

CITY OF PORTLAND, MAINE
Standing Committee on Sustainability and Transportation
Councilor Andrew Zarro, District 4, Chair
Councilor Roberto Rodriguez, At-Large
Councilor Victoria Pelletier, District 2

Agenda
May 10, 2023
5:00 PM
via Zoom

<https://portlandmaine-gov.zoom.us/j/84495294702?pwd=TXZnQVZENINJWE45MXE0RmsvY3dKQT09>

1. Review and approve minutes from March 22nd
 - a. March 22nd Minutes
2. Sustainability Program Updates
 - a. Sustainability Updates
3. Stroudwater Dam Presentation
Public comment will be taken.
 - a. Memo
 - b. Stroudwater Dam 2022 Inspection Report
 - c. Cost Estimate
 - d. Deed
 - e. Public Comment Received
4. Presentation by Metro
No Public Comment
 - a. Portland Metro Memo and Slides
5. Resolution Supporting a Fossil Fuel Non Proliferation Treaty
Public comment will be taken.
 - a. Staff memo and draft resolution

CITY OF PORTLAND, MAINE
Committee on Sustainability and Transportation
Councilor Andrew Zarro (D4), Chair
Councilor Victoria Pelletier (D2)
Councilor Roberto Rodríguez (At-Large)

Draft Minutes March 22, 2023

Members Present: Councilor Zarro, Councilor Pelletier, Councilor Rodríguez

Staff Present: Troy Moon, Erin Ferrell, Emma Perry

Meeting was called to order.

March 8 Minutes

Councilor Zarro makes a motion to approve the March 8th, 2023 meeting minutes. Councilor Pelletier moves the motion. March 8 minutes passed unanimously, 2-0.

Sustainability Update

Presented by Troy Moon and Erin Ferrell

We are excited to be testing out CMP's data access platform that will allow building owners to view whole-building energy usage data in a convenient online format. This platform will help owners of multi-tenant buildings comply with the Energy and Water Use Benchmarking Ordinance. We anticipate all multi-tenant buildings 20,000 sq ft or more will start reporting energy and water use metrics in 2024.

We met with Garbage to Garden on March 15th to discuss their transition to collecting at all of our compost sites, public schools, and municipal operations - including Portland City Hall & the Clocktower Cafe, the Barron Center, and the new Homeless Service Center. We expect them to take over collection this week.

The DC fast chargers at the corner of Spring and High Street are finally online and operational! The neighborhood charging hub at East End Elementary School should be online before the end of March, and we are still waiting for CMP to install a transformer for the chargers at Deering Oaks.

We started visiting retailers in Portland that stock and sell products subject to the Landcare Ordinance and provided signs to post in their facilities, as required by the ordinance. We sent out notices to all known practicing applicators in the city to remind them of the ordinance and new amendments restricting the use of synthetic fertilizers. The Landcare Ordinance goes into effect on March 19, 2023. The Office has been posting educational materials regarding the ordinance on social media and the landcare website which can be found at portlandmaine.gov/landcare.

Troy Moon testified against LD 89, "An Act to Preserve Heating and Energy Choice by Prohibiting a Municipality from Prohibiting a Particular Energy System or Energy Distributor". If

passed, this bill would prevent the City from adopting policies restricting the use of fossil fuel heating/cooling infrastructure in new buildings or major retrofits, which is a measure called for in One Climate Future.

Councilor Comment on Sustainability Update

Councilor Zarro shares his excitement about the Garbage to Garden partnership and the updates on the new EV charging infrastructure.

Councilor Rodríguez asks Director Moon if he knows if there is anything in Maine legislature about the sale of PFAS-contaminated soil? *Last session the legislature passed a bill prohibiting the landspreading of materials containing PFAS. Our Portland Landcare Ordinance also prohibits this activity.*

Resolution Opposing Federal Preemption of Municipal Pesticide Ordinances

Presented by Troy Moon

Director Moon explains there is a bill (HR 7266) attached to the Federal Farm Bill that would amend the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to prohibit local governments from regulating pesticides instead putting that power entirely in the hands of a lead agency at the state level and with the EPA. This year, Senator Cory Booker has offered the Protect America's Children from Toxic Pesticides Act of 2023 (PACTPA) to ensure that state and local governments retain the authority to regulate pesticides at the local level. We have attached a draft resolution for the Sustainability and Transportation Committee to consider that would authorize the Mayor and the Chair of the Sustainability and Transportation Committee to send a letter to the Chairs of the Agriculture Committee and Maine's Congressional Delegation expressing opposition to HR 7266 and supporting PACTPA and asking that they protect the authority of local governments to regulate pesticides.

Public Comment on Resolution Opposing Federal Preemption of Municipal Pesticide Ordinances

No comment. Councilor Zarro makes a motion to move the Resolution to Oppose the Federal Preemption of Local Pesticide Ordinances 2023. Councilor Rodríguez moves the motion. Seconded by Councilor Pelletier.

Councilor Comment on Resolution to Oppose the Federal Preemption of Local Pesticide Ordinances 2023.

Councilor Zarro asks if there is a timeline and need to bring this to the attention of the full Council by a deadline. *There is no specific deadline, but we should move this to the attention of the Mayor and put a Council meeting agenda as soon the Committee is ready.*

Councilor Zarro follows up by asking if there is communication with neighboring municipalities. Councilor Pelletier asks if there will be more public comment when/if this goes to council. *There will be more opportunity for public comment.*

Motion to approve the Resolution to Oppose the Federal Preemption of Local Pesticide Ordinances 2023.

Passes unanimously.

Communication on LMAC Report

Presented by Troy Moon

In September 2022, the Portland City Council approved amendments to the Pesticide Ordinance recommended by city staff and PMAC. The new Land Care Ordinance restricts the use of synthetic fertilizers in addition to the restriction of pesticides. These amendments go into effect on March 19, 2023. Staff conducted educational events, materials, and outreach throughout the year with residents, businesses, and landcare professionals. Staff connected with all applicators that reported in 2021 and found full reporting compliance. The first fine for application in violation of the Pesticide Use Ordinance was issued in 2022. With this report, the PMAC does not make any new recommendations for 2023. The committee will continue to assist in educating the public about the City's Landcare Ordinance.

Councilor Comment on the LMAC Report and Update

Councilor Zarro asks how people can ask questions and how the office has tried to educate the public. *The Office has been posting educational materials on social media and the Landcare website, sending direct notices to applicators and retailers, and fielding questions via email and phone.*

Composting Program Update

Presented by Emma Perry

Emma outlined the increased use of the neighborhood compost drop off locations around Portland. There are 8 sites total right now. There was roughly 400,000lbs of food waste diverted from the waste stream due to the drop sites in 2022.

Councilor comment on the Compost Program Update Presentation

Councilor Rodriguez asks if there is opportunity to have apartment buildings curbside compost as a building. *This has yet to be discussed but with the new partnership with Garbage to Garden, there is room for discussions.*

Updating the City's Greenhouse Gas Reduction Target to a Science-Based Target

Presented by Troy Moon

The latest IPCC Climate reports show that on our current trajectory, global temperatures will exceed 1.5°C in the early 2030s and 2.0C by the 2070s. Carbon emissions have fundamentally and irreversibly changed the climate and cutting CO2 emissions in half in the next decade is vital to keep 1.5°C possible. They outline that, to stay within the 1.5°C increase, global carbon emissions must peak by 2025, reduce by 48% by 2030 (relative to 2019 levels), and reduce to net zero by 2050. We propose the City updates their GHG reduction target to the science based

target of 65% reduction of CO2 emissions by 2030 (mid-term goal) and a 100% reduction of CO2 emissions (“net-zero”) by 2050 (long-term goal).

Public Comment on Updating the City’s Greenhouse Gas Reduction Target to a Science-Based Target

Bill Weber and the Portland Climate Action Team support the reasoning behind updating the City’s community wide greenhouse gas reduction targets. PCAT would like to add amendments to the OCF plan: 1) update the greenhouse gas inventory every 5 years. 2) Major assumptions and risks to meet the goals should be identified and then actively managed. 3) The revenue generated by RECs should only be used to promote sustainability programs and projects.

Ellen Grant adds that she believes there is an opportunity when hiring the new City Manager to choose a candidate with sustainability priorities.

George Rheault notes that there is concern about Portland’s ability to move the needle on reducing greenhouse gas for the country. There are smaller actions and investments that Portland could be doing to make efforts.

Councilor Comment on Updating Targets Presentation

Councilor Zarro asks how we can support this recommendation with a more concrete and substantial timeline, key policies and milestones, and buy-in or commitments from partners. *There are certainly things from a policy perspective that this committee can do. Some cities have adopted policies with less discretionary target language for things like fleet and equipment updates or new construction projects and we look to those as policy goals for our City too.*

Councilor Rodriguez notes that when we have a public discussion on the actionable items to put behind this, we inevitably must address that Portland is a small piece of this overall issue and hopefully find solutions to invest in that are cost-saving and operationally efficient in ways that solve some of our City’s immediate needs too. We are operating in a reality where resources are scarce.

Councilor Pelletier shares her support for the recommendation but notes similar concerns for the allocation of resources and realistic nature of gathering support and being on-board with the climate conversation. We need to better track a lot of our investments and successes moving forward. We also must be thinking about the impacts of our investments and what might be left behind as we make steps forward.

Motion to postpone the vote on Updating the City’s Greenhouse Gas Reduction Target to a Science-Based Target to April 12th meeting.

Motion passes unanimously.

Motion to Adjournment

Moved by Councilor Rodríguez, all adjourned.

Meeting Adjourned



CITY OF PORTLAND

Sustainability Office

Troy Moon

Sustainability Director

Sustainability Updates

May 10, 2023

Energy

Benchmarking reports were due by May 1 for all single-tenant buildings 20,000 square feet or more. The Office is using a benchmarking implementation platform, BEAM, to better evaluate benchmarking reports for compliance and accuracy. We've received over 100 reports so far with more expected by the end of the month. We are seeing improvements in report completeness using the BEAM platform already. Anyone with questions or looking for assistance with submitting their report should refer to portlandmaine.gov/energybenchmarking.

We launched the Electrify Everything! e-bike incentive "Electrify Bikes!" at our Earth Day Celebration. Electrify Bikes! will help income-eligible Portland residents purchase an electric bicycle or electric cargo bicycle that can provide a reliable, practical transportation option that does not rely on fossil fuels and supports goals identified in One Climate Future to reduce vehicle miles traveled in automobiles and to reduce carbon emissions from transportation. We began taking applications for incentives on Monday, April 24th at 8:30 AM, and by Wednesday, the 26th at 12 PM we had reached our \$150,000 anticipated spending limit. 76 individuals have received incentives and we placed 13 participants on a waitlist in case some incentive certificates may expire or are not used in full.

Waste Reduction

Garbage to Garden officially took over as Portland's official composting partner. We recruited offices and departments throughout City Hall to collect and compost their food scraps, visited the new Homeless Service Center to facilitate collection at the site, and look forward to increasing residential participation in the community composting program or curbside service. Weekly drop-off site maintenance continues and we recently updated all the QR codes on the signs. Garbage to Garden was also a fantastic help in managing all waste collection at the Earth Day celebration.

Electric Vehicles

The neighborhood charging hubs at East End Elementary School and at Deering Oaks are finally online and operational! Troy is working hard with EVGo to identify more sites to place the rest of the L2 and DCFC chargers. After presenting to the Housing and Economic Development

Department, we are looking into the feasibility of the parking lot on Marginal Way by Miss Portland Diner.

Landcare

The Office launched an educational campaign “[Mow Tall ‘Til Fall](#)” in support of sustainable landcare practices. We look forward to hosting educational webinars with partners such as Wild Seed Project, Maine Audubon, and ME-DACF throughout the summer, as well as in-person tabling at the Portland Farmer’s Market and Wayside Pop-Up Summer Picnics.

Community Support

The Sustainability Office is so excited to announce that amongst the neighborhood applications received, Libbytown and Parkside neighborhoods were selected to join Portland’s Sustainable Neighborhoods Program!

We have established engagement with both neighborhoods so far, but the next step is to schedule kick-off events for both neighborhoods inviting all neighborhood residents to learn more about the program and provide input on what types of initiatives the neighborhood might adopt. Each neighborhood has its own website to host information and track events and projects. Katie is working hard to put more flyers in both neighborhoods and spread the word to residents, no matter what neighborhood they live in.

Education and Outreach

On March 23, Katie spoke on behalf of the City of Portland on a panel at the kickoff event for Roux Institute’s Start Summit. Residents from all over Maine participated in this two-day idea hackathon focused on innovative solutions for waste reduction.

On April 7, the Sustainability Office participated in the Portland Public Health Fair in celebration of National Public Health Week (NPHW)! We got to spend the First Friday Art Walk in Congress Square Park on Friday, April 7 with other local organizations and got to speak with many residents about our programs.

On April 13, Erin represented the City of Portland at the Department of Energy’s [Better Buildings Summit](#) in Washington, DC. Alongside co-panelists from Dallas, TX and Maryland, she highlighted how the City built a climate action plan based on community participation and input in a session on best practices in state and local climate action planning.

On April 13, Troy and Katie welcomed Benard Nyabua and Sospeter Onunga, two colleagues visiting from Nairobi, Kenya. We talked and shared perspectives about climate action, waste management, and energy infrastructure in both of our Cities.

On April 22, the City of Portland hosted its first official Earth Day Celebration, bringing together City departments and partners across the City. Besides recruiting families and friends to

celebrate, the event launched our Electrify Bikes! incentive program and announced the two neighborhoods selected to join the Sustainable Neighborhoods Program. The event was such a success and we look forward to Earth Day 2024.

On April 27, Leadership Portland hosted a session on balancing environmental concerns and convenience; renewable and sustainable energy opportunities; and the impact of climate change. Troy was featured on the panel along with partners at ecomaine and ReVision Energy.

On May 4, Troy Moon spoke on behalf of One Climate Future on a panel at [an event](#) hosted by the Gulf of Maine Research Institute. The event featured the Halycon string quartet and a film on the impacts of sea level rise in Portland. We look forward to helping the Gulf of Maine Research Institute promote its upcoming workshops for organizations and volunteer groups interested in supporting engagement in the [Coastal Flooding Community Science Project](#).

On May 9, Katie presented at the Maine Resource Recovery Association Annual Conference. This was a great chance to connect with private and public sector leaders in recycling & solid waste management.

The One Climate Future team held a Coffee and Climate event on April 14th to discuss Sharing Economy & Electric Tools with Dr. Brie Berry. We hold our first in-person C&C tomorrow! Join the One Climate Future team and the New England Ocean Cluster for a fun evening and a discussion on sustainability in both our working waterfront and the local aquaculture industry. Register for [Gulf of Change](#) here.

Climate and Coffee events are community conversations that happen on the 2nd Friday of the month at 9 AM. We record sessions with guest speakers and post them on www.oneclimatefuture.org, along with other information about our work. You can also follow us on social media. Instagram [@sustainableportlandme](#) / Twitter [@SustainPortME](#) / FB [@SustainablePortlandME](#)

Coffee & Climate 2023 Series

January 13	Climate Ready Casco Bay <i>w/ GMRI & GPCOG</i>
February 10	Being Bird Friendly and Bird Safe <i>w/ Maine Audubon and Portland Society for Architecture</i>
March 10	Complete Streets <i>w/ Bicycle Coalition of Maine</i>
April 14	Sharing Economy & Electric Tools <i>w/ Brie Berry, economic & environmental anthropologist</i>
May 11	Aquaculture (in-person event) <i>w/ the Hus, Atlantic Seafarms, and the Lady Shuckers</i>
June 9	Sustainability & the Arts (in-person event) <i>w/ Portland Museum of Art</i>
July 14	Plastics & Producer Responsibility (in-person event) <i>w/ Go-Go Refill, Rubbish! Portland, NRCM, and Tandem Coffee</i>
August 10	Breweries & Sustainability (in-person event) <i>w/ NEEFC and local brewers</i>
September 8	Navigating State & Federal Incentives <i>w/ Efficiency Maine and Maine Governor's Energy Office</i>
October 13	How to Talk About Sustainability <i>w/ Our Climate Common</i>
November 17	Environmental Justice <i>w/ Color of Climate</i>
December 8	2023 Recap <i>w/ One Climate Future team</i>

Coffee & Climate is a monthly event exploring sustainability and climate topics with the help of guest experts.

For more information, visit oneclimatefuture.org/



To: Councilor Zarro and members of the Sustainability and Transportation Committee
Re: Stroudwater Dam recommendation
Date: May 5, 2023

Purpose

Receive guidance from the Sustainability and Transportation Committee about whether to pursue funds to continue repair and maintenance of Stroudwater Dam or to explore other options.

Background

The Stroudwater Dam is a masonry dam constructed at the mouth of the Stroudwater River in 1849. Its original purpose was to power a grist mill that once operated at the site. While it has no functional purpose, it creates an impoundment some area residents use for recreation and that many value for aesthetic reasons.



Stroudwater Dam as seen in November, 2020

The Maine Emergency Management Agency classifies the dam as a low hazard structure, which means that “failure or misoperation... results in no probable loss of human life and low environmental and economic losses” (MRSA Title 37B, Ch. 24.).

The City acquired the dam in 1944 from Ralph and Ruth Leavitt. Based on the Leavitt’s deed to the City (attached), the City assumed the obligation to maintain the dam in a satisfactory manner. Failing that, the title to the dam and the land on which it sits could revert to the Leavitts or their heirs.

The City has performed maintenance and repairs on the dam on several occasions which are described in a report prepared for the Department of Public Works by Streamworks in February, 2023. These include:

- Prior to 1983: Covering the upstream face with a concrete lining (exact date unknown);
- 1985: The low-level outlet (“sluiceway”) was repaired and re-surfaced with shotcrete, the design of which was performed by SEA Consultants, Inc.;
- 1989: The stop log structure controlling outflows to the low-level outlet was replaced by a steel slide gate manufactured by Whipps, Inc., and installed by Wyman and Simpson Inc.;
- 1998: The City’s Department of Public Works (DPW) designed and contracted the repair of a partial failure of the dam’s downstream face near the right bedrock abutment; and,
- 2021: The City’s DPW designed and self-performed the replacement of a steel slide gate with an aluminum slide gate and electric actuator.

Despite these interventions, Streamworks reports that the Stroudwater Dam is in poor condition. Their inspection conducted in November, 2022 identified a number of concerns including leaks, damaged masonry, vegetation growing on the structure, and unrestricted public access to the structure. They recommend a variety of actions to address these issues which are detailed in their full report that we have included in the back up material.

Staff in Public Works have reviewed the recommendations contained in the Streamworks report and the developed cost estimates for completing the work, which are included in the back up material. They note that funds available for dam repairs in existing CIP accounts are likely insufficient to complete the repairs recommended by Streamworks. In addition, maintaining the dam in satisfactory condition will require Public Works to request annual allocations of funds to perform routine maintenance and to address damage that may occur to the dam in the future.

