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NSF LEADING ENGINEERING FOR AMERICA'S PROSPERITY, HEALTH, AND INFRASTRUCTURE  
(LEAP-HI) MITIGATION AND INSURANCE FULL PROJECT REPORT:  
STAKEHOLDER PERCEPTIONS OF MITIGATION AND INSURANCE

Rachel Slotter  
Joseph Trainor<sup>1</sup>  
Farrah Nibbs  
Rachel Davidson  
Jamie Kruse  
Linda Nozick  
Meghan Millea  
Donna Kain

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<sup>1</sup> Direct correspondence to [jtrainor@udel.edu](mailto:jtrainor@udel.edu)

# Stakeholder Perceptions of Mitigation and Insurance

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<sup>2</sup> Direct correspondence to [jtrainor@udel.edu](mailto:jtrainor@udel.edu)

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# Chapter 1- Meeting Overview

## Purpose

This report summarizes the insights developed during a stakeholder engagement meeting held on September 15<sup>th</sup>, 2019, as part of a National Science Foundation-funded project. The broader effort focused on providing a scientific framework for evaluating the risks of hurricanes to residential communities and public policies to manage them. One of the primary objectives is to develop a tool that directly supports the management of natural disaster risk and promises long-term societal benefits through improved quality of life and economic competitiveness; we envisioned this meeting as a way to better understanding how practitioners think about mitigation and insurance incentives and options. As a result, representatives from the home building and insurance industries, relevant government agencies, and academia were invited by our team to discuss mitigation and ensure our work aligned with practical needs.

## Meeting Overview

The meeting included approximately 50 key stakeholders, including professors, government employees, industry representatives, and non-profit employees identified by members of our research team as experts in the mitigation field to participate in a one-day workshop focused on mitigation and insurance tools. All participants were asked to give their consent to participate in the facilitated discussions during the one-day meeting and to have those conversations treated as data. Participants were reassured that their participation is voluntary and that they do not have to answer all questions during a discussion. As can be seen in the agenda (Appendix A), the conference was split into four sessions. During session one, participants were introduced to the meeting objectives and were asked to speak about their experiences with mitigation and insurance. During session two, participants were asked to share their views on how mitigation and insurance programs interface with their daily job. Session three focused on experiences and opinions about mitigation regulations and incentives. The final session gathered feedback about the Disaster Policy Analysis Tool (DPAT) our team has been developing.

## Participants

People from many different agencies with diverse points of view and backgrounds were invited to share their perspectives. The idea behind this diverse group of participants was to get a broader perspective from many participants. Those that consented to have their information shared are listed in Appendix B.

## Data Capture

Participants were grouped at small tables of 5-8 and were joined by a trained graduate student facilitator.

## Analysis of Results

Following the workshop, the eight completed guidance posters were scanned as images to allow in-depth analysis. Each of the eight moderators also recorded individual notes and reflections on their group's discussions. These recordings were transcribed to text to be used for data analysis. The transcriptions, along with the scanned posters, were analyzed. Given the nature of this data, qualitative analysis was selected as the most appropriate technique to utilize. In order to analyze the data, coding was used. In qualitative research, a code is a word or short phrase generated by the researcher that assigns meaning to a portion of language-based or visually based data (Saldaña, 2016). "Coding" then is the act of a researcher assigning a word or short phrase to individual items of data that captures the data's essence and meaning. A variety of data can be coded, included interview transcripts, documents, and photographs (Saldaña, 2016). The act of coding is best thought of as the "critical link between data collection and their explanation of meaning" (Saldaña, 2016, p. 4). By coding, researchers generate interpreted meaning to each individual piece of collected data (Saldaña, 2016). Later, researchers aim to uncover patterns, categories, and themes within the texts which will be used for more in-depth analyses (Saldaña, 2016). It is the goal to uncover patterns and the like because they serve as "somewhat stable indicators of humans' ways of living and working to render the world more comprehensible, predictable and tractable" (Saldaña, 2016, p. 6). Patterns provide evidence to support a researcher's findings because "patterns demonstrate habits, salience, and importance in people's daily lives. They help confirm our descriptions of people's "five Rs": routines, rituals, rules, roles, and relationships. Discerning these trends is a way to solidify our observations into concrete instances of meaning" (Saldaña, 2016, p. 6).

The research team used two types of coding: in vivo and axial. The first type of coding used was in vivo coding, which is thought of as verbatim coding. While using this approach to coding, the codes assigned to an excerpt of text or an image refer to the actual language found in the data (Saldaña, 2016). Through this approach, researchers are more able to accurately capture and portray the meanings and experiences of the participants' experiences (Saldaña, 2016). These codes were then grouped conceptually to develop a code book that would be applied during axial coding. The code book was grouped into three sections to mirror the distinct sections of discussion during the workshop session. For the Objectives section, thirty-five codes were developed; for the Constraints section, fifteen codes were developed; and for the Collaboration vs. Conflict section, sixteen codes were developed. The purpose of axial coding is to deepen the analysis from the initial coding done. The axis is a category identified from the first round of coding. Axial coding wants to link categories and relevant subcategories to provide additional detail and information about the categories of significance in the data (Saldaña, 2016). The results of the axial coding are what informed the contents of the remainder of this report.

## Acknowledgments

We want to thank the participants for sharing their time and experience during the meeting. We learned a great deal from listening to the daily struggles and challenges you faced. We also want to thank the graduate students from the Disaster Research Center who volunteered their time to be trained and to serve as facilitators and recorders for these sessions. Your dedication to learning this material and making the conversations flow improved the meeting a great deal. Finally, we want to acknowledge our funding source, the material in this report is based upon work supported by the National Science Foundation under Grant CMMI-1830511. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



## Chapter 2- The Context of Mitigation

### Introduction

The first substantive session of the workshop was titled “Mitigation and Insurance Policy in Context.” During this session, participants were asked to share details about mitigation and insurance experiences they had in their current jobs. The moderators used a set of pre-formulated questions to guide each group's discussion (see Figure 1). The remainder of the chapter will discuss each of the three categories separately: Objectives, Constraints, and Collaboration vs. Conflict. Themes identified for each of the categories will be discussed in the context of mitigation and insurance.

<b>Mitigation and Insurance Policy Objectives</b> -What are you trying to achieve with Mitigation and Insurance tools?	<b>Complementary Objectives</b> -What other objectives do people have that complement yours?
<b>Competing Objectives and/or Unintended Consequences</b> -What other objectives or goals exist that run counter to yours?	<b>Constraints- Laws and Regulations</b>
<b>Constraints- Policies, Programs, and Procedures</b>	<b>Constraints- Guides, References, and Norms</b>
<b>Collaboration</b> -Who do you work with?	<b>Conflict</b> - Who do you argue with?
<b>Other Factors:</b>	

Figure 1: Session 2 Workshop Discussion Guide

## Objectives

We asked participants about their work experiences involving mitigation and insurance. Despite diverse work backgrounds and responsibilities, participants still shared many common objectives. This section begins by reviewing these objectives as expressed by our participants. Of those discussed, two objectives were overwhelmingly attended to more and with more passion among our participants. These were: 1) the desire to improve mitigation and insurance utilization as tools to reduce suffering and losses and 2) to educate a range of stakeholders about mitigation and insurance. Many also discussed a desire to make mitigation and insurance a more cohesive system. Discussion and examples of these objectives are provided below.

### To improve the utilization of mitigation and insurance as tools to reduce losses

Participants overwhelmingly said that this objective is what drives their daily work. During the workshop, participants commonly noted that they viewed mitigation and insurance as the best means to reduce communities' losses during future hazard events and disasters. The general notion was that if individual households maintained flood insurance policies and strengthened their properties via mitigation, the community would be more resilient in future disasters and less likely to experience substantial losses. Similarly, participants also wanted community level participation in mitigation to increase. Participants felt that when communities invest in and budget to strengthen their infrastructures to protect against hazards, they are also better protecting the entire community from future hazard-related losses. This objective resonates with the latest findings from the National Institute of Building Sciences. Through an analysis of 23 years of federally funded mitigation grants, the report determining that for every \$1 spent on hazard mitigation, \$6 will be saved in future disaster costs (Multihazard Mitigation Council, 2017).

During the discussion, participants identified different ways in which mitigation and insurance can reduce losses. Together, participants felt that an objective driving their work is to use both mitigation and insurance to reduce the population's suffering. This means that improving the utilization of mitigation and insurance can reduce the financial burdens and challenges individuals and families experience following a disaster. Specifically, by increasing the number of properties insured against flood risks and maintaining those policies over time,

participants felt that suffering could be reduced for those households in high flood risk areas. For participants, insurance was also seen as the means to keep individuals safe and in their homes. For various reasons, residents want to stay in their homes – regardless of the affiliated hazard-related risks. Participants wanted to help these residents safely achieve that goal and felt that flood insurance was the best way to do so. This is an example of risk reduction happening in-situ, which also helps prevent economic loss for the community.

Increasing the number of flood insurance policies also helped participants achieve a related sub-objective: to increase the risk pool. Increasing the risk pool means a greater number of individuals whose total losses will be estimated together to calculate premiums for coverage. Having a larger pool means that calculations will be more precise, making premiums more stable over time. To put it simply, increasing the risk pool means getting more people insured and having them remain insured over time. To increase the risk pool, flood insurance policies have to provide compelling enough coverage at an affordable price for homeowners to consider buying it seriously.

Another way to improve the utilization of these tools to reduce losses is to increase the adoption of mitigation actions to individual properties. If more properties are mitigated, this will help accomplish the sub-objective to save property. If an event impacts those properties, they would be better protected against any potential damage from wind or water. Participants with recent experience addressing property losses and damage in their communities noted that one of their sub-objectives going forward is to ensure that does not happen again to residents in communities they serve. Encouraging and funding mitigation for at-risk properties is the best way to ensure those properties are protected. Even if these properties were to be impacted, a mitigated property is likely to experience less damage than an unmitigated property. Another objective commonly expressed by participants was to help properties avoid wind and water damage. By improving the utilization of mitigation for individual properties, participants felt that objective could be achieved.

During an event, participants not only wanted to save property but also wanted to save lives. Participants view mitigation as a way to help save lives. For example, some residents

choose not to evacuate during any event and instead remain inside their homes to ride out a storm. Participants felt fewer fatalities would occur if those residents were riding out the storm in a mitigated property. It is important to note that throughout the discussion, participants emphasized the importance of saving lives. This objective drives their work, and many felt that better-utilizing mitigation was the best way to accomplish that objective.

Finally, participants wanted to improve how the local and regional levels share risk. Ideally, the sharing of risk would be improved for both the short and long term. Participants also wanted building codes to work more effectively alongside insurance policies to reduce loss effectively. One means of accomplishing that objective was to have stricter buffer zones in coastal communities. Changing buffer zones would involve buy-in from impacted property owners and local government agencies.

#### To educate a range of stakeholders about risks, mitigation, and insurance

Education of stakeholders was another common objective. Participants wanted to educate a range of stakeholders from the public, governmental and private sectors about mitigation and insurance. Many participants felt that people do not understand the importance of hazard mitigation and insurance. Further, they felt that people do not comply with recommendations or do not take more protective actions because they do not understand what these actions or policies are or how they could directly help their household in the future. Participants also felt that many policymakers were under-informed and or underappreciated mitigation due to alternate agendas or conflicting budget priorities. This reality impacts workshop participants' daily work and underlies why their second most emphasized objective was to educate various stakeholders about mitigation and insurance alternatives.

