trimming	1. Tree trimming
2. Tree trimming	2. New drainage structure	2. New drainage structures	2. Regular maintenance
3. Regular maintenance	3. Regular maintenance	3. Regular maintenance	3. Signage
4. Signage	4. Signage	4. Signage	
	5. Overlook Area – Proposed landscape, benches, trash receptacles and sidewalk	5. Fishing Area – Proposed Landscape, benches, trash receptacles and sidewalk	

The opinion of probable cost to build the proposed recommended pedestrian and bicycle facility, Segments 1, 2, the Overlook and the Fishing Area is approximately $78,000.00. A breakdown of the associated items and costs to complete the facility is provided in Appendix B. This preliminary

opinion does not include the costs related to environmental permitting efforts, property right-of-way acquisitions or utility relocation.

Based on the criteria established, PARE concludes that the best option for the Town would be to focus available funding on the sections along Poppasquash Road that connect Hope Street to the EBBP and connect the EBBP to the Overlook Area. By focusing on these sections, PARE believes that the Town will be best served in the quality and the success of the pedestrian and bicycle facility. The creation of the proposed sidewalk would provide pedestrians and bicyclists a connection from the EBBP to downtown Bristol via Hope Street. It would also create a connection to the scenic overlooks to view the Bristol Harbor and Mill Pond, provide a recreational facility along a portion of Poppasquash Road, and provide a place to fish. A connection to Downtown Bristol would provide pedestrians and bicyclists an opportunity to enjoy the bike path and the historical route of Hope Street through Downtown.

APPENDICES

Appendix A

COMPLETED DPM/DESIGN POLICY MEMO: BICYCLE SUITABILITY REPORT

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

BICYCLE ROUTE SUITABILITY REPORT

PROJECT: Bicycle & Pedestrian Facilities Study & Development: Poppasquash Road Facility

CONSULTANT: Pare Engineering Corporation REVIEW DATE: April 12, 2006

ROUTE NAME & NUMBER: Poppasquash Road CITY/TOWN: Bristol

ROADWAY LIMITS: Hope Street to East Bay Bike Path (Segment 1)

Technical Paper No. 155 Roadway Classification Unclassified

"Guide to Cycling in the Ocean State 2003" Roadway Designation Most Suitable Road

The State Highway noted above is being considered for signage as a "Signed Shared Roadway" in accordance with the criteria set forth in RIDOT DPM No. 920.06. The following information is to be provided to the Deputy Chief Engineer of the Design Section for consideration:

ITEM NO.	DESCRIPTION	COMMENTS NO. (SEE ENDNOTES)
1	Posted Speed Limit	25 MPH
2	85th Percentile Speed (Radar speed study)	33 MPH EB/30 MPH WB
3	Average Annual Daily Traffic (AADT) Volume	2,000 VPD
4	Percent Truck Traffic Volume	Information not available
5	Number of Travel Lanes	2; one in each direction
6	Width of Travel Lanes	10 feet
7	Width of Shoulders	1 foot
8	Delineation of Centerline & Shoulders	Yes
9	Sidewalk	None
10	Curbing	None
11	On-Street Parking	None

Based on the information contained in the above "Bicycle Route Suitability Report", the reviewing engineer:

Recommends (✓)

Does not recommend ( )

designation of this roadway as a Rhode Island Bicycle Route

Reviewing Engineer:	Date:
Approved Deputy Chief Engineer:	Date:
Approved Chief Engineer:	Date:

ITEM NO.	DESCRIPTION			COMMENTS NO. (SEE ENDNOTES)
12	Frequency of Curb Cuts	Moderate		
		Heavy		
		Commercial		
		Residential		Residential
13	Horizontal Alignment Constraints			None
14	Vertical Alignment Constraints			None
15	Intersections & Corresponding Stopping Sight Distances			Okay
16	Stop Controls Along Roadway			None
17	General Roadway Conditions	Surface		Fair
		Potholes		None
		Cracking		Moderate – along edge of road
		Catch Basin Types		None
		Sand & Debris		Sand along edge of road
18	Are all grates bicycle-safe? (If no, please indicate which ones)	Yes: _____	No: _____	
18A	Total Number of Grates: 0			
18B	Location of Grates (list): N/A			
19	Off-Road Obstacles	Mailboxes, signs		Both 4' off edge of pavement
		Poles		3' off edge of pavement
		Outcrops		None
		Hanging Limbs		Yes

ITEM NO.	DESCRIPTION		COMMENTS NO. (SEE ENDNOTES)
20	Facilities List on Roadway	Parks	None
		Schools	None
		Recreational Fields	None
		Historical Districts	Yes
		Commercial Establishments	None
21	Expected Bike User Type	A – Advanced	
		B – Basic	B – Basic
		C – Children	
22	Location of nearest Bike Route/Path as potential link		East Bay Bike Path
23	Additional Observations		
24	Accident History (Provide Crash Data for the previous three years according to type, location, injury, roadway surface and time		See Attached

COMMENTS
(Expand/Delete as needed)

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

BICYCLE ROUTE SUITABILITY REPORT

PROJECT: Bicycle & Pedestrian Facilities Study & Development: Poppasquash Road Facility

CONSULTANT: Pare Engineering Corporation REVIEW DATE: April 12, 2006

ROUTE NAME & NUMBER: Poppasquash Road CITY/TOWN: Bristol

ROADWAY LIMITS: East Bay Bike Path to End of Overlook (Segment 2)

Technical Paper No. 155 Roadway Classification Unclassified

"Guide to Cycling in the Ocean State 2003" Roadway Designation Most Suitable Road

The State Highway noted above is being considered for signage as a "Signed Shared Roadway" in accordance with the criteria set forth in RIDOT DPM No. 920.06. The following information is to be provided to the Deputy Chief Engineer of the Design Section for consideration:

ITEM NO.	DESCRIPTION	COMMENTS NO. (SEE ENDNOTES)
1	Posted Speed Limit	25 MPH
2	85th Percentile Speed (Radar speed study)	33 MPH EB/30 MPH WB
3	Average Annual Daily Traffic (AADT) Volume	2,000 VPD
4	Percent Truck Traffic Volume	Information not available
5	Number of Travel Lanes	2; one in each direction
6	Width of Travel Lanes	Varies 8 – 9 feet
7	Width of Shoulders	1 foot
8	Delineation of Centerline & Shoulders	Yes
9	Sidewalk	None
10	Curbing	None
11	On-Street Parking	None

ITEM NO.	DESCRIPTION			COMMENTS NO. (SEE ENDNOTES)
12	Frequency of Curb Cuts	Moderate		
		Heavy		
		Commercial		
		Residential		
13	Horizontal Alignment Constraints			Mild
14	Vertical Alignment Constraints			None
15	Intersections & Corresponding Stopping Sight Distances			Poor
16	Stop Controls Along Roadway			None
17	General Roadway Conditions	Surface		Fair
		Potholes		None
		Cracking		Moderate – along edge of road
		Catch Basin Types		Drop inlet on north side
		Sand & Debris		Sand along edge of road
18	Are all grates bicycle-safe? (If no, please indicate which ones)	Yes: _____	No: _____	
18A	Total Number of Grates: 0			
18B	Location of Grates (list): N/A			
19	Off-Road Obstacles	Mailboxes, signs		Both 3' off edge of pavement
		Poles		3' off edge of pavement
		Outcrops		None
		Hanging Limbs		Yes

ITEM NO.	DESCRIPTION		COMMENTS NO. (SEE ENDNOTES)
20	Facilities List on Roadway	Parks	None
		Schools	None
		Recreational Fields	None
		Historical Districts	Yes
		Commercial Establishments	None
21	Expected Bike User Type	A – Advanced	
		B – Basic	B – Basic
		C – Children	
22	Location of nearest Bike Route/Path as potential link		East Bay Bike Path
23	Additional Observations		Bicyclists and pedestrians observed using Poppasquash Road; Concrete wall along south side of road
24	Accident History (Provide Crash Data for the previous three years according to type, location, injury, roadway surface and time		See Attached

COMMENTS
(Expand/Delete as needed)

Based on the information contained in the above "Bicycle Route Suitability Report", the reviewing engineer:

Recommends (✓)

Does not recommend ( )

designation of this roadway as a Rhode Island Bicycle Route

Reviewing Engineer:	Date:
Approved Deputy Chief Engineer:	Date:
Approved Chief Engineer:	Date:

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

BICYCLE ROUTE SUITABILITY REPORT

PROJECT: Bicycle & Pedestrian Facilities Study & Development: Poppasquash Road Facility

CONSULTANT: Pare Engineering Corporation REVIEW DATE: April 12, 2006

ROUTE NAME & NUMBER: Poppasquash Road CITY/TOWN: Bristol

ROADWAY LIMITS: End of Overlook to the Culvert (Segment 3)

Technical Paper No. 155 Roadway Classification Unclassified

"Guide to Cycling in the Ocean State 2003" Roadway Designation Most Suitable Road

The State Highway noted above is being considered for signage as a "Signed Shared Roadway" in accordance with the criteria set forth in RIDOT DPM No. 920.06. The following information is to be provided to the Deputy Chief Engineer of the Design Section for consideration:

ITEM NO.	DESCRIPTION	COMMENTS NO. (SEE ENDNOTES)
1	Posted Speed Limit	25 MPH
2	85th Percentile Speed (Radar speed study)	33 MPH EB/30 MPH WB
3	Average Annual Daily Traffic (AADT) Volume	2,000 VPD
4	Percent Truck Traffic Volume	Information not available
5	Number of Travel Lanes	2; one in each direction
6	Width of Travel Lanes	Varies 9 – 10 feet
7	Width of Shoulders	Varies 0 - 2 feet
8	Delineation of Centerline & Shoulders	Yes
9	Sidewalk	None
10	Curbing	Very deteriorated at culvert
11	On-Street Parking	None