Before any further funds are used to start recommended repairs and the need for ongoing future funding, we seek guidance from the Sustainability Committee about whether they recommend pursuing significant repairs or whether the Committee recommends exploring options to relieve the City of the costs associated with owning the dam. As noted in the deed, if the City does not wish to maintain the dam, title to the dam would revert to the Leavitts or their heirs. Corporation Counsel will be available at the meeting to discuss what such a process might entail.



Stroudwater Dam

over Stroudwater River, Portland, ME

Technical Study:
2022 Visual Dam Safety Inspection
February 15, 2023

Prepared For:



Prepared By:

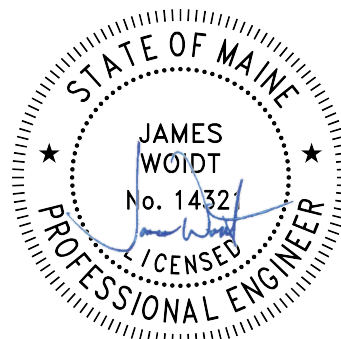


PO Box 6578, 31 Gorham Road, Scarborough, ME 04070



Renewable Power Consulting, PA
PO Box 195, Palmyra, ME 04965

Sealed By:



— FINAL —

Feb. 15, 2023

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List of Exhibits

Exhibit 1: Dam Condition Observations
Exhibit 2: Recommendations

List of Attachments

Attachment 1: Dam Inspection Checklist
Attachment 2: 2022 Inspection Photographs

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1 Introduction

1.1 Purpose of Investigation

The Federal Emergency Management Agency's (FEMA) and Association of State Dam Safety Officials' (ASDSO) *2007 Model State Dam Safety Program* recommends a professional engineer conduct regular inspections of low hazard dams every five years. The State of Maine's Revised Statutes require verification of the dam's hazard classification every twelve years but do not require inspections of low-hazard dams on a regular basis. The City of Portland (City) contracted Streamworks, PLLC (Streamworks) and its subconsultant, Renewable Power Consulting, PA (RPC), to conduct the regular inspection of the Stroudwater Dam (MEMA Dam #441, National Inventory of Dams #ME00311) in conformance with FEMA and ASDSO recommendations. Streamworks' scope includes reviewing existing documentation for the dam and conducting a visual dam safety inspection to identify any deficiencies in the surficial condition of the dam. Streamworks' scope also includes recommending actions to address observed or suspected deficiencies to maintain the dam in a satisfactory condition. Technical analysis, detailed design, permitting, and/or construction management is not included in Streamworks' scope of work but may be necessary to implement Streamworks' recommendations.

1.2 Project Location

The Stroudwater Dam is located approximately 100 feet upstream of Westbrook Street in the City of Portland (City) in Cumberland County, Maine. The dam is built across the Stroudwater River where immediately downstream of the dam, the river is subject to tidal fluctuations of the Fore River Estuary. Therefore, the dam is a "head-of-tide" dam.

1.3 Dam Description and History

The Stroudwater Dam is a masonry dam (Photo 1) that, per the US Army Corps of Engineers' (USACE) National Inventory of Dams (NID), was constructed in 1849. Geotechnical Engineers, Inc. (GEI; 1986) reported the dam was constructed to power a grist mill that previously existed at the site. The dam was raised to its current height in the late 1800s to produce ice. The dam is currently used for the aesthetic and recreational purposes its impoundment provides. The dam is part of the Stroudwater National Historic Register District. The dam is currently owned and operated by the City after it was deeded to the City by Ralph A. Leavitt in 1944 (Summit Geoengineering Services, 2012). Other major documented improvements to the dam include the following:

- Prior to 1983: Covering the upstream face with a concrete lining (exact date unknown);
- 1985: The low-level outlet ("sluiceway") was repaired and re-surfaced with shotcrete, the design of which was performed by SEA Consultants, Inc.;
- 1989: The stop log structure controlling outflows to the low-level outlet was replaced by a steel slide gate manufactured by Whipps, Inc., and installed by Wyman and Simpson Inc.;
- 1998: The City's Department of Public Works (DPW) designed and contracted the repair of a partial failure of the dam's downstream face near the right bedrock abutment; and,
- 2021: The City's DPW designed and self-performed the replacement of a steel slide gate with an aluminum slide gate and electric actuator.

The current dam is approximately 105-feet wide and composed predominantly of dry-stacked granite blocks with limited areas of mortared joints and/or concrete facing. From left (as facing downstream) to right (north to south), the dam includes the following components identified in Exhibit 1:

1. A left abutment composed of stacked masonry, dumped concrete, and a concrete wall integrated into the surrounding native ground;
2. A low-level outlet composed of a shotcrete-covered, masonry arch sluiceway through the dam with an actuated aluminum slide gate at the upstream end to control discharge (shut during normal operations); the dam crest immediately over the sluiceway is lower in elevation than the rest of the crest and functions as a sort of secondary spillway when the slide gate frame is overtopped; and,

3. A 77.5-foot wide primary spillway, the upstream face and crest of which is capped with concrete, that is separated from the low-level outlet by a divider pier.

The granite masonry blocks comprising the dam abut directly against a vertical bedrock outcrop that functions as the right abutment. This vertical bedrock outcrop is exposed immediately downstream of the dam. Based on ground-based lidar performed by Sebago Technics in 2021, the dam has a hydraulic height of approximately 14 feet (as measured from the toe of dam to the primary spillway elevation) and structural height of approximately 20 feet (as measured from toe of dam to the minimum elevation of the left abutment). The head of tide of the Fore River reaches the downstream face of the dam where the mean higher-high water will submerge the toe of the dam.

The dam is currently classified as a low-hazard structure by the Maine Emergency Management Agency meaning a “failure of misoperation [of the dam] results in no probable loss of human life and low economic and environmental losses,” (MRSA Title 37B, Ch. 24, §1111).

2 Review of Existing Records

2.1 Dam Records

Streamworks requested existing records for the dam from the City and MEMA. Table 1 summarizes the records for the dam provided to Streamworks from these two entities.

Table 1: Summary of Available Records

Document	Prepared By	Date(s)
Annual Inspection (2012)	Summit Geoengineering Services, Inc.	July 16, 2012
Annual Inspection [Draft] (2021)	City	June 30, 2021
Correspondence regarding Westbrook Street bridge construction	Maine Dept. of Environmental Protection	July and October 1988
Flood Hazard Analysis – Stroudwater River	Soil Conservation Service	December 1975
Flood Insurance Study [Preliminary] – Cumberland County, Maine	FEMA	March 8, 2022
Flood of October 1996 in Southern Maine	US Geological Survey	1997
National Inventory of Dams Registration	MEMA	October 28, 1981
Phase 1 Technical Report	SEA Consultants, Inc.	September 1983
Photographs	City	12/1998 to 2/1999; 5/16/2006; 03/2018; 04/2018; 11/2020; 02/2021; 03/2021; 06/2021; 09/2021; 01/2022; 09/2022
Stability Analyses, Stroudwater River Dam	Geotechnical Engineers, Inc. (GEI)	March 19, 1986

The following bullets summarize items of note identified in Engineer’s review of the documents identified in Table 1:

- The Soil Conservation Services’ (1975) *Flood Hazard Analysis* reported the 1-in-100 annual chance (100-year) event, which is often the minimum spillway design flood, would overtop the dam. Based on the provided cross-section, the current dam appears to have less spillway capacity than it did in 1975 (i.e., would be more prone to overtopping currently);
- Geotechnical Engineers, Inc. (GEI) conducted a stability analysis for the dam in 1986. The analysis indicated that the dam did not satisfy FERC’s (then-current) 1985 dam safety criterion, but GEI opined the dam was stable. Relative to current standards, RPC concluded that the factors of safety calculated by GEI in 1986 do not meet current US Army Corps of Engineers criteria. Nevertheless, the GEI analysis contained various assumptions which should be reconsidered. These include the following:
 - GEI’s analysis was conducted for the middle section of the dam which, as acknowledged in GEI’s analysis, was not the maximum height dam section (where overturning forces are usually greatest.) GEI’s basis for this selection was that the maximum height section, located adjacent to the right abutment, was “keyed into the near vertical bedrock abutment”. RPC notes the Stroudwater Dam is mainly comprised of stone masonry and, unlike concrete dams, is not keyed into the abutment: the end stones of the constructed

dam reside against the vertical rock faced abutment but do not have a confining attachment. The un-mortared joints of the stone dam also permit portions of the dam to move (slide) within a short distance from the abutment interface and its potential constriction affect. In other words, friction between the exposed bedrock and the adjacent dam masonry blocks would not translate between the abutting masonry block and the next internal masonry block such that friction against the exposed bedrock abutment would not be a consideration for stability analyses of a dam section even a few feet from the abutment. RPC recommends the maximum height section of the dam should be reviewed to confirm its stability.

- GEI's stability analysis was based on assumed material unit weight of 150 pounds force per cubic foot (pcf). This unit weight was selected by GEI based on an unusually high stone density and adjusted for assumed void ratios. RPC notes that the treatment of stone dams is generally ignored by many codes except for Chapter X of the Federal Energy Regulatory Commission Guidelines (FERC Guidelines). The FERC Guidelines indicate that material unit weight can vary between 130 pcf for loose based stone to 165 pcf for tightly jointed dams. Section 20 of Engineering for Masonry Dams (referenced in the FERC Guidelines) similarly confirms the high variability of the unit weight based on the voids present. RPC recommends that a unit weight between 130 pcf and 140 pcf that is more conservative and reflective of the current condition of the dam (considering stone loss) should be considered.
- RPC opines that the sliding coefficient of 0.6 used in GEI's analysis is conservative with the coefficient likely higher based on the materials used.
- RPC considered the uplift pressure and silt loading assumptions in GEI's analysis to be appropriate for the stability review.
- RPC notes that current dam safety codes no longer use the static seismic loading condition employed in the 1986 analysis; current codes require a pseudo-dynamic analysis, which typically yields a lower calculated factor of safety. The outdated, static stability analysis indicated that the dam does not satisfy dam safety code requirements.
- GEI's (1986) *Stability Analyses, Stroudwater Dam* included a visual inspection of the dam; key observations included:
 - GEI identified voids between the large stone masonry blocks along the base of the downstream face; these voids were found by GEI to extend at least 6 feet into the dam;
 - GEI indicated that the measurable lengths of the joints between stones in the upper portions of the downstream face decrease as the stones become smaller with some of the upper area stones grouted; and,
 - GEI noted bush growth along the top edge of the left [abutment] training walls appearing to dislodge portions of the wall resulting in a crack in the top of the wall. During their inspection, GEI found a sinkhole in the fill behind the wall at this location.
- Appendix 2 of GEI's (1986) *Stability Analyses, Stroudwater Dam* provides an Inspection and Maintenance Plan (I&M Plan) for the dam. The I&M Plan included a checklist form and generally consists of:
 - 6-month inspection cycle with photograph documentation;
 - Inspect for changes in horizontal and vertical alignment;
 - Inspect for changes in seepage patterns, quantity, color, and/or sediment load;
 - Inspect area for surface depressions, sink holes, cracking, sliding, or sloughing of abutment soils and/or bedrock outcrops;

- Periodic maintenance would include repairs to damaged concrete and mortared joints, replacement of displaced stones, removal of vegetation from the dam and walls, and debris removal; and,
- Based on Streamworks' discussion with the City and review of City records, some inspection and maintenance recommended in the I&M Plan has been done but at much longer frequencies than recommended in the I&M Plan; there is no evidence/documentation that many other inspection and maintenance activities recommended in the I&M Plan have been performed recently.
- GEI's (1986) *Stability Analyses, Stroudwater Dam* recommended a new wingwall be formed on the dam's left abutment, concrete repairs, repointing of masonry joints, removal of vegetation, and regular inspection and maintenance of the dam; of these recommendations, Summit (2012) noted that the left abutment was raised which possibly addressed the recommendation for a new wingwall but it was uncertain if the other recommendations were addressed;
- The dam was overtopped in October 1996 by what the US Geological Survey (USGS) estimated to be a flood event with a less than 1-in-500 annual chance of occurrence (greater than 500-year recurrence interval); no damage to the dam was documented, however local residents interviewed by Streamworks indicated that the downstream bridge conveying Westbrook Street over the Stroudwater River was damaged.
- Summit's 2012 inspection report concluded the dam to be in fair condition and recommended concrete repairs, removal of vegetation, repair or replacement of the slide gate, installation of a trash rack, repair of sink holes on the left abutment, and replacement of the slide gate. The slide gate has been replaced but whether the other recommendations were addressed is unknown; and,
- The City's draft 2021 inspection report concluded the dam to be in poor condition and recommended several investigations and technical studies of the dam in addition to replacing the slide gate and installing a trash rack upstream of the slide gate; of these recommendations, only replacement of the slide gate and monitoring of movement (via ground-based lidar survey by Sebago Technics) had been addressed prior to Streamworks' inspection.

3 Field Assessments

3.1 Dam Safety Inspection

James Woidt, PE of Streamworks and Alfred Nash, PE of RPC performed a visual safety inspection of the Stroudwater dam on Tuesday, November 29, 2022, shortly following low tide on the Fore River. There was less than 0.1 inches of precipitation in the preceding week, although flows were higher than during the 2012 and 2021 inspections due to seasonal factors. The City had fully opened the dam's slide gate the preceding day (November 28) such that the reservoir was drawn down at the time of the inspection (Photo 2) and the upstream face of the primary spillway was exposed (Photo 6). The dam was found to be in generally worse condition than reported in Summit's 2012 inspection report. Streamworks' and RPC's detailed observations are provided in Attachment 1 which is a detailed inspection checklist integrating the City's dam inspection template with the Massachusetts Department of Conservation and Recreation's Dam Safety Inspection Template (as no such similar template from MEMA, FEMA, or ASDSO exist). Attachment 2 provides photographs taken during the inspection including selected historic photographs used for comparison purposes.

The following bullets summarize key observations from the dam inspection:

- The dam is located adjacent to a small public area with bench (Photo 17) but there are no features (fence, signage, etc.) to deter public access to the dam, the approach to the low-level outlet, or left abutment training wall;
- Vegetation was observed growing from the dam at multiple locations. Continued tree growth (Photo 26 and 27) and joint vegetation (Photos 11, 12, 27, 28, 37, 38, 40 and 41) can lead to further stone dislodgement, destabilization of localized areas, and leakage pathways. This concern was particularly acute on the right (spillway) side of the divider pier where vegetation has expanded several masonry joints, displaced a few masonry stones, and likely propagated a vertical crack (Photos 12 and 13). Displaced concrete and masonry near the contact between the divider pier and the upper part of the spillway was suspected to be a source of leakage in Summit's 2012 inspection;
- The approach to the low-level outlet (Photos 15 and 19) was free of debris at the time of the inspection, although the City reported that debris has historically damaged the slide gate;
- Minor sinkholes and surface deformation were observed along the left abutment training wall (Photos 20 through 24). This area has a history of sinkhole development with various efforts to fill in these areas. These sinkholes are likely the result of water seeping through the masonry joints and shotcrete cracks of the left abutment training wall and into subsurface layers with sufficient velocity to erode soil materials along the seepage path through to the exit, causing soil piping;
- Cracks were observed in the shotcrete overlay of the divider pier and headwall of the low-level outlet (Photo 14) and are a likely source of leakage;
- The aluminum slide gate controlling discharge to the low-level outlet (Photo 15) operated without binding but operators have indicated that the slide gate can bind and require hand operation of the actuator. The gate leaf slot formed by two Ultra High Molecular Weight Plastic (UHMW) strips is narrow (Photo 16) and could be enlarged to provide smoother operation;
- Some leakage was observed between the wood beams composing the sill of the slide gate; minor leakage was also observed between the dam's masonry and the left side of the slide gate frame;

- The shotcrete overlay applied to the sluiceway in 1985 was in generally fair condition (Photo 30 and 31). However, the base of the overlay, at the interface with the bedrock, has been lost and some active flow could be observed entering the sluiceway through the missing sections of the overlay (Photos 32 through 36). Of note:
 - The shotcrete overlay loss is active (Photo 33)
 - The loss of dam material and seal between the shotcrete overlay and foundation bedrock can provide an exit for seepage and leakage emanating from the left abutment and cracks in the shotcrete overlay of the low-level outlet headwall; and,
 - Stone loss behind the shotcrete overlay has occurred (Photo 35) and may continue with seepage and leakage through the dam.
- The 1986 GEI report identified voids below the surface concrete fill placed atop the downstream face of the left abutment (Photo 25). The concrete fill was not significantly cracked or fractured indicating the void and associated material piping may have stabilized in this area;
- Sporadic stone loss or movement has occurred across the downstream face of the dam (Photo 40) and especially near the sluiceway outlet and divider pier (Photos 37 through 39);
- A portion of the exposed downstream dam face, adjacent to the divider pier, has been displaced downstream with a “bulge” appearing in this area (Photo 41 and 42). This distressed area was also noted in the 2021 inspection. The movement indicates that a portion of the stone mass has been displaced (likely from freeze/thaw action from dam leakage) and destabilized the area; the area may be in a similar condition as preceded the 1998 failure of the downstream face of the dam near the right-most toe (Photo 44). Reduction of leakage into the area from the divider pier interface (Photo 12) and spillway overlay cracking (Photo 6) may reduce further movement. The area should be monitored during the spring season for movement and localized stone loss;
- Numerous longitudinal cracks were observed across the upstream face of the primary spillway (Photos 6 through 9); these cracks are a likely source of leakage that has been historically reported through the downstream dam face (Photo 4) at normal pool conditions;
- A portion of the concrete overlay near the mid-point of the spillway crest is damaged and missing;
- Leakage was observed along the dam foundation when the impoundment was lowered below the upstream face of the primary spillway, suggesting that dam leakage is not occurring through the longitudinal cracks in the concrete overlay alone but possibly also along the contact between the dam and bedrock foundation;
- A 60-inch wide by 30-inch high by 45-inch deep void was observed near the right toe of the downstream face of the dam, near the contact with the bedrock foundation and right bedrock abutment (Photos 43 and 47 through 49); this void was observed to be conveying leakage at the time of inspection. The void is located near the area of a 1998 repair (Photos 45 and 46) of a partial failure of the downstream face of the dam (Photo 44) and this repair may have partially failed or been undermined. This loss of material was noted in the 2012 inspection report but was partially obscured in inspection photos by high water. Untreated, the void may continue gradually expanding until a sudden, uncontrolled piping failure of the dam possibly occurs which would pose a public safety concern; and,
- Spalling was observed immediately downstream of the dam along the toe of the exposed bedrock comprising the right bedrock abutment (Photo 50); the spalling may be the result of freeze/thaw action, weathering, and/or erosion of the bedrock which may also be occurring along the contact between the dam and the right bedrock abutment.

3.2 Hazard Classification Reconnaissance

The Stroudwater River confluences with the tidal Fore River estuary approximately 500 feet downstream of the Stroudwater Dam. The impacts of a sudden breach of the Stroudwater Dam would be negligible within the Fore River estuary, although some sediments may be re-distributed.

