WORKSHOP SUMMARY

SUBJECT: Climate Change Vulnerability Assessment (CCVA) Public Workshop

DATE, LOCATION: March, 2015, Kirsch Auditorium, Stata Center, MIT, Cambridge, MA

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On March 17, 2015, the City of Cambridge held a public workshop as part of the Cambridge Climate Change Vulnerability Assessment (CCVA) process. The workshop goals were to provide an overview of the CCVA findings on key vulnerabilities and priority planning areas; provide participants the opportunity to discuss project results; and seek community input on next steps. Approximately 140 people participated in the workshop, which was facilitated by the Consensus Building Institute. Kleinfelder and a steering committee of City staff lead the project. Workshop participants are listed in the Appendix. Workshop materials and project updates are available on the project website: www.cambridgema.gov/climateprep

Welcome and Introductions

Mr. Richard Rossi, City of Cambridge City Manager, welcomed the participants on behalf of the City. His key points were that the City of Cambridge (the City) has been working on climate change issues for many years. After recognizing the stresses that climate change could pose to Cambridge, the City began to reduce greenhouse gas emissions as early as 1999; these reduction efforts continue today. In 2012, the City started the vulnerability assessment to lay the foundation for climate change resiliency and preparedness planning. City government will now incorporate vulnerability assessment findings into their thinking and will soon embark on a long-term preparedness planning effort to increase resiliency.

Mr. Rossi said that in many respects Cambridge is already resilient, yet additional planning efforts are needed to increase the City's resiliency. Successful planning will require increasing levels of engagement with all segments of the local community and with regional entities that manage the systems to which Cambridge is connected. The planning effort will leverage the unique strengths and knowledge of local residents, local and regional stakeholders, and City staff.

Project Overview

Mr. John Bolduc, City of Cambridge Environmental Planner and CCVA Project Manager, presented an overview of the vulnerability assessment project.

The City began its climate change vulnerability assessment as part of a larger climate change preparedness and resiliency planning effort. The vulnerability assessment is essentially a 'climate stress test' that uses the best available science to understand the ways in which the City

is vulnerable or resilient in terms of impacts on people, infrastructure, public health, and the economy, under a range of plausible climate change scenarios.

The City completed the CCVA to understand how—if Cambridge were to take no action—storm surge conditions, sea level rise (SLR), and new norms in local temperature and precipitation parameters could impact public health and safety, quality of life, and the City's economy. Understanding these impacts will help the City to prepare and plan for natural disasters and to determine how the city might operate under the 'new normal' temperature and precipitation parameters. It will also help the City to identify key vulnerabilities in social systems and physical infrastructure, establish priority planning areas, and inform the preparedness planning process that will start in summer 2015. Understanding the implications of climate change will also highlight critical areas for collaboration and empower the community to become more resilient at both the household, business, and community levels.

Presentation on Vulnerability Results and Priority Planning Areas

Ms. Lisa Dickson, Kleinfelder Principal in Charge, described the overall project generally and the development of the climate scenarios specifically. The vulnerability assessment was completed in two steps; the first step was the development of climate scenarios and the second step was the assessment of vulnerability and risk under those scenarios.

The primary challenge of conducting the CCVA and preparing for climate change impacts is determining how to translate climate risk into practical planning and design solutions given increasing variability in weather patterns and limited data. Historically, consistent weather patterns enabled engineers to reliably design infrastructure to specific criteria such as the 100-year storm (or the storm with at 1% likelihood of occurring in any given year). However, the increase in variability of weather patterns decreases the extent to which historical data reliably indicates present or future conditions.

The climate scenarios developed for this assessment take into consideration two planning horizons for temperature, precipitation, sea level rise, and extreme event parameters. The 2030 planning horizon spans the years from 2015 to 2044, and the 2070 planning horizon spans the years from 2055 to 2084. The model shows how current-day Cambridge might be impacted under the climate scenarios if no mitigation steps were taken. The assessment does not account for secondary impacts such as impacts on growing seasons.

