

## Community Resilience Panel: Data, Metrics, & Tools (DMT) Standing Committee Meeting

**MEETING DATE:** March 18, 2016  
**TIME:** 2:00 pm EST to 4:00 pm EST  
**ISSUE DATE:** April 20, 2016

**Attendees:**

Attendee	Affiliation
Megan Clifford [Chair]	Argonne National Laboratory
Paolo Bocchini [Vice-Chair]	Lehigh University
Naiyu Wang [Secretary]	University of Oklahoma
Leanne Aaby	LMI
James Arnott	Aspen Global Change Institute
John Baker	Carey Business School, Johns Hopkins University
William Booher	Booher and Co.
Jerry Brashear	The Brashear Group LLC and National Institute of Building Sciences
Bruce Ellingwood	Colorado State University
Eleanore Hajian	DHS S&T Office of University Programs
Andrea Higdon	University of Kentucky
Ting Lin	Marquette University
Aaron Marks	Dynamis, Inc.
Keely Maxwell	US Environmental Protection Agency
Frederic Petit	Argonne National Laboratory
Mari Tye	National Center for Atmospheric Research
Duane Verner	Argonne National Laboratory
Richard Wright	American Society of Civil Engineers
Louis Conway	BC, Canada
Jeff Rubin	Tualatin Valley Fire & Rescue
Regan Murray	US Environmental Protection Agency

**Distribution:** Attendees and Data, Metrics, & Tools Standing Committee

**Notes By:** Naiyu Wang, the University of Oklahoma

### 1. Welcome and Introductions

Megan Clifford (Chair) called the meeting to order. She thanked attendees for participating and reviewed the agenda for the meeting. Following roll call, Megan proposed a motion to approve the agenda. Paolo moved, Naiyu seconded, and the Committee unanimously approved the motion.

## 2. Our purpose (Final Charter)

Megan Clifford read the following sections in the Charter to reaffirm the Panel’s mission and the Committee’s purpose and objectives:

- *Panel Mission* is to identify methods that can improve the resilience of communities by considering the adequacy of codes and standards, and participating in development, coordination, and harmonization of guidelines, best practices, and other tools that enhance the performance of the buildings and infrastructure systems that support the social and economic functions of communities.
- *Standing Committees* will be responsible for creating and maintaining the necessary documentation and organizational framework for their topic areas, such as discipline-specific risk assessments, prioritizations and informative references and gaps for Panel-recommended guidance.
- *The Data, Metrics, and Tools Committee* will be responsible for evaluating and/or creating data, metrics and tools needed to support community resilience.

## 3. Our approach

### 3a. What are the questions we want to answer as a committee?

*(Please reference to questions collected in advance of this meeting.)*

- *Megan Clifford:* We asked Committee members to provide the “Top 3 Questions” they think our committee should address. We have received many questions as listed in the “DMT Top Questions” document (dated 03/18/2016), mainly regarding *collaboration, goals and priorities, state-of-the-art, and climate change*. We would like to open the discussion for more questions – either questions we want to address as a committee or questions we think should be addressed by another entity (e.g., committee, government organization, etc). Once we compile a list of questions, we will prioritize the questions and chart our path forward.
- *Jerry Brashear:* The current resilience guide is missing risk analysis methods that include service continuity as an objective. For example, a recent project looked at various methodologies to perform risk analysis for lifeline infrastructures, and found that most federally-sponsored risk/resilience/vulnerability analysis methods are irrelevant to resilience-based decisions or can actively distort those decisions. **Suggestion:** The DMT Committee might consider developing minimum criteria for selecting among alternative risk analysis methods, and making further specific suggestions as to how to perform risk analysis, if possible. *[John Baker: agrees that risk is of primary importance.]*

**Action item:** Jerry P. Brashear to provide his research white paper regarding resilience of lifeline infrastructures to the DMT Committee *[Done]*. This document will be shared in the ARA document exchange platform once built.

- *Richard Wright:* stressed the importance of the *National Consensus Standards - Key Tools for Community Resilience* document. **Suggestion:** This document and related issue to be put on the agenda for the Committee discussion in Portland.

**Action item:** Megan will distribute the *National Consensus Standards* document by Richard Wright to the DMT Committee before the Portland meeting.