Participants wanted to educate stakeholders about these alternatives to address this lack of understanding of mitigation and insurance. They also expressed a desire and need for more resources to invest in education about mitigation and insurance. Specifically, participants wanted to better educate the public; emergency and disaster management officials at government agencies, non-profit organizations, and private sector organizations; members of the banking, building, and real estate industries; and government employees working on planning and policymaking.

Regarding the public, participants wanted to educate the population on several things: risk, hazards, and their mitigation and insurance alternatives. First and foremost, participants wanted to dispel the myth that disaster events – and thus, their associated risks- are rare. Participants also wanted to educate individuals about the risks specific to the communities they live in. To be most effective, participants felt that educational tools and programs should be localized. Education should be appropriate for the local culture(s), available in the appropriate language(s), and should include information about the different local waterways. Another sub-objective of participants was to provide localized education about the different hazards that may impact the community. Education would also include how to mitigate and prepare for these risks and hazards, including specifics on what community members should or should not be doing in response.

The final sub-objectives participants had regarding education for the public involve education about mitigation and insurance alternatives. As noted in the introduction to this section, people do not understand the alternatives. Educational tools and programs need to provide a clear, concise overview of individual households' different options. Participants discussed how concerned they were about the public's lack of understanding of flood insurance policies. Many participants expressed their concern that these policies are not easily understood by people trying to purchase them. Additionally, there was concern that participants who are already insured do not explore alternative policies, and this was considered an area in which investment in educational resources could impact the public. Participants felt that a series of education and outreach programs would be the best means to accomplish that objective.

Participants also want educational tools and programs to better emphasize the need for insuring and mitigating properties against future risks. The goal of these educational programs would be for individuals to have an improved awareness of the alternatives available in their communities and a better understanding of how hazards may impact their properties and livelihood in the future.

Beyond the public, participants were also interested in educating a variety of other stakeholders, including other emergency and disaster management staff at government agencies,

non-profit organizations, and private sector organizations; members of the banking, building, and real estate industries; and local, state, federal, and tribal government employees working on planning and policymaking. A real concern underlying these objectives is a challenge many participants face trying to convey “the big picture” to the public adequately. Mitigation and insurance are hard to sell given cost, inconvenience, and the lack of imminence; however, it can make a real difference for communities later impacted by disasters.

Similar to objectives for the public, participants also want to educate stakeholders about risks, hazards, and mitigation, and insurance alternatives. In thinking about these objectives, participants mainly wanted to emphasize to stakeholders how important it is to incorporate mitigation and insurance into their daily work. To best do that, these stakeholders need to understand the risks of the communities they serve and understand the potential hazards that these communities are likely to be exposed to. Participants wanted stakeholders to have a complete understanding of these alternatives so that if members of the public need assistance, they are fully capable of addressing any questions.

Out of all of the mitigation and insurance alternatives, participants expressed that it may be hardest to provide adequate education about flood insurance policies. The reasons for this included the vast number of policies available, the assumed lack of understanding about insurance policies, and the continual cost to maintain flood insurance policies.

Related to education, several participants also noted that they wanted to utilize technology better. This includes better incorporating and utilizing YouTube as an educational tool and utilizing modeling to help stakeholders better understand meteorological and physical hazards. Modeling can also be used to show the impacts of population change on community risk visually. In addition to modeling, YouTube is another tool that can be used to share educational videos and presentations with stakeholders. One example of YouTube as an educational tool is the FORTIFIED program video that the North Carolina Beach Plan developed to educate building industry partners.

Participants also noted that they wanted to invest more resources in the education of building, bank, and real estate industry partners. As mentioned above, participants want the building

industry to be educated about the FORTIFIED program. Additionally, participants wanted these stakeholders to buy into the notion of encouraging their clients to renovate or build their homes to be resilient from future water or wind-related damage. Beyond the building industry, participants also had an objective to educate members of the banking and real estate industries. Participants want to educate banks to change their practices to stop offering mortgages to people who cannot afford the related flood insurance policies. To educate the real estate industry, participants note that resources to develop and regularly offer continuing education credits towards real estate licenses would benefit both parties. Ideally, those for-credit courses would encourage real estate agents to convey risk levels and information about hazards to potential property buyers.

Ultimately, participants felt that increased education would help to create a culture of preparedness in communities nationwide. The idea behind a culture of preparedness is to invoke a sense of urgency in people to prepare for a potential disaster (FEMA, 2019). To create a culture of preparedness, there would need to be a nationwide change to the collective American culture. Disaster preparedness would need to be a value held by individuals and communities nationwide (FEMA, 2019). Participants mainly discussed how a culture of preparedness could benefit at-risk communities. If the culture of preparedness became widespread, there would be significant benefits for disaster recovery. Participants felt that households would be more likely to become self-sufficient in long-term recovery and that this would help reduce the current financial burden experienced by the federal government during disaster recovery. Additionally, if individuals were more prepared, more financial resources would be available to spend on disaster recovery rather than disaster response efforts like swift water rescue. Participants felt that they could help move towards a goal of having a more socially equitable recovery. Finally, participants suggested that by creating a culture of preparedness, the speed of recovery could be increased, reducing the financial and economic impacts in future disasters.

### To make mitigation and insurance a more cohesive system

While most groups discussed Objectives 1 and 2, other groups also shared extensive concerns and challenges regarding the lack of cohesiveness in the current mitigation and insurance system. Important points from the discussion and proposed improvements are presented below.



In the current system, disaster-related policies and tools are separated. For example, disaster mitigation policies and tools are created and implemented in distinction from the policies and tools related to disaster recovery. Participants felt that to make the system more cohesive, all disaster-related policies and tools should be linked. By linking these policies and tools, limited resources could be used more effectively and efficiently to make communities more resilient. Participants felt that emergency management officials needed to better integrate mitigation and insurance into the other phases of disaster and in “larger plans” such as emergency response plans or a jurisdiction’s comprehensive plans to help a broader set of stakeholders become invested in the mitigation.

As described by our participants, a more cohesive system would be beneficial. A more cohesive system would mean more stakeholders are aware of and actively working on increasing mitigation and insurance. This will help strengthen communities and reduce the loss for individual property owners in future disasters. Additionally, if mitigation and insurance are incorporated into the jurisdiction’s “larger plans,” that means those communities are more likely to assign a portion of their annual budget to these items.

## Unintended Consequences

During the discussion of objectives, several unintended consequences of mitigation and insurance also arose. Notably, this was a limited topic addressed in the groups’ discussions. Two types of unintended consequences were identified: 1) Disruption to the environment and 2) Negative effects to vulnerable populations.

By nature, mitigation alters the physical structure of infrastructure or property. Participants noted that they were concerned about how infrastructure-related mitigation measures may disrupt the environment. One example discussed was seawalls. Seawalls protect the built environment from flooding and storm surges. However, seawalls can cause significant disruption to the ecosystem and to the flow of waterways.

The second type of unintended consequences were negative effects on vulnerable populations. One group described vulnerable populations as the “losers” when it comes to disaster mitigation. Participants noted that mitigation measures tend to be prioritized in areas of



high economic influence from their experience. This results in increased inequity between richer and poorer vulnerable communities due to the latter's limited access to mitigation and insurance. While participants and other mitigation and insurance stakeholders may not intend to impact these populations negatively, participants suggested that it happens. This was seen as particularly problematic because many felt that increasing the prevalence of mitigation and insurance in marginalized populations was an essential part of reducing risks.

Participants shared two examples related to negative effects on vulnerable populations. The first example involved helping renters. Participants stated that they believe renters should be able to either add-on flood-related damages to their renters' insurance policies or to be able to take out flood insurance policies. At this time, no protection exists for renters. They are not able to have the contents of their rental property covered to protect against flood loss. Additionally, they are often not eligible to receive federal recovery grants because they are not the property owner.

The other example given was attending to issues for low-income individuals and households. Given the high cost of mitigation actions and insurance policies, many individuals are priced out of preparing for disaster. Considering that many low-income individuals and households are also renters, participants were very concerned about ways to make insurance more affordable for these populations. While many researchers have proposed affordability options for insurance (i.e., Wharton), participants focused more on how the lack of affordability negatively impacts the whole community. Having more uninsured individuals increases the potential for financial burden and negative economic impacts if a disaster happens. Participants did note that they believed flood insurance premiums should not increase annually and that the cost should instead be reduced for low-income individuals.

As noted, these were examples of unintended consequences that occur when mitigation and insurance officials can accomplish their various objectives. It is likely that there are other unintended consequences. However, disruption to the environment and negative effects to vulnerable populations are the only two categories that arose during workshop discussion.

## Stakeholders with Complementary Objectives

Once the common objectives were established, participants were asked to discuss entities with complementary objectives to their own. This discussion varied: some groups provided details on how these entities had complementary objectives, while others just stated the groups. Details in the following section reflect those differences in the discussion. Participants identified the following entities as having complementary objectives: individuals, the insurance industry, local/state/federal/tribal government, non-profits, the construction industry, and the real estate industry.

### Individuals/ Homeowners

Many participants identified individuals as a group with complementary objectives. By individuals, participants were referring to individual members of the public and/or individual property owners. Like participants, individuals also want to reduce loss from a disaster. Participants discussed how individuals do not want to experience property damage from a disaster. Individuals also do not want to incur any sudden expenses if they experience a disaster. Participants also discussed how elderly individuals are likely to have complementary objectives but are unlikely to have the means to afford to mitigate or insure. For example, elderly individuals may want flood insurance; however, many live on fixed incomes and are unlikely to have additional income to afford a policy.

### Insurance Industry

Most groups noted that the insurance industry has complementary objectives. Several groups provided details on how these groups complement one another. One group noted that the insurance industry could be a partner for the educational objectives. Mitigation officials could work with partners in the insurance industry to develop materials and then educate either the public or other stakeholders about flood insurance. This group noted that the insurance industry would be invested in this type of project because it would increase insurance sales. This type of partnership would also benefit members of the public by educating them about insurance and helping them to select the best insurance policy for their property. Another group also noted that the insurance industry has an objective to increase the number of policyholders. This complements the objective of our participants to improve the utilization of insurance to reduce

losses. Ultimately, the insurance industry would be invested in that objective as well. More policies and reducing losses mean more profit for their companies.

### Other Government Agencies

Every group stated that local, county, state, or federal government agencies have complementary objectives. Notably, groups were referring to non-emergency management agencies. One group felt that in particular groups that agencies working with natural resources would be the most likely to have complementary objectives due to the shared desire to make the environment more resilient from hazards. Another group felt strongly that government agencies at all levels have complementary objectives. When considering mitigation and insurance, these complementary objectives are likely to strengthen infrastructure and minimize financial or economic impacts. Preparing a community or state for a disaster means that government will suffer less of a financial burden during future events.

Several groups noted these government agencies also had desires to make policymaking more cohesive. Thus, agencies would also have the objective to integrate mitigation into “larger” plans, such as a jurisdiction’s comprehensive plan. Following a disaster, many different government agencies help a community recover. In communities that have recently been impacted by a disaster, there is likely to be significant interest from agencies to create cohesive programs and policies. This would allow for all relevant agencies to come together to plan, develop, and implement these policies and programs.

Like the insurance industry, government agencies also will be interested in educating stakeholders and the public about flood insurance. One group suggested that RASCAL, the Regional Cooperative for Information, would likely have complementary objectives. The mission of this agency is to provide information to experts and share it with communities. Participants felt RASCAL would be a great education partner to share information about mitigation and insurance.

