



Portsmouth, RI Climate Resilience Planning and Financing Strategy

Produced by the
Southeast New England Program (SNEP) Network

December 2021

The SNEP Network is administered by:
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This product has been funded wholly or in part by the United States Environmental Protection Agency under Assistance Agreement SE- 00A00655-0 to the recipient. The contents of this document do not necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does the U.S. EPA endorse trade names or recommend the use of any products, services or enterprises mentioned in this document.

Introduction to SNEP Network. In 2019, the US Environmental Protection Agency (US EPA) awarded a five-year cooperative agreement to the New England Environmental Finance Center (New England EFC) at the University of Southern Maine to establish a technical assistance network to support the work of multiple partner organizations that provide training and assistance to municipalities, organizations, and tribes across the region. The purpose of the network is to advance stormwater management, ecological restoration, and climate resilience within Rhode Island and southeastern Massachusetts. An important overarching component of the network is to create sustainable revenue streams and financing processes in support of local implementation efforts now and into the future.

The Southeast New England Program (SNEP) Technical Assistance Network (“the SNEP Network” or “the Network”) is composed of over 16 different partner organizations from across the region, thereby offering a full complement of technical and financial services to communities in support of leadership development and peer-to-peer learning. The Network’s collective goals are to bring about a broader understanding of the impacts of stormwater facing the community, and to overcome implementation barriers through capacity building and innovative financing systems.

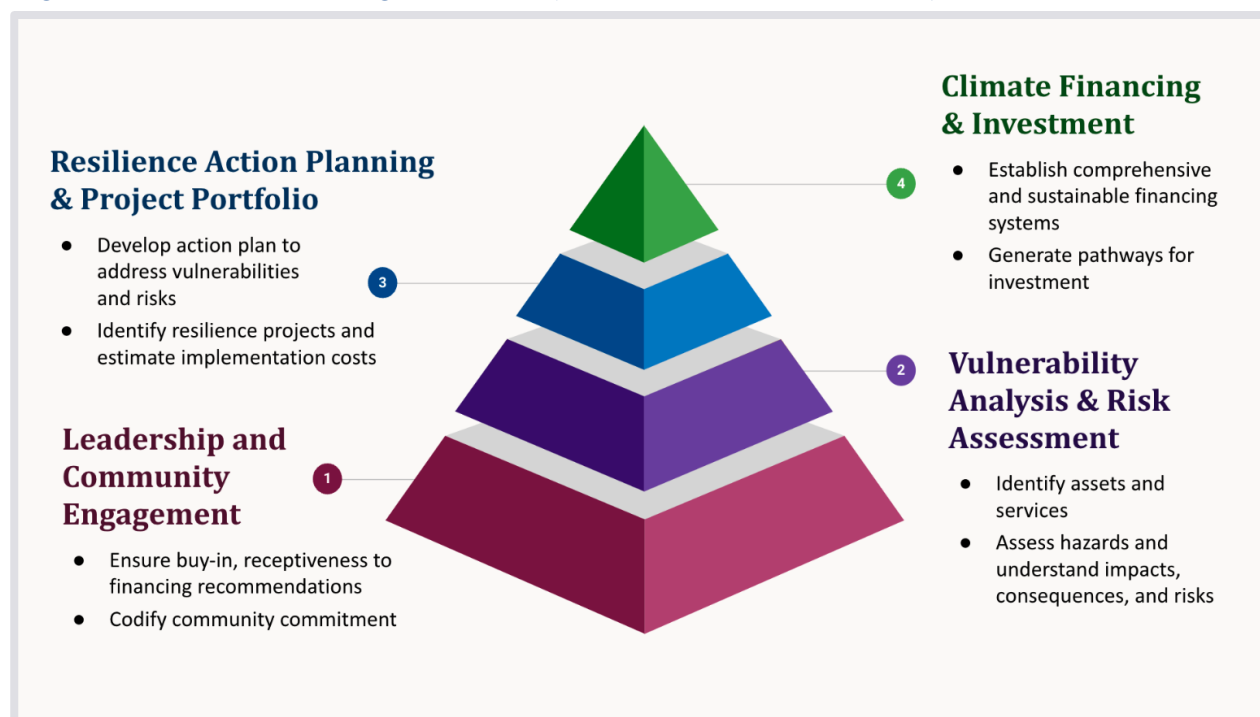
Executive Summary. The effects of climate change are already being felt across the State of Rhode Island generally, as well as in the Town of Portsmouth (“the Town”) specifically. In 2019, the Town of Portsmouth held a Community Resilience Building Workshop as part of the Rhode Island Municipal Resilience Program’s (MRP) efforts to engage community stakeholders to identify climate-related hazards, areas of vulnerability, and proposed projects and policies to enhance resilience. The [MRP Summary of Findings report](#) provided a solid foundation for larger resilience conversations within the Town; however, the community recognized the need for more comprehensive, long-term resiliency planning. Through the support of US EPA and the SNEP Network, the Climate Resilience Planning and Financing Project Team (“the SNEP Project Team”) worked directly with Portsmouth municipal leadership and a group of community stakeholders to address the impacts of climate change through the lens of long-term climate resiliency and sustainable financing.

Project Overview. Portsmouth applied for technical assistance support from the SNEP Network in Spring 2021. After conversations between Network partners and the Town, it was agreed that the technical assistance awarded to the Town would include (1) a facilitated process of identifying a list of high priority capital needs, as well as (2) support in hosting a workshop to solicit public input and secure community buy-in, (3) consultant services through the New England EFC to provide order of magnitude cost-estimates for priority capital projects, and (4) leadership engagement to ensure support for climate resilience planning and financing. It was also agreed that the findings of this technical assistance would be compiled and presented as a project deliverable in this Climate Resilience Planning and Financing Strategy.

Project Approach. The approach taken by the SNEP Project Team follows the step-by-step Resilience Financing Framework (*see Fig. 1*) laid out in the [Planning to Action: Climate Toolkit](#) (“PACT” or “the Toolkit”). PACT is a resource developed by [Throwe Environmental, LLC](#) to guide communities from the earliest stages of resilience planning through the latter stages of implementation and financing. PACT is an adaptation of the existing [US Climate Toolkit](#).

In collaboration with Town leadership, the SNEP Project Team formed a 35-member Climate Resilience Workgroup (“CRWG” or “the Workgroup”) of municipal staff and community

Figure 1: Resilience Financing Framework (Source: Throwe Environmental)



stakeholders to build on the strong levels of community engagement seen in the MRP workshop. Starting in April 2021, the CRWG convened regularly for conversations related to climate resilience and sustainable financing, as well as to respond to and provide feedback on the research, work products, and deliverables produced by the SNEP Project Team.

The SNEP Project Team, led by Throwe Environmental and Elizabeth Scott Consulting, conducted multiple resilience assessment and planning exercises to better understand the resilience challenges and opportunities facing the Town. The SNEP Project Team also used these activities to compile and refine a priority list of resilience-focused capital infrastructure projects and associated programs in the Town. The findings from these activities and the Project Team’s final recommendations are detailed in the following sections.

PART I: COMMUNITY ASSESSMENT AND LEADERSHIP ENGAGEMENT.

The first step of the Resilience Financing Framework considers engagement and buy-in from community leadership and stakeholders. The SNEP Project Team conducted a Resilience Capacity Review (“RCR”) to gauge the Town’s current approach to resiliency, as well as opportunities for enhancing that approach. The RCR consists of ten question-and-answer prompts that are distributed throughout this report. The first three questions explore how Portsmouth defines resilience and integrates resiliency into municipal operations.

Resilience Capacity Review Questions:

RCR #1) Is there a clear existing town-wide definition of, and community-based vision for, resilience that considers environmental, economic, and social resiliency? The Town of Portsmouth has an existing comprehensive resilience definition that considers all aspects of

resiliency. This definition pulls from external sources, such as the National Oceanic and Atmospheric Administration. Portsmouth's resilience vision is embedded in the Town's Comprehensive Community Plan (CCP), which is in public draft review as of March 2021 (*see quotation below*). Portsmouth is also moving to incorporate resilience-based thinking into townwide decision-making processes. Portsmouth's strong resilience foundation will make it easier to communicate the importance of investing in the Town's most vulnerable areas.

“Resilience is the ability from recover from a challenging event . . . However, from a planning perspective, resilience must be thought of as not just bouncing back but bouncing forward – not simply to return to a previous state, but to create a better, more thriving community, able to recover quicker, with less disruption.”

“Economic resilience is addressing the costs of building community resilience and the cost of failing to do so. Societal resilience involves minimizing human vulnerabilities to disasters and strengthening our social and institutional foundations. . . Ecological resilience is maintaining a healthy natural environment which in turn acts to protect our community against natural hazard events.” – Portsmouth Draft CCP, 2021

RCR #2) Is there an understanding of how resilience issues fit into other community priorities (e.g., economic development)? There is a good understanding of how these issues fit into other priorities across the community, and this understanding will only improve when the CCP is finalized. Town staff expect the connections to climate change to more clearly articulate Portsmouth's commitment to proactively addressing climate challenges.

RCR #3) Are regulatory, planning, and implementation activities coordinated across departments and carried out in synchronization? Portsmouth leadership has shown an increasingly dedicated commitment to town-wide coordination. This strategy of interdepartmental engagement aims to coordinate elements and objectives to meet shared goals. Current and future planning activities will likely continue to underscore this commitment.

Leadership Engagement. The SNEP Project Team took a two-pronged approach to the leadership engagement piece of the Portsmouth project. First, the SNEP Network, in partnership with the [Association for Climate Change Officers](#) (ACCO), offered [free scholarships](#) to Portsmouth community leaders to take part in ACCO's [Climate Change Professional \(CC-P®\) certification program](#). Upon completion of the CC-P, participants in the program will have had access to over 14 hours of peer-to-peer learning and climate change training to enhance their competency in the fundamentals of climate change preparedness and strategic planning.

Second, the SNEP Project Team provided Portsmouth with a large-scale engagement opportunity through the EPA Region 1 [“Soak Up the Rain” webinar program](#). This monthly webinar series highlights innovative approaches to addressing stormwater quality and quantity issues across New England, bringing these case studies to a national audience. In conjunction with EPA program staff, Throwe Environmental developed an [August 2021 webinar](#), entitled **“Addressing Stormwater**

Flooding through Resilience Action Strategies and Sustainable Financing,” that featured two SNEP Network technical assistance projects in Portsmouth, RI and Bourne, MA. Portsmouth Town Planner Gary Crosby and University of Rhode Island (URI) Coastal Resources Center (CRC) Associate Coastal Manager Pam Rubinoff were featured as community panelists representing Portsmouth. The webinar highlighted the innovative approach of the Portsmouth/SNEP Network project, as well as the strong record of community and leadership engagement in the Town. Once publicly available, the webinar recording will be linked [here](#).

Summary of Findings: Community Assessment & Leadership Engagement. The Town of Portsmouth has clearly demonstrated a strong community interest in proactively addressing the risks and impacts of climate change. This broad community support is documented in several places, including the Town’s Hazard Mitigation Plan, the draft CCP, and the MRP report. Additionally, the strong level of stakeholder engagement throughout the SNEP project indicates that there is not only a genuine desire to plan for climate change in Portsmouth, but that this desire can and has been activated through strategic, community-led planning efforts.

Additionally, there is clear engagement in resilience topics on behalf of Town officials and leadership. While there is currently no dedicated municipal position through which all resilience activities are coordinated, the various Town departments (Planning, Public Works, Town Administrator, etc.) have a record of collaboratively tackling resiliency challenges head-on.

The strong base of community and leadership engagement serves as a critical foundation for the remaining components of the Resilience Financing Framework. In other words, Portsmouth’s commitment to addressing the impacts of a changing climate enables the community to seriously consider its priorities for actions, as well as the key steps and mechanisms necessary for implementation, funding, and financing.

PART II: RESILIENCE PRIORITIZATION & ACTION PORTFOLIO

This section addresses the second and third stages of resilience planning: prioritization by way of a vulnerability and risk assessment, and resilience action planning. RCR questions 4–7 were used to assess the Town’s assessment and planning efforts thus far.

Resilience Capacity Review Questions:

RCR #4) Has the community identified and inventoried the assets (e.g., cultural, capital, economic, etc.) that are valued in relation to resilience? Portsmouth’s several documents provide a range of inventories. The [2018 Hazard Mitigation Plan \(HMP\)](#) categorizes assets generally. Similarly, the 2019 MRP Summary of Findings report lists several categories and locations that workshop participants identified to be of concern. These assets cover infrastructural, ecosystem, community, and social categories. Portsmouth also works with Jacobs Engineering to produce an annual assessment on the condition of Town facilities. The 2019 Jacobs Report identified \$12.7M in facility needs between 2019–2024.

The draft CCP recommends creating and maintaining a baseline asset inventory. This commitment to an up-to-date and inclusive inventory will help the Town understand the extent of its capital needs. Additionally, the Town will need to directly consider the climate impacts on those assets in order to produce accurate cost estimates.

RCR #5) Does the community have a clear understanding of the hazards it's facing and the assets that are exposed to those hazards? Does the community understand how to characterize relative vulnerability and risk? The Town has a good understanding of community hazards with the HMP providing a wealth of information on natural hazards. The HMP Committee used hazard frequency, potential extent of damage, and potential impacts as metrics to rank the level of concern/risk for each hazard (*see Fig. 2*).

Town staff have noted that hazards are sometimes ranked based on funding need or availability. Additionally, some reports have conflicting information on level of concern (e.g., sea-level rise is listed as low-risk in the HMP and as top-risk in the MRP). The Resilience Capital Improvement Plan ("RCIP") and future planning activities should help to clearly articulate resilience priorities.

RCR #6) Does the community have a clear understanding of potential mitigation steps, as well as the systems necessary to support mitigating risk? The HMP is the best source of information available for understanding mitigation steps. Beginning in Chapter 6, actions are listed with significant detail (priority level, risk, cost, etc.). HMP mitigation actions are updated with the entire plan on a five-year basis, with the next update scheduled for 2023.

Actions are also listed in the MRP report, though with less detail. Additional recommendations are listed in the regional 2017 Aquidneck Island Resilience Strategy (AIRS), though this document is more educational and does not list out which town(s) will take responsibility for each action. The 2019 Common Fence Point Community Resilience Building document lists details and potential actions along with level of priority for many of the assets (although not a complete list) in this extremely vulnerable part of town.

In summary, Portsmouth has ample documentation to understand the mitigation steps needed to become more resilient. However, the Town does not necessarily have the resources or assigned responsible parties in place to hold accountable to complete actions. Portsmouth does have the right economic, social, and infrastructural systems available to manage many of the proposed actions. The development of the RCIP should provide key details on action items, including timelines, cost-estimates, and parties responsible.

RCR #7) Does the community have a clear understanding of how short-, mid-, and long-term action steps should be prioritized?

Portsmouth does not appear to have a systematic method for tracking mitigation and prioritizing actions, either through the budget process or allocation of work assignments. However, Portsmouth does have a very engaged council and staff that have set up processes to prioritize and implement actions moving forward. The Town also has an engaged community interested

Figure 2: Portsmouth Climate Hazards
(Source: Portsmouth HMP)

HIGH	MEDIUM	LOW
Hurricane	Ice Storm	Brushfire
Nor'easter	Street Flooding	Dam Failure
Coastal Flooding	Extreme Temps.	Earthquake
Snowstorm	Drought	Hail
High Winds		Lightning
		Tornado
		Sea Level Rise
		Tsunami

in participating in future resilience planning activities. Remaining challenges that may impact implementation include competing priorities, lack of dedicated funding, and capacity limitations.

There is value in Portsmouth being part of Aquidneck Island that should not be discounted when prioritizing action steps. State, federal, and philanthropic resources are much more accessible when collaboration and cooperation exists among municipalities on a shared topic or action (such as those recommendations coming from the AIRS). The same could be said of the close proximity to the Towns of Tiverton and Little Compton. Regional collaboration could be a way to allow Portsmouth to provide scale on certain projects and to attract funding to complete certain actions and strengthen existing capacity.

Naval Station Newport (NAVSTA Newport) also offers a real opportunity for partnership and island-wide engagement and planning. Lines of communication are open between Aquidneck Island municipalities and NAVSTA Newport, with regular quarterly meetings and engagement with Navy contacts.

Resilience Capital Improvement Program. Despite ample information related to climate hazards, asset vulnerabilities, and potential mitigation options, the Town has not yet established a means of prioritizing actions. A clear method of prioritization is needed to ensure that necessary infrastructure and resiliency needs are embedded into all aspects of municipal governance and investment.

To that end, the SNEP Project Team worked with the Town of Portsmouth to develop an innovative yet familiar method of tracking resilience action item data. This tool, called the Resilience Capital Improvement Program (RCIP), adapts the key components of a traditional CIP. The RCIP works to elevate those projects and associated programs that enhance climate resilience.

In developing the RCIP, the SNEP Project Team extracted mitigation action recommendations from the HMP and MRP reports, the Project Team's literature review, and CRWG meeting notes. These action items were compiled into one "master list" of mitigation actions. The SNEP Project Team then worked with the CRWG Subgroup to narrow down this list to include only priority resilience actions that have not been completed and/or do not have funding secured to date. Actions that were capital in nature, clearly focused on enhancing resilience, **and** were financeable were grouped into the core RCIP master list of capital items. Other action items that were programmatic in nature (i.e., assessments, planning studies), were ongoing or recurring, or supported capital projects were grouped onto a secondary list of programmatic items.

