AFTER THE FLOOD:
EXERCISING BEST PRACTICES IN PROPERTY ACQUISITION PROGRAMS AND OPEN SPACE PROJECTS

By

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Introduction

One of the most effective tools communities have to mitigate the impacts of disasters is to relocate populations and property out of hazard-prone areas. This voluntary[1] process, often referred to as a "buyout" or property acquisition, is typically exercised in floodplains and is becoming a more common option for communities to consider, particularly those that have incurred repetitive losses from recurring flood events. This approach is not only used in the United States, but has also been used in other countries; in Christchurch, New Zealand, for example, buyouts were pursued following a series of earthquakes in 2010 and 2011 (MacMillan, 2013). The buyout process involves multiple decision points. First local municipalities must assess whether or not property acquisition is cost effective and an appropriate option (ideally with community input and support for the proposed buyout). They also must determine which properties should be prioritized for acquisition, if and how to respond to the housing needs of relocated residents, and how the land will be utilized upon acquisition. While buyout programs have disadvantages – including a loss of tax base, disruptions to social ties, and exacerbating equity issues, among others – many communities have successfully removed thousands of properties from flood-prone areas and the administrative process that these communities follow is relatively well understood (Salvesen, 2003; FEMA, 1998).

However, what gains little attention is what is done with the vacant land once the properties are removed. If communities use federal funding to acquire properties – which is often the case, as many municipalities will apply for Federal Emergency Management Agency (FEMA) funds through the Hazard Mitigation Grant Program (HMGP) which can cover up to 75% of the expenses of a buyout program) – the land must remain as open space in perpetuity (other federal programs that support buyout initiatives include US Department of Housing and Urban Development [HUD] Community Development Block Grants – Disaster Recovery [CDBG-DR], FEMA Pre-Disaster Mitigation Grants, and FEMA Flood Mitigation Assistance Grants).[2] While this regulation leaves communities with few options for repurposing the land, this constraint also presents an opportunity for the community to leverage its new land holdings – which are often along rivers – to create parks, greenways, and other open space amenities that can serve as an asset to the community. By gaining a better understanding of the buyout and open space planning and implementation processes through case study analysis and a literature review, this project identifies best practices

[1] Some have questioned the extent to which buyouts are purely "voluntary," given that some homeowners have expressed feeling pressured into the decision by local officials (Fraser et al., 2003). For the purposes of this project, the voluntariness of the buyouts will be assumed as that is a requirement for buyouts in the Unites States when federal funds are used for this purpose.

[2] Less common are state and locally-funded programs or some federal grant programs which may not explicitly carry the same open space deed-restriction requirement. While most do encourage the land to return to a natural state, the NY Rising program following Hurricane Sandy (funded with Community Development Block Grant – Disaster Recovery funding from the US Department of Housing and Urban Development), for instance, did allow redevelopment to occur in some instances so long as the repairs or new structures adhered to strict building codes and elevation standards that reduced flood risk (Freudenberg et al., 2016).

and lessons learned from communities that have successfully transitioned acquired properties to purposeful open space.[3]

Additionally, these lessons learned and best practices informed the creation of a series of activities to help municipalities make recovery decisions around buyouts and open space management following property acquisition. Specifically, the activities are informed by the actions taken by municipalities that have been successful at implementing green space projects following buyouts, as identified in the case studies. By comparing processes in municipalities that have been successful, I will be able to identify commonalities that can serve as potential best management practices.

Building this guidance is important because green space[4] can be valuable to a community for a number of reasons. First, there is a growing body of research that shows the positive mental and physical health benefits of access to quality green space (Frumkin and Eysenbach, 2003; Cohen et al., 2007; van den Berg et al., 2010; Wolch et al., 2011; Selhub and Logan, 2012). Second, quality open space can be a driver of economic development (National Recreation and Park Association, 2015). By using floodplain conservation strategies or creating a park, scenic river walk, or functional walking and biking path, the community may see increases in property values[5] (Kousky and Walls, 2014) or more visitors to the area; increased tourism may in turn bolster local businesses (Trust for Public Land, 1999; National Recreation and Park Association, 2015). Therefore, implementing purposeful open space projects following an acquisition may help a community offset tax base losses incurred by relocating homeowners paying property taxes out of the floodplain. Third, it is possible that creating quality green space provides an opportunity for the community to build social capital, not only through the actual development of the green space (if the neighborhood takes an active role in planning and building it) and the use of the green space for community events, but also as simply a place to gather, socialize, and feel connected to others (Kweon et al. 1998; DeGraaf and Jordan, 2003; Kearney, 2006; Zhou and Parves Rana, 2012; FEMA, 2014). Fourth, quality green space can incorporate features like green infrastructure, which reduce stormwater impacts, improve stormwater quality, and may mitigate the urban heat island effect (Benepe, 2013; American Planning Association, 2007). Lastly, open space can be used to memorialize past events or communicate risks about local hazards. In Biloxi, MS for example, a memorial has been erected to both commemorate the losses caused by Hurricane Katrina and also to educate the public, as the storm's surge level height is incorporated into the design of the memorial (Smith, 2011).

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[3] Throughout this paper, the phrase "purposeful open space" will be used to describe land uses that serve a purpose, or those that are not merely maintained as mowed vacant lots. For example, land uses that could serve a purpose include those that integrate enhanced stormwater management features, community amenities such as parks and greenways, and serve other benefits such as improving ecological functions or providing wildlife habitats. While vacant lots can surely offer some of these features, the idea with "purposeful open space" is that the community actively manages the land for a particular function.

[4] I will use the terms "green space" and "open space" interchangeably in this paper.

[5] Despite the advantages of quality green space, communities must be weary of displacing underserved communities if property values increase to such an extent that low-income residents can no longer afford to live there (Wolch et al., 2014). To combat this, some propose making neighborhoods "just green enough" (Curran and Hamilton, 2012). Essentially, making spaces that are "just green enough" include serving the needs of the local population, using the landscape that currently exists (e.g., embracing a neighborhood's industrial past), focusing efforts on distributed, smaller sites rather than large civic projects, and ultimately ensuring that improvements made are not so significant that they attract substantial development that could therefore displace current residents.

Another benefit of bringing green space into the fold is that it provides an opportunity for city planners, particularly land use planners, to be involved in the recovery process. More often than not, planners are not involved in the early stages of recovery planning. One reason for this is that emergency management personnel may feel ownership over the disaster recovery process because of their natural fit during the response phase. Also, planners are often not aware of what role they can play in the process and are not as familiar with FEMA policies and programs. Lastly, recovery roles in general are not clearly defined, particularly in comparison to the clear cut structures of emergency response (Smith, 2014). Because planners generally play a key role in guiding the growth and development of a community, their involvement in the recovery process is crucial to ensure that sound land use principles and the skills and assets that planners bring to the table are considered. Examples of ways that planners can contribute include leveraging community engagement experience, relationships with planners across a wide range of areas (transportation, economic development, housing, etc.), familiarity with local ordinances and community groups, and knowledge of other funding sources or grant opportunities to support recovery efforts.

Despite the advantages that quality green space can bring to a community, there are few resources available to ensure that municipalities create meaningful plans and effectively implement them following a buyout. Additionally, there are few case studies that illustrate the implementation phase of purposeful green space after a buyout, so municipalities that are considering this type of program have limited examples to learn from (Zavar and Hagelman, 2016). Planning for and implementing green space projects can face several barriers, such as insufficient financial resources needed to support such a sustained effort, an inadequate number of technical experts and personnel needed to ensure a smooth process, equity issues that may arise in underserved neighborhoods, and community ties and the sense of place that will likely need to be restored following the buyout process. Therefore, it is critical that communities have guidance to ensure they are prepared to carry out this part of the buyout process.

To that end, this project provides two activities, informed by case study analysis, that communities can use to ensure they are prepared to plan for and implement an open space management program following a buyout.[6] One activity presents questions that community members should consider before deciding whether or not to pursue a buyout; the second activity presents several open space scenarios for community members to discuss. While there are many issues to consider in recovery – including but not limited to natural and cultural resources, healthcare systems, and infrastructure – these two activities focus on a very narrow scope, recognizing that there are likely many opportunities for overlap with different issues.

[6] Please note that the activities developed for the purposes of this project are not HSEEP (Homeland Security Exercise and Evaluation Program) compliant and do not contain many of the supporting documents that typically accompany traditional emergency management exercises. Rather, they are meant to either stand alone as activities that can be done across many disciplines and stakeholder groups (particularly in places that lack a formalized exercise program), or be integrated into a formalized, more conventional exercise program and modified to address the needs of the activity participants.

A Note on Buyouts

Buyouts can be a controversial decision, as a buyout program can both threaten the viability of a community from the local government's perspective – particularly if it is a small community that does not have an extensive tax base – and from the viewpoint of the citizens being impacted, as they must uproot their lives and deal with the disruption to the social capital and neighborhood networks that residents have built. In some cases, where not all residents in a particular buyout area accept the buyout, it can also cause a phenomenon known as "checker-boarding," or a pattern of land use where developed properties are interspersed with vacant lots. This can be problematic both for residents – as their neighborhoods may not be as cohesive and their sense of community can be degraded – and for municipalities, since they must provide services to fewer properties and residents who may be more isolated (for example, imagine a road where only one household has rejected a buyout offer, and it is the house at the end of a street that must still be served). Buyouts have an especially contentious history, given that the populations most often located in floodplains are those that are historically marginalized and are already disproportionately vulnerable to the impacts of disasters, primarily low-income residents and people of color. Because low-lying areas are susceptible to floods, they are less attractive to build on and therefore less expensive, often making them the only place for vulnerable communities to settle.

By settling in the floodplain, low-income residents and people of color are disadvantaged for a variety of reasons: 1) they are less able to recover using personal savings (Fothergill et al., 1999); 2) they are less likely to have flood insurance (Bullard and Wright, 2010); and 3) low-income communities have fewer resources to manage land afterwards (Maantay and Maroko, 2009). Moreover, a higher proportion of low-income and people of color communities are renters, which means they have fewer options following a flood, and low-income residents are more likely to have lower quality or older homes that are more susceptible to flood damage (Fothergill et al., 1999).[7]

However, buyouts are still an option for communities, and in the event that they pursue them, they will inevitably be left with vacant land that they did not own before. Moreover, they are left with land that they likely do not know what to do with and therefore may potentially miss out on an opportunity to transition the vacant land to something that serves as a community asset. That being said, communities may not always want purposeful open space. Before that decision is reached, it is important to proactively address concerns community members have and ensure they understand the restrictions on the land so they have appropriate expectations of what can be done there once the properties are cleared. If the community decides that the disadvantages outweigh the advantages after outlining the benefits offered by green space, purposeful open space may not be the most appropriate use of the land. In other words, residents of the local neighborhood should play an active and informed role about what happens to the vacant land that is created by the buyout.

[7] Low-income communities and communities of color face a multitude of other challenges throughout the emergency management cycle; Fothergill et al. (1999) provide a comprehensive account of the barriers explored in the academic literature.

Literature Review

This paper covers a wide range of topics, and many have been covered extensively in academic literature. While this is not a comprehensive list of topics presented in this paper – nor is it a conclusive review of research that has been completed on these topics – it will provide the reader a broad overview of the issues discussed and previous work that has been carried out to more comprehensively explore these issues. The following topics have been selected for inclusion in the literature review: buyouts; green space; plan implementation and public engagement; and activity development.

Buyouts

Much of the academic literature on buyouts focuses on the challenges and opportunities of the buyout process, and many case studies have been written on communities that have implemented buyouts. For example, Salvesen (2003) presents case studies of Kinston, NC and Grand Forks, ND, and discusses the background of buyouts, how they have been used historically to reduce flood risk, and the pros and cons of buyouts. Advantages include financial savings, permanent hazard mitigation, co-benefits (such habitat conservation and open space preservation), and the protection of private property rights (as opposed to regulations). Disadvantages include significant financial investment, equity and issues related to housing affordability for those displaced by buyouts, impacts on community cohesion, potential "checker-boarding" if parts of a neighborhood do not participate, and loss of tax base (Salvesen, 2003).

However, a recent report published by the Lincoln Institute of Land Policy (Freudenberg et al., 2016) uses a fiscal impact analysis model to test the claims that a municipality's tax base will be significantly eroded if a buyout is pursued. By examining case studies of five different communities impacted by Hurricane Katrina, the researchers find that the effects of a buyout are not nearly as detrimental as government officials fear, particularly if only the most at-risk properties are targeted for acquisition. Moreover, their analysis does not include the financial benefits that may come with green infrastructure (and in turn the ecosystem services provided) or purposeful green space, which would likely make buyouts an even more attractive option financially.

Green Space

Parks and green space can offer tremendous benefits for communities. The literature highlights, however, the importance of the quantity of green space, the quality of green space, and the distribution of green space (Van Dillen et al., 2012). The Project for Public Spaces (n.d.) outlines nine strategies for great parks, ranging from acquiring diverse funding sources to providing amenities for different groups of park users.

Most of the academic literature about green space is not focused on the open space that is created through property acquisition, apart from the passing mention of the checker-boarding phenomenon and how it can be difficult to utilize these kinds of spaces. One scholar who has explored the topic in depth, however, has produced three interesting papers in this regard. Dr. Elyse Zavar has explored how nearby residents perceive open space that is created following a buyout, how 'magnetic agents' can have a powerful impact on land uses after an acquisition, and how land is utilized following

buyouts (Zavar, 2015; Zavar, 2016; Zavar and Hagelman, 2016). This last paper uses both geospatial data and survey techniques to determine how properties acquired through buyouts between 1990 and 2000 are being used. They find that a substantial portion of HMGP-funded buyout sites – 34.2% – are being maintained as vacant lots. The authors note that "the high frequency of vacant lots resulting from the buyout programs are likely linked to the ad hoc approach to open space management" (Zavar and Hagelman, 2016, p. 68). Indeed, they find that only 12% of survey participants reported having an operational open space management plan prior to acquisition activities. They also find a great multitude of uses, with more than 20 accounted for in their study. Other important findings from their survey of 142 local floodplain management staff are that expenses and maintaining the space accounted for 72% of the survey respondents' biggest challenges for these properties, and that nearly 11% reported that there were no funding sources for maintaining these properties (Zavar and Hagelman, 2016). These challenges are especially apparent in small and low-capacity communities such as Kinston, NC, where having more than 900 acres of open space far outstrips the ability of the town (with a population of less than 25,000) to transition it to purposeful open space (A. Short, class lecture, March 11, 2016).

