Powers Road Feasibility & Due Diligence Study

TOWN OF CAPE ELIZABETH
FORT WILLIAMS PARK COMMITTEE
November 4, 2024

Richardson & Associates

JAMES TASSÉ CONSULTING
ACTIVE TRANSPORTATION ACCESS & SAFETY

GORRILL PALMER
An LJB Engineering Company

Prepared by:
William C. Haskell, PE
whaskell@gorrillpalmer.com
207-800-4511

GORRILL PALMER
An LJB Engineering Company

300 Southborough Drive, Suite 200, South Portland, ME 04106
(207) 772-2515 | GorrillPalmer.com

November 4, 2024

Attn: Kathy Raftice, Fort Williams Park Director
Fort Williams Park Committee
343 Ocean House Road
Cape Elizabeth, ME 04107

Re: Powers Road Feasibility and Engineering Due Diligence Study

Dear Kathy:

Gorrill Palmer and our team of Richardson & Associates and James Tassé Consulting is pleased to submit the Powers Road Feasibility and Due Diligence Study. This report summarizes the results of over one year of research, design and coordination with the Fort Williams Park Committee to explore options for the roadway that support a comprehensive multi-modal approach to enhancing the primary access way to the Park. The main focus is on improving public safety, prioritizing non-vehicular modes of transportation, and making Fort Williams Park a premier park destination.

Our report aligns well with and builds upon many of the recommendations outlined in the Fall 2021 Master Plan. Additionally and similar to the Master Plan, while our focus is on the Powers Road corridor, we have presented several ideas that extend beyond the immediate corridor that have significant implications on the function and safety of Powers Road. These ideas focus on minimizing intersections planning for potential future improvements such as providing electric service to Ship Cove Parking to allow for electric vehicle charging stations and other enhancements that improve options for rental spaces in the vicinity of Ship Cove.

This report offers numerous options for safety, infrastructure, and safety improvements along the Powers Road corridor. As discussed in numerous meetings with the Fort Williams Park Committee (FWPC) we have segmented the road into what we believe to be reasonable and realistic sections that will allow the FWPC to consider and implement these improvements in a phased approach. While we believe that the recommendations presented herein all provide significant benefits, we understand that the FWPC may want to prioritize certain improvements over others for various reasons, including cost implications or just personal preferences.

Sincerely,

Gorrill Palmer – An LJB Engineering Company

William C. Haskell, PE
Municipal Operations Leader, New England

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Existing Conditions Assessment

Historical Improvements

Powers Road is the primary road to access Fort Williams Park. It was constructed in the mid-1970's as part of a significant transformation from a military fort into the park as we know it today. The main entrance was changed from the gate location adjacent to the Garden Pond (Farnsworth Road). The road was constructed with grants from the State of Maine Bureau of Recreation, Land & Water Conservation Fund, utilizing a private contractor along with additional resources from the town's Public Works Department. The entrance road was relocated in part to separate vehicular movements from an area historically used for passive recreational opportunities, such as family picnics, tennis, and walking. There have been several other improvements to Powers Road and adjacent areas over the years, including the following:

- 2008 Main Entrance Gate Improvements
- 2013 Ship Cove Parking Lot and Entrance – Parking lot was expanded and reconstructed. Entrance/intersection from Powers Road was improved along with pedestrian sidewalks and crosswalks.
- 2014 Wheatley Road Intersection Realignment – Intersection was realigned to provide more of a ninety-degree intersection with Powers Road
- 2019 Central Parking Lot – Parking lot was reconstructed to provide one-way circulation, improved bus and trolley drop-off and pickup, and improved pedestrian pathways and crosswalks. Electric vehicle charging stations were added along with pay to park kiosks.

Traffic Movements/Counts

Fort Williams Park and nearby roadways have a surprisingly high number of crashes. We reviewed the 20 year crash history at the intersection of Shore Road and Powers Road, Shore Road and Littlejohn Road, on Powers Road, and at several other locations on Shore Road along the frontage of Fort Williams Park. There were 27 crashes, including 6 on Powers Road. There were 6 bicycle/pedestrian crashes on Shore Road, mostly near the intersection of Powers Road and Shore Road.

Gorrill Palmer had Accurate Counts collect traffic counts on Saturday, August 12, 2023, at the Shore Road/Powers Road intersection. The peak hour was determined to be 2:45 PM to 3:45 pm. Accurate Counts also collected automatic traffic recorder (ATR) counts from Thursday, August 10 to Monday, August 14, 2023, between Shore Road and the Ship Cove Parking Lot entrance. Sunday yielded the highest peak hour, between 12 PM to 1 PM with 273 inbound vehicles and 296 outbound vehicles. The 2023 Raw Traffic Volume figure is included in Attachment 1.

Pavement Conditions

Powers Road extends about 2,230 feet from Shore Road down to the intersection of

Humphreys Road near the Central Parking Lot. The traveled way is 22 feet wide with a 5.5 foot wide bituminous sidewalk on the southerly/easterly side of the road. Since being constructed, the road has been paved once in 2005. The condition of the pavement has now deteriorated to a point where there is evidence of rutting and shallow potholes in both travel lanes. While a pavement condition rating assessment has not been completed, we consider the road and adjacent sidewalk to be in Fair condition.

Stormwater

The vertical alignment of Powers Road generally allows stormwater to sheet flow to the edges of pavement and curb line without ponding on the road surface. There are four existing catch basins near the entrance gate that collect stormwater. There is also a bioretention filter unit located just south of the entrance that was installed as part of a stormwater mitigation measure for the Shore Road Path Project. These structures are connected to a 24-inch concrete storm drain pipe that traverses the Meadow and eventually outlets onto the beach at Ship Cove.

There are two existing catch basins located just south of the entrance to Ship Cove Parking Lot. These structures collect stormwater runoff coming down from the Ship Cove overlook and from the high point of Powers Road at Battery Knoll. Another catch basin on Wheatley Road collects stormwater and prevents it from sheeting across the intersection of Powers Road. This was installed as part of a realignment of the intersection with Powers Road in 2014. These structures also discharge above Ship Cove.

Currently there are no catch basins between Wheatley Road and Humphreys Road. Stormwater in this section sheet flows from the pedestrian crossing at Battery Knoll down to Humphreys Road where it is collected in a catch basin located between the Central Parking Lot exit and Captain Strout Circle.

Public Safety Concerns

The Police and Fire Departments do not have any significant concerns about the vertical and horizontal alignment of Powers Road. The posted speed on Powers Road is 15 MPH but the Chief of Police did not have any history of speed enforcement on Powers Road. He said that an applicable citation could be imprudent speed if a driver were exceeding the posted limit, but he could not recall when the last time a citation was issued for that infraction. The Chief was supportive of the separated multiuse path concept.

Users/Stakeholders

The Park draws between 750,000 and 1,000,000 visitors each year, though that figure has never been officially confirmed with an actual count. Given that estimate, Powers Road is the conduit for vehicles of all types, including personal vehicles, motorhomes, tour buses, and service vehicles to enter the Park. Drivers enjoy stunning views of the Portland Harbor channel as they enter which can lead to a bit of distraction at times, especially as they approach the entrance to Ship Cove parking lot. There is also a significant amount of bicycle and pedestrian traffic that enters via Powers Road and via other entry points.