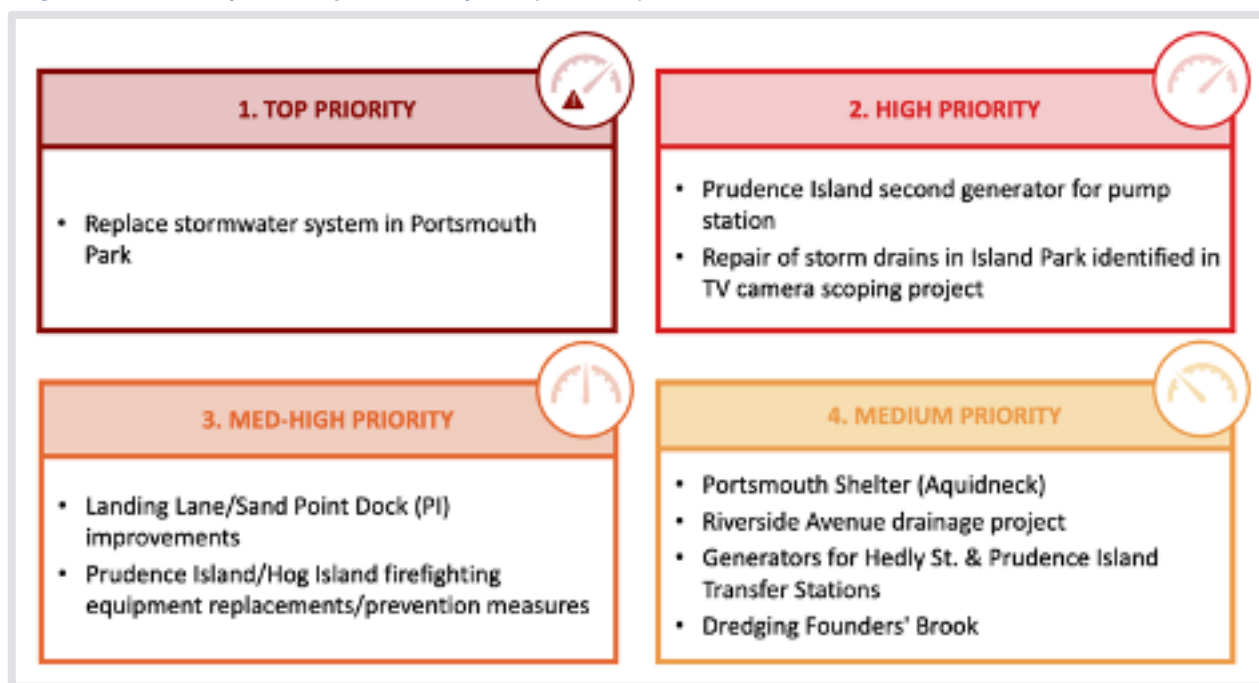
CRWG members were then asked to provide feedback on the draft RCIP list during and after a meeting of the Workgroup. The RCIP was also presented during the public "Climate Resiliency Planning & Financing Strategy Workshop" on October 7, 2021. The workshop was hosted by the Town of Portsmouth, and supported by staff from Elizabeth Scott Consulting, the University of Rhode Island Coastal Resources Center, and Throwe Environmental. The workshop was announced on the Town website and marked in the local press. The goals of the workshop were to detail the activities of the SNEP/Portsmouth project to date, make the case for a strategic approach to long-term climate resiliency planning and financing, and to solicit feedback on the draft RCIP. Following the workshop, the SNEP Project Team worked with Town staff to edit and finalize the RCIP based on the feedback received from the public and the CRWG. The full and final RCIP list consists of nine (9) capital projects and nineteen (19) programmatic items, and is attached in Appendix A.

While the SNEP Network and Portsmouth collaborated to complete the RCIP spreadsheet, the resource should exist as a living document. The Town of Portsmouth should revisit the RCIP process on an annual basis, as it would with other capital planning tools, so that it may continue as a resource to inform capital planning and resilience investments as a whole.

Analyzing RCIP Projects. The easiest way to analyze the projects on the RCIP capital list is by grouping them, which can be done in a number of ways: by priority level, timeline, geography, or focus area. Each grouping contributes to the overall narrative that the RCIP provides as a snapshot of Portsmouth’s current resilience needs.

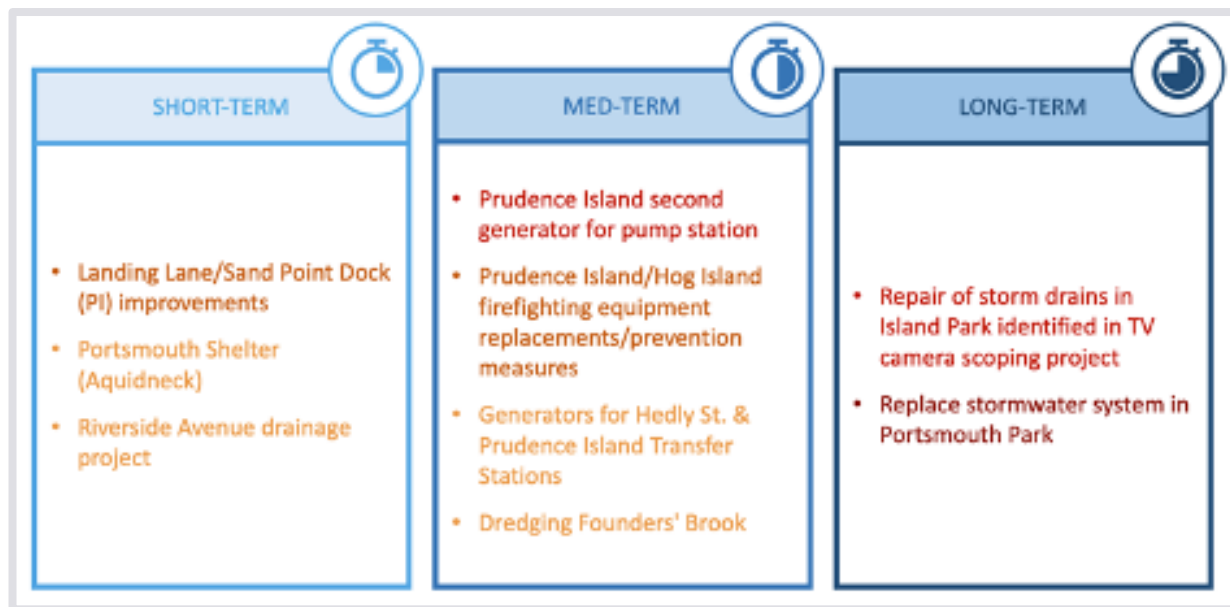
RCIP Capital Projects: Priority Level. Grouping RCIP projects by priority (*see Fig. 3*) shows that the Town has a clear understanding of its top capital priority—the replacement of the Portsmouth Park stormwater system. Additionally, other projects are fairly evenly distributed across high–medium priorities, leaving the Town with a clear hierarchy of priorities.

Figure 3: RCIP Capital Projects Grouped by Priority Level



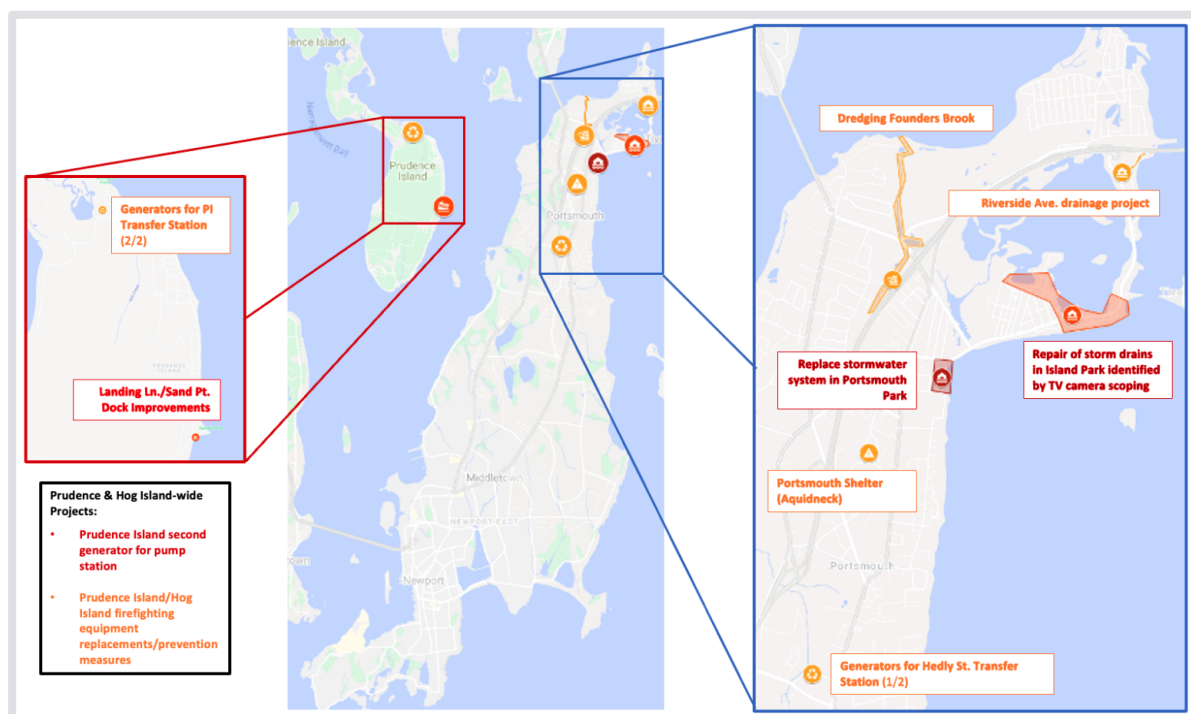
RCIP Capital Projects: Timeline. Organizing RCIP projects by timeline (*see Fig. 4*) helps to provide a more complete picture of the Town’s capital resilience needs. Most of Portsmouth’s RCIP carry a medium-term timeline, meaning they are to be initiated within 3-5 years. Interestingly, the top and high priority projects (indicated by shades of red) are clustered in the medium- and long-term timeline categories. Therefore, while these projects are of high importance, the scale of the projects themselves cause them to require longer-term time commitments.

Figure 4: RCIP Capital Projects Grouped by Timeline



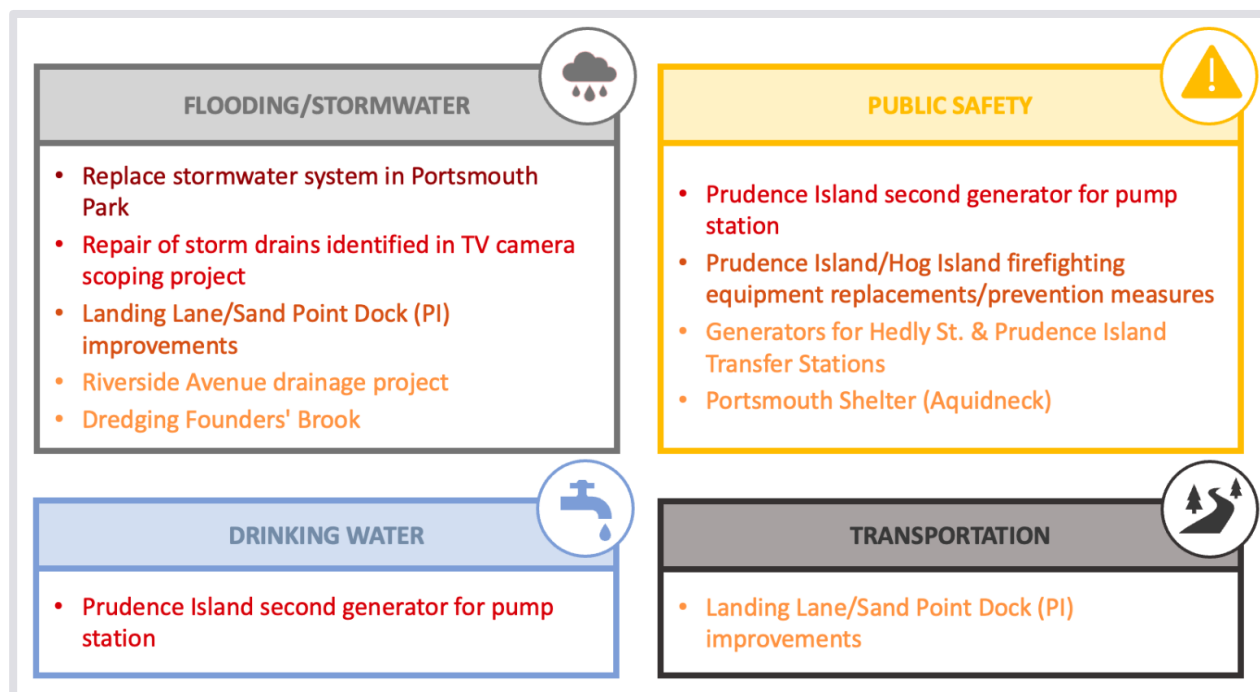
RCIP Capital Projects: Geography. Overlaying the RCIP on a map of the Town (*see Fig. 5*) reveals where most of the projects are geographically focused. Portsmouth's low-lying and/or isolated neighborhoods of Common Fence Point, Island Park, and Prudence Island are home to nearly all of the RCIP projects, including all of the top or high priority actions. The concentration of projects in these areas underscores the importance of enhancing resilience in the already vulnerable areas of the community.

Figure 5: RCIP Capital Projects Grouped by Geography



RCIP Capital Projects: Focus Area. Grouping RCIP projects by the focus or issue area they address (*see Fig. 6*) paints a picture of the climate-related challenges that Portsmouth is facing. Projects predominantly fall in the flooding and stormwater category, underscoring the magnitude of the Town’s stormwater/drainage issues highlighted in the HMP, MRP, and other planning documents. Additionally, several projects can be categorized as related to public safety, a topic that was prominent in CRWG meeting discussions. In general, CRWG members identified the need for improved shelter and emergency management capacities to respond to a climate emergency.

Figure 6: RCIP Capital Projects Grouped by Focus Area



Consultant Cost Estimates. As agreed upon in the project Memorandum of Agreement, the SNEP Network is also providing consultant services, free of charge, to the Town to produce cost-estimates on several of the higher priority items (*see Fig. 7*) that emerged from the RCIP exercise. More specifically, [Pare Corporation](#) (“Pare” or “the Consultants”) has been retained by the SNEP Network to provide guidance and work with Town staff to provide cost estimates that will be utilized for planning purposes on four (4) high priority infrastructure projects, and planning level scopes of work for two (2) programmatic priorities identified in the RCIP. The deliverables (*see Appendix C*) will inform the Town’s decisions about the most appropriate funding/financing options to advance these high priority capital projects and next generation resilience studies, as detailed below:

- **Project 1 - Replacement of Stormwater System in Portsmouth Park:** Pare will provide a stand-alone document of budgetary construction costs anticipated for approximately 2,000 lineal feet of stormwater drainage pipe, including 19 pre-cast catch basins located within Narragansett Avenue and Aquidneck Avenue, including any connecting streets.

- **Project 2 - Repair of Storm Drains in Island Park:** Pare will provide stand-alone documentation of the construction costs anticipated for six drainpipes that need repair or replacement as identified in the Town's Close Circuit TV scoping project as listed in the RFP.
- **Project 3 - Generators for the Hedly Street and Prudence Island Transfer Stations:** Pare will provide stand-alone documentation of the construction costs anticipated for two mobile generators, including the necessary accessories, diesel tank(s), and minor electrical work.
- **Project 4 - Riverside Avenue Drainage Project:** Pare will evaluate the need for an underground galley type drainage system to infiltrate/treat stormwater that collects at the low point of Riverside Avenue to eliminate flooding. This evaluation will provide a conceptual design of the underground stormwater infiltration system, list of permits anticipated, and the estimated costs to construct.
- **Project 5 - Island Park Sea Level Rise Adaptation Planning Study:** Pare will prepare a stand-alone planning-level scope of work and an estimate of engineering fees required to produce a study to identify strategies, including capital improvements, to enhance the resiliency of town, state, and private infrastructure in Island Park as related to sea-level rise and adaptation planning. The scope of work will be prepared utilizing conditions of a 1-foot sea-level rise by year 2035 and a 3-foot sea-level rise by year 2050. This task will also utilize readily available tools such as RI [STORMTOOLS](#) and other online GIS data and/or documents to prepare the scope of work for this study.
- **Project 6 - Town-wide Road and Drainage System Assessment/Analysis:** Pare will prepare a stand-alone planning-level scope of work and an estimate of engineering fees required to produce an assessment study for Town-owned or Town-maintained roadways and drainage systems relative to existing conditions, as well as the need for replacement and/or upgrade due to potential changes in increased precipitation as a result of future climate change. The assessment study will be used by the Town to identify needed capital improvements to support ongoing efforts to attain resiliency into the Town's infrastructure.

Summary of Findings: Resilience Prioritization & Action Portfolio. The Town of Portsmouth has a good understanding of the climate hazards it faces and the assets that are vulnerable to those hazards. Additionally, the Town has thoroughly explored the range of mitigation actions that are needed to address its climate risks and vulnerabilities; however, the Town did not have a process of prioritizing various actions across Town planning documents. The RCIP fills the gap that existed around action prioritization, allowing the Town to aggregate action information and focus on priority options.

Additionally, the RCIP elevates capital infrastructure projects that address resiliency, allowing them to compete with other capital priorities where they might normally be unable to. As a result, the RCIP is a tool that allows Portsmouth to maintain a strong and up-to-date portfolio of resilience projects, while also enabling the Town to easily identify magnitude of cost estimates associated

Figure 7: RCIP Capital Projects and Programmatic Items Included in Cost-Estimates

CAPITAL RCIP PROJECTS INCLUDED IN CONSULTANT COST-ESTIMATES				
Project Name	Priority	Timeline	Details	Reference Doc
Replace stormwater system in Portsmouth Park (Aquidneck Ave and Narragansett Ave)	TOP (#1)	Long-term (5yrs+)	Need to replace approx 2000 ft of stormwater pipe and install 19 pre-cast catch basins on Narragansett and Aquidneck Avenues and connecting streets.	CRWG Subgroup Meetings, Illicit Discharges Report
Repair of stormdrains in Island Park identified in TV camera scoping project	HIGH	Long-term (5yrs+)	Six pipes are to be repaired or replaced. See the separate list of specific drainage lines needing work.	CRWG Subgroup Meetings, Illicit Discharges Report
Riverside Avenue drainage project	MED-HIGH	Short-term (0-3yrs)	Underground Injection System needed to mitigate flooding	HMP
Generators for Hedly St. & Prudence Island Transfer Stations	MEDIUM	Med-term (3-5yrs)	Mobile generators with some accessory needs	FY22-30 Capital Requests, HMP

PROGRAMMATIC RCIP ITEMS INCLUDED IN CONSULTANT COST-ESTIMATES				
Program Name	Priority	Timeline	Details	Reference Doc
Island Park Sea Level Rise Adaptation Planning Study	TOP (#1)	Short-term (0-3yrs)	Sea level rise adaptation planning needed to identify strategies (including capital improvements) to enhance Island Park resilience	CRWG Meetings
Townwide Road and Drainage System Assessment/Analysis	HIGH	Short-term (0-3yrs)	Assessment of Town-owned (maintained) road and drainage system assets (conditions, need for replacement/upgrade) townwide taking into consideration projected changes in precipitation is needed.	Subgroup Meetings

with those projects. In turn, this positions Portsmouth well for a thorough consideration of sustainable funding and financing options to support its array of resilience projects and programs.