The final idea regarding government agencies' complementary objectives centered around the value of community participation and feedback. Participants felt that the local government could actively engage community members and seek their feedback on mitigation and insurance. This

engagement would allow for a better understanding of a community's perspective on mitigation and insurance. Participants also noted that community members like to feel like their voices are heard. Participation in local government is one way to ensure that their feedback directly influences local policies and programs.

### Non-Profit Organizations

Several groups also identified non-profit organizations as having complementary objectives. One group noted that many non-profit organizations exist that have shared interests in mitigation and insurance. These organizations, such as the Association of State Floodplain Managers (ASFPM) and the Insurance Institute for Business & Home Safety (IBHS), were identified as valued partners for sharing information about mitigation and insurance. Another group identified the Home Builders Association of North Carolina as having complementary objectives. This non-profit organization provides grants and tries to sell FORTIFIED products to property owners. They also offer FORTIFIED level certification programs to builders.

### Construction Industry

Some participants identified the construction industry as a group that has complementary objectives. Participants discussed how the construction industry is invested in mitigation to individual, large-scale residential, and commercial properties. The construction industry wants to do more mitigation because of the higher cost of those building materials. Ultimately, this would benefit their companies by yielding a greater profit per project.

### Real Estate Industry

The final entity participants identified as having complementary objectives was the real estate industry. To become licensed and maintain their licenses, real estate agents have to take continuing education credits. As was noted previously in the education objective section, some participants offer these credits on mitigation and insurance. This training helps real estate agents with their licenses while also promoting awareness for mitigation and insurance. The ultimate goal is to seek buy-in from the real estate agents so that they alert potential buyers to a property's risk and ways they could strengthen the property after purchase.

### Stakeholders with Competing Objectives

Participants also identified entities with objectives that competed against their own. The competing objectives often made it harder for the workshop participants to complete their objectives successfully. Just as with the discussion on complementary objectives, this discussion varied. Some groups provided details on how these entities had competing objectives, while others just identified the groups. Details in the following section reflect those differences in the discussion. Participants identified the following entities as having competing objectives: developers, historic preservation organizations, local government agencies, mortgage lenders, political leadership, private insurance companies, and property owners.

### Developers

Some participants identified developers as having competing objectives. While participants want to limit development in high-risk areas, developers often want to continue or even increase development in those areas. Participants noted that developers continue to develop in high-risk areas due to high demand and profit potential.

### Historic Preservation Organizations

Many participants discussed the competing objectives of historic preservation organizations. Participants viewed these organizations negatively. Many shared that historic preservation constrains their ability to complete mitigation actions. When participants try to implement acquisition programs in their jurisdictions, historic preservation organizations often fight against the programs because it could lead to the demolition of a historic property. Other participants noted that historic preservation argues against desired land usage changes proposed in support of mitigation. Often, historic preservation has the capacity and power to refuse land or property changes that would advance mitigation.

### Local Government

Participants identified two types of competing objectives with local governments. The first involves a strong desire to avoid any loss of property tax revenue. In the participants' experiences, the local government wants to maintain or increase their property tax revenue as a primary objective and, as a result, is likely to resist large property acquisition programs because that means they will lose a portion of their tax base. Additionally, local government is likely to support and even want new development in high-risk areas when it leads to revenue growth. This

focus on growing the tax base was seen as a competing objective that worked against participants' desires to reduce losses. The second type of competing objective of local government, also related to revenue, was a strong desire to avoid negative impacts on tourism. Participants shared that local governments are often resistant to highly visible mitigation changes, such as elevating homes on piles, given that coastal communities are dependent on tourism to fuel their local economies. Therefore, they often resist any mitigation that may negatively impact tourism and their economies regardless of the protection it may offer.

### Mortgage Lenders

Some participants noted that mortgage lenders have competing objectives in that they are focused on the profit potential and do not consider risk and insurance in their lending practices as much as they could. Participants suggested that lenders, such as banks, will approve mortgages to individuals who cannot afford the flood insurance policies for a property and take no responsibility for raising awareness of the risk or financial ramifications. Some did suggest that banks may not be aware of how these property owners or the local economy could be negatively impacted during a future flood. A third group discussed how banks are not viewed as team players when it comes to flood insurance.

### Private Insurance Companies

Several groups identified private insurance companies as having competing objectives. Some participants expressed frustration that private insurance companies are often unwilling to work with agencies focused on mitigation and insurance. Participants felt that private insurance companies had the capacity and audience to help educate stakeholders, but they refuse to be partners. Another group noted that private insurance companies prioritize their business objectives above all others. Their number one priority is to make money, which means they often charge higher premiums and may deny claims. While this hurts individuals, it ultimately benefits their businesses. Similarly, another group noted that private insurance companies might not want to cover high-risk properties or repeated flood loss properties. While this is not something that has actualized yet, participants felt this would likely be a big problem nationwide in the future.

### Property Owners

Several groups also noted that property owners have competing objectives. One group discussed the resistance of property owners and the perception that mitigation impeded on their property rights, and as a result, property owners have refused to allow increased buffer zones on their properties. Another group discussed how the nostalgia of property owners could create challenges for mitigation and insurance. Property owners may feel nostalgic about their properties or historic structures in the community, regardless of their risk or previous disaster losses. This nostalgia competes against mitigation officials' objectives and makes it difficult for them to influence changes in at-risk communities. Another group also discussed how property owners might not want their coastal community's current aesthetics to change. Subsequently, this also challenges the ability of mitigation and emergency officials to complete their objectives successfully. Ultimately, property owners' resistance, whether due to property rights, nostalgia, or aesthetics preference, harms at-risk communities. As summed up by one participant, property owners can often be their own worst enemy.

## Constraints

The second section of Session 2 asked participants to discuss factors that constrained their ability to do their job and complete the previously identified objectives. Participants identified a broad range of factors that constrained their daily work. Factors identified during the workshop can be grouped into the following categories: Administrative Issues, Attitude, Capacity Limits/Limited Resources, Funding, Lack of Collaboration, Organizations, Program Mismatch/Misfit, Regulations/Rules, and System-Level Problems. Within each category, there were a variety of responses, which will be discussed below in greater detail.

### Administrative Issues

Many participants identified administrative issues that constrain their work. Much of this discussion centered around the administrative burden of obtaining mitigation funding. Several groups noted that the amount of time it takes to apply for and then be approved for funding is a huge burden. By one group, the process of applying for funding was described as lengthy, burdensome, and confusing. Another group expressed frustration over what happens once the paperwork is submitted to FEMA. An agency may submit their application to FEMA and not hear anything back for months only to eventually learn something was missing in the application



that voided it. In some cases, participants noted this meant they were never able to get FEMA funding, even if their jurisdiction had been eligible and they had completed all of the requirements. Even if applications are correctly submitted, the time it takes for the federal government to review them can be lengthy. Participants noted that this length of time can cause additional stress and challenges for affected jurisdictions and their residents. Additionally, if a jurisdiction has back-to-back events, the current system requires they complete an entirely new application. Participants with this experience were very frustrated that the system did not allow for overlap if another application was necessary for the same jurisdiction in a specific period.

Beyond the burden of applying for funding, participants also discussed several other administrative issues. One group noted that they experience many challenges when they try to implement FEMA programs. Often these programs do not match the realities of local communities, so they are challenging to implement successfully. Another group also noted many bureaucratic restrictions at the local level that can cause administrative burdens for mitigation officials. The final administrative issues mentioned by participants involve federal bureaucracy. Participants shared that how a hazard event is defined can impact the funding or programs available to support impacted community members. This means that the community could be without much-needed support due to how an outsider has defined the hazard event. Another group discussed challenges with the allocation of grant money. As shared in this group, money that is intended for, and often highly needed by, the public is not going to them. Participants noted a learning curve for mitigation officials to ensure that the maximum amount of money possible is allocated to the public.

### Attitude

Participants discussed how attitude can constrain their work. When they talked about attitude, participants referred to either the attitude of the public or the attitudes of other stakeholders. Both parties could constrain the work of mitigation and insurance officials.

Regarding the attitude of the public, several groups discussed how this constrained their daily work. Generally, participants felt that the public does not see past the immediate inconvenience of mitigation and insurance to understand its benefits. For example, participants referenced property rights infringement and how that negatively constrains the ability to increase buffer



zones. Some participants also note that the public gets frustrated with government officials when they try to do their job. Additionally, participants noted that the public's attitude about mitigation and insurance costs is a significant constraint. One group discussed how the public as a whole views mitigation as costly and not at the top of their to-do lists. Participants said the public is more concerned with how they will afford their rent or mortgage payments and childcare costs. Another group talked about the public's attitude toward insurance. Participants stated that the public has an attitude that insurance is expensive and a re-occurring cost, making it a double negative in their eyes.

Beyond inconvenience and cost, participants identified several other ways that the attitude of the public is constraining. Right now, there is not a demand for resilient homes in at-risk communities. This reflects the public's attitude; they are not interested in investing in properties to be more prepared for their risk. Participants stated that individuals can be complacent and unwilling to seek out information about hazard mitigation and insurance. One group provided a rationale for why that may be the case. Participants agreed that individuals often have an "it happened to them, but it will not happen to me" attitude. This attitude influences the individuals' risk perceptions and may contribute to their reasoning for not preparing for extreme events. Participants say this attitude, combined with a lack of financial literacy skills, makes it challenging for individuals to properly evaluate their mitigation and insurance alternatives.

The attitude of other stakeholders is another constraint for mitigation and insurance officials. After a disaster occurs, local communities often adopt the "Build Back Fast" attitude, which is inefficient. Participants noted that they would prefer if communities adopted the attitude of "Build Back Stronger." Unfortunately, what happens now in communities results in structures that are vulnerable to future hazard events. Participants also expressed that stakeholders could have negative attitudes about the public. Stakeholders are frustrated that the public is unwilling or unable to mitigate and insure their properties. However, this negative attitude may prevent stakeholders from attempting to implement mitigation and insurance programs in communities. Participants also felt that the attitude of political leaders could constrain their work. Often these leaders favor restrictions for mitigation as a means to support the local tax base and tourism.

Participants had a negative attitude about many political leaders because of the lack of support for mitigation and insurance.

### Capacity Limits/Limited Resources

Every group discussed how capacity limits and limited resources are a constraint for mitigation and insurance. Local-level governments are expected to plan, manage, and execute any community-oriented mitigation and insurance grant programs throughout the United States. However, many local-level emergency management offices have few staff members. Participants indicated that results in a lack of education and outreach capacity in communities. Subsequently, this means that residents may be unaware or uneducated about their mitigation and insurance alternatives. In situations where a grant or subsidy program is running in their area, residents may be uninformed. Additionally, participants noted that at the local level, mitigation is not the only responsibility officials have. They are overextended and rarely have the bandwidth to do mitigation successfully. At the local level, the staff turnover rate is high. Participants discussed how turnover creates a constraint for the success of mitigation in a community. In particular, turnover limits the knowledge available at the individual institutional/organizational level, ultimately constraining mitigation. The final item discussed concerning capacity was the reliance on FEMA. Following a disaster, participants claim that local or state-level governments do not have the capacity to provide adequate individual or public assistance. Instead, these organizations rely on the monetary, physical, and personnel resources provided by FEMA. This reliance again indicates how limited capacity constrains the jobs of mitigation and insurance officials.

