

Belfast Climate Action Plan

Preamble

Global Climate Change poses a supreme challenge to human civilization on Earth, together with all life. The changes are proceeding at a rate that eclipses natural adaptation and evolution. Since the end of the last ice age, about 10,000 years ago, Earth's climate has been in a relatively stable condition that allowed human civilization to flourish. Since the Industrial Revolution began around 200 years ago, we have pumped vast amounts of carbon dioxide and other "greenhouse gasses" into the atmosphere, resulting in global warming that threatens to change our environment, to the point where large portions of the planet may not be suitable for human habitation, and the rest will be very different from the environment in which our civilization developed. Now, we must rely on a distinctively human ability to use our 'big brain' to adapt to, and possibly mitigate, the changes that we have precipitated. Scientists are optimistic: our understanding and technology make us capable of mitigating, and even reversing to a degree, the worst effects of climate change. If, collectively, humans have the will.

Belfast takes justifiable pride in a tradition of citizen involvement and activism in addressing community problems in the interest of making the City a better place for all. One way that involvement is expressed is through citizen advisory committees reporting to the City Council.

On March 20, 2018, the City of Belfast City Council voted unanimously to create the Belfast Climate Crisis Committee [CCC]. On January, 2019, the Mayor of the City of Belfast signed a commitment to the Global Covenant of Mayors. That document committed the City of Belfast to prepare for the impacts of climate change, to develop and formally adopt an assessment of climate hazards and vulnerabilities, and to develop a Climate Action Plan to address them.

This Draft Belfast Climate Action Plan [CAP] is a product of the Climate Crisis committee, in furtherance of that commitment. It is intended as a **living document** to initiate further public input. It identifies actions to accommodate and mitigate the effects of climate change on the community by emphasizing actions that lead to a resilient community with equity in support for all citizens. Ultimately, our CAP will be submitted to the City Council for formal adoption and implementation. The CCC will shortly issue a Green House Gas Inventory (GHGI) report that complements this document, and will offer insight into the sources of emissions that should guide adaptation/ mitigation priorities and measures.

The Belfast CAP mirrors the initiatives presented in the Maine State plan, “Maine Won’t Wait.” Links to this document and relevant others that inform about Climate Change, are referenced in Appendix A.

Brief explanations of vulnerabilities and proposed actions are in following sections.

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## **A. Threats To Critical Infrastructure**

Critical Infrastructure is defined as those common systems and resources that are vital to daily operations in the City and community.

### **Wastewater Treatment/Sewage System**

The Wastewater Treatment plant, located at an elevation of 10’ to 15’ above present mean high tide, will be vulnerable to flooding from the storm surge anticipated in the near future.

#### **Action:**

- Short-term, harden the site to prevent inundation.
- Long-term, build a new treatment plant at a site that is not vulnerable to flooding.
- Consider adopting new waste treatment technology that results in effluent (water) that may be reused rather than drained to the bay, and reduces sludge.
- Aim to upgrade any new system with increased capacity to accommodate the anticipated population growth.

### **Stormwater System**

The present stormwater system is mostly separated from the sewage system, and discharges to the bay at several locations. It is now barely adequate to accommodate the new intense rainfall with moderate flooding. It will not protect against serious flooding with anticipated increased storms both in frequency and rainfall amounts (100/500 year storms, in excess of 10” in a short period of time. The flooding hazard affects property and roads, with coastal erosion likely.

#### **Action:**

- Eliminate any points of mixed stormwater and sewage routing.
- Increase the capacity of the system (drain pipes and culverts) to accommodate projected peak storm rainfall intensity and durations.
- Consider increased use of appropriately sized retention ponds to store overflow.
- Encourage the planting of trees and ‘rain gardens’ with varieties that can absorb excess rain on both public and private land.
- Review the design and capacity of drainage ditches and culverts that redirect rainwater runoff in areas outside of the stormwater drain system, and make the appropriate upgrades.

### **Roads**

Some City streets and connecting roads will be vulnerable to nuisance tidal and storm flooding and erosion.

#### **Action:**

- Identify those areas where low elevation and ponding make flooding likely.
- Elevate, regrade, and upgrade roadbeds to appropriate standards where necessary, and improve drainage.

- Coordinate with Maine DOT on improving the critical roads under state jurisdiction, such as Routes 1/3.

## Communications Systems

Today's communication systems, particularly internet and cellular communications, are essential to public safety, education, and commerce. Increased storm severity could reduce both resilience and reliability: power loss and cable damage.