ITEM NO.	DESCRIPTION			COMMENTS NO. (SEE ENDNOTES)
12	Frequency of Curb Cuts	Moderate		
		Heavy		
		Commercial		
		Residential		Residential
13	Horizontal Alignment Constraints			Mild
14	Vertical Alignment Constraints			None
15	Intersections & Corresponding Stopping Sight Distances			Poor
16	Stop Controls Along Roadway			None
17	General Roadway Conditions	Surface		Fair
		Potholes		None
		Cracking		Minor in roadway; Moderate along edge of road
		Catch Basin Types		2 drop inlets at culvert
		Sand & Debris		Sand along edge of road
18	Are all grates bicycle-safe? (If no, please indicate which ones)	Yes: _____	No: _____	
18A	Total Number of Grates: 0			
18B	Location of Grates (list): N/A			
19	Off-Road Obstacles	Mailboxes, signs		None
		Poles		3' off edge of pavement
		Outcrops		None
		Hanging Limbs		None

ITEM NO.	DESCRIPTION		COMMENTS NO. (SEE ENDNOTES)
20	Facilities List on Roadway	Parks	None
		Schools	None
		Recreational Fields	None
		Historical Districts	Yes
		Commercial Establishments	None
21	Expected Bike User Type	A – Advanced	
		B – Basic	B – Basic
		C – Children	
22	Location of nearest Bike Route/Path as potential link		East Bay Bike Path
23	Additional Observations		Bicyclists and pedestrians observed using Poppasquash Road; Concrete wall along both sides of road
24	Accident History (Provide Crash Data for the previous three years according to type, location, injury, roadway surface and time		See Attached

COMMENTS
(Expand/Delete as needed)

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

BICYCLE ROUTE SUITABILITY REPORT

PROJECT: Bicycle & Pedestrian Facilities Study & Development: Poppasquash Road Facility

CONSULTANT: Pare Engineering Corporation REVIEW DATE: April 12, 2006

ROUTE NAME & NUMBER: Poppasquash Road CITY/TOWN: Bristol

ROADWAY LIMITS: Culvert to the Colt State Park Entrance (Segment 4)

Technical Paper No. 155 Roadway Classification Unclassified

"Guide to Cycling in the Ocean State 2003" Roadway Designation Most Suitable Road

The State Highway noted above is being considered for signage as a "Signed Shared Roadway" in accordance with the criteria set forth in RIDOT DPM No. 920.06. The following information is to be provided to the Deputy Chief Engineer of the Design Section for consideration:

ITEM NO.	DESCRIPTION	COMMENTS NO. (SEE ENDNOTES)
1	Posted Speed Limit	25 MPH
2	85th Percentile Speed (Radar speed study)	33 MPH EB/30 MPH WB
3	Average Annual Daily Traffic (AADT) Volume	2,000 VPD
4	Percent Truck Traffic Volume	Information not available
5	Number of Travel Lanes	2; one in each direction
6	Width of Travel Lanes	Varies 8 – 13 feet
7	Width of Shoulders	Varies 0 – 3 feet
8	Delineation of Centerline & Shoulders	Yes
9	Sidewalk	None
10	Curbing	Very deteriorated until end of stone wall
11	On-Street Parking	None

ITEM NO.	DESCRIPTION			COMMENTS NO. (SEE ENDNOTES)
12	Frequency of Curb Cuts	Moderate		
		Heavy		
		Commercial		
		Residential		Residential
13	Horizontal Alignment Constraints			Mild
14	Vertical Alignment Constraints			None
15	Intersections & Corresponding Stopping Sight Distances			Poor
16	Stop Controls Along Roadway			None
17	General Roadway Conditions	Surface		Fair to Poor
		Potholes		Very few
		Cracking		Moderate in roadway; Moderate along edge of road
		Catch Basin Types		None
		Sand & Debris		Sand along edge of road
18	Are all grates bicycle-safe? (If no, please indicate which ones)	Yes: _____	No: _____	
18A	Total Number of Grates: 0			
18B	Location of Grates (list): N/A			
19	Off-Road Obstacles	Mailboxes, signs		Both 2' – 3' off edge of pavement
		Poles		2' - 3' off edge of pavement
		Outcrops		None
		Hanging Limbs		Yes

ITEM NO.	DESCRIPTION		COMMENTS NO. (SEE ENDNOTES)
20	Facilities List on Roadway	Parks	Yes
		Schools	None
		Recreational Fields	None
		Historical Districts	Yes
		Commercial Establishments	None
21	Expected Bike User Type	A – Advanced	
		B – Basic	B – Basic
		C – Children	
22	Location of nearest Bike Route/Path as potential link		East Bay Bike Path
23	Additional Observations		Bicyclists and pedestrians observed using Poppasquash Road; Concrete wall along both sides of road
24	Accident History (Provide Crash Data for the previous three years according to type, location, injury, roadway surface and time		See Attached

COMMENTS
(Expand/Delete as needed)

Based on the information contained in the above "Bicycle Route Suitability Report", the reviewing engineer:

Recommends (✓)

Does not recommend ( )

designation of this roadway as a Rhode Island Bicycle Route

Reviewing Engineer:	Date:
Approved Deputy Chief Engineer:	Date:
Approved Chief Engineer:	Date:

Based on the information contained in the above "Bicycle Route Suitability Report", the reviewing engineer:

Recommends (✓)

Does not recommend ( )

designation of this roadway as a Rhode Island Bicycle Route

Reviewing Engineer:	Date:
Approved Deputy Chief Engineer:	Date:
Approved Chief Engineer:	Date:

Appendix B

OPINION OF PROBABLE CONSTRUCTION COST

OPINION OF PROBABLE CONSTRUCTION COST - ALL SEGMENTS

	SEGMENT			1A	1B	2A	2B	3A	4A
	SEGMENT LENGTH			215 LF	215 LF	290 LF	290 LF	360 LF	2320 LF
ITEM			UNIT						
CODE	ITEM	UNIT	PRICE						
201.0321	Clearing and Grubbing	SY	$ 3.50	-	-	$ 2,254.00	-	-	-
201.0409	Remove and Dispose Flexible Pavement	SY	$ 6.00	$ 216.00	-				
202.0100	Earth Excavation	CY	$ 9.00	$ 531.00	$ 918.00	$ 1,215.00	$ 1,242.00	$ 1,728.00	$ 11,142.00
204.0100	Trimming and Fine Grading	SY	$ 5.00	$ 660.00	$ 960.00	$ 1,615.00	$ 1,290.00	$ 1,800.00	$ 11,600.00
302.0100	Gravel Borrow Subbase Course	CY	$ 22.00	$ 858.00	$ 1,408.00	$ 2,376.00	$ 1,892.00	$ 2,640.00	$ 17,028.00
401.0101	Bituminous Base Course	TON	$ 62.00	-	$ 3,410.00	-	$ 4,650.00	$ 6,448.00	$ 41,354.00
401.0200	Bituminous Surface Course Type I-1	TON	$ 72.00	$ 360.00	$ 1,584.00	$ 4,032.00	$ 2,160.00	$ 3,024.00	$ 19,224.00
403.0300	Asphalt Emulsion Tack Coat	SY	$ 1.00	-	-	$ 452.00	-	-	-
601.0300	Class A Portland Cement Concrete	CY	$ 135.00	$ 1,080.00	-				
702.0702	Catch Basin Type 'D' Square Standard 3.3.0	EACH	$ 1,250.00	-	-	$ 1,250.00	$ 1,250.00	$ 1,250.00	-
702.0713	Precast Concrete Drop Inlet with Apron Stone Standard 4.5.1	EACH	$ 1,115.00	-	-	-	-	$ 1,115.00	-
905.0100	Portland Cement Sidewalk Monolithic	CY	$ 283.00	$ 3,113.00	-				
906.0210	Cement Concrete Curb Precast Straight	LF	$ 25.00	$ 5,375.00	-				
L01.0104	Plantable Soil 4" Deep	SY	$ 5.00	$ 480.00	$ 240.00	$ 970.00	$ 325.00	$ 400.00	$ 2,580.00
L02.0202	Residential Seeding (Type 2)	SY		$ 192.00	$ 96.00	$ 388.00	$ 130.00	$ 160.00	$ 1,032.00
T15.0100	Directional, Regulatory and Warning Signs	SF	$ 30.00	-	-	$ 60.00	$ 60.00	-	-
T20.2004	4"Epoxy White Pavement Markings	LF	$ 0.90	-	-	$ 522.00	-	-	-
T20.2006	6"Epoxy White Pavement Markings	LF	$ 0.40	-	$ 172.00	-	$ 232.00	$ 288.00	$ 1,856.00
T20.2012	12"Epoxy White Pavement Markings	LF	$ 2.65	-	-	$ 657.20	$ 699.60	-	
T20.2014	4"Epoxy Yellow Pavement Markings	LF	$ 0.55	-	$ 236.50	-	$ 319.00	$ 396.00	$ 2,552.00
	Tree Timming, Clearing & Grubbing at Bike Path	LS	$ 1,000.00			$ 1,000.00	$ 1,000.00		
Landscape Costs									
202.0100	Earth Excavation	CY	$ 9.00	-	-	$ 387.00	$ 387.00	-	$ 171.00
301.0200	Gravel Borrow Base Course	CY	$ 45.00	-	-	$ 1,305.00	$ 1,305.00	-	$ 585.00
905.0110	Portland Cement Sidewalk Monolithic	CY	$ 283.00	-	-	$ 4,245.00	$ 4,245.00	-	$ 1,698.00
	Cedar Post Rail Fence	LF	$ 11.50	-	-	$ 2,932.50	$ 2,932.50	-	$ 552.00
	Landscape Plantings	LS		-	-	$ 5,000.00	$ 5,000.00	-	$ 1,500.00
	Bench	EACH	$ 1,000.00	-	-	$ 1,000.00	$ 1,000.00	-	$ 2,000.00
			Subtotal	$ 12,649.00	$ 9,024.50	$ 29,406.70	$ 30,119.10	$ 19,249.00	$ 114,874.00
		25% Contingency		$ 3,162.25	$ 2,256.13	$ 7,351.68	$ 7,529.78	$ 4,812.25	$ 28,718.50
		SUB TOTAL		$ 15,811.25	$ 11,280.63	$ 36,758.38	$ 37,648.88	$ 24,061.25	$ 143,592.50
		TOTAL		**$ 15,900.00**	**$ 11,300.00**	**$ 36,800.00**	**$ 37,700.00**	**$ 24,100.00**	**$ 143,600.00**