Within the reach of the Stroudwater River between the Fore River Estuary and the Stroudwater Dam is a concrete-arch bridge that conveys Westbrook Street, a local road, over the Stroudwater River. Relatively convenient detour routes are available if the Westbrook Street bridge were to fail in the event of a dam breach, but failure of the bridge is a low likelihood as the abutments appear to be founded on bedrock and the bridge withstood the historic October 1996 flood. Two residential structures are located adjacent to this reach but appear elevated high enough above the tide line to be at low risk of flooding to a degree that would threaten human life.

Given that a sudden failure of the dam is unlikely to result in a loss of life (aside from incidental recreational use of the downstream area), Streamworks concurs with MEMA's current classification of the dam as a low-hazard structure.

3.3 Other Assessments

As of the time of this inspection, no other assessments, e.g., underwater inspections, were performed.

4 Conclusions and Recommendations

4.1 Conclusions

Based on a review of existing records and a visual safety inspection conducted on November 29, 2022, Streamworks concludes the following:

1. An Inspection and Maintenance Plan exists for the dam but does not appear to have been regularly implemented; several deficient inspection and maintenance items were identified in the visual inspection of the dam including:
 - a. Variable and infrequent inspection frequencies
 - b. Vegetation across the dam
 - c. Displaced masonry stones
 - d. Cracks in concrete and shotcrete surfaces
 - e. Uncontrolled / infrequently monitored leakage
2. Public access to the dam is unrestricted;
3. The aluminum slide gate controlling discharge to the low-level outlet was recently replaced and functional; however, some leakage between the wooden sill beams as well as the between the gate frame and the dam was observed; in addition, the slide gate has been historically damaged by debris and no trash rack exists;
4. The shotcrete overlay of the sluiceway is in generally fair condition except for the foundation where there is an almost complete loss of shotcrete and nearby dam material that is actively worsening;
5. Minor sinkholes along the left abutment training wall that have been historically observed are still present and likely caused by seepage; the gap between the shotcrete overlay of the sluiceway and the foundation provide an easy egress for seepage that exacerbates the seepage;
6. Numerous leaks through the dam and/or along its foundation were observed despite the impoundment being lowered during the inspection; cracks in shotcrete and concrete surfaces are likely significant sources of this leakage;
7. A portion of the dam's downstream face near the divider pier and sluiceway outlet have bulged, suggesting both stone movement and reduced stability;
8. A 1998 repair of the downstream face near the toe of the right bedrock abutment has failed and/or undermined; if not repaired, this could lead to a sudden failure of the dam;
9. The dam's current classification as a low-hazard structure is appropriate;
10. The dam likely has insufficient spillway capacity as shown in the SCS's (1975) *Flood Hazard Analysis*; exacerbating this finding is that construction of the left abutment appears to have reduced the spillway capacity of the dam and peak discharges have likely increased from those calculated in 1975 as concluded in updated flood studies of the Oyster and Lamprey Rivers in nearby coastal New Hampshire where current estimates of the 1-in-100 annual chance floods were found to increase 40 and 33 percent, respectively, from statistical projections conducted with pre-2005 peak discharge measurements (Wake et al., 2019); and,
11. Although GEI concluded the dam to be stable in 1986, GEI's stability analyses and results do not meet current standards for dam stability.

Considering the above conclusions, the dam has been deficiently maintained and shows evidence of structural distress through stone and foundation loss and movement caused by general aging, deferred maintenance, environmental factors, and/or uncontrolled seepage and leakage. The dam also likely has insufficient spillway capacity although it has withstood floods that are likely larger than the Spillway Design Flood. In addition, the dam may not meet required safety factors for stability. As such, Streamworks and RPC conclude the Stroudwater Dam to be in poor condition, defined in the City's 2021 Inspection Report as:

A condition where a dam safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. A poor condition also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.

4.2 Recommendations

Streamworks recommends the City identify a staff person who will be responsible for implementing the following readily implementable corrective actions to manage risk to the public and slow down the degradation of the dam until a permanent solution is decided upon:

1. Until permanent repairs are implemented, twice a year and more frequently after unusual events (including but not limited to: storms with total precipitation in excess of two inches, ice breakup, windstorms that may introduce debris to the river), conduct a visual inspection for changes in the dam's downstream face and document with photographs, focusing on:
 - a. The void in the downstream face near the toe of the right bedrock abutment;
 - b. The bulged area near the divider pier; and,
 - c. The area behind the left abutment training wall for sinkholes or surface deformation.
2. Review, update, and implement the I&M Plan; include regular visual dam safety inspections by a professional engineer on a minimum 5-year cycle, preferably at low-tide during non-freezing conditions, during the dormant season for vegetation;
3. Conduct the following routine maintenance activities:
 - a. Clear vegetation from the dam itself and an area 15 feet upstream and downstream;
 - b. Repair sinkholes along the left abutment training wall with in-kind materials;

Resolving the remaining deficiencies will require additional time, effort, and expenditure and also require a decision from the City regarding the fate of the dam (e.g., limited, short-term repairs; comprehensive, long-term rehabilitation; or removal). Assuming the City chooses to retain the Stroudwater Dam, Streamworks recommends the following actions:

4. Prepare a spillway capacity analysis for the dam including updated hydrologic and hydraulic analyses to confirm the dam's ability to safely pass the Spillway Design Flood;
5. Update the dam's stability analysis utilizing the higher (more critical) dam section and current dam safety criteria;
6. Install hand-railing, fencing, gate, and/or signage to deter public access to dam and immediately upstream area;
7. Repair longitudinal spillway cracks and cracks in shotcrete along the headwall of the low-level outlet with non-shrink packed grout, overlay seal material, or similar products;
8. Remove vegetation and seal the divider pier / spillway contact with packed grout or similar products to reduce leakage into the bulging section of the dam near the low-level outlet;

9. Re-point or shotcrete the left abutment training wall to reduce seepage through the left abutment and presumably the root cause of sinkholes in this area;
10. Repair the failed section of the downstream face near the toe of right bedrock abutment with in-kind materials or cast-in-place concrete;
11. Repair the bulging section of the downstream face near the low-level outlet by removing the displaced stones and re-constructing with in-kind masonry with mortared joints; cast-in-place concrete may be an option if alteration of the historic appearance is acceptable;
12. Repair damaged section of the crest lip and the depressed area of the spillway with packed grout or similar products;
13. Remove damaged sections of the sluiceway shotcrete coating along the wall base and place new cast-in-place concrete along the sluiceway wall bases with filtered drain pipe to safely convey seepage/leakage; and,
14. Install grizzly racks upstream of the slide gate. The racks are suggested to be placed at the upstream edge of the divider pier and angled to the flow to promote the flushing of debris over the dam during high flow events.

In addition, Engineer recommends the following optional actions to enhance the dam:

15. Seal the dam's foundation to reduce leakage between the dam and the bedrock foundation;
16. Seal or reduce gate leakage through periodic use of sands or permanent sealing products;
17. To enhance gate operation, widen the gate leaf slot of the slide gate by removing material or replacing the upstream slide; and,
18. Install crest gage to document peak impoundment levels during flood events. If installed, install with bottom cap above the elevation of the spillway to avoid frequent re-installation or maintenance.
 - a. The US Geological Survey provides details of these devices in the publication *Identifying and Preserving High-Water Mark Data (Chapter 24 of Section A, Surface-Water Techniques, Book 3, Application of Hydraulics)*.
 - b. Performance Results Plus, Inc. also sells these devices.

Streamworks recommends the City retain a licensed professional engineer experienced in dam safety to resolve Recommendations #2, 4, and 5 and design permanent repairs to resolve Recommendations #6 and #9 through 16; however, Maine's Revised Statutes do not require a professional engineer to perform these services for a low hazard dam. Also note that permits may be (likely are) required from the US Army Corps of Engineers and Maine Department of Environmental Protection for some or all of Recommendations #7 through 16; these same actions will likely also require a reservoir drawdown to reduce forces on the dam, perform the work, and manage environmental impacts. The Code of Maine Rules also requires that design plans be filed with MEMA. Finally, note that resolution of Recommendation #4 and #5 to perform spillway capacity and stability analyses may identify additional deficiencies that will need to be addressed.

4.3 Proposed Schedule for Corrective Actions

Absent of continued degradation, the dam's successful service life during normal and flood flow conditions provides empirical evidence that the dam has minimum stability factors in excess of 1.0 and can withstand large floods, thus allowing the dam to remain in service until the City reaches a decision on the above recommendations for the dam. Table 2 on the following page summarizes Streamworks' recommended schedule to implement Recommendations:

Table 2: Proposed Schedule for Corrective Actions

Recommendation	Recommended Completion Date
1, 2, and 3	Continuous
4, 5, 6, 7, and 8	Within one year
9, 10, 11, 12, 13, and 14	Alternatives analysis and conceptual design within two years; construction within five (preferably three) years
15, 16, 17, and 18	At City's discretion

Upon completion of Recommendations #4 and #5 for updated spillway capacity and stability analyses, Streamworks and RPC recommend a comprehensive alternative analysis that considers life-cycle costs to identify alternatives that holistically address the recommendations above possibly including, but not limited to, spot repairs as recommended, partial or full reconstruction, and/or dam removal. A thorough alternatives analysis and ensuing schematic design will support identifying project constraints, developing appropriate, holistic, and cost-effective solutions, accurate estimating of project costs, identifying regulatory permits that will be required, and procuring regulatory pre-approval early in the design process when changes can be more readily accommodated.

4.4 Opinion of Probable Cost

Opinions of probable cost for each of the recommendations provided in Section 4.2 as well as regular inspection and maintenance of the dam are provided in Table 3. Cost opinions assume each recommendation is performed independently at prices current to the date of this report; cost savings can be achieved if one or more recommendations are performed concurrently, especially where water control and/or permits are required. The City's self-performance of multiple recommendations concurrently would trend towards the low range of provided cost opinions; contracting each recommendation individually would trends towards the high range of cost estimates. Appropriate escalation / inflation factors should be considered if the below recommendations are addressed in future years.

Table 3: Opinion of Probable Cost for Recommended Actions

Recommendation	Opinion of Probable Cost	Frequency
Regular Inspection & Maintenance	\$3,000 to \$7,500	Annual
1 – Interim Inspections	\$500 to \$1,500 per inspection	2 to 4 times per year
2 – I&M Plan Update	\$2,500 to \$6,000	Once
3 – Deferred Maintenance	\$3,000 to \$7,500	Once
4 – Spillway Capacity Analysis	\$3,500 to \$8,000	Once
4 / 5 – Survey	\$3,500 to \$7,000	Once
5 – Stability Analysis	\$4,000 to \$10,000	Once

Table 3: Opinion of Probable Cost for Recommended Actions

Recommendation	Opinion of Probable Cost	Frequency
6 – Fencing and Railing	\$4,500 to \$9,500	Once
7 – Crack Repair	\$7,000 to \$18,000 (w/o coffering)	Once
8 – Divider Pier Sealing	\$3,000 to \$6,500	Once
9 – Seal Left Abutment Training Wall	\$25,000 to \$60,000 (w/ permitting & coffering)	Once
10 – Repair Failed Section of D/S Face	\$20,000 to \$45,000 (w/ permitting)	Once
11 – Repair Bulging Section	\$10,000 to \$25,000	Once
12 – Repair Crest Lip	\$3,000 to \$7,500	Once
13 – Re-seal Sluiceway	\$12,000 to \$30,000	Once
14 – Trash Rack	\$8,000 to \$18,000 (diver install)	Once
15 – Seal Foundation	\$12,000 to \$25,000 (wet placement with isolation)	Once
16 – Sand Application	\$250 to \$500 per year	Annual
17 – Widen Gate Leaf Slot	\$3,000 to \$8,000	Once
18 – Install Crest Gage	\$600 to \$1,500	Once
Total Recurring Annual Costs	\$4,250 to \$14,000 (before repairs & pending environmental factors) \$3,250 to \$8,000 (after repairs)	
Total Repair Costs	\$124,600 to \$292,500	

4.5 Limitations

1. Streamworks' findings and recommendations are based on work conducted, and authorized by the City, as part of the Scope of Services in the Agreement between the City and Streamworks and reflect Streamworks' professional judgment. Streamworks' findings and conclusions must be considered not as scientific or engineering certainties but rather as professional opinions concerning the limited data gathered during the course of work. As such, conditions may vary at other locations.
2. Streamworks' observations are based on conditions observed at the time of the inspection. The City shall note that the condition of the dam is subject to numerous factors that are dynamic and constantly changing. In no way does Streamworks' inspection of the dam guarantee or imply a similar condition of the dam under future conditions. Regular inspection and maintenance should continue to maintain and/or improve the current condition of the dam.
3. Unless otherwise noted, observations of the site and/or structures were visual observations of the dam's surficial components (e.g., no removal of manhole covers) that are above water. Where access to portions of the structure and/or site are unavailable or limited (e.g., excessive vegetation), Engineer renders no opinion as to the condition of that portion of the site or structure. In particular, Engineer notes that water levels in the impoundment and downstream channel may limit Engineer's ability to make observations of submerged portions of the site and/or structure.
4. Engineer used reasonable care in identifying and interpreting applicable codes and regulations. Owner shall note that such codes and regulation are subject to change and also subject to various, and possibly contradictory, interpretations.

5 References

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- Federal Energy Regulatory Commission. (1997). *Engineering Guidelines for the Evaluation of Hydropower Projects, Chapter X: Other Dams*. Prepared by the Office of Energy Projects. October.
- Geotechnical Engineers, Inc. (1986). *Stability Analyses, Stroudwater River Dam, Portland, ME*. Prepared for the City of Portland, Maine under subcontract to SEA Consultants, Inc. March 19.
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- Summit Geoengineering Services, Inc. (Summit; 2012). *Existing Condition Evaluation: Stroudwater Dam, Westbrook Street, Portland, Maine*. Prepared for the City of Portland, Maine. November.
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- US Army Corps of Engineers. (2022). *National Inventory of Dams*. <<https://nid.usace.army.mil/>> (December 18, 2022).
- Wake, C.P., Knott, J., Lippman, T., Stampone, M.D., Ballesterio, T.P., Bjerklie, D., Burakowski, E., Glidden, S., Hosseini-Shakib, I., Jacobs, J. (2019). *New Hampshire Coastal Flood Risk Summary Part I: Science*. Prepared for the New Hampshire Coastal Flood Risk Science and Technical Advisory Panel. University of New Hampshire. Durham, NH.

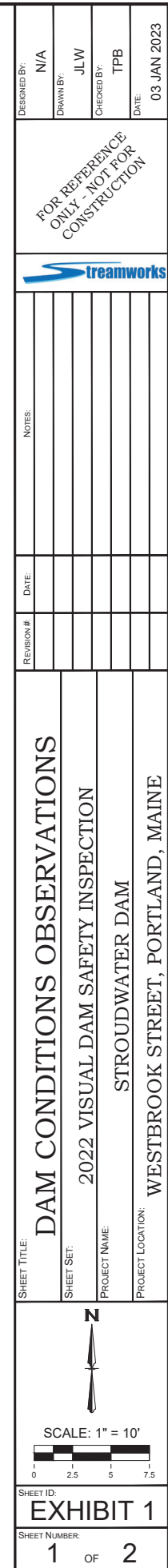


Exhibits

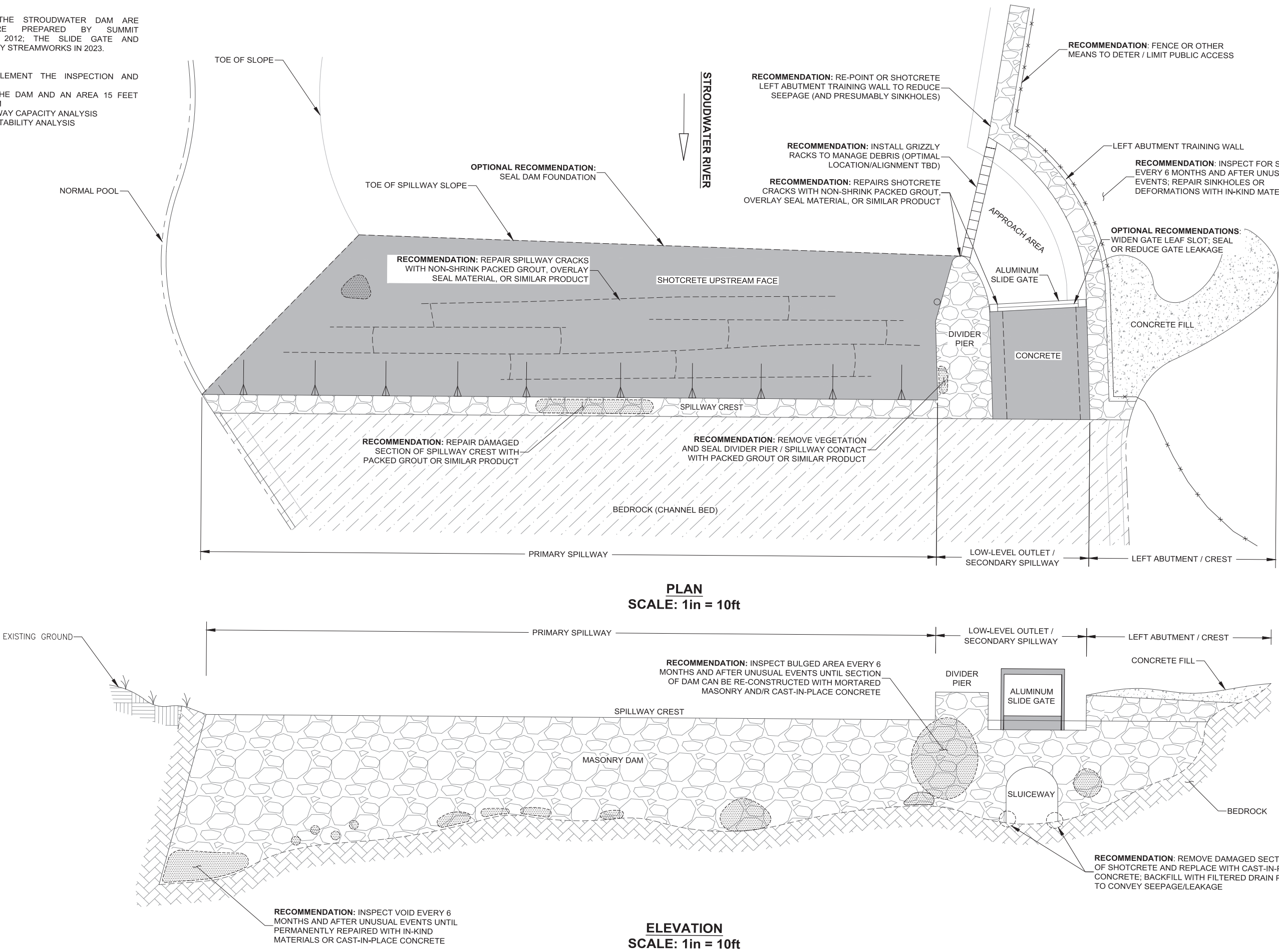
*Stroudwater Dam (MEMA Dam #441)
2022 Visual Dam Safety Inspection Report*

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1. PLAN AND SECTION OF THE STROUDWATER DAM ARE APPROXIMATE AND WERE PREPARED BY SUMMIT GEOENGINEERING, INC. IN 2012; THE SLIDE GATE AND SLUICWAY WERE MODIFIED BY STREAMWORKS IN 2023.