### Funding

Participants also identified funding as a constraint. When participants discussed funding, they were focused on two ways in which funding is a constraint: access to funding and lack of funding. Participants noted that it is hard for them and other officials to access funding for mitigation and insurance. Some participants discussed how it is easiest to obtain community-wide funding after a disaster occurs. Notably, though, this may be when community members have even less discretionary funding to spend on mitigation and insurance. However, participants pointed out that for communities to even be eligible for this funding was dependent on how the

government defined the hazard event. If it is not declared a disaster, the community is not eligible to receive mitigation funding from the federal government post-event. This can be significantly constraining for communities that have near-miss events, which may pique the interest level of residents in wanting to mitigate and insure. Similarly, some programs limit individuals' ability to receive mitigation funding if they have received an insurance claim payout. Participants note this can be a constraint because sometimes residents choose to pay for the damage out of pocket, or insurance may deny the claim; either way, these individuals would be ineligible to receive mitigation funding.

Participants also noted there is not enough federal funding available to acquire all properties whose owners are interested in participating in property acquisition programs. The limited funding available is also further constrained by taxation and restrictions. One participant expressed frustration that grants given to non-profits are taxed at the federal and state levels. Any amount paid in taxes ultimately limits the grant money available to individuals and communities to mitigate. Participants also noted that when communities receive funding, there are restrictions on what individuals can spend the grant money on. Ultimately, funding is a significant factor that constrains the daily work of mitigation and insurance officials.

### Lack of collaboration

Several participants noted that a lack of collaboration surrounding mitigation and insurance constrains their ability to do their jobs. Participants felt that there is a lack of relationships with external organizations. In one group, participants discussed how lack of communication could hinder collaboration. Specifically, communication between levels of government and within government can be a challenge. Another group discussed the lack of collaboration within states. State mitigation and insurance officials have a hard time getting multiple agencies to buy-in and agree on one idea. This group noted that this was the biggest constraint to their ability to do their jobs.

Participants noted that the lack of collaboration constrains mitigation planning efforts. One group described the current planning strategy as siloed. Agencies do not talk to each other; sometimes, it is even challenging to get departments within the same agency to collaborate. That group concluded that overall, community members, government agencies, and private industry

are siloed and do not collaborate. Participants noted that the lack of collaboration has several negative effects on planning. It means that there are consistently gaps between the federal versus local government mitigation plans. Additionally, it means there is often no mention of mitigation in a jurisdiction's comprehensive plans. Participants felt a lack of collaboration constrained the planning processes for how to incorporate mitigation into communities.

### Program Mismatch/Misfit

Some groups discussed how current mitigation and insurance programs and policies are not suitable matches for many communities. Participants noted that these programs and policies are treated as one size fits all; however, that is not the reality. Different communities have different needs based on their own cultural, economic, and geographic realities. Participants stated that many policies and programs do not meet every need. They expressed a desire for more variety in policies and programs to meet the diverse needs of communities better. Policies and programs should offer tailored options and information for groups with different needs. One group noted that if the ultimate goal is to get a bigger audience for mitigation and insurance, there needs to be more policy and program options. Their group felt tailored options were the best alternative to support communities.

Several other groups discussed other items that highlight program mismatch/misfit as constraining mitigation and insurance. One group noted that future conditions are not factored into current mitigation and insurance programs and policies. One group expressed concern over the "all-or-nothing" nature of some hazard mitigation grant programs. If twenty properties in one community have applied for property acquisition grants and one withdraws after the application closes, participants noted that it has the potential to ruin funding for the remainder of the group. This constraint shows just how much is at stake for mitigation officials when working on grant applications. A final group discussed how helpful mitigation tools are but felt they were applicable only in very narrow contexts. For example, the feasibility of existing structures can limit the applicability of mitigation. It is very challenging to mitigate townhomes and condominiums, given the nature of the structure.

### Regulations and Rules

Each group discussed how regulations and rules are a constraint on their daily work. The real concern is that there are so many regulations and rules about mitigation and insurance that it is confusing for individuals and stakeholders to know them all. Some participants said this exhaustive list of regulations and rules often leads to confusion and frustration. In particular, some participants were concerned about how challenging it is for developers and either current or potential property owners to understand all the regulations and rules adequately. This is also a concern surrounding funding programs, given the many rules and restrictions in place for these programs. One group had an interesting discussion surrounding the current levels of regulation of the insurance industry. Some participants wanted more regulation, and others wanted less.

Regulations and rules are a constraint for both individuals and stakeholders, including all government, private, and non-profit organizations. Regarding individuals, participants again noted that rules about property rights constrain their ability to implement community-level mitigation measures such as more stringent buffer zones or the construction of sea walls. In terms of the government, regulations and rules inform their ability to provide funding and mandate mitigation and insurance. Regulations dictate how hazard events can be defined, which participants noted ultimately influences what funding a community will be eligible to receive. At a local level, a jurisdiction's planning and zoning codes influence post-disaster construction. Participants expressed significant frustration over the lack of flexibility in what could or could not be built/rebuilt following a disaster. Often damaged properties are rebuilt to the same standards due to a lack of flexibility in the current regulations. This makes those properties and communities vulnerable to future hazard events. Other participants discussed how the current regulations and rules do not give FEMA the power to mandate lower-level governments (i.e., jurisdictions, counties, states) to mitigate or insure. If FEMA had the power to mandate mitigation and insurance, participants felt that communities would be much more resilient to coastal hazards.

Regulations and rules for the private sector also constrain the ability of participants to do their jobs. One group noted that licensing is a constraint to their work. States regulate how frequently individuals, such as real estate agents, have to obtain flood training. Some states require this annually, while others require it every three years or perhaps not at all. Another

group discussed the lack of state or federal regulation on online banks. This lack of regulation means that property owners are not protected. Individuals can go online and get approved for a mortgage easily; however, the online banks do not provide an idea of the property's flood risk or the cost of the mandatory flood insurance policy. This group noted that regulations have not caught up to technology. They saw this as a significant concern going forward.

### System-Level Problems

Several participants mentioned problems they saw with the overall mitigation and insurance system. One series of discussions focused on academic research. Participants in this group felt that academic research was too conceptual, and those research findings do not apply enough to the realities of practice or industry. Another problem is the language used to communicate risk. Participants felt that the 100- and 500- year flood language is inadequate. The language is confusing for both professionals and the general public to understand and then correctly interpret.

Several other participants identified problems that would need to be corrected at the federal government level. One group discussed a need for the underinsured population to gain more access to government funds, both pre-and post-disaster. Right now, participants felt that these individuals unfairly have less access to government funding for mitigation. Another group identified a problem with the current lack of quantity-based discounts. As described by this group: if a community manages to get a group of property owners who want to mitigate or insure, there is no opportunity for them to qualify for a group discount. This group felt that a group discount could benefit individuals financially and encourage individuals who were indecisive about mitigation.

## Chapter 3- Mitigation Tools

To prepare for the workshop, our team reviewed documents, literature, databases, and resource sites to develop a comprehensive list of mitigation and insurance tools currently being used or envisioned by those in policy, practice, and research. We asked groups of attendees to provide their qualitative assessment of each tool using the form below during our workshop. We also allowed participants to add comments to those initial assessments using post-it notes during the breaks. The content below was developed from the initial online searches and the responses from the workshop.

### Mitigation and Insurance Policy Tool Assessment

Policy Tool: \_\_\_\_\_

<b>Mitigation and Compatible Objectives-</b> What risk reduction or other policy objectives does this tool address?	<b>Competing Objectives/Unintended Consequences-</b> What other effects might the tool have?
<b>Advantages-</b> What makes this an appealing option?	<b>Challenges-</b> What is hard about this particular option?
<b>Supporters-</b> Who will fight for this and why?	<b>Opponents-</b> Who will fight against this and why?
<b>Case Use Examples-</b> Does experience tell us this will work or not?	<b>Research Evidence-</b> Does science suggest this will work or not?

Other:

### “Opt-out” / Automatic Renewal Insurance

Though “opt-out” and automatic renewal insurance are two distinct strategies, the elements participants discussed were similar for both options. They felt both would achieve the objective of reducing losses by taking advantage of well-known behavioral biases towards stability instead of change. Additionally, both would help reduce loss by increasing the size of

the insurance risk pool and distributing the risk across more individuals. Participants identified property owners as having competing objectives because they may object due to distaste for government control. Participants did not identify any complementary objectives or unintended consequences for either “opt-out” or automatic renewal insurance.

An advantage of automatic renewal and opt-out for insurance is that it is easy for consumers to use and likely would increase policy retention. However, participants also felt there were several challenges affiliated with these strategies. Challenges may include the feeling that people are stuck in the system or forced to pay too much money for insurance policies for an extended period of time. Participants also discussed the difficulty of implementing these strategies due to a lack of political appetite for them. Regardless of the challenges, the participants that discussed these options were broadly in support of the automatic renewal and opt-out for insurance approaches. Participants did not discuss opponents, use examples, or research evidence related to automatic renewal or opt-out for insurance.

## Base Zoning Ordinances

Participants noted that there are several objectives affiliated with using base zoning ordinances. The first primary objective is to reduce losses by removing people from high-risk areas, redirecting development in different areas, helping to determine land use, and reducing impermeable areas. The second primary objective was to educate stakeholders, which included education and awareness planning. Participants also noted several objectives that are exemplars of changes to the existing mitigation system: directing development, oversight of environmental impacts, and open space regulation.

Participants identified complementary and competing objectives and unintended consequences. Complementary objectives to base zoning ordinances are having oversight over the environment and environmental impacts and enabling open space zoning. These are likely to be objectives held by local governments. Impacts on the local economy are both competing objectives and unintended consequences for base zoning ordinances. A community does not want its tax base to be lessened as a result of zoning. Developers are sometimes seen as having competing objectives because their main objective is to profit from the development. Base



zoning ordinances may force new development to incorporate more open spaces or affordable housing, which lowers developers' profits.

Some advantages of base zoning ordinances include that it can be a long-term solution, zoning is locally controlled, and can give the community flexibility. Most of the challenges associate with base zoning ordinances center around the reality that they are locally controlled. One challenge is that local interests may go against regional interests. Participants explained that regional interests might differ from what the local community is interested in doing. The challenge lies in the reality that the local community is ultimately the decision-maker for what action happens. Another challenge is that there is a lack of resources at a local level. Many communities lack the resources and support in order to enable appropriate zoning ordinances. Participants also noted that another challenge is who has the authority over these issues at different government levels. They questioned if the higher levels would impact rules on the lower level. It seems that in many states, that is not the case. A final challenge of base zoning ordinances is that they could lead to flooding in different areas due to increased development in areas not restricted by the base zoning ordinances.

Participants identified several potential supporters and opponents of base zoning ordinances. Residents could be supporters depending on if they want the community to become more resilient. Insurance companies and emergency managers were also identified as supporters because base zoning ordinances would give them more control over their jurisdictions. Two opponents were identified; developers who likely want to build up the community and residents who want their property values to increase.

This group identified several examples of case use of base zoning ordinances. One example is a community just north of Dallas, Texas, where the local jurisdiction influence over impervious areas and flooding had increased. Another example was The Villages in Florida – where multiple jurisdictions came together to create a new community. Next, Houston, Texas, was mentioned for having no zoning. New York City was noted for a group called Zoning for Flood Resilience that focuses on zoning and how it can be used better in New York City. The final example was Frederick, Maryland, which just re-zoned the city walk area built specifically to help with flooding resilience.

