Comments on MEPA Interim Protocol on Climate Change Adaptation & Resiliency

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General Comments

- It will be very useful to establish guidance on climate change adaptation and resilience in the MEPA process. While some municipalities already ask project developers to address these issues, the guidance can help to start to bring some consistency on how to plan for climate change adaptation and resilience.
- The draft interim protocol focuses mostly on how well adapted or resilient the proposed project is to climate change impacts within the project site. This is one half of the story. The interim protocol should also ask proponents to address how the project affects the vulnerability and resilience of the area surrounding the project site. For instance, a project might be designed to be heat resilient on its site while exacerbating the urban heat island effect for the surrounding area.
- The guidance around sea level rise and storm surge flooding is generally clear. But the protocol needs to build out more detail on how projects should assess and address precipitation-driven flooding and heat impacts.
- The Boston Harbor and Massachusetts Coastal Flood Risk Models extend up to the 2070 time period. Sea level rise will continue long past 2070. Many projects that undergo MEPA review will have useful lives that go well past 2070. It would be useful to ask projects to describe how flexible their adaptation and resilience strategies are in terms of being able to respond to post-2070 risks.
- To facilitate review, it would be useful to have a form that includes summary tables to be filled in by proponents with specific data used by projects for heat, precipitation-driven flooding in addition to sea level rise/storm surge flooding and adaptation measures (e.g., area of vegetated cover, tree canopy before and after, etc.).

Heat Adaptation & Resilience

- Projects should address heat in terms of extreme events like heat waves and changes in average temperature.
- Key questions, some of which are already included in the draft protocol, that could address the site and area impacts could include:

    - Is there a net decrease, net increase, or no change in the vegetative cover of the site (including roof)?
    - Is there a net decrease, net increase, or no change in the tree canopy on the site?
    - What will be the change in surface reflectance, SRI, or albedo on the site as a result of the project?

- What percentage of the site is being treated with vegetated cover, tree canopy, reflective canopy, and/or solar canopy?
- What is the NDVI (normalized difference vegetation index) for the site before and after (to capture composite effect of ground vegetation and tree canopy)?
- Is the project qualifying for LEED credits related to roof and non-roof heat island reduction?
- What is the proposed SRI of the roof?
- Will the project include equipment that will vent heat to the area during summer?

- Key questions that could address the impact of rising temperatures on the building:
  - Does the project model the energy use of the building under future temperatures?
  - Given that trends are moving toward a greater number of cooling degree days compared to heating degree days, will the building be designed to adapt to a much greater degree of cooling and does that influence the design?
  - Is the project to be built to provide passive thermal resilience, i.e., would the internal temperature remain in a safe range for occupants if the site loses power? How many days of passive thermal resilience is expected? US Green Building Council proposed a LEED pilot credit on passive survivability and backup power during disruptions that would prov8ide guidance for this topic
- Will the proposed project have occupants or uses that are more vulnerable to high temperatures? For example, elderly residents, patients with health conditions that make them more vulnerable to heat stress, residents or patients that are less able to regulate body temperature due to health conditions or medications?
- What kinds of passive and active energy systems are planned for the project to provide energy resilience?

<u>Precipitation-driven Flooding</u>

- Flooding driven by extreme precipitation involves both riverine flooding and urban street flooding.
  - The draft protocol would ask proponents about historic flooding that has been mapped or observed. With climate change, those historic flood risks will be exacerbated and flooding will expand into new areas assuming no action is taken. So it is important to ask proponents to consider future flood risks from precipitation. There are some sources of information at least for some areas.
    - Future riverine flooding could be assessed with the FEMA 500-year flood risk maps. At least in some areas, the current 500-year flood plain approximates the future (2070) 100-year floodplain. Depending on the size of the watershed, proponents may be able to model future riverine flooding by using projected rates of precipitation in hydrologic models.
    - Urban street flooding (which is the greater and more immediate threat in many urban communities) with climate change is being modeled by a number of cities including Cambridge, Boston, Somerville, and Medford. There is also the MVP funded project undertaken by the Resilient Mystic Collaborative that has developed

a flood screening tool. The Boston Metro Mayors Climate Smart Cities Tool also identifies areas with potential stormwater challenges.

- Projects should assess how their stormwater calculations change with increasing rates of precipitation. A project might be designed to manage current runoff but in the future with higher rates of precipitation, the proposed measures may not work at certain return periods. Measures such as increased storage, infiltration, and conveyance should be understood in terms of future rates of precipitation. Proponents should also be asked how flexible their strategies are to adapting to different future conditions. For example, would there be space to increase storage or could barriers be elevated?
- Is the project meeting any local climate change adaptation and resilience requirements or guidance?
- If deployable barriers are planned, what is the assessed impact on neighboring properties?
- If the project is in a future flood risk area, will it be accessible by emergency responders during flood events, particularly for residential properties? What elements are included in the design to provide emergency access (i.e., above the first floor if projected flood elevations are above the first flood elevation?
- Will the project have an emergency management plan and what are its elements and how will be administered?
- Are there opportunities for neighborhood resilience measures, e.g., cooling spaces, mobile device chargers, parking for neighbors that don't have flood protection?

<u>Sources of Information</u>

- Cambridge Floodviewer (both precipitation-driven and SLR/storm surge flood risk for the present, 2030, and 2070 at the parcel level)
- Climate Ready Boston Map Explorer
- Boston Metro Mayors Climate Smart Cities Tool
- First Street Foundation Flood Factor