### Action:

- Ensure, in collaboration with whatever other parties may be necessary, that cell towers and cable repeater amplifiers have independent power backup systems for extended power outages.
- Establish a voluntary emergency backup Wi-Fi mesh city wide intranet that utilizes private and public Wi-Fi servers. Participants would need an installed software application for initiation, control, and security. Those participants that do not have a back-up power supply could be provided with one.
- Establish, in collaboration with whatever other parties may be necessary, clear warning systems for weather-related hazards and emergencies that are accessible to all citizens.
- Verify the resilience of traffic light systems on roads in the event of power outages.

## Public Shelters

As temperature extremes and storm intensities increase, a means of sheltering those whose homes are compromised will be more necessary. For example, extremes of temperature and humidity will combine to pose a serious health risk to many children and older citizens. Even though global and local average temperatures increase, periodic extreme low temperatures will occur as arctic wind patterns are disrupted.

### Action:

- Organize public and private warming/cooling centers, ideally with meal and sleeping provisions.
- Consider upgrading the Community Boathouse to serve as a central shelter.
- Promote adoption of efficient air conditioning/heat pump installations in private and public buildings.
- Establish a stockpile of emergency food and water sufficient for a percentage of the population over an significant duration.

## Marine Facilities and Access

The harbor facilities at City Landing, the Belfast Community Boathouse, and private harbor infrastructure are all at near-term risk from flooding, erosion, and damage from strong cyclonic storms.

### Action:

- An engineering study to rebuild the Breakwater at City Landing, raising it by 3.9', will be completed in the summer, 2022. The next step is to seek funding to implement the design, which will provide enhanced protection for City Landing facilities and some benefit to downstream infrastructure.
- Develop and implement a plan for total harbor protection from effects of waves driven by cyclonic storms.
- Consider measures, such as seawalls and berms, to protect infrastructure from storm surge.

- Consider storm gates (effectively check valves) to prevent backflow and flooding through stormwater drains to the harbor in the event of storm surge on top of high tides. This is certainly necessary to prevent compromising other measures, such as seawalls.
- A plan to raise the floor level of the Harbormaster's office is underway. Take same steps to raise or move other City structures (e.g. Community Boathouse).
- Regrade the harbor parking area and boat ramp.

## B. Transportation

A conclusion of the GHGI report is that, as in most cities, private cars and trucks are responsible for the largest share of local emissions in Belfast. Reducing the use of gas and diesel internal combustion engines is the 'low hanging fruit' in terms of climate change mitigation.

### Action:

- Encourage the adoption of hybrid and plug-in electric vehicles and other technologies (hydrogen/ethanol fuel cells) as they mature.
- Increase the availability of electric charging stations.
- Improve walking and bicycling pathways such as providing a safe means of crossing major roads. (An example would be a pedestrian/bicycle bridge over Route 3 to connect to the footbridge.)
- Increase the availability of low/no cost bus transport internal to Belfast and also to surrounding areas.
- Move to electric bus and City trucks where feasible.

## C. Energy

A major source of GHG emissions is electric power generation. The initiative of converting to an 'electric economy' to greatly reduce use of fossil fuels must be accomplished through a rationally staged plan. The vulnerability and capacity limits of the existing electrical generation and distribution model is a major contributor to lack of resilience and power source growth. Resilient sources of electrical energy, with major renewable generation, are the most essential response to a secure future.

### Action:

- Expand solar and wind generation wherever possible through the City. Make zoning, regulatory, and code changes that encourage renewable power installations.
- Establish a Belfast microgrid, allowing the interconnection of public and private renewable sources, combined with a substantial storage capacity for sustained operation independent of the grid where necessary.
- Encourage expansion of substation and other grid capacity to simplify establishment of the microgrid.

## D. Buildings

The systems we rely on to heat our homes, prepare our food, and provide hot water for cleaning are major contributors to greenhouse gas emissions. In the near future, cooling our homes will become an issue. The same considerations apply to commercial and City infrastructure. The transition to an 'electric

economy' as the energy source is the strategy, but that will require time to implement. Reducing energy loss--and use--n existing and new buildings is essential.