Ms. Dickson highlighted some of the key findings of the climate scenarios:

<u>Precipitation-driven flooding is likely to increase in frequency, extent, and depth</u>

- The climate scenarios indicate that the amount of time between storm/precipitation events will increase and that storms will intensify in the 2030 and 2070 planning horizons. Although the future storms are expected to produce more precipitation per event than today's storms, the anticipated yearly average amount of precipitation is projected to remain approximately equal to the current yearly average.
- Volume of precipitation per storm is another way to consider the predicted change in precipitation. For example, the 100-year storm of today (which has a one percent chance of occurring in any given year) is predicted to become the 25-year storm event

(which will have a 4% chance of occurring in any given year) in the 2070s-planning horizon. Since the size and intensity of these storms will impact existing wet weather infrastructure differently than the current storms, and since infrastructure is built to last several decades, it is important the City begin to plan how to address larger and more frequent storm events.

- The area of flooding (also called the extent of flooding) and the depth of flooding are anticipated to increase with larger storm events. For example, the 100-year 24-hour storm of today, which drops approximately 9 inches of rain, would drop an additional 2 inches of rain in the 2070-planning horizon. Similarly, flooding impacts of the 100-year 24-hour storm of today would cause flood impacts in approximately 12.5% of Cambridge whereas the 100-year 24-hour storm in the 2070 horizon is predicted to cause flood impacts in 22.7 % of Cambridge.[1] Much of the flooding is anticipated to occur in either western or eastern Cambridge. Flooding in western Cambridge would be concentrated around the Alewife Brook and wetlands. Manhole flooding would cause most of the flooding in eastern Cambridge and the Riverside area.

<u>Extreme heat events are likely to increase in frequency, intensity, and duration</u>

- Temperature scenarios were completed using ambient air temperature, heat waves, and the heat index, which is referred to as the "feels like temperature" since it is indicative of how humans experience heat as impacted by relative humidity. In the 2030s planning horizon, the ambient air temperature is expected to register above 90°F on three times more days than is currently experienced. By the 2070s, ambient air temperature is expected to register above 90°F on four to six times more days than is currently experienced. Heat waves were defined in the 2030 horizon as four consecutive days with ambient air temperatures above 90°F and in the 2070 horizon as five consecutive days with ambient air temperatures above 90°F with three of the days being over 100°F. The heat wave scenarios are conservative because heat waves of 2002 and 2010 already exceeded those projected in the CCVA model.
- Another way to envision the change in temperature is to plot the days projected to register 90°F or greater on a calendar. Doing this for June, July, and August would show nearly three months of consecutive 90°F or greater temperatures in the 2070 time horizon, which indicates it would be nearly impossible to avoid a heat wave. The temperature scenarios indicate that heat will be a major influence on public health and the operation of some key physical infrastructure by the 2070s.
- The heat index scenarios illustrate how people will experience heat under the different scenarios by factoring in the impact of relative humidity. The scenarios account for heat island effects and tree canopy cover. The maps illustrated that heat vulnerability will significantly increase by the 2070-horizon, if the City takes no action.

<u>The operation of the Amelia Earhart dam greatly influences the extent and depth of flooding in the Alewife area, and Cambridge is unlikely to be impacted by Sea Level Rise (SLR) or storm surges in the 2030-time horizon due to flood protection from the Charles River and Amelia Earhart dams.</u>

- Sea Level Rise (SLR) and storm surge modeling is still being completed using an Advance Circulation (ADCIRC) model in collaboration with the Massachusetts Department of

[1] These flooding area numbers have been corrected and are different than what was presented at the meeting.

Transportation.[2] Preliminary findings indicate that the Charles River Dam provides SLR and storm surge protection into the 2030-planning horizon. Protection from the Charles River Dam in the 2070-planning horizon will be assessed by modeling that is in progress.

Participants had the following questions and comments. *Responses are italicized*.

