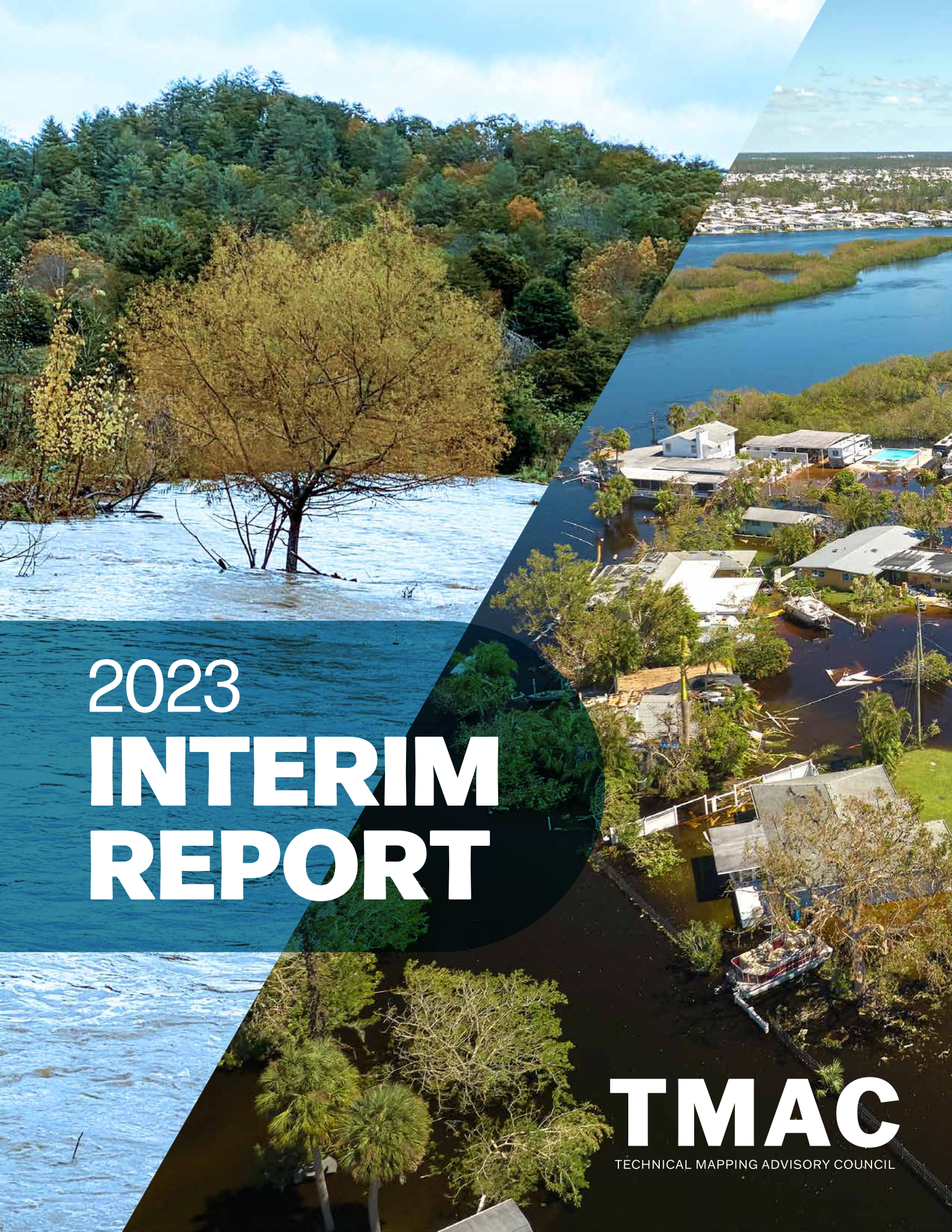

2023 INTERIM REPORT

TMAC

TECHNICAL MAPPING ADVISORY COUNCIL

Cover Letter (email/transmittal)

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1 Introduction

There is general agreement that changes in our Nation's land surface and climate, due to both human and natural causes, are resulting in increased flooding and damage. The best way to combat both the current and future threat of flooding is to embed consideration of these events into routine land use and design practices. The American Society of Civil Engineers has already started to address this challenge through its publication of ASCE 24-14 and ASCE 7-22 Supplement 2. Additionally, currently 20 states have adopted standards above the federal minimum National Flood Insurance Program (NFIP) participation requirements to avoid flood risks going forward. FEMA estimates over 80% of its 22,600 NFIP participating communities are also deploying higher standards as a result of state and local leadership in this area. Several members of the Technical Mapping Advisory Council (TMAC) who are in roles of responsibility for floodplain management and stormwater management have also promoted or implemented higher standards when it comes to managing flood risk. By adapting now, these leaders are paving new practical paths for increasing resilience to flooding and their communities stand to benefit greatly from their actions and long-term thinking.

There are many, however, who lack the capacity, capability, or political support necessary to act in the face of these challenges. As a leader in flood risk and emergency management, FEMA is in a unique position to help struggling communities by better equipping them to handle the challenges. In their letter dated April 11, 2023, FEMA requested TMAC to:

- Recommend if/how FEMA should modify the definition of the Special Flood Hazard Area (SFHA) or modify how the SFHA is currently calculated (without redefining it). Today, the SFHA is currently defined as "the land in the floodplain within a community subject to a 1-percent or greater chance of flooding in a given year."

- Recommend how FEMA might consider changing procedures for modifying the SFHA through letters of map change and map updates when land is filled or graded to be at or above estimated 1-percent-annual-chance exceedance (1% AEP) flood levels (or Base Flood Elevations [BFEs]).

Through a formal vote, the first step TMAC took was to confirm that change was needed. The result was unanimous that opportunities exist to improve in a variety of ways, including how flood hazards are identified and how fill within those areas is managed. This Interim Report outlines the process TMAC used to assess the challenges and to develop the six unanimously approved recommendations presented in this document. The assessment was conducted through a "sprint" process to facilitate development of draft concepts. These draft concepts were then shared with 86 individuals representing six distinct participant groups (local government officials, state government officials, lenders/financial community, development community, interest groups, and other professionals), collecting feedback via 17 separate 1-hour listening sessions. This process and the subsequent feedback received helped TMAC formulate these recommendations. Additional details

regarding the sprint process and listening sessions are discussed in the appendices to this document.

Throughout the development of these recommendations, TMAC was continually reminded of the significance of its work, viewing it as a once-in-a-lifetime opportunity to help put the Nation on a better path in the face of increasing flood damages and flood risk. Social, economic, and environmental rewards do not come without risk-taking. The recommendations outlined here are aimed at bringing better alignment to the risk-reward balance. This realignment is necessary and in part made possible by the fact that, under the NFIP, flood insurance pricing is less influenced by the data used for floodplain management. Estimating the costs associated with implementing these recommendations is not within the scope of TMAC's assessment; however, should be a consideration that FEMA takes, with recognition that those costs could exceed benefits in the near term. By implementing these recommendations, FEMA may be taking some near-term risks to achieve longer-term prosperity. This action may very well have more potential than maintaining the status quo, which will most certainly perpetuate or increase the current trend of escalating suffering, environmental loss, and economic harm resulting from flooding.

