

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

MEETING DATE: Wednesday, September 21, 2016 to Thursday, September 22, 2016

TIME: 1:30 – 5:00 PM MDT Wednesday, September 21, 2016;
8:00 – 10:00 AM MDT Thursday, September 22, 2016

ISSUE DATE: November 14, 2016

ATTENDEES:

Attendee	Affiliation
Megan Clifford [Chair]	Argonne National Laboratory
Paolo Bocchini [Vice-Chair]	Lehigh University
Ting Lin [Secretary]	Marquette University
Brendan Doyle	EPA
Bruce Ellingwood	Colorado State University
David Bonowitz	NCSEA
Edward Thomas	Natural Hazard Mitigation Association
Eleanore Hajian	DHS S&T Office of University Programs
Ellie Graeden	Talus Analytics
Floyd DesChamps <Remote>	The Desner Group, LLC
Frank Lavelle	ARA
James Arnott	Aspen Global Change Institute
Jay Raskin	Jay Raskin Architect
Jeff Rubin	Tualatin Valley Fire & Rescue
Jim Barrett	Xentity Corporation
Joe O’Keefe	DHS
Judith Mitrani-Reiser	NIST / Johns Hopkins University
Ken Harrison	NIST
Laura Clemons	CBI [Social & Economic Committee]
Leanne Aaby <Remote>	LMI
Liesel Ritchie	NIST Fellow
Louis Conway <Remote>	Architectural Institute of BC (AIBC) Post Disaster Response Committee
Mat Heyman	Impresa Management Solution
Megan Housewright	NFPA
Michael Molnia <Remote>	DHS S&T Office of University Programs
Molly O’Donnell	Boulder County Collaborative
Scott Behunin	DHS
Stephen Clawson	Facility Engineering Associates, P.C.

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NOTES BY: Ting Lin, Marquette University

1. Welcome (Day 1)

Megan Clifford (Chair) called the meeting to order. Megan thanked attendees for participating both in-person and remotely, and welcomed new members who joined DMT in Colorado. All attendees gave brief introductions to learn about each other's backgrounds.

2. Meeting Logistics

The DMT committee documents, including past meeting minutes (see “1. Meetings”) and member contributions (see “3. DMT Links & Presentations”), have been shared among members via Dropbox. The folder related to this meeting is “1. Meetings/f. 21Sep2016_FortCollins,CO”.

Megan proposed a motion to approve the September 9th Meeting Minutes (moved by Paolo, seconded by Eleanore). The committee unanimously approved (see “3-NIST DMT Committee Meeting Minutes 9-9-16_DRAFT”).

Megan reviewed the September 21st to 22nd Meeting Agenda and proposed a motion (moved by Jeff, seconded by Paolo). The committee unanimously approved the agenda, and agreed on Jeff's proposal to leave room for 2nd day agenda modification based on 1st day activities and progress (see “2-NIST DMT Committee Meeting Agenda_9-21 and 22-16”).

Ting outlined a plan for the DMT report out from all working groups, and suggested working groups draft the report out slides based on progress to date, e.g., “strawman” spreadsheets developed by Group A (see “7-NIST DMT Group A - Data_Source_Collection_20160915” and “8-NIST DMT Group A - Data and Metrics List - Steps 1 and 2_20160915_v02”), White House National Security Council (WH NSC) resilience metrics mapped by Group B, and a white paper drafted by Group C (see “9-NIST DMT Group C_Portfolio Management and Decision Making_9-19-16”).

3. Committee Discussion of Working Group Progress and Recommendations for CRPCC & RKB

Overview: Megan provided an overview of the DMT committee and progress to date, including Working Groups A, B, and C, as well as the Resilience Knowledge Base (RKB) subcommittee with representatives from all NIST CRP committees. Megan requested the NIST fellow list along with their contributions and color coded the list based on DMT working groups (see “5-NIST Fellows Updated GuideBriefs_List_Master_with DMT Coding”) prior to the Colorado meeting. As a result, three fellows will share their work during working group breakout sessions.