- *Jeff Rubin:* How do we assess resilience outside the built environment, where codes and standards may not apply? I think this requires qualitative assessment, but data/metrics/standards typically lean heavily toward quantitative assessment. This is particularly relevant for social/community resilience, including healthcare. **Suggestion:** The DMT Committee could review existing resilience documents on this subject, and make recommendations regarding community-level resilience metrics that require qualitative (as opposed to quantitative) assessment and what are the possible indicators for those metrics. [*Paolo Bocchini: There may actually be ways to find good indicators outside the built environment, and remain optimistic on the goal of preserving the analysis as quantitative.*]
- *Mari Tye:* In many cases we don't even know whether the codes and standards have been met in existing built environment. How do we evaluate resilience and mitigate risks when community buildings and facilities do not satisfy codes and standards? **Suggestion:** The DMT Committee can work with other standing committees to look at, for example, insurance policies as a mechanism for socializing risks, as well as adjusting community attitudes towards such insurance policies.
- *Frederic Petit:* Review of needs/requirements and existing tools/capabilities for considering dependencies/interdependencies between utility/critical infrastructure – how can we anticipate, be prepared, mitigate possible consequences? **Suggestion:** The DMT Committee can help identify what data and metrics are required to support research or modeling of interdependencies. [*Paolo Bocchini: NSF funded a CRISP program specifically on interdependency research. The program will start to produce results in a year or two. NIST might also have some initiatives and documents on this topic.*]
- *Megan Clifford:* Based on the *Questions* sent to us prior to the meeting, as well as the discussions today, the consensus on our priority next step is to identify existing DMTs and design our path forward accordingly. [*William Booher: benchmarking what's out there is the top priority to avoid duplicating efforts and omitting gaps.*]

**Action item:** Megan will send out a call, prior to the Portland meeting, for submitting more *Questions* the Committee should consider addressing.

### **3b. What important data, metrics, and tools already exist? Of these products, what do we recommend for posting to the Resilience Knowledge Base (RKB)?**

(Please reference links collected in advance of this meeting.)

Megan opened up the floor for suggestions of existing DMTs for review and possibly approval by the Coordinating Committee for posting to the Resilience Knowledge Base (RKB).

#### ***Sources for DMT documents:***

- **William Booher:** We could reach out to US Conference of Mayors, the National League of Cities, and the National Association of Counties since they are the community representatives. Several communities have begun resilience-based activities over the last couple of years. They will be a great starting point. Perhaps we can even ask them to reach

- out and find out what local communities are doing in terms of resilience planning. *[Megan: Excellent point. we should continue this discussion further in Portland as to how to reach out to these organizations and collect information in an effective and systematic way.]*
- *Paolo Bocchini:* the NIST Resilience Fellows, [NIST Resilience Guidelines](#), and the [NIST Center of Excellence \(COE\)](#) should have done a comprehensive literature review, we should start from there.
  - *Louis Conway:* The ISO is very interested in the topic of resilience. It will be worthwhile to determine whether there are [ISO documents](#) on resilience.
  - *Jeff Rubin:* [The National Resilience Council \(NRC\)](#) has a [Committee on Measures of Community Resilience](#). The existing literature would be enormous, so trying to narrow the field would be useful. The [NIST report](#) itself has a substantial list of existing assessment tools, comparing strengths and weaknesses: no single ideal system.
  - *Ting Lin:* [UNAVCO](#), [US Resiliency Council](#) and the [Arup City Resilience Framework](#) are great resources. *[Please reference document DMT Links (dated 03/18/2016) for web links.]*

**Action item:** Megan will send out a call, prior to the Portland meeting, for submitting more DMT Links, and for volunteers to review those documents/links and to present a summary at the Portland meeting. Preferably, the person who recommended a document will also volunteer to review that document and present summary in Portland. *[See Portland meeting agenda items in section 3.]*

**Data Structures of the DMT documents:**

- *Jerry Brashear:* The massive body of literature is overwhelming. We perhaps need to identify specific topics we would like to address. *[Megan Clifford: It is very important to design a good data structure. One possibility is to align the subjects/topics with the six planning steps.<sup>1</sup> Jerry Brashear and Paolo Bocchini concur.]* *[There is more discussion in 3c on working groups.]*
- *James Arnott:* A recent paper survey on climate adaptation indicators and metrics found that there are large differences between indicators (or metrics) that were developed by implementers versus those developed by academics and researchers versus those developed by funders of adaptation versus those developed by supporting organizations, such as boundary organizations. Who the indicators are developed by and developed for makes a huge difference. *[Megan Clifford: A way forward might be, e.g., within each of the six steps mentioned above, to identify developers and potential users for each category of data/metrics/tools.]*
- *William Booher and Jerry Brashear* engaged in a discussion on *systematic* data structure for reviewing and cataloging data/metric/tools versus a more *hazard-specific* data structure.