There are three overarching objectives being sought with these recommendations:

1. Reduce the number of uninsured losses;

2. Reduce future flood losses compared to maintaining the status quo; and

3. Improve transparency around the potential impacts of climate change and proposed development may have on flood risks to people, property, and the environment.

The six recommendations developed by TMAC, using the process described above, are presented in the sections below. Following each recommendation, a narrative discussion is included that represents TMAC's thinking and rationale supporting the recommendation. Additional information regarding the sprint process utilized by TMAC and feedback from the listening sessions are presented in Appendices A and B.

The content of this Interim Report will be included in TMAC's 2023 Final Report which will be delivered by the Spring of 2024. Although not anticipated, TMAC reserves the right to further refine the recommendations presented herein and provide additional supporting information if needed.

2 SFHA Definition Recommendations

Early in its deliberations TMAC concluded that the current definition of the Special Flood Hazard Area (SFHA) needed to be revised. After discussions and receiving input via listening sessions, TMAC developed the following four recommendations related to the definition of the SFHA. The goals of these recommendations are to increase confidence in the delineated floodplain boundaries, better communicate the uncertainties in developing the floodplain boundaries, and equip floodplain managers with tools to better manage flood risks.

2.1 Annual Report Recommendation 45 (2023)

FEMA should develop two flood hazard areas:

1) Special Flood Hazard Area (SFHA) – to be used for determining mandatory purchase requirements based on existing conditions

2) Flood-Prone Area (FPA) – to be used for floodplain management requirements based on future conditions.

TMAC is recommending that FEMA develop two flood hazard areas to better meet NFIP objectives. One of the goals of the NFIP is to reduce loss of life and property due to flooding. The current definitions in 44 CFR Part 59 provides definitions for "area of special flood hazard/special flood hazard area" and "flood plain or flood-prone area" as follows:

"Area of special flood hazard/ Special flood hazard area" is the land in the flood plain within a community subject to a 1 percent or greater chance of flooding in any given year. The area may be designated as Zone A on the FHBM. After detailed ratemaking has been completed in preparation for publication of the flood insurance rate map, Zone A usually is refined into Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, or V1-30, VE, or V. For purposes of these regulations, the term "special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard".

"Flood plain or flood-prone area" means any land area susceptible to being inundated by water from any source (see definition of "flooding"). "Flood plain management" means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and flood plain management regulations.

FEMA has historically equated special flood hazard areas and floodplain or flood-prone areas as the same. This is partially due to the data, technologies, and capabilities available when the program was developing in the early 1970s. However, we now have the data, technologies, and capabilities to readily provide two flood hazard areas to serve differing purposes to more readily achieve the NFIP's goal of reducing loss of life and property due to flooding.

TMAC is recommending that FEMA no longer equate special flood hazard areas (SFHA) and floodplain or flood-prone areas (FPA) as the same. There is one key difference between the SFHA and the FPA. The SFHA would continue to be based on existing conditions for determining the mandatory flood insurance purchase requirement while the FPA would be based on future conditions (land use and climate change are main factors) for establishing the area subject to floodplain management requirements.

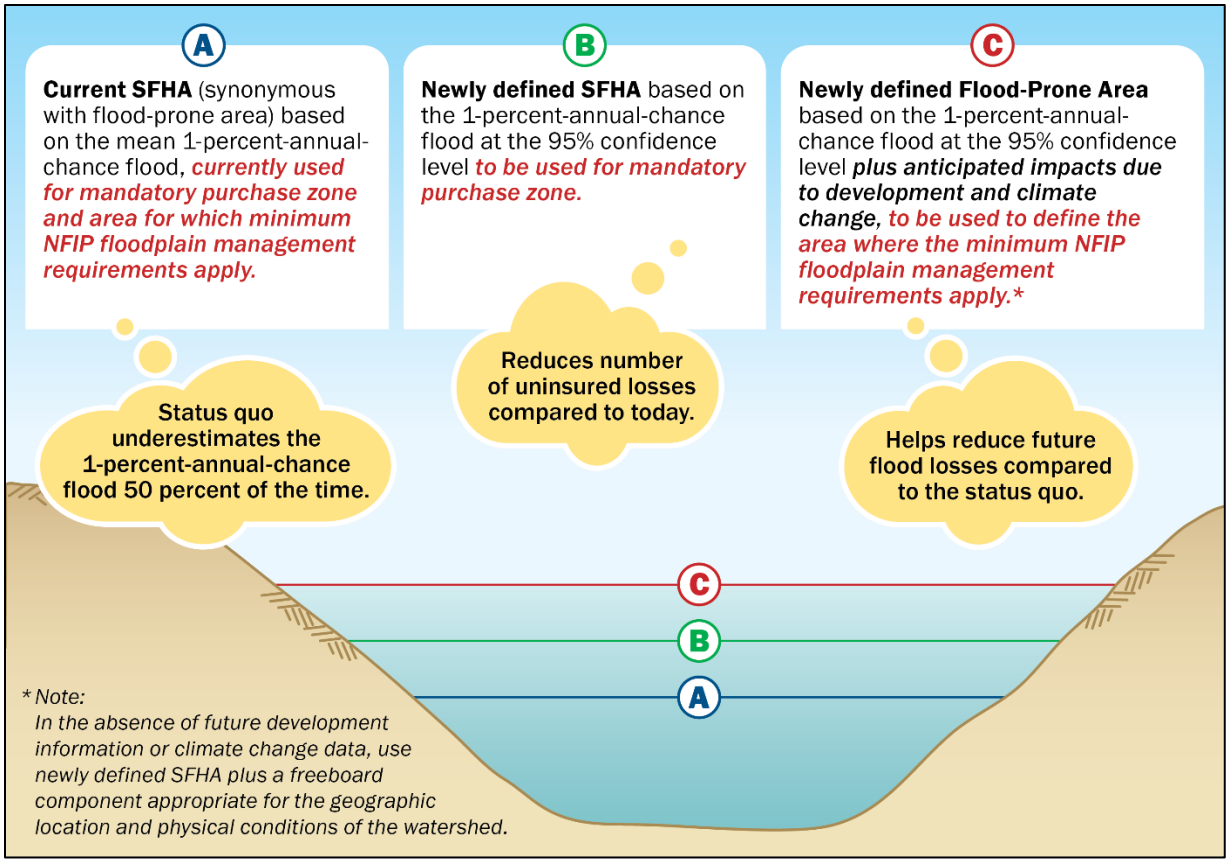

Figure 2-1: FEMA should develop two flood hazards, one for determining mandatory purchase requirements and one for floodplain management

TMAC is recommending that the Special Flood Hazard Area based on existing conditions continue to be the geographic area in which the federal mandatory purchase of flood insurance requirement applies for mortgages, made by federally regulated lending institutions (referred to herein as the "mandatory purchase requirement", refer to 42 U.S.C. 4012a). As a minimum standard, the mandatory purchase requirement ensures that a minimum number of homes and businesses exposed to high risk are covered by flood insurance.

TMAC believes it to be important that this minimum standard for the mandatory flood insurance purchase requirement remain based on existing conditions versus future conditions. As further described in AR 46 (2023) in Section 2.2 below, lenders subject to enforcement of the mandatory purchase requirement seek certainty, consistency, and credibility. TMAC believes that lenders would face even greater resistance to their enforcement of the insurance purchase mandate if it meant they had to require the purchase of flood insurance, on homes or businesses, not yet in the 1-percent-annual-chance floodplain but believed to be at some point in the future either due to development or changing climate conditions.

