

Webinar 1 Questions and Comments

Jeff Newman: Given the question of affordability of the sustainable infrastructure over the next 100 years as Mike stated, what are the proportions of the public and private sector investment profile in the transition to this model of infrastructure? And what are the best pathways (standards, political pressure, regulations, etc) to accomplish this shift over the long term? Thank you.

***Kathryn:** It will likely be a mixture of all of the pathways above. There is a significant gap between infrastructure financing needs and current spending. Additionally, needs are likely to grow as infrastructure continues to age and resilience needs increase – this will likely require a scale-up of private investment into infrastructure projects. There are some early examples of this succeeding, such as the sustainable infrastructure bond in Washington D.C., which successfully attracted private investment by using a performance-based methodology to reduce risk.*

I think standards and valuation methodologies to encourage creative collaborations like the above is a path forward. There is a detailed case write-up on D.C. in this report: <http://business.edf.org/sustainable-infrastructure-2017/>

Gurdeep Bhattal: Development of new standards and codes for sustainability, are Federal agencies like FEMA, ACOE, FHWA in agreement?

***CNRA:** It is hard to speak of “agreement” among federal agencies at this time, given the significant shifts in federal policy and the need to protect core functions of some of these agencies. Under the Obama Administration there were Executive Orders related to sustainability and adaptation, but some if not most have been rescinded. That doesn’t mean career professionals in federal agencies agree with this policy shift. But there is important work going on in the Army Corps of Engineers – even though not everyone is on the same page yet – to take into account future climate risks.*

Elliott Wezerek: I have a somewhat off-topic question for anyone leading the webinar to take up. I read that AB2800 "would require the working group to consist of registered professional engineers with specified relevant expertise from the Department of Transportation, the Department of Water Resources, the Department of General Services, and other relevant state agencies; scientists with specified expertise from the University of California, the California State University, and other institutions; and licensed architects with specified relevant experience." Does this group of permitted professionals seem in any way narrow or exclusionary? I would think you would want policy specialists (such as Peter Adams) and other types of thinkers involved in the working group.

***CNRA:** AB 2800 was primarily focused on bridging the gap between climate change impact science and the design and construction processes for state funded infrastructure. There are many efforts underway to guide policy around climate change impacts but there is limited*

institutional guidance for the design practitioner around the standards they should use to account for climate change. This working group structure was designed to organize the decision makers for the final report around this primary focus, but the members and facilitators were chosen additionally for their ability to draw the input of outside technical and policy experts into the process through meetings, webinars, and direct outreach.

Kathleen Ave: Question for Mike - Do any of your new policy and process recommendations address the need for integrated engineering efforts across sectors and currently silo'd organizations?

No response received.

Keeley Brooks: Will we be able to have a copy of these presentations? Lots of really good resources I'd like to share with our engineers and facility managers

CNRA: *The presentations (put together into one pdf) are already posted on the Climate-Safe Infrastructure Working Group's website.*

Kathleen Ave: Kathryn, did you consider including the ILFI Living Building framework in your evaluation?

Kathryn: *We did consider and are familiar with the Living Building Institute's certifications. However, we chose to focus the research on standards or approaches whose primary emphasis was on resiliency to bound the research.*

Meister Report: http://www.mc-group.com/wp-content/uploads/2017/05/MCG-Voluntary-Resilience-Standards-Report_.pdf

Gurdeep Bhattal: What are the sources of forward-looking climate data?

Peter: *NYC primarily relies on the NYC Panel on Climate Change (NPCC), composed of leading scientists from local universities and with support from a regional NASA office. Together, this panel provides downscaled climate projections for NYC and the surrounding area in reports updated every 4-5 years.*

Kathryn: *Some of the standards are backward-looking (e.g. rely on FEMA). However, some of the guidance suggests using local projections in order to make a risk assessment. In Boston, which I alluded to has a resilience checklist for new construction, consensus climate projections from academic institutions and scientists for the region are used to evaluate risks. See checklist and sea level rise hazard mapping tool: <http://www.bostonplans.org/planning/planning-initiatives/article-37-green-building-guidelines>*

***CNRA:** In California, there is the ongoing research – partially supported by the State of California – on climate change that is part of the state’s assessments. Cal-Adapt is one place where that information is presented in a georeferenced format. Other sources depend on the specific context, sector or need.*

Elliott Wezerek: Peter, how do you secure funding for future resiliency projects? Does the mayor's priorities to address present issues lead to discounting of future climate risks?

***Peter:** Many recovery and resiliency projects have been funded by federal and state agencies. Going forward, NYC is currently assessing how best to incorporate resiliency measures and added costs in capital planning, to test and demonstrate the need and the value of resilient design.*

***CNRA:** Note, we will have one or two webinars on financing resilient infrastructure later in the webinar series, please stay tuned.*

Cris Liban: How do you reconcile the costs with the criteria and principles? Who do you think will ultimately pay and where will the financial resources to do so come from?

