

REQUEST FOR PROPOSALS FOR ENGINEERING SERVICES:

Machias Waterfront Resilience and Renewal Preliminary Engineering Study

The Town of Machias is soliciting proposals for engineering services to develop conceptual designs and cost estimates for building flood protection along the Machias downtown waterfront. All engineering services shall be in conformance with the requirements of the Maine Coastal Program, which is providing principal funding for this project. Additional financial and staff support is being provided by the Town of Machias and the Washington County Council of Governments (WCCOG).

I. Project Description

The Federal Emergency Management Agency (FEMA) finalized new Flood Insurance Rate Maps (FIRMs) for Machias in July of 2017. The new FIRMs increase the coastal Base Flood Elevation (BFE) for Downtown Machias and place a number of downtown properties which were not in the Special Flood Hazard Area (SFHA) SFHA on the previous FIRM¹ into the 1% annual chance SFHA. While there is always fine tuning to be done in any mapping exercise, the flood hazards faced by the central village area of Machias are significant. The economic impacts of the present flood risk will be felt almost immediately, and property owners in Machias are compelled to purchase flood insurance through the National Flood Insurance Program. Furthermore, with rising sea levels, these risks and associated economic impacts are only expected to increase in the future.

The project funded by the Maine Coastal Program proposal will complete three discrete yet related planning tasks: 1) a feasibility study which will identify conceptual designs and establish a plan to build flood protection along the existing seawall in downtown Machias – this is the primary focus for which engineering services are sought herein, 2) an economic analysis of the protection afforded by improving flood protection to the businesses in downtown Machias; and 3) incorporation of seawall improvements into restoration of the historic wharf and river walk to separate pedestrians from vehicle traffic and revitalize downtown Machias. Task 2 and 3 will be completed by others but are related and a representative of the chosen firm will communicate with and provide support to the professionals and stakeholders working on these tasks.

II. Downtown Machias

The geographic scope of this proposal is the center of the Town of Machias. The Machias village center lies at the head of tide for the Machias River estuary. The town is working to revitalize the downtown by improving waterfront access while making it more resilient to storm surges and sea level rise. This is a multi-year effort and will involve significant changes to transportation infrastructure, water treatment, landscaping, and shoreline stabilization. Storm surge inundation modeling completed in 2014² indicates that downtown Machias faces the highest risk of flooding of any coastal embayment in Washington County.

¹ Ransom Consulting, Inc. 2017. Preliminary Flood Insurance Rate Maps Initial Review. Memorandum prepared for the Town of Machias by Ransom Consulting, Inc., Feb. 24, 2017.

² Johnson, T and J. East. 2014. Climate Vulnerability Assessment for Washington County. Accompanying online GIS mapping analysis: <http://gro-wa.org/washington-county-climate-change-response.htm> and Machias-specific map viewer: <http://machias.maps.arcgis.com/home/webmap/viewer.html?webmap=c650fd66cd694d0baf49cf01d074fc5>

The screen capture at right depicts likely flooding under conditions of a Category 1 Hurricane hitting Penobscot Bay with associated storm surge in Machias Bay at Mean Tide. Significant portions of the Machias downtown including portions of the wastewater treatment plant are flooded in this plausible scenario.



Since the 2014 Climate Vulnerability Assessment was released, the Federal Emergency Management Agency (FEMA) has issued updated Flood Insurance Rate Maps (FIRM) based on updated coastal flood hazard analyses and the same LiDAR data used to generate the storm surge inundation models created in 2014. The new FIRM, which became effective in July of 2017, increases the coastal Base Flood Elevation (BFE) for Downtown Machias and places a number of downtown properties which were not in the Special Flood Hazard Area (SFHA) on the previous FIRM³ into the 1% annual chance SFHA. While there is always fine tuning to be done in any mapping exercise, the flood hazards faced by the central village area of Machias are significant. The economic impacts of the present flood risk will be felt almost immediately. Property and business owners in the Machias village area are required and/or compelled to purchase flood insurance through the National Flood Insurance Program. Furthermore, with rising sea levels, these risks and associated economic impacts are only expected to increase in the future.

III. Stakeholders

Stakeholders in this project include municipal officials, local businesses, civic institutions, and wastewater treatment plant rate payers in downtown Machias. Travelers, freight and commuters on US Route 1 are also at risk from projected flooding as Route 1 traverses the downtown and continues east across the Machias dike that separates Middle River from the Machias River.

