# Smart Cities Stakeholder Workshop and Responder Technology Showcase

Session 2B : Urban Modeling and Analytics Breakout Session

2 May 2018, 11:00-12:30

Track B: Technology Stack

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Discussion began with the use of design software for urban modeling. The AECO software landscape is huge – upwards of 600K practitioners, $5.23b in tech spending, but potential of standardized and comprehensive approaches such as BIM models is not being fully realized. It also seems that such models are used more outside the urban core in simpler, more self-contained development zones. The broadly defined return on investment in such tools and data remains difficult to compute and communicate, even as construction productivity has declined over the last 20 years and costs continue to climb. One challenge to broader adoption is a tension between common practices that lead to economies of scale, and preservation of quality in individual project elements. This leads to limited, stove-piped adoption of automation technologies.

Discussion then transitioned to the role and effect of models specifically in urban settings. One example is decision support: how much model detail is needed for useful answers that does not also lead to information overload. A case in point may be incident response. Much of the detail that perhaps “should” be in a digital model is instead in the heads of municipal employees who can provide information as needed, but that access is always in danger of being lost, garbled, or forgotten. The key to developing methods of preserving and integrating such information without generating overload, is establishing a municipal culture that is open to change and to innovation.

The concept of “digital twins” received some attention, particularly as an ideal that may be unattainable, but can motivate movement away from model stovepipes towards broader yet still feasible simulations of city functions. The ideal would serve to motivate development of individual model elements in such a way (e.g. use of common standards) as to allow them to be interconnected over time. The “pieces of a future whole” approach may be particularly important where city infrastructure is old and cost of replacement so high that it can only be maintained, replaced, and digitally characterized in piecemeal fashion.

This led to a rather wide-ranging discussion of what the process of implementing urban models might look like, and what the implications might be for smart city architectures. In essence, an effective smart city architectural approach requires not only “As-is” and “To-be” stages, but also designs for “How-to-become” that have social and political as well as technical characteristics. “How-to-become” may even describe something like institutionalized innovation that continues to update the “As-is” to what has been changed, and push out the predictive horizon of “To-be” as the present changes. On a short-term basis, such a process needs to incorporate budgetary arguments that the cost of building and maintaining digital twin artifacts is paid back with increased efficiency. Short-term project decisions may also be driven more by how little pain it generates, rather than how much benefit.

Far-future predictions are also useful for planning and vision purposes, just with less soon-to-be obsolete technical detail. It was noted that smart cities will always need to strike this balance, since cities structures get built to last hundreds of years, while technologies go out of date after only a few years.

How do such models lead to smarter cities and happier constituents? Participants pondered how to define a smart city: is it “intelligent behavior”, “accessibility”, or even the ability of a city to shape people’s own behavior for their benefit. The particular priorities of people may vary. The participants from Cviker emphasized that European city dwellers tend to focus on comfort of life and resilience, while safety and security is often the highest concern in U.S. cities. There is always a challenge, however, of developing trust and transparency with urban communities: open the data but explain what they mean, and provide means for constituent engagement.

Practical concerns such as design of public-private partnerships were also discussed. Typical public information websites cost upwards of $500K/yr to maintain. Might make sense just to add information to Google Map, e.g. occurrence and progress of streetworks. Business model, however, needs transparency: who pays, who is the customer, who is the product, who decides what is a beneficial arrangement. Open data has its own issues, e.g. a city can provide transit data, but can’t control how it’s used in apps. There could be some intermediate partnership design where private partners commit to a standard of civic benefit.

It was also clear to participants that continuing innovation and change in smart city capabilities will not be a transitional phase, but actually the desired result, such as partnership models that look a lot like on-going hackathons. Finally, the question was asked whether smart city innovation should primarily be directed at the young, as long as we can envision who they will become and what their needs will be in the future.

These outcomes were reported out to a plenary workshop session.