- Did the CCVA consider greater amounts of snow or changes to the jet stream? *Yes, but more intensive analysis needs to be completed in this area. Preliminary analysis indicates that more intense snowstorms and ice storms are likely.*
- Does the CCVA capture black swan events (aberrant events) in the predictions? *We did not show the low probability, high consequence events tonight, however we did look at a variety of these events and that information will be included in the final report.*
- At the last public meeting, you showed two U.S. Army Corp of Engineers (USACE) maps that referred to category one and category two storms. The finding that Cambridge would not be affected seems to be in conflict with the maps shown last year. What category of storm did you use to reach this conclusion? *The USACE maps relied on SLOSH models, which predicted very high storm surge values and did not effectively account for the dams or the probability of events occurring. The ADCIRC model provides a more realistic picture of what might happen because it takes into account the probabilities of event occurrence and how the dams would operate during those events.*
- The Amelia Earhart dam was not referred to in terms of overtopping, but it has been studied thoroughly. Does the ADCIRC model include the Alewife area? *Yes, we have watershed and drainage models for the Alewife area that will be integrated into the ADCIRC model to show the probability of flooding, how the dam is operated during those times, and how those two variables will interact.*
- It is extraordinary that the City is conducting a climate stress test on itself.
- Can you please explain the Alewife flooding more? *Mr. Owen O'Riordan, City of Cambridge Department of Public Utilities, explained that two models were used to map the Alewife flooding; one model was a rainfall/runoff model for the river systems and the other model specifically addressed pipe infrastructure. Integrating SLR and surge models with the runoff models remains to be completed. The bigger challenge to overcome is determining the joint probability of a rainfall event and hurricane event with significant rainfall. Also, the FEMA maps presumed two pumps operating in the Amelia Earhart dam; however a third pump was reactivated since the maps were completed, and the dam has space for a fourth pump. Three pumps are presumed to be operating in the maps shown tonight. If one of the three pumps were to fail, then flooding would increase dramatically. Adding a fourth pump would add redundancy to the system but probably not provide a significant amount of additional flood protection.*
- The CCVA should consider extreme cold and high wind conditions.
- What rate of SLR did you use in the model? *We used the National Climate Assessment projections and bracketed SLR between what they call intermediate high and high sea level rise.*[3]

[2] The team initially planned to use the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model to estimate SLR and storm surge impacts; but opted to use the more advanced ADCIRC model due to its superior capabilities.

[3] The National Climate Assessment scenarios are based on the rate and magnitude of ice sheet loss. The high scenario is based on maximum possible glacier and ice sheet loss by the end of the century while the intermediate-high is based on an average loss. http://www.cpo.noaa.gov/sites/cpo/Reports/2012/NOAA_SLR_r3.pdf

Natalie Beauvais, Kleinfielder Project Manager, introduced the second step, the vulnerability and risk assessment based on the climate scenarios. After completing the modeling and mapping of exposure for each climate scenario, the technical team assessed the vulnerability and risk of built and social environments. The built environment included assets such as energy systems, transportation systems, water infrastructure, telecommunication services, urban forests, and other critical services. The social environment included assets such as the public health systems, community resources, vulnerable populations, and the economy. After assessing the critical assets and resources, the technical team ranked them with respect to the following key concepts:

Exposure:	The direct contact with a hazard (such as flooding or heat)
Vulnerability:	A function of asset sensitivity and adaptive capacity in relation to exposure.
Risk:	A function of the probability of occurrence and consequence of failure.

Geographic information systems were used to determine vulnerability and risk on a system-by-system and scenario-by-scenario basis. Each assessment started by identifying key assets of each system (energy, water, telecommunications, etc.) that would be exposed to an event. Next, the team determined the assets' level of sensitivity. For example, everyone will be exposed to heat, but the sensitivity to the heat is variable: every individual reacts differently to increasing temperatures up to a certain point. Next the team reviewed the adaptive capacity of key assets in each system. If the asset had a backup feature that would enable it to continue operating in the case of exposure, then the asset was deemed to have a degree of adaptive capacity. For example, if someone has central air conditioning in his or her home, then this is a form of adaptive capacity. Finally, the team determined the level of risk each scenario posed to the asset based on the probability of occurrence and the consequence of failure of that asset.

The technical team also overlaid the flooding and heat stresses, vulnerable populations data, and affected services on one map (slide 36 of the presentation slides). This overlay illustrates a simplified view of the more detailed vulnerability assessment to provide a general sense of priority planning areas and impacts to critical assets. For example, highly utilized roadways were assessed and illustrated as vulnerable if they would be covered with more than six inches of floodwater.

Ms. Beauvais highlighted the preliminary findings of the vulnerability and risk assessment:

<u>Heat vulnerability and inland flooding impacts are more imminent</u>

- Please see the above section on climate scenarios, and flooding and temperature impacts.

<u>Key infrastructure assets are vulnerable in the near-term</u>

- Heat and flooding events are likely to impact energy, telecommunication, transportation, and critical services in the 2030-planning horizon.