Participants did not know about research evidence for base zoning ordinances. However, they did know that in Delaware and Maryland, researchers were studying the effects of runoff. Participants also mentioned that Texas A&M has a planning group that researches this topic.

## Building Codes

Building codes are used to regulate the construction and design of structures in a way that maximizes their capacity to withstand hazards such as flooding, storm surge, and hurricane-force winds. Model codes have been developed to specify the standards and expectations for building stronger communities should consider, but the specific requirements in any given local code vary. Participants noted that if building codes are correctly done and grounded in science, then the building code acts as a tool to reduce losses by increasing the safety of individual properties. They also save communities money following a disaster and make insurance more affordable for individual households. Participants noted that one objective of building codes is to hold builders and local governments accountable for mitigation. This also applies to the states that have the authority to create and enforce building codes. Participants suggested building codes can provide stability and clarity for relevant stakeholders.

Participants only identified one entity with complementary objectives. In repeat flood communities, organizations and agencies are likely to push for building codes if insurance companies are resistant to continuing to offer policies. Property owners and local governments are likely to have competing objectives. Property owners may oppose the increase in property price, may object to infringement on their personal freedoms, and may have a false confidence in their property's safety. Participants noted that local government is likely to have competing objectives in the form of other codes that may supersede or interfere with the use of building codes. An unintended consequence of building codes is that property owners have to act as an intermediary to find good companies to update their properties to code. This is a big challenge because not all property owners have the knowledge to identify reliable builders. Another unintended consequence is that the use of building codes can price people out and raises the cost of properties. This negatively impacts vulnerable populations. A final unintended consequence is

that building codes can enable individuals to ignore their risk. Building codes can indicate that being in a stronger house may eliminate flood risk, which is not the case.

Participants identified many advantages and challenges of building codes. Advantages include making flood insurance more affordable, making the requirements transparent, holding builders and local and state-level government accountable for mitigation, and protecting properties in the event of a disaster. Participants noted several challenges as well. Two were most emphasized. First, building code ordinances are typically enforced at the time of construction or renovation through a designated code enforcement officer/ inspector, and there was a concern that enforcement varies significantly from place to place. Further, local governments may want to enforce their codes but struggle to afford them. This is primarily a challenge in economically disadvantaged areas because these communities cannot afford enough officers to monitor and enforce. Second, they felt it is challenging to enact building codes in states where nothing has been established before. Specifically, it is hard to get stakeholders, including homeowners and local government, invested enough to push for either enforcement of building codes or the creation of stricter building codes. Finally, challenges were identified regarding the codes. The technical nature of building codes was seen as a challenge in that people may not understand the building codes and their strength (or lack of strength). Further, the time between enactment and results was also seen as a challenge for building codes in that it takes time for legacy structures to be updated.

Supporters of building codes are the insurance industry and federal government agencies, such as NIST and FEMA. Participants suggested that a well-informed population would-be supporters of building codes; however, they felt the population is currently not well-informed about hazards, risk, and mitigation. Builders can be both supporters and opponents of building codes. Builders can be both opponents and supporters of building codes. One participant felt the building industry's old guard would oppose while younger builders may have a more holistic view of hazards/risk and be interested in adhering to building codes. Opponents of building codes include property owners who have to pay to update their properties to code and state and local level government who would need to expend political capital and lobby to get building codes passed.

There are many case use examples of building codes. Consensus Standards ASCE7 (minimum design loads for buildings) and ASCE 24 (flood-resistant design and construction) provide model guidance for hurricane risk standards. Following Hurricane Andrew, the Florida Department of Community Affairs ran a hazard mitigation program that strengthened building codes against higher wind speeds. Florida also has a four-point inspection program that ensures properties meet building codes and then qualifies property owners for an insurance discount. Brazoria County, Texas, adopted a freeboard regulation in order to combat flood loss. All new construction must be elevated two feet above the FEMA NFIP recommended standards for Special Flood Hazard Areas (SFHAs). Finally, the NCIUA (out of North Carolina) reported zero claims for water intrusion from Hurricane Dorian because they started to require a sealed roof deck. Participants also noted that research suggests building codes do work. One participant noted that IBHS had done much work in this area.

## Buy-Out Programs

Buy-out programs have the objective of reducing losses. They help reduce loss by saving taxpayer money, increasing resilience in a community, and preventing new construction in risky areas. Local government and property owners are likely to have competing objectives against buy-out programs. Property owners have competing objectives against buy-out programs because of the additional costs associated with relocation and uprooting their families. Stakeholders within the local government may have competing objectives because of the effects on their workforce. Participants felt these competing objectives make it hard to implement buy-out programs successfully. Specifically, the public opposition to buy-out programs was identified as a challenge for implementation. Other challenges identified were challenging to implement, difficulty getting community buy-in, and the length of time it takes for the program. The public's strong opposition, which is often vocally done in the public sphere, can make it challenging to implement these programs in communities. Regardless of these challenges and opposition, participants supported buyout programs. However, they were skeptical of how implementing these tools would look in reality. Notably, participants did not discuss complementary objectives, unintended consequences, advantages, case use examples, or research evidence.

## Cluster Subdivisions

Participants were confused about the purpose of cluster subdivisions. They acknowledge that their objective is to reduce losses by helping to limit development in at-risk areas. They thought of this as a preemptive managed retreat that leads to development with minimal disturbance and allows green space to be designed around a hazard risk. Participants were not confident that cluster subdivisions were an effective program to accomplish risk reduction. Participants felt the program had too small of a focus and would be best-considered part of a more extensive mitigation program. Property owners may have competing objectives to cluster subdivisions because it can cause cosmetic changes to their neighborhoods and may affect property values. Some advantages of cluster subdivisions are that it incentivizes development away from hazardous areas and involves the inclusion of green space in a new community. During the discussion, participants did not identify any complementary objectives, unintended consequences, supporters, opponents, case use examples, or research evidence.

## Community participation and improvement in Community Rating System (CRS)

The main objective of community participant and improvement in CRS is to reduce loss. There was some concern from participants that CRS criteria/standards are so low that it would be better to encourage communities to do more than just the CRS minimal. By exceeding the minimal requirements, participants hoped communities would be more protected and may experience less loss. The local government may have competing objectives against community participation in CRS because of the limited resources available to do community outreach. Additionally, local, state, and federal governments have competing objectives against CRS because it could lead to development in more at-risk areas. That is something these levels of government want to minimize or eliminate. Participants identified that as an unintended consequence: that it may encourage development in the floodplain so that a community can capitalize on the benefits of CRS. Communities will want to achieve the standard that qualifies all policyholders for an insurance discount - but in order to do that, they may develop and mitigate new properties in risky areas. Participants seemed to prefer that development would

occur in neighboring non-participating communities with lower risk. Participants identified stakeholders as having challenges that were likely to prevent their participation in CRS. Property owners, renters, and local, state, and federal government agencies only have so much bandwidth to take in information campaigns and participate in new programs. Participants did not discuss complementary objectives, advantages, supporters, opponents, case use examples, or research evidence.

## Density Bonus

Participants felt density bonus would reduce losses because they ensure fewer people reside in hazardous areas and help to preserve natural habitats and resources. Local government (specifically urban planning departments) would have complementary objectives in their desire to make communities more walkable. The state government may be in favor because it will restrict development in high-risk areas. However, several other stakeholders are likely to have competing objectives. State emergency management agencies may want to eliminate development from at-risk areas entirely. Developers may see density bonuses as complicated and problematic restrictions. Participants noted one concerning unintended consequence of density bonus. While the policy limits development in one hazardous area, it may lead to development occurring in another equally hazardous area "upstream."

An advantage of density bonus is that it may motivate and incentivize developers and land-use planners to mitigate. Participants indicated that it is different from current practices in many communities. Another advantage of density bonus is that it would help increase walkability, which benefits the goals of urban planners. The use of density bonuses also creates an opportunity for emergency management and developers to become better incorporated and have the opportunity to try and collaborate on this mitigation policy regulation. While there are many advantages to density bonus, participants also felt there were many challenges. In many urban areas, such as New York City, density bonuses would not work because there are "no bonuses left." Another challenge of density bonus is that community members could feel it would change the traditional character of the community. Another challenge of density bonus is that there is no authority at the state or federal level to push this regulation down to a local level. An additional challenge with density bonus is how different geographic areas define hazardous areas.

Subsequently, that could create problems when trying to identify areas to utilize the density bonus in. Several challenges involved developers. Since density bonus will be a new idea for developers, it will likely be hard to get their buy-in. Another challenge is that it gives power to the developer, and it also creates a lack of incentive to maximize the density with the currently existing building codes. Others felt the program is challenging to administer, and it can be challenging to determine who qualifies for any exceptions and who wouldn't, and that the program could cause unwanted tension between stakeholders.

Participants would support the use of density bonus in conjunction with either a transfer of development rights program and/or farmland preservation program. They felt this combination would be the best use of the program. Alone though, they would not support a density bonus program as a means to improve hazard mitigation. Other supporters of density bonus would be developers if the policy were implemented alongside an incentive (such as cashback or tax break). Opponents of density bonus could be land use and zoning councils and potentially developers or homeowners. Developers might oppose density bonuses because it would restrict how they can build. Homeowners might oppose the density bonus because it could change the character of the community.

A participant proposed how a case use example of density bonus could be modified for mitigation purposes. In Newark, Delaware, density bonus was used to help with walkability, urban sprawl, and meet housing needs due to the college's demands. The density bonus program supplies developers with parking waivers - but the participant proposed that the parking waiver could require that space be used as a floodwater retention area. Participants did not discuss any research evidence related to density bonuses.

## Escrow Monthly Insurance Premiums

Participants identified two objectives escrow monthly insurance premiums would help achieve. First, this policy tool would increase flood insurance saturation by making it easier for policyholders to pay for insurance. Second, escrowing monthly insurance premiums help reduce losses by increasing the number of properties insured, which leads to communities being more



financially prepared for disasters. Property owners may have competing objectives because this policy may reduce transparency for insurance rate changes.

Participants noted several advantages of escrow monthly insurance premiums. These advantages include making it easier for homeowners to understand the financial implications of insurance cost, third-party management, and meeting a long-standing request from FEMA. Participants noted many challenges of escrow monthly insurance premiums. One challenge will be logistics and communication about payments between banks and insurance companies. Another challenge is that this policy tool does not change the risk perception or behavior of policyholders, meaning that ultimately those individuals would not be any more likely to implement retrofit options. Other challenges include a need for oversight of the lending institute, lack of inclusion for renters, and homeowners' potential to experience additional fees.

There are several supporters of escrow monthly insurance premiums. Homeowners would support this because it would help with their financial planning. Government agencies would support it because it will encourage homeowners to buy insurance. Social justice groups would support this because it will likely help low-income households manage their finances. Insurers and reinsurers would support this because it could help with cut-ins. However, there are likely two opponents to escrow monthly insurance premiums. Lending institutions and insurers may oppose this because of additional administrative tasks. A case use example of escrow monthly insurance premiums is Pennsylvania's Private Mortgage Insurance. Participants did not discuss complementary objectives, unintended consequences, or research evidence.

## Grants and subsidies to builders

Grants and subsidies to builders achieve the objective to reduce losses. Utilizing this tool enables new construction and renovated properties to be mitigated, which could also support vulnerable and at-risk populations. Both the building industry and historic preservation would have complementary objectives. Builders would benefit financially from the grants and from the efforts to make the public more aware of mitigation and protecting the community. Historic preservation would have complementary objectives because the grants could make historic properties more affordable. Participants noted that local, state, and federal government and



property owners might have competing objectives that conflict with this policy. These stakeholders are unlikely to want to help builders directly by providing them grant money that stems from taxpayer dollars. Participants noted that grants and subsidies to builders might disincentivize builders to mitigate in areas that do not participate in the grant program. This could cause builders to build in higher-risk areas. One solution to overcome this may be to offer this incentive in only lower-risk areas.