One way that parks and other purposeful uses can provide multiple benefits is if they incorporate green infrastructure features. Green infrastructure can improve water quality, ensure quicker replenishment of underground aquifers, reduce erosion on riverbanks and shorelines, and mitigate flooding (EPA, n.d.). A group of researchers with the Regional Planning Association (Winters et al., 2012) recently published a report highlighting case studies of communities that used bioswales, rain gardens, and other types of green infrastructure to make communities healthier and more resilient. Using a case study analysis, the report details some best management practices, such as updating codes and regulations, assessing storm water fees, and coordinating between various local government departments.

Ultimately, however, merely having a plan to implement green infrastructure is not enough. In the case of Kinston, NC, a green infrastructure plan was developed for a large portion of buyout property the town acquired after Hurricanes Fran and Floyd in 1996 and 1999, respectively. However, because the town did not have adequate means to implement the plan, the green infrastructure strategies that were proposed were not carried out (A. Short, class lecture, March 11, 2016).

Plan Implementation and Public Engagement

While there is extensive literature on the effective implementation of plans, little of it focuses on green space planning or planning for buyouts in particular. However, the literature is still helpful in determining factors that are crucial to the effective implementation of projects. For one, the literature suggests that municipalities with sufficient resources drive plan implementation, as do those with a high quality plan (Laurian et al., 2004). While this paper will not explicitly be an evaluation of plans that have been created, it will be useful to determine the extent to which plans guided efforts.

The public participation literature has ties to plan quality and implementation. It stresses the importance of wide stakeholder involvement (Burby, 2003) – which is particularly salient for the buyout process and green space management – and using techniques that match the type of input being solicited (Glass, 1979).

Activity Development

In emergency management circles, exercises are a common occurrence; they provide states and localities the opportunity to practice how they would respond to an event by reacting to a hypothetical disaster scenario. Historically, exercises have been established around the response phase of the emergency management cycle, so these types of exercises are formatted to reflect the needs of first responders and government officials to prepare for the immediate aftermath of a disaster. There are many forms that exercises can take, but the most common are tabletop exercises, functional exercises, and full-scale exercises. Tabletop exercises focus on presenting a scenario and having participants discuss what their roles or tasks would be during the proposed scenario. A functional exercise can help people in specific roles test how they would respond to a given scenario in a simulated operational environment. A full-scale exercise is the most intensive type and most closely represents a real-life scenario. It is conducted in a realistic setting (i.e., often outdoors or in an Emergency Operations Center), with the full range of participants who would typically be tasked during an event. Generally, exercises can be helpful in clarifying roles and responsibilities, improving coordination between groups, and determining what resources exist or identifying resources that are needed (Ready.gov, n.d.).

While many exercises are led by local or state agencies, FEMA's Emergency Management Institute (EMI) is the main federal entity that conducts emergency management exercises through trainings delivered on the Institute's campus in Maryland or in the state or community receiving the training. While most of EMI's exercises are focused on the preparedness and response phases of the emergency management cycle, two courses provide an opportunity for participants to engage in recovery activities (interview with FEMA EMI staff member, March 9, 2017). The format of these recovery activities varies from the detailed structure of a response exercise, but there are important pieces of response exercises that can be applied and are used for the activity produced for this project. For example, it is important to have a clear sense of what the objectives of the exercise are to guide the exercise. Establishing objectives can be accomplished through completing a needs assessment which may highlight particular areas a municipality may want to focus on or improve. Additionally, developing engaging scenarios is an important factor so that participants take the activity seriously and are able to see how it can be applied to their own community. This can lead to more actively engaging with the content (Cabinet Office, 2006).

Exercises are often used to "test" plans that have been developed to determine where gaps and deficiencies might be. However, most localities do not have disaster recovery plans, much less detailed procedures for how a buyout would be implemented and what would be done with the resulting open space. In the case of recovery exercises, EMI provides plans that have been developed by other municipalities (if they do not have their own recovery plan) so that participants can use the documents as a basis for their decision making (interview with FEMA EMI staff member, March 9, 2017).

The activities developed for this project also borrow from scenario planning, a practice that is common in the comprehensive planning profession (Berke and Lyles, 2013). Specifically, developing varied land use development scenarios using different population projections and trends related to topics such as employment and housing can be a helpful tool for planners to make decisions about the future of their

communities (Xiang and Clarke, 2003). Moreover, by thinking through the implications of different scenarios, planners can more effectively plan for the uncertainties that exist when planning for conditions 20 or 30 years in the future.

Methods

The activities developed and provided herein are based on a review of the literature and case study analysis. The review of the literature utilized sources from academic journals, a variety of gray literature sources (white papers, government documents, reports, etc.), and newspaper articles. The review informed my understanding of a wide array of related topics, including open space planning, in general and as it relates to buyouts; buyouts in general; equity as it relates to buyouts and green space; thoughtful public participation; exercise and scenario development; and plan implementation. This review not only helped me to determine what other studies have learned from exploring the buyout process, but also helped to inform the selection of case studies and their associated analysis. By looking at a wide range of communities as part of my case study analysis, I am better able to address the various factors that could affect the buyout and open space planning and implementation processes, such as the financial resources a municipality has, if they use local funding mechanisms, if the buyouts are part of a longer term mitigation program, etc.

As Yin (2003) describes, case studies are valuable tools when the study questions are "how" and "why" and when the researcher is concerned with background conditions that provide context and may have an impact on the questions being studied. For example, this particular project seeks to understand how buyouts and open space management projects and plans have been implemented, and what influenced the success of the implementation. Additionally, the focus is not only on the why, how, and what conditions may have been influential, but also on the implementation process and programs used (rather than, for example, an individual's personal experience, although understanding the role someone played is helpful as it relates to the overall process).

To that end, there are many different factors that could impact the ability of a community to effectively convert acquired land to defined open space-related goals. In addition to intuitive factors such as more financial resources, the literature suggests that communities with strong plans (i.e., plans that identify issues, are supported by a solid fact base, involve multiple stakeholders, etc.), capable and committed government staff, and monitoring and evaluation mechanisms are more likely to be successful at implementation (Berke et al., 2005; Burby, 2003; Laurian et al. 2004; Seasons, 2003). While there are many additional factors that could influence implementation, due to the limited time and resources available it would be outside the scope of the project to research case studies that cover each of those issues independently. Therefore, seven case studies were initially selected to best address the factors that could affect the success of implementation based on the academic literature and anecdotal findings. The number of cases was selected to ensure "a representative sample and [...] useful variation on the dimensions of theoretical interest" (Seawright and Gerring, 2008, p. 296). In other words, this sample size allowed for enough diverse factors to be adequately accounted for and meaningful conclusions to be drawn and transferred to other communities. Once these seven case studies were selected, email requests were sent to relevant government staff to participate in the study. Of those requests, three

were returned. Ultimately, due to time and resource constraints, two full case studies were completed, though insights were gathered from all seven.

Because FEMA has contributed to tens of thousands of buyout projects over the past few decades, the scope of the case study selection was focused on those that have been carried out within the past 20 years – although some case studies include ongoing programs that have been in place longer than 20 years, as well as communities that have implemented buyouts after multiple disasters – but not those that started after 2014. This timeframe therefore excludes buyouts solely associated with the Midwest floods of 1993, which in large part made property acquisition a go-to strategy for hazard mitigation. However, this timeframe still includes case studies that overlap with consequential changes in federal government policy and programs, such as the passing of the Stafford Act in 1988 (which notably established the Hazard Mitigation Grant Program), the Project Impact initiative between 1997-2001, the Disaster Mitigation Act of 2000, and the ongoing development of the National Disaster Recovery Framework (Conrad, 1998; Rubin et al., 2004). Moreover, this time period is instructive because it not only provides variation in the years in which projects were implemented, but also ensures that enough time has passed to see how plans have played out and if best practices can be identified.

Several other components were considered in case study selection. First, three of the initial cases and one of the final two full cases are located in North Carolina, which facilitated a site visit and in-person meetings. Additionally, all of the selected communities and their buyout programs have been explored in the literature. This was an important factor that helped to narrow the field from thousands of possible cases to a reasonable list of approximately 30 potential cases, while also providing the author some context for understanding which communities would be most beneficial to examine. For example, these prior analyses offered details such as the current status of the buyout properties, local funding mechanisms that had been established, and stakeholders that were involved in the planning process that would otherwise have been difficult to discern without substantial additional research.[8] This also provided a way to determine what case studies might be fruitful to study based on how successful they were in converting acquired property to purposeful open space.

Success is a subjective term, and could be applied to a number of different stages throughout the process. Some could include whether pre-event planning had been conducted (either around buyouts or what would happen with resulting vacant land) and the quality of that planning, the buyout itself, the creation of an open space management plan post-acquisition, and the integration of disaster recovery goals and actions into other relevant planning documents. Others include the implementation of green space projects, the extent to which equity concerns were considered and addressed throughout, the rate of public participation, the extent to which neighborhoods surrounding open spaces have "recovered" (in and of itself a difficult term to measure) or where green spaces facilitated recovery, and the effective utilization of "checker-boarded" acquired properties. For the purposes of this project, cases were considered successful if they have been able to convert a significant quantity of buyout

[8] It is important to note, though, that these case studies did not provide an in-depth analysis of what factors impacted the success of plans and programs, detail the processes carried out to implement these plans and programs, and otherwise draw the meaningful and transferrable lessons learned that this study attempts to produce.

properties to purposeful open space. That being said, there was substantial variation in the level of success in these aspects of implementation, and success was not quantified.

As mentioned, the case study selection process resulted in two full case studies, in which I utilized interviews in addition to a review of the literature to learn more about each community's mitigation and acquisition programs. These interviews served as a way for me to learn more about the decision making processes that occurred throughout the buyout process, gather details about the community outreach and public engagement efforts that supplemented the process (if any), and otherwise elicit more information that enhanced my understanding of the entire process, paying particular attention to if/how they successfully transitioned buyout properties to purposeful open space. I also supplemented my case study analysis with an interview with a FEMA EMI staff member to learn about how best to structure and deliver an activity, especially one that focuses on disaster recovery.

Expected Results and Value to the Field of Planning

My research explored several examples of municipalities actively managing green space following a buyout; however, the case studies that have been published tend to give a broad description of the buyout and do not detail the open space planning and implementation phases of the buyout. By conducting a more in-depth analysis, I have been able to provide more detail about the process that communities that have been successful in their efforts have used to manage their post-buyout open space, and thus offer clearer guidance for how to develop and implement a successful program, from the early buyout planning stage through open space project implementation.

The communities that I profile in the two case studies that follow are ones which have a wide array of resources at their disposal to support their efforts. While some of the best management practices developed by these municipalities may be difficult for low-resource localities to implement, some of the strategies used can be applied to both low- and high-capacity communities. Shedding light on those lessons and best management practices and packaging them in a way that can be actively engaged with by local officials in an activity will be a valuable resource.

Additionally, because disaster recovery activities that can be widely applied (e.g., through FEMA) are minimal, creating an activity that touches on bigger-picture issues such as funding, staffing, and equity issues could add to the resources offered by FEMA. Moreover, there are few resources that hone in on the challenges posed by buyouts and the resulting open space in particular. This paper and the corresponding activities fill that gap. The activities may be particularly useful for municipalities as they could help to identify nontraditional partnerships and funding sources, and they encourage participants to consider the role that climate change adaptation can play in disaster recovery and hazard mitigation initiatives.

One interesting finding that emerged from my research is that in the two case studies I examined, land use planners and emergency managers played a marginal role in the recovery process. However, it appears that there are opportunities to engage these two groups of professionals in the process. This can be achieved by building a disaster recovery activity that considers land use planning factors and the role that planners can play in the recovery process, and subsequently, it has the potential to advance the field of disaster recovery so that it is more inclusive of professionals outside of emergency

management (Berke, Smith, and Lyles, 2012). To that end, the activities will also highlight the synergies that can be realized by coordinating with other local government entities such as Parks and Recreation and Stormwater Management departments.

Lastly, given the projected impacts of climate change, buyouts and open space planning will likely play a bigger role in climate change adaptation going forward. As communities face rising sea levels, more floods (and of increasing intensity), and stronger and more frequent heat events, they will need to consider a wider range of solutions to limit those impacts, especially as urban populations grow and development increases. In addition to buyouts, managed retreat (as a response to projected future conditions, primarily in coastal communities) and elevation are other adaptation and risk reduction strategies. All three present unique challenges, and planners are uniquely positioned to contribute to those policy discussions, particularly as they address issues of infrastructure investment/disinvestment, public engagement, and assessing land suitability to determine options for relocated neighborhoods.

Case Studies

The two case studies that follow, Tulsa and Charlotte, explore each city's flood history, actions they have taken to mitigate hazards, buyout programs that each city has used to reduce flood losses, and the resulting open space projects.

Tulsa

Tulsa is the second largest city in Oklahoma, the county seat of Tulsa County, and is home to many cultural and arts attractions. The city also has a wide range of economic sectors, including companies based in energy, aviation, technology, banking, and telecommunications industries (Tulsa, Oklahoma, n.d.)

Tulsa's flood history

Tulsa, Oklahoma is no stranger to flooding. In the 1960s, 70s, and 80s, Tulsa was hit with a series of devastating floods that damaged thousands of properties, killed nearly 20 people, injured dozens more, and caused millions of dollars in damage. Throughout some of this time period, floods struck Tulsa with alarming frequency, every two to four years. The most destructive flood, the Memorial Day flood of 1984, claimed 14 lives, damaged or destroyed nearly 7,000 buildings, and caused $180 million dollars ($418 million in 2017 dollars) of damages alone (Patton, 1994).