PART III: SUSTAINABLE FUNDING AND FINANCING.

The transition from the planning stages to project implementation relies heavily on the appropriate funding and financing schemes. Embedding funding and financing in the conversation early in the planning process can lead to more effective systems that meet the level of investment required. To that end, RCR questions 8–10 are intended to gauge the Town’s approach to funding and financing.

Resilience Capacity Review Questions:

RCR #8) Does the community currently have the revenue streams, procurement procedures, and financing systems in place to support resilience infrastructure and financing? Portsmouth currently does not have dedicated funding in place specifically for resilience needs. Typically, the Town funds resilience projects through general funds and grants. Each August, the Town prioritizes and allocates funding for annual capital expenditures from the general fund, while pursuing grant opportunities for other specialized projects. Town staff find that this approach leaves resilience projects competing with other priorities.

Portsmouth tries to maximize in-kind services for matching funds, though this strategy is increasingly difficult as Public Works services are spread thin. The Town is proactively addressing these issues by building up a small contingency fund (currently ~\$300K) and additional non-earmarked CIP reserve funding/cash-on-hand (currently ~\$300K) that can be used for studies or match. Town staff aim to continue building these funds over time.

Procurement in Portsmouth is divided into two processes. If procurement exceeds \$5,000 for general purposes and \$10,000 for construction, an RFP process is triggered. This process is the preferred method, and it follows state guidelines and clearly articulates metrics for decisions. When procurement falls below these thresholds, standard operating procedure is to get three price quotes and negotiate. Additionally, the town is allowed to take bidders directly off a master price agreement list.

The Town expects funding from the American Rescue Plan Act (“ARPA”) of 2021 (Public Law No: 117-2) to be a significant new source of funding. Town staff anticipate \$3.5M in funding (after accounting for lost revenues and new projects). Currently, ARPA funding is being steered towards water, sewer, and broadband improvements (green, gray, and hybrid). While there is little guidance on how funding will be distributed, Portsmouth and other municipalities will likely have to gain approval from Town Council and the state for proposed use of funds. Portsmouth has welcomed recommendations from the SNEP Project Team related to use of ARPA funding.

RCR #9) Has the community assessed how existing processes will need to be adapted to establish a sustainable and scalable financing system? Currently, most stormwater improvements are funded through the DPW operating budget. Portsmouth considered a stormwater management district/fee around 2017–2018, an approach which would grant these projects stable and dedicated funding. The idea faced significant political obstacles, as did a similar idea in the Town of Middletown. Town staff believe the future political climate might be more ideal to reintroduce this proposed funding opportunity.

Capacity issues (i.e., size, bandwidth) limit Town staff’s ability to take advantage of every available grant opportunity. In some instances, Portsmouth is unaware of grant opportunities, finds opportunities off-cycle, or cannot meet the match requirements. Staff are open to regional staffing/contracting opportunities to help address capacity issues related to grants.

RCR #10) Has the community considered innovative financing options that could draw in outside capital and investment for resilience infrastructure? While some options have been mentioned, the community has not yet seriously considered innovative financing options (e.g., TIFs, P3s, stormwater utilities, or enterprise funds). One previous experience using TIF on a small

project led to some confusion, suggesting that a comprehensive education strategy would be needed for innovative financing.

Criteria for Funding. The “Criteria for Funding” exercise was a process of developing metrics that the Town can use to quickly categorize projects by the term of funding need. In other words, the term of funding needed for a given project corresponds to the category in which it fits best. Characteristics of different projects are summarized below, and listed in full in Appendix B.

- **Short-term projects** are those that are to be initiated within 0-3 years. They address acute or recurring problems or fill information gaps about problems. Short-term projects decrease the likelihood of serious damage or loss of life and address critical facilities and top/high priority assets. They assess the criticality of threats to vulnerable ecosystems and/or populations; address stormwater issues with long-term implications; address low-lying areas; and enhance emergency services, economic and financial systems, communications, and operational activities.
- **Medium-term projects** are those that are to be initiated within 3-5 years. They address incremental problems or those that will become acute in the med-term. Medium-term projects address vulnerable town geographies (i.e., Common Fence Point, Island Park, Prudence Island), public facilities, and changing natural systems. They address the effects of hazards of high concern. They create systemic redundancies, promote regional coordination, and work to improve infrastructure networks. Medium-term projects address open space, housing, and community design goals, as well as those goals laid out in the HMP and MRP.
- **Long-term projects** are those that are to be initiated in 5 or more years. These projects address chronic and ongoing problems, or those that will become acute in the long-term. They address hazards of medium or low concern, as well as low priority assets. Long-term projects restore natural systems, address wildlife changes, enhance historical culture, and improve recreation.

While these criteria will not be applicable in every situation, they offer the Town another tool for resilience planning and financing. The criteria and the RCIP process were both used to establish timelines for funding opportunities, which were discussed further with Portsmouth municipal staff and leadership.

Resilience Funding and Financing Discussions. Throughout the duration of the SNEP/Portsmouth project, the Project Team had multiple discussions about potential opportunities for resilience funding and financing. In general, the group explored opportunities for short- and longer-term investment.

The SNEP Project Team engaged the Rhode Island Infrastructure Bank (RIIB) in these conversations. RIIB staff emphasized the importance of building on the momentum from the SNEP effort by identifying funding to support implementation of one or more of the RCIP projects. RIIB also encouraged the Town to take a holistic, process-based approach to the funding process. In other words, RIIB seems to encourage first considering the projects in need of a certain amount of funding before actually identifying the funding itself, rather than making projects fit a particular funding source.

Summary of Findings: Sustainable Funding & Financing. While Portsmouth currently does not have innovative and sustainable financing systems and mechanisms dedicated to resilience in place, the Town is actively exploring their options. This project through the SNEP Network, as well as conversations with outside organizations like the RIIB, demonstrate the Town's desire to pursue long-term, sustainable resilience funding and financing options. While current municipal structures might not support these innovative financing systems, the Town has a clear and growing understanding of the adaptations that will be needed to meet the challenges of climate resilience funding and financing. To that end, the following recommendations highlight the suggested next steps for the Town of Portsmouth to continue moving forward on sustainable funding, financing, and resilience planning.

PART IV: RECOMMENDATIONS.

With the project findings as the foundation, the SNEP Project Team recommends the following options as next steps to guide further resilience planning and sustainable financing in the Town of Portsmouth. As with the rest of this report, these recommendations are organized within the four steps of the Resilience Financing Framework that guided this project.

Recommendations: Community Assessment & Leadership Engagement

Recommendation 1: Establish a Portsmouth Resilience Program. A central component of Portsmouth's resilience efforts to date has been the development of the RCIP. Again, this process enables local leaders to effectively rank resilience actions within the broader suite of community investment needs and priorities. This first iteration of the RCIP has proven that effective resilience efforts in Portsmouth will require the coordination and engagement of virtually every department and agency that impacts the Town's capital planning and implementation process. Therefore, it is imperative that the Town establishes a formal Portsmouth Resilience Program ("the Resilience Program" or "the Program") that is designed to:

- Coordinate programmatic activities among existing programs and agencies;
- Lead efforts to develop and implement a resilience plan and action strategy;
- Help Town staff anticipate and plan for climate resilience infrastructure needs in the future;
- Serve as the primary conduit of information and outreach to citizens and businesses; and
- Identify the most efficient and effective mechanisms for funding and financing resilience infrastructure projects.

Though the resilience program will work directly with a range of local staff and programs, it should sit independently from existing agencies. Additionally, given the significant impact that climate resilience planning, financing, and implementation will have on multiple agencies and programs within the Town, our recommendation is that the resilience program leadership report directly to the Town Administrator. That is addressed in more detail in Recommendation 2.

Recommendation 2: Establish a Portsmouth Climate Resilience Program Director position. The Portsmouth Resilience Program will require dedicated leadership. Despite strong levels of community and leadership engagement and support, there remains a need for deliberate and dedicated coordination on climate resilience issues in the Town. To that end, an important first

step for Portsmouth will be to establish a municipal Climate Resilience Program Director (“the Resilience Director” or “the Director”). This position should report directly to the Town Administrator and should work in close collaboration with existing department heads and staff. The Resilience Director should also work closely with external organizations, including RIIB. As RIIB works to establish its own pilot Aquidneck Island Regional Resilience Coordinator, it will be imperative that the Resilience Director is well connected to intra- and extra-municipal efforts to enhance resiliency across Portsmouth and greater Aquidneck Island.

It should be the Resilience Director’s mission to manage and direct the Resilience Program, thereby ensuring Town infrastructure investments are working to achieve Portsmouth’s resilience vision and goals. The Resilience Director should also be responsible for the resilience planning and programmatic activities outlined in the recommendations that follow.

Recommendations: Resilience Prioritization & Action Portfolio

Recommendation 3: Develop and implement a dynamic hazard, risk, and vulnerability assessment process. One of the most fundamental responsibilities of the Resilience Director should be to ensure hazard, risk, and vulnerability assessments are up-to-date and reliable on an individual **and** holistic basis. To that end, Recommendation 3 is two-fold.

Firstly, we recommend that the Town adopts an adaptive process of assessing hazards, risks, and vulnerabilities on a project-by-project basis. The scale of climate impacts will not only require direct investments in new resilience infrastructure, but also indirect investments that make existing infrastructure resilient. Establishing an individualized assessment procedure will allow the Town to consider resilience in each of its infrastructure investments, even if a project is not directly charged with protecting the community against climate impacts. Specifically, the analysis should include four components:

- An inventory of the climate hazards that will potentially put the Town’s assets and resources at risk;
- An assessment of the Town’s vulnerability to those risks;
- An assessment of the impact that climate hazards will likely have on the Town’s assets and resources, including an estimate of the economic and financial costs; and
- The development of a suite of criteria for taking mitigation actions.

These four components of the risk and vulnerability assessment process will enable Town leaders to identify infrastructure investment needs and target resources more efficiently and effectively to those needs. Through its existing planning activities, Portsmouth has already done an excellent job of preparing for this recommendation. This process could be carried out by simply consulting the HMP, MRP, and/or other documents. The Town is also positioning itself well to take up future resilience planning. For instance, two studies identified and prioritized in the RCIP (the Island Park Sea-Level Rise Adaptation Planning Study and the Townwide Road and Drainage System Assessment/Analysis study) are being scoped out by the SNEP Network supported consultant.

Secondly, we recommend the Town commits to continuously reevaluating its more comprehensive, townwide risk and vulnerability assessments to ensure it is operating with the most up-to-date data available. Whereas planning documents become outdated over time, this should be done on a

more periodic basis. In some instances, this may be done through scheduled plan updates; in others, the Town should consider reconvening the appropriate community workgroups to reassess where climate resilience planning efforts should focus their attention. These activities—both the project-by-project and townwide risk and vulnerability assessments—would fall within the purview of the Resilience Director.

Recommendation 4: Use risk and vulnerability analysis to expand RCIP into a detailed project portfolio, segregated among the three categories. The development of the RCIP that took place throughout this project should provide Portsmouth with a good basis for future RCIP planning. As any other capital infrastructure planning exercise, the RCIP should be revisited on an annual basis. As projects are completed and new projects emerge, they should be moved off and added onto the list, respectively.

In the RCIP, the Town identified the need for an up-to-date list of “shovel ready” resilience projects that it can draw upon when funding opportunities arise. To that end, we recommend Portsmouth uses the RCIP process to produce that “shovel ready” list. Early conversations indicate that RIIB and other funding agencies are eager to work with communities that are ready and committed to enhancing their climate resilience. Therefore, it behooves Portsmouth to be as prepared as possible for funding opportunities that exist, both in the near- and longer-term.

The Director should also seek to further expand the RCIP process by classifying items across three project categories or typologies:

1. **Baseline** projects and programs provide structure to the Town’s resilience system, including staffing support (specifically the Resilience Director), necessary studies and assessments (such as the risk and vulnerability analysis), and implementation of catalytic projects. Baseline programs also include emergency management and hazard/disaster-response contingency funding.
2. **Enterprise** or outcome-based projects and programs are focused on many of the essential services that Portsmouth government provides to its residents and businesses. Climate resilience will overlap a variety of enterprise programs and outcome-based needs in the community, including wastewater/watershed management, drinking water management and delivery, solid waste management and recycling, emergency services and stormwater/drainage mitigation. Many of these outcome-based programs are codified through an established enterprise program/fund, while others such as stormwater management are addressed programmatically throughout various Town government agencies. All of them will be impacted by the Town’s resilience implementation process in some way. Existing Town enterprise funds include the Septic Loan Program Enterprise Fund and the Transfer Station Enterprise Fund.
3. **Capital** and infrastructure projects are the primary focus of the resilience financing process. These projects can be embedded within baseline or enterprise processes, but they are often implemented as a result of specific community needs, including:
 - ***Protecting an essential asset.*** The most targeted project approach is associated with protecting specific assets that are threatened by climate change (a particular community building, for example).
 - ***Protecting an asset class or system.*** Many community resilience projects are designed to a suite of assets within a particular system. This can include protecting road and transportation networks, residential and commercial

buildings, or essential public utilities. Projects designed to protect an asset class are often coupled with regulatory or permit changes (i.e., Building codes, floodplain management, etc.).

- ***Protecting threatened geographies or communities.*** Large-scale resilience projects are often designed to protect specific communities or neighborhoods from a variety of climate hazards and threats. These projects can include flood mitigation/abatement and transportation enhancements.
- ***Incentivizing outcomes.*** Finally, resilience projects may be designed to address a particular hazard or desired outcome. These projects are often associated with enterprise fund activities, but they can also include other community priorities such as habitat restoration and protection.

Classifying RCIP projects based on their typology (*see Fig. 8*) not only helps to better define the actions that are being undertaken, but also helps to provide a clear picture of potential revenue sources and financing options.

Figure 8: RCIP Projects Categories by Project Typology

Baseline	Enterprise (like)	Infrastructure
Island Park sea-level rise study		
Dam action plan		
Drainage/road system analysis	Prudence Island pump station generator	
Emergency communications	Prudence Island & Hog Island firefighting equipment	Landing Lane & Sand Point Dock
Prudence Island shelter assessment	Transfer station generators	Aquidneck Island shelter
Wildlife hazard assessment	Road paving/drainage program	Dredging Founders Brook
Neighborhood preparedness	Stormwater runoff control ordinance	Portsmouth Park stormwater system
Assessment of flood-prone parcels	Emergency management, response, and evacuation	Island Park storm drains
Zoning ordinances		Riverside Avenue drainage
Land-use management plans		
Power needs assessments		
Complete streets study		

Recommendations: Sustainable Funding & Financing

Recommendation 5: Establish a Climate Resilience Fund. The RCIP functions to incorporate climate resilience and adaptation into virtually all components of local government, including program and project development and financing. By nature, the diversity of the funds and revenues supporting the Town’s resilience programs will reflect the existing revenue system and resources. However, given the growing need to address climate impacts now and long into the future, it will be necessary to dedicate funding specifically to programs and projects that are essential for achieving the Town’s resilience vision and action plans. This in turn will require a dedicated funding and financing resource in the form of a Climate Resilience Fund (“the Resilience Fund” or “the Fund”).

The primary purpose of the Resilience Fund would be to expand resilience investments by creating efficiencies, economies of scale, and political synergies for addressing resilience infrastructure needs. The Resiliency Fund would provide Portsmouth with a variety of benefits, including:

- *Prioritizing resilience infrastructure projects within the financing system.* The targeted nature of the Fund would expand the impact of the RCIP process by enabling Town leaders to focus fiscal resources on those projects that are identified to be most critical to the resilience implementation process.
- *Accelerating and scaling the financing process by leveraging public and private revenue streams.* The Fund would have the focus and capacity to target investments in projects identified in the RCIP. If structured appropriately, the Fund would be able to incentivize private investment in support of infrastructure and resilience projects.
- *Establishing more effective partnerships with the private sector.* Public-private partnerships (“P3s”) are the foundation of local resilience design, implementation, maintenance, and financing. These partnerships will need to expand in scale, sophistication, and impact as climate change intensifies. The Fund would enhance the capacity of the Town to develop and advance innovative relationships with a broad spectrum of private firms and actors.
- *Reducing stress on Town budgets.* The Fund will not eliminate the need for public investment in resilience infrastructure; local infrastructure will always require local government leadership and investment. However, the Resilience Fund would potentially reduce pressure on local budgets by creating efficiencies, leveraging private investment, and reducing the cost of capital. It would also create opportunities to attract state and federal grants and investments, further reducing stress on Town budgets.

Climate Resilience Revenue Plan. The Resilience Fund would support key functions and activities in support of the Town’s Resilience CIP and overall Resilience Program. If designed appropriately, the Fund will have the capacity to secure and leverage multiple revenue sources. Therefore, an important function of the Director, through the auspices of the Fund, will be to develop a climate resilience revenue plan that addresses the unique resource needs of the three project typologies: baseline, enterprise, and capital infrastructure.

Revenue sources supporting resilience programs and infrastructure will be, by necessity, diverse. However, all potential revenue sources will fall within the three categories mirroring the project typologies: operational or baseline revenues, enterprise or ongoing revenue streams, or capital or project-specific revenues.