- NOTES:
1. PLAN AND SECTION OF THE STROUDWATER DAM ARE APPROXIMATE AND WERE PREPARED BY SUMMIT GEOENGINEERING, INC. IN 2012; THE SLIDE GATE AND SLUICEWAY WERE MODIFIED BY STREAMWORKS IN 2023.
- GENERAL RECOMMENDATIONS:
1. REVIEW, UPDATE, AND IMPLEMENT THE INSPECTION AND MAINTENANCE PLAN
2. CLEAR VEGETATION FROM THE DAM AND AN AREA 15 FEET DOWNSTREAM AND UPSTREAM
3. CONDUCT AN UPDATED SPILLWAY CAPACITY ANALYSIS
4. CONDUCT AN UPDATED DAM STABILITY ANALYSIS



DESIGNED BY:	N/A	DRAWN BY:	JLW	CHECKED BY:	TPB	DATE:	11 JAN 2023
FOR REFERENCE ONLY - NOT FOR CONSTRUCTION							
streamworks							
NOTES:							
DATE:							
REVISION #:							
RECOMMENDATIONS							
2022 VISUAL DAM SAFETY INSPECTION							
STROUDWATER DAM							
WESTBROOK STREET, PORTLAND, MAINE							
SHEET TITLE:							
SHEET SET:							
PROJECT NAME:							
PROJECT LOCATION:							
N							
SCALE: 1" = 10'							
0 2.5 5 7.5							
SHEET ID:							
EXHIBIT 2							
SHEET NUMBER:							
2 OF 2							



Attachment 1

Dam Inspection Checklist

Stroudwater Dam (MEMA Dam #441)
2022 Visual Dam Safety Inspection Report

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Stroudwater Dam</u>	STATE ID #: <u>441</u>
IMPOUNDMENT NAME(S): <u>Stroudwater River</u>	
HAZARD CLASSIFICATION: <u>Low</u>	NID ID #: <u>ME00311</u>
CHANGE IN HAZARD CLASSIFICATION APPROPRIATE? WHY? <u>No</u>	
<u><i>DAM LOCATION INFORMATION</i></u>	
CITY/TOWN: <u>PORTLAND</u>	COUNTY: <u>CUMBERLAND</u>
DAM LOCATION: <u>Westbrook Street, 800ft from Congress Street</u> (street address if known)	ALTERNATE DAM NAME: <u>STROUDWATER RIVER DAM</u>
USGS QUAD: <u>Portland West</u>	LAT.: <u>N43.656479</u> LONG.: <u>W70.310705</u>
BLOCK: <u>213</u>	LOT: <u>C013</u>
DRAINAGE BASIN: <u>Fore River</u>	RIVER: <u>Stroudwater River</u>
<u><i>GENERAL DAM INFORMATION</i></u>	
TYPE OF DAM: <u>Partially-capped masonry, run-of-river dam</u>	OVERALL LENGTH (FT): <u>105</u>
PURPOSE OF DAM: <u>Recreation; aesthetics</u>	NORMAL SURFACE AREA (ACRE): <u>20 ac ±</u>
YEAR BUILT: <u>1849 (per National Inventory of Dams)</u>	NORMAL POOL STORAGE (ACRE-FT): <u>152 (per MEMA, 1981)</u>
SPILLWAY CAPACITY (CFS): <u>Not documented</u>	MAXIMUM POOL STORAGE (ACRE-FT): <u>180 (per MEMA, 1982)</u>
STRUCTURAL HEIGHT (FT): <u>20</u>	EL. NORMAL POOL (FT): <u>ELEV 18.5 ± (ft, NAVD88)</u>
HYDRAULIC HEIGHT (FT): <u>14</u>	EL. MAXIMUM POOL (FT): <u>ELEV 22 ± (ft, NAVD88)</u>

NAME OF DAM: <u>Stroudwater Dam</u>	STATE ID #: <u>441</u>
INSPECTION DATE: <u>November 29, 2022</u>	NID ID #: <u>ME00311</u>
<u><i>INSPECTION SUMMARY</i></u>	
DATE OF INSPECTION: <u>November 29, 2022</u>	DATE OF PREVIOUS INSPECTION: <u>June 30, 2021</u>
TEMPERATURE/WEATHER: <u>30s, Sunny</u>	ARMY CORPS PHASE I: <u>No</u> If YES, date <u></u>
CONSULTANT: <u>Streamworks, PLLC</u>	
BENCHMARK/DATUM: <u>NAVD88 (approximate)</u>	
OVERALL PHYSICAL CONDITION OF DAM: <u>Poor</u>	DATE OF LAST REHABILITATION: <u>2021 (new slide gate)</u>
EL. POOL DURING INSP.: <u>ELEV 11.0 ±</u>	EL. TAILWATER DURING INSP.: <u>ELEV 2.0 ±</u>
<u><i>PERSONS PRESENT AT INSPECTION</i></u>	
<u>NAME</u>	<u>EXPERTISE</u>
James Woidt, PE	Hydrology & hydraulics
Alfred Nash, PE	Structural
Bill Boornazian, PE	Water Resources
Brad Roland, PE	Municipal Engineering
Justin Pellerin	Municipal Engineering
<u>REPRESENTING</u>	
Streamworks, PLLC	
Renewable Power Consulting, PA	
City of Portland	
City of Portland	
City of Portland	
NAME OF INSPECTING ENGINEER: <u>James Woidt, PE</u> SIGNATURE: _____	

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>
OWNER: ORGANIZATION	<u>City of Portland</u>	CARETAKER: ORGANIZATION
NAME/TITLE	<u>Department of Public Works</u>	NAME/TITLE
STREET	<u>212 Canco Road, Suite B</u>	STREET
TOWN, STATE, ZIP	<u>Portland, ME 04103</u>	TOWN, STATE, ZIP
PHONE	<u>(207) 874-8871</u>	PHONE
EMERGENCY PH. #	<u>(207) 874-8493 [DPW Dispatch]</u>	EMERGENCY PH. #
FAX		FAX
EMAIL	<u>wboornazian@portlandmaine.gov</u>	EMAIL
OWNER TYPE	<u>Municipality or Political subdivision</u>	
CONSTRUCTED BY:	<u>Not recorded</u>	DAM DESIGNER:
		<u>Not recorded</u>
DATE OF LAST H&H STUDY:	<u>1975 (Flood Hazard study)</u>	H&H STUDY NEEDS UPDATE?
		<u>Yes</u>
PRIMARY SPILLWAY TYPE	<u>Concrete overflow</u>	SPILLWAY DESIGN FLOOD (PERIOD/CFS)
		<u>Not established</u>
SPILLWAY LENGTH (FT)	<u>77.5 ft</u>	SPILLWAY CAPACITY (CFS)
		<u>Not documented</u>
AUXILIARY SPILLWAY TYPE	<u>Concrete overflow</u>	AUX. SPILLWAY CAPACITY (CFS)
		<u>Not documented</u>
NUMBER OF OUTLETS	<u>1</u>	OUTLET(S) CAPACITY (CFS)
		<u>Not documented</u>
TYPE OF OUTLETS	<u>Arched sluiceway w/ aluminum slide gate</u>	TOTAL DISCHARGE CAPACITY (CFS)
		<u>Not documented</u>
DRAINAGE AREA (SQ MI)	<u>27.6 (from StreamStats, 2022)</u>	DATE OF LAST DAM BREACH STUDY:
		<u>No dam breach study available</u>
DAM BREACH STUDY NEEDS UPDATE?	<u>No</u>	
HAS DAM BEEN BREACHED OR OVERTOPPED	☒ YES ☐ NO	IF YES, PROVIDE DATE(S)
		<u>October 1996</u>
DATE OF LAST STABILITY ANALYSIS:	<u>19-Mar-86</u>	STABILITY ANALYSIS NEEDED?
		<u>Yes</u>
DATE OF LAST SEEPAGE ANALYSIS:	<u>Not available</u>	SEEPAGE ANALYSIS NEEDED?
		<u>No</u>
INTERNAL DRAINAGE SYSTEM:	<u>Small diameter drain incorporated into 1998 repair of dam toe at right abutment</u>	
FISH LADDER (LIST TYPE IF PRESENT)	<u>No fish ladder present</u>	
DOES CREST SUPPORT PUBLIC ROAD?	<u>NO</u>	IF YES, ROAD NAME:
PUBLIC BRIDGE WITHIN 100' OF DAM?	<u>YES</u>	IF YES, ROAD/BRIDGE NAME:
		<u>WESTBROOK STREET</u>

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>			
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>			
INSTRUMENTATION					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	Instrumentation not observed	X		
	2. OBSERVATION WELLS	Instrumentation not observed	X		
	3. STAFF GAGE AND RECORDER	Instrumentation not observed	X		
	4. WEIRS	Instrumentation not observed	X		
	5. INCLINOMETERS	Instrumentation not observed	X		
	6. SURVEY MONUMENTS	Buried pins established by Sebago Technics	X		
	7. DRAINS	Instrumentation not observed	X		
	8. FREQUENCY OF READINGS	No readings available	X		
	9. LOCATION OF READINGS	No readings available	X		
	10. DEVIATIONS FROM HISTORICAL?	No historical readings	X		
ADDITIONAL COMMENTS: _____ _____ _____ _____ _____					

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>			
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>			
DOWNSTREAM AREA					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S AREA	1. ABUTMENT LEAKAGE	No concerns observed	x		
	2. FOUNDATION SEEPAGE	No concerns observed	x		
	3. SLIDE, SLOUGH, SCARP	Spalling / erosion of bedrock face near waterline downstream of right abutment		x	
	4. WEIRS	Instrumentation not observed	x		
	5. DRAINAGE SYSTEM	Feature not observed	x		
	6. INSTRUMENTATION	Instrumentation not observed	x		
	7. VEGETATION WITHIN 15 FT	Brush and large trees growing from exposed bedrock			x
	8. ACCESSIBILITY	Scramble from downstream left bank; slick rocks	x		
	9. DOWNSTREAM HAZARD DESCRIPTION	Westbrook Street bridge (MaineDOT #2561) - concrete arch founded on bedrock conveying local road (AADT ~ 700). Downstream is tidal Fore River estuary	x		
ADDITIONAL COMMENTS: <u>This page excludes observations of the downstream face of the dam and the immediate underlying foundation.</u> 					

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>
MISCELLANEOUS		
AREA INSPECTED	CONDITION	OBSERVATIONS
MISC.	1. RESERVOIR DEPTH (AVG)	9 ft +/-
	2. RESERVOIR SHORELINE	Well-vegetated with grass and/or shrubs; no concerns observed.
	3. RESERVOIR SLOPES	Saturated, fine-grained soils. Difficult to traverse but otherwise no concerns.
	4. ACCESS ROADS	Feature not observed
	5. SECURITY DEVICES	Feature not observed; see Addl Comment (1)
	6. WATER PUBLIC HAZARDS & PROTECTION	Feature not observed; see Addl Comment (2)
	7. LAND-SIDE PUBLIC HAZARDS & PROTECTION	Feature not observed; see Addl Comment (1) and (3)
	7. VANDALISM OR TRESPASS	☐ YES ☒ NO WHAT: Unrestricted public access
	8. AVAILABILITY OF PLANS	☐ YES ☒ NO DATE:
	9. AVAILABILITY OF DESIGN CALCS	☒ YES ☐ NO DATE: Stability Analysis - March 19, 1986
	10. AVAILABILITY OF EAP/LAST UPDATE	☐ YES ☒ NO DATE: N/A for low-hazard dam
	11. AVAILABILITY OF O&M MANUAL	☒ YES ☐ NO DATE: October 31, 1986
	12. CARETAKER/OWNER AVAILABLE	☒ YES ☐ NO DATE: November 29, 2022
	13. CONFINED SPACE ENTRY REQUIRED	☐ YES ☒ NO PURPOSE:
	14. EAP ACTIVATED SINCE LAST INSPECTION?	Not applicable for low-hazard dam
15. OTHER EVENTS SINCE LAST INSPECTION	None	
ADDITIONAL COMMENTS: 1) Provide handrailing along left retaining wall (publicly-accessible park with bench) with gate to prevent access to dam 2) Provide signage to warn in-stream users of dam 3) Provide signage to discourage swimming, boating, etc., near dam		

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>			
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>			
PRIMARY SPILLWAY					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Shotcrete-capped masonry spillway	x		
	WEIR TYPE	Free-overflow spillway (near-vertical downstream; sloped upstream; slight dip midway)	x		
	SPILLWAY CONDITION	Generally fair; depression near right abutment appears unchanged since 2012		x	
	TRAINING WALLS	Displaced stone on divider pier (left side of spillway), near shrub			x
	SPILLWAY CONTROLS AND CONDITION	Spalling about midway across control section		x	
	JOINTS	Presumed construction joint blw newer shotcrete @ control; see Addl Comment (1)		x	
	UNUSUAL MOVEMENT	Vertical gap / potential separation along divider pier, see Addl Comment (2)			x
	APPROACH AREA	Small void at upstream toe about midway along spillway width; covered by silt		x	
	DISCHARGE AREA / APRON	No concerns observed	x		
	DEBRIS	No concerns observed	x		
	VEGETATION	Small shrub and misc. grasses growing from divider pier			x
ADDITIONAL COMMENTS: 1) Longitudinal cracks observed in 2012 largely unchanged. One crack had 12"W x 6"D void about midspan of spillway. 2) Near shrub; also associated vertical crack and wide gaps; gap was previously-reported in 2012 to be source of leakage 					

NAME OF DAM: Stroudwater DamSTATE ID #: 441INSPECTION DATE: November 29, 2022NID ID #: ME00311**AUXILIARY SPILLWAY - See Additional Comment (1)**

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Concrete-capped masonry (immediately above Outlet Works)	x		
	WEIR TYPE	Sharp-crested weir (in-line with aluminum slide gate) to concrete overflow	x		
	SPILLWAY CONDITION	No concerns observed	x		
	TRAINING WALLS	No concerns observed	x		
	SPILLWAY CONTROLS AND CONDITION	No concerns observed; control section is in-line with aluminum slide gate	x		
	UNUSUAL MOVEMENT	No concerns observed	x		
	APPROACH AREA	No concerns observed	x		
	DISCHARGE AREA / APRON	No concerns observed	x		
	DEBRIS	No concerns observed	x		

ADDITIONAL COMMENTS: 1) This sheet used for lower-elevation section of dam crest left of divider pier and immediately above Sluiceway (incidental, not formal auxiliary spillway)

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>			
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>			
OUTLET WORKS					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
OUTLET WORKS	TYPE	Arched, shotcreted sluiceway with aluminum slide gate (replaced 2021)	x		
	LOCATION ON DAM	Between left abutment retaining wall and divider pier (separating primary spillway)	x		
	OPERABLE? INCL. DATE LAST TESTED	Operable; opened and closed November 29, 2022	x		
	INTAKE STRUCTURE	Approach channel bounded by left abutment masonry training wall	x		
	TRASHRACK	No feature observed			x
	PRIMARY CLOSURE	Electric actuator often lacks sufficient torque to fully open gate; see Addl Comment (1)			x
	SECONDARY CLOSURE	Manual wheel; no concerns observed	x		
	CONDUIT	[Sluiceway] separation between shotcrete and bedrock floor; see Addl Comment (2)			x
	OUTLET STRUCTURE/HEADWALL	No concerns observed	x		
	EROSION ALONG TOE OF DAM	No concerns observed	x		
	SIDE SLOPE STABILITY / PROTECTION	Shotcreted masonry retaining wall; sinkholes behind wall suggest seepage			x
	VEGETATION	No concerns observed	x		
	SEEPAGE/LEAKAGE (INCL. EST FLOW)	Leakage between aluminum slide gate and wooden sill; see Addl Comment (3)		x	
	DEBRIS/BLOCKAGE	No concerns observed but past history of logs damaging slide gate			x
	UNUSUAL MOVEMENT	No concerns observed	x		
	DISCHARGE AREA / APRON	Bedrock; no concerns observed	x		
	MISCELLANEOUS	Cracks in shotcrete overlay of headwall containing Aluminum Slide Gate			x
	ADDITIONAL COMMENTS: 1) Gate leaf slot could be wider to improve function (not critical to dam function however) 2) Appears active (freshly broken concrete); some loss of dam material (stones) behind void in shotcrete near bedrock floor 3) Leakage between wood beams composing gate sill; slight leakage along left side of gate frame and masonry. Also leakage from void between shotcrete and bedrock floor				

NAME OF DAM: Stroudwater Dam

STATE ID #: 441

INSPECTION DATE: November 29, 2022

NID ID #: ME00311

CONCRETE/MASONRY DAMS (LEFT ABUTMENT) - See Addl Comment (1)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	TYPE	Grouted masonry/dumped rock atop cast-in-place concrete wall	X		
	SURFACE CONDITIONS	No concerns observed	X		
	CONDITIONS OF JOINTS	No concerns observed	X		
	UNUSUAL MOVEMENT	No concerns observed	X		
	HORIZONTAL ALIGNMENT	No concerns observed	X		
	VERTICAL ALIGNMENT	No concerns observed	X		

ADDITIONAL COMMENTS: 1) This sheet used for concrete-filled masonry immediately left of Outlet Works

NAME OF DAM: <u>Stroudwater Dam</u>		STATE ID #: <u>441</u>			
INSPECTION DATE: <u>November 29, 2022</u>		NID ID #: <u>ME00311</u>			
CONCRETE/MASONRY DAMS (DOWNSTREAM FACE)					
AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S FACE	TYPE	Dry-stacked masonry with formed concrete wall along left abutment	x		
	SURFACE CONDITIONS	Extensive moss; some missing masonry particular near sluiceway outlet			x
	CONDITIONS OF JOINTS	Generally unmortared, except near left abutment; no concerns observed	x		
	UNUSUAL MOVEMENT	Bulge downstream of divider pier and near sluiceway outlet			x
	ABUTMENT CONTACT	No concerns observed	x		
	FOUNDATION	Bedrock with several gaps between stones; void at right abut; see Addl Comment (1)			x
	LEAKAGE (INCL. LOCATION & EST. FLOW)	3+ leaks near foundation high-point ~ midway of spillway; see Addl Comment (2)		x	
	VEGETATION	Some brush and grass growing from downstream face - should be removed			x
	MISC				
ADDITIONAL COMMENTS: 1) Void is approx. 30"H x 60" W x 45" D and located at the location of 1998 repair of failed face with apparent brick and mortar. 2) Some leaks observed in 2012 not observed, likely due to drawdown. In general, appears unchanged since 2012 					



Attachment 2

2022 Inspection Photographs

*Stroudwater Dam (MEMA Dam #441)
2022 Visual Dam Safety Inspection Report*



Photo 1: Downstream face of Stroudwater Dam from Westbrook Street Bridge (looking upstream)