TMAC believes that floodplain management requirements (associated with the identification of FPAs) should be based on future conditions that allow floodplain managers to manage and reduce current

and future flood damages. If the future flood hazard is not used to manage the risk, it will be difficult to avoid future damages.

An example of this is the current NFIP minimum elevation requirements to build at or above the existing conditions 1-percent-annual-chance flood elevation. However, the NFIP allows for fill and other development in a portion of the SFHA to increase the 1-percent-annual-chance flood elevation by up to one foot. The result of this framework (allowing buildings to have their lowest floors set at the current flood level while allowing development to increase that flood level by one foot) ultimately leads to homes one foot below standard flood levels resulting in damage and human suffering. Correcting this longstanding failure in logic is one way for FEMA to better meet NFIP objectives. It, along with other proposed enhancements, will help floodplain managers lower the probability of future flooding for all structures built today.

2.2 Annual Report Recommendation 46 (2023)

TMAC is recommending that the Special Flood Hazard Area continue to be the geographic area in which the mandatory flood insurance purchase requirement applies. For decades the mandatory purchase requirement has been criticized for at least two reasons:

1. Because mortgage loans are either subject to the mandatory purchase requirement or not, the perception of flood risk by some in the public is largely binary believing that "if my bank does not require flood insurance then my home is not at risk to flooding from a 1-percent-annual chance event"; and
2. Because structures outside of the Special Flood Hazard Area are also damaged by flooding, the perception of the current mapped Special Flood Hazard Area is that it is too small or not accurately determined.

FEMA should develop Special Flood Hazard Areas based on the existing 1-percent-annual-chance flood by including estimates of uncertainty at the 95% confidence limit, not the mean, as is currently done.

TMAC believes that FEMA can address these criticisms by identifying the Special Flood Hazard Area using the 95% upper bound confidence limit rather than the mean 1-percent-annual-chance flood as is done today. The practical effect of this change will be an expansion of the Special Flood Hazard Area; however, given the noted criticisms, the current perception of the SFHA is that it represents this upper bound already. In other words, homes and businesses just outside today's SFHA are subject to 1% AEP floods but the mapping does not show that fact. This partially explains the credibility concerns around today's SFHA depiction. By design, the flood used to map today's SFHA has a 50% chance of underestimating the area inundated during a 1% AEP event. Use of the 95% confidence value will reduce the likelihood of underestimating the 1% AEP flood from 50% to 5%.

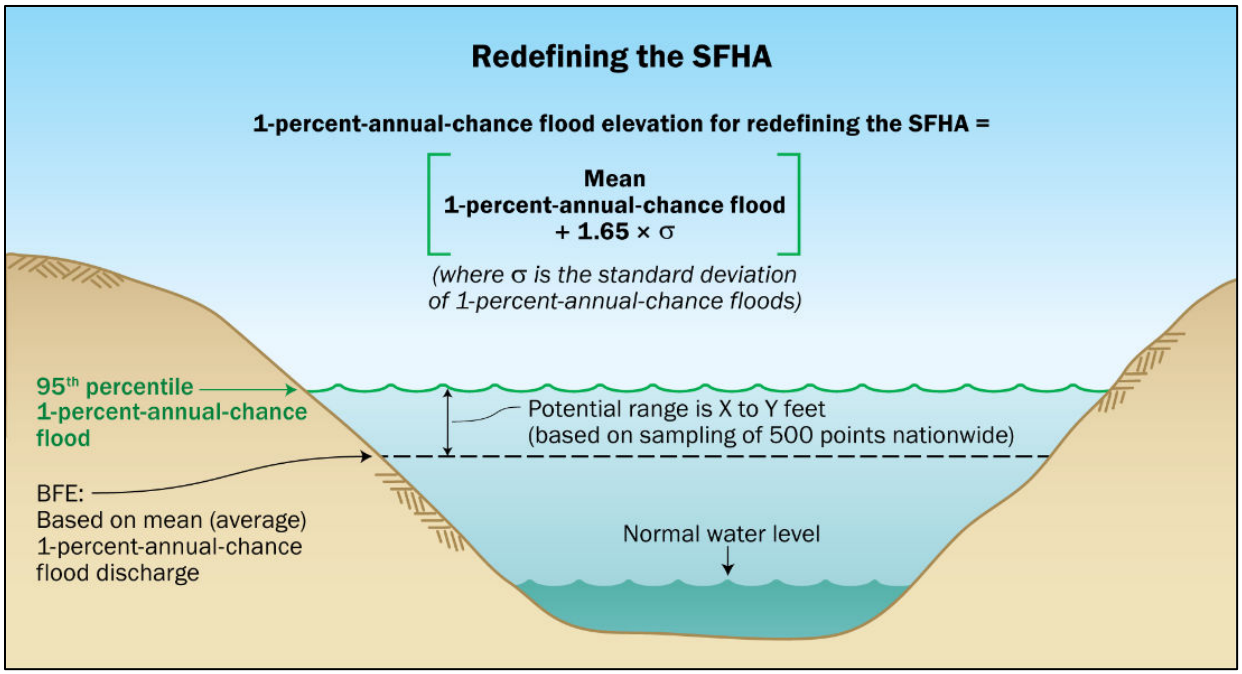

Figure 2-2: Redefining the SFHA

2.2.1 Lending Viewpoint

Ostensibly, banks and other lending institutions subject to enforcement of the mandatory purchase requirement seek a clear and consistent standard, backed by sound science and engineering, which serves to protect assets and reduces the likelihood that their customers (the borrowers, homeowners and business owners) will be unprepared and uninsured in the event of a flood. When uninsured flood losses occur, borrowers living in homes outside of the Special Flood Hazard Area who were not subject to the mandatory purchase requirement often look to their mortgage company as being at fault.

A bank executive shared the following perspective as part of the Gilbert F. White National Flood Policy Forum assembly in 2004:

> "Because of a perceived rise in flood occurrences on properties lying outside the SFHA, the lending community has become more suspicious of the standard's accurate application. Even if the misleading nomenclature can be overcome through better education and communication, the spectre of inaccuracy will stand, particularly since the standard serves as the determinant for the purchase of flood insurance. Mindful that development and construction proceed in accordance with a property's floodplain designation, the lending community wants the mandatory program based on an accurate and consistently applied standard which balances safe land use with economic benefit, a standard that can be easily interpreted and understood, so that borrowers know the risk and will act responsibly. The lending community will willingly devote resources for education and communication of such a standard, whether it be the current standard accurately applied, or one that finally may be found to be more appropriate."

Even back in 2004 and years prior, there was a concern that enforcement of the mandatory purchase requirement should apply to a larger geographic area. In fact, following the devastation of Hurricane Katrina and Hurricane Rita in 2005, Congress seriously considered legislation (H.R. 4320, "National Flood Insurance Program Commitment to Policyholders and Reform Act of 2005") that would have expanded the definition of the Special Flood Hazard Area to the "500-year floodplain" before being removed and changed by amendment to a recommendation for "a study regarding the impact, effectiveness, and feasibility of amending the … mandatory flood insurance coverage purchase requirements … to all properties located in the 500-year floodplain." The bill was not passed and therefore the study was not conducted.