<u>Social vulnerability is not evenly distributed among the neighborhoods</u>

- Demographic variables such as income, language isolation (or access to information), and age—which are predictors of social vulnerability—were used to identify the locations of vulnerable populations. Identifying the locations of vulnerable populations

will enable the city to identify priority areas and the tools they may need to deploy to increase resiliency in those neighborhoods.

Heat waves and indoor air quality will challenge public health efforts in the near future

- Increased heat will have significant impacts since many homes, like those throughout New England, are not as well equipped to deal with the heat as they are equipped to deal with the cold. Increased temperatures are expected to cause illnesses and death.
- Repeated flooding could cause mold in homes and buildings, which would negatively impact indoor air quality. Impacts to outdoor air quality appear negligible, but will need additional research.
- Vector based diseases such as West Nile Virus and Eastern Equine Encephalitis Virus will continue to be monitored.

Economic losses from a flood event or an area-wide power loss would be significant

- The team completed an economic analysis to determine the risk for structural damage from flooding in the 2030 and 2070-planning horizons. Residential impacts are expected to be greater in the 2030-planning horizon whereas impacts to commercial and institutional buildings are expected to be greater in the 2070-planning horizon. Economic loss from the contents of the buildings was not incorporated.
- A major, city-wide black out from increase temperatures could impact nearly all of the City's 128,000 jobs resulting in a loss of nearly $43 million dollars. This impact would likely extend outside the City boundaries.

Adaptation will require coordination with other entities

- Since Cambridge relies on systems that extend beyond the city limits, coordination with neighboring communities and operators of regional systems will be required.

Participants had the following questions and comments. *Responses are italicized*.

- Why were outdoor air quality impacts considered negligible, given the increase in ground level ozone formation tied to increasing temperatures? *We relied on a regional study for Boston metropolitan air quality that showed that dangerous levels will not be reached as they are in other cities; however, more study and monitoring at finer levels is needed. Mr. Sam Lipson added that temperature, nitrogen dioxide, and volatile organic (VOCs) compound concentrations contribute to ground level ozone, but in this case it may be that nitrogen dioxide and VOCs were not great enough to cause ground level ozone formation.*
- Is there any concern about lead exposure related to flooding? *This was not factored into the analysis.*
- Were schools assessed as vulnerable environments, since many do not have air conditioning? Are schools used for emergency management included in the assessment? *We assessed the vulnerability of schools and public day care centers, and incorporated the use of schools as shelters.*
- Did the analysis consider water insecurity? *We did not look at drinking water quality per se; however we did look at threats to Fresh Pond that would impact the drinking water system. There is indication that floodwater could carry contaminants into Fresh Pond. There is also a weir system to control upstream flow enabling drinking water to bypass*

Fresh Pond and reach the treatment plant; but additional investigations are required to determine when the weir system would be compromised.

- Were the reservoirs outside the City limits factored into the assessment in terms of drought/flooding, or water quality? *The assessment was limited to the bounds of the City; however we recognize the reliance on regional systems and therefore the need for regional collaboration on climate change planning.*
- Many facilities in Cambridge contain toxic materials. For example, MIT has a nuclear reactor that is in an area that could flood. Were these identified and incorporated into the vulnerability assessment? *MIT has a detailed plan to deal with contingencies and the City will review the plan to determine whether or not we think their plan is sufficient to protect against hazardous exposure.*
- Will the capacity of the new sewer systems be sufficient for the projected precipitation levels? *The City is installing the biggest sewer pipes possible and has created some underground rainwater storage facilities. We also added additional pipes in some locations to allow for future augmentation of the systems and creation of other underground water storage facilities; but there is only so much we can do—it won't be sufficient for the projections. The maps we showed only reflect the infrastructure the City has constructed to date; it doesn't include any proposed or planned updates to the system.*
- Have insurers been involved in this process because the maps you created will likely impact insurance rates? *The City will try to engage insurers in the next phase of the process.*

Discussion and Presentation of Draft Project Results

Participants broke into 11 small groups to discuss what they thought about the preliminary key findings of CCVA and what they hope will happen next. After the discussion, groups returned to plenary and presented a few highlights of their conversations.