Photo 2: Reservoir at time of inspection (looking upstream from dam)



[Historic] Photo 3: Dam spillage on May 15, 2006 (Mother's Day Flood) – NOTE overflow of former steel slide gate acting as a sort of secondary spillway



[Historic] Photo 4: Leakage areas through dam on February 17, 1999 (delineated by ice formations)



[Historic] Photo 5: Uneven spillway crest and spillage on November 19, 2020
(NOTE center discharge only)



Photo 6: Primary Spillway concrete condition (NOTE longitudinal cracks)



Photo 7: Deepest penetration (six inches) of longitudinal crack in Primary Spillway



Photo 8: Depressed area of upstream face of Primary Spillway (similar condition as in 2012)



Photo 9: Upper concrete overlay crack and crest deformation on Primary Spillway



Photo 10: Damaged portion of spillway crest near center of Primary Spillway



Photo 11: Divider pier with cracking and vegetation growth (potential leakage source)



Photo 12: Divider pier cracking and vegetation growth (potential leakage source)



Photo 13: Divider pier and interface with upstream face of Primary Spillway



Photo 14: Condition of upstream face of divider pier; NOTE cracks in shotcrete overlay



Photo 15: Aluminum Slide Gate (left side of dam) that controls discharge to Low-level Outlet



Photo 16: Guide strip slot clearance of Aluminum Slide Gate



Photo 17: Left abutment training wall



Photo 18: Upstream end of left abutment training wall with sediment accumulation

NOTE lack of shotcrete covering missing mortar in some joints



Photo 19: Upstream end of low-level outlet approach / upstream corner of left abutment training wall



Photo 20: Depressed surface behind left abutment training wall



Photo 21: Localized sinkholes across Left Abutment



[Historic] Photo 22: Left Abutment sinkhole on May 16, 2006 (subsequently filled)



[Historic] Photo 23: Left Abutment sinkhole on 6/30/2021



Photo 24: Sinkhole adjacent to left abutment training wall (in shaded portion of photograph)



Photo 25: Concrete fill in historic low part of dam crest (downstream edge of Left Abutment)



Photo 26: Tree growth on downstream side of Left Abutment



Photo 27: Tree growth and vegetation near Sluiceway outlet and downstream face of Left Abutment



Photo 28: Sluiceway outlet at time of inspection



Photo 29: Sluiceway, following closure of Aluminum Slide Gate



Photo 30: Condition of shotcrete overlay of Sluiceway ceiling



Photo 31: Condition of shotcrete overlay of Sluiceway left side



Photo 32: Interface between bedrock foundation and shotcrete overlay on left side of Sluiceway



Photo 33: Interface between bedrock foundation and shotcrete overlay of Sluiceway

NOTE fresh break of overlap lip seen in discoloration



Photo 34: Interface between sill of Slide Gate, bedrock foundation, and shotcrete overlay of Sluiceway

NOTE leakage through sill and left side of Slide Gate frame



Photo 35: Depth of void along left side of Sluiceway



Photo 36: Interface between bedrock foundation and shotcrete overlay on right side of Sluiceway



Photo 37: Stone loss and vegetation on downstream face of divider pier



Photo 38: Stone loss along downstream face of divider pier



Photo 39: Stone loss near downstream face of divider pier



Photo 40: Sporadic stone movement and vegetation along downstream face of Primary Spillway



Photo 41: Bulged area of downstream face, near left contact of Primary Spillway and Divider Pier

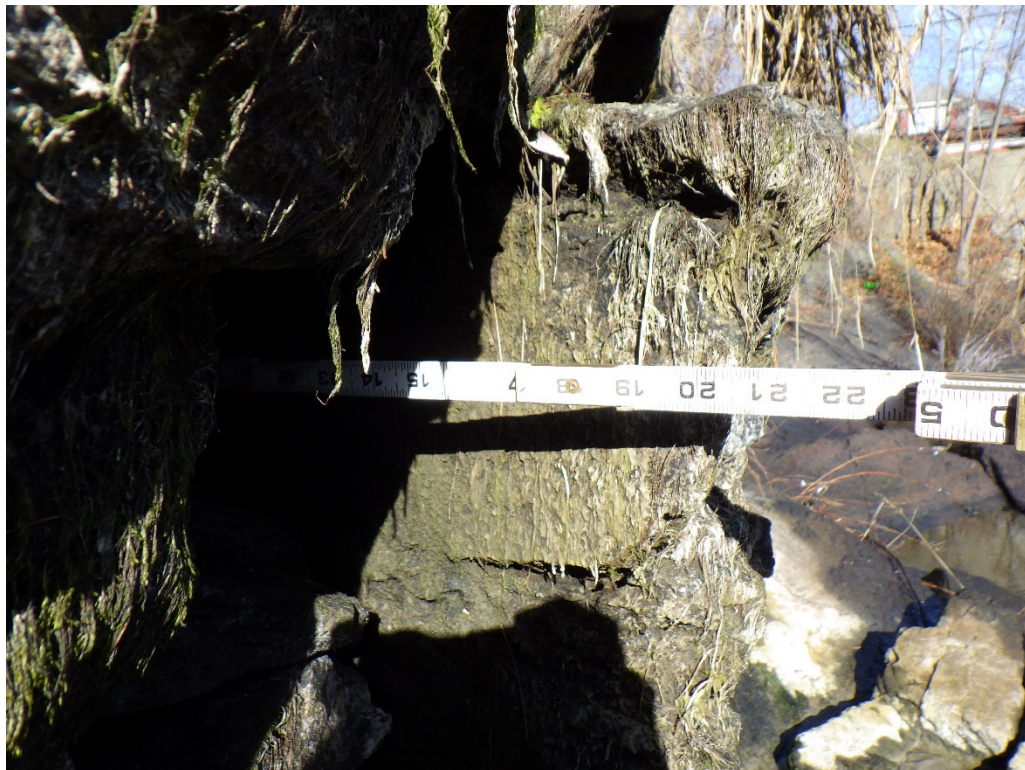


Photo 42: Stone movement and void depth at bulged area



Photo 43: Interface between downstream face and right bedrock abutment
(NOTE void at toe of downstream face at contact with abutment)



[Historic] Photo 44: 1998 partial failure of downstream face at current site of void



[Historic] Photo 45: 1998 repair of partial failure of downstream face at current site of void



[Historic] Photo 46: 1998 repair of partial failure of downstream face at current site of void (detail of contact with right bedrock abutment)



Photo 47: Void at interface of downstream face, right bedrock abutment, and bedrock foundation



Photo 48: Detailed photo of right side of void



Photo 49: Detailed photo of left side of void



Photo 50: Spalling along toe of right bedrock abutment, downstream of dam

Stroudwater Dam**2022 Visual Dam Safety Inspection Report**

1/13/2023 Revised 2023-04-25

Report Section 4.2		Lower	Upper	Subtotals
Recommendations	Description	Cost	Cost	Upper Costs
1	Interim inspections	\$ 500	\$ 1,500	
2	I&M plan update	\$ 2,500	\$ 6,000	
3	Deferred maintenance	\$ 3,000	\$ 7,500	\$ 15,000
Within 1 year				
4	Spillway capacity analysis	\$ 3,500	\$ 8,000	
4/5	Survey	\$ 3,500	\$ 7,000	
5	Stability analysis	\$ 4,000	\$ 10,000	
6	Fencing and railing	\$ 4,500	\$ 9,500	
7	Crack repair	\$ 7,000	\$ 18,000	
8	Divider pier sealing	\$ 3,000	\$ 6,500	\$ 59,000
Within 3 years				
9	Seal left abutment training wall	\$ 25,000	\$ 60,000	
10	Repair failed section of D/S face	\$ 20,000	\$ 45,000	
11	Repair bulging section	\$ 10,000	\$ 25,000	
12	Repair crest lip	\$ 3,000	\$ 7,500	
13	Re-seal sluiceway	\$ 12,000	\$ 30,000	
14	Trash rack	\$ 8,000	\$ 18,000	\$ 185,500
At City Descretion				
15	Seal foundation	\$ 12,000	\$ 25,000	
16	Sand application	\$ 250	\$ 500	
17	Widen gate leaf slot	\$ 3,000	\$ 8,000	
18	Install crest gate	\$ 600	\$ 1,500	\$ 35,000
Totals		\$ 125,350	\$ 294,500	\$ 294,500

Available Funding		
Account #	Account Name	Amount
C20304	Stroudwater Dam	\$ 9,533.81
C23510	Stroudwater Dam	\$ 128,397.13
	Total	\$ 137,930.94

CITY OF PORTLAND, GRANTEE

Ralph A. Leavitt

1732-321

To

Deed

City of Portland

All my right, title and interest in and to the following described property situated at Stroudwater in said Portland and bounded and described as follows. Beginning on the southerly bank of the Stroudwater River above the Westbrook Streetbridge at a point 10 feet below or easterly from the point of ledge at the southerly end of the Mill dam; thence southerly parallel with the line of said dam a distance of 10 feet to a point; thence westerly and at right angles to the line of said dam a distance sufficiently far to include said Mill dam and its foundations; thence northerly across said river on a course parallel with said dam and continuing the same course 10 feet beyond the northerly bank of the river to a point; thence easterly and at right angles to the line of said dam to a point 10 feet easterly of the easterly side line of said dam extended northerly; thence southerly across said river parallel with said dam to the point of beginning.

Also for the purpose of repair, improvement and maintenance of said dam, the right to the grantee, its successors and assigns, to enter the premises above described from Westbrook Street across land now owned by Clinton R. Parker on the northerly side of said river.

All the right, title and interest of this grantor in and to all rights of flowage on any part of the Stroudwater River; rights to cut and harvest ice thereon; together with any and all other easements, rights and privileges in or upon said river or the shores and banks thereof.

As part consideration for this conveyance the grantee herein agrees for itself, its successors and assigns, that it will not exercise or use any of the rights, privileges or easements hereby conveyed in connection with the cutting and harvesting of ice on said River for commercial purposes; and that it will pay or abate all unpaid taxes assessed against the property hereby conveyed.

And as part consideration for this conveyance the grantee herein agrees that it will forthwith repair said dam in a proper and workmanlike manner to prevent leakage and that the grantee will at all times hereafter maintain said dam and its foundation in a satisfactory manner; provided, however, that if the said grantee shall fail to so maintain said dam, title to the in and premises hereby conveyed shall thereupon revert to the said Ralph A. Leavitt, and if living, otherwise to his heirs.

March 21, 1944

Ralph A. Leavitt

Ruth B. Leavitt

March 21, 1944

March 30, 1944

NOTE - For more complete description see Q.C. 1457

94

CITY OF PORTLAND
CITY PROPERTY
NOT TO SCALE



RALPH A. LEAVITT
TO
CITY OF PORTLAND
DEED B.1732 P.321 MAR 21, 44

GARRISON ST.

WESTBROOK

STREET

RIVER

STROUD WATER

Flow



Troy Moon <thm@portlandmaine.gov>

Public Comment: Stroudwater River Dam and Water Quality

Rachelle Curran Apse <rachelle@prlt.org>

Wed, May 10, 2023 at 2:37 PM

To: thm@portlandmaine.gov

Cc: Curtis Bohlen <curtis.bohlen@maine.edu>, Matthew Craig <matthew.craig@maine.edu>

Dear City of Portland Sustainability and Transportation Committee,

As the Executive Director of the Presumpscot Regional Land Trust, I want to ensure you know that our nonprofit has been conducting water quality monitoring on the Stroudwater River for five years in collaboration with the Casco Bay Estuary Partnership and the State of Maine Department of Environmental Protection (DEP). The water quality of the Stroudwater River should be an essential consideration when deciding whether the City of Portland should continue to invest public funds into the current dam infrastructure.

Over the last five years, the Stroudwater River water quality data collected closest to the dam has met DEPs minimum for dissolved oxygen just 57% of the time. Typically dissolved oxygen is low when there is too much algae and/or too little water flow. Aquatic life, like fish and invertebrates, requires high levels of dissolved oxygen to survive and thrive.

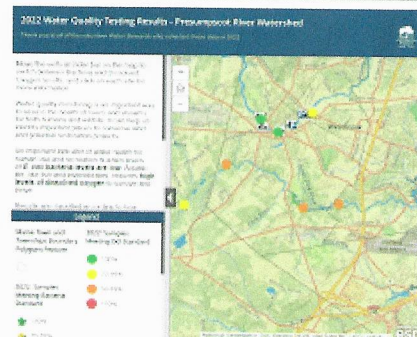
Please review the results of our water quality testing on the Stroudwater River in our online interactive map on our website: www.prlt.org/water.

We are also happy to share the raw data from our water quality testing and would be glad to meet with City of Portland staff and councilors to further discuss the water quality data. Attached is a snapshot of some of the data from our website.

Thank you for your consideration,
Rachelle

Rachelle Curran Apse
Executive Director
Presumpscot Regional Land Trust
(207) 839-4633

www.prlt.org
www.sebagotothesea.org



2022 Water Quality Testing Results Stroudwater River.png
891K

2022 Water Quality Testing Results - Presumpscot River Watershed

Thank you to all of the volunteer Water Stewards who collected these data in 2022



Move the vertical slider bar on the map to switch between Bacteria and Dissolved Oxygen results, and click on each site for more information.

Water quality monitoring is an important way to assess the health of rivers and streams for both humans and wildlife. It can help us identify important places to conserve land and potential restoration projects.

An important indicator of water health for human use and recreation is when levels of ***E. coli* bacteria levels are low**. Aquatic life, like fish and invertebrates, requires **high levels of dissolved oxygen** to survive and thrive.

Results are classified according to how

Legend

Maine Town and Townships Boundary Polygons Feature



2022: Samples Meeting Bacteria Standard



2022: Samples Meeting DO Standard

100%

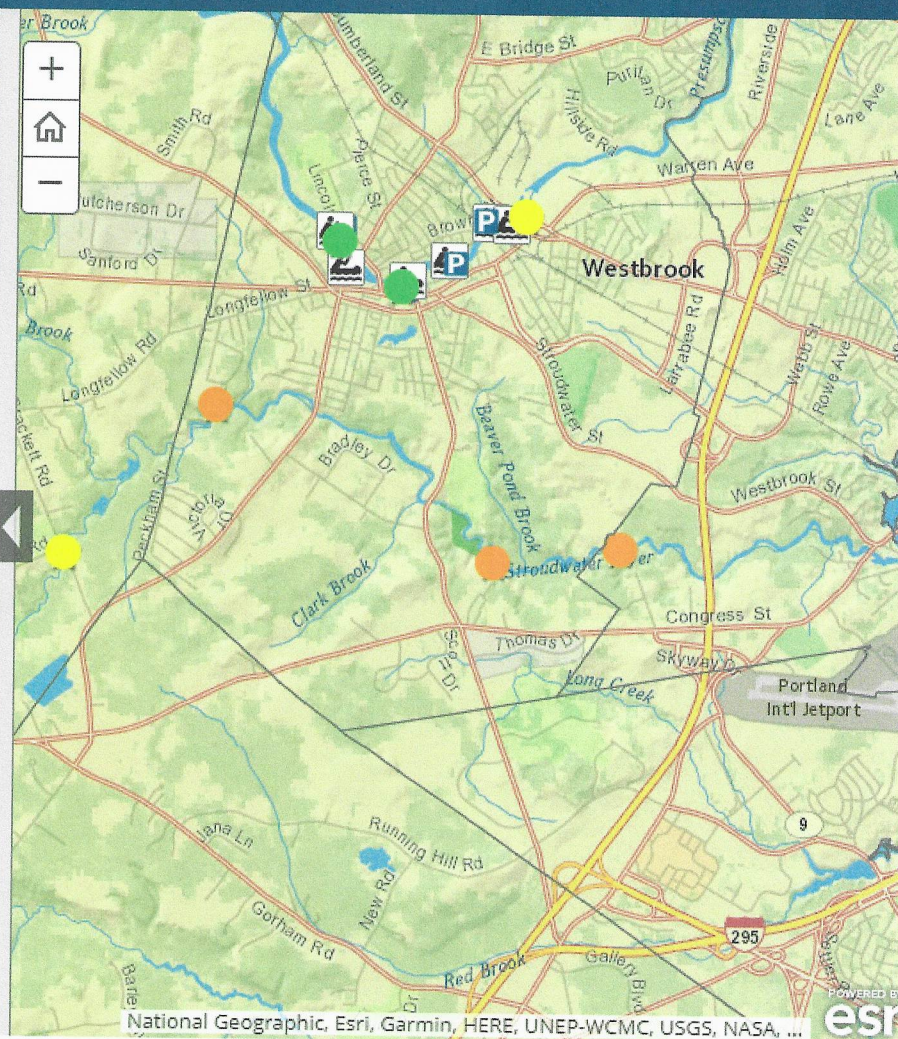
70-99%

50-69%

<50%

100%

70-99%





Troy Moon <thm@portlandmaine.gov>

Please include in the meeting packet. I did mail this but the link did not work on the web site for the TPC. I emailed this on Tues morning. .

Waldren, Carter <waldrenc@westbrookschoools.org>
To: thm@portlandmaine.gov

Wed, May 10, 2023 at 1:54 PM

Troy could you please include these questions for the Committee members? The mail was returned as undeliverable using the link on the web site.

Thanks

Carter Waldren
40 Garrison street.
Portland , Maine. 04102
Carterwaldren1966@gmail.com

I have read the engineering report in its entirety . From reading the report it is obvious that the city has not maintained the dam properly leading to its present poor condition.

Questions: For the transportation committee members as they ponder the fate of the dam into the future. If the committee chooses to pursue the removal of the dam please consider the below questions?

1. Has testing been done of the silt behind the dam and what are approximate amounts of silt? If the testing shows contamination then what are the costs of remediation? Pumping to a permanent site or removal and storage fees. Dumping the silt into the Fore river and not understanding the ramifications of the volume of silt would be a major oversight.

Forever chemicals are one example of chemicals that are discharged from the upstream farm in Westbrook or other chemicals from parking lots such as Unum or other manufacturing etc.

What possible manufacturing leakage possibly exists at this time that has been undetected and will be discovered once the dam is removed. Have those sites been located and tested?

Such as upstream farms, dairy etc. or spills from the highway or the Eco-Maine plant etc.

The farm in Westbrook is listed on the Maine Septage site related to forever chemicals being discharged on the land. There is a small stream that leads directly to the Stroudwater river from the farm. The forever chemical runoff is not hypothetical, it is already established. Look for the farm and the stream that runs to the Stroudwater river.

2. If the dam is removed and the river is smaller does that have an effect on the shorland zone that is already established? Have you consulted the Maine dep related to protected wetlands etc.

Legal documents would need to be created to ensure that the existing rules are followed into the future and not the new size of the river once the dam is removed to protect existing wetlands.

3. What is the baseline for environmental improvement ? How will you manage success if you have no knowledge of existing populations of wildlife or the ramifications for removing the dam?