There are any number of potential revenue sources in the form of fees, taxes, and grants that have the potential to provide either temporary or permanent support for the Resilience Fund and its activities. Key issues to consider when assessing the potential efficacy of a revenue source include its connection to the resilience issue; the potential scale of the source; the potential longevity of the source; and the impacts—positive or negative—on the community (specifically how the revenue source impacts fairness and equity). Specific opportunities within each of the three revenue categories include the following

- *Operational-baseline revenues.* Operational funds are those funds that, in theory, support any institutional activity. In actuality, they support those activities that are often not directly included in the project financing costs. In other words, operational

funding supports administration (indirect) *and* program-related activities (direct). Potential revenue sources include general fund revenues, targeted revenues from taxes and/or special service fees, grant funding, and enterprise program funds (exclusive to enterprise programs).

It is important to note that an essential component of climate resilience baseline programs is contingency funding to support disaster response. As the risk of climate hazards increases, the need for contingency funds, either through General Fund balances or more targeted funds will also increase. In addition, there is a direct connection between the level of contingency funding needed and the level of proactive project related investments in the community. If the community chooses not to expand its resilience infrastructure investments, it will therefore need to expand its emergency preparedness budgets. Conversely, expanded resilience investments tend to lessen the need to draw on emergency response funds following a disaster. In other words, while both resilience and emergency response investments are needed, there is a negative correlation between the two.

- **Enterprise revenues.** Enterprise funds are used to support activities for which a fee is charged to external users for goods or services. While the Resiliency Fund will not officially be an enterprise program, it will likely have important characteristics of an enterprise fund, including sustained revenue streams in the form of fees supporting activities directly associated with the assessment and collection of those fees. Additionally, enterprise and enterprise-like funds support all expenses associated with the enterprise—direct and indirect. Therefore, they are appropriate for supporting administrative, programmatic, and infrastructure capital costs.
- **Project-specific or capital revenues.** Project-specific funds refer to those revenues that are assessed and leveraged specifically to support a particular project. Though they can be in the form of taxes and fees, grants, or other investment revenues, they are often in the form of fees or infrastructure revenues. As is the case with enterprise funds, project funds can support administrative costs and direct project costs. Potential project-specific revenue sources include: general funds; property taxes (specifically through Special Taxing Districts and/or Tax Incremental Financing Districts); private capital through public-private partnerships and concession agreements; and private and nonprofit philanthropic investment, including donations, grants, and program investments.

There are clear overlaps between the three primary revenue categories. For example, fees generated through enterprise funds can cover all three revenue categories. Alternatively, project-specific funding must be dedicated, by definition, to costs that are associated with the project; while some of that may be administrative, those funds *cannot* cover the administrative costs associated with a program (i.e., outreach, communications). Therefore, while there is some overlap here, the distinctions between these three categories are what will enable Town leaders to identify potential sources of revenues most effectively.

Identifying and leveraging revenue streams is one of the most politically contentious and difficult tasks facing leaders in any community; Portsmouth is no exception. For that reason, establishing the resilience program and the Resilience CIP will be crucial for guiding the Town through very complex funding and financing decisions in the future. Specifically, the RCIP process will enable Town leaders to synchronize existing capital investment needs with anticipated climate resilience

needs.¹ As a result, the basic function of a revenue plan will be to increase the efficiency of existing fiscal resources thereby reducing the need for leveraging new resources. Certainly, new revenue will be needed for new infrastructure projects at some point in the future; the RCIP and the revenue plan will ensure that every public dollar invested will have maximum impact.

Project financing and cash flow management. The Fund will have the capacity to facilitate financing transactions, directly or indirectly, in support of resilience projects and practices throughout the Town. The SNEP Project Team recommends that the Resilience Fund be established as an internal component of the Portsmouth Resilience Program. This will have two advantages. First, the resources supporting the Fund's activities will be restricted to those activities. This provides system oversight and accountability. Second, the financing activities associated with the Town's resilience action plan will be conducted within the existing systems, agencies, and structures. This will allow the Fund to be established in a manner that leverages the strengths of that system and ensures that the resilience process is efficient and effective. The Fund will likely focus on three types of leveraging tools and processes: bond financing, value capture, and public-private partnerships.

- ***Bond financing.*** The use of municipal or publicly issued bonds is ubiquitous regarding infrastructure financing. Borrowing is essential for large-scale infrastructure projects and the use of tax-free bonds provides local and state governments with a relatively inexpensive source capital with long-term payback time horizons. The capacity to issue traditional tax-free revenue bonds will be important for many of the large-scale structural practices and projects in the Town's project portfolio.
- ***Value capture.*** Communities in Rhode Island rely heavily on property tax revenues to support government operations.² As a result, climate impacts on local assets and infrastructure have the potential to significantly impact local budgets. An important budgetary and financing mechanism will be to capture some or all the value that public infrastructure generates for private landowners. By capturing the subsequent increase in value, governments can recuperate funds, which can ultimately be used to generate additional value for communities in the future. Two specific types of value capture financing mechanisms that may benefit Portsmouth include:
 - ***Special assessment districts*** are independent, special-purpose governmental units, other than school district governments, that exist as separate entities with substantial administrative and fiscal independence from general-purpose local governments. Special district governments provide specific services that are not being supplied by existing general-purpose governments. Most perform a single function, but in some instances, their enabling legislation allows them to provide several, usually related, types of services. Special districts will not replace the

¹ For example, one of the most common funding requirements for local governments is associated school construction and redevelopment. Coupling climate resilience and mitigation outcomes to school construction can enable local officials to capture multiple investment outcomes, and in some cases reduce construction costs. (see: <https://publications.aecom.com/sustainable-legacies/projects/helping-dc-public-schools-create-green-and-sustainable-buildings>). The same is true regarding transportation redevelopment and stormwater/flooding management. Linking aggressive stormwater management to preplanned road infrastructure upgrades creates long-term financing efficiencies (see: <https://www.cnt.org/sites/default/files/publications/Increasing%20Funding%20and%20Financing%20Options%20for%20Sustainable%20Stormwater%20Management.pdf>).

² https://www.lincolnst.edu/sites/default/files/ri_nov_2016.pdf

need for broad-scale, community-wide revenue streams. However, value-capture programs will enable particular communities to address unique hazards and climate risks efficiently and effectively, while at the same time reducing the funding burden to residents and businesses that are not directly impacted.

- ***Tax increment financing (TIF)*** is a tool used by municipal governments to stimulate economic development in targeted geographical areas. TIFs are used to finance redevelopment projects or other investments using the anticipation of future tax revenue resulting from new development. When a TIF district is established, the “base” amount of property tax revenue is recorded using the status quo before improvements. To the extent such efforts are successful, property values rise, leading to an increase in actual property tax receipts above the base. While the base amount of property tax revenue (the level before redevelopment investments) continues to fund city services, the increase in tax revenue is used to pay bonds and reimburse investors and is often captured as city revenue and allocated toward other projects.

TIFs do not generate or leverage new revenue sources or tax assessments; rather, they are mechanisms for capturing the value of economic revitalization and investment. While the potential use of TIFs as a resource for incentivizing resilience investment is still in its nascent stages, the potential for TIFs and resilience investments to be linked as components of long-term economic development strategies may reduce revenue needs in the long-term, making necessary resilience infrastructure investments more viable.

Portsmouth has explored using TIFs in the past. While there was some confusion around that project, there may be an opportunity to use targeted public outreach and engagement to raise support and/or receptiveness to TIFs.

- ***Public-private partnerships.*** A public-private partnership (P3) is a cooperative arrangement between two or more public and private sectors, typically of a long-term nature. In other words, it involves government(s) and business(es) that work together to complete a project and/or to provide services to the population. P3s have become an increasingly popular way to get major infrastructure projects built. Compared with traditional procurement solutions, P3s can also spread a project’s cost over a more extended period and can thus free up public funds for investment in sectors in which private investment is impossible or otherwise inappropriate. In short, P3s can be very effective tools for delivering effective, cost-efficient projects and associated services. As governments seek to upgrade infrastructure and address the challenges of climate change, among other objectives, the need for private-sector involvement has grown. P3s will likely become important mechanisms for addressing climate risks in coastal communities like Portsmouth given their capacity to manage certain types of risk.

PART V: CONCLUSION & NEXT STEPS.

Through the completion of this technical assistance project, and through the Town’s previous HMP and MRP planning activities, the Portsmouth community and Town leadership have clearly demonstrated their commitment to addressing their climate impacts. With a strong foundation of resilience plans, Portsmouth is well poised to take the next steps to ensure its resilience vision and goals are cost-effective, efficient, and successfully implemented. To that end, we recommend the following next steps to build on the momentum from the RCIP process:

- Establish the Resilience Director position.
- Convene a municipal task force charged with conducting a feasibility study for the Resilience Program. The study should examine the optimal institutional structure of the Program, as well as the details of the required elements to support the Director, assessment activities, and financing system discussed in Recommendations 1–5.
- Quickly move to take advantage of, and leverage, available RIIB funds to support the RCIP projects identified in this technical assistance project. RIIB is eager to support “shovel-ready” resilience projects across Rhode Island. Therefore, the Town should seize the opportunity to work directly with RIIB to pursue potential short-term resilience funding opportunities for several of the already identified RCIP projects.
- Use the current RCIP to develop a portfolio of projects and programs that are ready for implementation, funding, and financing.
- Begin laying the groundwork to revisit the RCIP process on an annual basis. Ideally, this would be scheduled to align with the Town’s existing budgetary and CIP calendar(s).

These five “Next Steps,” coupled with the five key recommendations above, offer Portsmouth a clear roadmap for resilience planning and financing in the short-, mid-, and long-term. The SNEP Project Team is encouraged by the progress Portsmouth has made to date, and believes a decision to build on this momentum will prove invaluable to the resiliency of the Town of Portsmouth for years to come.



This report was produced by the dedicated team at [Throwe Environmental, LLC](#) in the company’s role as a core partner within the SNEP Network. Throwe Environmental is committed to developing climate resilience, environmental finance, and policy and governance solutions for its public, private, and nonprofit clients. As a SNEP Network partner organization, Throwe Environmental focuses on financing, training, and leadership development. Throwe Environmental is based in Bristol, RI and helps communities nationwide address their climate challenges.

APPENDIX A - RESILIENCE CAPITAL IMPROVEMENT PLAN

* Project Name (+ sub-items)	Department	Contact	Priority	Timeline	Details	Reference Doc	Justification
* Replace stormwater system in Portsmouth Park (Aquidneck Ave and Narragansett Ave)	DPW	Brian Woodhead	TOP (#1)	Long-term (5yrs+)	Need to replace approx 2000 ft of stormwater pipe and install 19 pre-cast catch basins on Narragansett and Aquidneck Avenues and connecting streets.	Subgroup Meetings, Illicit Discharges Report	Stormwater pipes are in need of immediate repair
Prudence Island second generator for pump station Small mobile generator	Prudence Island Water Authority	Robin Weber (Chair)	HIGH	Med-term (3-5yrs)	Gary did CDBG-DR grant for this a few years ago. Currently a large fixed generator in place. Second generator would be small mobile generator that can plug into the first one. Tanks, etc. are not needed	HMP Spreadsheet	High priority need to protect Prudence Island water supply
* Repair of stormdrains in Island Park identified in TV camera scoping project	DPW	Brian Woodhead	HIGH	Long-term (5yrs+)	Six pipes are to be repaired or replaced. See the separate list of specific drainage lines needing work.	Subgroup Meetings, Illicit Discharges Report	Assessment has been completed, can move on to repair
Landing Lane/Sand Point Dock (Prudence Island) improvements (roadway repair, dock replacement, stormwater system, and erosion protection)	DPW	Brian Woodhead	MED-HIGH	Short-term (0-3yrs)	Roadway down to the beach. 25'x20' section has new concrete. The remaining section (25'x77') needs concrete removed and new concrete poured.	FY22-30 Capital Requests, HMP Spreadsheet, CRWG Meetings	Project is already 1/3 of the way done and included in DPW budget. Should be finished by 2022. This is the roadway to Sand Point Dock that is used for emergency transport off the island
* Riverside Avenue drainage project	DPW	Brian Woodhead	MED-HIGH	Short-term (0-3yrs)	Underground Injection System needed to mitigate flooding	HMP Spreadsheet	Low area of roadway with no drainage this will help with the flooding on this roadway
Prudence Island/Hog Island fire fighting equipment replacements/prevention measures Modern, off-road capable equipment replacements (pumps, garage facility, etc.) Installation of new prevention measures	Portsmouth Fire District (aid from other municipalities), Town Administrator, PI Volunteer Fire Dept.	Rich Rainer, Chief Ford	MED-HIGH	Med-term (3-5yrs)	Coordination with private fire district. Garage facilities needed, could build structure on private property. Pumps needed. Everything on Hog Island is private property.	PI Community Wildfire Plan, CRWG Meetings	Hazard level of fire and drought on Prudence Island. No firefighting capabilities or pre-staged equipment, facilities, paved roads on Hog Island.
Portsmouth Shelter (Aquidneck) Structural improvements (i.e., hurricane clips) to HS gym (fieldhouse) to serve as shelter Mobile generators	Town Administrator, EMA Director, School Superintendent	Rich Rainer, Ray Perry, Tom Kenworthy	MEDIUM	Short-term (0-3yrs)	Roof improvements are being actively pursued. Town is asking for quote on improvements. Discussion is ongoing around which gym space(s) is/are most appropriate	MRP Spreadsheet, CRWG Meetings	Currently no primary shelter on Aquidneck Island because HS gym is not suitable. Middle School is current secondary shelter
Generators for Hedley St. & Prudence Island Transfer Stations							
* Hedley St. Generator (1 mobile, diesel-fueled), some minor electrical, diesel tank PI Generator (1 mobile, diesel-fueled), some minor electrical, diesel tank	DPW	Brian Woodhead	MEDIUM	Med-term (3-5yrs)	Mobile generators with some accessory needs	FY22-30 Capital Requests, HMP Spreadsheet	Importance of keeping transfer stations running during a long-term power outage
Dredging Founders' Brook	DPW	Brian Woodhead	MEDIUM	Med-term (3-5yrs)	On CIP. Bundled with drainage projects on Riverside Ave and CFP RR Dock. Grant funds had to be pulled to CFP portion of project, so this project needs to be funded again.	HMP Spreadsheet	Needs funding still after previous funding was pulled for CFP drainage project

CAPITAL ITEMS

(Sheet 1 of 2)

This list of capital items includes on-the-ground projects that are intended to enhance climate resiliency. These projects align with traditional capital infrastructure projects that would appear on a capital improvement plan, and they are supported by the appropriate studies, assessments, etc.

KEY:

- CRWG = Climate Resilience Workgroup (SNEP + Portsmouth)
- HMP = Hazard Mitigation Plan
- MRP = Municipal Resilience Program
- PI = Prudence Island
- CFP = Common Fence Point
- IP = Island Park

* (Col. A) = Selected for consultant cost estimates to prepare Town for next stage of resilience planning



