TMAC

Technical Mapping Advisory Council Meeting
October 29-30, 2020

TMAC Members
Doug Bellomo, Vice Chair
Nancy Blyler
Scott Giberson
Jeffrey Giering (day 1)
David Guignet
Suzanne Jiwani
Carey Johnson
Carolyn Kousky
David Love
Robert Mason
Salomon Miranda
James Nadeau (day 2)
Ngoc Nguyen
Jon Paoli
Luis Rodriguez
Jonathan Smith
Jeff Sparrow, Chair
Joshua Stuckey (day 2)
Michael Tischler

Government Attendees
Andy Neal, FEMA (day 1)
Emily Slater, FEMA (day 1)
John Ebersole, FEMA, Legal Advisor
Mike Grimm, FEMA
Brian Koper, FEMA ADFO
Michael Nakagaki, FEMA, DFO

Support Staff
Andrea Valladares, Team Deloitte
Annelise Buck, Team Deloitte
Henry Cauley, Team Deloitte
Alexis Richmond, Team Deloitte
Jen Marcy, Atkins Global
Molly Tuttle, AECOM
Phetmano Phannavong, Atkins Global
Ryan O'Conner, AECOM

Public Comment
Susan Gilson, National Association of Flood and Storm Water Management Agency (day 2)

Other Attendees

Purpose
The purpose of the virtual Technical Mapping Advisory Council Meeting is to: (1) make progress on the 2020 TMAC Annual Report, (2) review the results of the stakeholder engagement effort, (3) receive an update on Risk Rating 2.0, (4) go through each subcommittee's draft sections, and (5) discuss the TMAC's next steps and discuss what to recommendations to make to FEMA regarding the 2021 Tasking Memo

Day 1: October 29, 2020

Opening Remarks/Administration/Introductions

Mr. Michael Nakagaki, the FEMA Designated Federal Officer (DFO), welcomed members and participants to the meeting and introduced the Government attendees and support staff. He then proceeded with a roll call of TMAC members and went through the day's agenda. He provided an overview of the Zoom virtual meeting audio, chat, and voting functions. He reminded everyone of the Federal Advisory Committee Act (FACA) compliance provisions and reminded the members this would be a public meeting. Per FACA requirements, a public comment period would be held each day, offering the public the opportunity to provide remarks or feedback about the topics being considered for a vote. Mr. Nakagaki reported that there were no registered public comments for Day 1. Mr. Nakagaki noted that participants could still register for public comments via the TMAC email address or the Zoom chat function.

Introduction and Goals

Mr. Jeff Sparrow, Chair of the TMAC, put forth a motion to begin the meeting. Mr. Doug Bellomo seconded the motion. Mr. Nakagaki took a moment to remember and honor Mark Crowell, the original TMAC DFO and member of the future conditions subcommittee. He passed away on September 27, 2020. Mr. Nakagaki fondly remembered their bond over subjects such as paleontology and foraging for local food. Mr. Nakagaki held a moment of silence for Mark Crowell.

Mr. Sparrow thanked Mr. Nakagaki for his kind words about Mr. Crowell. Mr. Sparrow explained that the purpose of this meeting was to make progress on the 2020 TMAC report. He thanked the subcommittees for their hard work and effort on the report thus far. Mr. Sparrow noted that the TMAC will also go into the results of the stakeholder engagement effort thus far. He went on to explain that the TMAC would receive an update on Risk Rating 2.0. The TMAC would discuss next steps, as well as brainstorm what areas they would like to tackle as a council in 2021. Mr. Sparrow thanked everyone for attending the meeting virtually. He reminded everyone to please mute their phones unless they were actively speaking.

Survey/Focus Group Brief Out

Mr. David Love thanked Ms. Jen Marcy for her contribution to the stakeholder feedback effort. Ms. Marcy began by reviewing the stakeholder engagement plan, which included a survey, two webinars that included a smaller group of people, and smaller focus groups planned for the coming weeks. The focus groups would start the week after the TMAC meeting. Ms. Marcy detailed the survey and webinar tabular results. The survey received 973 responses from various stakeholders in the floodplain management sector. Stakeholders indicated that binary flood risk was not rated highly, and graduated risk scored better. Ms. Marcy noted over 60% of the stakeholders served by respondents may be considered non-technical stakeholders. The top tool or resource people indicated they wanted was more information to explain flood risk to non-technical audiences. Ms. Marcy noted it might be important to know how and why these stakeholders are engaged. She detailed that the webinar went into this question, and most stakeholders are engaged in small, in-person interactions. Ms. Marcy elaborated that the purpose

of these interactions differs for elected officials, homeowners, and developers. Respondents indicated they would like interactive tools for displaying data as needed. Ms. Marcy explained the team then tried to divide the audience to see how the results compare. The team landed on the divide between "users" and "producers." By categorizing the respondents, both serve the general public, and the team concluded that tools to communicate to nontechnical audiences might be a helpful takeaway. By combining and sorting the responses into categories, the insights that were gained included users need information for the general public, and users needed information for flood risk or insurance communications. Ms. Marcy then went through the free text results. Only 13% of the comments were not supportive of the shift from binary to graduated risk. The remaining comments were supportive or neutral. She noted full text answers can be included in an appendix in the official TMAC report. Many free response answers fell into the category of "specific recommendation," "guidance needs," and "specific concerns." In the specific concern category, transparency, resource constraints, community backlash, the 4-legged stool, quality control, duplication of efforts, urban flooding, and increased workload were common themes. Ms. Suzanne Jiwani noted in the chat, "I know that Indiana has had an incident with duplication of data. And the data wasn't consistent."