All meeting participants were invited to fill out an individual handout answering the same questions as were asked in small groups and a several additional questions about demographics. The additional demographic questions were asked to get a sense of the participants at the meeting; the results do not reflect the demographics of Cambridge. Of the 62 people who filled out some or all of the handout (percentages rounded):

- 36% had people in the 25-44 year age range living in their household; 29% had people living in the 45-64 year age range living in their household; and 18% had people in the 65 or older age range living in the household; and 17% of respondents had people in the 0-24 age range living in their household.
- 13% had people living in their household with a disability.
- 45% had an annual income of $100,000 or more; 7% had an annual income of $75,000 to $100,000; 18% had an annual income $50,00 to $74,000; 16% had an annual income of $25,000 to $49,000; and 14% had an annual income of less than $24,000.
- 38% of respondents own a residence in Cambridge. 34% rent housing in Cambridge. (Note: not all meeting participants live in Cambridge.)
- Most respondents work in Cambridge (63%).
- Approximately 18% of respondents own their own business.

- The top five modes of transportation the respondents said they use most frequently were, in descending order, the subway, walking, car, bus, and bike.

The following themes emerged from both the small group discussions and from the individual written comments provided by 62 of the 140 participants.

A. Collaboration will be critical for success:

- Several groups discussed the need for collaboration between the stakeholder groups and interested parties within Cambridge at the local level, throughout the greater metro Boston area, the New England region, and even internationally. Several groups commented that the City should engage a more diverse set of people at the local level in discussion of the CCVA results and climate change preparedness planning. Noting Cambridge's reliance on regional systems, and recognizing that some of Cambridge's vulnerability is directly linked to the vulnerability of other neighboring cities, some participants suggested the City seek greater collaboration with the operators of those regional systems while others identified the need for increased collaboration with stakeholder groups or cities in the greater metro Boston area. Still others suggested that the City should seek to engage and collaborate with communities throughout New England who might face similar situations. Finally, some suggested the City could partner with sister cities in less developed countries to help them prepare for climate change, too.
- Participants suggested the City attempt to engage the following stakeholder groups: property developers, private property owners, homeowners, trustees of condo associations, insurers, business owners, vulnerable populations, low-elevation residents, non-profit organizations, community groups, the general population, institutional stakeholders, non-English speaking populations, neighboring municipalities, religious congregations, and elementary, middle school, high school, and university environmental student groups.

B. Alternative forms of engagement are needed to engage and understand a broader, more diverse set of actors:

- Related to engaging a wider local audience in the vulnerability and risk assessment and preparedness planning, several comments addressed the need for the City to find creative ways to engage populations that are less likely to be able or willing to participate in typical public meetings. Alternative forms of engagement the City could attempt include broadcasting meetings via CCTV, use of online forums, videos, presentations, and question and answer sessions; neighborhood listservs; in person role-play simulations or participatory charrettes; neighborhood-specific events held at a variety of times; or neighborhood task forces.
- Several participants highlighted the importance of reducing the use of technical jargon and developing presentation and informational materials that are more accessible to a wider, less scientifically inclined, audience. For example, consider the use of cartoons to explain the concepts.
- Many participants stressed the need for the City to better understand and address the possible impacts of climate change impacts on people, their lifestyles, and their social networks. Many noted that engagement with vulnerable populations on these issues is especially important. Many suggested the City should engage residents to hear about

their concerns and needs and identify the areas residents perceive to be priority planning areas, then use that information to generate ideas for adaptation planning and determine how to prioritize action and eventually implement key activities in ways that are consistent with local residents' habits and preferences.

- The City could review the National Methodist Women and NAACP Climate Justice documents to determine steps the City could take to ensure vulnerable populations are included in resiliency planning.
- Some participants stressed that the City should begin to facilitate collaboration and social connectedness between community members at the neighborhood scale to increase the likelihood that neighbors look after each other during emergency situations, since neighbors are often the first responders in times of emergency.

C. Use green space and natural resources to minimize potential impacts

- Several participants in different groups highlighted the need to use local natural resources (e.g. areas with specific soil composition, opens spaces), vegetation, and green infrastructure in adaptation planning. For example, some suggested that green open spaces could be used in combination with engineered solutions to provide cost effective natural buffers that would provide protection from floods or respite during heat waves. Several suggested the City start to incorporate open green space and tree planting into new developments.

