

**Climate Resilience Zoning Task Force
City of Cambridge, Massachusetts
Meeting #9 Summary
October 10, 2019
City Hall Annex**

Task Force Members Present

1. Louis Bacci Jr, Laborers Local 151/East Cambridge/Planning Board
2. John Bolduc, Environmental Planner
3. Doug Brown, West Cambridge
4. Ted Cohen, North Cambridge/Planning Board
5. Conrad Crawford, East Cambridge/Cambridge Redevelopment Authority
6. Iram Farooq, Assistant City Manager for Community Development
7. Brian Goldberg, MIT Office of Sustainability
8. Tom Lucey, Harvard University
9. Lauren Miller, Climate Consultant, CDM Smith
10. Mike Nakagawa, North Cambridge
11. Jim Newman, Resilience Consultant, Linnaean Solutions
12. Craig Nicholson, Just-a-Start
13. Mike Owu, MITIMCo
14. Kathy Watkins, City Engineer/Assistant Commissioner

Project and facilitation team members present

1. Jeff Roberts, Director of Zoning and Development, City of Cambridge
2. Sarah Scott, Associate Zoning Planer, City of Cambridge
3. Pat Field, Consensus Building Institute facilitator
4. Elizabeth Cooper, Consensus Building Institute facilitator
5. Nathalie Beauvais, Kleinfelder
6. Indrani Ghosh, Weston & Sampson
7. Eric Kramer, Reed Hilderbrand
8. Stephanie Hsia, Reed Hilderbrand

Next steps

The next task force meeting will take place November 6, 2019 at the City Hall Annex at 344 Broadway.

Meeting Overview

The meeting was focused on three objectives of resilience zoning: resilient buildings, site/cool factor measures, and emergency response planning. Project staff shared analysis and key questions in each category, which was followed by small group discussions to elicit Task Force member perspectives to refine strategies under discussion. See presentation slides and meeting materials online:

<https://www.cambridgema.gov/CDD/Projects/Zoning/climateresiliencezoning>.

Introduction

Jeff Roberts, Director of Zoning and Development, briefly reviewed the list of resilience zoning principles and objectives that the group had previously considered and grouped them by 1) efforts to create resilient buildings, 2) site/cool factor measures, and 3) emergency response planning. He reviewed the types of zoning tools that could be used to accomplish zoning objectives and the levels of review that each tool involved.

Project staff then presented in more detail on each of these three categories. After each presentation, Task Force members discussed the following prompts in small groups:

1. How do these approaches meet the principles established by the Task Force? Where are there potential conflicts with these principles?
2. Under what development scenarios should these standards be applied (large-scale vs. small-scale, residential vs. non-residential, new construction vs. renovation)?
3. When should these apply as prescriptive standards (e.g. requiring minimum tree planting) versus performance standards with options for how a baseline threshold is met (e.g. “Cool Factor”)?
4. When should these be requirements and/or when could they be incentivized?

Resilient buildings and flooding zoning strategies

Kathy Watkins, City Engineer, presented broad ideas for zoning strategies that would achieve the goal of adapting Cambridge’s buildings for future flood risks by regulating dimensional and use requirements.¹

Task Force small group discussion feedback²

Small discussion groups offered feedback on flooding-related zoning strategies. This feedback does not indicate consensus among small groups or the Task Force, but rather brainstorming of possibilities:

- Commercial buildings should generally have more flexibility to “protect from” for more scenarios than residential buildings, which should be required to “build to” for more scenarios. However, various types of commercial buildings will need different requirements to account for levels of risk tolerance. For example, small businesses are more vulnerable to a temporary closure due to damage than larger institutions are and thus, buildings that house them may require a higher level of protectiveness.
- Science and research facilities have special considerations for the risks that flooding implies due to sensitive or expensive equipment, issues of contamination, and others.
- Prescriptive standards may result in less liability for building designers and potentially for owners, as compared to performance standards. This could be a benefit.
- There may be benefits to establishing more generalized, prescriptive standards to reduce regulatory complexity, e.g. build-to levels across the city for classes of buildings.
- If a higher level of protectiveness is not a lot harder to achieve than a less protective level, standards should err on the more protective side (e.g., elevating slightly more to protect against a 100-year event rather than a 10-year event.)