What are the possible impacts to the wetlands that feed into the river? Those small inlets are flooded with water and there are many frogs, turtles, etc. that use those areas. Tributaries that feed the river and are flooded with river water. Water flows up into those areas and meets the incoming small feeder streams. Have those areas been mapped and are they understood?

4. Has the existing wildlife been studied and does the committee understand the species that currently use the river that is above the dam? Or below the dam such as duck populations or herons and other species such as eagles etc.
5. What efforts have been made to get buy-in from the community or to get buy-in from the neighbors who have property that runs along the river? What community effort are you doing to include all the stakeholders in the process?
6. What are the real restoration costs after dam removal? The removal is just the beginning of the process. Looking at that cost compared to repairs is not a valid comparison. I would assume the restoration costs would be very high also.
7. If the city does pursue the removal of the dam. Could the project include a restored area below the dam that would promote the area and open it up to swimming, kayaking etc below where the dam is currently located? Maybe buying the small park at the entrance and then putting stairs and access down to the river mouth. The land abutting the dam is privately owned and the owner would need to be consulted related to fencing and kayaking access. Many people use the river for swimming also.
8. Have there been studies of public access and trails to upstream areas that could be utilized after the dam is removed.

The committee needs to actually have a plan rather than making decisions on costs as the only metric. The city has been negligent in the repairs and that is in the report.

9. What are the negative aspects of removing the dam and lowering the water level?
10. What are the costs involved? Have multiple sources been explored and what are they?
11. Who is responsible for making such a large decision such as removing a dam like this one and is that person or persons qualified to make that decision?
12. Has the committee found guidance from other state relevant entities such as the Dep or consulted other cities that have gone through this process.
13. What is the permitting process to remove the dam? What is the role of the public in that process?
The Stroudwater dam, deed states that if the city is not taking care of the dam then they need to give it back to its original owners. Have they been consulted? .
14. Have the committee members read the deed?

Removing a dam requires a thoughtful process and the removal will impact the entire watershed. Dumping all the silt behind the dam will create new areas in the fore river and may make access to the fore river difficult for some homeowners or areas such as water access for boat launches etc. downstream.

15. What are the possible effects on the estuary, birds, otters, shellfish, egrets, fish etc.
 This dam is at the entrance to the estuary and is tidal.

16. What other focal points are left in the city? The Stroudwater area is the first settlement of Portland. How does the city value that and its history?

You need wildlife biologists, reports of silt, heights of river after removal estimates and mapping, and shoreline restoration costs. Does the committee understand how much concrete and debris is below the water line? How is the dam constructed and that will be related to how it is removed?

17. What will be done with the debris or the contaminated silt if the dam is removed?
18. What do the records show of the existing area before the dam construction?
19. What efforts are being done to stop contamination of the river from other sources such as parking lot runoff. If the goal is to restore the river then just knocking down the dam is not a plan.
20. Who owns the river? Who has jurisdiction over the river? What rights do the abutters have related to the river and can you be sued?

Please don't make rash decisions that are based on uniformed short term problems. We all want to have improvement but there is a process and it takes patience and direction. We are all looking to a better Portland in the future and a decision this large needs to be well thought out and planned.

Carter Waldren
40 Garrison Street
Portland, Maine,
04102

10. What are the local, state, and federal laws that regulate the use of the river? How does the city view that and its history?
11. You need a bill, but please account of all the things of new after removal estimates and mapping, and the design and construction costs. Does the contribution anticipated from each contract and design is below the water line? How is the river being treated and that will be related to how it is removed?
12. What will be done with the debris in the contaminated area if the dam is removed?
13. What do the records show of the existing river before the dam construction?
14. What efforts are being done to stop contamination of the river from other sources with the existing dam? If the goal is to restore the river then that history of down the dam is not a plan.
15. Who owns the river? Who has jurisdiction over the dam? What rights do the adjacent land related to the river have for the river?

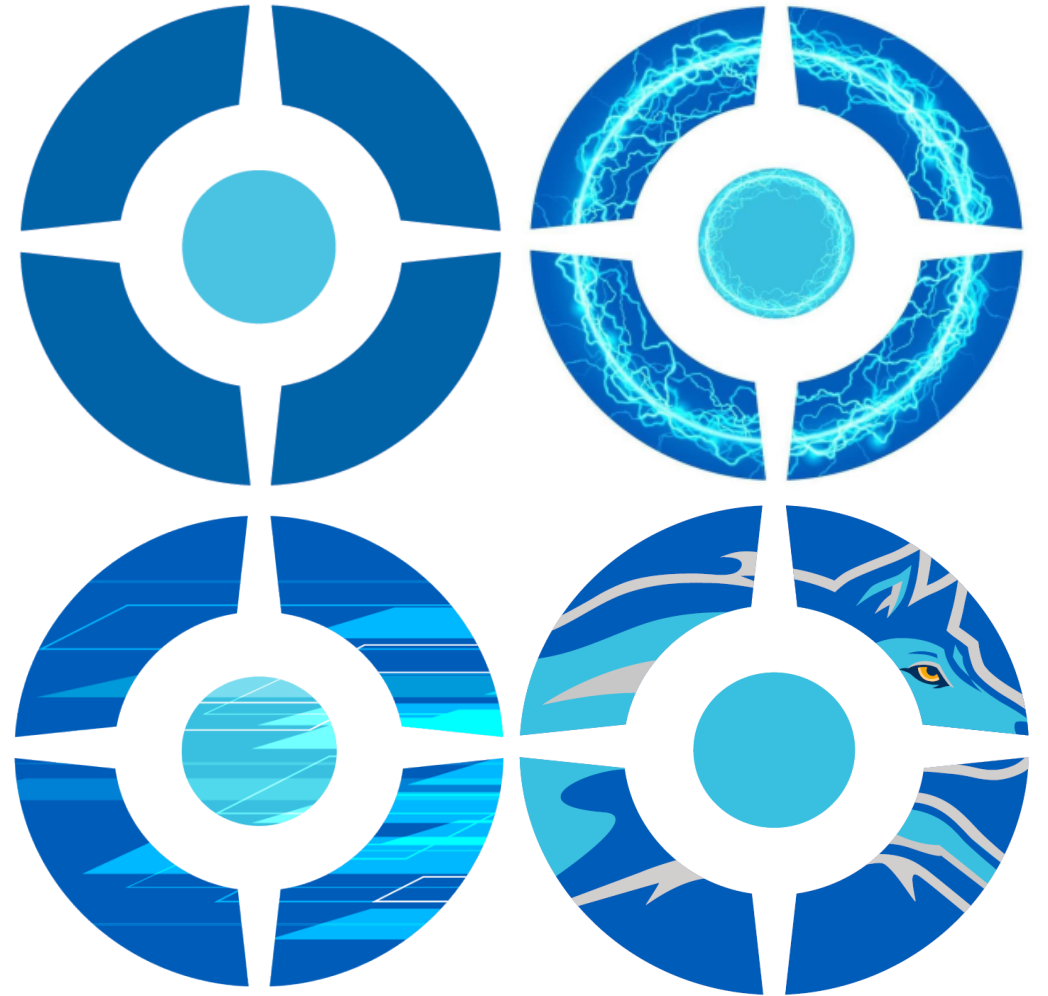
Please don't make rash decisions. Don't get caught in a uniformed about how to handle. We all want to have a plan, but there is a process and it takes patience and direction. We are all looking for a better future in the river and a decision that is not to be well thought out and planned.

Center Station
4000 Main Street
Portland, Maine
04103

GREATER PORTLAND METRO

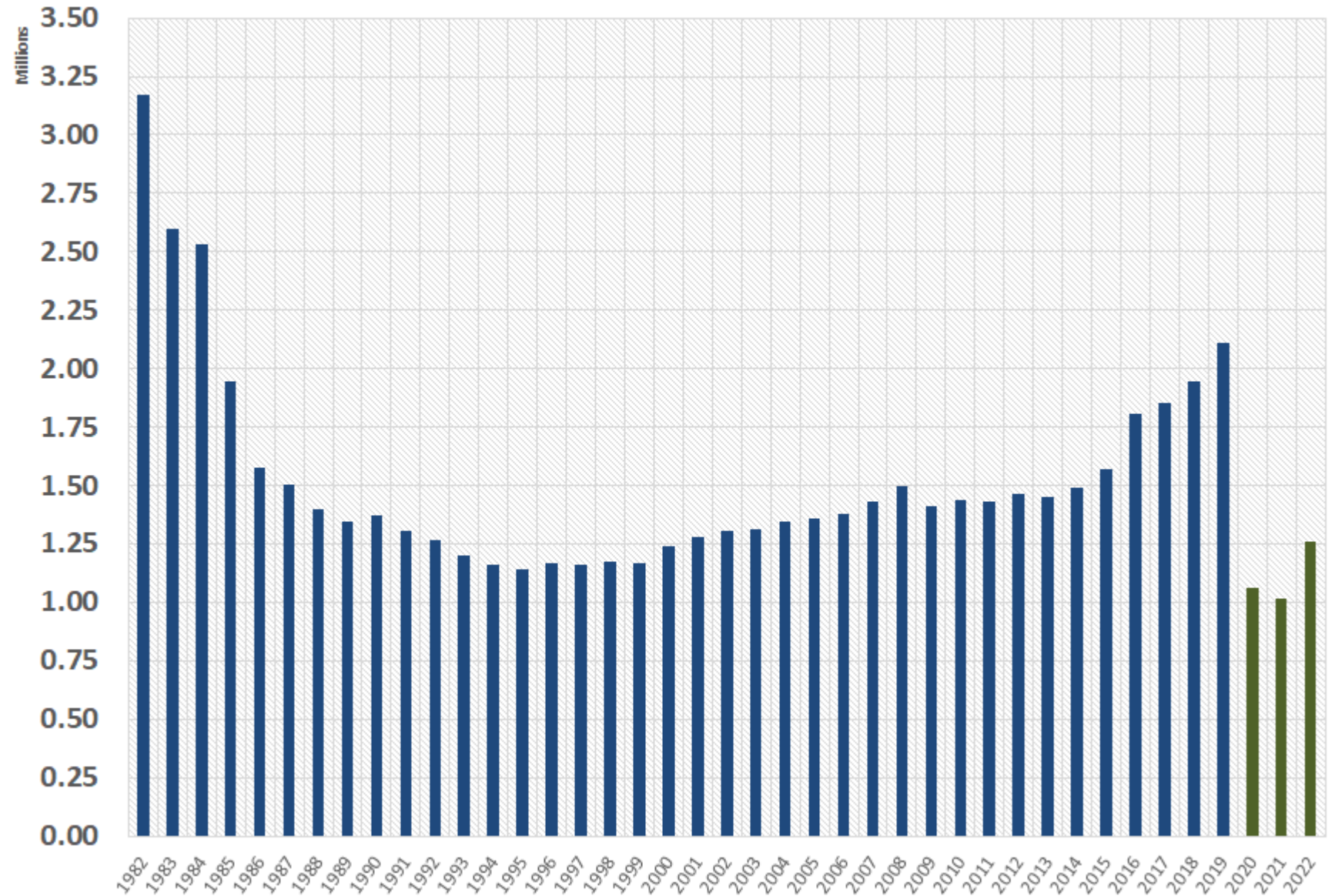
Board of Directors Meeting

April 27, 2023



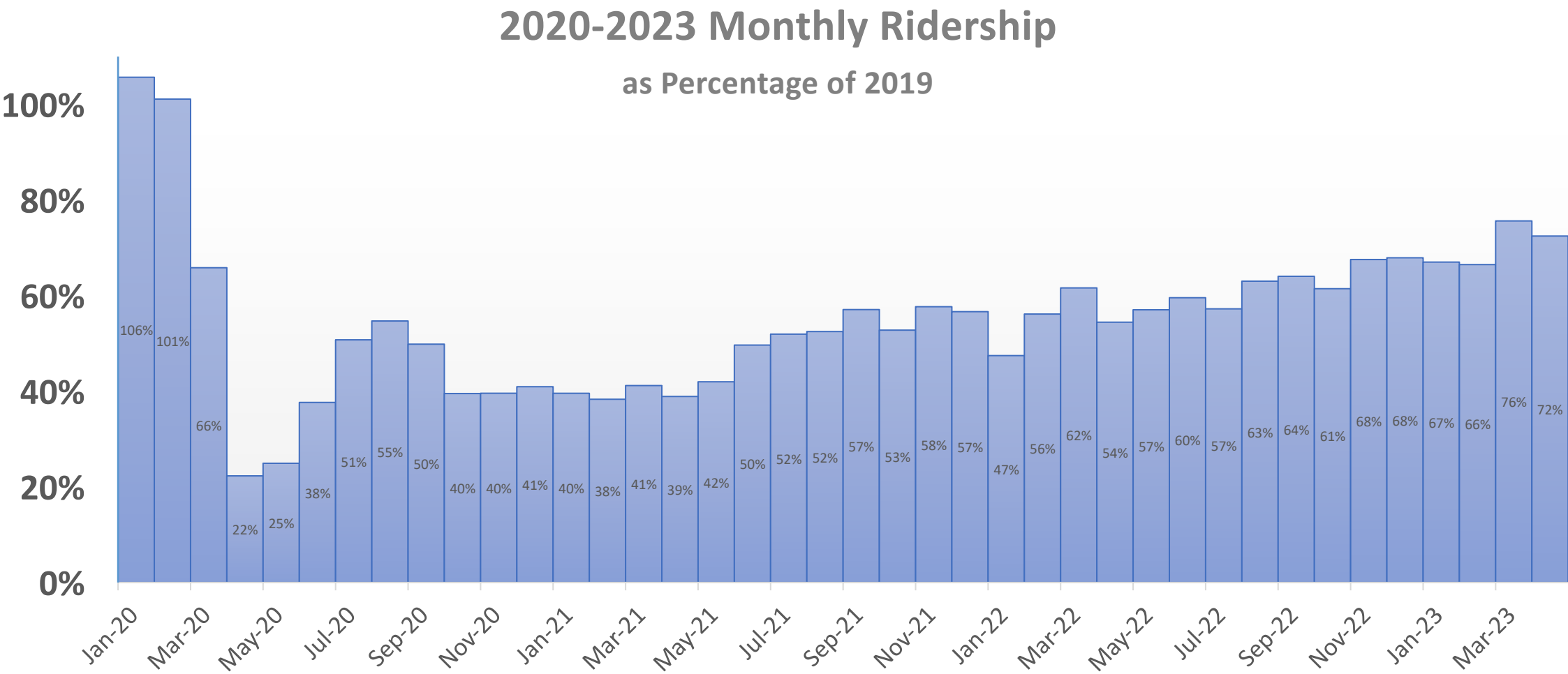
Past Performance

Greater Portland METRO: 30 Year Ridership Trend



Recent Performance

Ridership



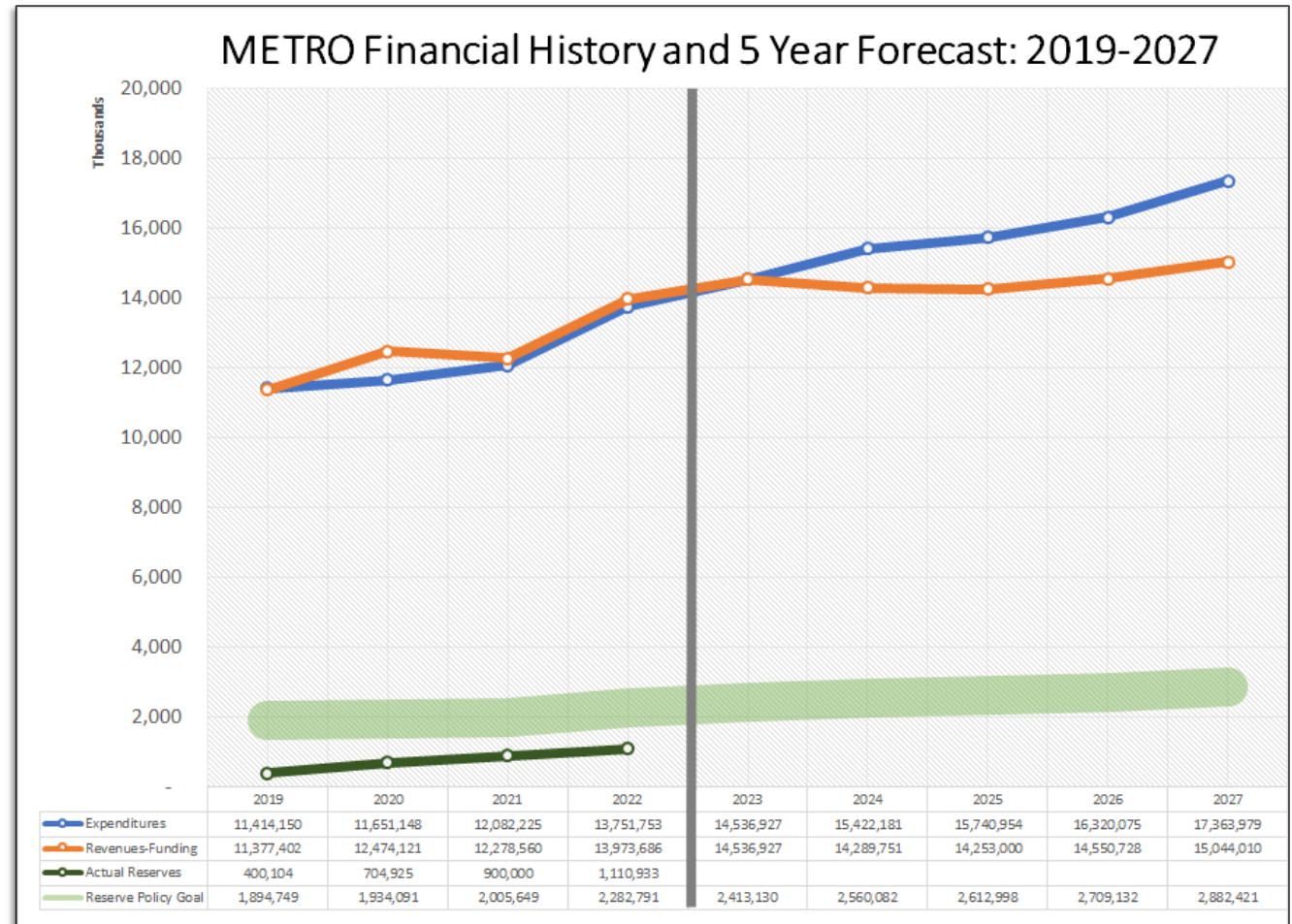
Major National Trends

Operating Funding

Many US Transit Agencies are facing fiscal cliffs in the next 1-2 years:

- Slow recovery of ridership and fare revenue.
- Rapidly rising costs.
- Final drawdown of emergency federal funds.