D. Alewife is an area of concern

- Several participants expressed concern about the projections for flooding extent and depth around Alewife and suggested Alewife might be an area where the City should start work sooner than later.
- Some participants were concerned that the Alewife area is developing too quickly and without regard for the projections and data provided by the CCVA.

E. The City is leading by completing this assessment

- Many participants indicated they are glad that Cambridge is taking climate change seriously and allocating significant time and resources to understand how the City and residents could be impacted. Many were impressed by the amount of work completed. A few suggested that Cambridge's efforts are more advanced than most cities, which enables the City to serve as an example and resource for other communities that will need to assess their vulnerabilities.

F. The City should begin to incorporate these findings into City thinking and City policies.

- Several commented that the work completed thus far is only the beginning and much greater efforts during the planning phase will be needed on a neighborhood-by-neighborhood or stakeholder group specific basis.
- Some suggested the City should start to translate the findings into action instead of continuing to study the issue. They suggested the following specific actions:
    - Incorporate the information into ongoing, planned or proposed construction/development, emergency preparedness planning, comprehensive/master planning processes, planning and zoning codes, building standards, bylaws and ordinances (wetlands, stormwater, etc.), and other processes or policies that guide city decision-making and development.

- Seek regional coordination and collaboration in research and implementation, identification of resources that can be shared, and grant funding; identify and define value and investment potential, avoided costs, and secondary use/emergency use.
- Provide low-income and low-elevation residents with information on how to decrease risk of heat stress and flood damage
- Develop mitigation plans including a plan for heat island mitigation through development
- Complete emergency preparedness planning, including identification of medium-term housing/emergency shelter needs that may arise due to flooding, mold, heat, or other impacts
- Establish a mitigation funding mechanism
- Complete cost effectiveness analysis of individual versus collective response to increase climate preparedness.
- Create practical guidance for builders, developers, etc. on protection measures to incorporate into construction designs
- Consider ways to develop and utilize decentralized power grids/microgrids and renewable energy
- Leverage other ongoing sustainability actions such as Net Zero Energy
- Develop operational strategies (e.g. evacuation kits)
- Be clear about when and how the information will be incorporated into planning for future development in areas that will be prone to flooding such as Alewife and Kendall Square.

G. Feedback on the presentation and data

- Many participants thought the presentation of the information was thorough and generally helpful to understand how Cambridge's social and built environments could be impacted.
- Some thought there was too much technical language in the presentation and too much information to easily understand the extent of the impacts.
- Others said the presentation of the results was too general and not detailed enough.
- Some noted the presentation was heavily focused on the impacts to the built environment and rather than on the impacts on the social environment.
- Many participants are eager to read the final report to better understand the analysis, the assumptions made, the sea level rise and storm surge analysis components, the specific recommendations produced by the information, as well as the potential impacts on vulnerable populations and infrastructure.
- Many would like to see this data presented at a more granular, neighborhood level.
- Some requested the City provide access to more detailed information and raw data that they could analyze; others requested maps with more precise detail.
- Some requested the information be presented online in an interactive form.

H. Other Comments

The following comments were also made during small groups or submitted on individual handouts, though they were made by only one or a small handful of people, so were not heard as widely as those topics described in the themes in the sections above.

- Participants suggested the vulnerability assessment incorporate additional data such as impacts from this winter's snow disruption to better understand the human and economic cost of disruption to the T and MBTA bus system, or impacts on outdoor air quality due to increasing traffic on Cambridge Street and Massachusetts Avenue over the next ten years.
- Some participants suggested the City seek lessons learned from places that have dealt with flooding and heat emergencies. For example, the City could create case studies to understand how flooding and heat waves impacted people after Hurricane Katrina, Super Storm Sandy, or Chicago (1995), then use that information to better understand potential impacts and potential needs of the Cambridge residents. This information could also serve as a basis for conversations to develop understanding of how issues of race, equity, and displacement tie into climate change preparedness planning in Cambridge. It could also help the City determine how other cities have planned for risks and financed projects.
- Emphasize public health impacts.
- Emphasize the impacts in the 2030-time horizon.
- Consider replacing or upgrading the Amelia Earhart Dam.
- One participant suggested that the extreme temperatures are typically found in other locations of the US and the world, so flooding impacts should be prioritized over heat impacts if resources are limited.
- One participant commented that the city should provide financial assistance for finer-grained local assessments.
- Some expressed fear and uncertainty about the potential impacts; while others suggested they felt protected due to the City's efforts.
- Several participants posed questions:
    - How can we mitigate the disaster?
    - What can be done immediately?
    - Do we need an engineered approach to maintain the use of Kendall Square, or do we decide to abandon the location?
    - How will the City decide what to prioritize in terms of timing and budgeting?
    - How will the city integrate preparedness and resiliency projects and investments into city budgeting process?
    - Who will be involved in deciding what areas deserve to be addressed first versus later?
    - How will the City pay for needed improvements to infrastructure?
    - How can we ensure housing affordability and that vulnerable populations will be protected?
    - Will the City have better, smarter development to account for climate issues?
    - What role can the city play in increasing social connectedness and real or perceived safety?
    - How can indoor mold be rapidly addressed to prevent greater damage and extended displacement as seen in New Jersey post-Sandy?
    - How can the City prevent permanent displacement of low-income residents, as seen in New Orleans post-Katrina?