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APPENDIX A - RESILIENCE CAPITAL IMPROVEMENT PLAN							
* Program Name (+ sub-items)	Department	Contact	Priority	Timeline	Details	Reference Doc	Justification
* Island Park Sea Level Rise Adaptation Planning Study	Planning	Gary Crosby	TOP (#1)	Short-term (0-3yrs)	Sea level rise adaptation planning needed to identify strategies (including capital improvements) to enhance Island Park resilience	CRWG Meetings	Study to identify needed capital improvements will support on-going efforts to build resilience.
Updated/improved evacuation routes							
• Common Fence Point Route	EM	Ray Perry	HIGH	Short-term (0-3yrs)	Pressure from FEMA and RIEMA, does not require significant effort	CRWG Meetings	Planning needed to manage the evacuation routes. Not a significant expense
• Island Park Route							
• Melville Route							
Melville Pond Dam Emergency Response/Action Plan	Planning	Gary Crosby, Ray Perry	HIGH	Short-term (0-3yrs)	Just finished Rhody Resilient grant to rehabilitate dam. Not very intensive (essentially a contact list, funded by staff time)	CRWG Meetings	Plans for 4 dams, need to be updated
	EM Director	Ray Perry	HIGH	Short-term (0-3yrs)	Several different pieces to be completed	CRWG Meetings	Guides town's emergency response. Plans meet minimum requirements, but need to make operational needs
Updated Town Emergency Response Plan							
* Townwide Road and Drainage System Assessment/Analysis	Planning	Gary Crosby	HIGH	Short-term (0-3yrs)	Assessment of Town-owned (maintained) road and drainage system assets (conditions, need for replacement/upgrades) townwide taking into consideration projected changes in precipitation is needed.	Subgroup Meetings	Study to identify needed capital improvements will support on-going efforts to build resilience.
Emergency communications	Planning, Emergency Management, Town Administrator, DPW	Gary Crosby, Ray Perry, Rich Rainer, Brian Woodhead	HIGH	Short-term (0-3yrs)	Assessment of new equipment needs for PD, FD, and/or PEMMA. Enhancement of interdepartmental communications operations (i.e., holistic risk planning and communications). Opportunity to also enhance capacities for environmental/climate-related communications and public education	CRWG Meetings	Continued conversations to improve and enhance emergency communications
Prudence Island Shelter and substation assessment	Fire District, Town Administrator	Rich Rainer	HIGH	Med-term (3-5yrs)	Currently in planning stages. Likely will not result in rehabilitation of existing facility. Might be bundled with public safety complex (see Prudence Island Public Safety Complex/Shelter Study). Construction of a new substation to house equipment in a temperature controlled environment. Current Jepsen Lane substation is sole power line to island	PI Community Wildfire Plan, CRWG Meetings	Study required before capital project can be completed
Hazard Assessment for Wildfire Suppression	PFD, PIVFD	Chief Ford, Chief Thurber	HIGH	Med-term (3-5yrs)	Fire is primarily an issue for PI, not AI, and PI Community Wildfire Plan has been done	PI Community Wildfire Plan	Fire is a main hazard on PI
	DPW	Brian Woodhead	HIGH	Ongoing	Funded to \$800-900K/yr, could use more funding. Goal is \$1M/yr and maintain a minimum RSR of 72+. When 3-year paving plan is developed town takes in account if drainage or upgrade is needed to the drainage system before paving	FY22-30 Capital Requests	Already funded to \$800K-\$900K/yr
Road Paving and Drainage Program							
Establish neighborhood preparedness committees	Emergency Management	Ray Perry	MED-HIGH	Short-term (0-3yrs)	Building off of successful models in CFP and PI, building capacity as an example of neighborhood engagement. Interest shown in this model from other neighborhoods. Future areas of focus to include Island Park and Hummocks Point (e.g. Cliff Avenue, areas under Sakonnet Bridge and an cove)	CRWG Meetings	Successful model has worked in some neighborhoods, interest in applying that model to others
Assessment of flood-prone parcels to consider and/or for land acquisition for natural buffer advancement zones	Planning	Gary Crosby	MED-HIGH	Long-term (5yrs+)	Up until 2009, there was an open space committee (volunteer). Their job was task 1a. There was a provision where a % of revenue from real estate transfer tax was put into a fund for open space acquisition. Cmte. ended in 2017/18. A good deal of coordination in past with ALT. Conflict about land prices/properties. ALT lost faith with Cmte. and Council disbanded. Council now has responsibility for recommendations about acquiring open space. CCP recommends reestablishing tax and reestablishing cmte. Places where they can migrate are not ideal. Town has never done any stuff	HMP Spreadsheet, MRP Spreadsheet	Town's current land aquisition capacities are very low
Zoning ordinance amendments	Planning	Gary Crosby	MEDIUM	Med-term (3-5yrs)	Thought is to revisit zoning ordinance to make sure it aligns with CCP (needs to be done with entire zoning ordinance). Likely will hire consultants. Currently doing one for solar farms. Intention to re-write completely in next few years	HMP Spreadsheet	Will have to update to align with CCP. Goal to re-write in short-term
Adopt Post-Construction Stormwater Runoff Control Ordinance	Planning	Gary Crosby	MEDIUM	Med-term (3-5yrs)	There is a soil and sediment control ordinance which serves some function for this	Draft Community Comprehensive Plan	Has to be completed to be in compliance with Phase II permit MCMs.
Develop land use management plans for Town-owned open space properties	Planning	Gary Crosby	MEDIUM	Med-term (3-5yrs)	Plans needed to coordinate ongoing management activities	Draft Community Comprehensive Plan	Town is engaging on management activities for these properties (mostly recreational), but no plans yet
Emergency management and response enhancements	Emergency Management	Ray Perry	MEDIUM	Med-term (3-5yrs)	Assessment of emergency operations needs (i.e., EOC, mobile command post, vehicles, training, softwares, etc.) to support a centralized emergency management hub that can manage different phases of crises. Focus on continuity of operations and hard and soft infrastructure needs. Assessments and enhancements should be tied to other planning/prioritization activities.	Public Workshop	Need to enhance emergency management, response, and COOP capabilities. All phases of resilience should be considered. Also supports NIMS requirements and eligibility for EM grants
Prudence Island Public Safety Complex/Shelter Study	DPW, Planning, Town Administrator, Police & Fire	Brian Woodhead, Gary Crosby, Rich Rainer	MEDIUM	Long-term (5yrs+)	Could potentially use federal funds dollars. Single complex to house Police, Fire, DPW, and perhaps also serve as a shelter (see Prudence Island Shelter and substation assessment). Funding has been challenging	CRWG Meetings, Subgroup Meetings	Study needs to be done before capital project can begin. Need to understand when, where, how, etc.
Power Needs Assessment (pharmacy, grocery, north/south gas stations)	Building Official	Building Official, EM Director	LOW	Short-term (0-3yrs)	Low priority, not started. Simple survey. 3 pharmacies, 1 grocery, 5 stations	HMP Spreadsheet	Does not require significant effort
Prudence Island and Hedley Transfer stations power assessments							
• Hedley Station assessment	DPW	Brain Woodhead	LOW	Short-term (0-3yrs)	Effort is low	HMP Spreadsheet	Does not require significant effort
• Prudence Island Station assessment							
Complete Streets Study	DPW	Gary Crosby, Brian Woodhead	LOW	Short-term (0-3yrs)	Gary has developed a draft complete streets ordinance. Already funded	FY22-30 Capital Requests	Town roads already have existing capacity for multi-use. 1/4 of roads are state-owned

PROGRAMMATIC ITEMS
(Sheet 2 of 2)

This list of programmatic items includes assessments, studies, or other operational exercises that are intended to supplement capital projects. However, these items themselves are not capital in nature. This list is intended to support ongoing conversations around future capital resilience projects in the Town of Portsmouth.

KEY:

- CRWG = Climate Resilience Workgroup (SNEP + Portsmouth)
- HMP = Hazard Mitigation Plan
- MRP = Municipal Resilience Program
- PI = Prudence Island
- CFP = Common Fence Point
- IP = Island Park

* (Col. A) = Selected for consultant cost estimates to prepare Town for next stage of resilience planning



Throwe
Environmental

This resource was produced by the dedicated team at [Throwe Environmental, LLC](#) in the company's role as a core partner within the SNEP Network. Throwe Environmental is committed to developing climate resilience, environmental finance, and policy and governance solutions for its public, private, and nonprofit clients. As a SNEP Network partner organization, Throwe Environmental focuses on financing, training, and leadership development. Throwe Environmental is based in Bristol, RI and helps communities nationwide address their climate challenges.

APPENDIX B – CRITERIA FOR FUNDING

CRITERIA FOR FUNDING: CREATING A RESILIENT PORTSMOUTH

Prioritization of Short, Medium, and Long-Term Projects

June 2021

Criteria Used to Fund Projects

All projects should be categorized as short-, medium-, or long-term based on when funding is needed (i.e., short-term projects necessitate funding within the next 3 years, medium-term within the next 3-5 years, and long-term within the next 5 years or more). In order to identify funding classification, the following criteria should be used.

Note: These criteria were developed using information from existing town documents and reports (i.e., 2018 Portsmouth Hazard Mitigation Plan [HMP] and 2019 Municipal Resilience Program [MRP] Summary of Findings), as well as from Town staff and local experts.

Characteristics of Short-term Projects:

- Projects and/or phases of projects to be initiated (through planning, assessment, estimation for future projects, etc.) between **now and 3 years from now**
- Projects that seek to address an acute problem or a recurring annual problem (operational/capital)
- Projects that would provide information (i.e., monitoring, assessing) about identified problems about which information is currently lacking
- Projects that would decrease likelihood of serious property damage and/or loss of life
- Projects that will help protect critical facilities (e.g., Police Station, Fire Station, Town Hall, etc.) or top/high priority assets (see Climate Prioritization Tool)
- Projects that assess the criticality of threats to ecosystems (Prudence Island, Melville Pond, and wastewater/septic issues, etc.)
- Projects that address stormwater issues that may have long-term implications as related to flooding and water quality
- Projects that address low-lying roads, especially those that provide sole access to neighborhoods (i.e., bottlenecks)
- Projects that will help protect important communications infrastructure
- Projects that enhance/establish evacuation routes and emergency shelters in the event of a natural disaster (including on Prudence Island)
- Projects that improve management activities, communications, and/or public outreach and education (operational expense—ongoing cost in budget)

Characteristics of Medium-term projects:

- Projects and/or phases of projects to be initiated between **3 and 5 years from now**
- Projects that address incremental problems or problems that will become acute in 3-5 years
- Projects that would assess vulnerable town geographies (e.g., Common Fence Point, Island Park, Prudence Island)
- Projects that address public facilities (libraries, schools, admin offices, etc.) or medium priority assets (see Climate Prioritization Tool)
- Projects that would address the effects of hazards of high concern (hurricane, nor'easters, inland and coastal flooding, snowstorms, high winds, sea-level rise)

- Projects that address/assess changing natural systems (i.e., salt marsh migration)
- Projects that create systemic redundancies/safeguards to enhance resilience

Characteristics of Long-term projects:

- Projects and/or phases of projects to be initiated **5 or more years from now**
- Projects that address chronic/ongoing problems or problems that will become acute in 5+ years
- Projects that address the effects of hazards of medium and low concern (as articulated in the HMP)
- Projects that restore natural systems
- Projects that address low priority assets (see Climate Prioritization Toolkit)

Meeting Portsmouth's Priorities: Goals of Short-Term Projects

All projects that fall under the following goals and priorities should be classified as **short-term** projects:

- Natural Systems
 - Any project that addresses water resource challenges, including management (wastewater, stormwater, etc.)
 - Any project that improves water quality or larger ecological integrity
- Community and Social
 - Any project that improves awareness, education, and outreach
 - Any project that decreases the likelihood of loss of life
 - Any project that protects adversely vulnerable populations (elderly, Prudence Island population, etc.)
- Built Systems
 - Any project that directly improves the resiliency of critical facilities, built systems and assets
 - Any project that decreases the serious likelihood of property damage
- Economic and Financial
 - Any project that improves the resiliency of economic and financing systems
 - Any project that mitigates financial losses

Meeting Portsmouth's Priorities: Goals of Medium-Term Projects

All projects that fall under the following goals and priorities should be classified as medium-term projects to be funded.

- Natural Systems
 - Any project that addresses open space goals
 - Any project that improves the resiliency of natural systems and habitats
- Community and Social
 - Any project that promotes regional coordination across Aquidneck Island
 - Any project that improves housing affordability, resiliency, and availability
 - Any project that improves the resiliency of social systems and assets
- Built Systems
 - Any project that improves or enhances community design
 - Any projects that address/assess important public facilities (libraries, schools, admin offices, etc.)
 - Any project that directly improves infrastructure networks (water, utilities, transportation)

- Economic and Financial
 - Any projects that secure funding to further the goals of the HMP and MRP

Meeting Portsmouth's Priorities: Goals of Long-Term Projects

All projects that fall under the following goals and priorities should be classified as long-term projects to be funded.

- Natural Systems
 - Any project that restores natural systems (wetlands, streams, etc.)
 - Any project that addresses wildlife challenges
- Community and Social
 - Any project that enhances Portsmouth's historical character/culture
 - Any project that directly improves recreation
- Built Systems
 - Any project that develops new or redevelops existing facilities within an established community design
- Economic and Financial
 - Any project that addresses ongoing/chronic economic vulnerabilities or financing system weaknesses



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APPENDIX C:

COST ESTIMATING AND SCOPING SERVICES FOR CLIMATE RESILIENCE PLANNING AND FINANCING STRATEGY - PORTSMOUTH, RI



Engineers | Scientists | Planners

PARECORP.COM



May 3, 2022

Ms. Elizabeth Scott, Project Manager
SNEP Network
University of Southern Maine
P.O. Box 9300
Portland, ME 04104-9300

Re: **Cost Estimating and Scoping Services for
Climate Resilience Planning and Financing Strategy
Portsmouth, Rhode Island**
Pare Project No.: 22014.00

Dear Ms. Scott:

The Southeast New England Program (SNEP) Network has been working with the Town of Portsmouth, RI (Town) and their Climate Resilience Work Group on the development of a Climate Resilience Planning and Financing Strategy Plan. Under contract to SNEP, Pare Corporation (Pare) has completed the cost estimating and scope development for six (6) projects identified within the Town's Resilience Capital Infrastructure Plan (RCIP). We understand that these cost estimates and scopes of work will be incorporated into the Town's Climate Resilience Planning and Financing Strategy and used to make informed decisions on the most appropriate financing options to advance these projects forward.

A brief summary of the scope of work and cost estimate for each of the six (6) projects is provided below. Drafts of the summary scopes and cost estimates were reviewed with SNEP and the Town. The final, full summary and cost breakdown for each task is included as an attachment.

Project 1: Aquidneck Avenue & Narragansett Avenue Drainage Replacement

A field review of the project area was performed with the Town and Pare reviewed existing drainage infrastructure plans and IDDE field data sheets provided by the Town. Based on discussions with the Town and review of the notes for the illicit discharge detection field investigations, septic odors were observed throughout the project limits within the drainage collection structures. Several private interconnections were identified as part of the investigations, and groundwater is assumed to contribute to the drainage system through separated pipe joints. The collection system ultimately discharges directly to the Sakonnet River.

The scope of the drainage system replacement includes replacing 2,200 feet of existing drainpipe with new water-tight PVC pipe and replacement of 20 precast concrete catch basin structures. Replacement of the system will provide an opportunity to further investigate and eliminate any illicit private connections and provide a water-tight system to limit adjacent septic flows from leaching into failed pipe joints or drainage structures.

Pare has prepared an opinion of probable construction cost of \$608,000 for this Project 1 task.





Ms. Elizabeth Scott

(2)

May 3, 2022

Project 2: Repair of Storm Drains in Island Park

Pare reviewed notes and summaries from the CCTV inspection program completed by the Town. Six locations through Island Park were identified as requiring repair or replacement. Pare provided recommendations for scope and limits of repair, as well as estimate costs for each location. The Town will need to coordinate with adjacent property owners to discuss the limits of work, access to the pipes and outfalls, and scope of restoration.

Pare has prepared an opinion of probable construction cost for all six locations of \$191,000 for this Project 2 task.

Project 3: Generators for the Hedley Street and Prudence Island Transfer Stations

The Town has identified the importance of keeping the transfer stations running during a long-term power outage. Through discussion with the Town, a diesel fueled generator is preferred. No additional storage tanks are required as the Town anticipates having a sufficient supply of diesel for refilling.

The Town indicated that a minimum 35 kw generator will be required for Prudence Island. The Town also provided the specifications for the generators at Hedley Street. Pare consulted with the sales department from a generator manufacturer who recommended a 125 kw generator.

Pare has prepared an opinion of probable construction cost for both locations of \$200,000 for this Project 3 task.

Project 4: Riverside Avenue Drainage Project

The Town identified that stormwater generated from the surrounding residential neighborhood along Riverside Street collects and ponds within the property located at 131 Cottage Avenue. A field review of the project area was performed with the Town. Pare estimated the contributing watershed area, reviewed the Soil Survey of Rhode Island, and reviewed construction drawings for a similar system previously constructed on Cove Street. A concept design for an underground infiltration was prepared and system sizing was completed for two alternative design storms: a 1.2" water quality design storm and a 1-year (2.8") design storm.

Pare prepared opinions of probable construction cost for both system sizes, with the larger system estimated at \$186,900 for this Project 4 task.

Project 5: Island Park Sea Level Rise Adaptation Planning Study

Through coordination with SNEP and the Town, Pare prepared a planning-level scope of work for a study to assess vulnerabilities and identify strategies, including capital improvements, to enhance resiliency of Town, State and private infrastructure in Island Park from projected sea level rise and related climate change impacts.

Pare provided an estimated budget range of \$50,000 to \$150,000 depending on the level of detailed analysis requested by the Town for this Project 5 task.



Ms. Elizabeth Scott

(3)

May 3, 2022

Project 6: Town-wide Road and Drainage System Assessment/Analysis

Through coordination with SNEP and the Town, Pare prepared a planning-level scope of work for a study to assess the vulnerability of local roads and associated drainage/utility infrastructure through the Town, and to conduct feasibility analyses of potential solutions. The project tasks within the planning scope correspond to priority actions identified by many New England communities in their vulnerability and resilience planning to identify and assess roadways, road segments, drainage and utility systems, bridges, and culverts vulnerable to flooding from projected sea level rise and/or storm surges, and future increased precipitation. The study scope seeks expertise to determine the extent of vulnerabilities, or where future vulnerabilities may occur, what potential adaptation options are, and cost estimates for solutions.

All communities along coastal New England have flood-prone roads that currently flood or are expected to flood under future sea level rise and worsening storm conditions. The Town of Portsmouth seeks to proactively plan for adaptation strategies that will help mitigate impacts to these areas from future flooding resulting from climate change.

Included in this study scope is updating the Town's existing utility information in a GIS format. The scope includes an assumed number of catch basins/manholes, outfalls, and miles of roadway utilities.

Pare provided an estimated budget range of \$160,000 to \$175,000 depending on the level of detailed analysis and the extent of infrastructure inventoried for this Project 6 task.

Thank you for the opportunity to work with SNEP and the Town on this important project. If you have any questions, please contact us at your convenience.

Sincerely,

Keith MacDonald, P.E.
Managing Engineer

KM/kl

Attachments:
Tasks 1-6 Summary Memorandums



MEMORANDUM

DATE: February 22, 2022

TO: Mr. Brian Woodhead
Portsmouth Public Works Director
Town of Portsmouth

FROM: Keith MacDonald, P.E.
Robert J. Sykes, P.E.

RE: Portsmouth Climate Resilience Plan
Project 1: Aquidneck & Narragansett Drainage Replacement
Pare Project No. 22014.00

This memorandum has been prepared to document the scope and opinion of probable construction cost for the drainage infrastructure replacement on Aquidneck Avenue and Narragansett Avenue, between Park Avenue and Tallman Avenue. Based on discussions with the Town and review of the notes for the illicit discharge detection field investigations, septic odors were observed throughout the project limits within the drainage collection structures. Several private interconnections were identified as part of the investigations, and groundwater is assumed to contribute to the drainage system through separated pipe joints. The collection system ultimately discharges directly to the Sakonnet River as indicated within Figure 1.

The scope of the drainage system replacement includes replacing approximately 2,200 feet of existing drainpipe with new water-tight PVC pipe and replacement of 20 precast concrete catch basin structures. Replacement of the system will provide an opportunity to further investigate and eliminate any illicit private connections and provide a water-tight system to limit adjacent septic flows from leaching into failed pipe joints or drainage structures.

As part of the replacement, the roadway restoration scope includes placement of a 5" full depth permanent asphalt patch within the pipe trench, followed by a 2" mill and overlay of the entire roadway width.