Tulsa's geography makes it particularly vulnerable to intense storms due to its location in "tornado alley" and its placement along a wide river that is connected to an expansive network of streams and creeks (Patton, 1994). In addition to the industries that have bolstered Tulsa's status as a hub of economic activity in the region, this network of streams and rivers makes it an attractive place to live; in fact, the population increased by more than 43% between 1950 and 1960, beginning a trend of growth over the next few decades that brought extensive development to the area (Patton, 1994; U.S. Census). Unfortunately, much of this development occurred in the floodplain and removed storage space and conveyance areas for stormwater, replacing open meadows and pastures with buildings, roads, and parking lots. This development was a double-

edged sword: not only did it put more people in the 100-year floodplain, but it also caused an increase of impervious surface which limited the space available for stormwater to go in intense storm events and in turn expanded the 100-year floodplain. This development was perhaps exacerbated by the structural solution promised by the Keystone Dam, built 15 miles upstream from Tulsa in 1964, as it offered a sense of security from flood risk; Burby (2006) described this phenomenon as the "safe development paradox." However, as citizens would learn, this measure was not sufficient in protecting life and property.

Widespread regulatory change at the local level was slow to come, but citizen activists – galvanized by the seemingly endless process of flooding and rebuilding – were successful in shifting city policies after federal programs and regulations enacted through the National Flood Insurance Act of 1968 failed to produce results (Patton, 1994). The first inroad came when city commissioners responded to their constituents' concerns and put in place several mechanisms to help the city cope with its flood risk, including a master drainage planning process for major creeks and stormwater detention regulations for future developments, among others. While these changes were critical to ensuring new development did not compound flooding issues, it did not adequately address the challenges that remained with existing development (Patton, 1994). It took the Memorial Day flood of 1984 for newly elected political leaders to realize more needed to be done to prevent widespread damage from occurring every few years. They concluded that the best way forward was to pursue property acquisition for the homes damaged by the flood rather than encourage rebuilding. This was a practice the city had used in the aftermath of the "Year of the Floods" in 1974 – when some residents were flooded three times in one year – and to great success given that the 1976 Memorial Day flood hit just after the acquired properties had been demolished, removing homes that would have likely experienced significant damage given their location along Mingo Creek (Patton, 1994).

As a result of its progressive policies, Tulsa has been spared a major flood-related disaster since the 1986 Arkansas River Flood which had minimal damage compared to the 1984 Memorial Day flood. However, there is concern among some long-time local flood experts that this period of calm is ushering in an era of complacency that could be detrimental in the long term (interview with city consultant, January 30, 2017).

Tulsa's flood mitigation program

During the so-called "Nonstructural Era of Stormwater Management" that began in 1978, Tulsa implemented various policies and programs to ensure that flood risk was mitigated to the greatest extent possible, and indeed leaders recognized the importance and value of enacting a multi-pronged strategy to reduce flood risk (Patton, 1994). In addition to the master drainage plans for all of its basins and stormwater detention regulations for new developments mentioned above, Tulsa also created its first full-time hydrologist position, instituted a floodplain building moratorium, developed an earth change ordinance, and adopted a series of floodplain management regulations (Patton, 1994). In the wake of the 1984 flood, the city realized the importance of coordinating its disparate efforts through a central city agency, and so formed the Department of Stormwater Management (currently the Streets and Stormwater Department) which

would oversee the city's comprehensive stormwater management program (Patton, 1994). To support its work, the city also adopted a stormwater utility fee. Annually, the fee – together with sales taxes and general obligations bonds to assist with capital improvements projects – covers the approximately $17 million per year needed to operate and maintain the city's stormwater management program activities (R.D. Flanagan & Associates, 1994). Because every property has impervious surface, which is a significant contributor to stormwater issues, the city levies the stormwater utility fee on every property. For residential parcels the fee only amounts to a flat-fee of a few dollars each month, and for non-residential properties the rate is based on the amount of impervious surface on the parcel (R.D. Flanagan & Associates, 1994).

This funding is also helpful with a number of other activities that the Streets and Stormwater Department oversees. For example, staff engage in public information and education programs to ensure citizens are aware of the risks they face and opportunities that exist to reduce that risk. The Streets and Stormwater Department also assists with emergency preparedness, mitigation, and long-term recovery, efforts that are key parts of traditional emergency management but not explicitly carried out by the Tulsa Area Emergency Management Agency (interview with city consultant, January 30, 2017).

While the actions described above are fully funded and coordinated by the city, Tulsa has also received outside support to accomplish its stormwater management objectives. From 1984 to 1999, Tulsa entered into a cost-sharing project with the U.S. Army Corps of Engineers (ACE) to construct a flood management system along the Mingo Creek, one of the city's most flood-prone creeks (Carney, 2014). This capital improvements project integrated low-impact landscape interventions such as detention basins and vegetated buffers to better control flood water. Moreover, while the initial ACE plans had the singular purpose of mitigating flood risk, the city and its citizens realized a unique opportunity to leverage the ACE project to provide community amenities. To this end, planning consultants hired by the city collaborated with community groups and leaders to determine how best to utilize the land along Mingo Creek, utilizing a 'multi-objective' planning strategy (R.D. Flanagan & Associates, 1994). In turn, they produced a plan that used the same flood mitigation measures laid out in the ACE plan and stayed within the same budget but focused on multiple objectives that could be achieved by the Mingo Creek Project. This resulted in a series of linear trails, parks, and recreation areas along Mingo Creek that are useful to the community year-round, not just when there are flood events (R.D. Flanagan & Associates, 1994).

Tulsa's buyout program

The Mingo Creek Project also illustrates a critical mitigation strategy that has served the city well: property acquisition. In all, the city has acquired and cleared over 900 structures in the floodplain and financed this from local coffers – primarily through bond issues and sales taxes – and funds from FEMA's Hazard Mitigation Grant Program (Carney, 2014; interview with city consultant, January 30, 2017). In Mingo Creek alone, more than 300 homes and 200 mobile home pads were cleared. While originally there were nearly 26,000 structures in the floodplain, Tulsa's acquisition program has reduced that number to approximately 12,000 structures (interview with city consultant, January 30, 2017).

As previously mentioned, master drainage plans have been developed for each of Tulsa's basins. Within each of these plans, both structural and nonstructural solutions are presented (recognizing that in many cases a combination of the two approaches is best). Acquisitions are considered a nonstructural mitigation practice, and are often identified in the master drainage plans as a possible course of action. To that end, specific properties are identified as target buyout properties in the master drainage plans (interview with city consultant, January 30, 2017).

City employees directing these buyout efforts recognized, however, the importance of public engagement in the buyout process. Community representatives from both the blue collar neighborhoods most severely impacted by repeated flooding along Mingo Creek and the wealthier residents across the city concerned with the effects of the floods served an important role as liaisons to provide a wide range of perspectives to city officials (interview with city consultant, January 30, 2017). Journalists with local media outlets were also integral to ensuring that the interests of the working class residents that bore a disproportionate burden were expressed and heard by government staff. Moreover, city departments leading the acquisition made sure to educate the public about the buyouts and gather their input about possible solutions (interview with city consultant, January 30, 2017). Tulsa also made additional funding available as a way to incentivize relocation to an area outside of the floodplain. To obtain the additional $1,000 offered, buyout participants needed to sign a contract and while Tulsa was not able to monitor or enforce those agreements, it helped to encourage residents to ensure they were not moving from one hazardous area to another. Furthermore, if a resident disagreed with the appraisal that was completed to determine the pre-flood value of their home, the city paid for a private appraisal and then negotiated between the two so that homeowners were getting a fair buyout offer (interview with city consultant, January 30, 2017).

To finance acquisitions, the city has used funding through FEMA's HMGP, bond issues at the local level, and a sales tax. In the past the city maintained a "rainy day fund" of $1 million per year to constitute the local match required for the HMGP in order to support acquisition and stormwater management activities. However, over recent years, that financial support has dried up and in the the last bond issue the city pursued, no money was allocated for stormwater management projects (interview with city consultant, January 30, 2017). This is largely because Tulsa is a victim of its own success; because the city's investment in the Mingo Creek Project and other stormwater management initiatives have kept the city relatively dry over the past 30 years, the issue has not been a priority.

Tulsa's purposeful open space

The multi-objective planning strategy that contributed to the success of the Mingo Creek Project is the broad planning framework the city uses when considering how best to repurpose buyout land to purposeful open space. Community assets have been incorporated into other buyout initiatives that have been carried out along the Mooser and Audubon creeks, among others, and each land use serves a dual purpose. Athletic fields function as detention ponds, ponds stocked with fish provide excess storage capacity for flood water, and parks incorporate green infrastructure measures to better filter stormwater (interview with city consultant, January 30, 2017).

While the open space projects have largely been a success, they are not universally accepted. Because the maintenance roads that accompany some of the stormwater facilities are public rights-of-way adjacent to backyards, some community residents have expressed safety and privacy concerns. The city is actively exploring solutions to reduce public access to private backyards (interview with city consultant, January 30, 2017).

The stormwater features that Tulsa has implemented do not maintain themselves, though. The city's Streets and Stormwater Department (formerly housed within the Department of Public Works) carries out the lion's share of maintenance and operations activities. To support these efforts, the city relies on a stormwater management fee that generates around $8 million per year (interview with city consultant, January 30, 2017). This revenue is also occasionally used for small acquisition projects when a high priority buyout opportunity becomes available and the budget is sufficient to cover associated costs.

Local staff familiar with the open space projects noted that it was helpful to house the operations and maintenance responsibilities within the Streets and Stormwater Department (formerly the Stormwater Management Department) rather than the Parks and Recreation Department, for example, so that efforts were streamlined and focused on technical solutions to stormwater issues (interview with city consultant, January 30, 2017). However, while the Tulsa Streets and Stormwater Department is largely responsible for operations and maintenance, the Parks and Recreation Department also assists with some upkeep. This is primarily on parcels that were originally park facilities that have been enhanced with stormwater management infrastructure. Because the Streets and Stormwater Department is able to provide funding for maintenance of these properties through the stormwater utility fee, the Parks and Recreation Department does not incur a financial burden for assisting with maintenance and operations duties. Additionally, the city has subcontracted out some management responsibilities to private groups. For example, the Tulsa Soccer Club has fields in almost all of the detention basins and has agreed to maintain and operate the facilities in exchange for their use (interview with city consultant, January 30, 2017).

Best management practices

Several trends were identified as particularly helpful in Tulsa's acquisition program and open space management process.

Comprehensive stormwater management program. Tulsa's city leaders realized that there was no one singular solution to its flooding problems. By engaging in planning processes across all of its major basins that provided both structural and nonstructural options, the city has built a more robust mitigation program. Moreover, because this program is based on solid data, science, and technical expertise, the city is able to determine the solutions that will most effectively reduce flood risk (interview with city consultant, January 30, 2017).

Eligible buyout property identification. To guide the buyout process, the city maintains a list of properties that are prioritized for buyouts – based primarily on cost-effectiveness and depth of flooding – and notifies the owners that their homes are

eligible for acquisition. To facilitate this process, if you have a home that is valued at less than $250,000 and in FEMA's "A" zone of the floodplain, no cost-benefit analysis needs to be carried out (interview with city consultant, January 30, 2017).

Future conditions assessment. Early on, city staffed recognized that Tulsa was growing at a fast rate and that the FEMA floodplain maps did not account for this growth. As development inevitably increases impervious surface and therefore exacerbates stormwater issues, this meant that city staff trying to implement mitigation measures did not have updated data on flood risk. By taking future development into account, the city not only had a better picture what their 100-year floodplain would likely look like in years to come, but also gave officials information that was helpful in developing regulations that limited risky development (interview with city consultant, January 30, 2017).

Pre-event planning. City contractors in the early 1980s had developed an exercise for use by FEMA officials to practice interagency hazard mitigation procedures, and the scenario closely resembled issues and characteristics of Mingo Creek. The acquisition decision and open space planning that focused on creating dual-purpose land uses were facilitated by the exercise. Therefore, when the flood of 1984 hit and the mayor asked for a more effective alternative than rebuilding to the status quo, city staff were prepared (interview with city consultant, January 30, 2017). While not formalized, this pre-event planning nonetheless prepared the city to undertake acquisition in a thoughtful way.

Teamwork. Talking with local staff involved with the buyout, floodplain management, and open space programs, it was clear that a strong sense of teamwork was a crucial factor in the city's success. In particular, the following groups were considered an important contributor to Tulsa's efforts (interview with city consultant, January 30, 2017):

1. Media: Local journalists helped keep the issue of flooding on everyone's radar and also provided a critical service in educating the public and putting pressure on local officials
2. Citizens: Several residents of impacted areas took up the cause and organized their neighbors to send a strong message to their elected officials to take action.
3. Professionals and professional organizations: Subject matter experts such as planners and wetlands managers offered their professional expertise and services to ensure Tulsa's projects followed best practices.
4. Government staff: Buy-in of government staff across a wide range of departments, such as Parks and Recreation and Engineering, was needed to ensure the multi-objective plans were carried out.
5. Elected officials: Without an elected champion, success would not have been possible – once representatives in office expressed support for stormwater initiatives, real change started to take place.
6. Government regulations: Regulations serve a critical role in ensuring development projects adhere to standards that mitigate risk.

Multi-objective planning. By focusing on how stormwater management facilities could also provide valuable community assets year-round, the city provided mitigation

measures while increasing recreation opportunities for Tulsans. This also encouraged inter-agency collaboration and provided more capacity to operate and maintain these lands that must remain as open space in perpetuity (interview with city consultant, January 30, 2017).

Charlotte

Charlotte is the largest city in North Carolina, one of the largest cities in the southeastern US, home to a robust financial services sector, one of the fastest growing metropolitan areas in the country, and is the county seat of Mecklenburg County (City of Charlotte, n.d.).[9] While all of this growth makes Charlotte an exciting place to live, it has also created stormwater management issues for a city with a plethora of creeks and streams. Development throughout the second half of the 20th century brought an increase in impervious surface, an expansion of the floodplain, and placed more people and property in harm's way. For example, between the mid-1980s and 2001, Mecklenburg County's tree cover and open space were both reduced by more than 20%, and there was an increase of impervious surface in the county increased more than 125% (Schwab, 2010).