2.2.2 Prior TMAC Recommendations on This Topic

Whether the mandatory purchase requirement applies to structures in a larger geographic area or not, it is important that FEMA attempt to overcome perceptions that the current SFHA represents the maximum of all possible 100-year floods. This can be done through better education and communication regarding the uncertainty around the Special Flood Hazard Area. TMAC refers FEMA back to the *2018 TMAC Annual Report* within which there is an entire chapter (Chapter 2, Communicating Uncertainty) and two recommendations regarding communicating the uncertainty.

AR 30 (2018): FEMA should establish upper and lower bounds for the 1-percent-annual-chance exceedance flood elevation using a confidence interval size of their choosing and use those limits to map the SFHA "Boundary Zone"—the area where this SFHA boundary is most likely to be. FEMA should share SFHA Boundary Zone information with the public, and other key interested parties, test how it is received, and make improvements prior to formalizing any specific standards or policy for routine map updates.

AR 31 (2018): As part of efforts to communicate uncertainty, FEMA should periodically conduct behavioral risk audits and address the biases that characterize how individuals process information on flood risk to their property. The audits and actions taken (including language regarding the likelihood of flooding) to address biases will also help other key stakeholders, such as floodplain managers, local officials, lenders, developers, and real estate agents, to encourage property owners to invest in cost-effective mitigation measures and purchase flood insurance before the next flood occurs.

One action that FEMA can take to improve the communication between lender and borrower is to revise the Standard Flood Hazard Determination Form (currently FEMA Form FF-206-FY-21-116, referred to herein as the "SFHDF"). In 1994, Congress required that FEMA develop and maintain a standard form to facilitate the determination of the mandatory purchase requirement by federally regulated lending institutions, which became the SFHDF. For example, the current SFHDF contains a question that requires a binary response: "Is Building/Mobile Home in Special Flood Hazard Area?" This question perpetuates that flood risk is a simple in or out proposition. While additional language attempts to communicate that flood risk is "not removed" and that this is only "based on examining the NFIP map", FEMA can do more to communicate uncertainty around this determination.

D. DETERMINATION
IS BUILDING/MOBILE HOME IN SPECIAL FLOOD HAZARD AREA (ZONES CONTAINING THE LETTERS "A" OR "V")? ☐ YES ☐ NO
If yes, flood insurance is required by the Flood Disaster Protection Act of 1973. If no, flood insurance is not required by the Flood Disaster Protection Act of 1973. Please note, the risk of flooding in this area is only reduced, not removed.
This determination is based on examining the NFIP map, any Federal Emergency Management Agency revisions to it, and any other information needed to locate the building /mobile home on the NFIP map.

Figure 2-3: Standard Flood Hazard Determination Form Example

FEMA has traditionally developed the SFHA based on a mean 1% AEP flood. The rationale behind picking the mean or average sized 1% AEP included, among other reasons, the notion of establishing a reasonable metric for flood insurance pricing. In other words, if the 1% AEP was a key element upon which rates could be set and program founders chose the use of a mean value. Today however, the BFE plays a much smaller role in rate setting for flood insurance premiums. Moreover, FEMA's states that "more than 25 percent of NFIP claims and one-third of disaster assistance for flooding" are outside of high-risk areas. Uninsured losses and insured but not properly rated policies, place a burden on homeowners, lenders, and the general public who carry the tax burden for federally-funded disaster recovery.

2.2.3 Improved Communication May Not Be Enough

Through its past recommendations and as part of deliberations leading to this report, TMAC has become less optimistic that improved communication alone will remedy misconceptions about the current SFHA. The new FEMA rating tools address the proper rating of policies, including those beyond the reach of the mean 1% AEP and will help improve understanding about flood risk; however, the new rating tools alone will not aid in improving the government's confidence that those exposed to the 1% AEP have insurance coverage. In fact, TMAC members have had first-hand experience with flood survivors who did not purchase insurance because, being outside the SFHA, they thought they were beyond the reach of the "100-year flood". Unfortunately, despite often clear communications that flooding still occurs outside the SFHA, many come away with an "I'm safe" conclusion which is based in part on a misunderstanding of the technical details. The current BFE (and as a result the SFHA) are better described as the land inundated by an average 1% AEP flood – a low confidence choice if the intent is to have insurance in place for those potentially exposed to 1% AEP flooding.

The recommendation to use the 95% confidence value for identifying the area in which the mandatory purchase will apply, accomplishes the following objectives:

- It will improve confidence in reaching insurance coverage goals;
- It will reduce risk (and surprise) to homeowners, lenders, and the general taxpayer in areas just above the current mean 1% AEP

Though a 5% chance of being impacted by the 1% AEP flood will still exist, use of the 95% confidence level will move the NFIPs hazard identification process closer to general engineering practices where

people have grown to assume that compliance with a given standard will eliminate (or nearly eliminate) the odds of loss or failure.

2.3 Annual Report Recommendation 47 (2023)

FEMA should require the flood hazard area developed for Flood-Prone Areas (FPAs), for the application of floodplain management requirements, be based on future conditions (including land use and climate change) at the 95% confidence limit.

As stated earlier, FEMA has historically used the SFHA as a means for implementing both mandatory purchase requirements and minimum floodplain management standards. The current SFHA is identified using an average size 1% AEP, formulated using conditions at the time the flood study is performed. Using existing conditions for floodplain management purposes puts floodplain managers in a lagging position when hazards are on the rise. In other words, floodplain managers are unable to be proactive and thus find themselves needing to find solutions to problems that could have been avoided. Many communities have recognized this shortcoming and have taken steps to develop data or ordinances that allow them to manage their flood hazards based on future conditions. In many cases this is done by simply adding a freeboard value to the FEMA provided Base Flood Elevations (BFEs) and requiring all structures to be built above this elevation (BFE + Freeboard). If the nation's flood risk is to be reduced, we must avoid creating news risks by managing our floodplains with the future in mind.

In its *Future Conditions Risk Assessment and Modeling* report, dated December 2015, TMAC made several recommendations regarding FEMA providing future conditions flood risk products. In the December 2015 report TMAC stated, "The availability of future conditions flood risk products, tools, and information will help communities make more informed development decisions that mitigate the loss of life and property by lessening the impact of future disasters. This information will also enable current local property owners to become more resilient. Risk information supported by future conditions data can save lives; protect property and the environment; and allow for focused, planned recovery when keeping future conditions flood hazards in mind." The importance of this data for improving resilience was re-affirmed by the TMAC in 2021.

Figure 2-4 below depicts TMAC's concept for developing the FPA elevation and associated boundary. The FPA should be based on the 95th percentile 1-percent-annual-chance flood plus the allowable floodway surcharge (no greater than one foot) plus other increases due to climate changes and planned land use. The FPA reflects the horizontal extent of the FPA elevation.