Ms. Marcy went on to explain the next question in the survey, which asked what FEMA should allow SLTTs to do more independently. The answers ranged from better use of community input into the flood hazard mapping process, allowing flexibility in local products on top of national-level best data, and allowing communities to map independently, a more streamlined LOMC process, no changes, and less independence. Ms. Marcy detailed the next question about how FEMA can create a more consistent flood risk message in the context of flood insurance, floodplain management, flood hazard mapping, and flood mitigation. The answers ranged from broaden stakeholder participation, interactive tools, national policy/process, product recommendation, and messaging. The next free response question asked how FEMA should utilize flood hazard mapping to enhance floodplain management and flood hazard mitigation. Connecting the "4 legs," providing online, interactive tools to visualize risk, specific technical requirements, better use of community-provided data, mapping the nation, using the mapping process to support other activities, and expanding non-regulatory products were common themes. The final free-text question asked if there was a topic the TMAC should address next year. The responses ranged from specific technical topics, next steps on probabilistic, future conditions, mapping the nation, connecting the "4 legs," specific studies, changes to the Mapping Program elements, continued engagement, and 44 CFR changes. Ms. Marcy went into the stakeholder engagement group's next steps. She questioned the TMAC about what they want from the data. She noted the focus groups started the following week and continue through early December, which involve FPA/Mitigators, insurance representatives, mappers, and two non-homogenous groups. She said TMAC members are welcome to attend and that the sessions would be recorded. She also discussed potential future engagement of groups that were not well represented in the survey. Ms. Marcy noted insurance and other groups were not well represented in the respondent group, and future engagements might involve these groups, dependent on next year's tasking.

Mr. Sparrow thanked Ms. Marcy for her presentation. Mr. Carey Johnson noted that the survey results contained very interesting data. All of the data provides interesting perspective on Section 3 of the report (Subcommittee 2), which the subcommittee might want to include in their section. Ms. Marcy asked Mr. Johnson if he noticed the same themes Ms. Marcy highlighted. Mr. Johnson affirmed Ms. Marcy's assessment. Ms. Marcy will provide her presentation to the TMAC members. Mr. Bellomo thanked Ms. Marcy and team for compiling this information. He elaborated that it provides a rich set of perspectives that will be useful to the TMAC. He asked if the data could be stripped of PII and provided to the TMAC members. Ms. Marcy agreed that the data should be shared. Mr. Bellomo proposed that the TMAC continue to do surveys so that they have a history of this data overtime. He went on to say the focus groups can be used as a sounding board for subcommittee recommendations. Ms. Marcy replied that the first focus group would happen next week. She noted she planned to send out the questions that the focus group would be asked. Ms. Marcy agreed to include questions that come out of the subcommittee conversations and any recommendations that come out of the TMAC meeting today for the focus groups.

Mr. Sparrow also agreed he likes the idea of sharing the data. He affirmed that the TMAC should continue to do these surveys to analyze trends. Mr. Luis Rodriguez thanked Ms. Marcy for the tremendous amount of information she provided. He explained FEMA has been wrestling internally with similar questions through the Future of Flood Risk Data (FFRD) initiative. Internally, FEMA will be focused on what they will develop next. There are roots, regulation, and statue in the program that currently exists. Mr. Rodriguez said surveys should continue on an ongoing continuum as the mapping program evolves. Mr. Scott Giberson said that the information was fantastic. He agreed with Mr. Johnson that he will need to edit his section based on the information from the presentation. Mr. Giberson elaborated that the focus on information, accuracy at the local level, and the user understanding and acceptance of products stood out to him. Mr. Giberson asked a clarifying question about respondents from the insurance stakeholder group. Ms. Marcy explained the number Mr. Giberson was referring to was about which stakeholders were served. He also asked how the focus group meetings will be organized. Ms. Marcy explained the first focus group meeting will be a welcome and orientation for the members. She also explained that the focus group participants were selected from the group of people that indicated that they would like to be involved and were then selected from a random number generator. The second focus group meeting will include open discussion and the third will go through recommendations and affirm understanding from the second meeting. The two non-homogenous focus groups will be used to help ground the results and recommendations. All sessions will be recorded. Ms. Marcy noted TMAC members can listen in to these meetings if they would like. A DFO will be there, and the meeting will run as more of a facilitated discussion. Mr. Giberson explained lenders see themselves as a very indirect user of the FEMA data and just want to be told what to do. They do not feel they know what is best for their borrowers. The climate change discussion has shifted this a bit, and they want to have faith in their products. Mr. Giberson elaborated that lenders may not see the value in providing their opinion. Mr. Giberson offered his help with the insurance focus group. Ms. Marcy noted that the survey was a little technical which may have deterred insurance stakeholders from responding

She offered that surveys can be tailored to insurance practitioners in the future. Mr. Sparrow agreed that it is important to further engage insurance folks in the future. Mr. Josh Stuckey asked about if the survey team was able to ask a question about what incentivizes states to undertake mitigation projects. Ms. Marcy said the survey did not include this question. She offered that it could be added to the focus group discussions. Mr. Rodriguez asked to what degree is there an effort to baseline information on what graduated risk analysis means to the audience, and more specifically, does the audience have enough context about what it means to shift from binary to graduated risk analysis. Ms. Marcy agreed this is probably a bit of a gap that exists in the survey. She elaborated that the survey included questions about how binary vs. graduated meets the needs of the respondents, but there is still a lot of confusion about what probabilistic is. The survey did include a table that incorporated the definitions of different types of risk. Mr. Bellomo also explained probabilistic risk assessment during the webinars. He elaborated, once there are prototypes, it might be helpful to do focus groups on those products. Once there are products to show stakeholders, the score may go up. Mr. Rodriguez pointed that there is a section in the TMAC report that might want to include this data. Mr. Sparrow noted that probabilistic and graduated are often used interchangeably, but these terms are not necessarily the same. The TMAC should be precise in using these terms. Ms. Jiwani agreed that this is an important point—the difference between binary and graduated is how risks are shown, but the difference between probabilistic and deterministic is how you calculate the risk. She continued, people like the Average Annualized Loss (AAL) metric and see that as more helpful in presenting risk to their communities. She also brought up that people start to worry about the "black box" in the calculation of the risk. Ms. Marcy agreed this is a good point; the angst comes from probabilistic risk assessment, not the graduated depiction of risk. Mr. Bellomo noted that there are subtleties that should be clarified with stakeholders. Mr. Rodriguez added that as FEMA has been exploring FFRD, when FEMA talks about shifting from a binary to graduated depiction of risk, FEMA means a probabilistic approach to data. Mr. Sparrow agreed the public may not have this knowledge. Mr. Rodriguez asked that this clarification should be included in the focus groups. Ms. Marcy agreed that is an important element to clarify. Mr. Robert Mason agreed the product versus the process is a very important piece of information to keep in mind. The probabilistic piece gives a chance to discuss uncertainties. Mr. Sparrow thanked Mr. Mason for his points.