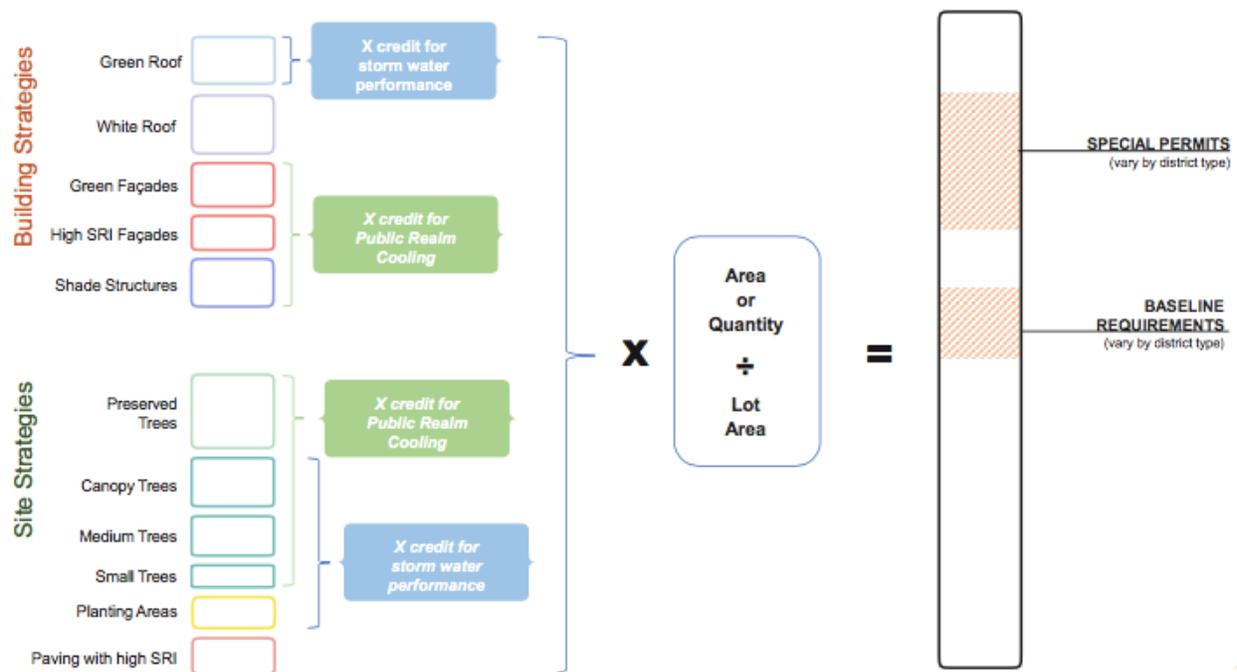
¹ For detailed discussion of zoning strategies to address flood risk, see previous meeting summaries and slides.

² When discussing storm risk, this document is referring to the 2070 scenarios – i.e. 100-year storm in 2070, in line with the modeling and analysis the City has presented to the Task Force.

- The Task Force should consider recommendations to change other zoning requirements that may be at odds with strategies to mitigate flooding impacts, such as minimum parking requirements/ratios, height regulations, basement zoning, and others.
- Different sizes of development should trigger requirements at different thresholds. For example, new construction of any scale in vulnerable areas should require elevating to protect from the 100-year storm level. Existing small residential buildings (1-3 units) should only be required to meet these requirements during major renovations. A threshold lot size may also be considered.
- Flexibility needs to be offered for various building types and needs. For example, historic buildings may build to protect (rather than elevate) during major renovations. Performance standards also afford more flexibility than prescriptive standards.

Cool factor strategies

Eric Kramer with Reed Hilderbrand presented a concept for a green area ratio development standard, called the Cool Factor, that would reduce urban heat island effects while also helping to manage storm water. The Cool Factor would be a performance-based approach in which a property owner selects strategies from a menu of options in order to meet a baseline score. Strategies would be valued according to their effectiveness at mitigating heat and the final score would be calculated based on the percent of lot area that they impact. Additional credits would be offered for public realm cooling and stormwater performance. Larger developments would be required to meet higher scores. See conceptual diagram below.³



³ This diagram was included in the presentation slides, which provide additional detail and discussion of key considerations for this developing framework.

Task Force small group discussion feedback

During open discussion and in small groups, Task Force members offered feedback on the Cool Factor concept. This feedback does not indicate consensus among small groups or the Task Force, but rather brainstorming of possibilities. *Direct responses from project staff are in italics:*

Green space and vegetation:

- How will the quality of the green areas be valued?
 - *Factors including soil volume in planting areas, permeability, and others would be accounted for in the score.*
- Scoring should strongly incentivize preservation of existing trees. The biggest thing zoning can do for trees is to make room for them. More requirements to create notching for trees in the street wall could be beneficial.
- It would be valuable to afford more points to green space in the public realm. Currently there are incentives to create private green space.
- Grey infrastructure performs better in some cases, but green infrastructure provides more co-benefits. However, the co-benefit values vary. For example, the stormwater infiltration benefits of some green infrastructure primarily installed for “cooling” are helpful, but are not going to replace grey stormwater infrastructure, in all likelihood.