Action Items: Megan encouraged any interested DMT members to participate in the upcoming (2nd) RKB meeting at noon on Thursday, September 22, 2016. Ting shared the DMT Dropbox with new members who would like access.

Resilience Knowledge Base (RKB): James inquired about the history of RKB. Paolo responded that RKB is the ultimate goal of CRP per Jay's morning presentation (agenda posted as “1-FortCollins_MeetingAgenda”). Jeff mentioned that RKB might not be clearly defined at the moment, and Mat pointed out that CRP will include products of the Panel based on gaps identified. Frank agreed that RKB will not be the only product of CRP. In response to the DMT committee's request, Megan will press for a clear statement of what RKB is and is not.

Eleanore stressed the importance of value-added contributions. Since there are endless resources available, it would be helpful to focus on the data, metrics, and tools that better enable a community to

implement the NIST Guide. This committee could help address some of the challenges in practical application, e.g., Joe's Fort Collins implementation. A potential next step is to talk to the communities highlighted in the panel morning presentations in order to identify helpful resources to address their challenges.

Megan highlighted the difference between the Portland and Colorado panel meetings: in Portland, we asked general questions of what already exists to identify gaps to guide impactful products for the working groups; in Colorado, we would have the opportunity to address specific challenges from communities using the Guide and focus on efforts most helpful for implementation.

Brendan Doyle joined the DMT committee because the US Environmental Protection Agency (EPA) is a new Federal co-sponsor of the Panel. He referred to similar resilience efforts by other organizations, e.g., the National Academies and its roundtable with six communities, and recommended a closer look at what was done elsewhere to find the niche of the Panel. Bruce pointed out that the NIST Center of Excellence (COE) focuses on developing physics-based impacts and that its mission is different from but consistent with the NIST Guide and economic document. Joe mentioned that the Fort Collins community followed resilience implementation per the NIST Guide to the letter. Bruce raised the potential need for supervision in community implementation and recommended “hot links” to appropriate publications to answer why communities do what they do and how to do it.

Mat stated that the CRP has a unique role and NIST would welcome Eleanore's proposal. Megan suggested that RKB could be a supplement to the NIST Guide, e.g., with links to the EPA tool, US Census Bureau data, and additional resources. Bruce followed that such links would not be exhaustive: as every organization develops its data and resources with a specific objective, these links could aim to provide enough information for intelligent users. Ellie Graeden, a new DMT member from Talus Analytics, supported Eleanore's proposal and pointed out that references would not necessarily be academic literature, but perhaps step-by-step guides that drive practical implementation, with contributions based on expertise of this group to fill in what is lacking. David Bonowitz, a new DMT member from NCSEA, noted that this committee can be and should be the authority in advancing resilience standards or codes that would result in substantial change in practice. Jeff added that four regional workshops were held to draft the NIST Guide, standards and codes were part of the discussion, but it would be hard to turn the guide to standards: while it might be ok for the built environment, it was difficult and not intended to be a standard for the non-built environment.

Paolo referred to Eleanore and Jeff's points as well as the panel morning presentations to emphasize that one role of the CRP is to identify gaps in the NIST Guide, and interviews with implementation communities could be the potential modification of the second day agenda proposed by Jeff. Bruce noted that in NIST's vision, the NIST Guide Briefs have the role of expanding the NIST Guide to clarify the applications of the NIST Guide. One of the roles of the CRP would be to recommend resources for NIST fellows to write the Guide Briefs.

Megan pointed out that Leanne from Working Group C already drafted a white paper (available for DMT committee review) to recommend what NIST-funded entities could do. Molly O'Donnell, a new DMT member with implementation experience via Boulder County Collaborative, asked DMT members about their experience with the NIST Guide Briefs; Mat, Frank, and Molly responded that they were reviewers of the Guide Briefs.