Public Comment Period

Mr. Nakagaki opened the Public Comment Period. Per the FACA, the TMAC holds a public comment period, written or spoken, about any of the topics the TMAC discusses. If commenters have not registered, Mr. Nakagaki asked commenters to write in the Zoom chat. The public comment period should not exceed 30 minutes. Mr. Nakagaki noted that no written public comments were received before the meeting. No comments were received via Zoom or the phone line. Mr. Nakagaki formally closed the public comment period.

Survey/Focus Group Brief Out (Continued)

Mr. Sparrow resumed the conversation about the survey and focus group. Mr. Stuckey mentioned that the TMAC should ask themselves whether they are getting closer to structure-

specific risk and to keep the end user in mind. Mr. Sparrow brought up an element of feedback detailed in the survey brief out about the "4 legs of the stool need to be connected" and asked about the genesis of this comment and whether it came from Risk Rating 2.0. Ms. Marcy agreed that this comment probably did come from RR 2.0, as well as grants. Mr. Bellomo noted the interim, during the transition from binary to graduated risk, is where people are concerned about the connectivity of the "4 legs of the stool." This should be something the TMAC is focused on. Mr. Sparrow agreed it may be worth mentioning in the report that as the transition happens, the "4 legs" will stay intact. Ms. Jiwani noted there is a concern in the mitigation group that their needs will not be considered. Mitigation stakeholders should be in the mix as well, and their programs should be aligned. Mr. Rodriguez mentioned one of the recent pieces of feedback collected about FFRD is creating a value proposition. He explained, "why would a mitigation stakeholder use graduated risk?" is a question they asked themselves. He went on to say focusing on a value proposition might avoid this disconnection. Mr. Sparrow thanked Ms. Marcy, Mr. Love, and Mr. Neadeau for their work on the stakeholder engagement plan, survey, and focus groups. He noted the TMAC is looking forward to continuing the discussion of the focus groups at the next TMAC meeting.

Presentation – Risk Rating 2.0

Andy Neal and Emily Slater joined the meeting to discuss Risk Rating 2.0 (RR 2.0). Mr. Neal explained that since most people on the call are familiar with RR 2.0, he would not give the general overview he would give a non-technical audience. The RR 2.0 team wants to get to a place where people will know where and if a flood can happen. New risk considerations will represent a fuller reflection of flood risk through graduated data, including pluvial flooding, among others. Pluvial flood risks involve the flooding risks from heavy rainfall. RR 2.0 also identifies differences between inland and coastal risk. RR 2.0 takes into account modeling levees according to pluvial, fluvial, and coastal risk. RR 2.0 will also identify the variation of risk throughout the county. RR 2.0 modeling includes tsunami risk on the West Coast and will reflect flooding modeled in the Great Lakes. RR 2.0, through collaboration with the United States Army Corps of Engineers (USACE), modeled the risk of overtopping levees. Mr. Neal explained that there were data gaps when the RR 2.0 data gathering began, especially with tsunami and levee risk. The data gathering to complete RR 2.0 closed some of these gaps. RR 2.0 does not include dams, West Coast wave action, or alluvial fan flood models. Mr. Neal explained that the reason the RR 2.0 team is moving forward is that the rates need to reflect the updates gathered thus far. Mr. Neal further explained the rating process using a diagram developed by Mr. Will Lehman from the USACE. The diagram focused on the way rates are determined for properties near levees. Where levee data was not available, terrain data was used to estimate overtopping. Mr. Neal explained that multiple models are used to calculate and Average Annualized Loss (AAL). These estimations are used on a dataset of 90 million properties in the US. This helps with estimation. The multiple model view has helped the RR 2.0 team come up with a more accurate picture of flood risk throughout the United States. Mr. Neal detailed that the rating process uses GLN, Concentration Leads, Territory Factors, and State Allocations for a comprehensive rating process. He explained that some models will have zero risk, but most properties have an AAL $100/day. He followed by saying this is why historical validation is important. Single family

homes and non-single-family homes are separated into levee and non-levee risk categories. Mr. Neal emphasized the reflection of replacement cost value is important to bring into the idea of "what is your risk?" Mr. Neal went into the overview of lessons learned. He noted (1) many PRPs currently participating have been underpriced, and many who do not yet have policies could have lower premiums, (2) the same flood zones are not equal around the country, (3) pre-FIRM subsidies are not the main shortfall of the NFIP, (4) and the actual number of properties that are grandfathered is lower than previously estimated. Mr. Neal said that the calculation for someone's rate is not uncomplicated—there are geographic and structural variables. The calculation is exponentially more complicated for RR 2.0 than RR 1.0. There is however an increased simplicity in the use of the RR 2.0 model; the system is designed with the idea that flood risk is changing, and this new model is built to expect these changes. These changes are modeled against historical values, so rates do not exceed the 18% increase cap mandated by law. Mr. Neal concluded by saying RR 2.0 will be launched in October 2021. Mr. Sparrow opened the floor for questions.