POPPASQUASH ROAD BICYCLE & PEDESTRIAN FACILITY COST ESTIMATE - SEGMENT 1

	SEGMENT			1A	1B
	SEGMENT LENGTH			215 LF	215 LF
ITEM			UNIT		
CODE	ITEM	UNIT	PRICE		
201.0409	Remove and Dispose Flexible Pavement	SY	$ 6.00	$ 216.00	-
202.0100	Earth Excavation	CY	$ 9.00	$ 531.00	$ 918.00
204.0100	Trimming and Fine Grading	SY	$ 5.00	$ 660.00	$ 960.00
302.0100	Gravel Borrow Subbase Course	CY	$ 22.00	$ 858.00	$ 1,408.00
401.0100	Bituminous Base Course	TON	$ 62.00	-	$ 3,410.00
401.0200	Bituminous Surface Course Type I-1	TON	$ 72.00	$ 360.00	$ 1,584.00
601.0300	Class A Portland Cement Concrete	CY	$ 135.00	$ 1,080.00	-
905.0100	Portland Cement Sidewalk Monolithic	CY	$ 283.00	$ 3,113.00	-
906.0210	Cement Concrete Curb Precast Straight	LF	$ 25.00	$ 5,375.00	-
L01.0104	Plantable Soil 4" Deep	SY	$ 5.00	$ 480.00	$ 240.00
L02.0102	Residential Seeding	SY	$ 2.00	$ 192.00	$ 96.00
T20.2006	6"Epoxy White Pavement Markings	LF	$ 0.40	-	$ 172.00
T20.2014	4"Epoxy Yellow Pavement Markings	LF	$ 0.55	-	$ 236.50
			Subtotal	$ 12,649.00	$ 9,024.50
		25 % Contingency		$ 3,162.25	$ 2,256.13
			TOTAL	$ 15,811.25	$ 11,280.63

POPPASQUASH ROAD PEDESTRIAN & BICYCLE FACILITY COST ESTIMATE - SEGMENT 2

	SEGMENT			2A	2B
	SEGMENT LENGTH			290 LF	290 LF
ITEM			UNIT		
CODE	ITEM	UNIT	PRICE		
201.0321	Clearing and Grubbing	SY	$ 3.50	$ 2,254.00	-
202.0100	Earth Excavation	CY	$ 9.00	$ 1,215.00	$ 1,242.00
204.0100	Trimming and Fine Grading	SY	$ 5.00	$ 1,615.00	$ 1,290.00
302.0100	Gravel Borrow Subbase Course	CY	$ 22.00	$ 2,376.00	$ 1,892.00
401.0100	Bituminous Base Course	TON	$ 62.00	-	$ 4,650.00
401.0200	Bituminous Surface Course Type I-1	TON	$ 72.00	$ 4,032.00	$ 2,160.00
403.0300	Asphalt Emulsion Tack Coat	SY	$ 1.00	$ 452.00	-
702.0702	Catch Basin Type 'D' Square Standard 3.3.0	EACH	$ 1,250.00	$ 1,250.00	$ 1,250.00
L01.0104	Plantable Soil 4" Deep	SY	$ 5.00	$ 970.00	$ 325.00
L02.0102	Residential Seeding	SY	$ 2.00	$ 388.00	$ 130.00
T15.0110	Guide Signs Standard 29.2.0	SF	$ 30.00	$ 60.00	$ 60.00
T20.2004	4"Epoxy White Pavement Markings	LF	$ 0.90	$ 522.00	-
T20.2006	6"Epoxy White Pavement Markings	LF	$ 0.40	-	$ 232.00
T20.2012	12"Epoxy White Pavement Markings	LF	$ 2.65	$ 657.20	$ 699.60
T20.2014	4"Epoxy Yellow Pavement Markings	LF	$ 0.55	-	$ 319.00
	Tree Timming, Clearing & Grubbing at Bike Path	LS	$ 1,000.00	$ 1,000.00	$ 1,000.00
			Subtotal	$ 13,537.20	$ 14,249.60
		25% Contingency		$ 3,384.30	$ 3,562.40
			TOTAL	$ 16,921.50	$ 17,812.00

POPPASQUASH ROAD BICYCLE & PEDESTRIAN FACILITY COST ESTIMATE - SEGMENT 3

	SEGMENT			3A
	SEGMENT LENGTH			360 LF
ITEM			UNIT	
CODE	ITEM	UNIT	PRICE	
202.0100	Earth Excavation	CY	$ 9.00	$ 1,728.00
204.0100	Trimming and Fine Grading	SY	$ 5.00	$ 1,800.00
302.0100	Gravel Borrow Subbase Course	CY	$ 22.00	$ 2,640.00
401.0100	Bituminous Base Course	TON	$ 62.00	$ 6,448.00
401.0200	Bituminous Surface Course Type I-1	TON	$ 72.00	$ 3,024.00
702.0702	Catch Basin Type 'D' Square Standard 3.3.0	EACH	$ 1,250.00	$ 1,250.00
702.0713	Precast Concrete Drop Inlet with Apron Stone Standard 4.5.1	EACH	$ 1,115.00	$ 1,115.00
L01.0104	Plantable Soil 4" Deep	SY	$ 5.00	$ 400.00
L02.0102	Residential Seeding	SY	$ 2.00	$ 160.00
T20.2006	6"Epoxy White Pavement Markings	LF	$ 0.40	$ 288.00
T20.2014	4"Epoxy Yellow Pavement Markings	LF	$ 0.55	$ 396.00
			Subtotal	$ 19,249.00
		25 % Contingency		$ 4,812.25
			TOTAL	$ 24,061.25

POPPASQUASH ROAD BICYCLE & PEDESTRIAN FACILITY COST ESTIMATE - SEGMENT 4

	SEGMENT			4A
	SEGMENT LENGTH			2320 LF
ITEM			UNIT	
CODE	ITEM	UNIT	PRICE	
202.0100	Earth Excavation	CY	$ 9.00	$ 11,142.00
204.0100	Trimming and Fine Grading	SY	$ 5.00	$ 11,600.00
302.0100	Gravel Borrow Subbase Course	CY	$ 22.00	$ 17,028.00
401.0100	Bituminous Base Course	TON	$ 62.00	$ 41,354.00
401.0200	Bituminous Surface Course Type I-1	TON	$ 72.00	$ 19,224.00
L01.0104	Plantable Soil 4" Deep	SY	$ 5.00	$ 2,580.00
L02.0102	Residential Seeding	SY	$ 2.00	$ 1,032.00
T20.2006	6"Epoxy White Pavement Markings	LF	$ 0.40	$ 1,856.00
T20.2014	4"Epoxy Yellow Pavement Markings	LF	$ 0.55	$ 2,552.00
			Subtotal	$ 108,368.00
		25 % Contingency		$ 27,092.00
			TOTAL	$ 135,460.00

Landscape Costs

Poppasquash Road Bike Facility Cost Estimate - Segment 2

	SEGMENT			2A	2B
	SEGMENT LENGTH			290 LF	290 LF
ITEM			UNIT		
CODE	ITEM	UNIT	PRICE		
202.0100	Earth Excavation	CY	$ 9.00	$ 387.00	$ 387.00
301.0200	Gravel Borrow Base Course	CY	$ 45.00	$ 1,305.00	$ 1,305.00
905.0110	Portland Cement Sidewalk Monolithic	CY	$ 283.00	$ 4,245.00	$ 4,245.00
	Cedar Post Rail Fence	LF	$ 11.50	$ 2,932.50	$ 2,932.50
	Landscape Plantings	LS		$5,000.00	$5,000.00
	Bench	Each	$1,000.00	$3,000.00	$3,000.00
			Subtotal	$ 16,482.50	$ 16,482.50
		25% Contingency		$ 4,120.63	$ 4,120.63
			TOTAL	$ 20,603.13	$ 20,603.13

Poppasquash Road Bike Facility Cost Estimate - Segment 4

	SEGMENT			4
	SEGMENT LENGTH			2320 LF
ITEM			UNIT	
CODE	ITEM	UNIT	PRICE	
202.0100	Earth Excavation	CY	$ 9.00	$ 171.00
301.0200	Gravel Borrow Base Course	CY	$ 45.00	$ 585.00
905.0110	Portland Cement Sidewalk Monolithic	CY	$ 283.00	$ 1,698.00
	Cedar Post Rail Fence	LF	$ 11.50	$ 552.00
	Landscape Plantings	LS		$1,500.00
	Bench	Each	$1,000.00	$2,000.00
			Subtotal	$ 6,506.00
		25% Contingency		$ 1,626.50
			TOTAL	$ 8,132.50

Appendix C

CRASH DATA

Poppasquash Rd. Bicycle Facility
Pare Project No. 05087.00, Task 1
July 11, 2006

PARE
ENGINEERING CORPORATION

HOPE STREET (RI 114) AND POPPASQUASH RD

Report No.	Date	On Street	Intersecting Street	No. of Vehicles	Injuries	Fatalities	Weather Condition	Road Condition	Lighting	Crash Type
02-57-AC	1/26/2002	POPPASQUASH RD	HOPE ST	2	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END
02-428-AC	6/22/2002	HOPE ST	POPPASQUASH RD	2	2	0	OTHER	WET	DAYLIGHT	REAR END
02-467-AC	7/4/2002	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END
02-573-AC	08/03/02	HOPE ST	POPPASQUASH RD	3	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END
02-765-AC	10/14/02	HOPE ST	POPPASQUASH RD	1	0	0	NO ADVERSE	DRY	DAYLIGHT	RAN OFF ROAD
02-909-AC	12/04/02	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END
02-945-AC	12/13/2002	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	BROADSIDE

Report No.	Date	On Street	Intersecting Street	No. of Vehicles	Injuries	Fatalities	Weather Condition	Road Condition	Lighting	Crash Type
03-392-AC	5/30/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END
03-427-AC	6/10/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	ANGLE
03-432-AC	6/12/2003	POPPASQUASH RD	HOPE ST	1	1	0	RAIN	WET	DAYLIGHT	LOSS OF CONTROL
03-486-AC	6/21/2003	HOPE ST	POPPASQUASH RD	1	0	0	OTHER	OTHER	DAYLIGHT	OBJECT (DEER)
03-508-AC	7/4/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DARK (LIGHTED)	ANGLE
03-640-AC	8/19/2003	POPPASQUASH RD	HOPE ST	1	0	0	NO ADVERSE	DRY	DARK (LIGHTED)	RAN OFF ROAD
03-669-AC	8/30/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END
03-700-AC	9/7/2003	POPPASQUASH RD	HOPE ST	1	1	0	NO ADVERSE	DRY	DAYLIGHT	OBJECT (BICYCLIST)
03-749-AC	9/24/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DUSK	ANGLE
03-789-AC	10/5/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	ANGLE
03-887-AC	11/6/2003	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	WET	DAYLIGHT	REAR END