Mat noted that fellows would welcome comments from the CRP. Megan followed that we should be helping to influence what Guide Briefs are developed. Frank provided additional background that the Guide Briefs started before community implementation, and that future versions could respond to the

CRP and implementation communities to address critical steps or issues. Mat shared he spoke to two NIST fellows, who we will hear from regarding activities from Steps 1-2. Paolo suggested the committee help channel the next round of Guide Briefs prior to the next meeting in Florida. Frank agreed it would be helpful and productive to provide recommendations regarding specific topics to include in the Guide Briefs.

Judith Mitrani-Reiser from NIST summarized the converging ideas observed in DMT committee discussions: this committee can recommend future Guide Briefs, informed by data gathered by Eleanore, Jeff, and others; community implementation experience by Joe and Molly; and hot links recommended by Bruce. Megan noted that the CRP/DMT does not have the time and resources to work on products, but can influence the directions and drive the results of those funded, e.g., by Judith's program, to make products, and subsequently inform other programs such as EPA and HUD. Paolo added that this clarified role would be more aligned with how the CRP was presented in November 2015 as a forum of stakeholders to sharpen the focus of community resilience.

Working Group Progress: Group A Coordinator Eleanore circulated the Group A product, thanks to major contributor Mike. The approach was to break down the NIST Guide Steps 1-2 into sub-steps and develop a spreadsheet following the WH NSC taxonomy, with an eye towards value adding for community implementation. Besides major references such as the NIST Guide and FEMA Mitigation Framework Leadership Group (MitFLG) draft, additional resources include those contributed by Group A members, e.g., the American Red Cross Guidebook for Creating Resilience Networks contributed by Mat. The next step would be to get feedback from communities regarding data sources. As a result of this discussion, Molly joined Group A, thanks to Megan's recommendation. Megan pointed out that some other committees characterized resources according to hazard/disaster type. Ting suggested the DMT committee could look at the Buildings and Facilities committee' approach of hazard scenarios to identify common resources across hazards/communities. James remarked that there is a substantial amount of work by Group A and inquired about the sustainability of such contribution, perhaps as a "live" document. Ting mentioned a wiki as a "live" option, or perhaps having both paper and online versions such as that of the Encyclopedia of Earthquake Engineering.

Table 1: Working Group Membership

Legend:

** indicates working group members present in Portland.*

^ indicates working group members present in conference calls prior to the Colorado meeting.

+ indicates working group members present in the Colorado meeting.

GROUP A – DATA (Steps 1&2)	GROUP B – METRICS (Steps 3&4)	GROUP C – TOOLS (Steps 5&6)
Bev Corwin	James Arnott*^+	Leanne Aaby^+
Eleanore Hajian *^+	Paolo Bocchini*^+	Jerry Brashear^
Mat Heyman*^+	Donald Byrne^	Megan Clifford ^+
Ting Lin*^+	Roy Emanuel	Bruce Ellingwood*+
Michael Molnia^+	Aaron Marks *^	Frank Lavelle*^+
Molly O'Donnell+	Jeff Rubin*^+	Emily Wasley Seyller*
Joe O'Keefe*^+	Duane Verner*^	Richard (Dick) Wright^
Fred Petit^		
Sunil Sinha^		
Wenjuan Sun^		

James questioned whether resources and documents come to us or we go to them. Paolo raised the need to establish rules for RKB, in terms of not only the process to add, but also to remove documents. Jim Barrett, a new DMT member from Xentity Corporation, noted that Molly's community implementation could be a living construct that matures across all dimensions for such a framework. Megan gave examples of data overlap with the Water and Wastewater committee, the NIST COE's role to develop tools, and the NIST fellows as subject matter experts. In response to Jim's question of powerful yet ill-defined "community" and targeted audience, Mat referred to the definition of "community" in the NIST Guide. Regarding James' notion of over-subscribed resilience outside the CRP, Mat stressed the CRP's focus on buildings and infrastructures based on various communities' needs.

