



June 24, 2015

Dear Chairman Zurier,

Thank you and the Commission for allowing the DPPC an opportunity to address the infrastructure and maintenance needs of Providence's downtown public spaces. Since our last meeting we have pursued cost estimates for these infrastructure repairs through consultation with our colleagues at the Providence Parks Department, as well as through a site visit with CDR Maguire. At this stage of assessment these are rough estimates, some are from older studies such as *River Relocation (Memorial Blvd, Contract 5)* that built Waterplace Park and the Riverwalk from Steeple to Francis Streets, so they might be low and could be affected by inflation and other contingencies. However, we believe that they demonstrate an order of magnitude that will allow us to move ahead with our efforts. The estimates included below total approximately \$9.7MM.

We are grateful for your consideration and look forward to speaking with you and the Commission again.

Sincerely,

Cliff Wood, Executive Director
Downtown Providence Parks Conservancy

Attachments: *Continuing Our Investment in the Success of Our Capital City*, by The Providence Foundation and WaterFire Providence
CDR Maguire document regarding river dredging

Cc: Wendy Nilsson, Providence Parks Department
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Waterplace Park

- Walkways at approximately 50,000/SF or 5,500 SY @ \$200/SY to replace, \$1.1 million
- Electric repairs, 16,000 feet of wire, about 100 fixtures, 6000 feet of conduit in the walkways, etc., \$1.2 million
- Lighting repairs, \$25,000
- Potential fall hazard repairs southeast of Waterplace Towers and across river, \$140,000
- Complete repair of tripping hazards site wide, \$50,000
- Stage Replacement at Waterplace Amphitheater, \$35,000 – \$75,000
- Bridge joints at College and Crawford Streets, \$250,000
- College Street Crosswalk, \$50,000
- Handrails along South Water Street, 1,400 feet at \$100/foot, \$150,000
- Rehabilitate and repair docks, \$250,000
- Other miscellaneous, handrails, concrete repair, etc., \$250,000
- Design/Engineering/Contracting, \$300,000

Subtotal: \$3,840,000

Dredging of river: The 2012 U.S. Army Corps 2012 study, included dredging from the Point Street Bridge to the Francis Street Bridge (Plan A in attached study). Plan B includes all work in Plan A and also includes dredging the Moshassuck River from the Washington Street Bridge up river about 1,700 feet.

- **Plan A** **\$3,127,268**
- **Plan B** **\$5,706,368**

Burnside Park

(Several repairs and upgrades already addressed by \$395K Champlin grant awarded to the project in 2014 such as monument repair and upgrades, fencing upgrades, upgrade and extension of electrical infrastructure and lighting.)

- Fountain renovations, cost not currently available
- Wrought iron fencing repair, \$20,000

Biltmore Park

- Irrigation repairs, \$10,000
- Bench Replacement - \$2,500/each x 10 = \$25,000
- Complete repair of tripping hazards site wide, \$20,000
- Monument renovations, \$15,000

Subtotal: \$70,000

Skating Rink

- Rink infrastructure repairs, \$50,000
- Building repairs, including bathroom, \$15,000
- Other infrastructure and systems (e.g.; chiller, Zamboni), costs not yet assessed