Mr. Stuckey noted that the RR 1.0 process does not have enough to balance out the "good risk" with "bad risk." Mr. Stuckey continued that his area, Houston, probably has a high concentration load, and this will make it difficult to push flood insurance. Mr. Stuckey suggested offering policies to balance this "bad risk." Mr. Neal explained there is a cost to produce the NFIP. The cost of risk transfer needs to be priced in. Mr. Bellomo thanked Mr. Neal for his presentation. He asked about showing homeowners their actuarial rate vs. their rate with subsidies, and how connected is flood insurance pricing with variances at the micro level e.g. building codes? Mr. Bellomo continued land use and building decisions should impact price, so the risk level is appropriate for the structure they are working with. He wondered if the connection is strong enough that people will get the right idea? Mr. Neal explained that there are incentives in the new rating plan that impact how people build their houses. He elaborated, for every foot of elevation of your first-floor height above your flooding source, the premium is radically reduced. If a structure is elevated on piles vs. a wall, the premiums are priced accordingly. The safer the building, the greater the incentive is. He concluded by saying pricing will be reflected in communities that really go above and beyond. Ms. Jiwani asked about the risks they are not considering, such as dams and alluvial fans, and whether they are priced into the models. Mr. Neal answered this data is indirectly included in historical data. Ms. Jiwani followed up by asking whether if this data was available, would it be included in the model? Mr. Neal said yes, and an example of this is the inclusion of the Great Lakes data. Mr. Sparrow thanked Mr. Neal for his time and asked him if he would answer the rest of the TMAC's questions via email. Mr. Neal replied that he would respond to the questions via email, but that there is a review process on RR 2.0 inquiries. Mr. Sparrow instructed TMAC members who still have questions to email Mr. Sparrow and Mr. Nakagaki. Mr. Neal left the call. Ms. Kousky asked the TMAC why you could not take the modeling from RR 2.0 to make a flood risk heat map? Mr. Bellomo answered the challenge associated with having a federal agency roll that information out has equity implications and opens the government up to challenges. There may be public policy hurdles and consequences. Mr. Love's community did a structural analysis a few years ago and the community did not want it to be made public because of the reasons Mr. Bellomo raised.

Subcommittee 1 Briefing

Mr. Sparrow invited Mr. Bellomo and Mr. Guignet to give Subcommittee 1's updates. Mr. Bellomo explained that Subcommittee 1 considered the feedback from the TMAC's previous meeting and that their section is still a work in progress.

Mr. Love began by detailing Section 2.1. He explained that this section included the stakeholder engagement information. which was detailed this morning by Ms. Marcy. Mr. Love noted the subcommittee would add to the section based on the morning presentation. Mr. love explained the section begins by detailing the three-pronged stakeholder engagement approach: the survey, the webinar, and the focus groups. He elaborated that respondents were split into users and producers of the map. He noted people are looking for information to support flood risk or insurance communications and enhanced modeling information. Mr. Love explained the results of the survey are included, which may need to be updated based on Ms. Marcy's presentation. Mr. Love then explained the next section goes into the Webinar series. The webinar series began with Mr. Bellomo explaining the stakeholder engagement process and the difference between binary vs. graduated risk. Mr. Love continued that the next part of the section goes through the focus group process which would occur the coming weeks. Mr. Love noted that his analysis of the results differs slightly from Ms. Marcy's. Mr. Nadeau added more information about the statistic that 26% of survey respondents ranked the expected usefulness of graduated risk data over binary risk data. He noted the number may be so low because the program is misunderstood. He asked the group whether they should expand the survey reach. Mr. Nadeau explained that there is a real need for knowledge about the program at the community level. Mr. Sparrow noted the schedule may not allow for time to expand the reach of the survey. He went on to say that next year, the TMAC could continue this level of stakeholder engagement to expand the respondent pool. Mr. Bellomo brought up the idea of a conclusion section for this chapter, which may be useful to determine the takeaways. Mr. Bellomo also noted that the TMAC should be careful to not repeat recommendations from years prior. Mr. Sparrow replied that this year's report may not need include recommendations, or recommendations can be included at the end of each chapter. Mr. Sparrow agreed that the survey sections could have a summary section, but not all sections may not need an official conclusion paragraph.

Mr. Bellomo, in his Section 2.2, incorporated the vision statement from last month's meeting. He explained because the TMAC moved to a concise vision statement, the subcommittee included context around the vision statement in the section. He went into detail about the Risk-Informed Decision section, Adaptive Strategies section, Natural Beneficial Floodplain Function section, and a User-Centric Design section. He related this user-centric design to Mr. Neal's sentiment of "it is going to flood; I want to know about it" that he brough up during the RR 2.0 presentation. Mr. Bellomo cautioned the TMAC that some communities do not share this sentiment. Mr. Bellomo then went through the conclusion paragraph. Mr. Rodriguez added that there is a larger

movement toward reducing disaster suffering, and the NFIP is changing to reduce disaster suffering. Mr. Rodriguez explained that these changes are seen through RR 2.0 and FFRD. Ms. Jiwani commented that the Partnerships and Collaboration section seemed out of order to her. Mr. Bellomo agreed, and he will reorder the section. Ms. Jiwani also suggested removing the word "conclusion" from the final section, in effect having a final paragraph but not labeling it conclusion. Mr. Mason noted that the final paragraph seems like a reiteration of the introduction paragraph. The introduction mentions three elements while the final paragraph only incorporates two. Mr. Rodriguez indicated the subcommittee would address this.