Charlotte's flood history

The city's most destructive flood events came in August 1995 following Tropical Storm Jerry, when between four and 10 inches of rain inundated the area, and in July 1997 following rainfall in excess of 13 inches from Hurricane Danny (Schwab, 2010). These two events caused millions of dollars in damages across hundreds of buildings, resulting in the need for millions of dollars in loans and insurance claims for repairs (MCEM, 2005). Because of the scale of the impacts and the fact that these storms led to flooding in areas that were outside the floodplain, residents of Charlotte filled public meeting rooms and advocated for change. This public outcry helped to usher in a series of programs and policies beginning in 1998, and precipitated the first buyout program between 1999-2000 (T. Trautman, class lecture, September 23, 2016). While Charlotte has been successful in mitigating flood damages, they are not immune to flood impacts. Indeed, another large flood in 2008 inundated homes near the Dunlavin neighborhood along Briar Creek, and other flood events occurred in 2003 and 2011 (T. Trautman, class lecture, September 23, 2016).

While Tulsa has had an extensive history of federally declared flood disasters, Charlotte has never had a presidential disaster declaration for flooding due to the localized nature of their events and the fact that disaster declarations are based on per capita damage (G. Smith and D. Canaan, class lecture, September 23, 2016). Not being able to rely on federal funding has posed some challenges, but it has also forced the city to leverage its assets and create opportunities.

[9] The case study area is referred to as Charlotte-Mecklenburg County due to the many government functions that the two municipalities share. This paper will use the name "Charlotte" (or the "city") for simplicity sake.

Charlotte's flood mitigation program

Despite the lack of presidentially declared flood disasters, Charlotte has taken a proactive approach to ensure they have the ability to mitigate hazards through measures that mirror Tulsa's efforts. Fortunately, Charlotte is a municipality with a high level of technical capacity, personnel capabilities, and monetary resources that has been able to use a suite of powerful financing and mapping tools to cope with these events. These efforts are mainly coordinated through Charlotte-Mecklenburg Storm Water Services, which boasts a staff of more than 150 people and an annual budget of nearly $75 million (as of 2009) (Schwab, 2010).

First, the city has created a local funding stream to help finance hazard mitigation measures by implementing a stormwater management fee, which was created in 1993 (Schwab, 2010). This fee is levied on all property owners in the city, and the rate structure is based on impervious surface. Detached, single-family residential property owners pay a fee depending on what square footage of impervious surface they have using a tiered system, and all other property owners pay a fee tied to the amount of impervious surface on their property. Impervious surface areas are determined using aerial photography analyzed on a per parcel basis (City of Charlotte, n.d.).

Second, Charlotte was one of the first municipalities to institute a future land use mapping program to depict the future floodplain based on projected growth and development (this is called the "community floodplain" rather than the "FEMA floodplain") (City of Charlotte, n.d.). This has been a crucial step in the city's hazard mitigation program, as it recognizes the impact that future development and the corresponding buildup of impervious surface will have in expanding the floodplain. Using current zoning ordinances, future land use conditions, and projected population growth, the city can harness data and technology to ensure risky development is reduced in the floodplain and to identify where mitigation measures should be targeted (Schwab, 2010). The remapping process began in 1999 when the city applied for funding from the Hazard Mitigation Grant Program to support the initiative, leveraged the city's stormwater fee revenues, and secured assistance from the US Army Corps of Engineers. In under three years and with $3 million, Charlotte was able to remap all 16 of its major watersheds (Schwab, 2010).

Third, while these maps do not replace FEMA flood maps, the city uses them to guide planning efforts.[10] For example, the city's floodplain maps are integrated with its water quality protection initiative, named the SWIM (Surface Water Improvement and Management) Program (Schwab, 2010). Additionally, they facilitate information sharing and transparency with property owners, particularly because they are available online in a user-friendly, searchable interface. While this may seem detrimental to business and development interests, Charlotte was able to use sound data and science to convince stakeholders – such as real estate firms and building companies – of the importance of

[10] Schwab (2010) notes, however, that Storm Water Services, Planning, and Emergency Management officials should take a more proactive approach to integrating plans across the three departments. Instead of letting land use planners determine where development should go and updating the flood maps accordingly, the maps should be leveraged to guide development more thoughtfully so as to decrease flood risk. Moreover, he notes that the concept and practices of hazard mitigation need to be more fully realized in strategic planning and policy documents.

their efforts and successfully obtained buy-in from these groups (Schwab, 2010). Importantly, these maps do not carry flood insurance requirements; rather, the main driver in their use is to regulate future development. Also, while the city does not currently incorporate climate change projections into their mapping efforts, they are actively exploring how best to reflect projected climate changes to make their maps more reflective of likely conditions (T. Trautman, class lecture, September 23, 2016).

Lastly, the city recently launched a program called "retroFIT," which provides small grants to homeowners to complete upgrades to their homes in order to make them more resilient to flood impacts. These grants can help reimburse 75-95% of eligible expenses for flood-proofing repairs (City of Charlotte, n.d.). To show the potential benefits of this program, Storm Water Services financed one model retrofit project, and is working with community partners such as banks to help homeowners fund the balance of repair expenses (T. Trautman, class lecture, September 23, 2016).

With a focus on data-informed policies and practices, the city also attempts to quantify losses when possible, and is currently trying to develop habitat assessment protocols to evaluate the quality of habitats before and after Storm Water Services projects (interview with Storm Water Services staff member, February 6, 2017). All together, these tools help the city to mitigate damage to structures that currently exist in the floodplain and reduce future losses by regulating development in the floodplain. For instance, without these policies and programs in place, 700 additional buildings would have been built in the floodplain over the course of their use. They also support planning processes, such as the watershed-based flood mitigation plans that the city developed between 2000 and 2003 (T. Trautman, class lecture, September 23, 2016).

Charlotte's buyout program

One strategy that has been effective at mitigating flood losses is Charlotte's floodplain buyout program. Launched in 1999, the program has purchased and removed almost 400 residential and commercial structures from the floodplain, achieving the program's two goals of 1) protecting lives by giving property owners the opportunity to move out of the floodplain, and 2) removing structures from the floodplain so it may return to a natural state (City of Charlotte, n.d.; Schwab, 2010). The first iteration of Charlotte's buyout program was funded through a combination of federal grants (through FEMA's Hazard Mitigation Grant Program, which also helped finance elevation projects), state funds, and a local match (Schwab, 2010). However, Charlotte is now able to finance its buyout program with local funding for most acquisitions, largely due to its stormwater management fee. This is helpful because over time, fewer and fewer properties have qualified for federal (or state) funding (City of Charlotte, n.d.). Annually, the city utilizes $4 million in local funding to support its buyout program. Over time, the city has invested more than $65 million to acquire properties, and 48% of that funding has been come from local coffers (City of Charlotte, n.d.). In all, the avoided losses that result from buyouts are estimated to have saved the city $25 million. Storm Water Services estimates that $300 million in future losses have been avoided due to the larger property acquisition program (City of Charlotte, n.d.).

Storm Water Services manages two acquisition programs: the local risk-based buyout program and the Quick Buy program. The former, began in 2012, uses only local funding to support buyouts not associated with a specific flood event. The latter, started

in 2003, uses a "rainy day" fund to acquire properties following flood events that have been significantly damaged. Because it uses local funds, the Quick Buy program has the flexibility to acquire the properties soon after the event occurs and before property owners make repairs, saving all parties time and money and reducing the uncertainty for homeowners that typically accompanies acquisition programs (City of Charlotte, n.d.). The program covers the pre-flood value of the property, but deducts any funding used for repairs or rebuilding. Following three destructive flood events over the past 15 years, the city has used the Quick Buy program to acquire 67 properties that sustained severe damage (City of Charlotte, n.d.)

When identifying which properties should be targeted for acquisition, two factors drive the decision making process: cost-effectiveness and total flood risk (City of Charlotte, n.d.). First, in order to determine if acquiring a property would be the most cost effective measure, Storm Water Services makes an assessment of what the cost to acquire the property would be and compares it to future long-term benefits the city could capture if the structure would not need to be rebuilt or repaired after future flood events. Financial factors to be considered in addition to actual repair or rebuilding costs are taxes that would be spent on emergency response activities (such as rescues), disaster relief and recovery, and National Flood Insurance Program contributions. Other advantages include ecosystem services and benefits (such as improved water quality and increased wildlife habitat), increased floodplain functions, and opportunities to create recreational opportunities (although these are not quantified in financial terms). If the cost of acquisition is less than the cost of maintaining the status quo, a buyout is the more cost-effective option. Second, flood risk is evaluated by considering two factors: how likely a flood is to impact the property, and the amount of damage expected from flood events (which relates to the assessment of financial implications discussed above) (City of Charlotte, n.d.).

To support these efforts, since 2012 the city has implemented its Risk Assessment/Risk Reduction (RA/RR) Plan. This plans provides a formalized evaluation process for all 5,000 properties in the floodplain that the city completes on an annual basis, and includes a scoring system to determine flood risk for each property. Each property is also given flood risk reduction recommendations (that may or may not include acquisition) (City of Charlotte, n.d.). Twenty-one different mitigation strategies are evaluated for each property and are given one of four ranks (highly effective and recommended, effective, more evaluation needed, not recommended). Lastly, properties in the RA/RR Plan are given mitigation priority scores to help identify which properties, or groups of properties, and their respective mitigation projects should be prioritized (Charlotte-Mecklenburg Storm Water Services, 2014). Scores are generated with algorithms and are weighted to reflect Storm Water Services priorities. This data-driven process allows the city to quantify the benefits provided by different mitigation techniques, as they can analyze the money spent on properties versus how many points (used in the scoring system) have been reduced. For example, a recent analysis showed that $58 million had been spent on mitigation measures, whereas $306 million had been saved (T. Trautman, class lecture, September 23, 2016).

Charlotte's buyout programs have several unique components. First, in contrast to Tulsa's buyouts, Charlotte does not engage in a negotiation process with homeowners. This practice was the standard with the initial grants the city received and has been integrated into the current program the city manages. Instead, the city uses

other creative approaches, such as educating residents about the benefits of relocating outside of a floodplain, to encourage buyout participation (interview with Storm Water Services staff member, February 6, 2017). For example, the city has a peer-to-peer program where past buyout participants can talk with those considering acquisition but who may be on the fence so that information can be shared. Video testimonials from those who have participated in past buyout, easement, or stream restoration projects are also made available through a communications toolkit (T. Trautman, class lecture, September 23, 2016). However, similar to those funded in part by FEMA, the city's acquisition program is voluntary and residents can choose not to participate at any point in the process up until the actual transaction. Approximately 85% of homeowners who go through the appraisal and offer process complete the buyout (interview with Storm Water Services staff member, February 6, 2017).

The city is also intentional about exploring opportunities to partner with other local departments in order to more efficiently leverage assets and ensure acquisition decisions are in line with capital improvements projects and other departmental plans. For example, in one area that Storm Water Services was planning to do buyouts, they discovered that a relief sewer was planned for the neighborhood. Charlotte Water, which was managing the project, was planning to buy easements from homeowners to complete the project; instead they partnered with Storm Water Services and gave them the money they would have otherwise spent on easements to support the acquisition project. This had additional benefits for the utility because acquiring the properties outright meant they did not have to navigate around structures along the easements to build the sewer, which reduced construction costs (T. Trautman, class lecture, September 23, 2016). In another example, due to an established relationship Storm Water Services had with Mecklenburg County Park and Recreation, the two departments were able to finance a $6 million Quick Buy program following a flood in 2008 to acquire homes that had been significantly damaged. This allowed the buyout process to begin within two months and about half of the targeted properties had been acquired within six to nine months, a remarkably short amount of time given the typically long buyout process (T. Trautman, class lecture, September 23, 2016). While discussions with other local departments do not always result in a partnership due to different objectives and timelines, the city maintains an open line of communication with and explores plans of other departments to recognize opportunities when they arise. Moreover, city staff occasionally meet formally to review capital improvement projects, which provides another chance to realize partnership potential (interview with Storm Water Services staff member, February 6, 2017).

In addition to Charlotte Water, Storm Water Services also collaborates closely with Park and Recreation. The Fire Department (within which the emergency management department is embedded) is supportive of Storm Water Services efforts as well due to their role in flood response and rescue, but does not coordinate on the use of properties after acquisition. For its part, the Planning Commission supports stormwater management efforts by recognizing a lot of the floodplain as as open space.[11] City

[11] Per North Carolina state law, there is also an approval process – managed through a special committee run by city planning staff – for any fee simple government parcel acquisition.

planners would likely be more involved if the acquisitions occurred at a larger scale[12] (interview with Storm Water Services staff member, February 6, 2017).

Another important aspect of Charlotte's buyout program is that Storm Water Services has utilized an effective and ongoing dialogue with the city's elected officials. This has proven to be a helpful strategy, as it has set clear expectations and goals associated with the buyout program. They emphasize that property acquisition is not the last step in stormwater management efforts, but rather that the open space created by the buyouts is part of a larger stormwater system that must be maintained in perpetuity (interview with Storm Water Services staff member, February 6, 2017).

Charlotte's purposeful open space

Charlotte's buyout program has resulted in the creation of 185 acres of land that has been returned to its natural function as a cleared floodplain. Moreover, the Greenway Plan Update references more than 3,000 acres of floodplain and riparian habitat that have been conserved (Mecklenburg County Parks and Recreation, 2008). Apart from recreation amenities such as parks, community gardens, and greenways, Storm Water Services also builds wetlands and stormwater treatment areas and completes stream restoration projects. Overall, approximately 25% of acquired properties have been transitioned to purposeful open space.[13] These efforts have not only improved stormwater indicators, but have also resulted in significant water quality gains; in fact, water quality indicators have shown a 51% improvement between 1998 and 2015 (T. Trautman, class lecture, September 23, 2016). The following provide some examples of how Charlotte has been able to transition vacant buyout land into purposeful open space.