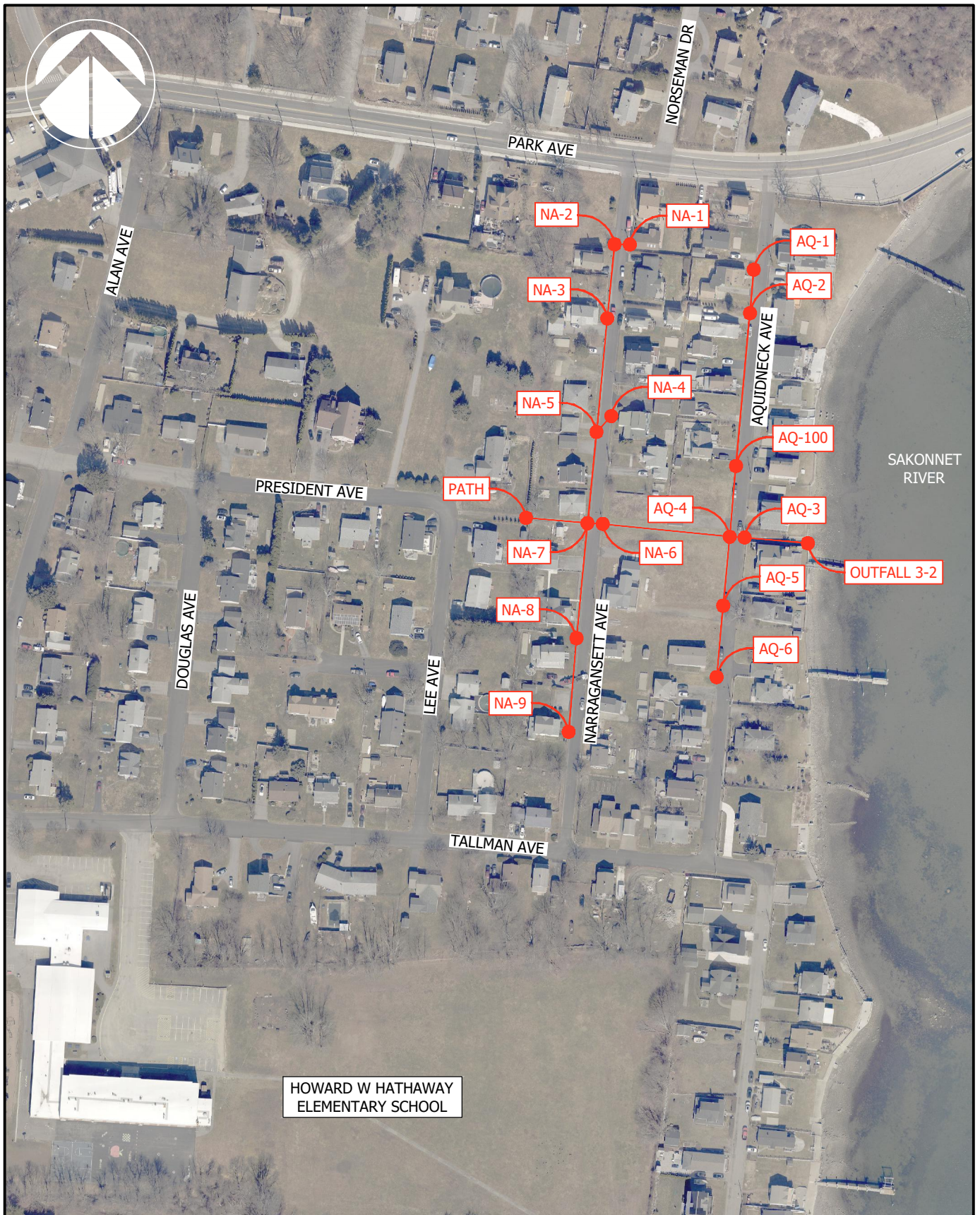
Pare has prepared an opinion of probable construction cost of \$608,000.

We are available to discuss the above memorandum with you at your convenience.

ATTACHMENTS:

Figure 1 – Locus Map – Riverside Street

Figure 2 – Opinion of Probable Construction Cost



PROJECT NO. 22014.00

DATE: FEBRUARY 2022



FIGURE 1
LOCUS MAP

AQUIDNECK AVENUE & NARRAGANSETT AVENUE
PORTSMOUTH, RHODE ISLAND

FIGURE 2

Opinion of Probable Construction Cost - Concept Figure

Climate Resilience Planning-RI
Portsmouth, Rhode Island
22014.00

Prepared By: MSC
Checked By: RJS
Date: 2/18/2022



RIDOT No.	Work Item	Quantity	Unit	Unit Price	Total
Project 1: Replace Stormwater Systems in Portsmouth Park (Aquidneck Ave & Narragansett Ave)					
209.0200	Sack Insert Catch Basin Inlet Protection	20	EACH	\$ 175.00	\$ 3,500.00
201.0410	Remove and Dispose Catch Basins	20	EACH	\$ 550.00	\$ 11,000.00
201.0414	Remove and Dispose Pipe - All Sizes	2000	FT	\$ 20.00	\$ 40,000.00
702.0605	Precast Catch Basin 4' Diameter Standard 4.4.0	20	EACH	\$ 3,600.00	\$ 72,000.00
702.0512	Frame and Grate Standard 6.3.0	20	EACH	\$ 1,000.00	\$ 20,000.00
701.9901	8-Inch Polyvinyl Chloride Drain Pipe (SDR 35)	2000	LF	\$ 55.00	\$ 110,000.00
701.9901	24- to 30-Inch Polyvinyl Chloride Drain Pipe (SDR 35)	200	LF	\$ 150.00	\$ 30,000.00
203.0530	Dewatering	1	LS	\$ 10,000.00	\$ 10,000.00
302.0100	Gravel Borrow for Subbase	450	CY	\$ 40.00	\$ 18,000.00
401.9901	5" Class 12.5 HMA Permanent Patch	390	TON	\$ 180.00	\$ 70,200.00
935.0400	2" Micromilling Bituminous Pavement	4500	SY	\$ 5.00	\$ 22,500.00
401.2100	2" Modified Class 12.5 HMA Surface	520	TON	\$ 125.00	\$ 65,000.00
403.0300	Asphalt Emulsion Tack Coat	500	SY	\$ 0.50	\$ 250.00
L01.9901	Loam and Seed	500	SY	\$ 10.00	\$ 5,000.00
923.9901	Temporary Traffic Control	1	LS	\$ 5,000.00	\$ 5,000.00
936.0110	Mobilization/Demobilization (assume 5%)	1	LS	\$ 24,200.00	\$ 24,200.00
				20% Contingency	\$ 101,330.00
				Total	\$ 608,000.00



MEMORANDUM

DATE: March 8, 2022

TO: Mr. Brian Woodhead
Portsmouth Public Works Director
Town of Portsmouth

FROM: Keith MacDonald, P.E.
Robert J. Sykes, P.E.

RE: Portsmouth Climate Resilience Plan
Project 2: Repair of Storm Drains in Island Park
Pare Project No. 22014.00

The below memorandum has been prepared to document the preparation of the conceptual opinion of probable construction cost to address the drainage issues identified by the Town of Portsmouth (Town) within Island Park.

Project Description

The Town has identified six (6) locations throughout Island Park requiring repair and/or replacement (see Figure 1 Locus Map for locations). Damaged sections of pipe were observed through a recent TV camera scoping project.

Existing Conditions Review:

Outfall 2-19 (Cedar Avenue at Leedham Street): A 6-inch reinforced concrete pipe for stormwater drainage has been identified to be repaired on Cedar Avenue at the intersection of Leedham Street. The section of pipe has been identified from CCTV footage to have cracked and shifted at a location approximately 27' downstream of catch basin CE-5. The existing pipe is located on the side of Cedar Avenue on a vacant private property under a gravel driveway.

An estimated cost was prepared proposing the replacement of an anticipated 20-foot segment of pipe. Rhode Island Department of Transportation (RIDOT) standards were used to develop an estimate of probable cost based on assumed quantities and work required to complete the repairs. The existing pipe segment to be repaired is located off the roadway under a gravel parking area. The cost to remove the pipe is calculated per linear foot of pipe and includes all excavation and earthwork required to complete the repairs. The existing pipe segment will be replaced with a pipe of equivalent diameter and constructed of smooth interior corrugated polyethylene. Restoration costs were developed based on the existing surface treatments.

Outfall 2-20 (Green Street): A 12-inch steel pipe for stormwater drainage has been identified to be repaired on Green Street between Coral Street and Bay Street. The section of pipe has been identified from CCTV footage to have cracked and shifted at a location of approximately 19' downstream of catch basin GR-3. The existing pipe is located on the edge of the roadway and is located within the CRMC right-of-way. An existing utility pole is located within proximity of the right-of-way boundary to the

north and an existing retaining wall and fence are located adjacent to the right-of-way boundary to the south.

An estimated cost was prepared proposing the replacement of an anticipated 20-foot segment of pipe. RIDOT standards were used to develop an estimate of probable cost based on assumed quantities of work required to complete the repairs. The existing pipe segment to be repaired is located outside of the roadway in an existing CRMC right-of-way. From measurements within field documents provided by the Town, the existing pipe is assumed to be shallow and require only approximately 3-feet of excavation to remove the existing section of pipe. Access to the pipe is expected to be restricted in this location and a cost has been included to support existing utilities which may be disturbed during excavation. The cost to remove the pipe is calculated per linear foot of pipe and includes all excavation and earthwork required to complete the repairs. The existing pipe segment will be replaced with a pipe of equivalent diameter and constructed of smooth interior corrugated polyethylene.

Outfall 2-11 (Seaconnet Blvd. at Gould Avenue): A 10-inch pipe segment consisting of both vitrified clay and corrugated metal for stormwater drainage has been identified to be replaced on Seaconnet Boulevard at the intersection of Gould Avenue. The approximately 235-foot pipe run identified between catch basin SEA-2 and the outfall (through catch basin SEA-3) has been identified from CCTV footage to be damaged with segments of pipe cracked or missing. Between SEA-2 and SEA-3, the existing drainage pipe appears to be located along the edge of roadway under landscaping, driveways, and grass shoulder. An existing utility pole is located in proximity to the pipe. An existing wood fence is located adjacent to catch basin SEA-2 and runs along the existing pipe alignment for approximately 35 feet. From SEA-3 to the outfall, the pipe appears to be located under asphalt and discharges through a concrete retaining wall.

An estimated cost was prepared based on replacing the entire 235-foot segment of damaged pipe. RIDOT standards were used to develop an estimate of probable cost based on assumed quantities of work required to complete the repairs. The existing pipe segment to be replaced is located on the shoulder of the roadway and runs parallel to the roadway, then turns and runs under a paved parking area before discharging through a concrete retaining wall. The estimate of probable cost includes saw cutting asphalt and repaving a trench in the roadway and through driveways. Costs for partial replacement of the retaining wall and rebuilding catch basin SEA-3 are also included. Access to the pipe is likely restricted by an existing utility pole and adjacent wooden fence. A cost has been included to support the utility pole and reset the fence which is likely to be disturbed during excavation. The cost to remove the pipe is calculated per linear foot of pipe and includes all excavation and earthwork required to complete the repairs. The existing pipe segment will be replaced with a pipe of equivalent diameter and constructed of smooth interior corrugated polyethylene.

Outfall 2-17 (Cedar Avenue at Beach Street): An 8-inch vitrified clay pipe for stormwater drainage has been identified to be replaced on Cedar Avenue between Green Street and Beach Street. The approximately 255-foot pipe segment between catch basin CE-2 and catch basin CE-3 has been identified by CCTV footage to be damaged beyond repair. The existing drainage pipe appears to be located along the southern edge of the roadway and crosses under two driveways and a side street and runs adjacent to two utility poles and a chain link fence.

An estimated cost was prepared based on replacing the entire 255-foot segment of damaged pipe. RIDOT standards were used to develop an estimate of probable cost based on assumed quantities of work required to complete the repairs. The existing pipe segment to be replaced is located on the shoulder of the roadway and runs parallel to the roadway. From provided plans and available aerials, the exact pipe

location is expected to be located under two existing driveways, a fence, and a large tree. Alternative pipe alignments may be preferable to minimize impacts to private property and utility poles. The cost to remove the pipe is calculated per linear foot of pipe and includes all excavation and earthwork required to complete the repairs. The existing pipe segment will be replaced with a pipe of equivalent diameter and constructed of smooth interior corrugated polyethylene.

Outfall 2-22 (Riverside Street): An 8-inch corrugated metal pipe for stormwater drainage has been identified to be replaced on Riverside Street at approximately 301 Riverside Street. The approximately 25-foot pipe segment located between catch basin R-3 and outfall 2-22 has been identified by CCTV footage to be damaged beyond repair. The pipe segment limits to be replaced are located under an existing asphalt pavement roadway and under a paver driveway apron.

An estimated cost was prepared based on replacing the 25-foot segment of damaged pipe. RIDOT standards were used to develop an estimate of probable cost based on assumed quantities of work required to complete the repairs. The existing pipe segment to be replaced is located under the roadway and runs perpendicular to the roadway. The estimate of probable cost includes saw cutting asphalt and repaving the roadway after the installation of the new pipe segment. The cost to remove the pipe is calculated per linear foot of pipe and includes all excavation and earthwork required to complete the repairs. An additional cost is included for miscellaneous work which may be required such as removing and resetting the driveway paver stones which is likely to be disturbed during construction. The existing pipe segment will be replaced with a pipe of equivalent diameter and constructed of smooth interior corrugated polyethylene.

Outfall 2-13 (Seaconnet Blvd. At Ivy Avenue): An 8-inch polyvinyl chloride pipe for stormwater drainage has been identified to be replaced on Seaconnet Boulevard at the intersection of Ivy Avenue. The approximately 100-foot pipe segment located between catch basin SEA-4 and outfall 2-13 has been identified by CCTV footage to be damaged. The pipe segment lies under an existing stone masonry retaining wall and an existing utility pole is located within proximity of the pipe.

An estimated cost was prepared based on replacing the entire 100-foot segment of damaged pipe. RIDOT standards were used to develop an estimate of probable cost based on assumed quantities of work required to complete the repairs. A portion of the existing pipe segment to be replaced is located in the roadway for approximately 25-feet running perpendicular to travel. The remaining 75-feet is located within a CRMC designated right-of-way. An additional cost was included to support an existing utility pole on the side of the roadway and reset approximately 6 feet of stone masonry retaining wall which appears to be located adjacent to the existing pipe. The cost to remove the pipe is calculated per linear foot of pipe and includes all excavation and earthwork required to complete the repairs. The existing pipe segment will be replaced with a pipe of equivalent diameter and constructed of smooth interior corrugated polyethylene.

Opinion of Probable Construction Cost:

Outfall 2-19 (Cedar Avenue at Leedham Street):
\$7,000.00

Outfall 2-20 (Green Street):
\$11,000.00

Outfall 2-11 (Seaconnet Blvd. at Gould Avenue):
\$64,000.00

Outfall 2-17 (Cedar Avenue at Beach Street):
\$70,000.00

Outfall 2-22 (Riverside Street):
\$10,000.00

Outfall 2-13 (Seaconnet Blvd. At Ivy Avenue):
\$29,000.00

Total 6 Projects
\$191,000

- - -

Additional Recommendations:

The Town should coordinate with adjacent property owners and discuss restoration prior to the commencing the work.

Water and gas utilities appear to be present within the streets. Utility locations and depths should be assessed for impacts from the excavation as the design advances and additional costs for supporting utilities may be warranted.

We are available to discuss the above memorandum with you at your convenience.

ATTACHMENTS:

Figure 1 - Locus Map

Figure 2 – Opinion of Probable Construction Cost



PROJECT NO. 22014.00

DATE: FEBRUARY 2022

FIGURE 1
LOCUS MAP
ISLAND PARK
PORTSMOUTH, RHODE ISLAND

Figure 2

Opinion of Probable Construction Cost - Concept Figure

Climate Resilience Planning-RI
Portsmouth, Rhode Island
22014.00

Prepared By: MSC
Checked By: RJS
Date: 2/18/2022



RIDOT No.	Work Item	Quantity	Unit	Unit Price	Total
Project 2: Repair of Storm Drains in Island Park (per CCTV inspection)					
2-1. Outfall 2-19 Cedar Avenue at Leedham street					
201.0414	Remove and Dispose Pipe - All Sizes	20	LF	\$ 50.00	\$ 1,000.00
209.0200	Sack Insert Catch Basin Inlet Protection	2	EACH	\$ 175.00	\$ 350.00
701.9901	6 Inch Smooth Interior Corrugated Polyethylene Pipe	20	LF	\$ 85.00	\$ 1,700.00
L01.9901	Loam and Seed	20	SY	\$ 10.00	\$ 200.00
	Gravel Driveway Restoration	1	LS	\$ 500.00	\$ 500.00
	Temporary Traffic Control	1	LS	\$ 2,000.00	\$ 2,000.00
	20% Miscellaneous & Contingency				\$ 1,150.00
Total					\$ 7,000.00
2-2. Outfall 2-20 Green street					
201.0414	Remove and Dispose Pipe - All Sizes	20	LF	\$ 50.00	\$ 1,000.00
209.0200	Sack Insert Catch Basin Inlet Protection	2	EACH	\$ 175.00	\$ 350.00
701.9901	12 Inch Smooth Interior Corrugated Polyethylene Pipe	20	LF	\$ 100.00	\$ 2,000.00
L01.9901	Loam and Seed	20	SY	\$ 10.00	\$ 200.00
	Utility Pole Support	1	LS	\$ 2,000.00	\$ 2,000.00
	Gravel Driveway Restoration	1	LS	\$ 500.00	\$ 500.00
	Landscaping Repair	1	LS	\$ 800.00	\$ 800.00
	Temporary Traffic Control	1	LS	\$ 2,000.00	\$ 2,000.00
	20% Miscellaneous & Contingency				\$ 2,000.00
Total					\$ 11,000.00
2-3. Outfall 2-11 Seaconnet Blvd. at Gould Avenue					
201.0414	Remove and Dispose Pipe - All Sizes	235	LF	\$ 50.00	\$ 11,750.00
209.0200	Sack Insert Catch Basin Inlet Protection	2	EACH	\$ 175.00	\$ 350.00
701.9901	10 Inch Smooth Interior Corrugated Polyethylene Pipe	235	LF	\$ 95.00	\$ 22,325.00
401.2000	Class 12.5 HMA Surface (2-inches)	11	TON	\$ 150.00	\$ 1,650.00
401.1000	Class 19.0 HMA Intermediate (3-inches)	16	TON	\$ 150.00	\$ 2,400.00
932.0210	Full Depth Sawcut of Bituminous Pavement	300	FT	\$ 4.00	\$ 1,200.00
L01.9901	Loam and Seed	60	SY	\$ 10.00	\$ 600.00
	Utility Pole Support	1	LS	\$ 2,000.00	\$ 2,000.00
	Partial Replacement of Concrete Retaining Wall	1	LS	\$ 5,000.00	\$ 5,000.00
	Rebuild Catch Basin	1	LS	\$ 2,500.00	\$ 2,500.00
	Landscaping Repair	1	LS	\$ 800.00	\$ 800.00
	Temporary Traffic Control	1	LS	\$ 2,000.00	\$ 2,000.00
	20% Miscellaneous & Contingency				\$ 10,515.00
Total					\$ 64,000.00