In addition to the many visitors, the Park has several stakeholders that have historically been engaged in long-term planning efforts in the Park. These stakeholders have contributed

valuable feedback and input on previous enhancement projects in the Park dating back several years. This group includes but is not limited to, the following:

- US Coast Guard
- Fort Williams Park Committee
- Rental unit lessees
- Friends of Fort Williams Park
- Cape Elizabeth Public Works
- Cape Elizabeth Community Services
- Portland Head Light Museum and Gift Shop volunteers
- Organized Sporting Programs, such as Little League, Soccer, Tennis, and Pickleball
- Cape Elizabeth/South Portland Rotary Club
- Cape Elizabeth Garden Club
- Dog walkers (Dogs of the Light)
- Playground patrons
- Expressive vendors
- Tour companies (Buses & Trolleys)
- Food vendors
- Beach to Beacon and other special event planners
- Residents from adjacent neighborhoods

Vehicular Deficiencies

One of the primary challenges of the road is the width of the travel lanes in certain areas. In addition to the main entrance, the segment that includes the wooden guardrail and the segment between the entrance to Ship Cove and the Wheatley Road intersection are considered “pinch points.”

The main entrance was improved with new stone pillars, lighting, and ornamental fencing in 2008. The distance between the stone pillars at the entrance is 24 feet. Vehicles entering the Park from the south sometimes have to wait for an exiting vehicle to clear the pillars before entering. Again, this is more of an issue when meeting a bus or delivery vehicle.

In the wooden guardrail section, it is quite common for one vehicle to mount the sidewalk when meeting on-coming vehicle, especially if it is a bus. (Some of the curb reveal was lost during the last overlay which makes it easy to accomplish). The high point of this segment is also a popular place for sledding during the winter months. Given the proximity of the guardrail to the road, there is not a level area for the sledders to queue, so some children stand in the roadway and/or sit on the guardrail. This creates an unsafe situation for both sledders and motorists.

Between the entrance to Ship Cove and Wheatley Road, vehicles are not able to mount the curb, so often one vehicle has to wait for the other to safely pass by before proceeding. There are several tire scuff marks on the curbing in this area which indicates that motorists are feeling intimidated transiting this segment. This segment did see some improvements in 2013, when the sidewalk was replaced, and drainage infrastructure was added.

Heading south on Powers Road the corridor opens up all the way to the Humphreys Road

intersection. Other than navigating pedestrian crossing movements, there are few challenges in this segment for motorists.

Bicycle Deficiencies

There are no dedicated or shared bicycle lanes or bicycle specific signage within the park. Powers Road has numerous curves and intersections and is narrow and hilly which limits its use to experienced cyclists. There are other roads within the park that are closed to vehicular traffic that area suitable for bicycle use by families and/or children, however, accessing those roads may require navigating portions of Powers Road to get to them. In general, the Park is difficult to navigate by bicycle for families and children.

Pedestrian Deficiencies

The Park is a popular walking destination for residents who live in the adjacent neighborhoods off from Shore Road. There are six pedestrian entrance gates along Shore Road, with two of those providing access to the sidewalk on Powers Road.

Pedestrians often cross Powers Road at the main entrance even though there is a crosswalk alongside Shore Road to get them safely to the southerly pedestrian entrance gate. There is a pedestrian gate on the north side of the main gate, but it is hard to distinguish from the ornamental fencing and is not connected to the sidewalk on Powers Road via a bituminous walk or a crosswalk.

The sidewalk along Powers Road extends from the main entrance to the intersection of Humphreys Road. It is a bituminous walk approximately 6' wide without an esplanade. The sidewalk starts on the southerly side of the road from Shore Road but crosses to the easterly side at the Ship Cove Parking entrance and continues on that side to the Central Parking Lot. The sidewalk is separated from the travel lane by a low-profile bituminous berm curb. The curb can be and is mounted by vehicle traffic presenting safety concerns for pedestrians using the sidewalk. The sidewalk was not constructed during the original construction of Powers Road but was later added in phases between 1984 and 1990.

There are three painted crosswalks on Powers Road between the main entrance and Humphreys Road. In addition to these defined crossings, there are numerous other areas where pedestrians cross Powers Road without the protection of a formal crosswalk. Areas where pedestrian crossing is popular without definition include the entrance to the Parade Field parking lot, Farnsworth Road at the food vendor site, and between the Picnic Shelter parking lot and Battery Knoll.

The existing sidewalk does connect users to significant features in the Park. The walk provides access to Ship Cove, the northerly section of the Cliff Walk, the Cliffside pod of the Arboretum, the Interpretive Display Panels, Battery Knoll, the Picnic Shelter, and Captain Strout Circle.

Utilities

Powers Road is not the primary utility corridor for the park. Utilities enter the park at several locations, but the primary power, water, telephone and cable services enter the park south of

the Powers Road entrance.

There is an underground out-of-service power line located on the north side of Powers Road just off the edge of pavement. It runs from a utility pole just north of the entrance gate to a transformer pad base next to the Ship Cove parking lot. The transformer has been removed. This service line used to provide electrical service to the former Emergency Preparedness bunker and Ram Island Ledge Lighthouse. The transformer was removed when the bunker was taken out of service and the lighthouse was converted to solar power. The phase rating and condition of this dormant line is unknown.

There is no sanitary sewer in Powers Road or the Park as a whole. The existing dwellings in the Park are served by a combination of a septic system, a holding tank, and in the case of the Portland Head Light, an overboard discharge system. The closest sanitary sewer to Powers Road is located on Littlejohn Road, just in from the Shore Road intersection

Mapping

For this study we have used existing available mapping coverage of Powers Road, including the 2011 survey completed by Nadeau, aerial photography and NOAA LiDAR topography. If the FWPC wishes to proceed with the recommendations in this report, we recommend that detailed existing conditions and topographic survey be completed for each section of the road.

Alternatives Analysis

2021 Master Plan Goals & Objectives

The 2021 Master Plan goals for Powers Road included:

- Prioritize and enhance the Park for the year-round enjoyment of all local residents.
- Advance safe access, circulation, and easy wayfinding for all park visitors.
- Preserve, protect, promote, and enhance the Park's natural, scenic, and historic resources.
- Establish a long-term sustainability plan to maintain the overall quality of the park.

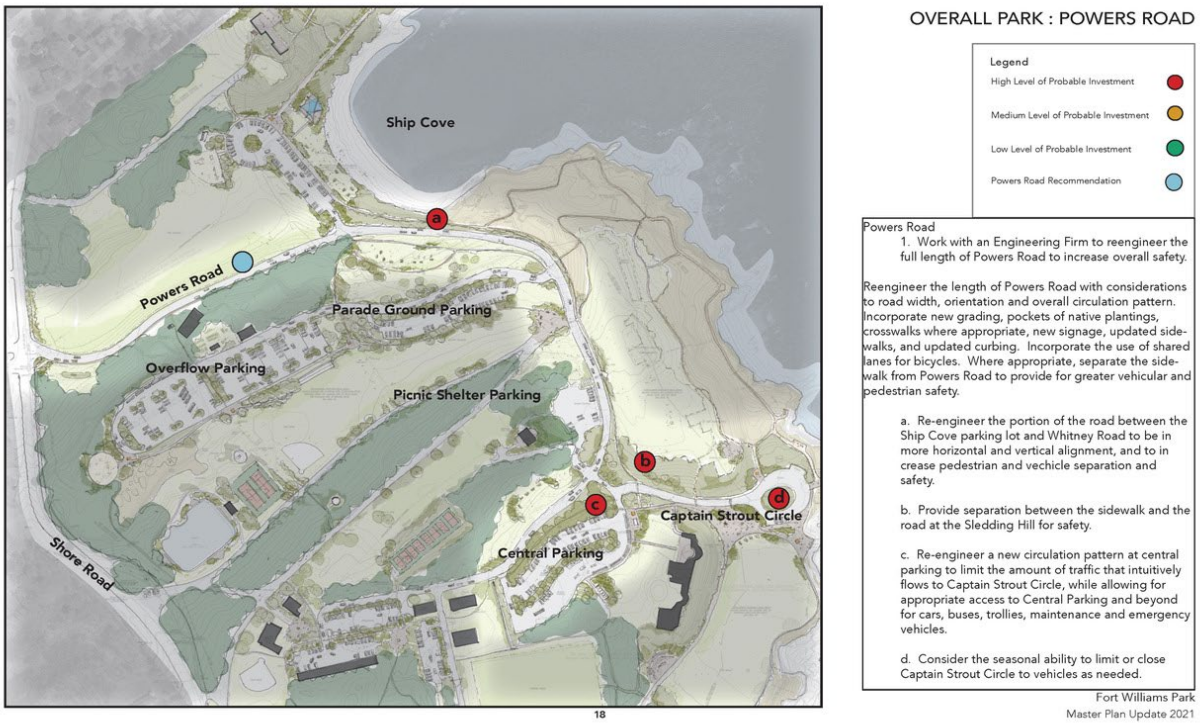


Figure 1 2021 Master Plan Recommendations for Powers Road

(image by Richardson & Associates)