The health of Machias, surrounding communities, and surrounding ecosystems depends on effective wastewater treatment. Flooding of the sewage treatment plant could cause a release of raw sewage to the Machias River that would have multiple negative impacts on water quality and would result in closure of shellfish harvesting areas in Machias Bay. In addition, the shellfish harvesters in Machiasport face closure of their clamflats whenever the Machias wastewater treatment plant experiences a Sanitary Sewer Overflow (SSO) or an uncontrolled wastewater release. Even a short-term closure of the clamflats can result in hundreds of thousands of dollars in lost revenue to the local economy.

Downtown flooding may also impact emergency response and management access in Machias and beyond, particularly if Route 1 is flooded risking the health, safety, and welfare of the people of Machias. More specifically, downtown businesses and infrastructure are vulnerable to flooding under a variety of scenarios (e.g. Category 1-4 hurricane at mean and high tide at both current sea levels and with 3 feet of sea level rise, Extra-tropical coastal storm concurrent with high astronomical tides and sea level rise). The aging Machias dike is also at risk of being overtopped by flooding (and possibly failing). Machias has informed MDOT of their plans to assess the feasibility of flood risk reduction for the downtown and the engineering firm chosen in this process will

³ Ransom Consulting, Inc. 2017. Preliminary Flood Insurance Rate Maps Initial Review. Memorandum prepared for the Town of Machias by Ransom Consulting, Inc., Feb. 24, 2017.

also coordinate with Maine DOT personnel (specifically: William Pulver, PE Director of Project Development Maine DOT, and Judy Gates, Director of Environmental Services, Maine DOT).

IV. Scope of Services

The project partners propose to retain an engineering consultant to develop conceptual designs and cost estimates for building flood protection along the Machias downtown waterfront. The designs will include design criteria such as structure heights and alignment based on up-to-date flood hazard information and sea level rise projections, estimated costs for final designs and construction, and a plan for next steps including required site investigations and identification of permitting requirements and regulatory obstacles (though no permitting is included in the scope of this project). The Town of Machias is working with an engineering firm, Olver Associates, on several upgrades to its sewer lines and plant. Since submission of this proposal the Town has requested Maine DEP funding for wastewater treatment plant adaptation planning. Any firm hired to conduct adaptation planning work for the sewage treatment plant will share all information to the advisory committee created for this project.

The Town and WCCOG has consulted with Judy Gates, MaineDOT Environmental Director on a strategy for integrating analyses of downtown flood protection with MaineDOT activities to repair the dike. This strategy includes 1) participation by the town and its contractors in MaineDOT outreach meetings regarding their review of alternatives for repair of the dike, 2) the town or its contractors will coordinate with MaineDOT to identify cross-cutting issues of concern and relevance to the two projects such that all are aware of any research and/or alternatives analysis, and 3) committing to frequent informal conversations with Maine DOT.

Additional Related Tasks to be Completed by Others

In addition to the conceptual design work the Town of Machias seeks to quantify the economic impacts of various flooding scenarios. The UMM-GIS Service Center has already digitized buildings vulnerable to flooding and assembled a preliminary model to quantify economic impact of flood scenarios, assuming total loss of building value. This analysis does not account for building contents or other forms of loss (e.g. loss of business or decreased property value). They have created a fine-scale land cover layer for the Machias Bay region using color infrared aerial photography available from USDA, and are in the process of:

- a) using the land cover to determine the ecosystem services value of wetlands in Machias Bay as flood mitigation and deterrents;
- b) geo-referencing and digitizing old maps showing the historical shoreline of the downtown area, and
- c) assembling some of the depth damage curves required to estimate cost of repairs or replacement of transportation infrastructure and wastewater treatment facilities and outfalls.

Finally, they have completed a crowdsourcing data collection activity to determine inundation levels during the highest annual tide, "king tide," to create localized highest-annual-tide scenarios which will help to refine sea level and storm inundation estimates.

Next steps in the work and analyses being conducted by the UMM-GIS Service Center include compiling data about vulnerable structures that will help to further refine the model including identifying the number of stories, height of first floor, building materials, basement, usage (ie commercial, government or residential), etc. They are seeking realistic replacement cost data on WWTP and transportation infrastructure to create more locally-applicable depth damage curves in our models.