Participants identified several advantages of grants and subsidies to builders. One advantage is that there would be clear transparency of what and whom the grant money is going towards. Another advantage is that it could attract developers to develop affordable housing that is mitigated and resilient. Additionally, given that it is grant money, it would come with strings attached, which may disincentivize the builders. The final advantage is that it would help builders get some money back from participating in mitigation.

Participants identified many advantages of grants and subsidies for builders. These advantages benefited not only builders but also at-risk populations, the government, and homeowners. Advantages for builders include that it can encourage new partnerships and showcase builders who support the local community by wanting to reduce risk. Using this policy tool would ensure at-risk populations are protected by ensuring rental properties and affordable housing units are mitigated. This policy tool also provides an advantage for the government by encouraging non-traditional partnerships with builders. Finally, grants and subsidies for builders provide several advantages for homeowners, including that it takes the burden off of homeowners to secure mitigation grants or discounts, makes mitigation for historic properties more affordable, and minimizes the cost of damages from future hazards.

While there were many advantages to grants and subsidies for builders, participants were concerned there were even more challenges related to the policy tool—these challenges impacted government agencies, homeowners, and builders. Administration and enforcement of the grants and subsidies would be challenges and likely a large burden for local, state, and federal government agencies. For homeowners, challenges include increased property value and a subsequent increase in annual taxes and dissatisfaction about not receiving the grant money themselves. Challenges impacting builders include how to market the savings to homeowners

and reimbursement. Ultimately, participants questioned if grants and subsidies for builders would be the best usage of limited resources. Their perspective was a resounding no, and they also felt state governments would feel the same.

Participants identified historic preservation as supporters of grants and subsidies for builders. Opponents of this type of program include the public and participants of the workshop. Ultimately, participants questioned if taxpayer dollars should go to developers or builders over other stakeholders.

There is no research evidence to support or show how grants and subsidies to builders would work in a community. A participant suggested a pilot study is needed to determine what would happen with such a program. Case use examples and unintended consequences were not discussed during the workshop.

## Grants and subsidies to homeowners

Grants and subsidies to homeowners are a policy tool that achieves two objectives: tools to reduce losses and educate stakeholders. To reduce losses, grants and subsidies to homeowners would increase mitigation by establishing partnerships between constituents and government. Grants and subsidies would also help to fund mitigation and encourage mitigation planning. Two stakeholders may have competing objectives. Local government is likely to have competing objectives because administering these grants could impact their budgets and resources. Property owners may have competing objectives because they will have to front the money for mitigation before receiving the grant or subsidy.

Advantages of grants and subsidies to homeowners include the following: the potential to lower insurance premiums if the home is determined to be less at-risk following the retrofit; properties and lives will be less vulnerable to impacts from hazards; greater access to mitigation for vulnerable populations; and increased property and resale values. Participants found many challenges with grants and subsidies for homeowners. Challenges include acquiring funding for the program that covers the full cost of the retrofit; the burden on non-federal partners; limited staffing and administrative resources; determining equitable qualifications for eligibility to

receive a grant or subsidy; time to apply and process the application; and increased property taxes for homeowners.

Supporters of grants and subsidies for homeowners include lending institutions, emergency management officials, the construction industry, and homeowners. Lending institutions and emergency management officials would benefit financially from more mitigated properties. The construction industry would benefit from the likely increase in jobs. Homeowners would support because they would get more money towards mitigation projects. However, there are several opponents to grants and subsidies for homeowners, including homeowners, historic preservation, and the construction industry. A grant and subsidy program for homeowners will have specific qualification rules that may cause a divide in the community regarding who qualifies and who does not. Another opponent will be historic preservation (no explanation provided). A final opponent is the construction industry because programs will likely have stringent codes and processes to implement the mitigation measures.

Participants identified many case use examples of grants and subsidies to homeowners. They are the following: 1) State acquisition relocation fund in North Carolina; 2) New Jersey Shore subsidy program to elevate homes; 3) Glenville, Delaware grant programs (which struggled with funding, scaling up, and implementation time); 4) Centralia, Pennsylvania buy-out program; 5) Individual Assistance program to elevate utilities (which was too challenging); and 6) Project Impact under the Clinton Administration. Research evidence involving grants and subsidies to homeowners was done on the North Carolina state acquisition relocation fund involving capped and buy-out offers. Participants did not discuss complementary objectives or unintended consequences.

### Group/Community Insurance Purchase

The objective of group/community insurance purchase is to improve the utilization of flood insurance. This is a program that FEMA is interested in implementing. Participants discussed several advantages of group/community insurance purchase. This type of program would ensure there was uniformity in messaging across different levels of government. Another

advantage is that this program increases the number of insured properties and simultaneously allows FEMA to meet its goal of increasing the insurance coverage rate significantly.

An advantage of group/community insurance purchase is the involvement of the local community in this process. This policy tool is a way to help get the community engaged in mitigation and support their residents, which is something communities commonly express interest in doing. Challenges of group/community insurance purchase include having a hard time selling local community members on the idea, finding early adopters to the program, and that the program in each community will likely need to be slightly different/customized. Supporters of group/community insurance purchase are FEMA, FIMA, and community resilience advocate groups. Participants did not discuss complementary objectives, competing objectives, unintended consequences, opponents, case use examples, or research evidence.

## Home Inspections

Participants thought home inspections would accomplish the objective of tools to reduce losses. Ensuring properties meet codes pre-hazard events and home inspections would help reduce losses and help homeowners recover more quickly. Individuals are likely to have complementary objectives about home inspections because it can help these property owners or renters recover faster. Local government has complementary objectives with home inspections because it can increase property taxes resulting in increased tax revenue. Participants also thought property owners and local government would be likely to have competing objectives for home inspections. For property owners, many inspections are already mandatory post-disaster, so having an additional could be a burden. Property owners also will not want their property taxes to increase. The local government may have competing objectives due to their limited resources. Subsequently, they may be unwilling to spend additional resources completing home inspections related to mitigation.

An advantage to home inspections is that they may help individuals recover quicker because they would have more precise information about the inspected properties. Some challenges for home inspections come from the agency side. Many agencies are limited in resource capacity. They are unlikely to be willing to take on the time and resource-intensive task of home

inspections. Participants felt that there would need to be a large amount of external funding for agencies to take this on. Other challenges affiliated with home inspections are the volume of home inspections that would happen after an event, additional burden and irritation to homeowners due to the volume of home inspections, and lack of power for homeowners around the number of inspections needed. Participants were supporters of home inspections, but they were skeptical of how the implementation of these tools would look in reality. Participants did not discuss unintended consequences, opponents, case use examples, or research evidence.

### Increased coverage limits

Participants stated that increased coverage limits have the objectives of tools to reduce losses and to educate stakeholders. Increased coverage limits are tools to reduce losses by providing more protection for properties. Increased coverage limits can also be used to educate stakeholders about what is covered in their insurance policies. Participants discussed how insurance companies and property owners would have competing objectives about increased coverage limits. Insurance companies prefer to keep a reserve of funds, so an increase in coverage limits would make it more challenging to achieve that objective. This was also the only challenge identified by participants. Participants also thought property owners would have competing objectives because increased coverage limits would result in additional financial burdens. Three opponents were identified: workshop participants, insurance companies, property owners, and workshop participants. Insurance companies would be opponents because it would challenge their abilities to make a profit. Property owners are likely to oppose increased coverage limits because of the increased financial burden. Notably, participants in this discussion group also opposed increased coverage limits. This group did not discuss complementary objectives, unintended consequences, advantages, supporters, case use examples, or research evidence.

### Information Campaigns

Participants noted the importance of and need to use information campaigns to accomplish the objective of educating stakeholders. Specifically, future information campaigns need to

educate stakeholders about their risk and preparedness options. Information campaigns can also accomplish the objective of reducing losses. Local government and property owners have competing objectives with information campaigns due to information overload and limited resources.

An advantage of information campaigns is that the campaigns enable more information to be shared with different stakeholders. Participants believed “Knowledge is power” and that it is advantageous to provide stakeholders with additional knowledge on mitigation. One challenge associated with information campaigns is that the volume of information coming to property owners can be overwhelming. It may even result in individuals not heeding any of the campaigns' advice or action items. Another challenge related to information campaigns is that it is hard to make the campaign effective and distinguishable from other public service announcements. Participants did not discuss complementary objectives, unintended consequences, supporters, opponents, case use examples, or research evidence.

## Insurance Credit

Participants identified one objective of insurance credits: to increase the prevalence of mitigation and insurance simultaneously. Local and state governments may have competing objectives against insurance credits because they would have to confirm properties mitigated. Time would likely be a challenge for the government and lead them to oppose this incentive. Participants did not discuss complementary objectives, unintended consequences, advantages, supporters, case use examples, or research evidence.

## Insurance Deductible Reductions

Participants felt that insurance deductible reductions would help to achieve the objective of reducing losses. However, participants were not sure this policy tool/incentive was the best option. Local government has complementary objectives with insurance deductible reduction programs because the mitigation that would be required may help increase the community's CRS score. Property owners are likely to have competing objectives because of the increased cost of compliance to qualify for the reduction. Local governments may have competing objectives

against insurance deductible reductions because funding the program could take money away from other programs or projects. One unintended consequence of insurance deduction reductions is that they could take away funding from other programs in local communities.

Advantages of insurance deductible reductions are that policyholders get the discount right away, and it helps to lower risks. Participants noted many challenges regarding insurance deductible reductions. Participants identified some challenges related to administration, including scaling issues, hard for local or state governments to track who earned the reduction, hard to track overall benefits from program participation over time, hard to align with insurance cycles, hard to coordinate with other grant programs and the amount of time and money associated with code inspection. This type of program would also have challenges for individuals. For policyholders, the uncertainty about if they would ever reach the deductible makes this option seem like less of an incentive. Additionally, high enrollment in an insurance deductible reduction program means insurance rates across the region would increase to offset the cumulative cost of the reductions. Policyholders will not support that. An additional challenge is the lack of inclusion of renters in this type of program. Finally, participants felt this program did not change the policyholder's preparedness behavior, which was their ultimate objective.

Participants identified three parties that will be both supporters and opponents. Local officials and code enforcers may oppose the administrative burden, but it may also lead to more homeowners buying insurance, which would lessen the community's financial vulnerability. The real estate industry may see adverse effects but may also benefit from being able to market a house as eligible for a reduced deductible. Other supporters of insurance deductible reductions include homeowners, state agencies, and FEMA. Participants did not identify any case use examples or research evidence.

## Insurance Mandates

Insurance mandates can serve as a way to educate policyholders and to reduce losses. Participants note that insurance mandates educate the public by signaling their flood risk and raising awareness about insurance policies. Participants said insurance mandates would help

reduce losses by increasing the insurance purchase rates and ensuring policyholders would have the ability to recover from a disaster. Property owners are likely to have several competing objectives against insurance mandates. These include a lack of awareness about the risk to their property, dissatisfaction with mandated insurance cost, and confusion about the complexities of mandated coverage. Property owners have competing objectives due to the related costs for having the mandated insurance policies. Private insurance companies are likely to have competing objectives against mandatory offers for insurance because they will be required to offer policies to any property or policyholder. This can result in an overall loss to the company if there is flood damage. The federal government (specifically the NFIP) has competing objectives to mandatory offer for insurance because they would have to compete with private insurance companies and banks to provide policies and garner enough business. An unintended consequence of insurance mandates is that they may enable policyholders to ignore their risk. Another unintended consequence is that insurance mandates do not help people realize the actual risk affiliated with their property.