Built environment:

- Credits for paving with high solar reflective index should not provide incentive for more paving. More infrastructure for cars (i.e. parking spaces) will attract more cars. Decreasing car reliance would be a valuable co-benefit. Additionally, cars themselves add heat to the microclimate. There should be nuance in the scoring system and in communication about it to distinguish between paving for a necessary pathway versus massive amounts of paving for cars.
- Could a minimum amount of unbuilt space be required to be shaded either by structures or trees?

Conceptual questions and comments:

- How much would this approach achieve relative to simply improved open space requirements?
- The flexibility of the point system is a benefit.
- How can properties that don't have much site to work with beyond the building meet the score?
- It would be beneficial to incentivize the development of district-wide strategies and to encourage coordination among parcels to connect spaces to create a network of cool spaces. Allowing some amount of “time lapse” or payment system to allow collective actions to accumulate could help incentivize collaboration. Might points be transferable or pooled?
- Height could interact with the cool factor, for example by offering the ability to go higher with higher scores, etc.
- What does this concept mean for property and development costs? The cost to implement a strategy could vary by site, e.g. the soil needed to plant one species of tree could cost more if a site has poor soil conditions.
- We need to be mindful of unintended consequences of an approach such as this. For example, could the scoring system exacerbate gentrification issues? How can we ensure the value of social equity remains central in this approach?

- For what types of development and redevelopment would scores apply? For example, what about building an addition or renovating existing small properties?
- This approach is something lay people can understand, at least conceptually. A scoring system is relatively accessible (even if the details are hard to grasp.)
- Institutions are interested in guidance on area-wide strategies.
- Might the system include “penalty” points to disincentivize problematic things like paving and tree loss? Alternatively, setting a high requirement for points and aligning the scoring to incentivize the most beneficial choices might accomplish this.
- The approach should be scaled down to be simpler for small properties.
- How would historic buildings be impacted?

Emergency planning strategies

Kathy Watkins, City Engineer, presented potential opportunities to incorporate community-based emergency planning strategies into zoning. Emergency planning is distinct from emergency response in that it is focused on better preparing residents for emergency scenarios by providing them with educational resources and connecting them with their community in the instance of an emergency event. Key emergency planning requirements for large-scale development could include elevated emergency egress, back-up power, programming that enhances social resilience, food and water supply, and a communication system that works even in an outage. Another strategy is a community space or “resilience room” that could serve as a shelter in the instance of an emergency event and could provide resources such as cell phone charging stations, refrigerators, and heat or cooling.

Task Force small group discussion feedback

During open discussion, Task Force members offered feedback on incorporating community-based emergency planning strategies into zoning. *Direct responses from project staff are in italics:*

- Is this kind of requirement appropriately placed in zoning?
 - *Transportation demand management is an example of placing a requirement in zoning for policies not directly related to the built environment – in this case, the impacts of development on traffic congestion.*
- Could the police or fire departments or other professionals recommend emergency response measures that could be incorporated into a special permit? The requirement could be for the plan to be approved by such a department, which could also provide ongoing review for compliance with the policies.
- Emergency planning provisions need to consider the duration of events.

Public comment

Lee Farris, a resident, provided several comments:

- Regarding basements, could a certificate of occupancy for basement units expire in a certain year or when a certain progression towards expected flooding is reached? Would there be a balance to be reached that would still provide enough benefit for property owners in the shorter term while putting in place restrictions to protect against public health harms and property damage in the longer-term?
- Could zoning approaches interact with property or flooding insurance? Could requirements make it easier or harder to insure? Could this be an incentive to adopt stricter requirements?

- Rather than using a property value threshold for when new resilience zoning requirements kick on for renovations or redevelopment, what about using an increase in gross floor area as a trigger?
- Regarding Cool Factor, there are building finishes that can generate solar energy. What is the relationship between generating solar energy on a façade and the reflectivity of heat on solar panels?
- How much of a façade should be allowed to be glass, considering the relationship between the amount of glass and the level of passive resilience of a building? The performance and environmental impacts of building materials should be considered.
- Could the Cool Factor concept require a certain percentage of open space to be permeable?
- Regarding trees on front yards: a tree close to my house can require ongoing maintenance not to threaten the house. Could the City provide that maintenance, if that dissolves a barrier to a homeowner being willing to have a tree in their front yard?
- Attention should be paid to which side of the building a tree is on for shading purposes.
- Green roofs require ongoing review to make sure they remain “green” and don’t quickly become covered in dead plants.

The meeting was adjourned at 8 PM.