For NY resiliency standards, how do you consider the evolving science into the standards. In other words, how can the engineers and constructors better prepare for these standards.

***Peter:** See answer above on funding for resiliency projects. For NY resiliency standards, how do you consider the evolving science into the standards. In other words, how can the engineers and constructors better prepare for these standards.*

I envision resiliency ultimately becoming embedded in building code and design standards. As new consensus climate science emerges (represented by the IPCC’s report cycle), the new data can be integrated into codes and standards as part of their typical updates.

Phil Gibbons: How do the Resiliency Guidelines incorporate uncertainty in climate projections?

***Peter:** Our guidelines incorporate uncertainty by recommending using high end climate change projections where cost effective and when they provide many benefits. The guidelines recommend using mid-range projections where there is an opportunity to use flexible adaptation pathways in a design. These pathways allow for initial upfront investments in resilience while leaving room for facility upgrades later when more information is at hand.*

Michael Sanio: Peter, as designers/contractors designing/building sustainable/resilient projects, what do you need to help do better?

Peter: *There's a lot yet for all of us to learn about the ins and outs of resilient design, and best practice has yet to be defined. Share your experiences and highlight challenges and creative solutions. In particular, we are always looking for potential conflicts between emerging practice in resilient design and existing code requirements; the sooner we can identify and address these, the better, and we can bring resilient design into the mainstream.*

Jeff Newman: Peter, do you use Robust Decision Making Tools in regard to guiding your flexible adaptation approach?

Peter: *No, but that's an interesting idea that I will look into further. We are also considering how MCDA could be of help.*

Michael Sanio to Everyone: From what you shared Peter, looks like there needs to be greater urgency to revise standards/guidelines by the profession, tell me more.

Peter: *I think there is a great urgency to engage professionals in standards-setting organizations (and many already are), but I would hesitate to rush the deliberative pace of code and standards revision. We want to get this right, and adding forward looking climate data and a new range of uncertainties are large changes with many potential impacts. So while you're absolutely right about the urgency, I think there is an opportunity now to use resilient design guidelines like NYC's to begin building a body of best practice that can inform updates to official standards and codes in the coming years.*

Kathryn: *I would generally agree with this statement. The resiliency needs for public and private infrastructure, particularly in exposed coastal zones, seem to be outstripping the guidance that is within codes.*

Michael Sanio: How can ASCE be helpful in revising/updating the standards and guidelines?

Peter: *One big way is working with us to assess how our guidelines interact with existing ASCE standards and identify all the areas where forward looking climate data should be integrated.*

Kathryn: *Each of the standards has its own process for updates and review, since they are all largely independently operated. I would note that LEED and ReLi recently merged, and there will likely be upcoming processes and procedures for inputs into their new combined standards.*

Dan Cayan: Can you clarify what "useful numbers" mean [in guidelines for users]? How do you handle the fact that projected changes have uncertainty (not fixed number)?

Peter: By “useful numbers,” I was referring to how we present climate change projections. For example, the projected number of days above 90F (a common climate data point) is less useful to an MEP engineer than the number of cooling degree days projected. Where possible, we present the climate data in the most useful ways available given the audience.

Regarding uncertainty, the academic community provides a wide range of climate projections with well documented levels of uncertainty. Choosing which projections becomes a question of balancing cost, facility requirements, and risk tolerance. In our guidelines we recommend specific numbers to designers to use for different climate stressors. We chose those numbers based upon the types of facilities and infrastructure NYC has and their function. We also plan to update the guidelines as new scientific consensus emerges around different climate projections.

Susi Moser: Several of you spoke of pilots and assessing performance (through CBA). I presume a holistic integrative approach would need to look at broader performance standards. None of you spoke, however, to what is needed to set up appropriate monitoring protocols so that we can learn how these new standards, codes and guidelines or procedures are working. So, what is needed so we learn over time what is working and what is not?

Kathryn: Many of the standards are still in a pilot stage or are working with their first sets of buildings. Thus, it is hard to define what is working, since there is not yet enough data. Standards, which offer a certification, have either third-party verification or self-verification built into the maintenance of the credential, which provide a helpful monitoring framework for buildings within those programs. However, holistically, there is a lot more that needs to be done.

Peter: Monitoring is an important issue and one we are beginning to explore. One of the big things we need to develop is an effective way to identify and measure losses avoided from extreme weather events. Similarly, we need to improve our ability to put a value to urban heat island reduction. O&M generally will be a crucial part of resiliency, and I see monitoring fitting into that. We need to train and fund O&M to maintain facility health despite climate stressors, and to simultaneously help document the performance of resilient design and identify the costs of inaction.

Melissa Barton: The American Institute of Architects, California Council stands ready to assist in reviewing, revising, or updating the standards and guidelines.

Susi Moser/Juliette Finzi Hart: Thank you, Melissa. Please stay tuned as the work of the Working Group continues. We welcome your feedback.