The Town of Machias needs to integrate resilience planning with downtown revitalization efforts. The Machias Downtown Revitalization Committee is working on several fronts to support downtown businesses, improve the safety of pedestrians, and capitalize on the tremendous and under-utilized asset of the Machias River that tumbles over Bad Little Falls in the center of the village. There are photographs from less than a hundred years ago showing the water and land side activities of lumber movement from the upper watershed, sawmills at the dam at

Bad Little Falls, and then dockside loading services directly onto ships at the wharves. These wharves flanked the waterfront along the downtown and could again be integrated with a riverwalk and seawall that has the 3-fold purpose of providing resilience to flooding, improving pedestrian safety, and enhancing economic development opportunity from tourism. The Washington County Council of Governments will develop a plan that coordinates previous downtown revitalization efforts with historic waterfront use and the latest information in climate resilience. Itemized tasks to include:

- a) Coordinate riverwalk improvements with Downtown Revitalization Committee and previous Downtown Revitalization Plans
- b) Assemble historic photographs and oral histories of activities along wharves in downtown Machias
- c) Hold public meetings to obtain resident and property owner interest in Riverwalk improvements
- d) Prepare report of outreach and research with recommendations for capital improvements integrated with design and technical feasibility conclusions of the conceptual design study that is the subject and product of this RFP.
- e) Project Management

Note: the UMM-GIS Service Center is having to recreate some of these models for use locally, even though they are already available and widely used for larger municipalities and regions. Specifically, FEMA's HAZUS tool and InVEST from USGS are both only marginally helpful because they are built to work with scales that are entirely impractical for a town like Machias. They both allow input of some user-defined data, but some integrated data and elements can't be changed to accommodate a significant change in scale. For instance, the transportation data that comes with HAZUS includes only large highways--the nearest one to Machias is about 80 miles away. The documentation for HAZUS indicates that the model assumes a replacement cost of \$60 million dollars for a "small" wastewater treatment plant, which is likely at least twice the cost of the Machias WWTP.

The engineering firm chosen as part of this RFP process will integrate their tasks and work plan with those undertaken by the UMM-GIS Service Center and the Washington County Council of Governments to avoid duplication of effort and to provide expertise in the modification and down-scaling of national models to the rural conditions found in Machias.

Both the conceptual design work and the quantification of economic impacts will include consideration of the point at which the cost of investing in any improvements may become prohibitive, and alternative land-use approaches might be employed. This will include consideration of a range of options such as managed retreat and on-site accommodation as detailed in the resources provided by DACF⁴.

The Town of Machias, in cooperation with WCCOG, has appointed a project manager and created a Project Oversight Committee (Committee) composed of the following individuals and parties:

- Representatives of downtown Machias Revitalization Committee; Machias chamber of Commerce and properties identified in the recently issues FIRMs as being potentially affected by flooding associated with a 1% storm
- Selectman
- Town Manager
- Planning Board Member
- Local Insurance Consultant with experience in the federal flood insurance program
- County EMA Director
- Wastewater Treatment Plant Director
- Regional Economic Development non-profit
- Public Works Director
- Representative of the Maine Geological Survey
- Representative from Olver Associates

⁴ Intergovernmental Panel on Climate Change – Methodological and Technological Issues in Technology Transfer <http://www.ipcc.ch/ipccreports/sres/tectran/index.php?idp=299> and Adaptation Clearing House – Managed Retreat Strategies <http://www.adaptationclearinghouse.org/resources/managed-retreat-strategies.html>

- Representative of the WCCOG

The selected engineering consultant will be responsible for the following work tasks:

- Participate in and communicate with the Project Advisory Committee as draft products are developed and in response to questions raised at Advisory Committee and public meetings.
- Assemble all recent and current analyses of flood risk.
- Determine elevation and alignment for flood protection for the businesses in downtown Machias and along the Machias Riverwalk.
 - Conduct on-site external and internal inspections of all buildings to determine the elevations of doors, windows vents and other points of water access into buildings and the elevations of critical building infrastructure such as electrical entrances, fuel tanks, furnaces, etc. in relation to the 1% flood elevation.
 - During the course of completing individual building inspections, the engineering consultant may be asked by building owners for advice on other issues associated with their properties. While not a principal focus of the project, the provision of any such advice will not be discouraged as long as it does not dilute the overall work effort of the consultant.
- Prepare conceptual design with costs estimates for two design options, assess feasibility based on cost, accessibility and historic character.
- Identify potential flood protection measure tie-ins for the existing boat launch and Route 1.
- Identify permitting obstacles and regulatory requirements.
- Coordinate with MaineDOT on entire project specifically geotechnical conditions under Route 1 through Downtown and under the Machias dike.
- Complete a feasibility report that will allow the Town of Machias to pursue funding to complete final design including geotechnical investigation, sediment sampling if dredging, engineering specifications and permits for seawall construction. Report to include:
 - Identify and analyze the feasibility of a range of adaptation strategies to achieve protection from flood levels as defined above, and estimate rough costs. The adaptation strategies may include but not be limited to walls, berms, building flood proofing, elevation of equipment within impacted buildings, tank anchoring and similar techniques. Specific information about each adaptation strategy will include estimated construction cost, life span, maintenance requirements, and any pros or cons. Case studies of where a particular adaptation strategy may have been implemented successfully elsewhere will be included, if applicable.
 - Provide information on the Federal Flood Insurance Program including program requirements, application requirements, information on insurance premiums and estimates of the potential impact on premiums should building owners implement recommended building protection strategies.