#### Action:

- Adhere to Maine's Uniform Building Code, which has been adopted with robust requirements for insulation in new construction.
- Develop an incentive program to assist homeowners and rental property owners to upgrade existing housing stock. The future cost of energy will be the market incentive.
- Lead by example in weatherizing city buildings and facilities and using green energy methods.
- Every effort should be made to adopt electrical and other green energy sources for residential and commercial space heating. An incentive program to assist homeowners and other property owners to adopt these strategies should be developed, in combination with the City's strategies for developing more affordable housing.
- Create a study to evaluate the effectiveness of heating plant conversion from oil fired systems (~80% efficiency) to gas/propane systems (~96% efficiency) while the implementation of a robust electric microgrid/grid is built. Temporary adoption of these fuels could be considered, since completing an upgrade to the electrical power system will likely take 5-10 years. Even with widespread use of heat pumps, propane may be an acceptable alternative for backup heating in extreme weather.
- Consider adopting a geothermal heat pump system, and/or relying on ocean thermal exchange, for central municipal buildings. This could yield the highest operational efficiency throughout the season.
- Adopt changes to building codes for new construction that emphasize energy efficiency.
- Sponsor demonstrations of new building techniques using sustainable materials, including energy-efficient appliances for cooking, heating water, and laundering.

## E. Agriculture, Forestry

For a long time, Mainers have relied on a steady year-round supply of food from traditional sources, such as the US 'Midwest breadbasket' and California Central Valley, but these sources are now threatened by increasingly severe drought and loss of soil productivity. It is also clear that ocean temperature increases are forcing changes in the distribution of wild caught seafood.

#### Action

- Gather basic data on acreage, characteristics of farmland and woodlands in Belfast (actively farmed and open space).
- Identify food needs and sources for our community.
- Support local food security, distribution and resilience through expansion of local farming, particularly with organic practices that build soil fertility, and increase crop yields without recourse to pesticides.
- Encourage food-processing cooperatives, shared facilities, gleaning projects, and other approaches to maximizing use of the food we produce.
- Recognize that native trees will both improve the local environment and store carbon. Collaborate with relevant local organizations to improve Belfast's "urban forest".
- Investigate possibilities for pilot research project with students and others on carbon sequestration potential of small woodlands.

## F. Land Use

Land use will be impacted by climate change. As an example, increasing storm intensity may make some land use untenable, changing the existing boundaries of flood zones, and threatening the viability of public spaces.

### Action:

- Incorporate Climate Action Plan considerations throughout Comprehensive Plan.
- Adopt the federal and state land conservation goal of 30% by 2030 (aka “30x30”) into the City’s Comprehensive Plan
- Keep in mind that the state will probably be writing stricter regulations for development within areas vulnerable to coastal flooding from sea-level rise. Review such changes thoroughly and consider possible further changes necessary in Belfast.
- Adopt education, tax, zoning and other policies that encourage local farming.

## G. Public Health

The COVID19 Pandemic illuminated the challenging demands placed on our public health systems. Climate change will continue to cause the mass migrations/displacements of human and animal populations that will drive future pandemics.

### Action:

- Develop a local surveillance system for disease vectors.
- Develop system to provide citizens with local, timely information on air quality and weather hazards.
- Reinforce our local healthcare system’s capability for providing care to underserved/uninsured community members.
- Establish a permanent stockpile of materials and consumables to combat future pandemics.
- Support the growth and capabilities of our healthcare worker community.

## H. Community Outreach

A key to implementing actions for accommodation to and mitigation of the effects of Climate Change is a lack of understanding of this enormously complex problem. We all need to be on the same page in order to make good decisions on policy and spending of public funds.

### Action:

- Facilitate access to education for private property owners, industrial, commercial or residential, on changes in planning standards, zoning regulations, construction best practices, insurance, funding, and other matters re adaptation to sea-level rise.

- Facilitate access to education for building owners, industrial, commercial or residential, on changes in planning standards, construction best practices, funding and other matters re mitigation of GHG emissions, such as energy efficiencies and the use of renewable energy for heating and cooling
- Maximize participation by community members, especially students, in projects and decision-making aimed at addressing climate change.

## I. Planning

Even the best laid plans are diluted and defeated by the pressure to deal with immediate crises. Climate change is sure to generate that pressure.

### Action:

- Consider assigning responsibility for coordination of all these steps to one or two people in City government, to assure that the CAP goals remain in view whenever we are planning development, repair, growth, etc. Not a czar, rather someone to keep an eye on the whole, and (if necessary) bring issues to the attention of the City Council.
- Continue to encourage, tap, and listen to citizen expertise available in the Advisory Committees.
- Actively court public involvement through appropriate hearings on important issues.