Next Steps

Mr. Bolduc described the next steps to complete the CCVA assessment and report. The coastal storm surge and seal level rise scenarios will be completed and added to the vulnerability assessment while an interim report on precipitation and heat vulnerability is anticipated to be completed and available for the public by the end of April. The interim report will include three technical appendices. GIS maps and other detailed information will be made publicly available with the hope that residents and organizations utilize the information to assess and plan for vulnerabilities. Tonight is the beginning of the discussion about the CCVA results, and the City intends to meet with community members and stakeholders in smaller groups to dig deeper into CCVA findings. A two-year climate change preparedness planning process will begin in Summer 2015.

Mr. Bolduc also described other related activities. The City will also participate in the Metro Mayors climate resilience initiative to increase coordination and cooperation throughout the region and will engage with local and regional stakeholders who are also assessing vulnerability of their critical assets. The City is also about to begin a comprehensive planning process for development and land use issues. Climate change and building energy use recommendations from the Getting to Net Zero Task Force will be a driving factors in the process.

The meeting adjourned at approximately 8:30 pm.

APPENDIX: Participants

Participants

Franziska Amacher
Rosalie Anders
Kyann Anderson
Kathleen Baskin
Bea Beckwith
Brad Bellows
Roshan Bhakta
Peggy Blemart
Larry Bluestone
Tania Bronsoiler
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Sue Butler
Agestina Calamari
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Katrina Crocker
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Gary Dmytryk
David Downs
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Kara Falise
Seth Federspiel
Catie Ferrara
Alison Field-Juma
Rick Flanagan
Genea Foster
Barry Fradkin
Peter Frumhoff
Meital Ganor
Mia Goldwasser
Decia Goodwin
Kathleen Granchelli
Annemarie Gray
Ann Greaney-Williams
Paula Griswald
Nick Hambridge
John Hawkinson
Alice Heller
Joanna Herlihy
Shawn Hesse
Sarah Hill
Justine Hofherr
Joseph Hunt
Judy Johnson
Susy Jones
Jack Joseph
Steve Kaiser
Isabel Kaubisch
Undine Kipka
Helen Kobek
Jules Kobek
Peggy Kutcher
Anne-Marie Lambert
Steven Lanou
Josne Lopez
Marie Macchiarolo
Zeyneb Magavi
Claudia Majetich
Christine McCarthy
Joel McKellan
Alexander Metzger
Melissa Miguel
Sally Miller
Lauren Miller
George Mokray
Meg Muckenhoupt
Aziz Muqaddam
Hubert Murray
Nikhil Nadkarni
Shanthi Nair
Mike Nakagawa
Brad Nelms
Jim Newman
Michael O'Hearn
Hannah Payne
Paula Phipps
Geoff Pingreff
John Pitkim
Amy Plovnick
Susan Ringler
Jim Rowean

Tricia Rudy
Todd Schenk
Keren Schlomy
Garrett Seibers
Linda Shi
Emily Shorin
Sasha Shyduroff
Sarah Slaughter
Lois Solomon
Roslyn Spring
Lois Stanley
Emmanual Stefankis
David Stokes
Paul Tahharo
Charles Teague
Hannah Teicher
Dan Vallec
Minka VanBeuzekom
Sula Watermulder
Carol Weinhaus
Jim Wilcox
Matthew Willner
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