The Master Plan recommendations for Powers Road included working with an engineering firm to re-engineer the full length of Powers Road to increase overall safety with consideration given to the following:

- Vehicle/pedestrian separation
- Road width
- Orientation and overall circulation patterns
- New grading
- Pockets of native plantings
- Crosswalk locations and design

- New signage
- Updated sidewalks and curbing

The Master Plan specifically discussed the following improvements:

- Re-engineer the portion between Ship Cove parking lot and Wheatley Road.
- Provide separation between sidewalk and road at the sledding hill.
- Re-engineer new circulation pattern at central parking to limit traffic that flows to Captain Strout Circle, while allowing access to Central Parking for cars, buses, trollies, maintenance, and emergency vehicles.
- Consider seasonal ability to close Captain Strout Circle to vehicles as needed.

The goals and improvements expressed in the Master Plan focus on enhancing the main entrance road and providing a safe way to access the park for all users and visitors. Most of these goals and improvements can be accomplished with traffic calming measures and improvements that focus on encouraging other modes of transportation and access to and in the park. The improvements presented below will focus on these concepts and will consist of the following overall concepts:

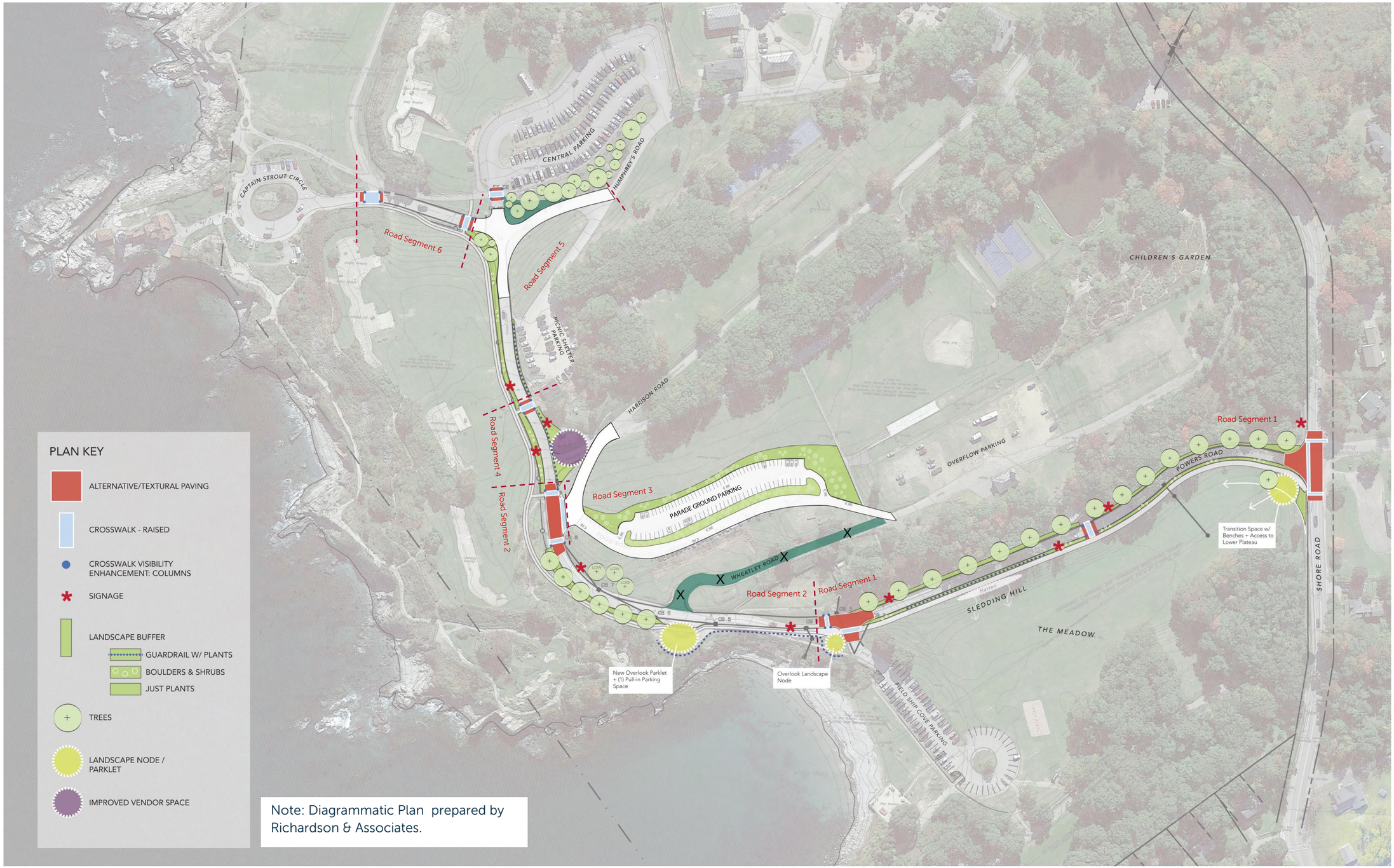
- Traffic calming
- Separating bicycle and pedestrian users from the vehicular traffic.
- Reducing the number of conflict points (intersections). Intersections are planned points of conflict. Reducing the number of intersections, reduces conflict and improves overall safety.
- Reducing vehicular speeds by adding speed tables and raised crossings, which are proven traffic calming measures supported by MaineDOT, Federal Highway Association (FHWA) and National Association of City Transportation Officials (NACTO). Raised crossings make the pedestrian more prominent in the driver's field of vision and the associated ramps help reduce vehicle speed.
- Adding street trees and plantings to improve aesthetics and increasing visual friction of a roadway corridor (and thereby reducing speed).

Project Phasing & Scope

Powers Road is approximately 2,230 feet (0.42 miles) long from Shore Road to the Central Parking exit driveway. The costs to reconstruct and improve this section of road will be substantial, therefore, we recommend breaking down the road into manageable sections, primarily for budgeting purposes, but also for constructability and lessening impacts to the park users. We recommend below six road sections, however, one of these sections consists of improvements to the Parade Ground Parking area, access to the overflow parking area, and demolition of a portion of Wheatley Road. See Figure 2 for an overall diagrammatic plan showing the proposed improvements along Powers Road.

Road Segment 1 – Shore Road to Ship Cove Parking

The section of Powers Road from Shore Road to Ship Cove Parking intersection is approximately 1,040 feet long. Refer to Figure 3 for a diagrammatic plan showing this segment of road. We have discussed several options for improving the intersection of Shore Road and Powers Road, including an option for a roundabout and a raised intersection, both



Note: Diagrammatic Plan prepared by Richardson & Associates.

Figure 2 – Overall Powers Road Diagrammatic Plan

Roundabout Concept at Shore Road & Powers Road

Note: Diagrammatic Plan and Roundabout Sketch prepared by Richardson & Associates.