Participants identified several advantages of insurance mandates. They are quicker recovery time for policyholders, increases the risk pool, and demonstrates the risk to the consumer. Participants also identified several challenges of insurance mandates. Challenges include a lack of understanding about the policy tool, the importance of insurance and risk; policyholders' desire for a rebate if they do not make a claim; enforcement; and ensuring insurance companies are mandated to provide adequate insurance coverage. Supporters of insurance mandates include federal and state governments, mortgage companies, and banks. Opponents of insurance mandates include the public and insurance companies.

Participants did discuss the Wharton School at the University of Pennsylvania's extensive research on insurance mandates. Participants did not identify any supporters or case use examples.

## Insurance Premium Reductions

Insurance premium reductions achieve two objectives: tools to reduce losses and educate stakeholders. Insurance premium reductions help reduce losses by increasing individual



properties' safety and the overall prevalence of mitigation and insurance. Insurance premium reductions serve as an opportunity to educate homeowners about different mitigation practices and insurance policy alternatives. State and federal governments are likely to have competing objectives against insurance premium reductions because each state sets its own legislative rules. Therefore, insurance premium reductions would have to be individually accepted, adopted, and regulated by each state, which would be challenging for the federal government to track and manage.

Advantages of insurance premium reductions are that it would be an incentive to help lower risk for the insurance companies and their policyholders. Participants felt this should motivate the insurance companies to offer these sorts of policy discounts. Some challenges of the insurance premium reductions include uncertainty about how insurance companies will determine pricing; what the long-term advantage would be for stakeholders; how compliance would be calculated and who would be responsible for compliance; how to incorporate individual property risk reduction due to so much variability; and impacts to the vulnerability blocks. Participants believed the biggest supporter of insurance premium reductions would be the homeowner because they would have to pay less for their premium. Participants identified several case use examples. Some participants described how FORTIFIED program participants were able to receive reduced insurance premiums after adopting risk mitigation strategies at their properties. Additionally, the CRS system qualifies eligible communities for insurance premium reductions in the NFIP.

Participants did not identify any complementary objectives, unintended consequences, or research evidence related to insurance premium reductions.

## Insurance Vouchers

Participants identified three objectives of insurance vouchers: to change the current mitigation system, to reduce losses, and to educate stakeholders. Insurance vouchers provide a possible way to finance the objective of making that change to the mitigation system. Participants noted insurance vouchers could also double as a means to educate stakeholders about their risk and the true costs of insurance. Participants also noted that vouchers could

increase the number of insurance policies held. When participants talked about insurance vouchers, one concern raised was taxation. Some participants expressed that insurance vouchers for mitigation should not carry taxation that the homeowner or renter would be forced to pay.

Several stakeholders would have complementary objectives to insurance vouchers. Individuals are likely to have complementary objectives because the vouchers would help cover the cost of their insurance policy for at risk individuals. This requirement would achieve the objective of increasing mitigation and insurance, which aligns with what local, state, and federal governments prioritize to minimize losses. However, several participants also believed any government level (local, state, or federal) might have competing objectives to using this incentive method. From a local government perspective, vouchers might compete with the CRS program. Lower CRS scores would limit funds for other programs, limited resources to administer the program, and have impacts on taxes. Additionally, insurance vouchers have an unintended consequence of enabling individuals to ignore their risk. While vouchers are intended to help vulnerable populations afford flood insurance, they can sometimes disadvantage them by requiring the installation of expensive mitigation actions. Some participants indicated that mandating both private-pay mitigation with insurance vouchers could make the program too expensive for low-income populations.

An advantage of insurance vouchers is that they could educate policyholders about their property's and community's risk. The second advantage of insurance vouchers for affordability make insurance more affordable for low-income residents. Participants identified many challenges for insurance voucher programs. These challenges include administration, taking money away from other programs, requiring the adoption of expensive mitigation actions to be eligible, incentivizes risk, and the concern that recipients may be taxed on the voucher. Supporters of the CRS are likely to be opponents for insurance vouchers of affordability because using these vouchers weakens a community's CRS rating. Participants did not identify any opponents, case use examples, or research evidence of insurance vouchers.

## Long-Term Loans

Participants noted that the objective of using long-term loans is to help reduce losses. Long-term loans would make it more financially accessible for homeowners to mitigate their properties. Participants believed long-term loans would be most useful in a post-disaster context where property owners already have to make home repairs. Some advantages of long-term loans include improving the affordability of mitigation; incentivizing property owners to go above the minimal codes; and reducing insurance premiums if properties are built more resiliently. Participants identified many challenges of long-term loan programs. The challenges include homeowner's willingness to take out loans for mitigation, questions about the cost-effectiveness of the loans; overcoming the ratio of loan to value; taking away funding from other community programs; and decisions about subsidized interest rates. Several participants indicated that they did not know if this type of program would be useful, people might not want or even be able to afford long-term loans. Potential supporters of long-term loans include communities who want to retain residents in vulnerable, high-risk properties. These loans could enable property improvements. The advantage of funding property improvements with long-term loans could be attractive to any homeowner exploring financing mitigation improvements. Improvements to homes, financed through long-term loans, would also be supported by emergency managers. Participants suggested mortgage lenders are likely opponents to long-term loans because it would take them longer to get a return on their investment. Participants identified two case use examples of long-term loans. In San Francisco, residents in low-income communities can use long-term loans to pay for earthquake retrofits. In the State of New York long-term loan programs enable homeowners to participate in solar programs. Though not a mitigation program, participants felt this mirrored closely to what long-term loan programs would be for mitigation. Participants did not identify any complementary objectives, unintended consequences, or research evidence.

## Low-Interest Loans

The objective of low-interest loans is to reduce losses. This type of loan program accomplishes that objective in several ways: making mitigation more affordable, helping people remain in their properties located in high-risk areas, protecting properties from extensive

damage, and protecting the local economy. Several stakeholders will have competing objectives for low-interest loan programs, including property owners, the building industry, insurance companies, and local and state governments. Property owners will have competing financial objectives; they must choose whether to mitigate their property or go on vacation or save for college. The building industry may have competing objectives because of the stringent rules to ensure the mitigation is built to local code. Local and state governments may have competing objectives because of concerns over complications with implementation.

Participants identified several unintended consequences of low-interest loans during their discussions. To qualify for low-interest loans, property owners must prove that they can make payments, which has adverse effects for vulnerable populations. Builder fraud is another unintended consequence of low-interest loans. In these loan programs, property owners have to find a builder to update their properties to code. This is a big challenge because not all property owners have the knowledge to determine who reliable builders are. Participants also suggested an unintended consequence of low-interest loans is that renters could be left behind.

Advantages of low-interest loans include increasing property value, maintaining a property's sellability, keeping communities together, and ensuring the post-disaster recovery process is faster. Participants discussed many challenges related to low-interest loans. Challenges include property owners' resistance to taking out a loan; length of time to roll out a program and its funds post-disaster; property owners' preference for grants over loans; increased property taxes; potential to result in gentrification; insufficient loan amounts; does not apply to renters; loan may be inadvertently misused (i.e.: used on non-mitigation home improvement projects); enforcement; and meeting lender's guidelines.

Local communities and banks are likely to be supporters of low-interest loans. Local communities would support these programs because it means the tax base will remain in the community. Banks would be supporters of low-interest loans because the loans can help keep residents in their properties and make properties in higher-risk area more affordable for low-income households. Participants do not think there would be any opponents of low-interest loans. Participants did not identify any complementary objectives, case use examples, or research evidence.

## Multi-year insurance

Participants noted that the objective of multi-year insurance programs is to increase the prevalence of insurance, which included increasing the rate of insurance coverage, lowering the long-term cost to the homeowner, and easing business owners' fears about risk uncertainties. Insurance companies and property owners are the two stakeholders that participants felt would be likely to have competing objectives. Insurance companies may have competing objectives because they may be at greater risk of insolvency due to the multi-year commitments. Participants also suggested that property owners may have competing objectives against multi-year insurance because this policy tool is unlikely to save them any money.

One advantage of multi-year insurance is that it allows policyholders to lock in a lower insurance rate. Challenges of multi-year insurance include that the policies may not be worth it for homeowners in the long run because rates could drop and they would be locked into the higher rate; risk changes from year to year in a community; and this policy tool does not encourage individuals also to take protective actions. Participants did not feel any stakeholders would be strong supporters of multi-year insurance. The stakeholders they included in their discussion were homeowners, insurance companies, and other consumers. Several participants were opponents to multi-year insurance. Participants also noted several opponents of multi-year insurance. They felt insurance companies would be opponents because multi-year insurance could impact their annual revenue. Consumers were likely to oppose because of the possibility of getting locked into a higher rate. State commissioners are likely to oppose because of the administrative burden. Participants said they were unaware of any case use examples or research evidence of multi-year insurance. Participants did not identify any complementary objectives or unintended consequences.

## Overlay Zones

Participants noted the objective of overlay zones is to reduce losses and educate stakeholders. Overlay zones can help to reduce losses by facilitating NFIP compliance. Overlay zones are also visual tools that can help communicate areas of risk on a map. Participants noted that one objective of overlay zones is to educate stakeholders by communicating risk to locations of

hazardous areas. Competing objectives when considering overlay zones include the potential for negative impacts to the local economy and the possibility of profit loss for developers. Property owners may also be worried about potential negative impacts, including decreased property value associated with flood risk. Several stakeholders (developers, local government, and real estate agents) are likely to have competing objectives to overlay zones because of the potential adverse impacts on property values. Developers will also have competing objectives towards overlay zones because it limits their ability to develop in hazardous areas, which are often the most profitable areas. An unintended consequence of using overlay zones would be limiting development in hazard areas. Participants viewed this as a positive unintended consequence.

The advantages of overlay zones include delineating hazard areas, supporting long-term planning, the ability to address multiple hazards, the ability to link overlay zones to other land use planning tools, and easy to update over time to reflect changing hazard conditions. Participants identified a number of challenges related to overlay zones. One challenge is that overlay zones establish discrete boundaries that do not capture the nuances of different degrees of risk and thus may present a distorted perspective. Other challenges involve cost; specifically that the costs to first create the tools and then enforce the overlay zones are high. Given these high costs, some participants felt overlay zones may be hard for communities to implement and enforce. Other challenges identified include that overlay zones may reinforce socioeconomic barriers in communities and may result in either crowding or the spill-over effect if people residing in high-risk areas are pushed out and relocate to more populated areas. Participants identified land use planners, code enforcement officials, emergency managers, insurers, and reinsurers as supporters of overlay zones. Land use planners will be supporters because overlay zones can also be used as a means to help them enforce their own planning strategies. Code enforcement officials will be supporters because the delineation of the overlay zones can make enforcement easier. Emergency managers, insurers, and reinsurers will support overlay zones because they can help prevent individuals and their assets from being located in high-risk areas. Opponents of overlay zones are developers, code enforcers, and land-use planners. Developers are likely to be opponents because there would be less land available for development and their existing property might decrease in value. Code enforcers and land-use planners may oppose

overlay zones due to an increase in workload. Participants noted several case use examples for overlay zones, including Norfolk, Virginia; Newport News, Virginia; West Virginia; Delaware; and California. Participants did not identify any complementary objectives or research evidence.