Mr. Guignet detailed Section 2.3. Mr. Guignet thanked Mr. Will Lehman from the USACE for his help with this section, which details graduated flood risk. This section explains the "in vs. out" nature of the current system. Mr. Guignet explained the section is more of a summary of graduated risk, with a more detailed explanation in the appendix. Mr. Guignet also detailed the efforts of reaching out to states for best practices, such as North Carolina, Iowa, Washington, Vermont, and Colorado. Then, Mr. Guignet explained the section goes into First Street Foundation and their use of graduated data as a best practice. The section goes onto explain other probabilistic approaches. Mr. Guignet said the conclusion goes into the reality that no one entity is fully using probabilistic approaches; it is a slow change that is currently happening. Ms. Jiwani remarked that she really enjoyed the write up on probabilistic approaches. She emphasized it is important that the report emphasize that these are some examples of best practices, not a comprehensive list. There may be issues for states in terms of transparency when it comes to probabilistic data, therefore, there will have to be guidelines for gathering the data. Mr. Mason questioned whether probabilistic data needs to be included in the level of data that is included, since this brings in questions of uncertainty in the models. Mr. Guignet explained he was lost until he read this section and wonders if other readers will be. Ms. Jiwani agreed that this section should stay and is an important factor we should be including. Mr. Bellomo added that the TMAC needed to break from the idea of having "an answer," because there may be multiple answers. He continued by saying in order to start changing the discussion, the TMAC has to push this idea that things are not binary. Mr. Mason added that it needs to be clear that probabilistic risk analysis needs to be identified as a method to get to graduated risk, but it is not the only method. Mr. Rodriguez noted he liked the section as it is a good level set for probabilistic data. Through FEMA's exploration, it feels as if they are trying to find others to buy into the change. Mr. Rodriguez asked the TMAC to consider a case for change paragraph within this section. Mr. Rodriguez explained the hypothesis is that by tapping into probabilistic data, decision making can be improved; a section about a modern enterprise risk framework might be worth including, perhaps in the introduction. Mr. Miranda commented that the mention of RR 2.0 in the introductory paragraph may warrant more of an explanation based on the presentation from the RR 2.0 team. Mr. Sparrow suggested also including a suggestion about the "4 legs of the stool" and keeping the stool together as this was mentioned as a concern from the survey this morning. Mr. Giberson will send Mr. Guignet some specific edits. He suggested including more about floodplain management in the introductory paragraph. Mr. Giberson remarked that the First Street Foundation paragraph seems like a sales paragraph, and the section might benefit from information about other catastrophic models. Mr. Sparrow agreed he felt the same way about the

First Street Foundation section. He continued, emphasizing its application of the data available may be a more relevant angle. Mr. Mason asked whether the English are undertaking a similar effort, and it may be worth adding if that is the case.

Closing Remarks

Mr. Sparrow concluded the meeting by saying that the TMAC will continue their discussion of Subcommittee 1's section tomorrow. He also asked the TMAC to consider what the TMAC should focus on in 2021 for discussion tomorrow. He thanked everyone for their participation.

Adjournment

Mr. Sparrow adjourned day one of the TMAC public meeting.

Day 2: October 30, 2020

Opening Remarks/Admin

Michael Nakagaki, TMAC DFO, welcomed everyone back to the second day of the TMAC Public Meeting. He then proceeded with a roll call of TMAC members and went through the day's agenda. Mr. Nakagaki provided an overview of the Zoom virtual meeting functions. He reminded everyone of the Federal Advisory Committee Act (FACA) compliance provisions and reminded the members that this meeting would be a public meeting. Per FACA requirements, a public comment period would be held each day, offering the public the opportunity to provide remarks or feedback about the topics being considered for a vote.

Introduction and Goals

Mr. Jeff Sparrow motioned to start the meeting.
Mr. Sparrow then welcomed everyone back and provided an overview for day two of the TMAC Public Meeting. Mr. Sparrow yielded the time to continue discussion of Subcommittee 1's sections.

Subcommittee 1 Briefing Continued

Mr. Sparrow alerted Subcommittee 1 to a minor typo in their section. Mr. Giberson brought up the question of what is meant by "metrics" in the probabilistic flood section. He also noted that the figure depicting graduated risk could be misleading, and the subcommittee should consider adding a graphic that shows more risk depiction. Mr. Giberson asked, if probabilistic is where FEMA is going, what does mandatory purchase look like? How does probabilistic work to satisfy the regulatory requirements? Mr. Guignet answered that that discussion should be had as a group and maybe included another section of the report. Mr. Johnson agreed that the discussion of mandatory purchase belongs in another chapter. Mr. Guignet suggested laying the groundwork for that discussion in his section. The TMAC added a placeholder for an introductory paragraph about mandatory purchase in Section 2.3. Mr. Mason suggested this section is where the TMAC should acknowledge elements of the current mapping program that have to be kept. Mr. Rodriguez elaborated that part of what the subcommittee was trying to convey in this section was an acknowledgement of what is required for change and to demonstrate that there is a different

way to think about the national flood risk management problem that they are trying to solve. The structure of the future is very different than the structure that exists today, i.e. a value proposition. Mr. Guignet suggested including this notion as a conclusion. Mr. Bellomo agreed that he can make the value proposition somewhere in his section. Mr. Bellomo suggested including mandatory purchase requirements and whether they will even be necessary for the future of the program. Ms. Jiwani noted that some of the comments that have been brought up are addressed in Section 2.4. Ms. Jiwani asked if the section should be moved elsewhere for improved flow and clarity. Mr. Mason pointed to Section to 2.2.3 and suggested including a note about including a note about insurance for those out on the 1-percent-annual floodplain. He also commented that there is nothing inherently conflicting with a mandatory purchase requirement and graduated risk.