PLAN KEY

- ALTERNATIVE/TEXTURAL PAVING
- CROSSWALK - RAISED
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  - GUARDRAIL W/ PLANTS
  - BOULDERS & SHRUBS
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- IMPROVED VENDOR SPACE

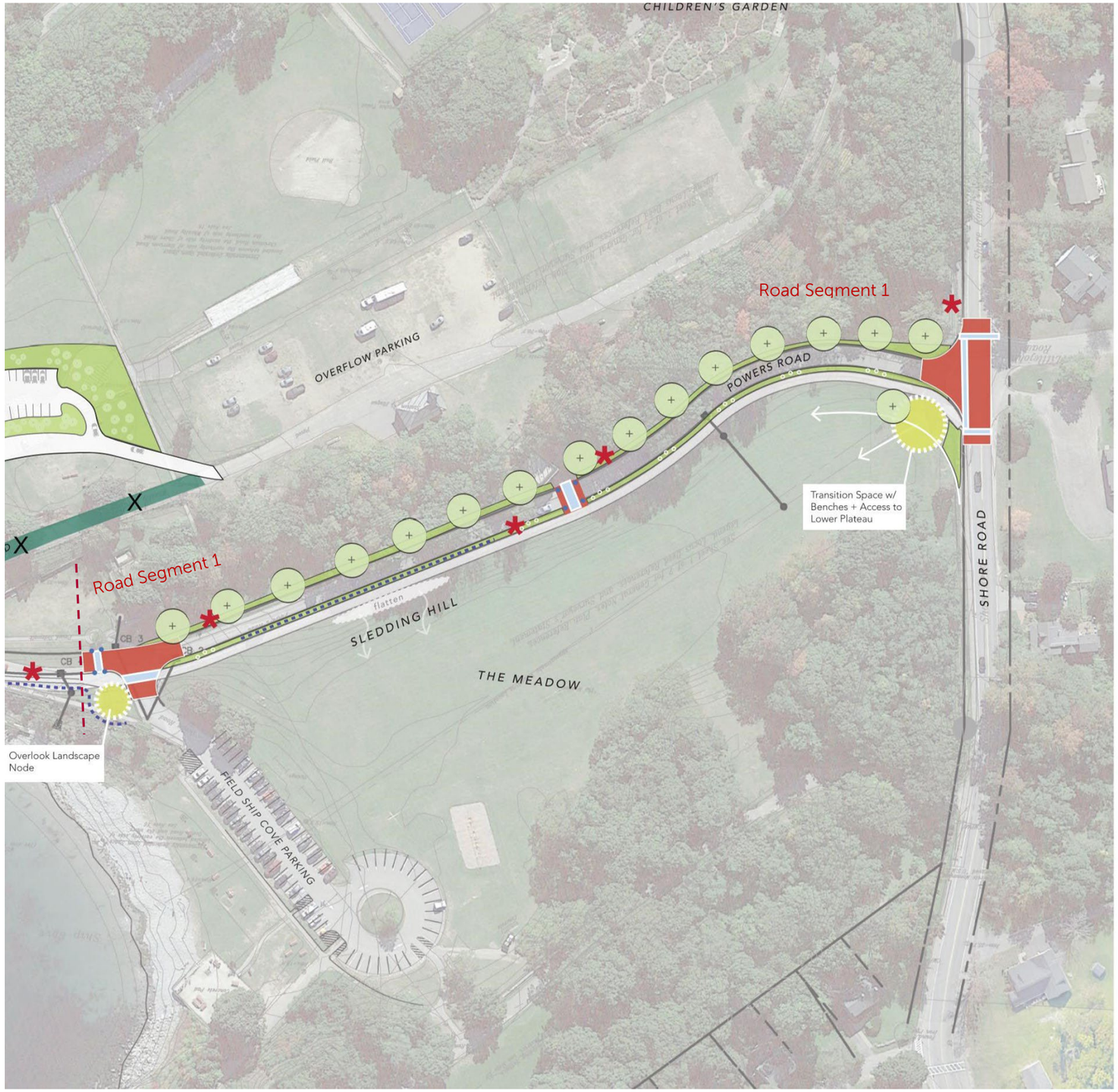

Figure 3 – Road Segment 1, Shore Road to Ship Cove Entrance

of which would provide traffic calming benefits. The existing intersection is offset with Littlejohn Road. The roundabout alternative would address this offset well and would create a statement for entering the park. The raised intersection alternative is more traditional and still provides substantial traffic calming potential. Consideration of either option, along with potential funding options should be reviewed as part of the Shore Road sidewalk improvement project.

The throat of Powers Road is quite wide resulting in a very long crosswalk along Shore Road. We recommend narrowing up that throat, however, we also understand that the curb radius coming from the south into the park is tight and needs to be eased. Improvements at this intersection will also include widening the space between the two gate pillars, widened gate, and associated electrical improvements. We anticipate that the northerly gate pillar can be relocated to the north to provide the additional space needed.

We have proposed a 10-foot-wide multiuse path along the north side of Powers Road. This path would be separated from the road with vertical curbing and a five- or six-foot esplanade that would allow for low plantings. Near the intersection we propose a landscape node or gathering space at the beginning of the multiuse path. The road would be shifted to the south by about five feet to provide more space and limit the need for as much fill along the embankment on the northerly side of the road. The multiuse path would extend out through a separate gate next to Powers Road and connect directly to the sidewalk along Shore Road at the intersection.

A raised crosswalk would be added near the former Power House to connect the north-south trail that comes down from the overflow parking area and providing a connection to the multiuse path. Street trees are proposed along the south side of the road where they do not obstruct easterly views towards Ship Cove. This raised crossing supports slow vehicle speeds before the straight road section to the Ship Cove intersection.

Approaching the Ship Cove parking intersection a widened area at the top of the slope will be added to provide a starting point for the winter sledding hill and activities. A wooden guardrail is also suggested at this location to provide additional separation between the sledders and vehicle traffic.

Another raised intersection and landscape/gathering node is proposed just east of the Ship Cover intersection.

Other recommended improvements along this segment of road include:

- Underground conduit from Shore Road to Ship Cove Parking for primary power. This could be useful for future electric vehicle charging stations at Ship Cove Parking or electrical service to the Ship Cove rental picnic platform.
- Drainage improvements along the road which could include stormwater quality and quantity management.
- Signage for pedestrian crossings and speed limit.

Road Segment 2 – Ship Cove Parking to Parade Ground Parking

Segment 2 is approximately 630 feet long. See Figure 4 for a diagrammatic plan showing the improvements for this segment of road. The primary goal of improvements in this section is to reduce unnecessary intersections and improve pedestrian/bicycle safety by extending the 10-foot-wide multiuse path along the left side of Powers Road.

We proposed to eliminate the Wheatley Road intersection and provide access to the overflow parking area/Children's Garden area via new access at the Parade Ground Parking (See Segment 3 below).

Immediately across from the Wheatley Road intersection there is a "jug handle" pullout that we propose to modify to an enhanced landscaped area and viewpoint with one parallel parking space to provide drop-off capability for the Cliffside rental area. This will reduce vehicle conflicts by eliminating two intersections for the "jug handle".

Additional native landscaping and tree plantings are proposed along this entire segment with consideration given to minimizing obstruction of coastal views.

A large, raised intersection is proposed at the Parade Ground Parking entrance. In conjunction, we will provide multiple crosswalks at this raised intersection to control where people cross Powers Road to and from the multiuse path.

Road Segment 3 – Parade Ground Parking and Alternative Access to Overflow Parking

Road Segment 3 includes reconstructing the Parade Ground Parking lot and a new access road that will replace Wheatley Road to the overflow parking area. See Figure 4 for a diagrammatic plan showing the improvements for this segment of road. The benefit of this design is that it eliminates the Wheatley Road intersection, which is currently not ideal given its proximity to the curve on Powers Road that is just south of the Ship Cove Parking Lot entrance. Rather than aligning the new access road through the Parade Ground Parking Lot, we recommend separating the road from the lot with new parking lot entrances at either end of the parking lot. The existing parking lot is quite narrow making access to the parking spaces tight.