Source: Eno Center for Transportation



Major National Trends

Ridership – Top Recovery Strategies

- Improve route directness and frequency with bus network redesigns.
- Center the mobility needs of historically disadvantaged communities.
- Emphasize high all day service levels, and longer operating hours (peaks have flattened).
- Serve major destinations and connect the modes (bus, rail, ferry, trails).
- Speed up transit with projects like Bus Rapid Transit, Transit Signal Priority, Priority Bus Lanes.
- Simplify transit for riders with smart fare payment, pass programs, intuitive trip planning tools, easy transfers between routes, effective communications, and steps to present a single (bus) transit system.
- Implement first mile-last mile strategies (microtransit, bus stop accessibility, connections to trails).
- Operate a safe and secure system and make sure the public knows this.
- **Mix land uses, increase affordable/multi-family housing, price and supply parking at levels that shift incentives, complete streets, increase pop/emp densities in core and along major corridors(s).**

GPCOG/PACTS Planning Work

Transit Together (2023)

A more seamless and simple regional transit network:

- More frequent service on key corridors
- Simpler and more direct routes
- Better connections between services
- Longer operating hours
- New or improved service to key destinations and transportation hubs

Greater integration of public facing elements of the transit network.

- Common branding for similar services.
- Common Automatic Vehicle Location (AVL) service for the region.
- Expanding Dirigo Fare Payment system to include more agencies.
- Common bus stop standard, including bus stop signage across the region.
- Explore opportunities for administrative partnerships (procurement, marketing, maintenance).



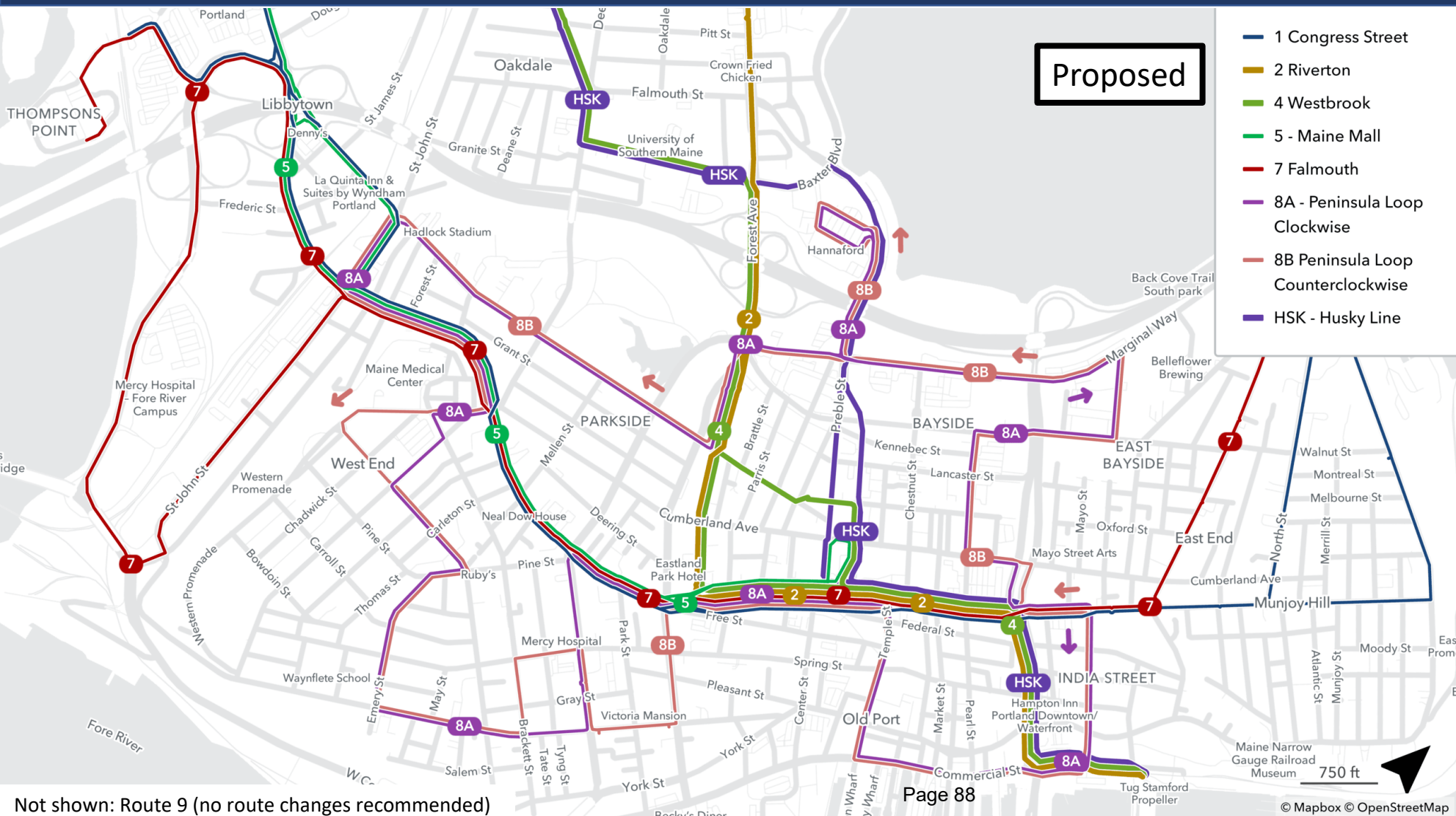
Transit Together

Proposed changes to Metro network – Portland Peninsula



Transit Together

Proposed changes to Metro network – Portland Peninsula



Proposed vs. Existing

- +4 routes serving Commercial St in Old Port
- High-frequency corridor on Congress Street

Transit Together

Proposed changes to Metro network – Route 8



Transit Together



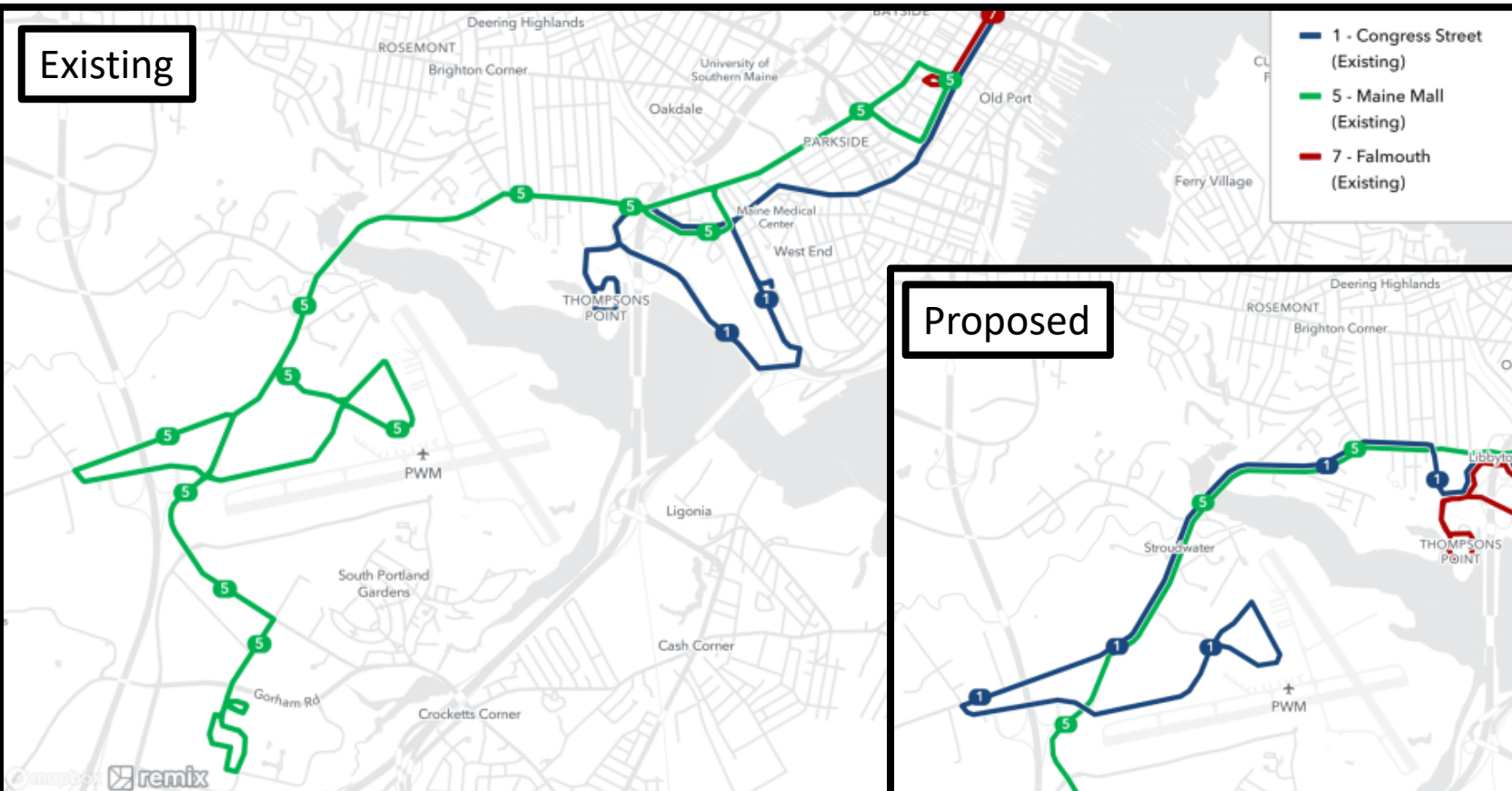
- +1000 population
- +1600 jobs
- +3 public housing buildings

Reconfigured 8B and clockwise 8A will require ~50 new bus stops, most with parking impacts