Midtown.[14] One of the most visible projects is the Midtown site, a buyout project that targeted the removal of commercial properties. The $50-million-dollar project (including $22 million for property acquisition from local land bond funds) removed an assortment of businesses – a bank, hotel, gas station, automotive shop, fast food restaurant – as well as part of a mall and its parking lot that had covered a creek for decades, and restored the stream underneath. As part of the deal to daylight the creek and return the area to its natural floodplain functions, the county had to buy the portion of Little Sugar Creek that had to be uncapped. The acquisitions and subsequent daylighting and stream restoration project ultimately created the Little Sugar Creek Greenway, a trail that runs from Central Piedmont Community College and continues to the popular Freedom Park. Educational signage is incorporated throughout the Midtown area of Little Sugar Creek to teach visitors about floodplains and the natural

[12] Outside consultants are not often used, but have assisted or may assist with design projects (for example, for a greenway, park, or stormwater treatment area) or public engagement efforts.
[13] Ashton Rohmer, "Buy-In for Buyouts: Buyout Best Practices and Their Implications for Hazard Mitigation and Climate Change Adaptation." Carolinas Climate Resilience Conference. September 14, 2016.
[14] The information in this section was gathered at a public presentation the author attended hosted by the Chapel Hill Alliance for a Livable Town at the Chapel Hill Public Library on Wednesday, October 26, 2016. Storm Water Services Project Manager Crystal Taylor-Goode presented on Charlotte's stream restoration efforts on Little Sugar Creek. The presentation can be viewed at https://vimeo.com/189101745 (part 1) and https://vimeo.com/189159670 (part 2).

resource assets they support. Today, a large mixed-use development lines the creek in the heart of Midtown, boasting access to one of the city's most beloved treasures, and more lots adjacent to the creek are slotted for residential development.

For this particular project, partnerships were key to success. Financial support, in addition to money contributed by Storm Water Services, included funds from the NC Division of Water Resources, Charlotte Water, Charlotte Department of Transportation, NC Department of Transportation, Mecklenburg County Park and Recreation, and the NC Clean Water Management Trust Fund. Other non-financial collaborators included Charlotte-Mecklenburg Utilities, Duke Energy, Central Piedmont Community College, and a private developer. The stream restoration part of the project was funded by $1.6 million provided by Storm Water Services and an additional $2.47 million in grants. In total, Storm Water Services was able to restore over a mile of stream that had previously been buried under impervious surface. Anything outside of the stream channel was managed by Park and Recreation, making an effective give and take relationship to create the amenity that exists today.

One particular facet of the project that included multiple stakeholders is especially interesting, given the focus on creating co-benefits and working with stakeholders to forge a win-win solution. Central Piedmont Community College was intent on building a culinary institute on acquired property adjacent to a Duke Energy substation. Additionally, most of the land was owned as right-of-way by Department of Transportation. Together, these stakeholders collaborated to give the college a culinary institute, and in turn aspects of the stormwater management strategy were integrated with the institute. First, a rain garden was built on the culinary institute's campus so that runoff from the building could be treated. Second, cisterns were installed to capture roof runoff; this water, once cleaned, could then be used for irrigation.

The Little Sugar Creek Greenway was a long time in the making. Planning for the process started in 2004 and 2005, and it was originally scheduled to be completed in the spring of 2010, but delays caused construction to be completed in the spring of 2012. Many of the delays were caused due to the highly complex nature of the project and the number of partners involved in its construction. To facilitate so many moving parts, the project was phased to accommodate different budget timelines and project schedules. Ultimately, the setbacks were worth it as 1,100 feet of asphalt and concrete were removed from on top of the creek, structures were removed from 15 acres of acquired floodplain, and two demonstration wetlands were created with a total drainage area of more than 30 acres. Analysis suggests that there has been up to a two-foot reduction in 100-year flood elevations due to the improvements made.

For Storm Water Services staff, some lessons learned emerged throughout the project. The first was the importance of public perception. With the Little Sugar Creek Greenway, the public was presented with beautiful conceptual designs of what the greenway could look like, but these sketches did not prepare citizens for the view they would have during the construction phases. The city learned the importance of setting expectations appropriately to maintain support throughout the process.

Second, for a project as big and complicated as the Little Sugar Creek Greenway, planning is a lengthy process; indeed, the Little Sugar Creek Greenway Committee had been working on the project for years before construction finally began. One reason why the process took so long is because buy-in from relevant stakeholders – such as the local community, county commissioners, and city councilors – is a crucial step in the process

and only comes after thorough public engagement and effective communication efforts are carried out. While it may seem like a hindrance, it is important to have as many stakeholders involved up front as possible. Having more parties at the table may add complexity, but it also provides funding opportunities, reveals potential options for ownership and management responsibilities, and ensures that time invested in the beginning to address stakeholder concerns and interests prevents lengthy delays later in the project. To facilitate the give and take that must occur with so many parties involved, it helps to have a shared vision or common goal that the group is working towards so that everyone is on the same page.

Lastly, with a $50 million price tag, the Little Sugar Creek Greenway was a hard sell at first. However, the city found that once it obtained some funding commitments up front, it helped secure more financial support as work got started.

Westfield Road portion of Little Sugar Creek Greenway. More than 40 properties were acquired along Westfield Road, south of downtown on the outer edge of the Myers Park neighborhood of Charlotte.[15] Given their flat topography, ideal location alongside Little Sugar Creek, and connection to other parts of the creek's greenway, these properties were integrated into the greenway network. In addition to providing a green space to adjacent residents, this part of the greenway also provides access to riders traveling from downtown Charlotte to The Park Road Shopping Center and Park Road Montessori School.

Hidden Valley Ecological Garden. The Hidden Valley acquisition was part of the first wave of buyouts the city ever pursued, and the resulting ecological garden project was the first time the city transitioned vacant land to purposeful open space. For this particular area, a low-income neighborhood northeast of downtown, there was no pre-existing park master plan or greenway planned by Park and Recreation. Because Park and Recreation was not interested in partnering on this specific project, Storm Water Services engaged in its own planning process. After eliciting feedback from the surrounding community about local needs, Storm Water Services decided to build a garden. This ecological garden has educational signage, boardwalks, a greenway that connects to a local magnet school, wetlands, and a stream restored from a channelized and riprapped condition to a more natural, meandering state. Even though Park and Recreation originally did not express interest in working in the Hidden Valley neighborhood, the success of the ecological garden captured their attention and staff there are now eager to connect it to the city's broader greenway and park system. Importantly, during the 2008 flood that hit the city, the road alongside the garden was covered in water, so this project has been helpful in mitigating flood losses (interview with Storm Water Services staff member, February 6, 2017).

While the land uses described herein are completed projects, many times the land will also have interim uses – such as a temporary farmers market – until a final decision is made given Storm Water Services needs and through public engagement efforts. For instance, the Dunlavin neighborhood along Briar Creek sustained substantial flooding

[15] Ashton Rohmer, "Buy-In for Buyouts: Buyout Best Practices and Their Implications for Hazard Mitigation and Climate Change Adaptation." Carolinas Climate Resilience Conference. September 14, 2016.

during a 2008 storm, and damaged many homes on the creek side of the street. Storm Water Services learned that there was interest in a neighborhood garden, so residents collaborated with Park and Recreation to establish rules that would govern a temporary land use (i.e., the garden could not be permanent, structures that would exacerbate flood risk like fences were not allowed, etc.). Because of this flexible collaboration with local stakeholders, the neighborhood has a garden that has served as an interim community asset (T. Trautman, class lecture, September 23, 2016).

In other cases, homeowner's associations and nonprofit groups have expressed interest in the temporary use of the land. This is helpful given that while Charlotte's locally funded program reduces the time needed for a single buyout transaction to occur (compared to programs that rely more heavily on federal funding), it often takes longer for an entire neighborhood to be acquired (in some cases five to 10 years before all flood losses are mitigated in a neighborhood through acquisition). Therefore, by managing the land in an interim state, the vacant property is more likely to serve a community need and less likely to be a neighborhood "disamenity". Other temporary arrangements used include orphan lease agreements, where residents adjacent to the acquired properties can lease the lots and are responsible for maintaining them. This is helpful for the city because it reduces expenses and staff resources required to manage the site over time (interview with Storm Water Services staff member, February 6, 2017).

Planning for Charlotte's purposeful open space[16]

While Charlotte has been able to successfully convert a number of vacant properties to purposeful open space, Storm Water Services does not actively engage in planning far in advance; rather, they take a more flexible approach. Because the program is voluntary, it can be a risk to engage in community dialogue before buyouts happen and set expectations for plans that may not be carried out. Therefore, they wait to see how much land is acquired and go through different planning and public engagement processes over time to learn more about community needs.

When planning is done in advance, however, it is typically one of two varieties. The first is when a specific area that has been acquired is already part of a master plan or separate planning process, such as Charlotte Water plans or greenway plans. In these situations, a greenway master plan may show a trail corridor in a general location where homes have been bought out. However, it may not provide the exact location where the trail would be. If such a plan exists, Storm Water Services will share that information with local residents who inquire about potential future land uses if it is too early for a final determination to be made. As the final buyout area becomes more clear, the more detailed aspects of these plans are determined through traditional planning processes with each of the respective departments that owns the plans.

The second planning approach, if a master plan does not already exist, is to carry out a planning process around the specific uses. When Storm Water Services is ready to carry out a planning and community engagement process (i.e., when the buyout is complete), several different options are used to gather input before a formal plan (that includes implementation features such as timelines and funding sources) is created. In

[16] The information in this section was gathered during an interview the author conducted with a Storm Water Services staff member on February 6, 2017.

some ways, the process is similar to a charrette-based design, where there is no current plan for the area. Starting with a blank slate, Storm Water Services will meet with community members and have them contribute ideas for how they would like the area to look given the area's limitations. In other cases, where Storm Water Services has an idea of what they would like to do with the land (for example, undertake a stream restoration project), they engage with citizens about the design of the project through public meetings, but do not solicit ideas for land uses since there is already a goal in place. In a few instances, Storm Water Services has worked with a neighborhood to address specific issues that arise due to property acquisition. For example, there have been a couple of places where streets that have been abandoned have caused issues, such as dumping, that are concerning to nearby residents. In these cases, Storm Water Services has worked with the neighborhood to implement an interim solution to prevent dumping on cut-off streets. Lastly, in the case that land is acquired but no needs or uses are immediately apparent, Storm Water Services will pitch an idea to the neighborhood. For instance, in an area where no community needs emerged, Storm Water Services mentioned that they could reforest the property and made efforts to engage the surrounding residents in a replanting initiative. In this case, local donors contributed tree saplings so that the area could be reforested.

Charlotte's less proactive approach to open space planning gives them the flexibility they need to ensure that projects can be implemented. However, one drawback is that there is not a systematic process to identify which properties should be transitioned from vacant land to purposeful open space. Rather, where Storm Water Services has a need, or where another government department or neighborhood has a need and voices it, that is where the attention is given. This could have equity implications, as neighborhoods with fewer resources or political savviness may not be able to advocate for the repurposing of vacant land to purposeful open space. Because low-income residents and communities of color more often lack access to quality green space, more proactively targeting open space projects in these areas could be a successful strategy to ensure city resources and efforts are distributed in areas most in need. Also, not having a plan (or relevant data) earlier in the process could result in missed opportunities for procuring funds, not realizing partnership opportunities, lack of project momentum/interest, or not prioritizing the open space projects above other community needs that are better organized or articulated.

Public engagement around Charlotte's purposeful open space[17]

In terms of public engagement efforts, Storm Water Services tries to identify the key players in each community, recognizing that each neighborhood is unique. For example, in one of Charlotte's watersheds a grassroots group advocates for their local creek. When Storm Water Services wants to do work that impacts the area – whether it's a stream restoration project or property acquisition – they coordinate extensively with this local group. In another area, Storm Water Services wanted to implement a large stormwater project. After approaching the neighborhood with a plan, local residents noted that there was a nearby elementary school that could benefit from educational

[17] The information in this section was gathered during an interview the author conducted with a Storm Water Services staff member on February 6, 2017.

components which could be integrated into the project; in turn, the plan evolved to reflect the community's input (T. Trautman, class lecture, September 23, 2016).

Despite their successes in incorporating community feedback, one challenge is that there is no 'one stop shop' between communities and different agencies that ensures information about issues and needs for both residents and government departments is accessible in one central location. For example, in areas where Storm Water Services has not done any work in the past, they would benefit from having standardized information or a formalized checklist that provided a general picture of the community they were going to work in. This would be a helpful tool to have particularly in a city as big as Charlotte, with its many diverse neighborhoods and the many projects and programs managed by government offices.

That being said, Storm Water Services staff have taken an active approach to gathering this information. For example, during the first buyout process the city pursued, at first only four areas seemed to be prime for acquisition based on information provided by citizens about the flood damage in their neighborhoods. However, that differed with the city's understanding of where the floodplain was and where damage likely had occurred. In their estimation, two other areas should have flooded and therefore would have been likely candidates for buyouts. When Storm Water Services staff visited these two neighborhoods, they discovered by knocking on doors and talking with residents that indeed it had flooded. However, residents there had not told anyone about their experience with the flood because they did not think anyone would address their issues. Once Storm Water Services learned of the risk this neighborhood faced and damage that had occurred, they included two additional areas in the acquisition program. Because of these efforts, there are now greenways and community gardens in these areas, and a two-mile long stream restoration project through one of the areas is underway.

Best management practices

In many ways, the best management practices that have emerged from Charlotte's experience mirror those of Tulsa. Charlotte has worked to create a comprehensive stormwater management program, identifies properties eligible for buyouts, uses future land use mapping for hazard mitigation measures, collaborates with a wide range of city partners, and capitalizes on any opportunity to realize co-benefits for their stormwater management projects. Research for this case study revealed some additional best management practices that could be useful for improving acquisition and open space management programs.

Lifecycle responsibility. When Storm Water Services begins a property acquisition project, they think about the benefits that go beyond just hazard mitigation. They recognize the need to both utilize the land in a way that serves multiple objectives for the local community (such as stormwater management and recreational opportunities), and that by acquiring the land, they are committing to being stewards of that land in perpetuity. Furthermore, this is an expectation that is set with city and county elected officials, and indeed has become the expectation that community members have for Storm Water Services. To facilitate this framing from the early stages of a buyout, Storm Water Services thinks about the fact that their work does not end with the buyout –

rather, the acquisition transaction is just the beginning (interview with Storm Water Services staff member, February 6, 2017).

Contingency planning. While Storm Water Services aspires to transition all of its acquired properties to permanent local assets that produce co-benefits, they also set realistic expectations for their projects and either have alternate options or remain open to ideas offered by residents in the event that initial plans fall through or take longer than expected. Having a contingency plan – such as reforesting properties, hosting community gardens, or returning them to a natural state if community needs are not found – helps them to be better stewards of the land and realize opportunities they may have otherwise not considered.