### Post improvement rebate

Participants mainly discussed how inadequate the current post-improvement rebates are. Their discussion did highlight the objective of changes to the current mitigation system. In this case, participants wanted post-improvement rebates to become more accessible and equitable. They liked the idea of accessibility grants rather than post-improvement rebates. The other objective of post-improvement rebates is to reduce losses. This tool accomplishes that objective by helping to encourage mitigation of individual properties and increasing resilience of properties while simultaneously not lessening or changing the character of the property. Participants identified one unintended consequence of post improvement rebates: to make mitigation inequitable or to have adverse effects on vulnerable populations. There were significant concerns that this tool, in comparison to others, would leave out vulnerable populations. A challenge of post improvement rebates is the high upfront amount of money that property owners must mitigate. The example participants discussed is that if a rebate requires an upfront investment of \$100,000 that privileges certain people while excluding others (likely vulnerable populations). This also means that only certain places will receive financial support to mitigate if this incentive is used. The participants were supporters of post improvement rebates of up to \$5,000. The reasoning behind this is that the smaller amount would enable organizations to assist more individuals and make the program more accessible to a larger population. Participants did not identify any complementary objectives, competing objectives, advantages, opponents, case use examples, or research evidence.

### Real estate disclosure requirement

Participants identified the objectives of real estate disclosure requirements to be educating stakeholders and reducing losses. The disclosure requirements educate potential property owners about the property's flood risk and flood history. The disclose requirements



reduce losses by motivating property owners to purchase flood insurance to protect their at-risk properties. Participants noted that many potential buyers or new property owners are unaware of their flood risk. These individuals would have complementary objectives and benefit from the transparency of the real estate disclosure requirements. The insurance industry would also have complementary objectives because this policy tool will incentivize individuals to take out flood insurance policies. Two stakeholders, property owners and real estate agents, are likely to have competing objectives. Participants noted that property owners trying to sell their properties are likely to have competing objectives because there is a common practice of sellers providing misinformation about flood history because they are afraid of not being able to sell their property. Participants noted that while real estate agents should be the biggest proponents of this policy tool - that is rarely the case. Real estate agents often have competing objectives because the market value can decrease, and they can lose sales. Additionally, participants thought real estate disclosure requirements had several unintended consequences. These include that the language in the statement may not clearly and accurately describe the risk; may give a false sense of security about the risk; may enable individuals to ignore their property's risk, and may negatively impact the local economy by decreasing the market value for previously flooded properties.

The one advantage of real estate disclosure statements that participants identified was the ability to share information and be more transparent about a property's risk. Participants identified many challenges of real estate disclosure requirements. These challenges include disclosing an accurate assessment of the property's risk; fails to include risk of other hazards; property owners, insurance companies, builders, or real estate agents often provide misinformation; and differing risk perceptions of potential homebuyers and sellers. Real estate agents were identified as both supporters and opponents of real estate disclosure requirements. Most participants with experience said real estate agents mainly opposed the tool, even though participants expected they would support it. Real estate agents are opponents because disclosures can cause properties to lose market value, which leads to a loss of sales for the agents. The participants assigned to discuss real estate disclosure requirements were opponents of the usage of this policy tool. Participants disliked the policy tool and felt that it had so many flaws it made



it useless. During the discussion, participants did not identify any case use examples or research evidence.

## Restrictions on post-disaster assistance

The objective of restrictions on post-disaster assistance is to reduce long-term losses. Local, state, and federal governments may have competing objectives towards post-disaster assistance restrictions because of the challenges associated with administering these programs. An unintended consequence of post-disaster assistance restrictions is that they can have adverse effects on vulnerable populations. Participants did not identify any complementary objectives, advantages, challenges, supporters, opponents, case use examples, or research evidence.

## Seals and certifications

Participants identified two objectives of seals and certifications: to educate stakeholders and to reduce losses. Seals and certifications can be used to educate stakeholders by making individuals aware of their risks. Participants stated that seals and certifications reduce losses by making recovery easier. Property owners are likely to have competing objectives because the use of seals and certifications may price them out of some properties and communities. Participants also identified this as an unintended consequence of seals and certificates. This policy tool is likely to have negative effects on vulnerable populations and may force individuals to move to riskier properties or areas. Participants thought another unintended consequence of seals and certifications is that it may enable property owners to ignore their risk by creating a false sense of security. Participants did not identify any complementary objectives, advantages, challenges, supporters, opponents, case use examples, or research evidence.

## Tax Incentives

The objectives identified by participants for tax incentives are to reduce losses. Tax incentives help encourage individuals to mitigate and provide funding for those who cannot afford mitigation. Participants believed individuals, local, state, and federal government, and the real estate industry would have complementary objectives towards tax incentives. Individuals

will because tax incentives can help them afford to mitigate. Local, state, and federal governments have complementary objectives because tax incentives encourage the adoption of mitigation actions. Additionally, local government and the real estate industry will have complementary objectives because adding mitigation to properties will raise property value and taxes. However, local governments may also have competing objectives because tax incentives will inevitably cause them to lose some of their tax revenue. Participants discussed two unintended consequences of tax incentives. The first is the potential for adverse effects to vulnerable populations. Participants noted that tax incentives would need to be provided uniformly across risk, creating many equity issues. The second unintended consequence is that it can enable individuals to ignore their risk since tax incentives would be implemented uniformly regardless of the property's risk.

One advantage of tax incentives is that it does not need to be created as an entirely separate program or law - instead, it could be added into existing mitigation programs and policies. Participants felt tax incentive programs would face many challenges. These include administrative challenges, selecting recipients, equity issues, would not make a difference in affordability, and hard to make the program understandable for potential participants. Participants also discussed supporters and opponents of tax incentives. Local government was identified as both a supporter and an opponent. They would support tax incentives if the federal government were to administer the programs; however, they would oppose them if they had to administer. The participants also expressed that they were opponents of tax incentives because they questioned if they would help and if a tax incentive would help individuals afford to mitigate. Participants did not identify any case use examples or research evidence.

## Appendix A – Mitigation and Insurance Workshop Agenda

### **8:30 am- Coffee and Breakfast**

### **9:00 am- Session #1-Opening and Introductions**

*In our first session of the day we will provide an overview of the day's goals and will ask all participants to introduce themselves to the group.*

### **9:30 am- Session #2- Connecting Hurricane Risk Creation and Management to its Daily Context**

*This session will focus on how mitigation and insurance programs and policies intersect with different priorities in communities, who supports or opposes these programs, and why. The goal is to have a discussion that explicitly identifies what concerns drive and/or derail this work in order to be able to think more about how different approaches manage those concerns.*

### **10:30 am- Morning Break**

### **11:00 am- Session #3- Exploring the Risk Management Toolkit**

*This session will focus on discussing a set of policy strategies that have been used or envisioned to encourage mitigation and insurance purchase. Participants will review descriptions and discuss the strengths and weaknesses of these tools on several dimensions.*

### **12:30 pm- Lunch Break**

### **1:30 pm Session #4- Disaster Policy Analysis Tool**

*This final session will focus on discussing the next steps for a regional risk model our team has been developing. It will explore if and how the tool might be useful to your decision process. We will also discuss how the model would need to change or evolve to become a usable tool.*

### **3:00 pm- Afternoon Break**

### **3:30 pm- Session #5- Closing Thoughts**

*This session will focus on gathering reflections from the day, lessons learned, and next steps.*

## Appendix B: Participant Contact Information

Susan Asmus  
National Association of Home Builders  
sasmus@nahb.org

Charles Baker  
Federal Emergency Management Agency Region III  
Charles.baker@fema.dhs.gov

Phil Barnes  
University of Delaware  
pbarnes@udel.edu

Dennis Burke  
Reinsurance Association of America  
burke@reinsurance.org

Dave Carpenter  
New Castle County (DE) Emergency Management  
David.Carpenter@newcastlede.gov

Chris Emrich  
University of Central Florida  
Christopher.Emrich@ucf.edu

Angela Gladwell  
Federal Emergency Management Agency  
Risk Management Division  
Angela.gladwell@fema.dhs.gov

Joe Gleason  
International Association of Emergency Managers  
cdrjoeg@yahoo.com

Roger Grenier  
AIR Worldwide  
rgrenier@air-worldwide.com

Sean Griffin  
Disaster Intelligence  
Sean.griffin@disaster-ai.com

Jennifer Helgeson  
National Institute of Standards and Technology  
Jennifer.helgeson@nist.gov

Mike Hinson  
Howard County (MD) Emergency Management  
mhinson@howardcountymd.gov

Thomas Hughes  
Pennsylvania Emergency Management Agency  
thughes@pa.gov

Josh Kelly  
Delaware Emergency Management Agency  
Joshua.kelly@state.de.us

Dana Kochnowier  
New York City Mayor's Office of Resilience  
dkochnowier@cityhall.nyc.gov

Leslie Ledogar  
State of Delaware Department of Insurance  
Leslie.ledogar@delaware.gov

Therese McAllister  
National Institute of Standards and Technology  
Therese.mcallister@nist.gov

Matthew McCullough  
Federal Emergency Management Agency Region III  
Matthew.McCullough@fema.dhs.gov

Pallab Mozumder  
Florida International University  
mozumder@fiu.edu

Gabriel Munoz  
New York City Mayor's Office of Resiliency  
Jorge.gabriel.munoz@gmail.com

Chris Murtha  
Delaware Emergency Management Agency  
Christopher.Murtha@delaware.gov

Erin Norris  
Delaware Emergency Management Agency  
Erin.Norris@delaware.gov



Frank Pyle  
State of Delaware Department of Insurance  
Frank.pyle@delaware.gov

Loren Reed  
Delaware Emergency Management Agency  
Loren.Reed@delaware.gov

A.J. Schall  
Delaware Emergency Management Agency  
a.j.schall@delaware.gov

Gina Schwitzgebel  
North Carolina Joint Underwriters Association  
Gina.schwitzgebel@ncjua.com

A.R. Siders  
University of Delaware  
siders@udel.edu

Virginia Silvis  
Institute for Business & Home Safety  
vsilvis@ibhs.org

Kevin Simmons  
Austin College  
ksimmons@austincollege.edu

Gavin Smith  
University of North Carolina  
Gavin\_smith@unc.edu

Tony Subbio  
Tetra Tech  
Tony.Subbio@tetrattech.com

Danielle Swallow  
Delaware Sea Grant  
dswallow@udel.edu

Gina Tonn  
Delaware Department of Natural Resources and  
Environmental Control  
Gina.tonn@delaware.gov

John Van de Lindt  
Colorado State University  
jwv@colostate.edu

Wendy Walsh  
Federal Emergency Management Agency  
Wendy.walsh@fema.dhs.gov

Lauren Wang  
New York City Mayor's Office of Resiliency  
LWang@resiliency.nyc.gov

Dave Warga  
Delaware Department of Natural Resources and  
Environmental Control  
David.warga@delaware.gov

Ross Woods  
New York City Mayor's Office of Resiliency  
rwoods@recovery.nyc.gov

Janet Zeis  
Chester County (PA) Department of Emergency  
Services  
jzeis@chesco.org

Derek Ziegler  
City of Philadelphia Office of Emergency  
Management  
Derek.Ziegler@phila.gov



## Appendix C - References

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