Mr. Nadeau began to discuss his section. He stated that he is a land surveyor and a realtor, and it seems like personalizing the program at the community level is worth considering. He tried to address disconnects that the program has that will need to be addressed in the shift from binary to graduated risk. Understanding the difference between a hazard and risk was integral to his section. Including mitigation as the "4th leg" of the stool and the stakeholder engagement survey led him to conclude that the process really needs to be personalized to the community. He continued by saying behavioral change and education needs to be emphasized. He noted understanding the National Flood Insurance Program (NFIP) amid climate change will be important for stakeholders. Mr. Nadeau then detailed data and software limitations. He explained the importance in the difference between precision and accuracy for the graduated system to work. Communities and stakeholders need to be educated about this uncertainty about risk, which will always exist in the program. Mr. Nadeau's next section suggested that flood consultants should have a higher level of education. Mr. Neadeau emphasized the importance of stakeholder education. He concluded by discussing a real estate disclosure. Not all states have statutes about real estate disclosure, and sometimes, it eliminates the need to disclose the flooding risk about a property. Mr. Nadeau detailed a real-world example he experienced involving a real estate agent marketing a property as "coming out of the flood zone" even though updated maps would eventually put the property back into the flood zone. Finally, Mr. Nadeau explained that higher education is starting to include floodplain management as a major, which is important progress in training more educated floodplain managers. He reiterated that more engagement is needed at the community level, and stakeholders need more education and knowledge at the community level. Ms. Jiwani suggested adding state examples to the suggestion about licensed land surveyors. She also asked about his recommendation to increase education for floodplain consulting. Mr. Nadeau answered that he would suggest continuing education for any type of floodplain consulting. Mr. Mason brought up the uncertainty issue and the graduated risk product. He suggested edits for Section 2.4 based on this sentiment. Mr. Bellomo cautioned the group that there is no product that FEMA can develop to make everyone an expert on flood risk data. He complimented Mr. Nadeau on his suggestions but noted there was no mention of the best way to depict graduated risk. Mr. Nadeau agreed and noted his section did not include maps. Mr. Nadeau dropped from the call.

Mr. Stuckey continued on with an explanation of Section 2.5. He explained that the section details how to incentivize communities to prioritize mitigation. He provided background by saying many communities only invest in mitigation after a disaster. Mr. Stuckey also provided a description of the verb vs. noun of floodplain management. His recommendation was to study why communities sell bonds to pay for mitigation projects. He noted the primary incentive has been found to be the Community Rating System (CRS). He explained the incentive is received by the consumer of the NFIP, not the community. Therefore, it may be more expensive, and the benefit does not go to the community. Mr. Stuckey suggested a connection between CRS and mitigation projects. He elaborated that his recommendation was to study what incentivizes communities to go above minimum floodplain management standards. Ms. Jiwani noted that there are many mitigation projects in Minnesota, and there are ways that are not associated with FEMA that incentivize mitigation. She remarked that Mr. Stuckey's section may be slightly too centered on FEMA program, and it might be worth discussing what states are doing outside of the FEMA program. Ms. Jiwani concluded that mitigation should be considered when setting insurance rates. Mr. Stuckey brought up how to incentivize Letters of Map Change (LOMC), which currently reduces premiums for the buyer. Mr. Mason shifted the conversation to the second paragraph of the section and suggested an amendment. Mr. Mason also suggested focusing less on whether FEMA has been successful and focusing more on studying the value or benefit of the higher standards. Mr. Stuckey added on it might also be interesting to study what incentivizes a community to adopt higher standards. Mr. Neadeau added that mitigation actions that protect the community long term and analyzing the costs and benefits cumulatively might be interesting and make incentives more tangible. Mr. Bellomo brought up a thought about the mandatory purchase requirement and the notion that it is tied to the Average Annualized Loss (AAL) and the value of the structure. Mr. Bellomo continued that having the mandatory purchase requirement tied to the risk might have an impact on the way homes are built. Mr. Stuckey noted that recommendation would require a federal law change. Mr. Stuckey explained that change would drive the homeowner or developer based on the cost. He said he would consider adding the suggestion to the section.

Mr. Nadeau continued the discussion of his section after briefly dropping off the call due to tech issues. Mr. Sparrow offered a few edits to his section. Mr. Miranda suggested adding to the Expanded Real Estate Disclosure section that the First Street Foundation and FEMA data are now included on realtor.com home listings. Mr. Nadeau countered that this causes the "in or out" attitude to persist. Mr. Sparrow added one more comment and asked Mr. Nadeau to explore if the University of Florida also has a floodplain management program. Mr. Sparrow offered to put Mr. Nadeau in contact with the ASFPM Higher Education Committee. Ms. Kousky clarified the First Street information included on realtor.com is for consumers and not realtors. Ms. Kousky echoed that graduated risk vs. uncertainty needs to be clarified from the document. She also made comments about how the information available to the consumer is not sufficient for decision making. She continued that there was some overlap between some of the sections. Mr. Mason asked if one of the surveys referenced was footnoted or referenced. Mr. Nadeau said he would include this reference. Mr. Sparrow paused the discussion for the public comment period.

Public Comment Period

Mr. Nakagaki opened the Public Comment Period. Per the FACA, the TMAC holds a public comment period, written or spoken, about any of the topics the TMAC discusses. If commenters had not registered, Mr. Nakagaki asked commenters to write in the Zoom chat. The public comment period should not exceed 30 minutes. Mr. Nakagaki noted that no public comments were received before the meeting.

Ms. Susan Gilson of the National Association of Flood and Stormwater Management Agencies (NAFSMA) She thanked the TMAC for their great work. She cautioned the TMAC against sounding like the TMAC is endorsing academic or training programs. She also noted that NAFSMA has been very supportive of the CRS program, but it is hard for elected officials to convince people to undertake mitigation projects while also convincing people to buy insurance.

Mr. Nakagaki thanked Ms. Gilson and formally closed the public comment period.