Steady stream of local funding to support "rainy day" fund. Perhaps one of the most important factors of Charlotte's success is its steady stream of local funding for both acquisition of properties and operations and maintenance of stormwater management activities. The money generated by the stormwater management fee enables the city to act quickly after a damaging flood event so that they can give homeowners a relocation option before rebuilding begins. This also supports open space project planning, because if more residents are incentivized to move out of the floodplain in a particular neighborhood that has sustained significant flood damage, the likelihood of there being contiguous parcels increases. Having contiguous vacant parcels gives the city more flexibility in repurposing the land. Additionally, having financial resources available to maintain the land after acquisition – that can be coupled with funding procured through grants or other city partnerships – ensures that the city can commit to being a steward of the land and that it does not become a burden on surrounding neighborhoods.

The more (and better) information, the better. Charlotte has benefitted from its technical and staff resources, which have enabled it to gather, analyze, and synthesize data. For example, following Hurricane Floyd, the state had more than $15 million of federal funding still in its coffers days before the appropriation expired. Rather than return the unspent money to the federal government – as it was unable to use any more funds on projects in eastern North Carolina – state staff approached Charlotte to determine if it had any unmet needs. Because the city had been previously able to collect data and analyze it for use in their funding application, they were able to demonstrate unmet need and use the leftover federal funding to finance hazard mitigation and disaster recovery projects (G. Smith and D. Canaan, class lecture, September 23, 2016). Another more recent example was during the planning phase for the Little Sugar Creek Greenway. The city had completed studies which supported the development of watershed management plans. These studies and the resulting plans were a key component of their success in securing grant funding for the greenway project (C. Taylor-Goode, public presentation, October 26, 2016). Lastly, it is important to not over rely on self-reporting mechanisms to gather data, or trust that data is always true. There may be instances when the only way to collect or verify information is to go door-to-door (whether it's in a neighborhood on the other side of town or the city department down the hall) and ask people about their experiences and needs.

Areas for Further Study

Buyouts present a unique set of challenges and opportunities that are interesting from a research perspective and important from a policy perspective. Moreover, the opportunities to analyze different aspects of floodplain buyouts and related open space planning processes are plentiful and varied; therefore, the examples that follow are in no way comprehensive.

While the two case studies profiled provided a wealth of information about some strategies that have contributed to successful buyout and post-acquisition buyout programs, they also represent high-capacity municipalities that have been able to leverage a wide array of resources to effectively manage these programs. Therefore, one area for future study is to assess smaller communities, such as East Grand Forks, Minnesota, and Ottawa, IL that have also been able to successful transition vacant land to purposeful open space. By identifying best management practices that were critical to their successes, researchers can provide more insight into methods that can be widely applied to municipalities of varying sizes and capabilities.

Furthermore, more research should be conducted to see how planning and implementation processes have been successful in instances where a large amount of land (e.g., hundreds of acres) has been acquired in a relatively short amount of time or when a lot of land is concentrated in a particular area.

This paper only focused on buyouts, but a related risk reduction strategy – relocation – merits further study. Additionally, the communities profiled in the case studies faced flood risk from riverine sources. However, coastal communities that experience storm surge or sea level rise-related flood events likely have slightly different challenges and needs that should be assessed.

Conclusion

This paper has explored successful buyout programs and open space planning and implementation strategies, challenges that have been faced, and best management practices that have emerged from two cities that have a long history with flooding. While Tulsa and Charlotte both have extensive resources at their disposal, practices such as building partnerships, capitalizing on projects that produce co-benefits, contingency planning, and an appreciation for the responsibility that comes with acquiring buyout properties are all lessons learned that can be applied to a wide range of communities.

As climate change impacts intensify and precipitate a shift in thinking around where we establish and maintain communities, particularly in flood-prone and coastal areas, the issues explored throughout this paper will become increasingly prevalent. Future research should continue to analyze buyouts and apply lessons learned from successful acquisition programs to community relocation decisions.

Activity 1: To Buyout or Not to Buyout

Most often, a buyout (also known as property acquisition) occurs when a flood event causes substantial damage to a significant proportion of properties within a jurisdiction. In this case, funding may become available to offer property owners in the floodplain that have sustained a certain level of damage the pre-event market value of their homes. Traditionally, if homeowners accept this offer and move out of their homes, the building will be demolished and the underlying property must be maintained as open space in perpetuity by a specified government entity.

The decision to offer a buyout in a community is not an easy one, and can have both positive and negative implications for many people, both in the short and long term. However, many times municipalities will decide to pursue a buyout without fully considering the implications, planning in advance for what happens after the buyout, or talking with residents about their needs and desires. By engaging a wide range of community stakeholders in a conversation about the advantages and disadvantages of buyouts, decision makers will be able to make a more informed plan for how their community will recover following a flood event.[18]

Objectives

By actively thinking through and discussing a series of questions pertaining to buyouts, participants will be more informed about the implications of a buyout and better able to determine if buyouts are an appropriate option for their community. Additionally, by bringing community stakeholders together, the activity will help to build relationships that will be helpful in implementing mitigation and recovery plans.

Participants

The activity should be inclusive of residents, local government staff, elected officials, members of the local media, nonprofit groups, local business owners and other private sector representatives, and any other community stakeholders. The activity is structured to accommodate both small and large groups, but at least 18 participants is preferred.

Background information

The questions posed in this activity should be answered as they relate to participants' own communities. It is likely that throughout the course of the activity, participants will identify data needs; it is not expected that participants will gather the required data during the activity, but rather that they will document data needs as they become apparent. Therefore, participants are expected to use their knowledge and experience to inform the discussion. However, it is also important for participants to recognize any assumptions that are being made and document those assumptions. Lastly, participants should make considerable efforts to consider the viewpoints of stakeholders that are not present in the activity but would be impacted during the recovery process. For example, to the extent possible, participants should consider the

[18] Many of the questions and steps of this activity would be helpful to reflect on if a community is also considering relocation. However, this activity will be focused on buyouts specifically and the issues they raise.

needs of low income residents or underserved community members and how disaster recovery policies and programs would impact these groups.

Pre-Activity Work

Participants are expected to review the list of questions provided by the facilitator(s) in advance of the activity session, and spend some time considering how they might tackle some of the issues presented.

Activity Outline

9:00 – Introduction to Day (objectives, rules of the road, background information, etc.)
9:15 – Overview of Important Terms and Concepts
9:30 – Warm Up Exercise
10:00 – Break
10:15 – Activity Overview
10:30 – Activity Begins
12:00 – Activity Ends; Lunch Begins
1:00 – Lunch Ends; Groups Reconvene for Synthesis and Posting
1:30 – Individual Reflection
1:45 – Open Gallery
2:00 – In-Group Debrief
2:30 – Full Group Activity Debrief
3:00 – Activity Ends; Course Assessment Begins
3:15 – Course Assessment Ends; Day Ends

Instructions[19]

Pre-work. Nine sets of questions have been created for this exercise (please see Appendix A). The facilitator(s) will send these questions to the participants a few weeks prior to the activity so the participants can review them. The facilitator(s) will also print two copies of each of these nine question sets on separate pieces of paper. Also, the facilitator(s) should print nine table-sized maps of the municipality and bring markers and a large easel pad with adhesive paper (at least nine sheets).

Prior to the activity, use the class roster (which should include affiliations) to make preliminary groups (these groups should stay flexible, as some people will not attend or others will attend). There should be a total of nine groups, and each should have a relatively even number of group members (i.e., one group should not have three members if another group has eight members). To the extent possible, these groups should include members from diverse backgrounds, so be sure to consider member affiliations when assigning groups both as they relate to issue area (housing, the environment, etc.) and status (formal organization, government department, informal group, unaffiliated individual, etc.).

Warm Up Exercise. Each of the nine groups will meet for 30 minutes to discuss the different assets in their neighborhood or community. These could be organizations,

[19] The activity should be led by at least one trained facilitator.

people, "third places", parks, employment centers, schools, etc.[20] According to Freitag et al. (2014), beginning a scenario-based exercise with asset identification (rather than diving directly into the scenario itself) encouraged participants to think more holistically about recovery, their adaptive capacity, and how recovery could be integrated with other planning processes. The authors continue,

> "In effect, we are applying principles of asset-based community development to disaster planning (Green & Haines, 2012), specifically the idea that creative thinking leads from strength-based positive approaches to inquiry and action, as expressed in the Appreciative Inquiry (AI) model (Emery & Flora, 2012). This project was specifically designed to explore what happens when a positive emphasis can prompt ideas for disaster response that are more adaptive than is usually the case in hazards mitigation and pre-disaster recovery planning exercises" (p. 326).[21]

To that end, the facilitator(s) should emphasize how asset identification can foster more holistic and adaptive thinking about planning efforts and how it will be helpful later in the activity. For each asset, the groups should list how the identified asset contributes to their neighborhood or community and which residents benefit most from the asset's contributions. The participants should be encouraged to mark the maps as needed to identify the location of community assets.

Activity. The facilitator(s) will pass out the questions, giving each of the nine groups one set of questions. Each table should also have a map – the maps can be reused from the previous exercise. While the questions are being passed out, the facilitator(s) will explain the activity. For 90 minutes, the groups will work through the set of questions they have. When discussing each set of questions, participants should pay particular attention to what data may be needed to fully answer the questions, which stakeholders may have interests in the questions being asked, how equity concerns may arise in relation to the questions, how those concerns may be addressed, what unintended consequences may occur given a particular course of action proposed by the answer to a question, etc. As a reminder, groups should recall the community assets they identified in the warm up exercise and how those would play a part in their questions.

Each group should designate a note taker. The note taker is responsible for capturing all the salient information that is addressed during the discussion. The types of information that are most important to capture are decisions that are made by the

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[20] Ray Oldenburg defines third places as "public places on neutral ground where people can gather and interact. In contrast to first places (home) and second places (work), third places allow people to put aside their concerns and simply enjoy the company and conversation around them [...] Oldenburg explains that beer gardens, main streets, pubs, cafés, coffeehouses, post offices, and other third places are the heart of a community's social vitality. Providing the foundation for a functioning democracy, these spaces promote social equity by leveling the status of guests, providing a setting for grassroots politics, creating habits of public association, and offering psychological support to individuals and communities." (Project for Public Spaces, http://www.pps.org/reference/roldenburg/)

[21] Freitag, R. C., Abramson, D. B., Chalana, M., & Dixon, M. (2014). Whole community resilience: an asset-based approach to enhancing adaptive capacity before a disruption. *Journal of the American Planning Association*, 80(4), 324-335.

group, open questions, data needs, interesting points made, etc. Otherwise, all group members should participate actively in the discussion and share their experiences and opinions on the matters at hand, especially to the extent they add diverse perspectives to the discussion. Throughout the activity, the facilitator(s) should spend some time with each group, both to offer challenges/additional considerations and to determine how the groups are progressing. After 90 minutes, the discussion will end and lunch will begin.

Synthesis and Posting. During lunch, the facilitator(s) will post nine easel pad sheets around the room, each with a copy of each set of questions. After lunch, the groups will reconvene to organize what they discussed. Collectively, the group will decide how to synthesize the most important points that they would like to share with the larger group into 5-6 bullet points that the team will write on their sheet of easel pad paper.

Individual Reflection. This part of the activity allows the group time to reflect on the process, including what they learned, what could have improved the activity, and what other questions they have. Participants should be given some scrap paper and writing utensils and complete the activity individually (no computers unless needed for special accommodations).

Open Gallery. For the next 15 minutes, participants will have the opportunity to see the other eight sets of questions that groups discussed as well as the notes that were included on the easel pad sheets. Participants are encouraged to take notes on the other groups' work so they can discuss in the next activity.

In-Group Activity Debrief. After looking at the sets of questions that other groups tackled and the notes they included on their respective easel pad sheets, the groups will again reconvene to discuss what they saw during the Open Gallery. This discussion can include questions that came up for other groups, ideas for how to approach questions that other groups tackled, general reflections about the other question sets, etc.

Full Group Activity Debrief. All of the participants across each of the nine groups will come together in a conversation guided by the facilitator(s) to debrief the activity. The participants should reflect on what they learned working in their small groups, what data needs they discovered, what equity concerns arose, what open questions remained, etc. They should also comment on the notes that other groups included on the easel pad sheets, questions they had after reading other groups' notes, how they might approach some of the questions other groups tackled, etc.

Course Assessment. Following the Activity Debrief, the facilitator(s) should lead a "plus/delta" evaluation[22], either through an open conversation following the activity debrief (in which a facilitator takes notes) or a written assessment to be collected and analyzed after. While 15 minutes is allotted for this in the agenda, more time may be required.

[22] A "plus/delta" (or +/ Δ) evaluation focuses on the things that worked well in the activity and those that should be changed. This can help to ensure continuous improvement of the activity.

Appendix A: List of Questions

1. Many times, those who are offered buyouts are members of underrepresented or underserved groups, such as low-income residents and people of color. What groups in your community may be disproportionately affected by a buyout? How might they be affected? What challenges are they likely to face?[23] What resources can be used to ensure those challenges are mitigated? How do we identify community needs and keep track of them? How could a buyout benefit them?
2. The funding for buyouts is typically established by the state. However, local governments can influence state criteria by voicing their needs. If a buyout is offered, how should your community determine who is eligible for a buyout (Damage amount? Cost to repair home? Homeowner vs. renter? Repetitive loss? Some other criteria – or combination of criteria?)? How will individual offers be determined? If demand for buyouts is larger than supply (of funding), how will offers be prioritized? Once funding is secured, how will homes be prioritized for acquisition and demolition? How will residents be informed about the buyout program and guided through the application and transaction process?
3. Buyouts can result in residents moving outside a municipality's boundaries, thereby reducing the community's tax base. What impact could this have on the community? What other impacts could result? Should there be incentives to encourage people to stay? If so, what could those incentives be? Who would be offered the incentives? How would financial incentives be paid for?
4. Where will people who accept buyouts go? Is there enough vacant housing to accommodate those who take buyouts? Is affordable housing plentiful enough for those who have been displaced? How can we ensure residents don't move into a hazard area? How will adjacent residents (or those who do not accept a buyout) be included in community outreach efforts?
5. Many grant programs that help pay for buyouts require that the properties remain as open space in perpetuity. What financial resources would be required to ensure that the land can be maintained as open space in perpetuity? Is there sufficient funding available to transition the property from vacant land into purposeful open space? Are there sufficient funds to maintain and manage the open space over time? Are staffing levels sufficient to transition the property from vacant land into purposeful open space? What personnel resources would be required to ensure that the land can be maintained as open space in perpetuity? Are there organizations that may be willing to take on this role or other financial responsibilities (e.g., non-profit, state agency, other)?
6. What are the objectives of the buyout? How could multi-objective planning opportunities be integrated into open space projects? How will success or progress for those objectives be measured? How would a buyout impact existing plans (comprehensive plans, capital improvement plans, etc.)? Are updates needed to any plans or policies to make buyouts possible or to guide their implementation? Would political will support the buyout and long-term

[23] Some issues to consider are cultural or historical ties to the land, social networks that exist (and may support needs like childcare or ride sharing) and may be broken, replacement housing, what happens if only some of a neighborhood takes the buyout (and what implications there are for those who choose to stay), etc.

management of purposeful open space? How will the local land use planner be engaged in the process? Other relevant local officials?