We have also considered rerouting the Farnsworth Road intersection and combining it with the new access road. This also eliminates another curb cut on Powers Road. While this would provide some benefit, given that Farnsworth Road is not regularly used by vehicles, the benefit is not as significant as eliminating the Wheatley Road intersection. There may be other options available to convert the Farnsworth Road intersection into a plaza area that could be utilized by the Vendor space during peak summer months and would still allow for vehicular traffic during key events requiring alternative ingress and egress options to the park.

Road Segment 4 – Parade Ground Parking to Picnic Shelter Crosswalk

This busy section of road is 195 feet long with steep grades leading up to the crosswalk at the top of the hill (Picnic Shelter Crosswalk). See Figure 4 for a diagrammatic plan showing the improvements for this segment of road. The Vendor space at the intersection of Farnsworth and Powers Roads creates the potential for significant vehicle and

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Note: Diagrammatic Plan prepared by Richardson & Associates.

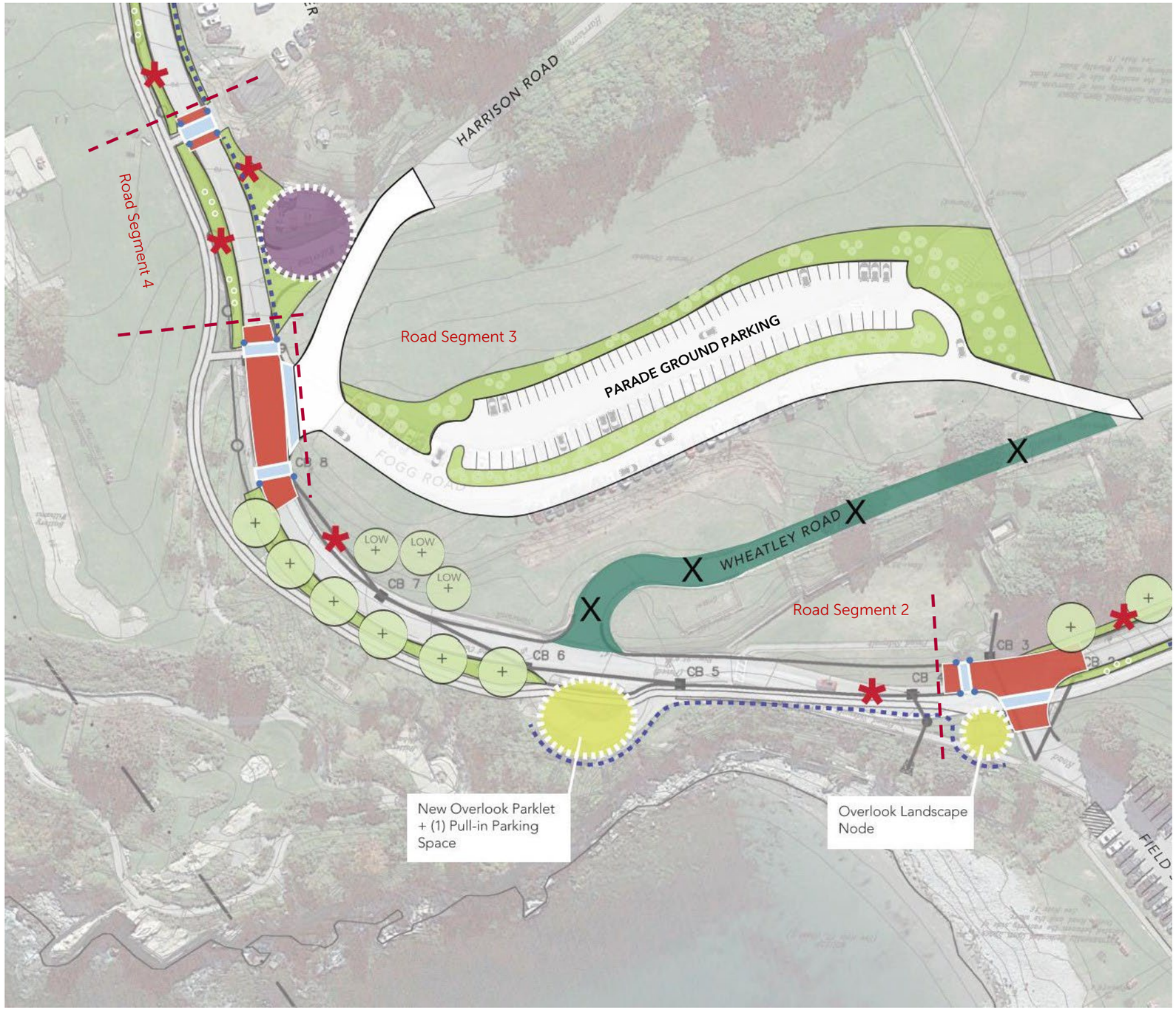

Figure 4 – Road Segments 2 - 4, Ship Cove Entrance to Picnic Shelter Crosswalk

pedestrian/bicyclist conflict in this segment. The vendor space also has limited space for queuing at the food truck, seating, and gathering and would benefit from expanding the space. The Farnsworth Road intersection could be modified to provide expanded space for the vendor area and still be designed to allow for Farnsworth Road to be used for emergency access, pedestrian/bicyclist use, and special event use.

The 10-foot-wide multiuse path continues along the left side of this road segment with a variable width esplanade and crosswalk connections to the Parade Ground Parking lot and Farnsworth Road and Vendor area. The raised intersection provides safe crosswalk locations. Fencing may still be desirable along this section (as exists today) to control pedestrian crossings at preferred locations.

Road Segment 5 – Picnic Shelter Crosswalk to Humphreys Road

This road segment is approximately 510 feet long. See Figure 5 for a diagrammatic plan showing the proposed improvements for this segment of road. The hill down from the Picnic Shelter Crosswalk to the Central Parking lot exit is steep and the existing sidewalk along the left side of the road is narrow and pitched steeply towards the road creating unsafe pedestrian access. The 10-foot-wide multiuse path will extend along this segment with a variable esplanade width and then turn the corner towards Captain Strout Circle (See Segment 6 below).

The exit from Central Parking and Road to Captain Strout Circle will be reconfigured and Powers Road will be realigned slightly and bend right to reconnect to Humphreys Road near the intersection with the Picnic Shelter parking access road. This will create some additional space for more trees and native plantings to provide a visual buffer from Powers Road to the Central Parking Lot. Additional design work is necessary to fully flesh out the Powers/Central Parking Exit/Captain Strout intersection.

Road Segment 6 – Central Parking Exit to Captain Strout Circle

Segment 6 is about 275 feet long and will include two raised crosswalks. See Figure 5 for a diagrammatic plan showing the proposed improvements for this segment of road. The first near the Central Parking intersection and the second at the pedestrian trail just east of Battery Blair. The 10-foot-wide multiuse path continues along the left side of the road to the trail crossing just east of Battery Blair.

Consideration should be given to whether any utility upgrades or replacements are needed in this area as part of these improvements.