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CONTINUING OUR INVESTMENT IN THE SUCCESS OF OUR CAPITAL CITY

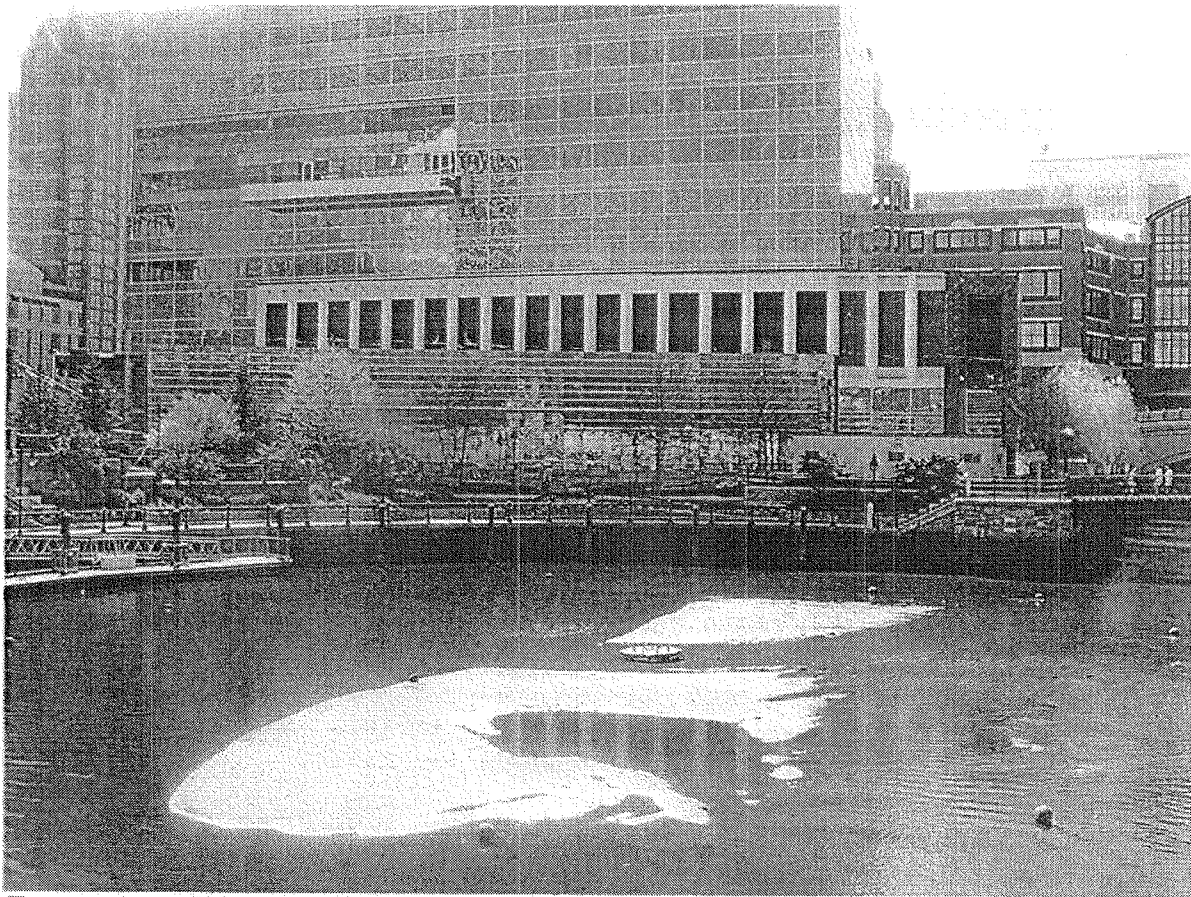
Twenty-two years ago, Waterplace Basin opened as the first phase of Capital Center and the relocation of the rivers. A joint Federal, State and City project, piloted by the Providence Foundation, thirty-five years of planning and construction and \$170 million in public dollars for infrastructure had an amazing impact on Providence and Rhode Island, stimulating over \$1.2 billion in private investment in new buildings in the Capital Center District with more to come. The project created an entirely new district in downtown with sweeping river views and gracious parks and walkways designed by William D. Warner. The key to the project was uncovering our rivers and celebrating Providence's maritime history. The experience of the rivers was deemed so important and so central to the Capital Center program that in order to better highlight and capitalize on the river assets, the rivers were physically moved at great expense to permit the river walks to run alongside the water. The new riverfront district transformed Providence and people's vision of the capital. Capital Center brought millions of federal dollars into the state and triggered well over one billion dollars in private investment into the capital center. This momentum helped spur extensive further private investment all across downtown in renovation and new construction.

Since moving the rivers, 13 new buildings have been built and 12 buildings adjacent to the rivers have been extensively restored or remodeled. The new rivers and their gracious parks have been a huge catalyst for this change and they are at the heart of the new district. The new rivers also made WaterFire possible, which has been a huge success attracted over 15 million visitors to RI, and generated an additional \$2 billion in visitor spending over the past 20 years.

Capital Center and the river relocation project are a stunning success story for the capital city and for all Rhode Island. After nearly twenty-five years of use, even with excellent maintenance, it is to be expected that there is now a need for the State and the City to invest in some refurbishment and replacements. There is now a need to return our attention back to this award winning river park system to make the needed upgrades are done to assure another twenty-five years of further success.