7. Typically, the buyout process is lengthy, and planning for and implementing land use change after the transaction is completed can take years. How will you set expectations for residents, both for the buyout process itself and for how the land is used after? How will you deal with delays that may disrupt certain plans and communicate those delays with the public? How will you set expectations for elected officials and communicate information about delays? How will interagency efforts be coordinated to streamline partnerships that exist to implement open space projects?
8. How much open space already exists in the community? Is it equitably distributed? What is the quality? What amenities are needed? How will you balance community feedback for how the space should be used with resource constraints or differing municipal priorities? How could the open space connect to existing community plans and programs (e.g., greenway, parks and recreation plan, floodplain management plan, etc.)?
9. If a buyout is offered, it is likely that some people will accept the buyout and others will not. This may result in neighborhoods that are fragmented, creating a pattern known as “checker-boarding” when there are houses and vacant lots mixed together. This makes creating purposeful open space difficult, and can also lead to undesired conditions such as homes that are isolated from neighbors and abandoned street ends that attract dumping or other unwanted uses. What resources does the community have to mitigate these impacts? How can these issues be handled proactively? Are vacant lots that are maintained as mowed lawns an appropriate and acceptable land use for the community? If vacant properties are made eligible for lease by adjacent land owners, how will lease requests from two adjacent landowners for the same piece of land be handled? Sometimes the “checker-boarding” effect is the result of heir issues (i.e., one property has a dozen heirs that need to be tracked down and who must agree to the terms of the buyout before a transaction can occur). What can be done to solve this issue?

Activity 2: From Acquisition to Asset

The buyout process does not end when the transaction to purchase the property has been completed; indeed, that is only the beginning. When municipalities decide to pursue a buyout with the support of federal grant programs, they are also committing to being stewards of the land, maintaining it as open space in perpetuity. While this stipulation prohibits development, it also offers the chance to provide recreational amenities, stormwater management features, and other creative uses that can benefit the surrounding neighborhood. By engaging community stakeholders in a conversation about how to realize opportunities to turn vacant property into a community asset given realistic constraints, decision makers will be better prepared to tackle the challenges presented by buyout properties.

Objectives

By participating in a scenario-based activity that encourages innovative thinking and creative problem solving, participants will be more informed about the planning process around open space following a buyout. Additionally, by bringing community stakeholders together, the activity will help to build relationships and a coalition of support across varied stakeholders that will be helpful in implementing open space projects.

Participants

The activity should be inclusive of residents, local government staff, elected officials, members of the local media, nonprofit groups, local business owners and other private sector representatives, and any other community stakeholders. Relevant state and federal stakeholders are also encouraged to participate. The activity is structured to accommodate both small and large groups, but at least 15 participants is preferred.

Background information

The scenarios presented in this activity should be considered as they relate to participants' own communities. It is likely that throughout the course of the activity, participants will identify data needs; it is not expected that participants will gather the required data during the activity, but rather that they will document data needs as they become apparent. Therefore, participants are expected to use their knowledge and experience to inform the discussion. However, it is also important for participants to recognize any assumptions that are being made and document those assumptions. Lastly, participants should make considerable efforts to consider the viewpoints of stakeholders that are not present in the activity but would be impacted by the open space planning and implementation process. For example, to the extent possible, participants should consider the needs of low income residents or underserved community members and how open space projects would impact these groups.

Activity Outline

9:00 – Introduction to Day (objectives, rules of the road, background information, etc.)
9:15 – Overview of Important Terms and Concepts
9:30 – Warm Up Exercise

10:00 – Break
10:15 – Activity A Overview
10:30 – Activity A, Part A Begins
11:30 – Activity A, Part A Ends; Activity A, Part B Begins
12:15 – Activity A, Part B Ends; Lunch Begins
1:15 – Lunch Ends; Synthesis and Posting Begins
1:30 – Synthesis and Posting Ends; Break and Open Gallery
1:45 – Activity B Overview
2:00 – Activity B Begins
3:15 – Activity B Ends; Individual Reflection
3:30 – In-Group Debrief
3:45 – Full Group Activity Debrief
4:30 – Activity Ends; Course Assessment Begins
4:45 – Course Assessment Ends; Day Ends

Instructions[24]

Pre-work. Prior to the activity, the facilitator(s) should use the class roster (which should include affiliations) to make preliminary groups (these groups should stay flexible, as some people will not attend or others will attend). These groups should be no fewer than three and no larger than eight members. The total number of groups should be three, six, or nine (or some other multiple of three if there are many participants), and should have a relatively even number of group members. To the extent possible, these groups should include members from diverse backgrounds, so be sure to consider member affiliations when assigning groups (i.e., if there are three participants from the local Public Works Department, they should be assigned to three different groups). If there are not enough representatives for the number of groups (i.e., three Public Works employees but a total of six groups), not every group needs to have a representative from each sector. These groups will stay consistent throughout Activities A and B. For very small communities with limited staff, government staff members should be equally distributed among the groups. Also, the facilitator(s) should bring markers and a large easel pad with adhesive paper (at least as many sheets as pre-determined groups).

Two sets of three scenarios have been developed for this exercise. The first set of scenarios (please see Appendix A) will be used for Activity A; the second set of scenarios will be used for Activity B (please see Appendix B). Each group will only be assigned one scenario for each activity, and each participant should be given one copy of the assigned scenario for each of the two activities. Based on the preliminary group numbers, the respective number of scenarios should be printed (e.g., if there are six groups of five members each, ten copies of each scenario should be printed). Print a few extra copies of each scenario in case the number of participants changes and for the Open Gallery (one copy of each scenario should be posted to each sheet of easel pad paper per group).

Warm Up Exercise. Transitioning buyout properties from vacant land to open space presents opportunities to build a community's resilience to hazards and the impacts of climate change. These can be physical features, social aspects, or other actions that

[24] The activity should be led by at least one trained facilitator.

support resilience. In this warm up exercise, participants will discuss how hazard mitigation or climate change adaptation measures can be incorporated in open space projects. Moreover, communities can further benefit from these improvements by adding them to their Community Rating System (CRS) program, which can help residents save on flood insurance (please refer to the Resources section for more information on the CRS).

For this exercise, the facilitator(s) should split participants into groups no smaller than three and no larger than eight (no particular sorting is necessary, but best to break up pre-existing affiliations to encourage building new relationships). Each group will meet for 30 minutes to brainstorm different ways the open space could be used to promote community resilience to hazards or incorporate climate change adaptation strategies. Participants should be encouraged to think "outside of the box" and consider the many ways resilience could be supported. Throughout all activities, the facilitator(s) should spend some time with each group, both to offer challenges/ additional considerations and to determine how the groups are progressing.

Activity A. This activity will encourage participants to consider an important part of planning: data collection. Specifically, this activity will be broken into Part A (gathering information from the community about needs and opportunities) and Part B (gathering information from municipal partners about needs and opportunities). The facilitator(s) should set the groups that were established during the pre-work period, and distribute the scenarios accordingly.

While scenarios are presented (i.e., urban vs. rural community, riverine vs. shore flooding), any additional information that is not included should be assumed to be consistent with the participants' home municipality. For example, participants should assume their simulated communities are in their home state (and thus have access to state resources), that the local government has the same departments (although perhaps at a different scale), etc. Any assumptions made should be noted.

> Part A: Public Engagement Strategy. For the first hour of Activity A, each group will review the scenario that has been presented to them. The scenario only provides general information, so participants should apply it to their own communities. Once the group has reviewed the scenario, they should work to develop a public engagement strategy.
>
> Participants should be sure to create strategies that are inclusive of all community interests (even those that are typically not strongly advocated for), meaningfully engage residents in the decision making process, and set appropriate expectations. Some important items to consider:
>
> - What is the purpose of engaging the community in the planning process?
> - Who are the stakeholders that should be involved in the public engagement process? These can include informal groups, formal organizations, and individuals.

- Will the process include more than typical "public meetings"?[25] Will they include focus groups, surveys, targeted outreach, small group activities, social media interaction, etc.?
- Where will meetings be held? Are the locations accessible to everyone?
- When will the meetings be held? Are the times accessible to everyone?
- How will traditionally underrepresented groups be involved in the process?
- How will multiple perspectives from member groups be incorporated so group representation does not fall to one person (who may not be representative of an entire group)?
- How will power dynamics be balanced so that underrepresented groups feel comfortable about participating in a government-led effort?
- What sensitive historical, cultural, political, economic, or other social issues must be considered when doing outreach and planning?
- What information will be shared, with whom, and when? How will information that is shared be made clear and simple enough so that it can be widely understood (free of jargon, complicated concepts, etc.)?
- How will the meetings be structured?

Part B: Municipal Engagement Strategy. For the next 45 minutes of Activity A, Part B will focus on creating a strategy for working with municipal partners, to both include elected officials and nonelected department staff. Viewed from a data collection perspective, this activity will be helpful in determining which municipal partners would be best to explore partnerships with, which have plans that would be relevant to consider for open space planning, which have information that would be helpful to learn more about the communities where buyouts are occurring, what political will exists, etc. Moreover, participants should determine what data needs exist (and could be served by other municipal entities) and think through constraints that may introduce challenges (different project timelines, department goals and objectives, funding streams, etc.).

Once groups have completed their community and municipal engagement strategies to support data gathering efforts, they should email a copy to the facilitator(s) before breaking for lunch.

Synthesis and Posting. During lunch, the facilitator(s) will post as many easel pad sheets around the room as needed so that each group has one sheet. Following lunch, group members will be tasked with organizing what they decided throughout Activity A, Parts A and B. Collectively, the group will decide how to synthesize the most important points that they would like to share with the larger group into 5-6 bullet points that the team will write on their sheet of easel pad paper.

[25] The term "meeting" will be used herein to refer to meetings in general (i.e., times when people gather), not specifically to describe "public meetings." Therefore, the term "meeting" can describe a public meeting, focus group, design charrette, etc.

Open Gallery. For the next 15 minutes, participants will have the opportunity to see the other scenarios that groups discussed as well as the notes and strategies that were included on the easel pad sheets.

Activity B. After the open gallery, the facilitator(s) will give a brief overview of Activity B (groups will not change). In this activity, each group will be presented with a second set of scenarios. Groups should imagine that these scenarios are the results of the community and municipal engagement strategies that they developed in Activity A. Once they review the second set of scenarios and have considered the needs, opportunities, and constraints presented, the groups are tasked with creating an implementation plan. This will involve both deciding what to do with the land and how to implement whatever open space projects are decided upon (to include potential funding sources, project timelines, designating responsible agencies for each part of the implementation process [such as design and planning, construction, and long-term operations and maintenance], etc.).

Groups are encouraged to integrate multi-objective projects into their plans, such as water quality improvement projects, recreational features, and stormwater management best management practices. Additionally, the groups should seek opportunities to integrate the climate change adaptation and hazard mitigation measures discussed in the warm up exercise. Lastly, the scenarios presented will likely not provide all the information that groups wish they had. To supplement the information contained in the scenarios, participants should both inform their decision making process by what they know about their jurisdiction's policies and stakeholders, and otherwise make educated guesses as to constraints and opportunities. Groups should state any assumptions made somewhere in their plan.

Individual Reflection. At the end of Activity B, the group will have time to reflect on the process, including what they learned, what could have improved the activity, and what other questions they have. Participants should be given some scrap paper and writing utensils and complete the activity individually (no computers unless needed for special accommodations).

In-Group Activity Debrief. The group will then have 15 minutes to both discuss what the saw during the Open Gallery and their own experience in Activities A and B. This discussion can include open questions, highlighting ideas that other groups had for their engagement strategies, general reflections about the scenarios, etc.

Full Group Activity Debrief. All of the participants across the groups will come together in a conversation guided by the facilitator(s) to debrief the activity. The participants should reflect on what they learned working in their small groups, what data needs they discovered, what equity concerns arose, what open questions remained, etc. They should also comment on the notes that other groups included on the easel pad sheets, questions they had after reading other groups' notes, how they might approach some of the scenarios other groups tackled, etc.

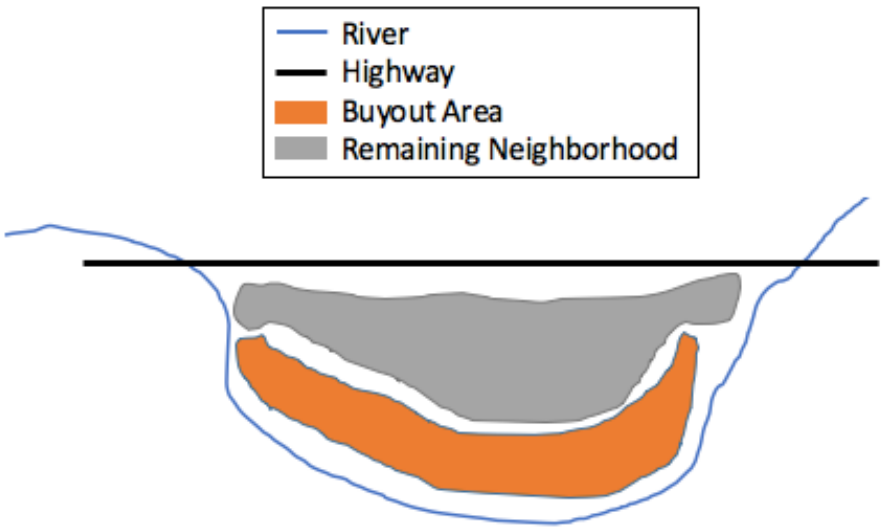
Course Assessment. Following the Activity Debrief, the facilitator(s) should lead a "plus/delta" evaluation[26], either through an open conversation following the activity debrief (in which a facilitator takes notes) or a written assessment to be collected and analyzed after. While 15 minutes is allotted for this in the agenda, more time may be required.