Report No.	Date	On Street	Intersecting Street	No. of Vehicles	Injuries	Fatalities	Weather Condition	Road Condition	Lighting	Crash Type
04-191-AC	3/18/2004	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	WET	DAYLIGHT	BROADSIDE
04-205-AC	3/23/2004	POPPASQUASH RD	HOPE ST	1	0	0	NO ADVERSE	DRY	DAYLIGHT	OBJECT (WALL)
04-574-AC	7/29/2004	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DARK (LIGHTED)	SIDESWIPE (SD)
04-679-AC	9/5/2004	POPPASQUASH RD	HOPE ST	1	1	0	NO ADVERSE	DRY	DARK (LIGHTED)	LOSS OF CONTROL
04-777-AC	10/8/2004	POPPASQUASH RD	HOPE ST	2	0	0	NO ADVERSE	DRY	DARK (LIGHTED)	REAR END
04-874-AC	11/11/2004	HOPE ST	POPPASQUASH RD	2	0	0	NO ADVERSE	DRY	DAYLIGHT	REAR END

POPPASQUASH ROAD

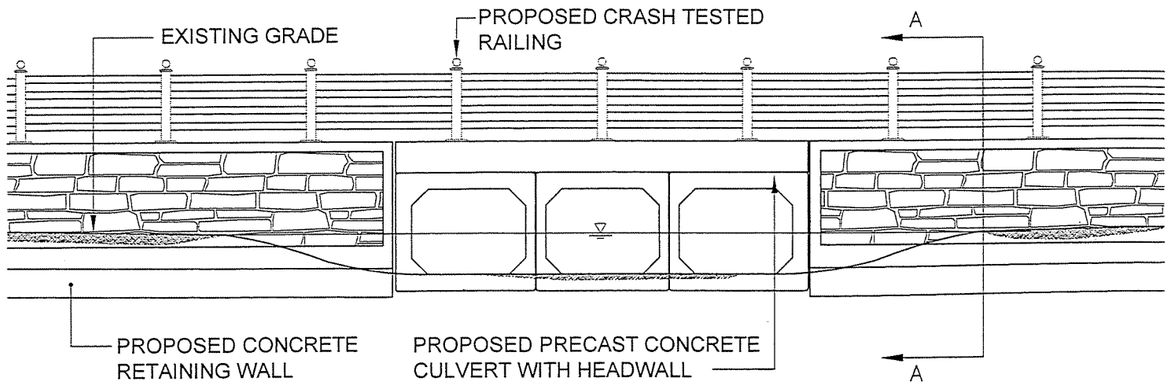
Report No.	Date	On Street	Intersecting Street	No. of Vehicles	Injuries	Fatalities	Weather Condition	Road Condition	Lighting	Crash Type
03-767-AC	9/29/2003	POPPASQUASH RD	FRONT OF 99	1	0	0	NO ADVERSE	DRY	DARK (NL)	LOSS OF CONTROL

HARBORVIEW AV AND POPPASQUASH RD

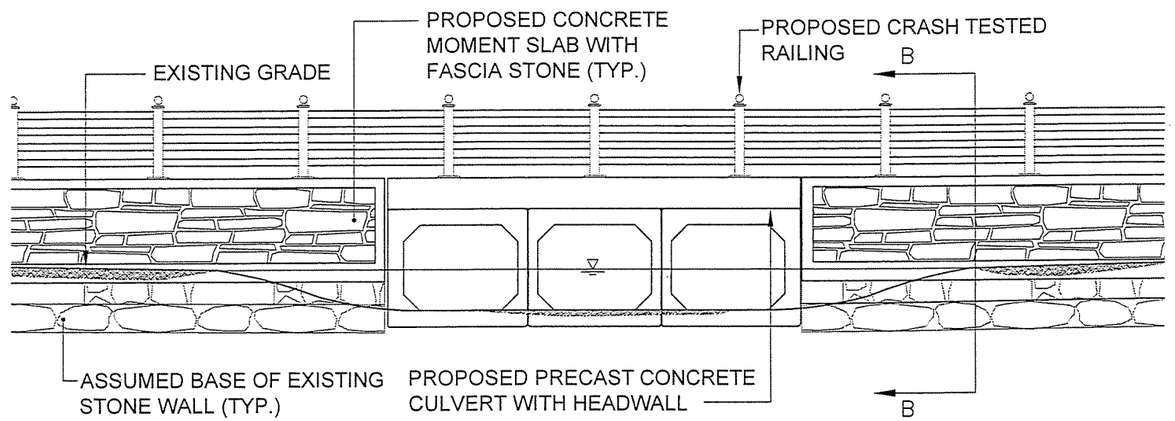
Report No.	Date	On Street	Intersecting Street	No. of Vehicles	Injuries	Fatalities	Weather Condition	Road Condition	Lighting	Crash Type
04-558-AC	7/24/2004	POPPASQUASH RD	HARBORVIEW AV	1	0	0	NO ADVERSE	DRY	DARK (LIGHTED)	RAN OFF ROAD

Appendix D

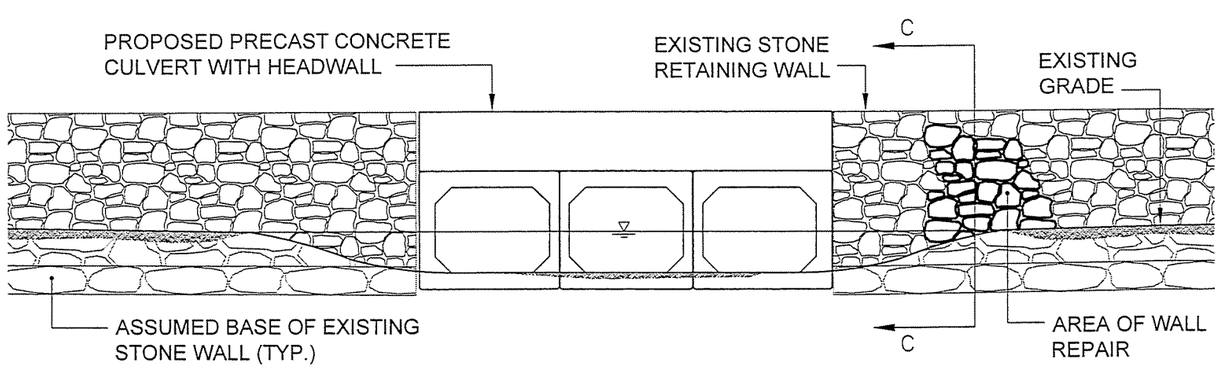
SCHEMATIC DRAWINGS



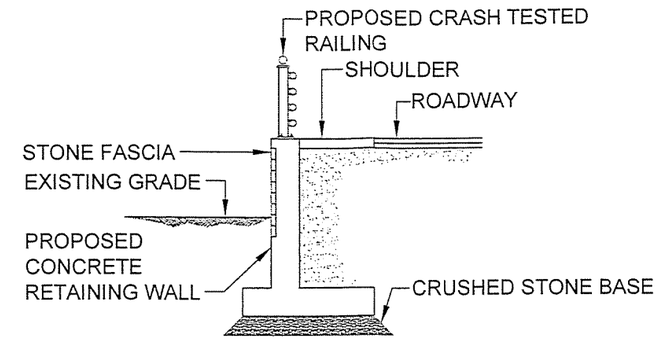
Proposed Wall A, Alternative 1 with Precast Concrete Culvert



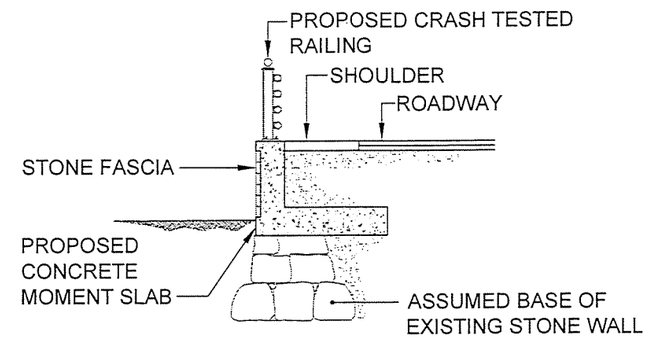
Proposed Wall A, Alternative 2 with Precast Concrete Culvert



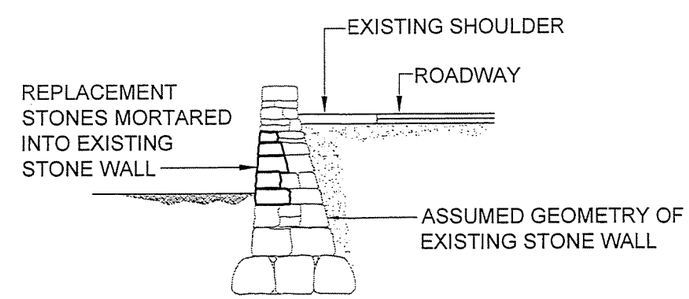
Proposed Wall A, Alternative 3 with Precast Concrete Culvert



SECTION A-A



SECTION B-B



SECTION C-C

SCALE: N.T.S.