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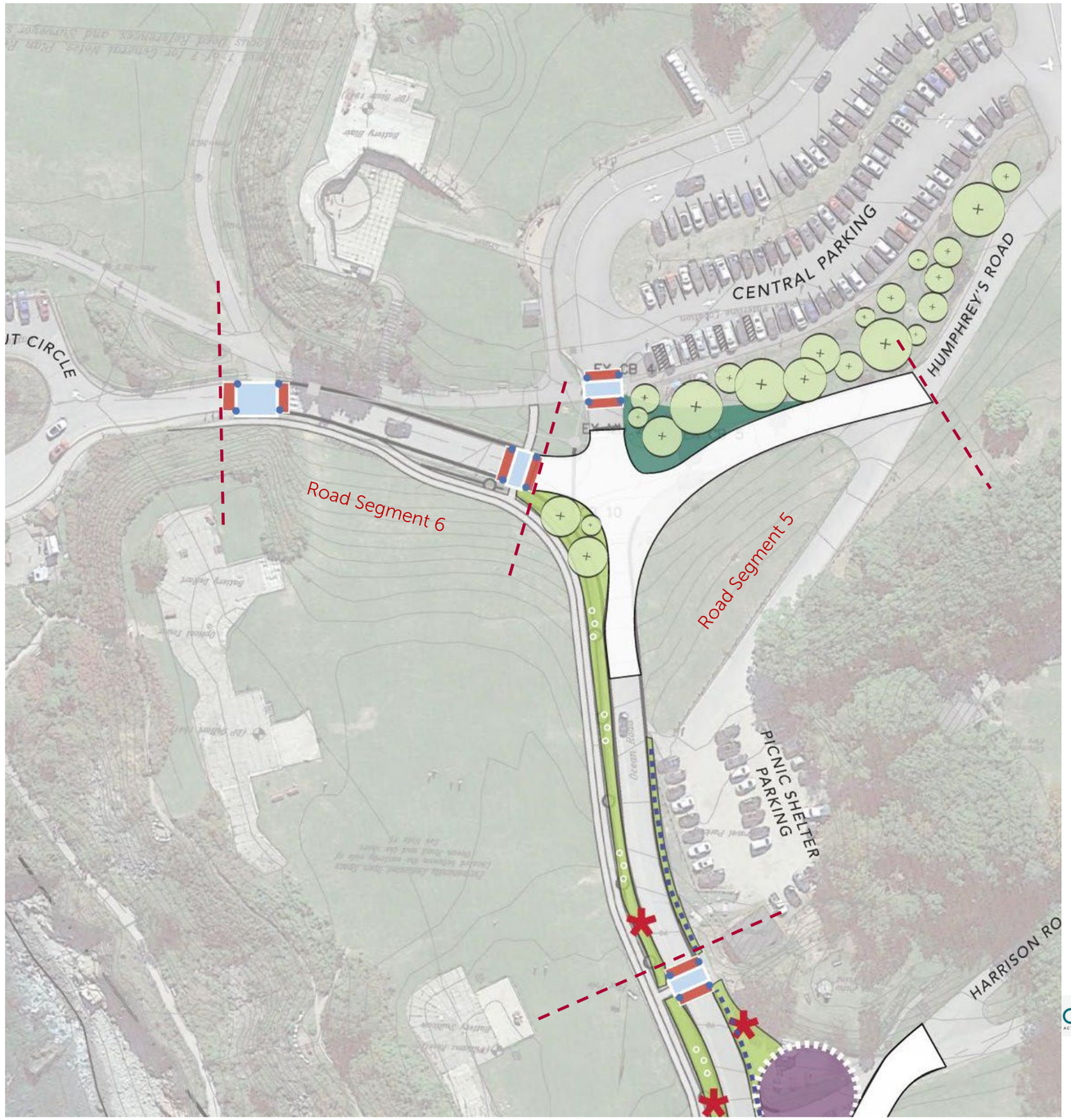


Figure 4 – Road Segments 5 &6, Picnic Shelter Crosswalk to Humphreys Road & Central Parking Exit to Captain Strout Circle

Opinions of Cost

We have prepared conceptual opinions of probable construction and soft cost estimates for the identified alternative improvements. We have prepared these estimates for each road segment identified in the alternatives section above. A summary of the proposed costs is presented in the following table. More detailed cost information, including assumptions is provided in Attachment 2.

Description	Cost Type	Conceptual Cost Estimate
Road Segment 1 – Shore Road to Ship Cove Parking Entrance	Construction + 20% Contingency	$1,402,000
	Design/Permitting (12%)	$169,000
	Subtotal	**$1,571,000**
Road Segment 2 – Ship Cove Parking Entrance to Parade Ground Parking	Construction + 20% Contingency	$948,000
	Design/Permitting (12%)	$114,000
	Subtotal	***$1,062,000***
Road Segment 3 – Parade Ground Parking & Alternative Access to Overflow Parking	Construction + 20% Contingency	$866,000
	Design/Permitting (12%)	$104,000
	Subtotal	***$970,000***
Road Segment 4 – Parade Ground Parking to Picnic Shelter Crosswalk	Construction + 20% Contingency	$348,000
	Design/Permitting (12%)	$42,000
	Subtotal	***$390,000***
Road Segment 5 – Picnic Shelter Crosswalk to Humphreys Road	Construction + 20% Contingency	$407,000
	Design/Permitting (12%)	$49,000
	Subtotal	***$456,000***
Road Segment 6 – Central Parking Lot Exit to Captain Strout Circle	Construction + 20% Contingency	$190,000
	Design/Permitting (12%)	$23,000
	Subtotal	***$213,000***
All Road Segments 1 – 6	Construction + 20% Contingency	$4,161,000
	Design/Permitting (12%)	$501,000
	Total	**$4,662,000**

Recommendations

The decision to proceed with improvements to Powers Road is a significant one. The road has been in use since the 1970's and has served well as the main entrance to the park. Park visitation has increased substantially since Fort Williams was converted from a military fort to a park and it will continue to increase moving forward. It is important to note that the type of traffic that uses Powers Road has also changed since the road was originally constructed. With the increased visitation, there is significantly more larger tour and cruise ship buses and trolley traffic. These larger vehicles have impacted the comfort level of pedestrians and bicyclists within the park. Providing more separation with the wider multiuse path that is separated from the roadway is an important point in the decision making process.

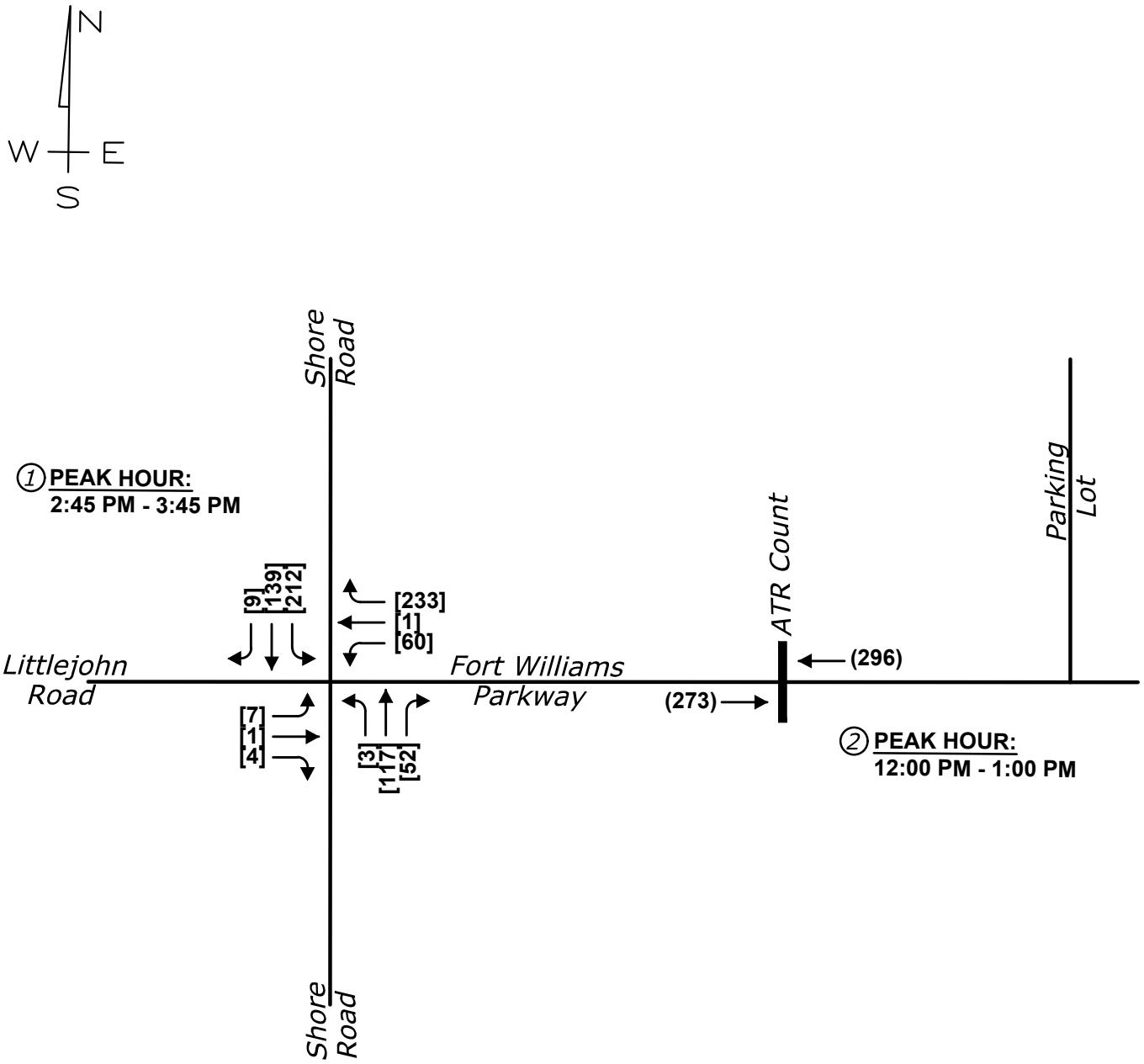
The improvements to Powers Road presented in this report will help support the increased visitation and provide improved and safe access into and throughout the park for all users and will promote sustainable transportation options. We have divided the road into more manageable segments. Usually, we would recommend starting a road rehabilitation project for a dead-end road at the end and working back out to the entrance. This could be done here as well, however, we believe there are benefits in this case to start at the entrance and work into the park. This approach will allow users to see the immediate benefit and it will generate excitement and interest in improving the rest of the road. For this reason, we recommend Road Segment 1 as the first phase.