The engineering consultant will report directly to the Project Manager, who will keep the Committee up-to-date by providing status reports and a project schedule. The Project Manager will provide the engineering consultant with feedback from the Committee. The engineering consultant will periodically meet with the Committee to review progress and discuss potential changes in the scope of work to address new conditions or significant findings. Any reports with details on individual buildings will be provided confidentially to building owners.

Upon receipt of the summary report and discussion by the Committee of its findings, the Committee will host a public informational meeting to which all owners of vulnerable property, local news outlets, local officials and the general public will be invited to attend. The engineering consultant will also attend the meeting to review the recommendations and answer questions. Following this public meeting, the report and recommendations may be updated to reflect comments made at the public meeting.

V. Project Schedule

The Committee will work with the selected consultant to develop an agreed upon project schedule. It is expected that the consultant will begin work in February of 2018 with field work to be conducted in spring/summer of 2018

and the project completed by November 30, 2018.

VI. Maximum Award Amount:

The maximum award amount for the above scope of services will be \$30,000.00.

VII. Contacts for Consultant

Project Manager and Main Point of Contact: Judy East, Washington County Council of Governments

Marine Geologist: Peter A. Slovinsky, Marine Geologist, Maine Geological Survey.

GIS Services: Tora Johnson, Director, University of Machias GIS Laboratory and Service Center

Town Manager: Christina Therrien

VIII. Responses to RFP

Responses must include the following:

- the firm's legal name, address, and telephonenumber;
- the qualifications of the professional personnel to be assigned to the project demonstrating their knowledge and experience in completing the tasks identified in Section IV of the RFP; special attention should be given to demonstrating knowledge and experience of waterfront structures;
- knowledge of FEMA flood regulations and the federal flood insurance program;
- capacity to meet time and project budget requirements;
- present and projected workload for key projectstaff;
- related experience on similar projects including the name and phone number of a local official knowledgeable of the firms work;
- proposed project approach, costs and schedule for activities to be performed.

IX. Proposals Evaluation

Engineering proposals will be evaluated according to the following factors:

- | | |
|--|-----|
| • Overall quality of the proposal | 20% |
| • Overall understanding of the project and project approach | 20% |
| • Staff qualifications | 20% |
| • Experience with the design of hard or soft structures and techniques to mitigate flooding damage | 15% |
| • Experience with coastal and marine structural engineering | 15% |
| • Cost or amount of work offered in exchange for maximum award amount | 10% |

X. Selection Criteria

The selection of a firm or firms to be interviewed will be based on the evaluation of the written responses, if deemed necessary. The Town of Machias reserves the right to select a firm directly from the written proposals without an interview. Interviews, if held, will be at the Machias Town Office within 3 weeks of the proposal submission deadline. The award will be made to the most qualified firm whose proposal is deemed most advantageous to the overall proposed project, all factors considered. Unsuccessful firms will be notified as soon as possible.

This solicitation is being offered in accordance with federal and Maine state requirements governing the procurement of professional services. Accordingly, The Town of Machias reserves the right to negotiate an agreement with the selected firm based on fair and reasonable compensation for the scope of work and services proposed as well as the right to reject any and all responses deemed unqualified, unsatisfactory, or inappropriate.

Questions and responses should be directed to:

Christina Therrien, Town Manager
Town of Machias
PO Box 418, Maine 04654
Voice: (207) 255-6621
Email: townmanager@machiasme.org

XI. Proposal Submission Deadline

Two (2) physical copies of the proposal must be received by 3:00 PM on January 23, 2018 at the Machias Town Office, PO Box 418, Machias, ME 04654. Please indicate: "RE: Machias Waterfront Resilience and Renewal; Attn: Christina Therrien" on the outside of the response package. Please transmit one copy in PDF format electronically townmanager@machiasme.org and to jceast@wccog.net by the same deadline.