PARE
PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

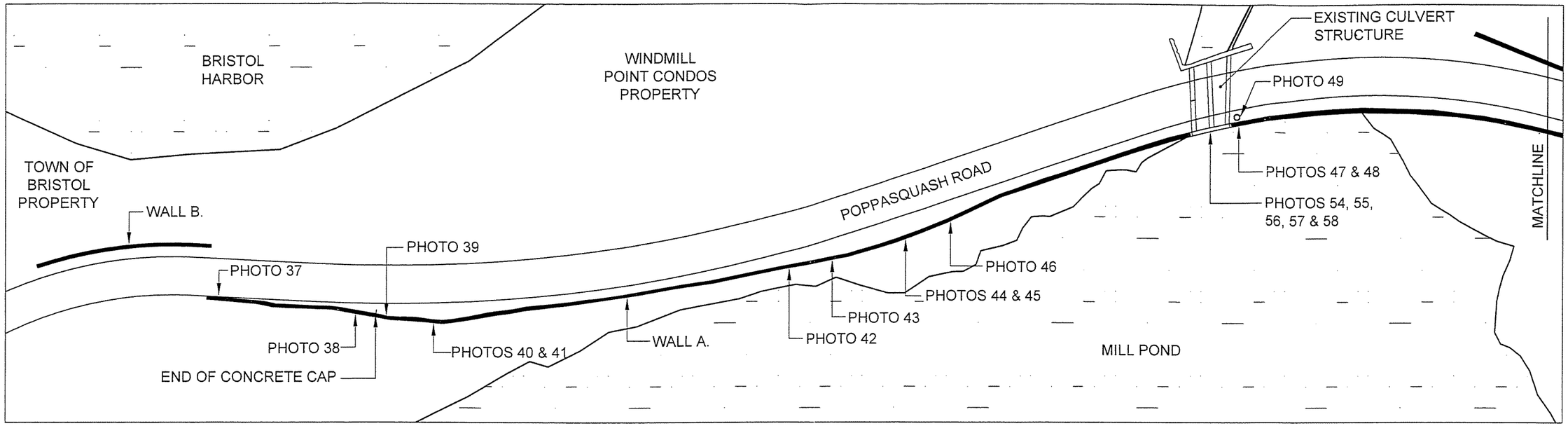
BICYCLE AND PEDESTRIAN STUDY AND DEVELOPMENT

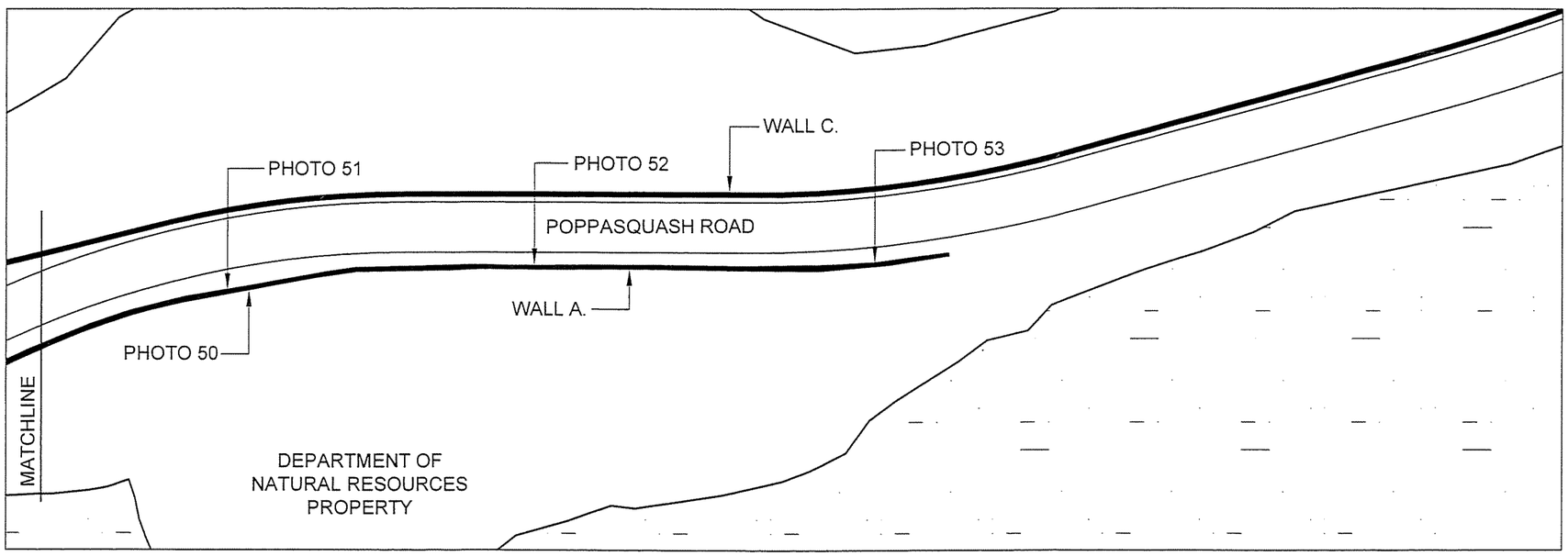
POPPASQUASH ROAD

Bristol, Rhode Island

WALL A ALTERNATIVES AT CULVERT

FIGURE 15





SCALE: 1"=50'-0"

S
E W
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PARE

PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

BICYCLE AND PEDESTRIAN
STUDY AND DEVELOPMENT

POPPASQUASH ROAD
Bristol, Rhode Island

PHOTO KEY PLAN FOR WALL A.

FIGURE 1

Appendix E

PHOTOGRAPHS

Photo 37: East end of Wall A

Photo 38: Wall A collapse

Photo 39: Damage to top of Wall A

Photo 40: Stone missing from Wall A

Photo 41: Loose stones at base of Wall A

Photo 42: Failed section of Wall A

Photo 43: Missing stones from bottom of Wall A

Photo 44: "V" shape break in Wall A

Photo 45: "V" shape break in Wall A

Photo 46: Missing stones in Wall A

Photo 47: Collapsed section of Wall A adjacent to culvert and catch basin

Photo 48: Collapsed section of wall A adjacent to culvert and catch basin

Photo 49: Catch basin behind Wall A at collapse

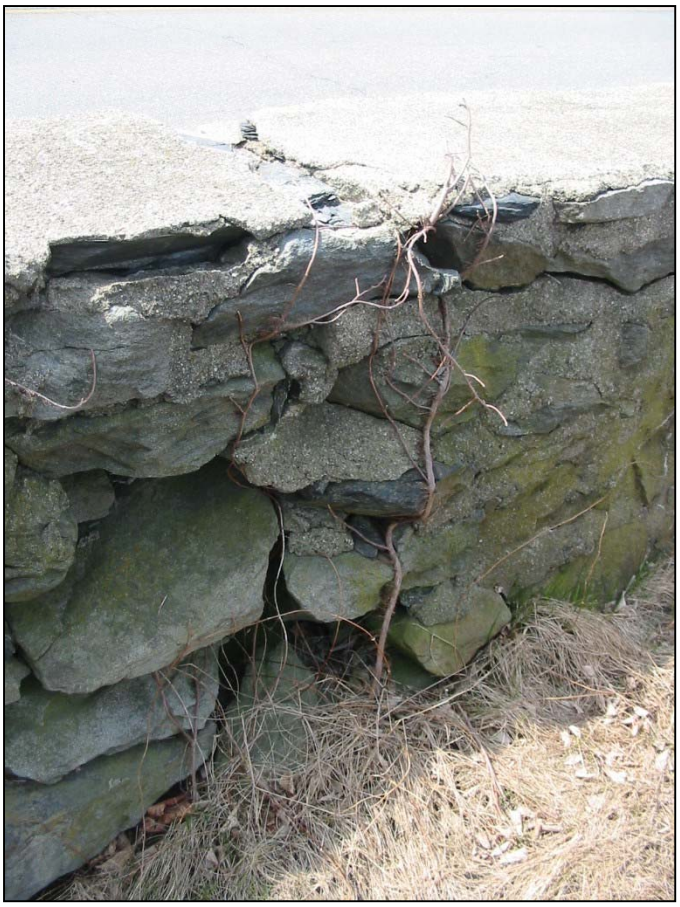


Photo 50: Missing stones at base and cracking at top of Wall A

Photo 51: View of west end of Wall A along roadway

Photo 52: View of west end of Wall A along roadway

Photo 53: Cracking and missing stones on roadside of Wall A

Photo 54: Culvert, Mill Pond side

Photo 55: Culvert entrance Mill Pond side

Photo 56: Culvert west concrete pier

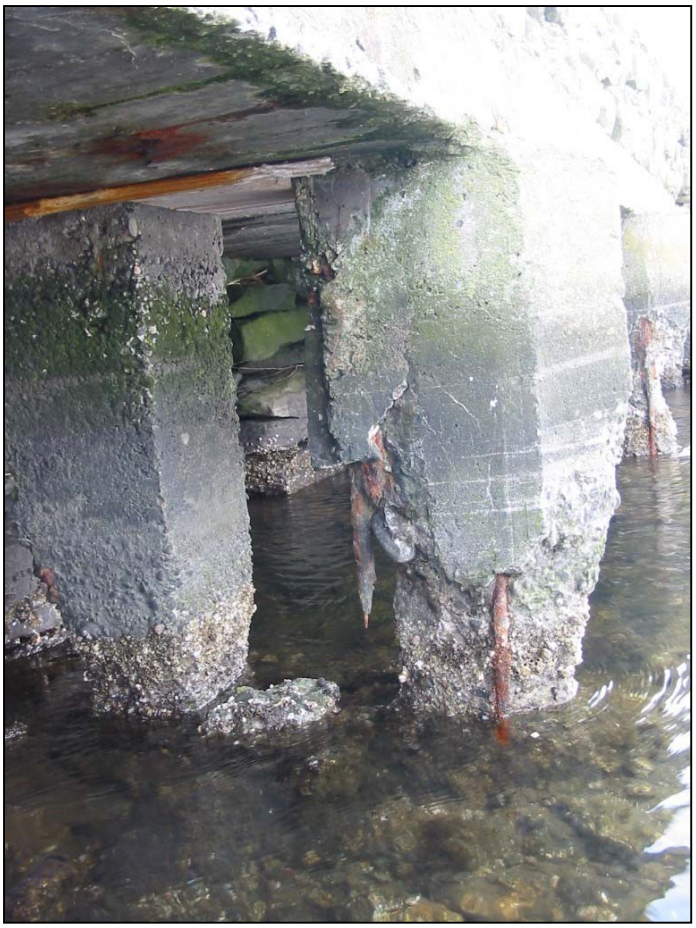


Photo 57: Culvert concrete pier

Photo 58: View of original stone culvert structure from Mill Pond side

Photo 59: View of original stone culvert structure from Bristol Harbor side

Photo 60: View of original stone culvert structure from Bristol Harbor side

Photo 61: View of stonewall at third bay location

Photo 62: View through original stone culvert from Bristol Harbor side showing stone falling in center of opening

Photo 63: Wall B from west

Photo 64: Broken concrete cap on west end Wall B

Photo 65: East end of Wall C

Photo 66: Concrete segment of Wall C

Photo 67: Mortared segment of Wall C with cracking and opening at base

Photo 68: Wall C, joint between mortared stonewall and concrete wall

Photo 69: Wall C, concrete wall with opening at base

Photo 70: Opening in concrete wall segment of Wall C

Photo 71: East side of Wall C opening, concrete wall segment

Photo 72: West side of Wall C opening, mortared stonewall segment

Photo 73: Wall C, opening in mortared stonewall

Photo 74: Wall C, mortared stonewall with cracking

Photo 75: Wall C, mortared stonewall with vertical crack and opening at base

Photo 76: Wall C, mortared stonewall with cracking

Photo 77: Wall C, mortared stonewall with cracking

Photo 78: Wall C, mortared stonewall with missing stones and cracking

Photo 79: West end of Wall C, mortared stonewall segment

Appendix F

CORRESPONDENCE

0508700/001
2/24/06
KB (DJ) J

Town of Bristol, Rhode Island

Poppasquash Road Bicycle Facility Project

Name: Lyn Udvardy

Address: 900 Hope St.
Bristol RI 02809

Comments: I spend a great deal of time on Poppasquash Rd. — dog walking, bike riding, horseback riding and plain walking — and have done so for many years. (I used to roller blade there as well.) I see no need for the construction of a foot or bike path and am opposed to it for the following reasons.