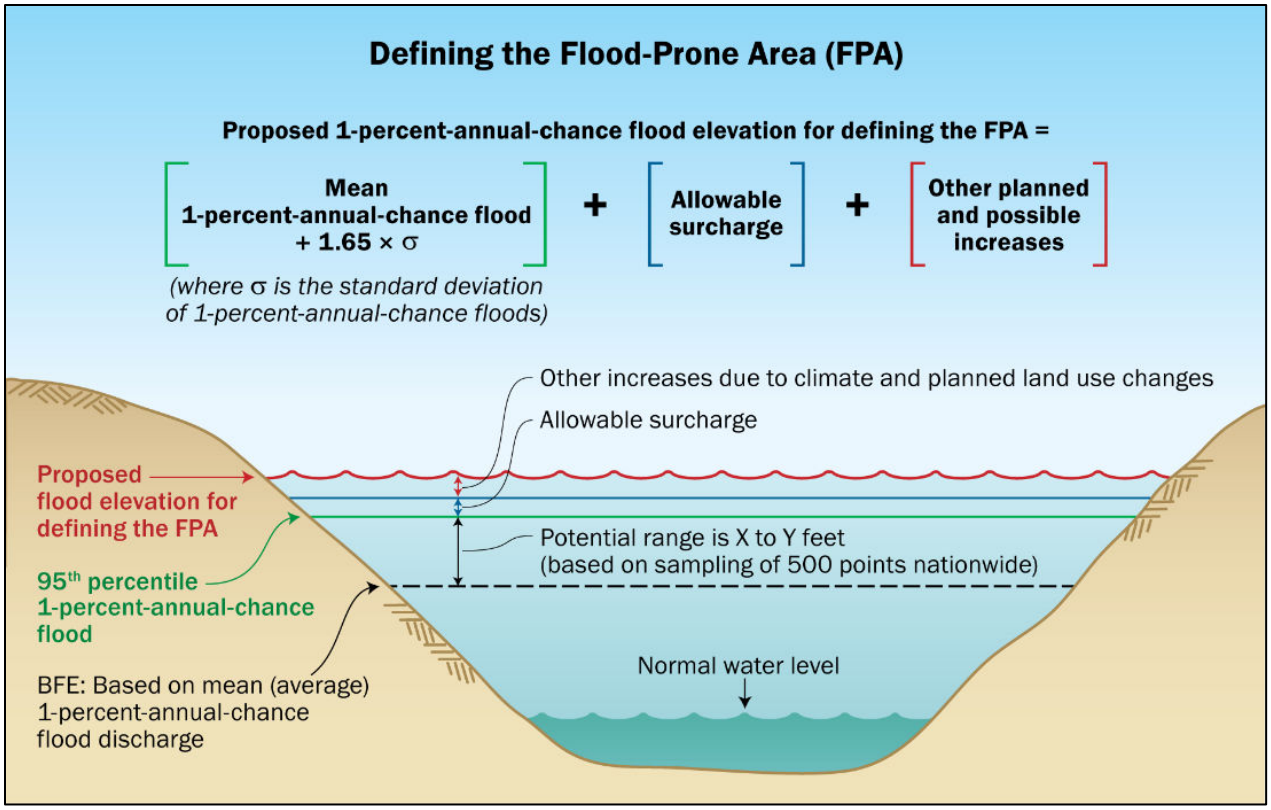

Figure 2-4: Defining the Flood-Prone Area

TMAC recognizes that determining future conditions can be complex and difficult for some communities and this was a topic of discussion during the listening sessions. However, there was support from the listening session participants to use future conditions for floodplain management purposes. Should FEMA choose to implement this recommendation it would need to execute a concerted outreach campaign and provide training to floodplain managers on the use of the FPA and the proposed new definition of SFHA.

It is understood that in some communities there may be issues with the following:

- There may not be adequate land use information to determine the impact of future development or
- There may not be planned development expected to change flood conditions or
- There may not be sufficient information to determine the impacts of climate change.

For these cases FEMA should estimate an appropriate amount of freeboard to add, in addition to the floodway surcharge value, as a proxy for 1-percent-annual-chance future conditions. This estimate could be based on reviewing watersheds with similar physical and climatological characteristics across the nation, which can be credibly applied to watersheds where insufficient data exists to estimate future conditions.

In the rare situations where future FPA boundary is smaller than the SFHA boundary, the greater should be used for floodplain management. Increasing flood risks by ignoring the current condition and hedging on expected lower hazards in the future is unwise. In situations where the SFHA and FPA are very close or similar to one another, FEMA could consider not making a distinction between the two areas.

While FEMA always strives to keep flood hazard information as current as possible there was clear feedback during the listening sessions that FEMA must continue to strive to keep the SFHA for determining mandatory purchase and the FPA for floodplain management as current as possible.

During its deliberations TMAC discussed if the floodway should be developed based on the modeling used to develop the SFHA or the FPA. TMAC recommends that the floodway be based on the model used to develop the newly defined SFHA. As TMAC examines the implementation of 2D modeling it will consider the implications to floodway modeling.

2.4 Annual Report Recommendation 48 (2023)

FEMA should continue to develop the 0.2% annual chance flood consistent with the SFHA and FPA boundaries and elevations proposed. That is, the 0.2% chance boundary and elevation should be set at the 95% confidence limit and developed based on the same parameters used to develop the 1-percent-annual-chance flood SFHA and FPA. Consistent use of the 95% confidence limit is an important part of clear communications as noted earlier. Use of the mean 0.2% annual chance flood would likely result in confusion, particularly in areas where it is at or below the 1% AEP- 95% confidence value.

FEMA should develop the 0.2% chance flood based on the same parameters as the 1% including existing and future conditions.

3 Fill Placement Recommendations

To obtain a first-floor elevation above the 1-percent-annual-chance flood, the use of fill to elevate proposed structures has been a common practice since establishment of the NFIP floodplain management requirements. On a yearly basis FEMA receives and processes over 3,600 requests for issuance of Letters of Map Revisions Based on fill (LOMR-Fs) and Conditional LOMR-Fs. The placement of fill for this purpose reduces the carrying capacity of the floodplain, leading to increased flood risk over time. In many cases where States or communities have not implemented higher standards, elevation based on fill may only increase the first-floor elevation of structure to inches above the 1-percent-annual-chance flood level. Not only does this leave no margin of error, but it also removes the mandatory purchase requirement, and can lead to a false sense of security by leaving the property owner with an impression that their structure is free from 1% AEP flooding. Additionally in some cases entire parcels or lots are being filled to gain exclusion from the minimum

floodplain management requirements of the NFIP. Once the land is removed from the SFHA, structures with basements can be built posing life safety risks to basement occupants.

For this and other reasons, the TMAC considered maintaining the mandatory purchase requirement for structures removed from the SFHA based on placement of fill. However, this approach would be punitive on the homeowner who in many cases purchased the property with the understanding that the structure was properly elevated and built such as to be removed from the mandatory purchase requirement. Additionally, a heavy burden would be placed on communities to track fill placement over time, making it difficult to differentiate areas excluded from the SFHA based on fill versus natural grade. TMAC listening sessions confirmed that maintaining a mandatory purchase requirement on structures where adjacent grades were at or above the 1% AEP flood would be administratively challenging. TMAC then reviewed ways to allow fill, but still work toward protecting properties from flooding. TMAC looked at how the fill could affect, not only the development where the fill in the SFHA is taking place, but also the properties around the development since the fill can have impacts on flood hazards. As a result, TMAC is recommending the following:

3.1 Annual Report Recommendation 49 (2023)

FEMA should include all requirements related to the placement of fill in flood-prone areas be included as part of the floodplain management requirements in 44 CFR 60.3.