RIVER ASSET, WATER DEPTH AND DREDGING:

Capital Center was built around the rivers as the prime visual asset and investors built in the district on the promise of attractive water vistas and boat access, not the sight of smelly mud flats strewn with debris. Waterplace Basin instead of a smooth expanse of water, now has an island of mud and sand visible at low tide. Even when the tide is not low, the infill of debris is just below the surface and prevents the safe passage of boats for about 50% of the time, depending upon their draft. As boaters are worried about these uncertain marine hazards underwater, it discourages all boating traffic from coming upstream at any time, defeating the purpose of the park.



Exposed sand island in Waterplace Basin prevents boat traffic from using the river

The rivers are now much shallower due to on-going siltation and need regular maintenance dredging and improved upstream watershed and stormwater management to reduce the rate of siltation. The rivers need to be dredged to a depth of at least -4.5' below MLLW (-10.25' from Providence MHW) to allow a 3.5' draft clearance for a boat to pass through at a low tide of -1'. The rivers were last dredged in 1998 and are in serious need of dredging again. Whole sections of the river in Waterplace Basin, Providence Place Mall, Parcel 2 (beneath Jacky's), the Confluence and the RISD flagpole plaza downstream of Washington Street are all unpassable for boat traffic for 50% of the time and are unsightly with mud and debris at many low tides. Another significant risk factor from the accumulated siltation comes from the reduced available cross-section for water flow in the river. This sand and debris increases the risk of flooding upstream and reduces the storage capacity for rainfall that gives the hurricane barrier additional capacity to protect from hurricane-related flooding of downtown.

Siltation management and the need for on-going maintenance dredging was part of the original plans, but since 1998 this has not occurred. It is critical that we develop funding sources to maintain the rivers to their proper depth. Potential funding sources could include a combination of federal appropriations, emergency flood management funds, a DID style district, or via a state bond referendum.



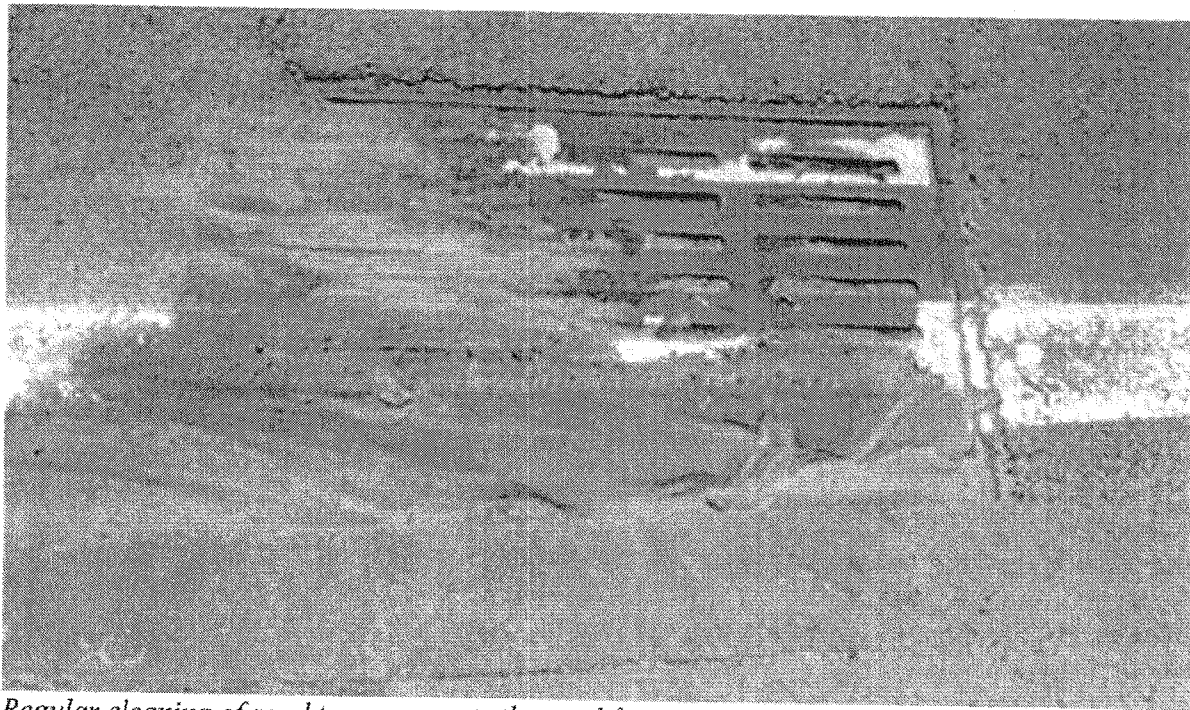
Sandbar blocks half the river in the Parcel 2 area, below the current Jacky's