1- NO NEED There is already a well worn path for pedestrians on the north side of the road. It does not accommodate bikes which can use the road

2- ROUTE TO COLT STATE PARK - If this is a reason for the project, it makes no sense. The bike path goes directly from Poppasquash to Asylum Rd in the park. It is already there and it is safe!

3- DANGER from CARS - increased police patrols to control speeding and cutting the bushes between Poles #10 and #12 on the North side to improve visibility around that curve will help.

4. Any construction or landscaping will attract MORE people and aggravate the situation even more.

Your comments and suggestions regarding the Poppasquash Road Bicycle Facility Project are appreciated.

5. LEAVE Poppasquash Rd alone! It is still fairly natural and should stay that way. Every bit of Bristol does not have to be manicured - prettied up with useless paths which there is little room for. Please, do not construct any kind of bike or foot path.

Please Mail to:
Pare Engineering Corporation
8 Blackstone Valley Place
Lincoln, RI 02865
Or e-mail comments to: kbloomer@parecorp.com

2/15/06.

Town of Bristol, Rhode Island

Poppasquash Road Bicycle Facility Project

Name Mrs. Charlotte F. Church

Address 60 Poppasquash Road
Bristol, R.I. 02809

Comments: Just leave Poppasquash Road the way it is. The Bicycle path are put in that way so they would have to go in on the right side of the road. The right side of the road is where cars run off the the road to park to fish or go to the shore to clam or Quahog. There is never a problem of too many parking at any one time. I live right at the head of the harbor and own land at the water side and lived here for 91 years.

Poppasquash Road is a very heavy traveled road now that so many people live on Poppasquash Road and the point. They travel very fast even with 25 mile an hr. signs. It is also has heavy use to go to Colt State Park.

It is not a walking or bicycle road.

I think bicycles should stay on the bicycle Path. They can go right to Colt State Park on that which is on Poppasquash Road. If you want right away to water then you have a profit like this that would make it hard perhaps impossible for people to get to the last piece of shoreline on the water left. Over on the west side of the

OVER

Your comments and suggestions regarding the Poppasquash Road Bicycle Facility Project are appreciated.

RECEIVED PARE
DATE: 3-14-06
JOB NO: 05087.00/001
COPIES TO:
Civil
Marketing
Environmental & Planning
Transportation
KB
JP
DT
JOB FILE: ✓ INC.

Please Mail to:
Pare Engineering Corporation
8 Blackstone Valley Place
Lincoln, RI 02865
Or e-mail comments to: kbloomer@parecorp.com

of the Road you could repair the wall. That is a mess. People like to sit on the wall. There is almost no wall left. That Area needs work. If you have any questions about this. I am usually home. Come to the second house with the redwood in same drive with another house at the head of the harbor.

Name and address on 11, and Box

Charlotte J. Church

Lenmarine, Inc.
Rholen East, LLC
Rholen West, LLC

Bristol Marine
Established 1998
(401) 253-2200 Tel. • (401) 253-0007 Fax
99 Poppasquash Road • Bristol, Rhode Island 02809 • www.bristolmarine.com

February 16, 2006

Diane Mederos
Town Administrator
Town of Bristol
10 Court Street
Bristol, Rhode Island 02809

Re: Poppasquash Road Bike Path and Improvements

Dear Mrs. Mederos,

I would like to thank you for holding the public workshop regarding the bike path project on Poppasquash Road. I found the workshop to be very helpful and informative in terms of the different issues facing the extension. I must say I was fairly surprised to see any resistance to this project. In my opinion, if it can be done, it will result in added safety to all who travel Poppasquash Road.

I am writing to you to request that the Town of Bristol consider extending the bike path to the Bristol Marine facility or possibly even through Coggeshall Farm. I feel that our marina is a destination spot in Bristol and I have personally witnessed many pedestrians and bicyclists stopping at our facility to view boats and the harbor as well as to use our restrooms and facilities. We would further encourage curious visitors and our customers to use the extended path. Furthermore, Bristol Marine would like to work with RIDOT and the Town of Bristol to build a public harbor viewing platform, with steps down to the water, in front of our facility. This platform would be adjacent to the path and could be accompanied by bike racks and water front picnic tables for public use. Our plans would also include a kayak launching dock, improved landscaping and possibly incurring some of the cost associated with extending the bike path beyond Colt Park. If you have any questions about this request please contact me at the Bristol Marine office.

Sincerely,

Nick King
Bristol Marine

RECEIVED
FEB 21 2006

CC: Stephen Devine, Chief of Intermodal Planning, RIDOT

Diane Johnson

From: Church, Steve [schurch@DOT.STATE.RI.US]
Sent: Tuesday, February 21, 2006 8:53 AM
To: 'Diane M Williamson'
Cc: Keith Bloomer; Diane Johnson
Subject: Poppasquash Road -- Comments from Bristol Residents

FW poppasquash road bicycle fa... FW Proposed oppasquash Road B. FW Proposed bike path extensio...

Diane,

Attached are 3 e-mail messages Pare Engineering received following the Poppasquash Road public workshop.

Do you want to respond to the messages? or we could develop a generic response & copy you as this is a Town sponsored project.

thanks,
Steve Church

From: Keith Bloomer [KBloomer@parecorp.com]
Sent: Friday, February 17, 2006 12:17 PM
To: Church, Steve
Subject: FW: poppasquash road bicycle facility project

Steve,

I thought I would forward these to you as I receive them.

Thanks,
Keith B.

-----Original Message-----
From: Louise Moss [mailto:lsdlhs32@rcn.com]
Sent: Friday, February 17, 2006 10:31 AM
To: Keith Bloomer
Subject: poppasquash road bicycle facility project

Thank you for your participation in the Poppasquash Road Bicycle Facility Project Workshop on Wednesday evening.
Here are my comments.

1. Safety.
Adding more walker/jogger/bicyclist traffic to an already risky road is asking for trouble. What will happen when someone falls on the bicycle facility -- into the road -- on a curve in the road? There are many curves. Will a driver be able to see the fallen pedestrian before the accident happens?

2. Mother Nature.
The swans, ducks and geese that inhabit the waters that border Poppasquash Road might be able to tolerate the additional human traffic. But the egrets will likely find a new home. They are my favorites.

Have you ever seen a baby egret? I will miss them -- a lot.

3. Construction.
How is a bicycle facility going to be built? There is insufficient room for this project.

4. Need for this project.
Using Asylum Road, there is already easy access to Colt State Park from the existing bike path. What is the reason for creating another route?

My tax money can be better spent on many, many other projects. This one has no positive value. The sooner this study is terminated, the sooner my tax dollars will be spent for something useful.

Thank you for your efforts and thank you for your attention to my comments.

Louise Moss
3 Poppasquash Road
Bristol

-----Original Message-----
From: Dimock, Stan [mailto:SDimock@SaveBay.org]
Sent: Saturday, February 18, 2006 12:12 PM
To: Keith Bloomer
Subject: Proposed Poppasquash Road Bicycle Facility

I am opposed to the Poppasquash Road Bicycle Facility Project for the following reasons:

1) Asylum Road currently provides safe and convenient pedestrian/bicycle access from the East Bay Bike Path and Hope Street to Colt Park.

2) By making Poppasquash Road a destination for pedestrians/bicyclists, the proposed Poppasquash facility will encourage even more pedestrians/bicyclists to traverse an already dangerous roadway.

3) Any increase in the width of Poppasquash Road to accommodate a bike lane or sidewalk will result in a decrease in the grass buffer which presently helps filter runoff from the existing roadway.

4) An increase in pedestrian/bicycle activity adjacent to Mill Pond is likely to drive away wildlife which is sensitive to human activity - especially the egrets and herons that roost and feed in the marshes surrounding the north end of Bristol Harbor.

5) Any expansion of the bike path is a luxury we can ill afford when one considers the present state of Poppasquash Road. The roadway is in desperate need of resurfacing, the walls that line the street are collapsing, the riprap that abuts the roadway needs to be relocated to its original location, and the bridge which presently restricts the water flow between Bristol Harbor and Mill Pond needs to be replaced/widened.

6) The area surrounding the roadway simply doesn't allow sufficient width to create a safe pathway for pedestrians/bicyclists.

7) If the Town of Bristol truly wants to make Poppasquash Road safer for pedestrians and bicyclists, the town should increase its police presence in the area to deter speeding and the rampant public

consumption of alcohol.

8) The north end of Bristol Harbor is an environmental gem. We should respect it as a haven for wildlife and do all that we can to protect the area, keeping it as natural as possible.

Thank you for the opportunity to express my opinion.