Action Items: Group C still needs a coordinator. New DMT members: please indicate your preferred working group. If you are interested in being the Group C coordinator or joining any of the working groups, please contact the corresponding group coordinator and copy Ting and Megan.

Cross-Collaboration: Laura Clemons joined the DMT committee from the Social and Economic committee. She was surprised that the Social and Economic committee is working on a similar document as that of the DMT Group A. As a volunteer who spent many hours on developing such a document, she wondered how to make it more efficient across silos. Megan responded that the DMT committee was aware of this issue and, as the DMT Chair, she took a proactive approach earlier to email every committee chair, including the Social and Economic chair, to help with cross-collaboration. There are DMT members serving dual roles in other committees, and other committee members, e.g., Sunil Sinha from Water and Wastewater, joining DMT, to address the issue of "silos of excellence" in this panel. Paolo suggested that other committees could work on a similar template for the same communities that Buildings and Facilities committee used. Laura responded that Social and Economic committee was indeed using the same template. Judith recommended time set aside in meetings to allow committees to mix up for discussions. Ken Harrison from NIST emphasized that products should be driven by users. As a user, Molly noted that there have been more high-level federal resources, but users will need more information at the local level. Practicality is important, and conversational language is key for actual implementation. David suggested that we interface with the Rockefeller Foundation's resilience effort to get feedback, while Paolo noted the challenge of the Rockefeller effort not following the NIST Guide. David reiterated that building codes and standards need DMT. Louis responded that the Buildings and Facilities committee did pull out links to DMT. Jeff noted the important application of DMT to socio-economic aspects.

Action Items: The DMT committee has representatives in/from most committees. As an update from the last meeting, Jeff, James, and Keely are now included in Social & Economic committee, and Paolo in Transportation. To fill in the remaining committees, if you are interested in serving dual roles in Energy or Communications committee, please contact Ting and Megan.

4. NIST Fellows' Presentations to Working Groups

Donna Boyce presented her work related to Step 1 of the NIST Guide to Working Group A (Steps 1-2). This presentation is posted as "*12-Collaborative Planning Team_Boyce_09 21 16*".

Liesel Ritchie gave a presentation on her work related to Step 2 of the NIST Guide to Working Group A (Steps 1-2). This presentation is posted as "*13-Social Dimensions_Ritchie_09 21 16*". As a result of this meeting, Liesel will join the DMT committee.

Stuart McCafferty discussed his work with Working Group B & C (Steps 3-6). The referenced document had been distributed among DMT members prior to the in-person meeting as

“6-NIST Community Resilience Maturity Model User Guide V1.0”. The model is posted as “10-Community Resilience Maturity Model CRMM V2.1” and requested comment as “11-COMMENT FORM_Community Resilience Maturity Model”.

5. Committee Discussion of NIST Work

Groups B & C: Paolo said that Stuart McCafferty will distribute the CRMM survey discussed, and would appreciate specific and general feedback from DMT members.

Bruce pointed out potential challenges of users with general “Scientific American” level of understanding.

In response to Eleanore’s question about the purpose of using this tool, Megan answered that low scores could be used to indicate areas to focus on, but that there was no prioritization.

Group A: Jeff summarized the two NIST fellows’ presentations and pointed out potential refinements of questions to ask to address the less technical, especially socio-economic, aspects that would be useful for communities.

In response to Megan’s question regarding the status of the fellows’ work, Eleanore mentioned that the two fellows’ work were in review, and pointed out the need to better understand key aspects of communities in order to provide additional insights with helpful tools.

Action Items: DMT members will provide comments to Stuart McCafferty’s CRMM model. Based on the common themes observed from three NIST fellows’ presentations to three DMT working groups, Megan proposed modifying the 2nd day meeting agenda to allow time for Molly to speak from user perspectives of the NIST Guide, and encouraged DMT committee members to reach out to other committees to facilitate cross-pollination. The committee unanimously approved this “miraculous” (according to Jeff) modification.