Various studies have been done on the issue and all have called for dredging (Maguire Group 2007; US Army Corps 2012). Since the Army Corps site survey in 2010, there has been an increase in the height of the siltation of +1.1' on average, further blocking boat traffic and increasing the amount of material needed to be dredged, as indicated by two spot river transect surveys in April 2015. Both of these two studies will have underestimated the current need, project scale and costs due to 1) increased and continued siltation since their survey (+1.1' since 2010 USACE survey); 2) an inadequate planned dredge depth for the anticipated river traffic (needs to be -2.2' deeper at a minimum); and 3) a too limited area of dredging, skipping critical areas, not including vital traffic lanes under bridges, not going close to shore, and not reflecting the impact of the proposed new pedestrian bridge, whose boat lane is currently outside the boat traffic lane.

The siltation is being caused primarily by road sanding operations that enter the river due to poor maintenance of stormwater drains. This was established in two studies done by two Fuss and O'Neill engineers in training continuing their professional studies at Johns Hopkins University, Ashlee Tyce and Maren Frisell. Adoption of best stormwater management practices and more diligent and frequent clearing of sand traps and catch basins will make dredging operations less frequent in the future.



Road sand spread on roads in winter is the main source of the silt that is filling the rivers.



Regular cleaning of sand traps prevents the sand from entering the water and the sewers system.

PARK REFURBISHMENT:

The Providence Parks department has been given primary responsibility for maintaining what was originally planned to be a state park. They have done a great job keeping up with the many needs of a very complex park that has a variety of design challenges that make maintenance and repair particularly difficult, including: 1) greatly constrained vehicular access; 2) no on-site dumpster or trash support; 3) regular flooding with salt water due to high tides; 4) construction subsidence of walkways, foundations, paving, stairs, and bridges; 5) incomplete development has left planned adjacent support structures and anticipated buildings un-built; 6) some plantings originally specified have proven problematic; 7) lighting and hardware elements were not standardized and involve many different styles and types of fixture, which creates inventory challenges. These challenges result from the original design of the park as built by the state.

Despite inheriting these design challenges the Providence Parks Department has done a great job maintaining this large and densely programmed park. The Parks Department has been a great partner with WaterFire in making this parks a success. Inevitably after nearly 25 years of heavy use there are a range of needed structural changes in the park that are of a higher order of expense than routine maintenance. The Park Department needs additional funding to tackle infrastructure issues such as:

1) replacing the cobblestone and other walks which have settled and proved unhelpful for visitors with mobility issues; 2) correcting or replacing stairs and footings where subsidence has created tripping hazards; 3) installing tie-backs and resetting riverwall elements that have rotated out of vertical alignment; 4) replacing decorative stone medallions in the walkways that have proved to be too fragile for site traffic; 5) repairing dock structures that have weakened and failed; 6) installing power in the park that has failed; 7) rebuilding and improving the stage structure in the Basin; 8) replacing spalled stair treads, sunken manhole covers, and non-code compliant stairs; 9) replacing stolen handrails; 10) decorative lighting and electrical systems need upgrading; and 11) infrastructure improvements to better accommodate WaterFire. We urge our political and civic leadership to address these issues and to build a structure to provide financial resources for a further investment in this important state asset.

CONCLUSION:

Our investment in Capital Center, the river parks, our downtown rivers, and WaterFire have been a huge positive success for the entire state returning well over one billion dollars in private investment, plus jobs, economic activity, taxes, and civic vitality. The area is highly visible and hosts millions of visitors a year (one million a year just from WaterFire), leaving a lasting memory of the state of RI. The Providence Parks Department has been an able and diligent partner in making the park the success that it is. Just as we have all invested in refurbishing Kennedy Plaza and Burnside Park, or moved I-195 to open new areas for development, we must devise ways for the entire state to preserve, improve and maintain Capital Center, dredge the rivers, and refurbish our largest and most well-known jewel of a downtown park system.