Sincerely,

Stan Dimock

25 Poppasquash Road

Bristol, RI 02809-1001

-----Original Message-----
From: Nancy Richard [mailto:nancylrich@msn.com]
Sent: Friday, February 17, 2006 6:08 PM
To: Keith Bloomer
Subject: Proposed bike path extension

Though my husband and I were unable to attend the workshop, as we are both very much under the weather, I would like to present my comment with regard to the proposed bike path expension.

Like many, we too feel that, to spend any appropriations in order to provide additional access to Colt Park would be a grave misuse of funds. The redundancy of providing another path to the Park, when we already have access by Asylum Road is senseless. If monies are available, it would be better spent in repairing the bridge, or burying the electric wires which have killed the water fowl that hit them in trying to fly across from the cove into Mill Pond.

The area is ecologically sensitive, being attractive to nesting egrets and herons, (as well as swans, ducks and geese). There are few areas in Bristol where wildlife might raise their young. The heavy construction of a bike path and the resultant traffic will cause undue stress to water fowl, and will place a burden upon their already tenuous hold on feeding and raising their young. (I will attach a photo of a heron on the north side of Poppasquash Rd..)

Though I am not against folks using the bridge to fish, it does not stop with that harmless pasttime. Wildlife is further burdened by the havoc which the fishermen cause in setting out crab pots in the mill pond, breaking down the stone wall for easier access, and generally causing a dawn to twilight nuisance. Additional access to sensitive areas will only result in further disruption.

If the town or state has monies to burn, I would suggest that they be appropriated to addressing the dangers posed by LNG and fighting that possibility before the town is exposed to terrorism.

Nancy and Roland Richard
39 Poppasquash Rd.
Bristol, RI

PARE
ENGINEERING CORPORATION

MEMORANDUM OF MEETING

DATE: February 17, 2006

TO: File

CC:

Diane Johnson, P.E.	PARE
John Shevlin, P.E.	PARE
Attendees:	
Steve Church	RIDOT
Steve Devine	RIDOT
Robert Smith, P.E.	RIDOT
John Preiss	RIDOT
Diane Williamson	TOWN
Diane Mederos	TOWN

FROM: Keith Bloomer, P.E., PTOE

RE: **Bicycle and Pedestrian Facilities Study & Development - Various Locations**
Poppasquash Road Bicycle Facility Town Sponsored Public Meeting
RI Contract No.: 2005-E1-001
PARE No. 05087.00 - Task 001

A public meeting concerning the above referenced project was held at 6:00 p.m. on February 15, 2006 at the Town of Bristol Town Hall. This meeting was held to gather input from the public concerning the Poppasquash Road Bicycle Facility study. The following was discussed:

1. Ms. Williamson made introductions of TOWN, RIDOT, and PARE staff. Ms. Williamson explained that the Town applied to RIDOT for this project to be studied due to the apparent use of Poppasquash Road by pedestrians and bicyclists. The objective is to make the roadway safer for current users.

2. Mr. Devine discussed the process by which the project was included on the Transportation Improvement Program (TIP) and that the project is for study and development only. The Town could apply for the project to be advanced to the design stage during the TIP application process that should start up in 2007.

3. Mr. Bloomer discussed PARE's familiarity with the TOWN and RIDOT Bike Facility Projects. PARE will investigate the potential for on road and off road facilities as well as surface treatments for any off road facilities. The wall and culvert will be investigated to identify the need for repairs. RIDOT recently repaired the section of wall that had previously failed near the culvert.

4. The schedule for the study was discussed. The contract is a one year contract signed in July 2005. The start of the project has been delayed but PARE is making every effort to remain on schedule for a July completion.

5. Mr. Sanroma, a resident of Bristol and abutter to Poppasquash Road, presented a power point presentation he had created that included photographs of the project limits. This presentation was very helpful to the attendees and pointed out a number of the issues that must be addressed during the study phase. Issues include the limited pavement width, the proximity of utility poles to the roadway, the location of stonewalls to the roadway, the steep sideslopes leading to the freshwater and saltwater wetlands, and potential disturbances to animal habitat and feeding areas.

6. The following comments were presented by members of the audience:

   a. Why should we encourage people to use Poppasquash Road for access to the East Bay Bike Path (EBBP) when they can use the Colt State Park entrance to get to the EBBP?

   b. There is more traffic on the EBBP than on Poppasquash Road. We shouldn't encourage EBBP users to get on Poppasquash Road. The need for this path is not apparent.

   c. I use Poppasquash Road to access Colt State Park and it is dangerous. I don't picture a facility on Poppasquash Road ever being safe. The back entrance to Colt State Park has a steep incline that may discourage use.

   d. This would bring too much additional pedestrian and bike traffic onto Poppasquash Road.

   e. I see many strollers and pedestrians on Poppasquash Road and it is dangerous competing for space with vehicles.

   f. How will this project move forward from study to design? Will there be a Town wide vote on the issue?

   g. This project could be very expensive if the wall needs to be moved. Why not just resurface the road?

   h. Poppasquash Road needs more speed limit signs and more enforcement. More police presence is needed not only for speed control but to control rowdiness at the public right-of-way.

   i. It is important to make the road safer between the bike path and the park. The use of the road could increase due to curiosity and sight seeing. If the use of the road increases the potential for accidents could increase. Crash data should be reviewed but many crashes may not be reported. Increased use of the road would impact noise and trash for the abutters. The current right-of-way users are rowdy, loud, and leave trash behind. Birds roost in the area and feed there. They will be impacted by increases in people using the area. The area is relatively undeveloped and should stay that way.

j. I don't think safety can be improved in the area.

k. The right-of-way users damage the riprap at the culvert and sideslope at the right-of-way by removing rocks to look for crabs and to create sitting areas. This increases erosion in the area.

l. Vegetation should be cut back on the northern side of Poppasquash Road to improve visibility at the bike path.

m. There are other access points to the bike path so why move forward with this project.

n. Why not install a sidewalk or pedestrian facility rather than a bike facility?

o. It would be nice to be able to walk from the Condo's to Hope Street.

p. Bristol Marine was represented at the meeting and requested that the study be extended to their property. There is the potential for a viewing platform at their facility. Customers of theirs and their tenants may choose to walk or ride to the facility rather than drive. This would benefit the other road users by decreasing the number of vehicles on Poppasquash Road.

q. Can overhead utilities be relocated to underground?

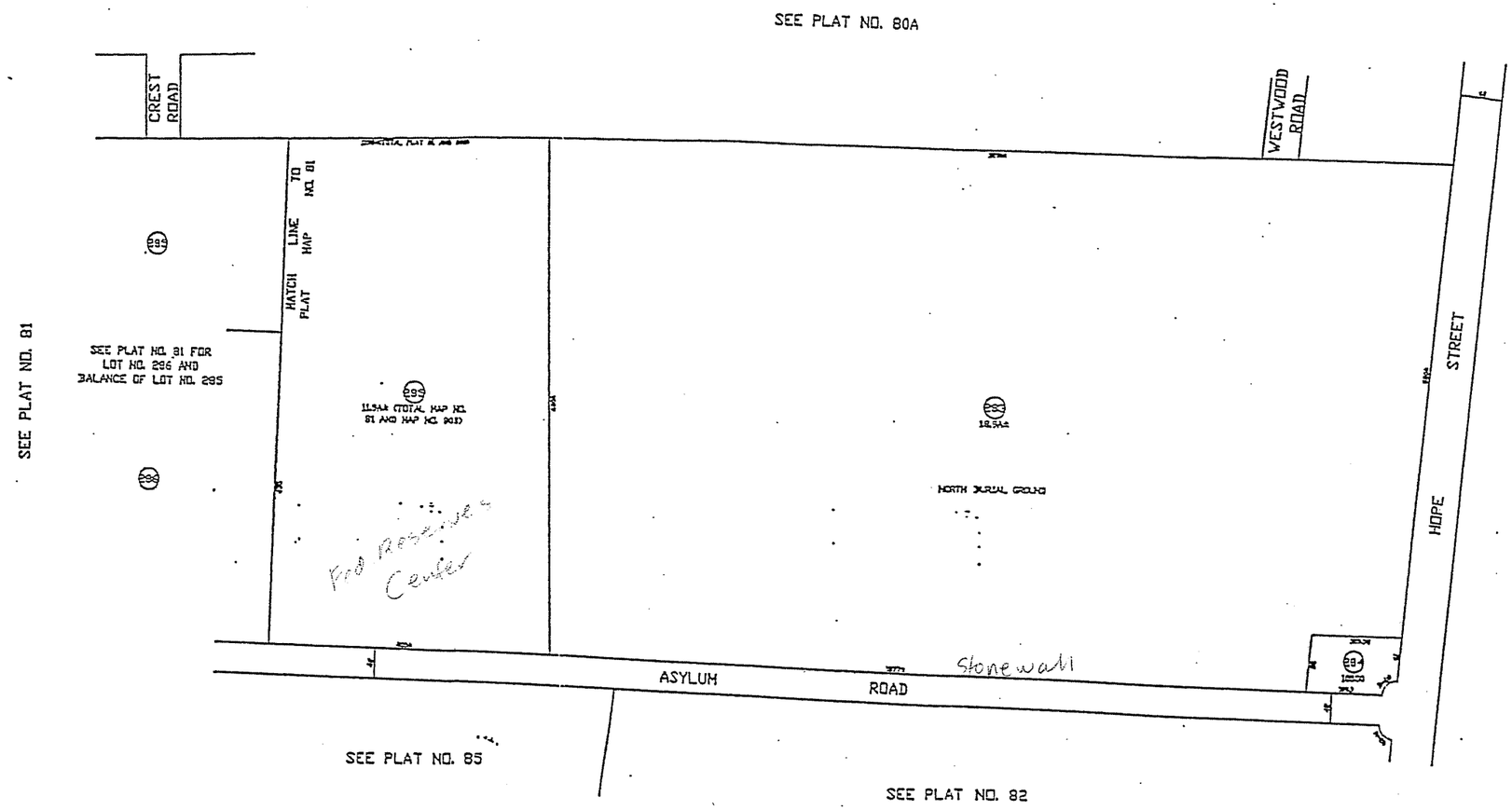
Many of these comments were discussed in further detail with answers provided by the Town, RIDOT and PARE where appropriate. PARE will ensure that these questions and comments are addressed in the study prepared for this project.

7. The resurfacing of Poppasquash Road was discussed. Since this study could recommend some improvements that could be incorporated into a resurfacing contract, the resurfacing contract, although in the system for design, will be held until this study is completed.