6. Welcome and Debrief of CRPCC Meeting (Day 2)

Megan welcomed attendees of Day 2 DMT committee meeting and summarized observations from the CRPCC meeting she attended on Day 1 (meeting minutes available at https://www.crp-panel.org/wp-content/uploads/2016/02/CRPCC_Minutes_092116.pdf).

7. Presentation of Boulder Implementation Challenges

Molly started sharing her first-hand experience with the major difference between Fort Collins (start to finish) and Boulder’s (selective) implementation of the NIST Guide. Selective implementation eventually scales up to the whole Guide, along with outside references and resources to use. From the local government perspective, it would be good to have links to resources, explanations of what those can do for communities, and information regarding what to pull out, without requiring more research to implement. A practical implementation process with step-by-step resources for resilience is important. A first look at resources from organizations such as the International City Management Association (ICMA) is helpful. Handholding in certain phases of the project would be valuable. A comprehensive plan is necessary. Performance goals, such as recovery time and other meaningful measurements, are useful, but they are different from other plans local governments are familiar with, and so will require “translators” to effectively communicate to stakeholders. It is not easy to write a handy guide. Human connections - mentors can help deliver a clear process people are used to, to engage the local community to focus on

all-hazards community-wide performance goals. A data person is the most necessary element to make life easier for communities.

Questions and Comments:

Mat commented that organizations such as the ICMA have blogs.

Ellie asked when implementation handholding, independent of the Guide would be needed, as well as what might be useful for Molly's community: metadata aggregated to a comfortable level, templates to populate, and useful components of an implementation guide. Molly's response is summarized above.

David commented on the input and output of performance goals. Molly mentioned consideration of interdependencies and three tiers of goals, along with percentage targets. Paolo inquired about percentage of users in energy distributors, and Molly responded there was energy coordination towards minimum goals. Paolo mentioned the potential of energy to help local government. David pointed out the issue of information sharing, e.g., San Francisco Bay Area pressured utilities to share information, whereas Jeff noted the liability for assessing vulnerability and the benefit of involving telecommunication to set goals.

Judith shared the value of Bloomberg's 100 cities data-driven initiative, where experts work with local governments. She also gained experience working with local governments while at Johns Hopkins University. Molly agreed that such initiative helped changing the local conversation.

When Molly gave the example of watershed flooding, Brendan highlighted the importance of considering environmental resilience, which Jeff echoed. James asked about climate change: what may be incremental vs. transformational, and whether the Guide is sufficient for places like Jamestown. Molly noted that currently it may not be adequate for long-term stressors; time to recovery is shock-related; standards should apply to both long- and short-term stressors; as for performance goals, it is easier to translate criteria to officials via a checklist. Laura pointed out that the 100-year flood is a bare minimum and it is important to consider future adaptation to sea-level rise for resilience of places like Louisiana. Molly responded that at least by starting the process to get incremental progress, interim improvement can be made to alleviate immediate issues. Ken noted the importance of forward projections and adding resilience: proposed future projects should design for resilience. Molly agreed that there would eventually be changes to the flood plain – the Boulder community's consideration of 500-year event flow velocity is perhaps a first step.

Action Items: As a result of this discussion, Brendan shared the EPA's effort via "14-ResilientVA Conference Slides 031816 EDW" and will draft a white paper related to environmental resilience.

8. Report Out

Please refer to the presentation "4-Report_Out_Slides_StandingCommittees_Sept21-22_DMT" from Working Groups A (Eleanore), B (Paolo), and C (Megan). Megan summarized key observations from the DMT committee, including the opportunity to listen to community users like Molly to identify needs and gaps, the role of the committee to influence (not create) future products, and the continuation of DMT's initiative of cross-collaboration with other committees that started half a year ago.

Action Items: As a result of Social and Economic Committee member Laura's participation in DMT and observation of DMT Working Group A's data product, Social and Economic committee Vice Chair John Plodinec expressed collaboration interest with DMT in exploring data sources. Megan, Eleanore, and John will share documents and discuss next steps.