As stated above FEMA issues over 3,600 LOMR-Fs and CLOMR-Fs each year. These likely represent a fraction of the fill and other development taking place in the flood fringe, that portion of the current SFHA that is outside the floodway. FEMA has map change regulations in place (44 CFR 65.5) related to placing fill in the flood fringe and there are regulations regarding the measurement of impacts of fill in the SFHA in 44 CFR 60.3(d)(3). There is also guidance to meet the “reasonably safe from flooding” requirement at 44 CFR 60.3(a)(3), when fill is proposed to be used for structural support. Unfortunately, the scattered nature of these requirements and guidance make it difficult to understand appropriate uses of fill and when or how to communicate the impacts fill may have on flood hazards.

For example, fill is sometimes placed as a means of having land removed from the SFHA so that the mandatory flood insurance purchase and floodplain management requirements no longer apply. This practice can sometimes lead to the construction of basements (increasing life loss risks) or the foregoing of flood insurance (increasing burden on the general taxpayer when floods do occur). Additionally, the placement of fill in these areas often increases hazards to nearby property owners. These increases go unnoticed because there are no requirements to communicate these changes to impacted landowners.

The placement of fill in these areas can also have negative environmental impacts. While FEMA does require local authorities to sign a form stating they have met all state, local, and federal requirements, before a map change based on fill can be executed, some signatories may be unaware of when or where environmental impact assessments need to be performed.

These challenges and the scattered nature of fill requirements leaves local governments guessing and ill-equipped to understand how the use of fill might shape their communities flood risk profile.

TMAC recommends FEMA consolidate and clarify fill requirements into 44 CFR 60.3. Such requirements should consider prohibiting the use of fill as an elevation technique for residential and commercial structures in the SFHA (both coastal and riverine); prohibiting fill as a floodproofing technique (e.g. prohibiting basements protected by fill in the SFHA); and allowing (under certain conditions) a limited amount of fill for bridges, dams, and wastewater treatment facilities along with other uses functionally dependent on proximity to water. A specific recommendation regarding notification is presented in the next section.

3.2 Annual Report Recommendation 50 (2023)

FEMA should require participating communities as part of permitting duties, to quantify and put on file the impacts of proposed fill and other development on flood stages and the environment prior to issuance of the fill permit. When increases in flood elevation or potential negative environmental consequences are found and cannot be mitigated, at a minimum property owners and appropriate environmental agencies must be notified prior to permit issuance

With limited resources or regulations at their disposal, many local governments are not able to develop procedures or adopt higher regulatory standards to quantify the impacts of fill in the SFHA on landowners or the environment. Therefore, TMAC is recommending that FEMA require participating communities (through updates to 44 CFR 60.3) prior to the issuance of permits, quantify and document the impacts of proposed fill and other development on flood stages and the environment. When increases in flood elevation or potential negative environmental impacts are allowed and proposed, at a minimum, property owners and appropriate environmental agencies must be notified prior to permit issuance. These requirements, some of which are already addressed when proposing fill in the floodway, should be expanded to projects in the flood fringe. Even when fill is being placed for an intended purpose beyond elevating a structure at or above the flood level (such as transportation or stream restoration project) the impacts to other properties and the environment should be analyzed.

Currently, the LOMR-F process allows areas to be removed from the SFHA solely based on the elevation of the ground without regard for any impacts to other properties or the environment. In riverine areas small and large amounts of fill being placed in the flood fringe can potentially create

significant impacts upstream, downstream or both, but as long as the impacts are equal to or less than the minimum allowed (1 ft at a national level, less than one foot in areas where states or locals have adopted higher standards) there are no notification requirements. This is in effect a risk transfer to uninformed landowners and environmental stewardship organizations. While a requirement to notify falls short of a requirement of consent, it is an improvement over today's framing where risks are allowed to be transferred to others without their awareness.

4 Conclusion

TMAC believes the six recommendations included above will achieve three overarching objectives which are:

1. Reduce the number of uninsured losses;
2. Reduce future flood losses compared to maintaining the status quo; and
3. Improve transparency around the potential impacts of climate change and proposed development may have on flood risks to people, property, and the environment.

TMAC recognizes that implementation of these recommendations would not be easy. Indeed, what is proposed are monumental shifts in the underlying framework of the NFIP. However, if implemented they would resolve longstanding flaws in the current framework which leads to flood surprises, insurance coverage gaps, and ultimately homes and commercial property below the BFE. There will be detractors to these recommendations, those who are comfortable with the status quo, but it is clear that the current SFHA definition and fill requirements contribute to flood surprise, uninsured losses, property damage, human suffering, and harm to the environment. The time to make bold change, to enhance prosperity is now.

Appendix A: Sprint Methodology

The TMAC used a modified Design Sprint approach to brainstorm, discuss, and ultimately finalize the recommendations. The Design Sprint concept was developed at Google and has been used widely for driving teams to conclusions on business and governmental questions or problems.

The Design Sprint has 5 phases, illustrated in Figure A-1 below, and each typically is done in a single day. The modified Design Sprint developed for the TMAC, split the work of the sprint into 2-6 hours sessions that took place during the TMAC's public and administrative meetings. Each of the phases and the work of TMAC in those phases are described in additional detail in the sections that follow.

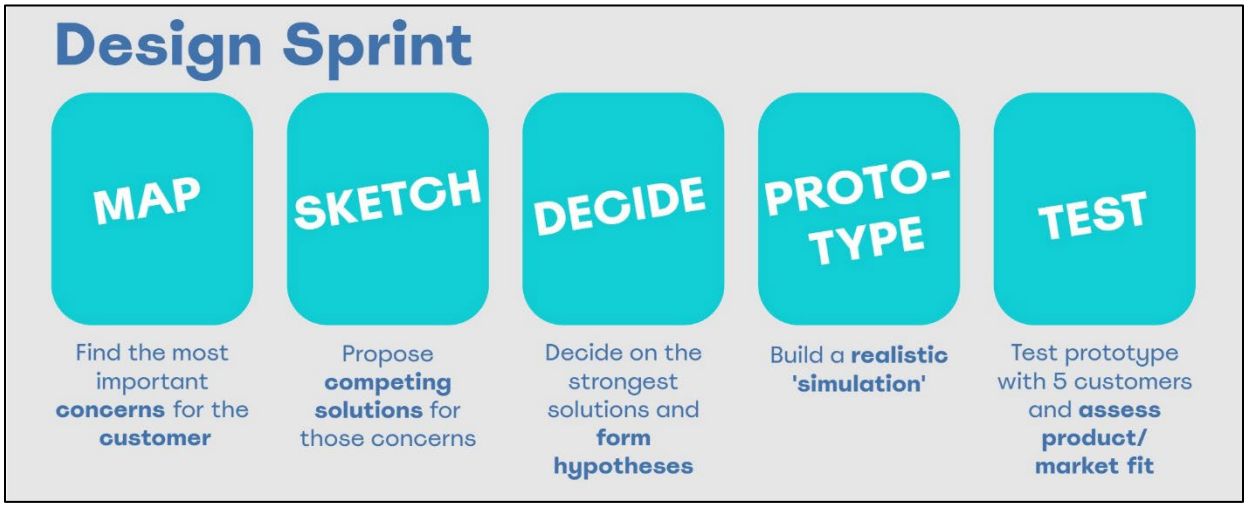

Figure A-1: Design Sprint

A.1 Map

In the Map phase, the TMAC identified the customers for each of FEMA's requests and the outcome that those customers seek. The TMAC then conducted 'Ask the Expert' sessions with stakeholders and subject matter experts related to each request. Then based on TMAC's expertise and the 'Ask the Expert' sessions, the TMAC developed maps that show the flow of how each customer currently achieves their outcome, allowing the TMAC to identify the issues and concerns. Lastly the TMAC evaluated which issues and concerns could be addressed through their recommendations, and which are outside the control of FEMA. At the conclusion of this phase, the TMAC voted to determine if change was needed based on the issues or concerns that exist.