KB/mjh

Appendix G

PLAT MAPS



[REVISIONS]

NO.	LOT	DESCRIPTION	DATE

[LEGEND]

- PROPERTY LINE (LENGTH in FT.)
- RIGHT-OF-WAY BOUNDARY
- EASEMENT BOUNDARY
- (00) LOT NUMBER
- 00000 LOT AREA (S.F. or ACRES)

THIS PLAT MAP SHALL BE USED ONLY TO PROVIDE GENERAL INFORMATION REGARDING LOT DIMENSIONS, AREAS, ETC. AND DOES NOT REPRESENT, OR TAKE THE PLACE OF, ACTUAL FIELD SURVEYS OF THE INDIVIDUAL LOTS. THE INFORMATION PRESENTED ON THIS MAP WAS COMPILED FROM TOWN OF BRISTOL RECORDS INCLUDING DEEDS, EXISTING PLAT CARDS, SUBDIVISION PLANS AND SIMILAR DOCUMENTATION PRODUCED BY OTHERS. NEITHER THE TOWN OF BRISTOL NOR ROBERT HAIG ASSOCIATES ASSUMES ANY RESPONSIBILITY FOR THE ACCURACY OF SAID INFORMATION ON THIS MAP.

MAPS FOR TAXATION PURPOSES ONLY!

MAPS OF RECORD AVAILABLE WITH THE TOWN CLERK

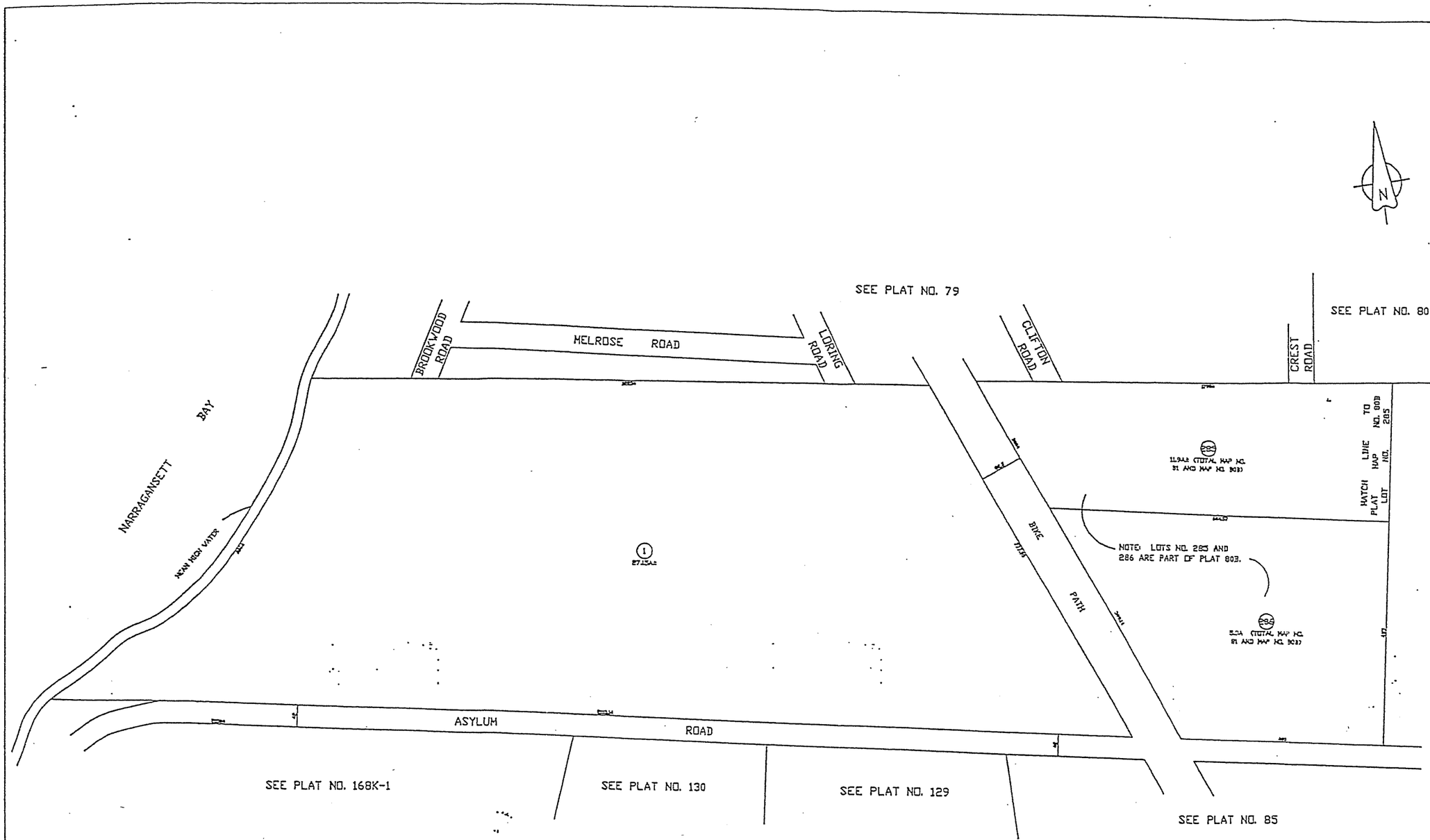
PLAT MAP
SHOWING LAND IN THE TOWN OF
BRISTOL, RHODE ISLAND
JANUARY, 1991

SCALE: 1 in. = 100 FT.

Key to Bristol Town Hall 3/19/03 - plat 80B owned by ~~STATE~~, (North Burial Ground + Federal Reserves Center)

[PLAT NO. 80B]

66



[REVISIONS]

NO.	LOT	DESCRIPTION	DATE

[LEGEND]

- PROPERTY LINE (LENGTH in FT.)
- RIGHT-OF-WAY BOUNDARY
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MAPS FOR TAXATION PURPOSES ONLY!

MAPS OF RECORD AVAILABLE WITH THE TOWN CLERK

PLAT MAP

SHOWING LAND IN THE TOWN OF

BRISTOL, RHODE ISLAND

JANUARY, 1991

SCALE: 1 in.= 100 ft.

[PLAT NO. 81]

Ray to Bristol Town Hall: 3/19/03

[REVISIONS]

NO.	LOT	DESCRIPTION	DATE

[LEGEND]

PROPERTY LINE (LENGTH in FT.)

RIGHT-OF-WAY BOUNDARY

EASEMENT BOUNDARY

00 LOT NUMBER

00000 LOT AREA (S.F.or ACRES)

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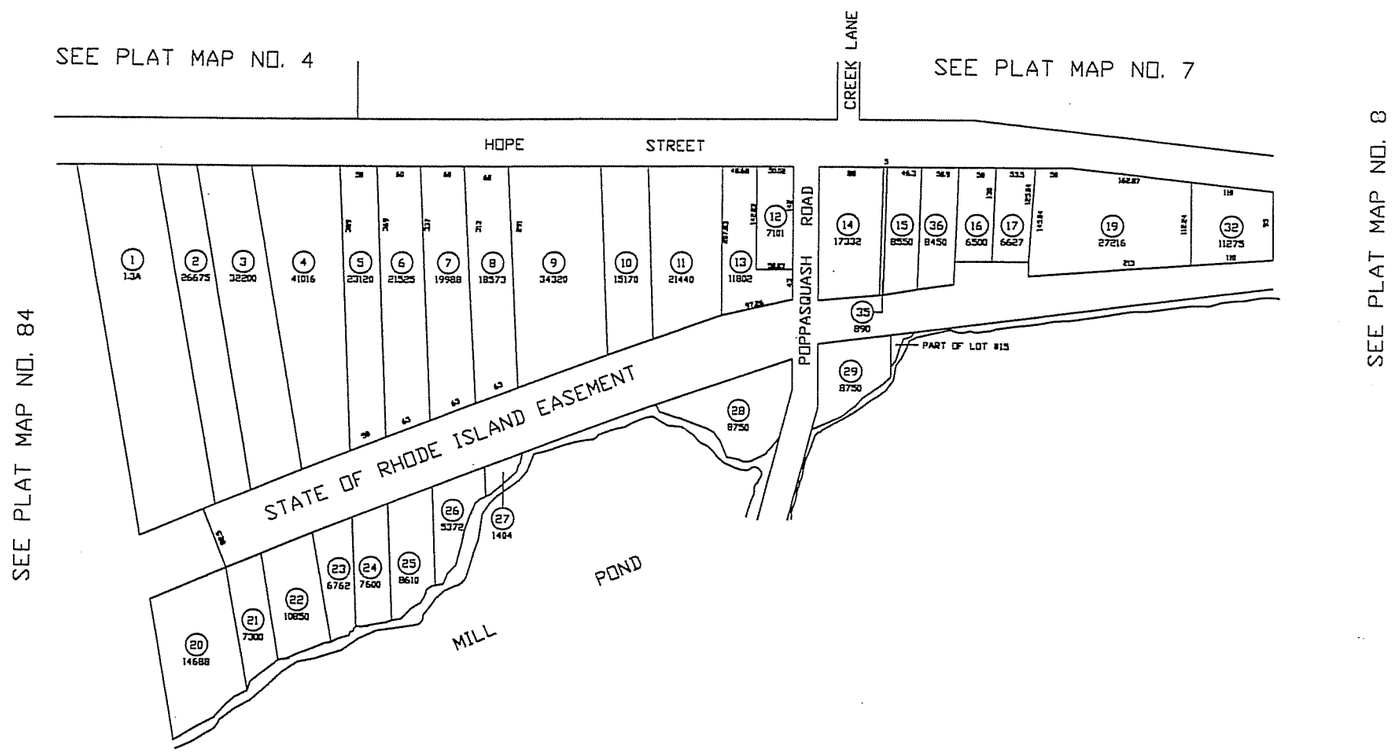

MAPS FOR TAXATION PURPOSES ONLY!

MAPS OF RECORD AVAILABLE WITH THE TOWN CLERK

PLAT MAP

SHOWING LAND IN THE TOWN OF

BRISTOL, RHODE ISLAND

FEBRUARY 1999

100 50 0 100 200

SCALE: 1 in.= 100 Ft.

[PLAT NO. 5]