[26] A "plus/delta" (or +/ Δ) evaluation focuses on the things that worked well in the activity and those that should be changed. This can help to ensure continuous improvement of the activity.

Appendix A: Activity A Scenarios

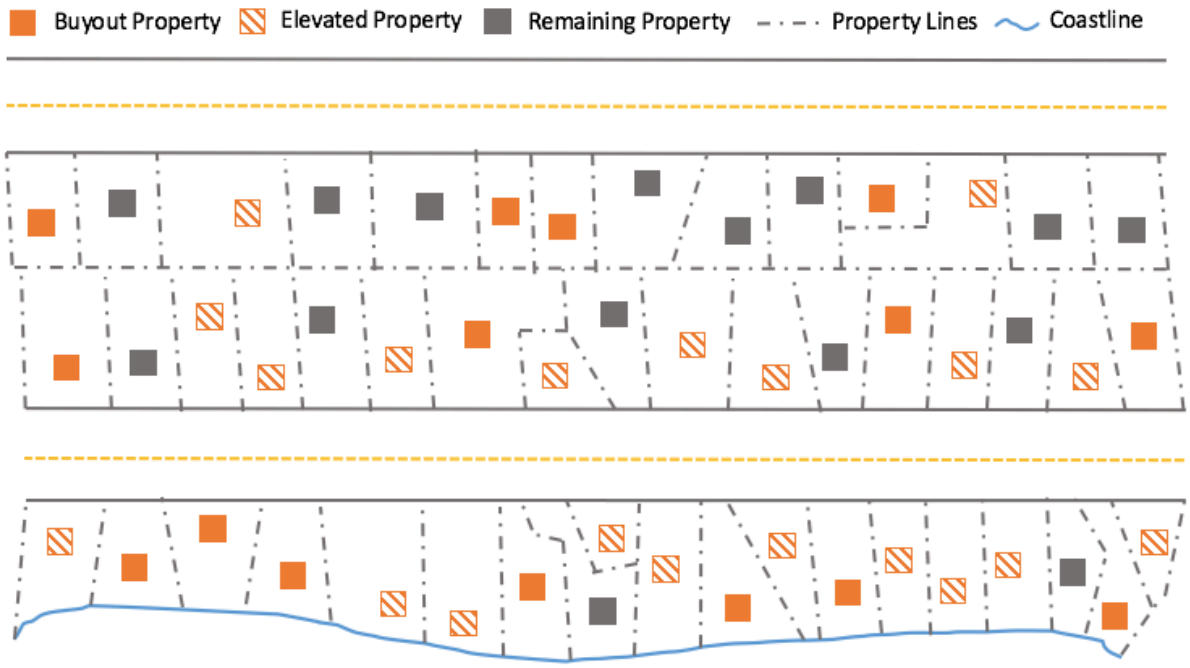
Group 1. Your community is in a rural area that has seen its fair share of flood damage over the years; a creek that runs through the southern part of town is susceptible to riverine flooding during intense rainfall events. Finally, enough federal funding has been secured to offer a buyout to residents, and in one particular neighborhood 100 homeowners have accepted buyouts. Together, these parcels form a contiguous piece of land that totals 100 acres; the rough configuration can be seen in the diagram below. This particular neighborhood is mostly low-income, with a large proportion of black residents that have long been at odds with local government officials. This is the fourth time in 20 years that the creek has caused extensive flooding, yet just the first time that any solutions have been offered. This neighborhood is bordered to the north by another neighborhood built on higher ground that does not get flooded. However, most residents in this higher-ground neighborhood are also black, are all considered low-income, and have strained relations with local government officials as they are disproportionately underserved in terms of access to public services and other amenities.

Figure 1. Buyout configuration of Group 1.



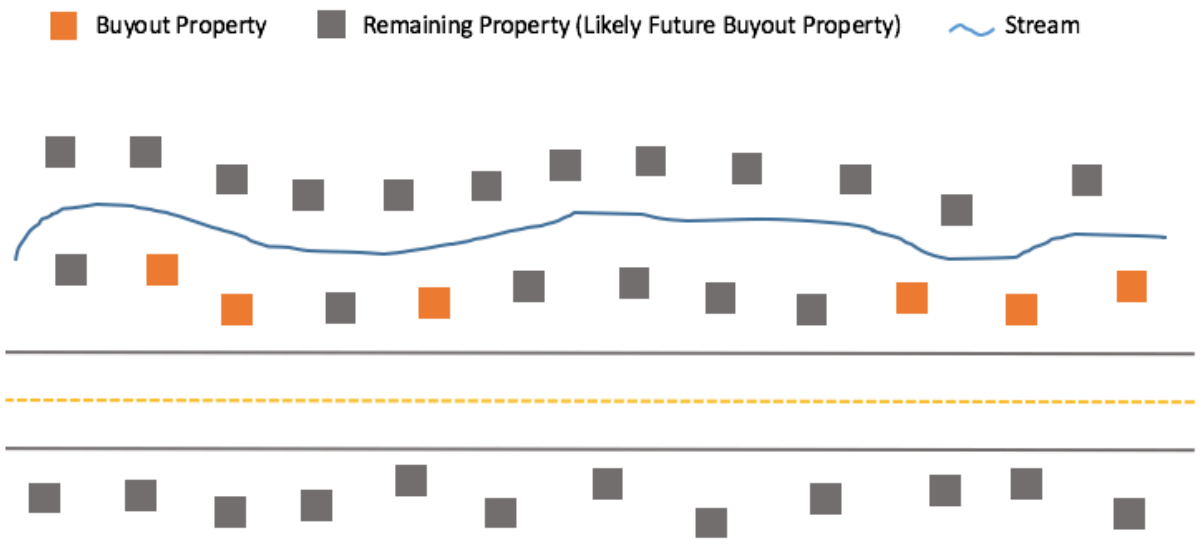
Group 2. Your community is in a coastal suburban area that has only recently begun to experience flooding impacts. Within the past three years, storm surge associated with strong storms has caused flooding of yards and some streets five times, and most recently a hurricane caused several feet of water to come ashore and damage the first floors of many homes. In one particular neighborhood, 15 homes have accepted buyouts from a state initiative out of the 50 that were substantially damaged, and another 20 have decided to elevate their homes using funds from the same state program. Together, the buyout parcels form a checkerboard pattern totaling 30 acres; the rough configuration can be seen in the diagram below. In this particular neighborhood, most of the residents are upper class and while many do not associate the increase in storm surge events with climate change impacts, the local university recently published research detailing the coastal changes that are linked to climate change suggest storm surges will become more intense.

Figure 2. Buyout configuration of Group 2.



Group 3. Your community is in an urban area that has experienced very localized flood events; these events do not impact the whole city, but rather parts of individual neighborhoods, which makes getting federal funding difficult (as presidentially declared disasters are based on per capita damages). Fortunately, your city has taken a proactive role in creating a funding stream to finance buyouts; however, that funding stream only supports a small number of buyouts on an annual basis. This year, the fund generated enough money to purchase six homes in a neighborhood along a stream that has flooded three times within the last 10 years; in this particular neighborhood, there are 30 additional homes that have flooded and all have expressed interest in a buyout. The six buyouts this year will produce 3 acres of vacant land, and if all 30 homes are bought out, they will add an additional 15 acres. The rough configuration of the current and potential buyouts can be seen in the diagram below. Over time the city hopes to be able to offer these homeowners a buyout, but does not expect to be able to fund them all at once; indeed, at the current rate it would take 6-10 years to purchase all the homes. This particular area is made up of mostly blue collar workers, many of whom are immigrants.

Figure 3. Buyout configuration of Group 3.



Appendix B: Activity B Scenarios

Group 1. After executing your community and municipal engagement strategies, you have learned a lot about the needs of both the neighborhood being bought out, the adjacent neighborhood, and the departments in your local government. The residents of the 100 homes that have been bought out are advocating for a memorial to be built on the site, as it was home to a famous gospel singer and was a site of a civil rights event that is widely known about in your state. Most of the residents in the neighborhood to the north are not pleased with the buyouts, because it means that the land cannot be developed and must be maintained as open space; for a low-income community, that means that significant economic growth and opportunity in the area is not likely to occur. Some residents in that neighborhood see the potential, though, to have a beautiful riverfront park that can attract visitors from around the state and perhaps drive economic growth in other areas of the town, which may in turn mean more economic opportunities for them.

The town has sufficient open space and recreational facilities to support the local population, however they are not distributed equitably. There are no parks close to the neighborhood to the north of the buyout area; indeed, this community is cut off from the rest of the town by a freeway that passes through, so it is difficult for residents there to access parks north of the freeway. The Parks and Recreation Department has limited resources to create any new facilities, as it recently finished construction on a brand new recreation center on the north side of the highway that took nearly 8 years to complete. However, you did learn from the Parks and Recreation Director that there is a coalition of up-and down-stream towns that are interested in creating a network of biking and hiking paths along the creek. The town council and mayor did not express overwhelming support for undergoing yet another large-scale Parks and Recreation project, but they are intrigued by the regional greenway idea. You also learned that the Stormwater Services Department will be implementing a stormwater fee on all properties in the municipality to support stormwater management projects throughout the town. After talking with the Director of Stormwater Services, there seems to be interest in using some of the fee to support recreational green space efforts, so long as they also accomplish stormwater management objectives. The funding will likely not be available for two years.

A local tech entrepreneur who has reinvigorated downtown with her successful business has expressed interest in supporting local economic development initiatives. Additionally, a local school recently received a grant to launch a coding curriculum, which may attract families from nearby areas and increase what has been a slowly declining population and economic base.

Group 2. After executing your community and municipal engagement strategies, you have learned a lot about the needs of both the neighborhood where homes are being bought out and the departments in your local government. There is likely no additional interest in buyouts, as most residents that participated in your public engagement efforts stated that they would probably elevate their homes if future funding became available. Moreover, a state representative said that more funding for the buyout initiative was unlikely. At the local level, the city is not interested in subsidizing any more people moving from their tax base.

Residents did express a lot of concern about the condition of the buyout properties, though, and want assurance they will not remain as vacant lots that will negatively impact their property values. Your community is supported by a strong tax base, but city councilors made clear that they were only really interested in supporting a park project that enjoys widespread public approval. If there was strong consensus, elected officials would be willing to entertain a local bond referendum to support open space projects. Unfortunately, public outreach efforts revealed the there was no strong consensus from nearby residents about how to utilize the vacant land. Ideas ranged from athletic facilities to pocket parks to community gardens to leasing the lots to adjacent homeowners so they could have larger yards.

Meanwhile, you heard from a particularly active local advocacy group that is interested in converting the vacant properties to wetlands. This group is the local chapter of a national environmental organization that is interested in potential partnership opportunities. Before any plans are made (wetland or otherwise), the state Department of Environmental Quality must review proposed actions given the close proximity of the land to sensitive local nesting bird populations. Newly passed state regulations give DEQ the authority to make it exceedingly difficult to implement projects that will significantly harm the bird populations.

Most city departments do not have projects planned in the buyout area, but the local municipal water and sewer authority will likely have funding available next year to make repairs and upgrades to underground pipes in the buyout neighborhood, and will need access to the buyout properties in order to complete their project. The project is slated to take one year to complete, but that is if all goes according to plan.

Group 3. After executing your community and municipal engagement strategies, you have learned a lot about the needs of the neighborhood being bought out, residents in adjacent neighborhoods, and the departments in your local government. One concern that was especially prevalent after public outreach efforts was that this particular area of the city is facing gentrification pressures. Residents in surrounding neighborhoods are worried that if a large, high quality green space gets built, it will attract development to the area and increase housing costs, thereby forcing them to relocate to less expensive parts of the city. Indeed, you have already seen evidence of a changing community: two residents new to the area – who do not identify with the existing ethnic groups – were very involved with the outreach efforts you conducted and were particularly interested about the prospective of a community garden. This issue is exacerbated by the fact that the city's current comprehensive plan indicates that this particular area is targeted for mixed-use development over the next 20 years. Otherwise, you have heard that although there are green spaces nearby, none of them cater to the needs that have been articulated by groups that are most represented in this area, who value places for their kids to play and areas to socialize.

Your Transportation Department is hoping to revamp the city's pedestrian and bicyclist infrastructure, and has an ambitious plan to build 100 new miles of bike lanes over the next five years, some of which are planned to go through the buyout neighborhood. However, only one quarter of the project has received federal appropriations so far, and the future of the project is unclear. They are currently drafting a grant application for a competitive state program that funds greenway development projects to keep the plan on track if the rest of the federal funding does not come through.

Your local Health Department also supports a greenway or building some sort of recreational amenity, as a recent report showed some concerning public health trends in the buyout neighborhood. The Health Department thinks that by making recreational opportunities more accessible, public health indicators will improve. While they have some funding available to support such efforts, there are many neighborhoods in the city they must support so this money will be widely distributed.

Resources

Community Development Block Grant Disaster Recovery (CDBG-DR) Toolkits, US Department of Housing and Urban Development. https://www.hudexchange.info/programs/cdbg-dr/toolkits/#buyout

Community Rating System Explorer (for NC coastal communities). http://coastalresilience.org/natural-solutions/openspace/

Community Tool Box, Work Group for Community Health and Development at the University of Kansas. http://ctb.ku.edu/en/table-of-contents

Floodplain Buyout Case Studies, Environmental Law Institute. https://www.eli.org/sustainable-use-land/floodplain-buyout-case-studies

National Flood Insurance Program Community Rating System: A Local Official's Guide to Saving Lives, Preventing Property Damage, and Reducing the Cost of Flood Insurance. https://www.fema.gov/media-library-data/1444398921661-5a1b30f0f8b60a79fb40cefcaf2bc290/2015_NFIP_Small_Brochure.pdf

US Climate Resilience Toolkit, National Oceanic and Atmospheric Administration. https://toolkit.climate.gov

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