A.2 Sketch

In the Sketch phase, the TMAC members worked individually to brainstorm and sketch out potential solutions to the issues and concerns identified in the Map phase. Then each member presented their best ideas to the group, including examples of where they have seen similar solutions implemented in industry. Then the TMAC collaborated to combine aspects of the potential solutions and add in additional detail where needed.

A.3 Decide

In the Decide phase, the TMAC down selected the potential solutions formed in the Sketch phase. The TMAC discussed the merits of each potential solution and identified which potential solutions, or parts of potential solutions, with which they wanted to move forward. The potential solutions were then summarized into a set of 'Initial Thinking' of TMAC's recommendations. At the conclusion of this phase, a subcommittee was formed for each FEMA request, that would then work on the Prototype phase.

A.4 Prototype

In the Prototype phase, the subcommittees laid out the Initial Thinking into a more detailed and consumable product. The subcommittees assessed where any gaps existed in the Initial Thinking that would make it easier to understand and evaluated how best to present it to stakeholders for feedback. This phase resulted in a presentation that would be used in the Test phase.

A.5 Test

In the Test phase, an expert in focus groups was contracted to conduct a series of listening sessions with a variety of stakeholders that matched up to the customers identified in the Map phase. Subcommittee members were able to listen in to these sessions, and reports were generated from the voluminous feedback received.

A.6 Concluding the Design Sprints

Once the Test phase was completed, the subcommittees reviewed the listening session reports and worked to revise the Initial Thinking. This was ultimately presented to the full TMAC, and discussions proceeded to finalize the recommendations presented in this report.

Appendix B: Feedback from First Set of Listening Sessions: Definition of SFHA and Placement of Fill

B.1 Introduction

To inform its work related to if/how the definition of the Special Flood Hazard Area (SFHA) should be modified, as well as whether FEMA should consider changing procedures for modifying the SFHA when land is filled or graded, the TMAC commissioned a series of listening sessions. The purpose of the listening sessions was to obtain input on the TMAC's initial thinking related to the definition of the SFHA and the placement of fill. The TMAC considered this input when making its final recommendations.

B.2 Methodology

A series of 17 listening sessions were conducted August 21–25, 2023. Each session lasted one hour and were conducted virtually. The sessions were facilitated by an independent researcher. At the start of each session, the facilitator presented information on the TMAC, identified the topics/questions the TMAC is investigating, presented various challenges identified by the TMAC, and described the TMAC's initial thinking.

TMAC's initial thinking on these topics included:

- That there should be three distinct hazard areas: the SFHA (to be used for mandatory purchase), current conditions (for informational purposes), and future conditions (as the regulatory area).
- That placement of fill would not eliminate the requirement for mandatory purchase.
- That fill would be allowed to be placed in the fringe and the floodway after analysis showed no impact on hazards and/or risks, including social justice impacts.
- That current conditions would be updated to reflect fill placement, but the SFHA would not (since placement of fill would not remove the requirement for mandatory purchase).

Once the moderator had presented the information, participants were asked to provide their initial reactions. They were then asked to answer a series of guided discussion questions to gather additional feedback.

A total of n=86 participants took part in the sessions. Sessions were stratified according to the following audience segments:

- Local government officials (n=37)
- State government officials (n=10)
- Lender/financial community members (n=13)

- Development community members (n=7)
- Interest group members (n=5)
- Other professionals (n=14)

All sessions were recorded and transcribed. Transcripts were analyzed, and findings are grouped thematically.

B.3 Findings

B.3.1 SFHA as a distinct layer

Broadly, there was support for having the SFHA as a distinct layer. However, the SFHA needs to be clear and binary, so it is obvious who is and is not required to purchase flood insurance.

Participants concurred with maintaining the SFHA at a 1-percent or higher annual chance of flooding. This value is established and well-understood. However, many noted that more accurate data sources may de facto adjust the 1-percent to better reflect actual risk (and thus increase the number of affected properties). This was seen as acceptable.

- *"I don't know that I see a different event being used. I think it would be a monumental shift through the insurance industry. And I don't see an issue maintaining the 1% annual chance storm being the boundary for mandatory purchase."* —Local government official
- *"I don't think the issue is necessarily the 1% standard. Again, I think it is … about sort of the frequency with which the updates are being done. I don't think there's anything wrong with a 1% annual chance protection standard. But what we need to do is keep whatever we're tagging with that description up to date."* —Interest group member

Some participants were concerned that adding any additional layer will add complexity and lead to confusion. Thus, clear messaging around any changes is seen as important.

B.3.2 Current conditions as an informational layer

While additional information was viewed as helpful, having an additional layer solely for informational purposes was seen as adding complexity. Thus, participants had mixed support for adding current conditions for informational purposes only. Several expressed concerns about separating current conditions from the SFHA and believed that this could also lead to confusion.

- *"I'm having a hard time with the question of saying that we're going to map current conditions but not update the Special Flood Hazard Area. So it seems to me that if we have current condition information, that should be updating the map."* —Local government official
- *"I do have some heartburn separating it from this mandatory purchase requirement of the SFHA. And having, in a sense, two existing condition flood risk maps being shown for separate purposes."* —State government official

- *"It could be helpful. But it could also just be more stuff that is just more information. Then when I have to speak to a homeowner, and I have three different maps in front of them, and I'm telling them, 'Well, this is the most restrictive,' but they're like, 'Well, how are the other three all that different?' Sometimes that's going to be a hard conversation."* —Local government official

- *"I think my concern with it is, unless I'm misunderstanding, another layer, another detail to understand. And the thing that we constantly talk about and that we've heard already here is simplify things to make them more intuitive."* —Lender/financial community member

Many participants also did not understand the proposed distinction between the SFHA and current conditions. Several also noted that keeping maps current can be a challenge for some communities.

- *"I suspect that the public would probably find that pretty confusing, because why wouldn't mandatory purchase be based on current flood conditions? And what would be the difference between those two? I think the other aspect of that is if we know that current conditions are different than what the SFHA is, why wouldn't we change the SFHA to match what we think current conditions are?"* —Local government official

- *"One of my concerns with both the current conditions and future … is that these would be updated … fairly often. So that is a concern only because in many states like mine, we don't have auto-adopt. And so the states have to go through the whole FEMA preliminary process, and the towns have to adopt the new maps. I would think that if you're going to do that, and you're going to have some regular updates across the nation, that you would want to allow every state to have communities with auto-adopt."* —State government official

B.3.3 Future conditions for floodplain management

Most participants supported moving toward future conditions as a regulatory area (several localities are already doing this or considering this). There was widespread acknowledgement that more flood events are happening outside the SFHA.

Regulating to future conditions is seen as complex. Concerns include 1) a lack of consensus on which inputs/models to use; 2) a lack of agreement on future time frame; 3) data uncertainties rapidly increasing as time frame gets longer; 4) pushback against regulating against conditions that do not currently exist; and 5) difficulty for some communities to develop and maintain future conditions.