Opinion of Probable Construction Cost - Concept Figure

Climate Resilience Planning-RI
Portsmouth, Rhode Island
22014.00

Prepared By: MSC
Checked By: RJS
Date: 2/18/2022



RIDOT No.	Work Item	Quantity	Unit	Unit Price	Total
2-4. Outfall 2-17 Cedar Avenue at Beach Street					
201.0414	Remove and Dispose Pipe - All Sizes	255	LF	\$ 50.00	\$ 12,750.00
209.0200	Sack Insert Catch Basin Inlet Protection	3	EACH	\$ 175.00	\$ 525.00
701.9901	8 Inch Smooth Interior Corrugated Polyethylene Pipe	255	LF	\$ 90.00	\$ 22,950.00
702.0630	Precast Manhole 4' Diameter Standard RIDOT Std 4.2.0	1	EACH	\$ 4,000.00	\$ 4,000.00
401.2000	Class 12.5 HMA Surface (2-inches)	15	TON	\$ 150.00	\$ 2,250.00
401.1000	Class 19.0 HMA Intermediate (3-inches)	22	TON	\$ 150.00	\$ 3,300.00
932.0210	Full Depth Sawcut of Bituminous Pavement	440	FT	\$ 4.00	\$ 1,760.00
L01.9901	Loam and Seed	30	SY	\$ 10.00	\$ 300.00
	Landscaping/Wall/Fence Repair	1	LS	\$ 4,000.00	\$ 4,000.00
	Utility Pole Support (2 Poles)	1	LS	\$ 4,000.00	\$ 4,000.00
	Temporary Traffic Control	1	LS	\$ 2,000.00	\$ 2,000.00
	20% Miscellaneous & Contingency	1	LS	\$ 2,000.00	\$ 11,567.00
Total					\$ 70,000.00
2-5. Outfall 2-22 Riverside Street					
201.0414	Remove and Dispose Pipe - All Sizes	25	LF	\$ 50.00	\$ 1,250.00
209.0200	Sack Inset Catch Basin Inlet Protection	1	EACH	\$ 175.00	\$ 175.00
701.9901	8 Inch Smooth Interior Corrugated Polyethylene Pipe	25	LF	\$ 90.00	\$ 2,250.00
401.2000	Class 12.5 HMA Surface (2-inches)	2	TON	\$ 250.00	\$ 500.00
401.1000	Class 19.0 HMA Intermediate (3-inches)	3	TON	\$ 250.00	\$ 750.00
932.0210	Full Depth Sawcut of Bituminous Pavement	50	FT	\$ 6.00	\$ 300.00
	Driveway Paver Repair	1	LS	\$ 1,000.00	\$ 1,000.00
	Temporary Traffic Control	1	LS	\$ 2,000.00	\$ 2,000.00
	20% Miscellaneous & Contingency				\$ 1,645.00
Total					\$ 10,000.00
2-6. Outfall 2-13 Seaconnet Blvd. at Ivy Avenue					
201.0414	Remove and Dispose Pipe - All Sizes	100	LF	\$ 50.00	\$ 5,000.00
209.0200	Sack Inset Catch Basin Inlet Protection	2	EACH	\$ 175.00	\$ 350.00
701.9901	8 Inch Smooth Interior Corrugated Polyethylene Pipe	100	LF	\$ 90.00	\$ 9,000.00
401.2000	Class 12.5 HMA Surface (2-inches)	2	TON	\$ 250.00	\$ 500.00
401.1000	Class 19.0 HMA Intermediate (3-inches)	3	TON	\$ 250.00	\$ 750.00
932.0210	Full Depth Sawcut of Bituminous Pavement	70	FT	\$ 6.00	\$ 420.00
L01.9901	Loam and Seed	40	SY	\$ 10.00	\$ 400.00
	Utility Pole Support	1	LS	\$ 2,000.00	\$ 2,000.00
	Landscaping/Wall Repair	1	LS	\$ 3,000.00	\$ 3,000.00
	Temporary Traffic Control	1	LS	\$ 2,000.00	\$ 2,000.00
	20% Miscellaneous & Contingency				\$ 4,684.00
Total					\$ 29,000.00



MEMORANDUM

DATE: March 23, 2022

Revised: April 27, 2022

TO: Mr. Brian Woodhead
Portsmouth Public Works Director
Town of Portsmouth

FROM: Keith MacDonald, P.E.

RE: Portsmouth Climate Resilience Plan

Project 3: Generators for Hedly Street & Prudence Island Transfer Stations

Pare Project No. 22014.00

The below memorandum has been prepared to document the preparation of the conceptual opinion of probable construction cost to provide backup generators for the Hedly Street and Prudence Island transfer stations in the Town of Portsmouth (Town).

Project Description

The Town has identified the importance of keeping the transfer stations running during a long-term power outage. Through discussion with the Town, a diesel fueled generator is preferred. No additional storage tanks are required as the Town anticipates having a sufficient supply of diesel for refilling.

At the Hedly Street transfer station, the compactors are outside but under a roof and there is sufficient space between the bays for placement of the generator. The Town has provided specifications for the compactors installed at Hedly Street. The compactor model is a Marathon M-1475XW, 14 Yard Heavy Duty Compactor, with a 50 HP motor.

At the Prudence Island transfer station the generator will be outside and exposed. The generator will require a concrete pad and underground conduit to connect to the compactors. The Town has indicated that a 35 kw generator is required for this setup.

Recommendation

Through coordination with the sales department of a generator manufacturer, the recommended generator at Hedly Street is a 125 kW diesel powered generator. The generator manufacturer's estimated cost, inclusive of installation, minor electrical work, and concrete pad placement is \$150,000. Based on the Town's indication of a 35 kw generator on Prudence Island, the estimated cost, inclusive of installation, minor electrical work, and concrete pad placement is \$50,000. The combined estimate for both locations is \$200,000.

We are available to discuss the above memorandum with you at your convenience.



MEMORANDUM

DATE: February 22, 2022

TO: Mr. Brian Woodhead
Portsmouth Public Works Director
Town of Portsmouth

FROM: Keith MacDonald, P.E.
Robert J. Sykes, P.E.

**RE: Portsmouth Climate Resilience Plan
Riverside Street Underground Infiltration**
Pare Project No. 22014.00

The below memorandum has been prepared to document the preparation of the conceptual design to address the issues identified by the Town of Portsmouth (Town) at Riverside Street.

Project Description

The Town has identified that stormwater generated from the surrounding residential neighborhood along Riverside Street collects and ponds within the property located at 131 Cottage Avenue (Assessor's Map 20, Lot 268) within the grass area adjacent to Riverside Street illustrated in the below photo.



The project proposes the construction of an underground infiltration system within the roadway, designed to exfiltrate.

Existing Conditions Review:

The contributing area that flows to the low point on Riverside Street was delineated to be approximately four (4) acres with approximately 2.75 acres of impervious cover.

According to the Soil Survey of Rhode Island (US Department of Agriculture Soil Conservation Service 1981), the soil classification at the site is primarily Merrimack-Urban Land Complex, 0 to 8 percent slopes (MU). Merrimack-Urban Land Complex is considered a well-draining material with a Hydrologic Soil Group “A”. The Town has also indicated that the soils within the project area are well draining “Sandy” materials.

Plans for the similar Cove Street underground infiltration system were also provided by the Town to Pare for review. The estimated seasonal high groundwater elevation illustrated within the plans was identified to be at approximate elevation 2.0. Fill material was observed within the subsurface explorations to a depth of approximately 10 feet, at an elevation below the estimated seasonal high groundwater elevation.

The existing low point along Riverside Street was identified to be at approximate elevation 6.0 based on available LiDAR contours with elevations ranging upward to approximately 14.0 in the vicinity of Cedar Avenue.

Recommendations:

An underground infiltration system is proposed within Riverside Street. A grassed swale is proposed along the shoulder on Riverside Street to provide pretreatment prior to the infiltration system and limit the required depth of the proposed pipe inlet. Due to the relative low elevation of the area, and proximity to groundwater, the vertical section of the proposed underground infiltration system will need to be shallow to fit within the vertical constraints.

The Rhode Island Stormwater Management, Design, and Installation Rules require a minimum of two (2) feet separation from the bottom of an infiltration practice to the estimated seasonal high groundwater elevation for infiltration practices receiving flow from residential areas. The system also requires a minimum of 8-inches of cover below the pavement section.

The system invert is proposed at elevation 4.0. The system has a total section height of 1.5 feet and has been designed with a minimum cover of 1.5 feet. To satisfy the design cover, the system has been conceptually located beginning in an area where the surface elevation is approximately 7.0. An 8-inch pipe is proposed to convey flow from the swale to the system as illustrated in Figure 1 below.

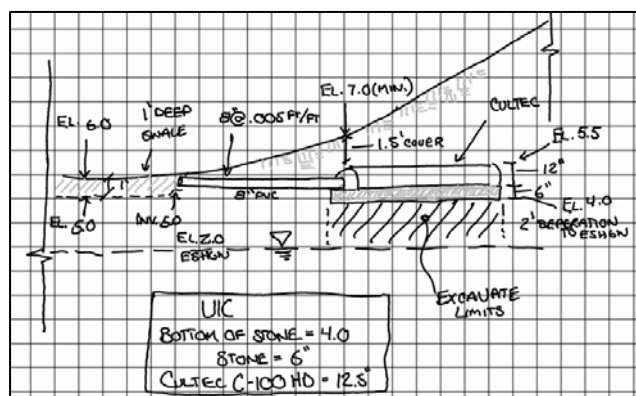


Figure 1

Two alternative design storms were reviewed when sizing the underground infiltration system footprint. A 1.2" water quality design storm and a 1-year (2.8") design storm were both assessed and the required footprints for each are included within Figure 2. Since the system does not have a mechanism for overflow in larger storm events, the system was sized to completely exfiltrate the contributing volume of runoff. During larger storm events, ponding will occur within the swale and adjacent property. Within the analysis, an infiltration rate of 8.27 inches per hour was used for the assumed well-draining sands.

An Opinion of Probable Construction Cost for this concept has been prepared and is attached as Figure 3. Scope of improvements may be revised, or alternate materials may be employed through value engineering.

Opinion of Probable Construction Costs 1.2" Design Storm: \$125,500.00

Opinion of Probable Construction Costs 1-Year Design Storm: \$186,900.00

- - -

Conclusions:

It is anticipated that the project will require a Stormwater Construction Permit with the Rhode Island Department of Environmental Management for compliance with the Groundwater Discharge Rules.

Water and Gas utilities appear to be present within Riverside Street which may require alternative footprints be assessed for installation. Excavation for the system exceeds 10-12 feet at the high side toward Cedar Avenue. The footprint was conceptually assessed with consideration of support of excavation and intended open cut excavations. Utility location and depths should be assessed for impacts from the excavation as the design advances.

We are available to discuss the above memorandum with you at your convenience.

ATTACHMENTS:

Figure 2 – Locus Map – Riverside Street

Figure 3 – Opinion of Probable Construction Cost



PROJECT NO. 22014.00

DATE: FEBRUARY 2022

FIGURE 2 LOCUS MAP

RIVERSIDE STREET
PORTSMOUTH, RHODE ISLAND

FIGURE 3

Opinion of Probable Construction Cost - Concept Figure

Climate Resilience Planning-RI
Portsmouth, Rhode Island
22014.00

Prepared By: MSC
Checked By: RJS
Date: 2/18/2022



RIDOT No.	Work Item	Quantity	Unit	Unit Price	Total
Project 4: Riverside Avenue Drainage Project					
1.2" Design Rainfall Event (Underground Storage Chamber - (Cultec 100 HD) 2,346 CF)					
202.0100	Earth Excavation	680	CY	\$ 25.00	\$ 17,000.00
204.0100	Trimming and Fine Grading	250	SY	\$ 10.00	\$ 2,500.00
203.0650	Crushed Stone	290	CY	\$ 65.00	\$ 18,850.00
701.9901	8 Inch Corrugated Interior High Density Polyethylene Pipe	35	LF	\$ 55.00	\$ 1,925.00
701.9902	Cultec 100 HD	550	LF	\$ 60.00	\$ 33,000.00
401.2000	Class 12.5 HMA Surface	30	TON	\$ 150.00	\$ 4,500.00
401.1000	Class 19.0 HMA Intermediate	40	TON	\$ 150.00	\$ 6,000.00
932.0210	Full Depth Sawcut of Bituminous Pavement	75	FT	\$ 4.00	\$ 300.00
L01.9901	Loam and Seed	83	SY	\$ 10.00	\$ 833.33
920.0050	Riprap	10	SY	\$ 200.00	\$ 2,000.00
923.9901	Temporary Traffic Control	1	LS	\$ 5,000.00	\$ 5,000.00
936.0110	Mobilization/Demobilization (assume 5%)	1	LS	\$ 4,600.00	\$ 4,600.00
				<i>Sub-Total</i>	\$ 96,508.33
				<i>Contingency (30%)</i>	\$ 28,960.00
				Total	\$ 125,500.00
1-Year Design Rainfall Event (Underground Storage Chamber - (Cultec 100 HD) 2,346 CF)					
202.0100	Earth Excavation	1040	CY	\$ 25.00	\$ 26,000.00
204.0100	Trimming and Fine Grading	370	SY	\$ 10.00	\$ 3,700.00
203.0650	Crushed Stone	440	CY	\$ 65.00	\$ 28,600.00
701.9901	8 Inch Corrugated Interior High Density Polyethylene Pipe	35	LF	\$ 55.00	\$ 1,925.00
701.9902	Cultec 100 HD	850	LF	\$ 60.00	\$ 51,000.00
401.2000	Class 12.5 HMA Surface	40	TON	\$ 150.00	\$ 6,000.00
401.1000	Class 19.0 HMA Intermediate	60	TON	\$ 150.00	\$ 9,000.00
932.0210	Full Depth Sawcut of Bituminous Pavement	75	FT	\$ 4.00	\$ 300.00
L01.9901	Loam and Seed	83	SY	\$ 10.00	\$ 833.33
920.0050	Riprap	10	SY	\$ 200.00	\$ 2,000.00
923.9901	Temporary Traffic Control	1	LS	\$ 7,500.00	\$ 7,500.00
936.0110	Mobilization/Demobilization (assume 5%)	1	LS	\$ 6,900.00	\$ 6,900.00
				<i>Sub-Total</i>	\$ 143,758.33
				<i>Contingency (30%)</i>	\$ 43,130.00
				Total	\$ 186,900.00
Design, Bidding, & Construction Contract Administration Services					
	Base Plan Preparation	1	LS	\$ 5,500.00	\$ 5,500.00
	Project Meetings & Administration	1	LS	\$ 2,000.00	\$ 2,000.00
	75% Design	1	LS	\$ 5,000.00	\$ 5,000.00
	Permitting	1	LS	\$ 11,000.00	\$ 11,000.00
	Advertisement	1	LS	\$ 5,750.00	\$ 5,750.00
	Bid Phase Services	1	LS	\$ 3,500.00	\$ 3,500.00
	Construction Contract Administration	1	LS	\$ 7,500.00	\$ 7,500.00
				Total	\$ 40,250.00

ATTACHMENT A - Project Description

Island Park Sea Level Rise Adaptation Planning Study (Neighborhood-specific Assessment)

Introduction

The Town of Portsmouth seeks consulting assistance to provide a planning level study to assess vulnerabilities and identify strategies, including capital improvements, to enhance resiliency of Town, State, and private infrastructure in the Island Park area of Portsmouth from projected sea level rise and related climate change impacts. Generally, the area to be included in this neighborhood-specific assessment is shown in the attached Figure 1.

The Town of Portsmouth envisions the analysis for this project to generate resilient solutions for the neighborhood, infrastructure, and governance that will prepare for future projected impacts due to climate change. The study will be based on the best available science, with the end deliverable including an inventory of public assets, categorizing assets by their vulnerability and risk to public safety and services, estimating the value of at-risk assets by time horizon. The proposal for consultant services must also include public engagement, meeting facilitation, and public hearing attendance. Further, the deliverables will include development of a range of potential adaptation measures with a focus on addressing at-risk critical infrastructure and other high priority assets, estimated costs for implementation, and a qualitative cost-benefit analysis of identified adaptation measures.

The Town of Portsmouth is seeking consulting assistance that will:

- Provide a completed neighborhood-specific assessment of projected climate change impacts on Town, State, and private infrastructure through clearly communicated reporting and interactive data visualization.
- Assess vulnerabilities from projected flooding and related climate change impacts utilizing available modeling that simulates processes that affect coastal water levels, including increasing precipitation, tides, waves, winds, storm surge, sea level rise, and wave set-up.
- Develop risk estimates at various time horizons to allow for better and strategic long-term planning for the neighborhood. Based on the region's existing and evolving climatology, the project's goal is to identify projected elevations that estimate modeled flood depths by producing suitable mapping which identifies vulnerabilities to public safety, governmental and civic services, and quality of life for the residents.
- Leverage state-of-the-practice methodologies to establish a base-flood elevation that can be accepted by the Town and incorporated into future planning.
- Identify improvements to enhance resiliency of Town, State, and private infrastructure.
- Conduct outreach to affected residents to understand their interests and concerns, while effectively communicating the methodology of assessments, impacts anticipated, and recommendations for adaptation based on findings.
- Evaluate existing local and state building codes and suggest amendments to promote climate readiness.
- Review and identify existing and potential legal issues and liabilities.
- Analyze existing land use and zoning ordinances and provide suggested options and/or zoning code revisions to mitigate flooding impacts, including expanding existing flood zones or incorporating new overlay districts.
- Create design guidelines for retrofits and new construction that mitigate coastal flooding risks in the neighborhood.
- Identify the potential for land transfers, public property acquisition of private property,

- and inclusion of deed restrictions for properties impacted by projected flooding.
- Produce a plan of action to address vulnerabilities identified.