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<sup>1</sup> Defined in NIST Community Resilience Planning Guide (2015), Volume I, page 5, as the six planning steps to achieve community resilience, i.e. Step 1. Form a Collaborative Planning Team; Step 2. Understand the Situation; Step 3. Determine Goals and Objectives; Step 4. Plan Development; Step 5. Plan Preparation, Review, and Approval; Step 6. Plan Implementation and Maintenance.

*[Paolo Bocchini: I think both perspectives are important and both are under the scope of our Committee. Megan Clifford: This healthy dialogue highlights the need to cover the spectrum of specific to systematic within our committee. While we are interested in both, some specifics might be addressed in other standing committees.]*

**3c. How do we work effectively as a group? (e.g., form smaller working groups by hazard, topic, question, etc.)?**

- Megan asked everyone to help recruiting new members, especially representatives from the state and local government community.
- A brief discussion on establishing working groups quickly achieved consensus: the preferred path forward is breaking up into small working groups, each focusing on a different subject/topic.
- Megan proposed the following grouping mechanism, emphasizing this can serve as a starting point and we should reevaluate the format after a few months and be flexible going forward. *[Bruce, Duane concurred.]*

Group A (aligned with Planning Steps 1&2) – data

Group B (aligned with Planning Steps 3&4) – metrics

Group C (aligned with Planning Steps 5&6) – implementation tools, use cases, etc.

**Action item:** Megan to solicit committee members’ areas of expertise and preferences on the working groups prior to the Portland meeting. Based on the responses, the committee will officially form three working groups, and each working group will have an opportunity to discuss and outline their work plan in Portland. *[See the Portland meeting agenda items in session 3.]*

- *Jerry Brashear:* There might be a need for a coordination and communication mechanism among the three working groups. Lin: we can encourage resource sharing between working groups. *[Megan: Great point. The committee leadership will take on the role of coordinating among the working groups. Jerry could also help in that regards, if interested and willing.]*

**3d. Do we want a member of our committee to serve on another committee to promote integration across the entire Community Resilience Panel?**

The consensus is YES. The volunteers for each standing committee are:

<b>Standing Committee</b>	<b>DMT Representatives</b>
Transportation	Paolo Bocchini
Water and wastewater	Frederic Petit
Buildings and facilities	Ting Lin; Louis Conway
Social & economic	Jeff Rubin; James Arnott; Keely Maxwell
Energy	TBD
Communication	TBD

**Action item:** Megan will send out a call, prior to the Portland meeting, for volunteers to act as representatives in the Energy and Communication Standing Committees.

- *William Booher:* NIST has a summer internship program. We might be able to ask for a couple of short-term interns to help put together a list of literatures in a manageable form for us. [Megan: Agreed. I will follow up in Portland with NIST and see if and how we can build such internship programs into the Committee resourcing structure].

#### **4. Plan for Portland, Oregon**

**How do we want to spend our time in Portland? In other words, what are your recommendations for discussion topics?**

Megan proposed following tentative meeting agenda items:

- Form three working groups (see 3c) – all committee members
- Discuss/outline work plans – each working group, then the Committee as a whole
- Present DMT documents and web links – volunteers (see action item in 3b)
- FEMA activity updates (~30 mins) – FEMA personnel
- NIST COE updates – Bruce R. Ellingwood, NIST COE Co-director

**Action item:** Megan to distribute a finalized agenda prior to the Portland meeting and to explore the possibilities for remote participation to the breakout discussions.

#### **5. Request for volunteers**

**5a. Volunteers still needed for Energy and Communication Committees.** [See action item in 3d.]

**5b. Volunteers are needed to review existing documentation and products and make recommendations to include or not to include in RKB.** [See action item in 3b.]

**5c. Volunteers are needed to assist in defining “tags” and organizational construct for the RKB.**

**Action item:** Megan will send a call for volunteers to be involved in the RKB.

#### **6. Meeting is adjourned.**