- *"The challenge with future condition is always … you want some foreseeable reasonable future condition; you don't want something that's going to be like 20 years down the line. Something in the near future that you could predict, 'Yeah, it's going to get constructed.' And you could remap a future condition."* —Local government official

- *"I'm loath to make the smaller communities have to figure out future conditions for them when they—my familiarity with the future conditions with these groups of communities was all based on future land use, not precipitation data. So if you sit there and take a little teeny-*

tiny town of less than 1,000 people and tell them, 'You now have to regulate to the future conditions,' they're going to say, 'No, thank you.' And then we'll see a lot of issues with communities not able to keep up and maintain the requirements of the National Flood Insurance Program." —State government official

- *"Future land use is going to be very unique to each individual locality. And so I don't quite understand how FEMA is going to be able to map that, I guess. It's going to require a lot of coordination between FEMA, the states, and the localities. And, depending on what locality you're dealing with, they may not have data readily available or in a format that would be usable for this purpose. Particularly rural, smaller, and lower-income communities."* —Local government official

- *"I'm looking at that through the lens of an attorney. And when I look at that, and I think about that, it makes me think of, you're regulating somebody, and you're impacting them, based on future conditions that you're not certain are going to occur."* —Development community member

Some communities have adopted an approach of adding a margin of safety (e.g., additional feet of freeboard) as a way to regulate toward the future without reaching consensus on these issues.

- *"It's a struggle to get residents and stakeholders and other developers and stuff to all agree. So we did a couple analyses on this and still couldn't get consensus. So currently, in our county, we've got an extra one-foot freeboard requirement over and above our already one-foot freeboard, and that'll get replaced whenever we actually agree on future conditions."* — Local government official

B.3.4 Placement of fill

There was less agreement about whether the placement of fill should eliminate mandatory purchase. Interest groups and lenders supported the idea of fill not eliminating mandatory purchase. Local and state officials and other professionals more often supported than opposed this idea, but they expressed concerns, largely related to anticipated pushback from the community. Developers were opposed and think fill should continue to eliminate mandatory purchase.

- *"Advantages would probably be more people getting flood insurance, which given how many floods there have been in areas that are considered to not be Special Flood Hazard Areas, that would probably overall be a good thing."* —Other professional

- *"As a homeowner, if I went to someone, did a project for my house, got myself out of it, like if I was on the boundary of the map, and then I was still paying the insurance, my question would be like, 'Why am I still paying all this money for the insurance if I did all this work to get out of that risk?' And that'd be a tough question to answer."* —Local government official

- *"You are effectively making a certain amount of property undevelopable. And some people would say that's maybe what they want to see. Obviously, the development community doesn't want to see that."* —Development community member

Many participants across all groups noted that this would be very challenging to apply retroactively and would be hard to justify as future maps are created (e.g., via LIDAR) that show topography that reflects fill.

- *"I mean, at some point the fill is just kind of natural grade."* —Local government official

- *"We've got statewide LIDAR. And the LIDAR, depending on when it was flown, picks up not only the footprint of that building, but the fill underneath it with the bare earth data." —State government official*

Some participants questioned why insurance would be required if the risk had been mitigated. However, others expressed a concern that fill does not truly mitigate risk, and often displaces risk.

- *"To me, it really is just black and white of if the fill moved that person outside of the 1% annual chance of flooding, then I think they should be allowed to map out. And if you're telling me that the fill d*oesn't accomplish that, then they shouldn't be allowed to map out." — Lender/financial community member

B.3.5 Desired additional inputs into modeling

Participants were asked to identify what other inputs they would like to see in models. They noted interest in several areas, including:

- Flow velocities (many are interested in depth times velocity)
- Climate inputs, including both sea level change and changes in precipitation
- High-intensity events
- Current permeable areas
- Future land use/development
- Stormwater capacity
- Pluvial risk
- Levees and possible dam breaches/inundation
- Gradients
- Erosion zones
- Flood duration

B.3.6 Special concerns of state DOTs

State transportation officials noted that the ability to place fill in the flood fringe was very important to their work. They strongly cautioned against any changes that would interfere with this work.

- *"We still make it possible for folks to be able to do things in the flood fringe area, like place fill, because one of the reasons the floodway was created in the first place … [was] to say we're not going to infringe on all property rights. … So especially from an infrastructure standpoint, if I can't put certain things in the flood fringe, then I cannot build public infrastructure with public dollars. And nobody does more work in a floodway in any given state than a Department of Transportation."* —State government official

- *"I have to do that all the time across the state—all of my bridge piers, culverts, roadways, and all of the infrastructure that I am mandated by the Federal Highway Administration, USDOT, and the Congress to replace, maintain, and keep functional—are generally at one point or another going to cross a floodway. … I need the tools that make it easy, like a notarized certification for me to try to crunch some numbers to prove that I'm not causing an adverse impact on others. And I believe that is totally appropriate."* —State government official

- *"If we weren't allowed to operate within the floodway, I think the cost to DOTs across the country would skyrocket."* —State government official

B.3.7 Need to keep maps updated

When fill is placed, there was strong agreement that maps need to be updated. This is important both for proper documentation and also to fully understand impacts to the rest of the floodplain.

- *"Every time you fill something … I think there should be a map of change as a record, not only because it's a good thing to keep in the record, but also, it probably helps a lot of engineers and other people to know what's going on here. Because a lot of time when we do our … modeling stuff, we'll see a lot of topography changes that we were not aware of, and then we have to dig into research and a lot of reports and contact a lot of people to find out."* —Other professional

- *"The slides were describing that the fill areas in the floodplain would not be mapped as being out. So it's still being shown as being mapped in. I'm really curious to know, is that in perpetuity into the future? And how do we keep track of that? Because sometimes it's already hard enough to keep track of, say, different no-rise scenarios or things like that, that are going on. So if those areas would always be mapped in, how do we keep track of that so we know not to map them in when that study is redeveloped in the future? I'm concerned about how to manage that aspect of things."* —State government official

B.3.8 Need for clarity

One key recurring theme throughout all the sessions was the need for clarity. Participants are open to different presentations of information (e.g., graduated risk) as long as those presentations clarify vs. add confusion. Many noted that community members struggle to properly understand risk

information (e.g., they may think they are no longer at risk in the time period immediately after a "100-year flood").

- *"I do think that if there were an ideal way to present this information, it would not include things such as 1%, 0.2%, 5%, 10%, 100-year flood zone, 500-year flood zone, or 100-year floodplain, none of that. I think if you wanted to be able to show it to people in a helpful way, you could have a graphic that says … 'Here's your house. Here's where we predict water could be at in five years. Here's where we predict water could be in 10 years.' Something very easy for people to see."* —Lender/financial community member

- *"A lot of times it's just about explaining to people the risks and what's involved with where they're building, and understanding where the data from these maps come from. And that, just because there's a line on that map, does not mean that you're safe if you're five feet on the other side of it."* —State government official

B.4 Conclusions

Feedback from these listening sessions was helpful for the TMAC in making its recommendations. TMAC made several adjustments to its initial thinking in response to this feedback. For example, TMAC is recommending two hazard areas (vs. three) in response to feedback that having an area for informational purposes only can add to complexity. TMAC made several adjustments to its initial thinking based on these conversations and the continued discussions of the group.