Future phases would continue sequentially, however, several of the latter phases are smaller in scope and could be combined into a single phase (for example Road Segments 5 and 6).

Attachment 1 - 2023 Raw Traffic Volumes

2023 RAW VOLUMES

Figure No. 1



Source: Collected by Accurate Counts

1. **Saturday, August 12, 2023**
   Counted from 9:00 AM - 5:00 PM
2. **Sunday, August 13, 2023**
   24 Hour Count

(XX) = SUNDAY PEAK HOUR
[XX] = SATURDAY PEAK HOUR

Note: The "ATR Count" was completed Thursday, August 10, 2023 to Monday, August 14, 2023. Sunday yielded the highest peak hours.

FORT WILLIAMS PARK: POWERS ROAD FEASIBILITY STUDY
CAPE ELIZABETH, MAINE

Design:	KJB	Scale:	NONE
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Attachment 2 - Detailed Cost Breakdown

Fort Williams Park - Powers Road							
Cost Worksheet							
Rev: September 6, 2024							
Description	**Unit**	**Unit Cost**	**Quantity**	**Cost**	**Notes**		
Road Segment 1- Shore Road to Ship Cove Entrance							
Entrance -raised intersection/crosswalks	LS	$ 75,000.00	1	$ 75,000.00	6		
Entrance gate/pillars and fencing	LS	$ 100,000.00	1	$ 100,000.00	7		
Miscellaneous gate electrical	LS	$ 15,000.00	1	$ 15,000.00	7		
Main entrance park sign	LS	$ 25,000.00	1	$ 25,000.00			
Road reconstruction - full depth	LF	$ 185.00	1050	$ 194,250.00	8		
10-foot wide bituminous multiuse path	LF	$ 65.00	1050	$ 68,250.00	9		
Granite curb and esplanade	LF	$ 75.00	950	$ 71,250.00	10		
Storm drainage - catch basins & storm drain	LS	$ 44,500.00	1	$ 44,500.00	11		
Raised crosswalk @ Power House	LS	$ 25,000.00	1	$ 25,000.00	12		
Raised intersection/crosswalk @ Ship Cove parking entrance	LS	$ 27,000.00	1	$ 27,000.00	20		
Masonry posts at crosswalks	Ea	$ 2,000.00	4	$ 8,000.00	13		
Pavement markings - lines	LF	$ 0.55	2100	$ 1,155.00	14		
Pavement markings - crosswalks	SF	$ 5.00	210	$ 1,050.00			
Underground electric conduit/handholes	LF	$ 75.00	2300	$ 172,500.00	15		
Landscape node/parklet at main entrance	SF	$ 85.00	500	$ 42,500.00			
Landscape trees on south side of road	EA	$ 1,500.00	15	$ 22,500.00			
Esplanade plantings on north side	SF	$ 85.00	350	$ 29,750.00			
Esplanade boulders on north side	EA	$ 350.00	30	$ 10,500.00			
Earthwork	LS	$ 171,000.00	1	$ 171,000.00	16		
Guardrail at sledding hill	LF	$ 60.00	250	$ 15,000.00			
Widened landing for sledding hill	LS	$ 15,000.00	1	$ 15,000.00			
Landscape node/parklet at Ship Cove entrance	LS	$ 85.00	350	$ 29,750.00			
Signage	SF	$ 70.00	50	$ 3,500.00	17		
Construction Contingency				**$ 234,000.00**	20% of construction costs		
Construction Subtotal				**$ 1,402,000.00**			
Estimated Design & Permitting				**$ 169,000.00**	12% of construction subtotal		
Segment Subtotal				**$ 1,571,000.00**			
Road Segment 2 - Ship Cove Entrance to Parade Ground Parking Entrance							
Road reconstruction - full depth	LF	$ 185.00	750	$ 138,750.00	8		
Granite curb and esplanade	LF	$ 80.00	875	$ 70,000.00	18		
10-foot wide bituminous multiuse path	LF	$ 65.00	850	$ 55,250.00	9		
Storm drainage - catch basins & storm drain	LS	$ 125,000.00	1	$ 125,000.00	19		
Raised intersection at Parade Ground parking	LS	$ 22,000.00	1	$ 22,000.00	20		
Retaining/stone wall improvements	LS	$ 60,000.00	1	$ 60,000.00	21		
Pavement markings - lines	LF	$ 0.55	1500	$ 825.00	14		
Pavement markings - crosswalks	SF	$ 5.00	200	$ 1,000.00			
Water service for irrigation oat Cliffside	LF	$ 25.00	475	$ 11,875.00	22		
Landscape node/parklet at jug handle	SF	$ 85.00	2652	$ 225,420.00			
Esplanade plantings	SF	$ 10.00	4874	$ 48,740.00			
Landscape trees on north and south side	EA	$ 1,500.00	9	$ 13,500.00			
Masonry posts at crosswalks	EA	$ 2,000.00	6	$ 12,000.00			
Signage	SF	$ 70.00	75	$ 5,250.00	23		
Construction Contingency				**$ 158,000.00**	20% of construction costs		
Construction Subtotal				**$ 948,000.00**			
Design & Permitting				**$ 114,000.00**	12% of construction subtotal		
Segment Subtotal				**$ 1,062,000.00**			
Road Segment 3 - Parade Ground Parking & Alternative Entrance to Overflow Parking							
Demolish Wheatley Road & Intersection with Powers Road	LS	$ 75,000.00	1	$ 75,000.00			
New access drive to overflow parking area	LS	$ 140,000.00	1	$ 140,000.00			
New parade ground parking lot	LS	$ 270,000.00	1	$ 270,000.00			
Relocate pay to park stations	LS	$ 25,000.00	1	$ 25,000.00			
Storm drainage - catch basins & storm drain	LS	$ 150,000.00	1	$ 150,000.00			
Pavement markings	LS	$ 1,000.00	1	$ 1,000.00			
Landscape plantings at Parade Ground parking lot	EA	$ 50,000.00	1	$ 50,000.00			
Signage	LS	$ 10,000.00	1	$ 10,000.00			
Construction Contingency				**$ 145,000.00**	20% of construction costs		
Construction Subtotal				**$ 866,000.00**			
Design & Permitting				**$ 104,000.00**	12% of construction subtotal		
Segment Subtotal				**$ 970,000.00**			
Road Segment 4 - Parade Ground Parking to Picnic Shelter Crosswalk							
Road reconstruction - full depth	LS	$ 18,000.00	1	$ 18,000.00	8		
10-wide bituminous multiuse path	LF	$ 65.00	150	$ 9,750.00	9		
Granite curb and esplanade	LF	$ 75.00	150	$ 11,250.00	10		
Storm drainage - catch basins & storm drain	LS	$ 30,000.00	1	$ 30,000.00			
Farnsworth Road intersection reconfiguration	LS	$ 20,000.00	1	$ 20,000.00			
Gate for Farnsworth Road	EA	$ 10,000.00	1	$ 10,000.00			
Raised intersection/crosswalks at vendor area	LS	$ 10,000.00	1	$ 10,000.00			
Vendor space improvements	LS	$ 50,000.00	1	$ 50,000.00			
Electrical service and riser for Vendor space	LS	$ 15,000.00	1	$ 15,000.00			
Raised crosswalk at top of hill	LS	$ 10,000.00	1	$ 10,000.00			
Masonry posts at crosswalks	EA	$ 2,000.00	6	$ 12,000.00			
Pavement markings - lines	LF	$ 0.55	300	$ 165.00	14		
Pavement markings	SF	$ 5.00	80	$ 400.00			
Esplanade plantings	SF	$ 10.00	5393	$ 53,930.00	dscape Archiect		
Vendor space plantings	SF	$ 10.00	2052	$ 20,520.00			
Esplanade boulders	EA	$ 350.00	15	$ 5,250.00			
Split rail fence	LF	$ 100.00	100	$ 10,000.00			
Signage	SF	$ 70.00	50	$ 3,500.00			
Construction Contingency				**$ 58,000.00**	20% of construction costs		
Construction Subtotal				**$ 348,000.00**			
Design & Permitting				**$ 42,000.00**	12% of construction subtotal		
Segment Subtotal				**$ 390,000.00**			