Providence Foundation and WaterFire Providence

5. Plan Formulation

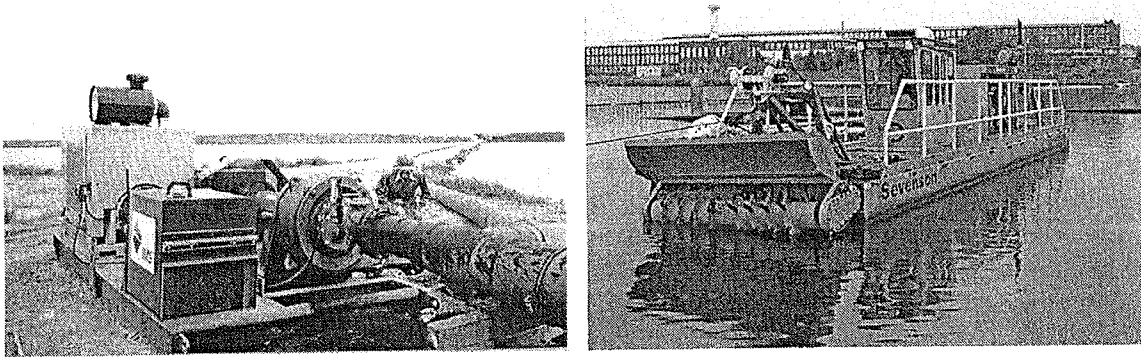
Most portions of the study area were last dredged by the Rhode Island Department of Transportation in 1998 using a backhoe with clamshell bucket. A staging area was constructed near the intersection of Dyer and Delta Streets where the sediment was dewatered and the final product was trucked away to be used for clean landfill cover. Significant urban development and continual siltation since 1998 has reduced depths in the river to the current conditions where the river bottom is exposed and portions of the channel are impassable at low tide.

In 2007, a dredging study was performed by the Maguire Group at the request of the Providence Foundation and the City of Providence Parks Department, to evaluate the feasibility of dredging the rivers and managing future sedimentation issues. The expertise of the US Army Corps of Engineers, New England District (NAE) was enlisted in 2009 when the Providence Foundation and other stakeholders met with Corps personnel to discuss the results of the Maguire Report. As a result of the meeting, a pre-dredge sampling effort was coordinated with the Woods Hole Group to extract sediment cores at various depths and locations within the river system. Sediments were characterized as approximately 50% medium sand, 30% fine sand and 20% mud or silt. The Woonasquatucket and Upper Providence sediment may be suitable for aquatic disposal. The Moshassuck sediment may be disposed upland. All dredging quantity and cost estimates in this analysis include an overdepth allowance of one foot below the design depth to account for survey and dredging inaccuracies and dredge efficiency. Based on the type and quantities of sediments, the following two dredging plans were evaluated:

- Plan A will dredge the Upper Providence River and the Woonasquatucket River to -4 feet MLLW starting at the Point Street Bridge, near the Fox Point Hurricane Barrier, upstream to the Francis Street Bridge, near the Providence Place Mall. A sedimentation basin will be dredged to -5 feet MLLW immediately upstream of the Mall and Interstate 95 for a distance of approximately 600 feet.
- Plan B will dredge the Moshassuck River in addition to all dredging performed in Plan A. The Moshassuck River will be dredged to -4 feet MLLW from the vicinity of the Washington Street Bridge for a distance of approximately 1700 feet upstream to an abandoned wooden foot bridge that will also be removed as part of this plan.

The Woonasquatucket and Upper Providence Rivers present several challenges to the dredging activity. Thirteen bridges span the rivers for pedestrian and vehicle traffic. Several of the smaller foot bridges have chord elevations too low to allow large equipment to pass underneath. The upstream reach is narrow with substantial urban development along the shores. Using shore access where available would require substantial cranes to lower dredge equipment more than 50 feet to the water surface. Plan A accomplishes the dredge task by using a small hydraulic dredge and floating pipes; similar to the equipment shown in Figure 3 below. The dredge will travel up the river and pump sediment through the pipes back to the disposal vessel. All *Waterfire* braziers and landing floats will be removed from the river before dredging starts.