Subcommittee 2 Briefing

Mr. Johnson kicked off the review of Section 3, which the subcommittee broke into five main sections. The subcommittee focused on two bounding assumptions, (1) graduated risk and (2) looking ahead, considering the paradigm shift in the flood mapping program. Mr. Johnson noted incorporating RR 2.0 into this section was also important. Mr. Johnson agreed that the report will need to be looked at as a whole at the end to avoid overlaps. He explained Section 3.1 looked into the three open ended questions asked at the end of the stakeholder engagement survey. Mr. Johnson thanked Ms. Marcy and Subcommittee 1for sharing their data with Subcommittee 2. Mr. Miranda went through his section and detailed how he grouped the responses, and he noted stakeholders made it clear that they would like the mapping process to be quicker than it is now. He also mentioned he had to go back through the survey and reconcile his graphs and information with Ms. Marcy's information. Mr. Johnson explained that his subcommittee wanted to give an overview of what the respondents look like but will reconcile with Subcommittee 1 so that the results are in line. Mr. Johnson moved on to Questions 2 and 3. He called out certain comments that he found valuable. The main takeaway was engaging regional partners for better messaging and clearer messages to communicate risk, which is will be important in the shift from binary to graduated risk. Mr. Johnson moved on to Question 3, which main takeaways included all actions are local, positive feedback about graduated risk, and creating tools that allow communities to make informed decisions. Mr. Johnson and Mr. Miranda will follow back up with Subcommittee 1 to align their data. Mr. Miranda asked if there should be a placeholder to discuss what the focus groups are going to discuss. Mr. Bellomo agreed this would be a good idea. Mr. Love asked if Section 3.1 should serve as the analytical section of the results with Section 2.1 including the results and the methodology. Mr. Rodriguez asked about the title for Chapter 2, which denotes a "framework for transition." Mr. Rodriguez remarked that this section felt like it was missing an actual framework. Mr. Johnson detailed the outline of the report, which goes into stakeholder engagement before it offers recommendations and considerations for the future. Mr. Miranda agreed that Mr. Rodriguez's comment was valid and that with TMAC input, they can incorporate more of a framework. Mr. Love suggested keeping the analytical

results in Section 2, while proposing a framework in Section 3 based on the results. Mr. Johnson agreed that the data from the survey should be applied toward the framework.

Mr. Michael Tischler went through Section 3.2, which details four key areas for FEMA to explore, including (1) improving the national building footprint database, (2) improving hydrographic data to include engineered and groundwater systems, (3) improvement in integration of surface topography, natural and engineered topography, natural and engineered hydrology, and near-surface geology, and (4) in Alaska, accelerating and improving the dataset throughout the state, which can be used to improve flood mapping data within the state. Mr. Sparrow asked how much of the unmapped areas are planned to be developed, and where the areas of focus should be in Alaska. Mr. Tischler answered that the coastal areas and urban centers are most at risk. Mr. Sparrow also commented on the building footprint suggestion and asked if the suggestion should include the mention of elevation data. Mr. Tischler brought up that first-floor elevation would be difficult in Alaska, which might need vehicular LiDAR. He explained vehicular LiDAR may open a partnership with car companies. Mr. Johnson added that there are other tools that are becoming more available, such as the latest iPad Pro, which will collect LiDAR data. Mr. Tischler brought up the PII and standardization issues with this idea. Mr. Johnson also mentioned the collaboration of various levels of government. He also brought up discussing the M4 mapping of urban hydrology. Mr. Nadeau cautioned the group that LiDAR technology can have limitations based on tree canopy. Mr. Giberson brought up that he had a call this week from a bank in Alaska about lending in unmapped areas. Mr. Giberson offered to discuss his commercially available building footprint product. Mr. Tischler elaborated that he has not seen anyone confirm they would maintain a national building footprint database. Mr. Rodriguez noted the section seems as if it is anchoring in RR 2.0. Mr. Tischler based his recommendations on a probabilistic, structure-level approach. Mr. Rodriguez elaborated on the Future of Flood Risk (FFRD) data, which includes the shift from binary to graduated risk assessment, so the anchor should be the risk-informed NFIP. Mr. Rodriguez offered other edits based on framing this section around FFRD, not RR 2.0. Mr. Bellomo asked about whether Mr. Neal yesterday said whether they were aiming for an AAL for every structure in the US. Mr. Rodriguez confirmed this is true. Mr. Mason reacted to Mr. Rodriguez's feedback, and noted that in referencing RR 2.0, the TMAC may have been referencing the flood mapping program. Mr. Rodriguez confirmed they should anchor in the risk-informed NFIP, not RR 2.0.

Mr. Jonathan Smith went through Section 3.3, which details partnerships, a process of continuous improvement, and the tools that have been developed in the current system. Mr. Sparrow commented that the discussion of the "4 legs of the stool" should involve a discussion of maintaining linkages between the legs. Mr. Johnson cautioned against the use of terms such as a Flood Insurance Rate Map (FIRM) in the official TMAC Report because they will not exist in the future. Ms. Kousky suggested explaining in the report that under RR 2.0 does not explicitly use the FIRM to determine rates. Mr. Sparrow questioned even using the word "map." He suggested the word "dataset" would be better. Mr. Rodriguez shared that as FEMA works through FFRD, there will be a focus on data not a map. In the past, the program has focused on a product, the FIRM. The focus on the future is shifted form delivering a product and more shifted toward development of data that others could use to develop their own products. Mr. Rodriguez

also referenced the bullet in the section that included the Risk MAP program, which is an umbrella term for many things, which may be worth elaborating on. Ms. Jiwani commented on the final bullet and noted that many of the elements will not be kept or maintained from the current program. She explained the TMAC should be specific about what should be kept or maintained about each element. She suggested the TMAC may want to say that FEMA is maintaining data in a central database. Mr. Miranda mentioned he would like to see an inclusion of regulatory and non-regulatory product discussion in this section. Mr. Bellomo provided a reminder that there is good information relating to this section in the survey. Ms. Marcy mentioned that the question relating to this section was intentionally vague. Ms. Marcy offered to assist Mr. Smith with this section to parse out the data. Mr. Rodriguez referred to the list of past products and suggested elaborating on the capabilities and the outcome rather than the specific mechanism that is in place today. Mr. Johnson agreed that the products could be broken up into capabilities and tools. Mr. Sparrow paused the meeting for a scheduled lunch break.