Road Segment 5 - Picnic Shelter Croswalk to Central Parking & Humphries Road							
Road reconstruction - full depth	LF	$ 185.00	690	$ 127,650.00	8		
10-foot wide bituminous multiuse path	LF	$ 65.00	390	$ 25,350.00	9		
Granite curb and esplanade	LF	$ 75.00	510	$ 38,250.00	10		
Raised crosswalks at Central Parking exit	LS	$ 1,500.00	1	$ 1,500.00			
Masonry posts at crosswalks	EA	$ 2,000.00	4	$ 8,000.00			
Storm drainage - catch basins & storm drain	LS	$ 16,000.00	1	$ 16,000.00			
Pavement markings	LF	$ 0.55	2200	$ 1,210.00			
Pavement markings	SF	$ 5.00	95	$ 475.00			
Esplanade plantings	SF	$ 10.00	3748	$ 37,480.00			
Tree plantings at Central Parking	EA	$ 1,500.00	30	$ 45,000.00			
Split rail fence	LF	$ 100.00	370	$ 37,000.00			
Signage	SF	$ 70.00	10	$ 700.00			
Construction Contingency				**$ 68,000.00**	20% of construction costs		
Construction Subtotal				**$ 407,000.00**			
Design & Permitting				**$ 49,000.00**	12% of construction subtotal		
Segment Subtotal				**$ 456,000.00**			
Road Segment 6 - Central Parking to Captain Strout's Circle							
Road reconstruction - full depth	LF	$ 185.00	270	$ 49,950.00	8		
10-foot wide bituminous multiuse path	LF	$ 65.00	210	$ 13,650.00	9		
Granite curb and esplanade	LF	$ 75.00	350	$ 26,250.00	10		
Storm drainage - catch basins & storm drain	LS	$ 17,000.00	1	$ 17,000.00			
Raised crosswalk near Central Parking	LS	$ 2,500.00	1	$ 2,500.00			
Raised crosswalk near Capt Strout's Circle	LS	$ 5,000.00	1	$ 5,000.00			
Masonry posts at crosswalks	EA	$ 2,000.00	12	$ 24,000.00			
Pavement markings	LF	$ 0.55	800	$ 440.00			
Pavement markings	SF	$ 5.00	450	$ 2,250.00			
Esplanade plantings	SF	$ 10.00	683	$ 6,830.00			
Split rail fence	LF	$ 100.00	60	$ 6,000.00			
Signage	SF	$ 70.00	50	$ 3,500.00			
Construction Contingency				**$ 32,000.00**	20% of construction costs		
Construction Subtotal				**$ 190,000.00**			
Design & Permitting				**$ 23,000.00**	12% of construction subtotal		
Segment Subtotal				**$ 213,000.00**			
Construction Grand Total				**$ 4,161,000.00**	Includes 20% contingency		
Design & Permitting Grand Total				**$ 501,000.00**	12% of construction subtotal		
Grand Total				**$ 4,662,000.00**			
Notes:							
1. All totals and subtotals are rounded up to the nearest $1,000.							
2. In providing opinions of probable construction cost, the client understands that the Consultant has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that the Consultant's opinions of probable construction costs are made on the basis of the Consultant's professional judgment and experience. The Consultant makes no warranty, express or implied, that the bids or the negotiated cost of the Work will not vary from the Consultant's opinion of probable construction cost.							
4. Opinion of cost does not include right-of-way acquisition or environmental contamination clean up costs.							
5. Design & permitting fee estimate does not include construction phase services.							
6. Road segment 1, raised intersection/crosswalks are assumed for the entrance reconstruction. This also includes 2 rectangular rapid flashing beacons (RRFPs, solar powered) for the cross walks across Shore Road. This does not include costs for construction of the roundabout option.							
7. Road segment 1, entrance gate pillars, gate and fencing assumes northerly pillar will be relocated, new double swing gate with electric opener, relocation of existing							
8. Road reconstructrion costs assume full depth box cut and replacement with 12" Type D gravel, 6" Type A gravel , 2" 19mm HMA, and 1.5" 12.5mm HMA.							
9. Multiuse trail section assumes 10' wide trail, 15" Type D gravel & 2" HMA 9.5mm.							
10. Assumes vertical granite curb and loam/seed/mulch in esplande.							
11. Road segment 1 drainage assumes 2EA of 4' CB and 200LF of 18" SD.							
12. Raised crosswalk includes two rectangular rapid flashing beacons (RRFBs, solar powered).							
13. Masonry posts - 4 at each crosswalk.							
14. 2 - 4" white fog lines. No centerlines.							
15. (2) 4" nonmetallic conduit from Shore Rd to Ship Cove (1150 LF per 1 run).							
16. 5000 CY fill, 640 CY common excavation for multiuse path.							
17. 2 "Yield to Pedestrians" and 2 "Ped crossing (W11-2)" @ 30"x30" per sign per Crosswalk. TOTAL # of Crosswalks = 2; (8 total signs)							
18. Assumes vertical granite curb and loam/seed/mulch in esplande. Esplanade is wider in this section so higher than esplanade for note 10.							
19. 500' of 18" SD & 7 CBs							
20. Assumed 6" HMA thickness @ $175/ton							
21. Assumed 100' long x 6' high = 600 sf x $100/sf = $60,000							
22. Assumed 450 linear feet.							
23. Four (4) 30"x30" signs @ each crosswalk.							