Figure 3- Typical Small Capacity Booster Pump with Floating Pipeline (right) & Hydraulic Dredge (left)



A project staging area would be established on city-owned land near the Fox Point Hurricane Barrier, under the I-195 Bridge. The fenced-in area will contain an office trailer and restroom facilities for site personnel, a laydown area for equipment and supplies, and parking for contractor and government personnel. The hydraulic dredge and piping will arrive by truck to be assembled and lowered into the river near the Point Street Bridge. A small barge and a 100-horse-power (HP) launch or push boat will accompany the dredge along the river to transport the crew and assist with the pipe line. The barge will also arrive via truck to be assembled in the laydown area. The barge will carry sections of pipe and a small 1300 HP booster pump needed to move the sediment through the floating pipes. When the dredge reaches a low-clearance bridge, it will be lifted from the water and returned on the other side of the bridge by using a medium-sized crane and heavy equipment hauler.

A pocket bottom-dumping scow, small enough to fit through the hurricane barrier gates, will be anchored near the Point Street Bridge to receive the sediment. When the scow is full, operations will stop while the scow travels to the disposal site. The pump will continue to pump water through the pipeline to reduce clogging and start-up time for the next cycle. It is possible that the contractor will operate a second scow so that dredging can continue while the sediment is transported. The scow will be supported by a push boat capable of pushing the loaded scow to the confined aquatic disposal (CAD) cells located about 500 meters outside the hurricane barrier in the 40-foot Providence Harbor Basin. Approximately 29,500 cubic yards of sediment will be removed from the channel under Plan A. The time needed to complete the dredging and disposal is estimated to be two months.

The upriver settling basin included in both plans may require dredging by crane mounted bucket from land along that section of the river. If so, the dredged material would be dewatered on site, loaded onto trucks and transported to an upland site designated by the State. Dewatering will entail depositing the sediment in mounds, no higher than 10 feet, so the sediment can dry. The draining water will be directed back to the channel.

Plan B includes dredging the Moshassuck River in addition to the dredging activity described above for Plan A. The staging area for work in the Moshassuck River would be situated on the right bank downstream of Smith Street near the railroad tracks. At the approximate midpoint of the project reach, there is a pedestrian, concrete plaza that covers the river for a

7. Study Findings

This study involved an initial appraisal of operations and maintenance dredging in the Upper Providence, Woonasquatucket and Moshassuck Rivers. The alternatives included restoring the Upper Providence and Woonasquatucket Rivers to their original State-dredged depths and creating a sediment basin to impede the flow of sediment into navigable waters downstream, and a second alternative that includes dredging the Moshassuck River to remove accumulated sediment, cobble and debris. For engineering purposes, channel configurations and dredge volume estimates were based on design criteria used in the 1998 Maguire report and drawings provided by the RI Department of Transportation. The dredge quantities associated with each plan are listed in Table 1 below.

Table 1 Dredge Plans for Upper Providence, Woonasquatucket and Moshassuck Rivers		
Plan	Channel Depth	Dredge Quantities (Cubic Yards)*
Plan A: Maintenance Dredging in Woonasquatucket/Upper Providence River using hydraulic dredge	Dredging to 4 feet below MLLW of the existing channel to the Francis Street Bridge; Dredging to 5 feet below MLLW from I-95 Bridge for a distance of 600 feet upstream	29,400
Plan B: All feature of Plan A PLUS Maintenance Dredging in Moshassuck River using hydraulic dredge and dry-land excavation equipment	Dredging to 4 feet below MLLW of the existing channel between the Washington Street Bridge and Smith Street	41,000

*Dredge quantities include a one-foot overdepth allowance.

Construction costs for the two dredge plans were developed using estimates of \$41.00 per CY for hydraulic dredging and ocean disposal (Table 2). Costs include 25% contingency, Engineering and Design estimates, Supervision and Administration estimates, and estimated real estate costs. Interest during construction is calculated for a construction period of 1.5 months for Plan A and 5.5 months for Plan B using the FY 2012 Federal interest rate of 4.00 percent. Project costs are annualized over a 50-year life cycle.