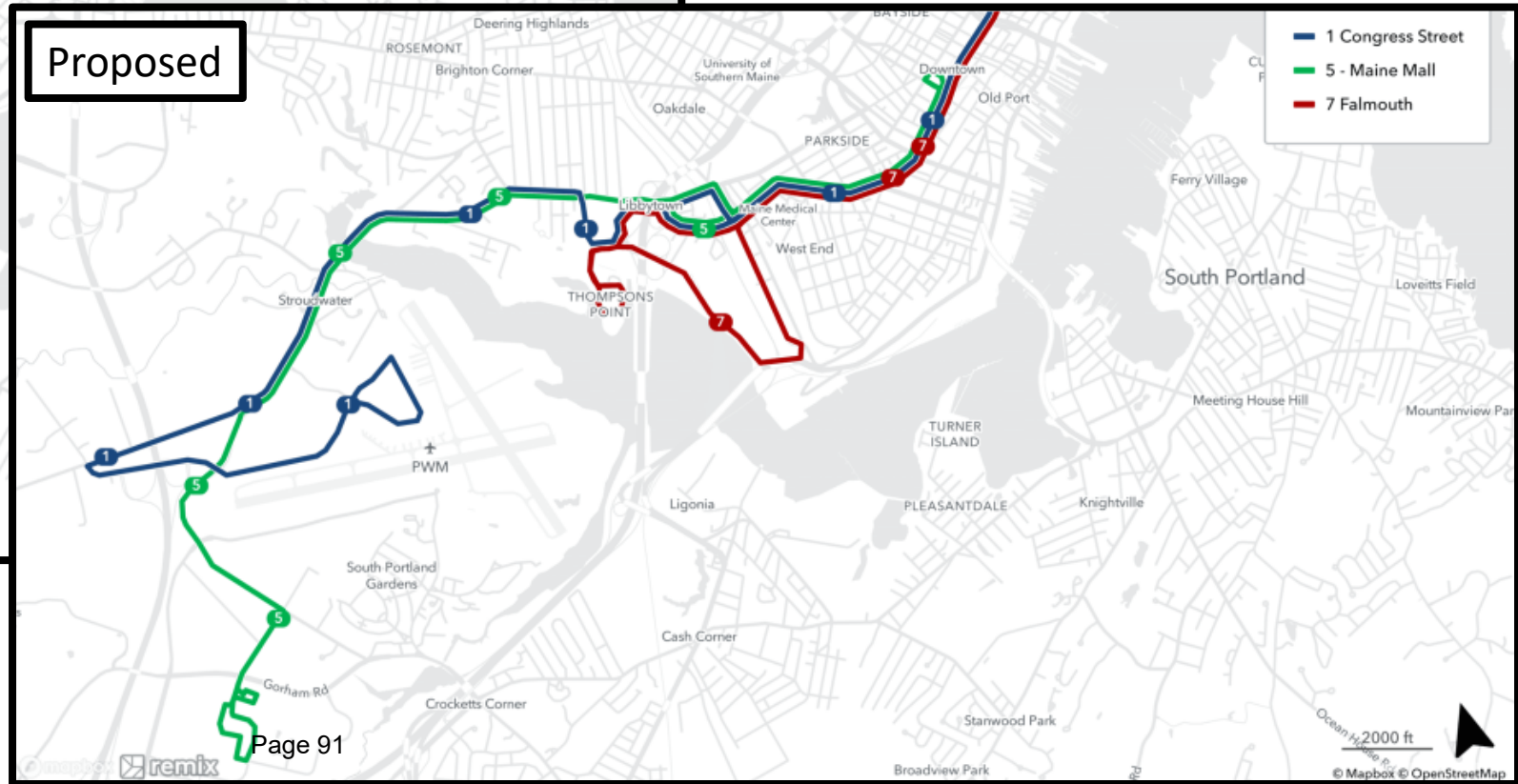
Transit Together

Proposed changes to Metro network – Jetport and Maine Mall

Existing



Proposed



Transit Together

Proposed changes to Metro network – Falmouth

Existing

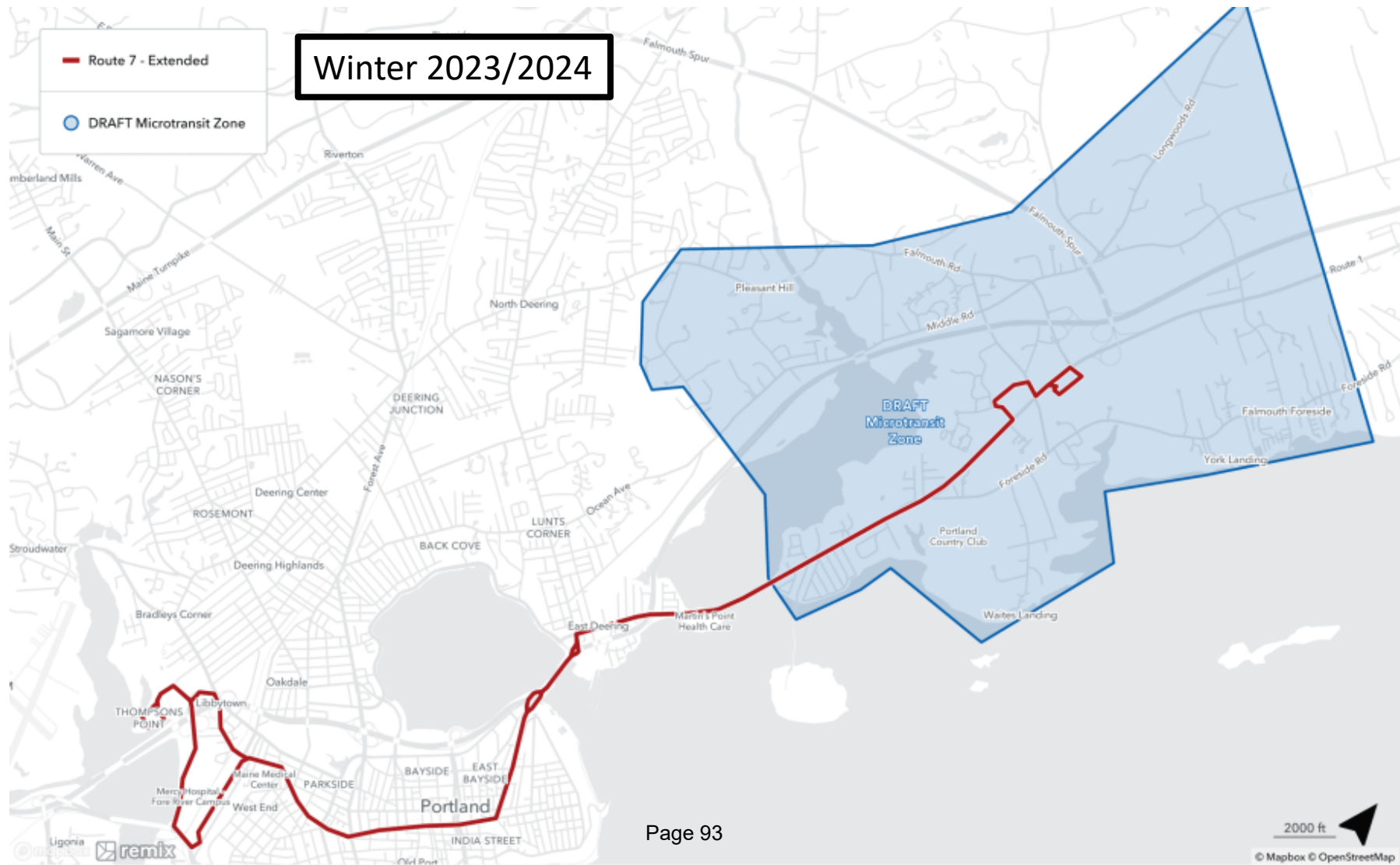
Route 7 - Falmouth

Fall 2023

Route 7 - Transit Together, pre-microtransit

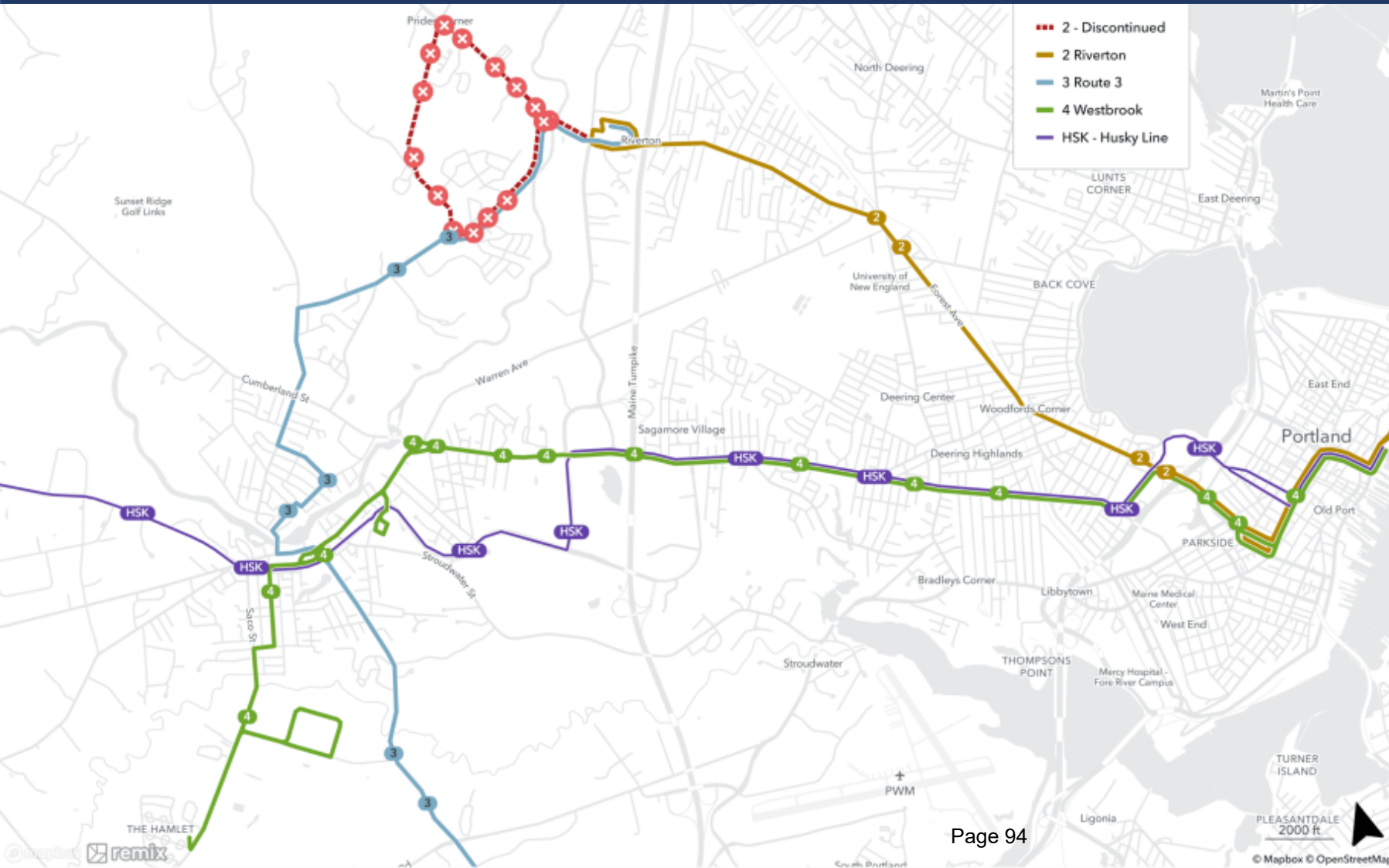
Transit Together

Proposed changes to Metro network – Falmouth



Transit Together

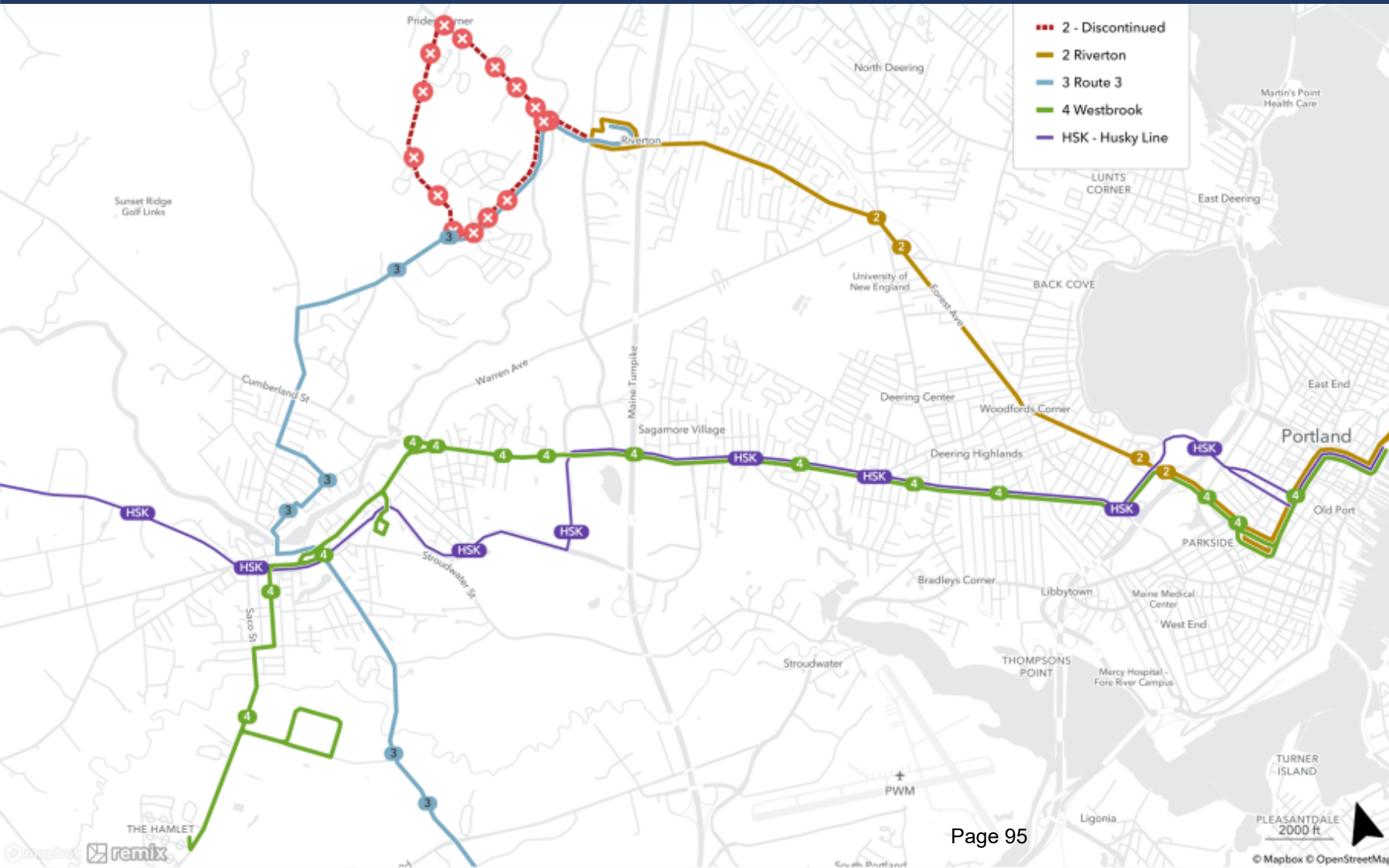
Proposed changes to Metro network – Westbrook



- Reduce or eliminate service to Pride's Corner in Westbrook
- Simplify Route 4 schedule
- Extend 2/4/HSK to Ocean Gateway

Transit Together

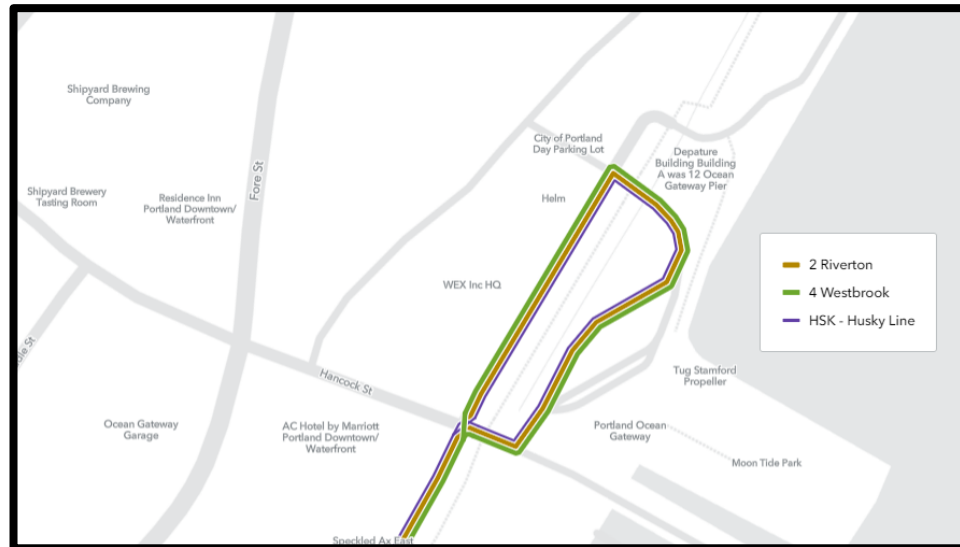
Ocean Gateway mini-hub



- Reduce or eliminate service to Pride's Corner in Westbrook
- Simplify Route 4 schedule
- Extend 2/4/HSK to Ocean Gateway

Transit Together

Ocean Gateway mini-hub



- Ocean Gateway would be a terminus for three routes
- Space to lay over 3+ buses needed
- Ideal location is on-street
 - Space for shelters
 - Pedestrian-scale lighting
 - Visible

Portland Transportation and Sustainability Committee

5/5/2023

Councilor Andrew Zarro
Councilor Roberto Rodriguez
Councilor Victoria Pelletier

Re: Transit Together Network Changes and Metro's financial outlook

Dear Councilors Zarro, Rodriguez, and Pelletier,

Thank you for including Metro on your May 10 agenda. We have some exciting upcoming improvements that we are eager to share with you, and need your help to implement some of them. We also want to discuss how these improvements, as well as the status of state and federal funding, will shape the city's financial picture with Metro in the coming years.

Transit Together Improvements

As you may be aware, Metro, in partnership with the Greater Portland Council of Governments (GPCOG), and our partner transit agencies in southern Maine, have been working on a transit optimization plan called Transit Together for the past 18 months or so. This plan aims to use existing resources to reallocate service to maximize the benefit of the transit network, while making transit service more streamlined and user-friendly no matter what mode you ride or where you're boarding a transit vehicle.

Metro applied for, and was granted, American Rescue Plan Act (ARPA) funding to improve transit service and encourage ridership to return to Metro. This funding was allocated to a regional fare promotion, the "Fare Deal", which halves fares for all riders using Metro, South Portland Bus Service (SPBS), and Biddeford Saco Old Orchard Beach Transit (BSOOB); to improve accessibility at bus stops; to add transit signal priority (TSP) along major corridors in Portland, and to make comprehensive improvements to service throughout the Metro network. The funding for service improvements was accounted for in the Transit Together process, and we are planning on making most of these improvements beginning in the fall of 2023.

Changes to the Metro network proposed by Transit Together include:

Expanded coverage

- Extending Routes 2, 4, and the Husky Line from downtown Portland to the Eastern Waterfront, specifically, Ocean Gateway Terminal
- Establishment of a bidirectional Route 8 along with additional service into the evening, more than doubling Route 8 service
- Extension of Route 7 to Thompson's Point
- Extending Metro's Route 1 service from Portland Transportation Center to the Jetport

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Frequency enhancements

- Establishment of a high-frequency corridor on Congress Street, where several bus routes (Routes 1, 5, 7, and 9) would combine to provide service along Congress Street every 10 minutes or less
- Improved off-peak BREEZ service on weekdays
- Improved off-peak frequency on Route 9

Service optimization

- Direct Route 5 service to the Maine Mall
- Elimination of service to the Pride's Corner neighborhood of Westbrook

New technology

- Piloting an on-demand transit (or "microtransit") program in Falmouth, replacing inefficient fixed route service with more dynamic on-demand service

One of the proposed changes is a modification to the Route 8. In 2020, Metro proposed a "peninsula reboot", which would have substantially changed how Metro served neighborhoods on Portland's peninsula. Metro conducted a robust public process, including significant concerns about the loss of direct connections to low-income and elderly housing locations, and we listened – the proposed Route 8 recommendations would continue to serve these vital stops, while expanding the Route 8's coverage to Commercial Street, East Bayside, and Parkside. Adding a complementary clockwise loop to the Route 8 with the same schedule would significantly improve round-trip travel times for most Route 8 passengers.

New bus stops and parking implications

Several of these improvements, particularly the new opposite-direction Route 8 and the extensions of three routes to Ocean Gateway, will require new bus stops. The exact locations of these stops are being identified over the next few months. However, Metro has identified that the ideal location for a transit mini-hub at Ocean Gateway Terminal would be along the curblane on Thames Street along the frontage of the Terminal. This curblane has sufficient width for accessible bus stops, room for bus shelters adjacent to the tree pits, pedestrian-scale lighting, and close access to the Terminal for bus operator reliefs. Metro understands that this street parking may be reserved for specific users at this time; however, we believe that the best public use for this curblane would be for public transit use. Because this would be a layover area, up to three buses may need to use this curb space at a given time; as such, Metro would need approximately six parking spaces (120 feet) of this curb space, ideally beginning just north of Hancock Street. This would allow Metro to use the Ocean Gateway parking lot as a turnaround.

Metro will work with appropriate City staff, namely Jeremiah Bartlett, the Traffic Operations Engineer, to identify bus stops along the new Route 8A, and adjust parking where necessary.





Proposed Metro “Mini-hub” on Thames Street at Ocean Gateway Terminal

Fiscal Impact

Specifically, the ARPA-funded service improvements include the microtransit pilot, the extension of the Husky Line to the Eastern Waterfront, and frequency improvements on several routes. The ARPA-funded improvements, which required no local match to implement, will last two to three years, during which, Metro will assess whether these improvements should continue and, if so, apply for federal funding through the Portland Area Comprehensive Transportation System (PACTS) process to continue them.

As of today, ridership is lingering at about 74% of pre-pandemic levels, rising steadily but slowly since January 2021. This ridership gap, in addition to the depletion of federal CARES Act funding and to rising labor, fuel, and equipment costs, has resulted in a projected deficit in Metro’s budget beginning in 2024.

The changes proposed in Transit Together will also affect Portland’s local contribution to Metro’s fixed costs. Most of the proposed improvements to service, including extension of the three routes to Ocean Gateway, extensions of Route 1 and Route 7, more than doubling Route 8 service, and improving Route 9 frequency will occur within the City of Portland. Metro has not calculated the exact post-improvement allocations; these will be finalized after the ongoing public process.



Please feel free to reach out to me if you have any questions. My email address is mtremblay@gpmetro.org.

Thank you,

Mike Tremblay, Director of Transit Development
Greater Portland Metro

CC:
Troy Moon, Sustainability Coordinator, City of Portland



To: Councilor Zarro and members of the Sustainability and Transportation Committee
Re: Resolution in support of the Fossil Fuel Non-Proliferation Treaty
Date: May 5, 2023

Representatives from the University of Maine Law Schools student organization, the Energy and Environmental Law Society have requested the the City of Portland's City Council pass a resolution in support of the [Fossil Fuel Non-Proliferation Treaty](#) sponsored by the the small island nations of Vanuatu and Tuvalu, which face the prospect of complete inundation by rising sea levels due to climate change caused by the continued burning of fossil fuels. The fossil fuel non-proliferation movement seeks to follow the example of the Nuclear Non-Proliferation Treaty that was propelled by cities passing "nuclear free" resolutions. In addition to these two sponsor nations, the resolution supporting the treaty is endorsed by the European Parliament, and dozens of cities and regional governments around the world including 25 cities in the US and Canada.

The Treaty is designed to complement the Paris Climate Agreement, which does not specifically mention oil, coal, and natural gas and seeks to stop fossil fuel at their source, to phase out existing fossil fuel reserves in line with the 1.5 degree C goal, and to support an equitable transition to renewable energy.

Adopting the resolution aligns with the City of Portland's existing climate goals including the adoption of One Climate Future, Resolve 7-16/17 committing the City to run on 100% clean energy by 2040, Resolve 10-16/17 committing to the goals established by the Paris Climate Agreement, and Resolution 8-19/20 declaring a climate emergency and prioritizing actions to eliminate the use of fossil fuels by 2030.

Representatives from the Energy and Environmental Law Society will be on hand to present their recommended and to request that the Sustainability and Transportation Committee recommend it to the full City Council for adoption.

A RESOLUTION AFFIRMING the City of Portland's ONGOING COMMITMENT TO THE GOALS OF THE PARIS CLIMATE AGREEMENT AND ENDORSEMENT OF THE FOSSIL FUEL NON-PROLIFERATION TREATY.

WHEREAS, the scientific consensus is clear that human activities are primarily responsible for accelerating global climate change, and that the climate crisis now represents one of the preeminent threats to global civilization; and

WHEREAS, the Intergovernmental Panel on Climate Change (IPCC) reported in 2018 that we must achieve net zero in greenhouse gas emissions (GHGs) by the middle of this century in order to have a reasonable chance of limiting global warming to 1.5 degrees Celsius; and

WHEREAS, the IPCC released its Sixth Assessment Report from Working Group II, which was approved by 195 member states, in February 2022, which notes that there is high confidence that “the rise in weather and climate extremes has led to some irreversible impacts as natural and human systems are pushed beyond their ability to adapt.”; and

WHEREAS, the UN Secretary-General Antonio Guterres has called the Working Group II report “an atlas of human suffering... according to current commitment, global emissions are set to increase almost 14 percent...It will destroy any chance of keeping 1.5 alive...coal and other fossil fuels are choking humanity,” and

WHEREAS, changes to the City of Portland's climate are already being felt, including such impacts as rising seas, increased numbers of high heat days, increasingly frequent high intensity rain events, and dramatic ocean heatwaves in the Gulf of Maine that threaten natural ecosystems and the maritime economy; and

WHEREAS, our entire community is impacted by the health and safety risks of fossil fuel expansion, particularly those who also face socioeconomic and health inequities, including low-income families, those experiencing homelessness, People of Color and Indigenous people, youth, seniors, those experiencing mental and physical disabilities, and people with health conditions; and

WHEREAS, our youth and future generations have the most to lose from a lack of immediate action to stop fossil fuel expansion as they face major and lifelong health, ecological, social, and economic impacts from prolonged and cumulative effects of climate change, including food and water shortages, infectious diseases, and natural disasters; and

WHEREAS, the Paris Climate Agreement is silent on coal, oil and gas, an omission with respect to the supply and production of fossil fuels (the largest source of GHGs) that needs to be collectively addressed by other means; and

WHEREAS, global governments and the fossil fuel industry are currently planning to produce more than double the amount of coal, oil and gas by 2030 than can be burned if the world is to limit warming to 1.5°C and avert catastrophic climate disruption, and such plans risk undoing the work of our city to reduce GHG emissions; and

WHEREAS, the construction of new fossil fuel infrastructure and expanded reliance on fossil fuels exposes communities to untenable risks to public health and safety at the local and global levels; and

WHEREAS, the economic opportunities presented by a clean energy transition far outweigh the opportunities presented by an economy supported by expanding fossil fuel use and extraction; and

WHEREAS, our community is committed, as part of our climate emergency response, to a just energy transition and to ambitious investments in the green infrastructure and industries that will create jobs and rapidly decarbonize our economy; and

WHEREAS, the City of Portland recognizes that it is the urgent responsibility and moral obligation of wealthy fossil fuel producers to lead in putting an end to fossil fuel development and to manage the decline of existing production; and

WHEREAS, a new global initiative is underway calling for a Fossil Fuel Non-Proliferation Treaty that would end new fossil fuel exploration and expansion, phase out existing production in line with the global commitment to limit warming to 1.5°C, and accelerate equitable transition plans;

NOW, THEREFORE, BE IT RESOLVED, the City of Portland formally endorses the call for a Fossil Fuel Non-Proliferation Treaty; and

BE IT FURTHER RESOLVED, the City of Portland urges the United States government to support the initiative for a Fossil Fuel Non-Proliferation Treaty.

BE IT FURTHER RESOLVED, that the City of Portland affirms its ongoing commitment to the goals of the Paris Climate Agreement and the GHG reduction targets as called for by the IPCC, and pledges to take action to meet its proportionate greenhouse gas reductions under the Paris Climate Agreement.