Technical Approach, Methodology, and Detailed Work Plan

The Respondent's technical proposal should describe in detail how the offeror intends to carry out the requirements and tasks outlined herein, with an identified schedule to carry out the work specified. The technical proposal should demonstrate a clear understanding of the work to be undertaken and the responsibilities of all parties involved. The offeror should include details on analysis methodology proposed, as well as personnel, equipment, and contractors who will be used to carry out the required services.

- The Respondent's technical proposal should outline the Respondent's history of utilizing the methodology proposed, with references provided for Agencies that are currently employing adaptation strategies developed by the Respondent.

The Town recognizes that many resources currently exist for analysis and adaption strategies, and the Respondent shall propose a methodology that is widely accepted, in accordance with local, state, and federal guidance, strategy, and programs on the matter which addresses, at a minimum, the existing resources:

- *Input provided by municipal staff familiar with Town's infrastructure*
- *Input garnered at public meetings*
- *Portsmouth Municipal Resiliency Program Community Resilience Building Workshop Summary of Findings (September 2019)*
- *Portsmouth, RI Climate Resilience Planning and Finance Strategy prepared with support from the SNEP Network.*
- *Existing plans and GIS on file with the Town (to be shared with consultant awarded contract)*
- *RI Coastal Resource Management Council (CRMC)'s Coastal Hazard Application*
- *Rhode Island's Special Area Management Plan (SAMP)*
- *Rhode Island StormTools*
- *Resilient Rhody*
- *Rhode Island's Coastal Property Guide*
- *Rhode Island Geographic Information System (RIGIS) Road Assets Exposed by SLR by 2100*
- *NOAA's Sea Level Rise Viewer*
- *NOAA's Detailed Method for Mapping Sea Level Rise Inundation (January 2017)*
- *Additional resources identified by Respondent that may be useful to complete the project*

The Respondent must have demonstrated sufficient and successful prior experience in infrastructure analysis, public asset impact assessment, sea-level rise modeling, and coastal adaptation planning. Respondents that have strong familiarity working locally and within the State of Rhode Island are strongly encouraged and preferred. Additionally, the following experience will be evaluated:

Required Experience

- Demonstrated experience with analysis of historical impacts of climate change as well as climate change projections
- Experience in the communication of climate change impacts and planning
- Experience with GIS software, high volume spatial analysis, and data management

- Access to computational facilities/resources necessary to complete required tasks
- Strong technical writing skills. References to publicly available publications on the subject matter, produced by the Respondent, is strongly encouraged

After evaluating submitted technical proposals, the Town will conduct reference checks and may elect to interview the Respondent's team at a time and format that is acceptable to the Town's selection team.

The project tasks indicated below are anticipated for this project. Additional items and/or revisions to the project tasks may be incorporated into a final Scope of Services between the Town and the Respondent awarded this contract.

Project Tasks

Task 1 – Kickoff Meeting and Data Review

Following award of the project, the selected consultant will:

- Meet with the Town of Portsmouth to review the consultant's proposal, review the consultant's methodology, communicate project deliverables, highlight anticipated timelines, and discuss project expectations.
- Work with the Town's project manager to identify data available at the Town, State and Federal levels (plans, reports, GIS, sea level rise modeling tools and projections, studies, etc).
- Evaluate available data and incorporate into consultant's study as appropriate.
- Identify public meetings/workshops and dates to incorporate into the project's study/schedule – this strategy will be further refined in Task 3.
- Conduct site visits for review of existing conditions.

Task 2 – Initial Data Analysis

The selected consultant will:

- Utilize approved methodology to identify anticipated impacts to Town infrastructure.
- Identify initial impacted assets/areas of concern within the neighborhood.
- Work with the Town to screen and prioritize areas of the neighborhood by assessing vulnerability and risk to infrastructure and perform risk assessment for impacts to roadways/utilities. The consultant will work with Town staff to develop a framework for scoring these areas based on flood risk and related climate change impacts, transportation impacts, and related issues identified by the team.
- Identify critical public safety concerns, including public safety buildings, evacuation routes, and critical services to the public that may be impacted. Impacts to community systems shall include:
 - Built environments (buildings, roads, bridges, water, energy, utilities, etc.)
 - Social environments (health, emergency response, vulnerable populations, etc.)
 - Cultural environments (native American tribes, environmental justice areas, etc.)
 - Natural environment (aquatic, marine, terrestrial ecosystems, etc.)

Task 3 – Public Outreach and Engagement

The selected consultant will:

- Work with the Town staff to reach and engage stakeholders at a public workshop (or workshops). The goal of the public workshop(s) will be to review and then further prioritize the sites identified, based on local input. During the workshop(s), the consultant will present the risk assessment for each location and help explain the process by which the priority areas were identified. This public engagement strategy will outline the number and type of meetings and engagement acceptable to the Town.

Task 4 – Adaptation Plan Analysis

The selected consultant will:

- Evaluate critical infrastructure, inventory available wetland and natural resources available on existing GIS systems, model sea level rise impacts, and identify potential adaptation strategies to impacted Town, State, and private infrastructure over the approved planning horizon for impacted areas.
- Provide conceptual level adaptation plans/strategies, and their associated tradeoffs, for the neighborhood. A comprehensive review of alternatives should include improvements to infrastructure including construction of protection measures that would enhance resiliency for the neighborhood and strategies to mitigate for projected climate change related issues.
- Provide an “order of magnitude” cost estimate(s) anticipated to implement the strategy(ies) depicted by each alternative.
- Meet with Town staff to discuss proposed alternatives and concepts identified, explore benefits and tradeoffs, and help the Town identify preferred solutions to pursue based on input received during the Town staff input, the public workshop session(s), cost estimates for implementation of concepts generated, and other Town criteria. This goal of this task will position the Town to seek funding to complete design for preferred alternatives and move ahead with implementation of projects that address vulnerabilities identified.
- Outline a phased Implementation Strategy that details steps, timelines, permitting required, legislative approval processes anticipated, design elements needed, order of magnitude cost estimates for implementation measures proposed, and related information needed to act on the strategy(ies) outlined. *Note: permitting, design, and implementation are not part of this task, assignment, and/or project overall. The selected consultant shall provide the strategy and process anticipated only.*
- Engage stakeholder in a workshop (or workshops) to review and accept feedback on draft Implementation Strategies.
- Revise the Implementation Strategy as appropriate to incorporate input from stakeholders.
- Present findings at a public hearing (or hearings) identified by Town staff.
- Provide a written report that incorporates a summary of findings, drawings, cost estimates, memorandums, details the data that is utilized, and includes all relevant information garnered, generated, and discovered during the performance of this work.
- Provide all data (electronic and a hard copy) and published materials garnered, generated, and produced during the performance of this work, at the request of the Town.

Task 5 – Identify Known Funding Sources to implement strategies

As a supplement to the selected consultant’s report, the selected consultant will:

- Research available funding opportunities, and identify programs, grants, and funding strategies that may be available to implement recommendations and strategies presented.

Estimated Fee

A less detailed analysis could be completed in the \$50,000 - \$75,000 range and a much more detailed analysis could be completed for upwards of \$150,000. A higher budget would likely attract larger, national firms with more resources, but perhaps with a local office.

ATTACHMENT A - Project Description

Town-wide Road and Drainage System Assessment/Analysis

Introduction

The Town of Portsmouth seeks consulting assistance to provide a planning level study that will identify and assess the vulnerability of local roads and associated drainage/utility infrastructure throughout the Town, and to conduct feasibility analyses of potential solutions. The project tasks respond to a priority action identified by many New England communities in their vulnerability and resilience planning to identify and assess roadways, road segments, drainage and utility systems, bridges, and culverts vulnerable to flooding from projected sea level rise and/or storm surges, and increased precipitation. Expertise is sought to determine the extent of vulnerabilities, or where future vulnerabilities may occur, what potential adaptation options are, and cost estimates for solutions.

All communities along coastal New England have flood-prone roads that currently flood or are expected to flood under future sea level rise and worsening storm conditions. The Town of Portsmouth seeks to proactively plan for adaptation strategies that will help mitigate impacts to these areas from future flooding resulting from climate change.

The Town of Portsmouth envisions this analysis for this project to be based on the best available science, with the end deliverable including an inventory of vulnerable roadways and public assets, categorizing assets by their risk to public safety and services, estimating the value of at-risk assets by time horizon, public engagement and meeting facilitation, and public hearing attendance. Further, the deliverable will include development of a range of potential adaptation measures with a focus on addressing at risk critical infrastructure and other high priority assets, estimated costs for implementation, and a qualitative cost-benefit analysis of identified adaptation measures.

The Town of Portsmouth is seeking consulting assistance that will:

- Provide a completed Town-wide assessment of projected climate change impacts on Town and State infrastructure through clearly communicated reporting and interactive data visualization.
- Assess roadway vulnerabilities to projected flooding and related climate change impacts utilizing available modeling that simulates processes that affect coastal water levels, including increasing precipitation, tides, waves, winds, storm surge, sea level rise, and wave set-up – all at a fine enough resolution to identify site-specific locations that may require adaptation alternatives.
- Develop risk estimates at various time horizons to allow for better and strategic long-term planning in the Town. Based on the region's existing and evolving climatology, the project's goal is to identify projected elevations that estimate modeled flood depths by producing suitable mapping which identifies vulnerabilities to public safety, governmental and civic services, and quality of life for the Town's residents.
- Leverage state-of-the-practice methodologies for roadway vulnerability assessment and adaptation planning, such as new assessment standards and design guidelines developed by state and federal resources for roadways facing coastal climate change impacts.
- Identify improvements to enhance resiliency of Town and State infrastructure.
- Effectively communicate to stakeholders the methodology of assessments conducted, impacts anticipated, and recommendations for adaptation based upon the findings.
- Establish a base-flood elevation that can be incorporated into future planning.
- Produce a plan of action to address vulnerabilities identified.

Technical Approach, Methodology, and Detailed Work Plan

The Respondent's technical proposal should describe in detail how the offeror intends to carry out the requirements and tasks outlined herein, with an identified schedule to carry out the work specified. The technical proposal should demonstrate a clear understanding of the work to be undertaken and the responsibilities of all parties involved. The offeror should include details on analysis methodology proposed, as well as personnel, equipment, and contractors who will be used to carry out the required services.

The Respondent's technical proposal should outline the Respondent's history of utilizing the methodology proposed, with references provided for Agencies that are currently employing adaptation strategies developed by the Respondent. The Town recognizes that many resources currently exist for analysis and adaption strategies, and the Respondent shall propose a methodology that is widely accepted, in accordance with local, state, and federal guidance, strategy, and programs on the matter which addresses, at a minimum, the existing resources:

- *Input provided by municipal staff familiar with Town's infrastructure*
- *Input garnered at public meetings*
- *Portsmouth Municipal Resiliency Program Community Resilience Building Workshop Summary of Findings (September 2019)*
- *Portsmouth, RI Climate Resilience Planning and Financing Strategy prepared with support from the SNEP Network.*
- *Existing plans and GIS on file with the Town (to be shared with consultant awarded contract)*
- *Rhode Island Coastal Resource Management Council (CRMC)'s Coastal Hazard Application*
- *Rhode Island's Special Area Management Plan (SAMP)*
- *Rhode Island StormTools*
- *Resilient Rhody*
- *Rhode Island's Coastal Property Guide*
- *Rhode Island Geographic Information System (RIGIS) Road Assets Exposed by SLR by 2100*
- *NOAA's Sea Level Rise Viewer*
- *NOAA's Detailed Method for Mapping Sea Level Rise Inundation (January 2017)*
- *Additional resources identified by Respondent that may be useful to complete the project*

The Respondent must have demonstrated sufficient and successful prior experience in infrastructure analysis, public asset impact assessment, sea-level rise modeling, and coastal adaptation planning. Respondents that have strong familiarity working locally and within the State of Rhode Island are strongly encouraged and preferred. Additionally, the following experience will be evaluated:

Required Experience

- Demonstrated experience with analysis of historical impacts of climate change as well as climate change projections
- Experience in the communication of climate change impacts and planning
- Experience with GIS software, high volume spatial analysis, and data management
- Access to computational facilities/resources necessary to complete required tasks
- Strong technical writing skills. References to publicly available publications on the subject matter, produced by the Respondent, is strongly encouraged

After evaluating submitted technical proposals, the Town will conduct reference checks and may elect to interview the Respondent's team at a time and format that is acceptable to the Town's selection team.

The project tasks indicated below are anticipated for this project. Additional items and/or revisions to the project tasks may be incorporated into a final Scope of Services between the Town and the Respondent awarded this contract.

Project Tasks

Task 1 – Kickoff Meeting and Data Review

Following award of the project, the selected consultant will:

- Meet with the Town of Portsmouth to review the consultant's proposal, review the consultant's methodology, communicate project deliverables, highlight anticipated timelines, and discuss project expectations.
- Work with the Town's project manager to identify data available at the Town and State (plans, reports, studies, GIS, etc.)
- Evaluate available data and incorporate into consultant's study as appropriate.
- Identify public meetings/workshops and dates to incorporate into the project's study/schedule.
- Conduct site visits for review of existing conditions.
- Identify gaps in existing GIS information on file with the Town and outline a program for Town-wide GIS upgrade to water, sewer, and drainage utilities.

Task 2 – GIS Updates to Utilities

Utilizing data provided and gaps in existing information identified in Task 1, the selected consultant will:

- Update existing utility information in a GIS format acceptable to the Town.
 - The Town anticipates collection of data on sanitary sewer and public stormwater infrastructure as a primary objective of this Task.
 - Collection of data on additional utilities and assets is also desirable to the Town, should funding allow.
- Additional field work may be added, as funding allows, to collect additional information related to this infrastructure (rim elevation, pipe sizing verification, visual catch basin/manhole structure evaluation, depth to invert(s), etc.).
 - For the purposes of this RFP, the selected consultant shall anticipate performing field inventory and incorporating into the Towns' GIS database the following infrastructure assets:
 - 500 catch basins/manholes
 - 50 outfalls
 - 10 miles of drainage pipe
 - 10 miles of sanitary sewer
 - 10 miles of roadway

Task 3 – Initial Data Analysis

The selected consultant will:

- Utilize approved methodology to identify anticipated impacts to Town infrastructure.

- Identify initial impacted assets/areas of concern.
- Work with the Town to screen roads/areas of Town by assessing vulnerability and risk to infrastructure and perform risk assessment for impacts to roadways/utilities. The consultant will work with Town staff to develop a framework for scoring roadways based on flood risk and related climate change impacts, transportation impacts, and related issues identified by the team.
 - The consultant will develop critical elevations for each road segment (up to 1/4 mile in length) and assess roadway segment vulnerability.
 - At a minimum, the top twenty sites scoring highest will be selected for presentation to the public through a public forum type workshop.
- Identify critical public safety concerns, including public safety buildings, evacuation routes, and critical services to the public that may be impacted. Impacts to community systems shall include:
 - Built environments (buildings, roads, bridges, water, utilities, energy, etc.)
 - Social environments (health, emergency response, vulnerable populations, etc.)
 - Cultural environments (native American tribes, environmental justice areas, etc.)
 - Natural environment (aquatic, marine, terrestrial ecosystems, etc.)

Task 4 – Public Outreach and Engagement

The selected consultant will:

- Work with the Town staff to reach and engage stakeholders at a public workshop (or workshops). The goal of the public workshop will be to review and then further prioritize the sites identified through Task 3, based on local input. During the workshop the consultant will present the risk assessment for each location and help explain the process by which the priority road segments were identified.

Task 5 – Roadway Feasibility and Alternative Solutions

The selected consultant will:

- Evaluate critical infrastructure, inventory available wetland and natural resources available on existing GIS systems, model sea level rise impacts, and identify potential adaptation strategies to impacted infrastructure over the approved planning horizon for impacted areas.
- Outline initial findings from Task 4 with the Town to further develop roadway segments/areas of the Town that will be advanced for concept level adaptation planning and strategy.
- Provide conceptual level adaptation plans/strategies, and their associated tradeoffs, for each priority road segment/area of Town identified. For the purposes of this RFP, the consultant should assume ten (10) concepts will be generated.
- Provide an “order of magnitude” cost estimates anticipated to implement the strategy(ies) depicted by each alternative.
- Meet with Town staff to discuss proposed alternatives and concepts identified, explore benefits and tradeoffs, and help the Town identify preferred solutions to pursue based on input received during the Town staff input, the public workshop session, cost estimates for implementation of concepts generated, and other Town criteria. This goal of this task will position the Town to seek funding to complete design for preferred alternatives and move ahead with implementation of projects that address vulnerabilities identified.
- Outline an implementation strategy that details steps, timelines, permitting required, design elements needed, and related information needed to act on the strategy(ies) outlined. *Note: permitting, design, and implementation are not part of this task, assignment, and/or project overall. The selected consultant shall provide the strategy and process anticipated only.*
- Present findings at a public hearing (or hearings) identified by Town staff.

- Provide a written report that incorporates a summary of findings, drawings, cost estimates, memorandums, details the data that is utilized, and includes all relevant information garnered, generated, and discovered during the performance of this work.
- Provide all data (electronic and a hard copy) and published materials garnered, generated, and produced during the performance of this work, at the request of the Town.

Task 6 – Identify Known Funding Sources to implement strategies

As a supplement to the selected consultant's report, the selected consultant will:

- Research available funding opportunities, and identify programs, grants, and funding strategies that may be available to implement recommendations and strategies presented.

Estimated Fee

The infrastructure inventory work based on the assumed 500 structures, 50 outfalls and 10 miles of roadway utilities, is estimated at \$60,000 - \$75,000. The remainder of the scope is estimated at \$100,000, for a total estimated fee of \$160,000 - \$175,000.