The TMAC returned from lunch and Mr. Johnson continued to go through Subcommittee 2's section. He began by describing the section that reviews potential obstacles, including statutory funding allocations, tying in mandatory purchase and graduated risk mapping. Mr. Johnson detailed another obstacle, which involved gaining and retaining public trust. Mr. Johnson explained the next part of the section goes over current obstacles, which includes funding allocations, collaborative partnerships, the possibility the public will not buy into graduated risk, and the possibility that there are problems with implementing RR 2.0. The section concludes with the suggestion that FEMA serve as the curator of the data for the products used to communicate flood risk. The final point Mr. Johnson made was the importance of communicating the future of the flood hazard mapping program. Mr. Giberson explained that the circular structure came out of the need for a framework as Mr. Rodriguez discussed earlier. He went on to say that there are more obstacles than mentioned in his section, and based on the survey, there could be a section added about usability, and making sure those needs are met in the future. Mr. Miranda brought up the relationship from RR 2.0 and existing statues, which will be interesting to observe going forward. He also brought up the public trust and the many factors that go into maintaining this trust. Mr. Miranda thanked Mr. Johnson and Mr. Giberson for their work. Mr. Rodriguez commented that he feels like the section is missing something. He posed the question: how can the real and potential obstacles inform a framework? He went on to say there is no, "what's next?" Mr. Rodriguez said there is a need for continuous stakeholder engagement. Mr. Nadeau noted that great information and good data is better than great data and good information. He continued that stakeholders are a huge component in moving toward the future. Mr. Mason asked if FEMA has piloted any probabilistic mapping data in a community and have gotten feedback. Mr. Rodriguez answered that that is what FEMA is planning on next; they have probabilistic data that they have generated and want to pilot the use in a community. Mr. Mason asked if the TMAC should include information about a pilot in the report. Mr. Rodriguez noted that this is where the framework could come into the report. He explained FEMA intends to use an agile development in the FFRD process. Mr. Mason replied that the report focused on the difficulties that might arise when moving toward the new paradigm, and not so much the framework to get there. Mr. Giberson discussed using a RR 2.0 heatmap and the

"black box" issue. Mr. Giberson noted that the Risk MAP process brings communities along in the mapping process and losing that input may cause a loss of trust.

Ms. Jiwani detailed Section 3.5, which focuses on partnerships. Ms. Jiwani brought up an example of LiDAR mapping in Minnesota, and the importance of balancing needs in partnerships. Ms. Jiwani then detailed a paragraph about how FEMA is working with other federal partners. At the state level, floodplain managers partner with Cooperating Technical Partners (CTPs). She explained the biggest strength in the CTP program is that they communicate how to use the FEMA data. Ms. Jiwani also added information about FEMA partnering with Hazard Mitigation Assistance Grants (HMA). Mr. Jiwani explained FEMA also partners with local governments, and they are a strong candidate for using the data efficiently. She noted many regional governments have pluvial data that they are not sharing with FEMA.

Ms. Kousky suggested that her section should probably come earlier in the report. Her section details mapping in the private sector, NGOs such as First Street Foundation, academic flood mapping activities, and challenges and opportunities. Ms. Kousky mentioned there are now a number of players producing flood hazard data, and a potential challenge could include reconciling all of those models. She questioned whether FEMA should put out guidance as to how to use their data or determine who should use it. Ms. Kousky also suggested the reconciliation between the actuarial view of risk with RR 2.0 and mapping side of risk. Mr. Mason asked about when the Risk MAP guidelines and standards are updated. Mr. Johnson answered that guidelines and standards are updated every six months. Mr. Rodriguez spoke to the paradigm shift and working with the community to make sure what is developed meets their needs. He continued that the challenge is changing the stakeholder's mindset for a flood risk management framework. Mr. Rodriguez said there is much more modeling capability out there, and the federal government may not have a competitive modeling capability in the future. The catastrophe modeling today relies heavily on FEMA's product. He posed the idea that maybe FEMA's role is to provide the data that drives innovative catastrophe modeling. Mr. Miranda asked Mr. Rodriguez if the mapping program is considering the same variables as RR 2.0. Mr. Rodriguez answered that they are not using the exact same methodologies because some are specific to actuaries. Mr. Johnson thanked everyone for their input on the chapter. Mr. Rodriguez commented about FEMA's role among other federal agencies. He cited the Integrated Water Resources Science and Services (IWRSS) as a positive example. He concluded by saying an improved coordinated federal framework could also improve the task of better understanding the nation's flood risk. Ms. Jiwani agreed to add this to her section.

Report Discussion (Appendices/Formatting)

Mr. Sparrow pivoted the conversation to next steps for the TMAC. He suggested that each subcommittee update their sections based on the feedback from the TMAC meeting by December. He also suggested an administrative meeting to receive results of the focus groups on 12/11. Then, the TMAC can update the report based on focus groups by 12/31. Next, the TMAC will vote on the final report on 1/13-1/14.

Mr. Bellomo asked for clarification about whether subcommittee recommendations would be

discussed at the Administrative Meeting. Mr. Sparrow clarified that he asked for subcommittee recommendations by the end of November. The subcommittees can then hold an administrative meeting to swap recommendations. Mr. Sparrow said he can work with the subcommittee leads to develop an Executive Summary in the meantime. He explained the appendices will include the charter and bylaws, the tasking, the Subcommittee 1 appendix on probabilistic modeling, and the summary of results of the stakeholder engagement.

Next Steps and Closing Remarks

Mr. Sparrow thanked all of the TMAC members for their active participation over the last two days. He thanked everyone for staying focused and engaged. Mr. Sparrow thanked Mr. Andy Neal for his presentation on RR 2.0. Ms. Jiwani asked a final question about federal collaboration examples such as NOAA. Mr. Rodriguez replied he could send more examples to Ms. Jiwani. Mr. Sparrow continued and thanked all of the support staff. Mr. Bellomo said subcommittee leads should get together to discuss integration of the chapters in the coming weeks. Mr. Nakagaki confirmed that a meeting with subcommittee leads would not result in a quorum, so the meeting can proceed without the DFO.

Mr. Sparrow moved to adjourn the meeting. Mr. Johnson and Mr. Bellomo seconded the adjournment. Day two of the TMAC Public Meeting was adjourned.