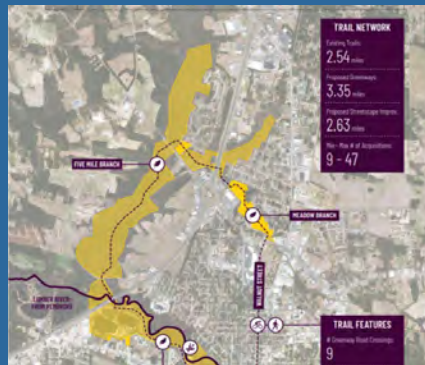


MAKING MITIGATION WORK WEBINAR

OPEN SPACE MANAGEMENT GUIDE

Building Community Capacity to Program
FEMA-Funded Housing Buyout Land

Dr. Gavin Smith, AICP



Housing Buyouts

Federal Emergency Management Agency (FEMA) buyouts

Lands must remain as undeveloped open space

Minimal guidance for how to practically manage open space



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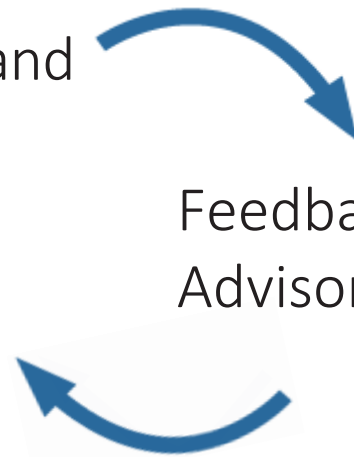
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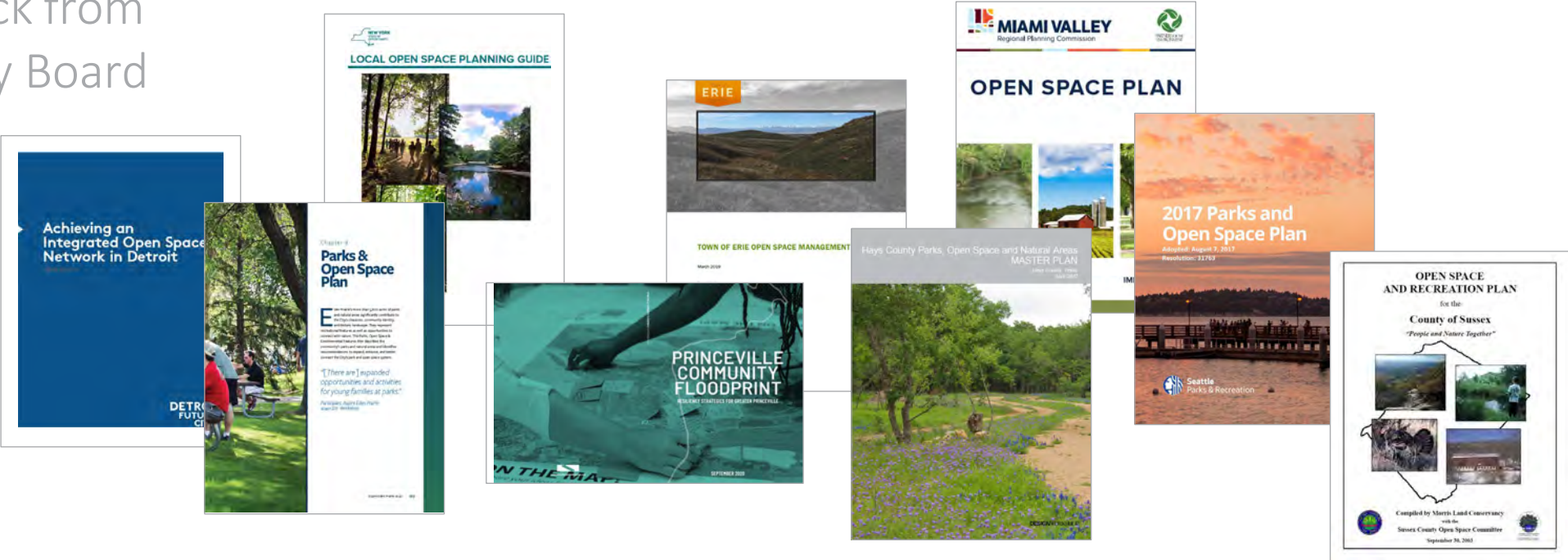
Main_Open Space Guide_Tracker																		File Edit View Insert Format Data Tools Extensions Help										75% 75% 123 Default... - 10 + B I A [icons]										K42 [icons]										[icons] Share [profile]									
Open Space Guide Title	WORKSHOP CATEGORY	Urban, rural, suburban	Ecosystems within region/area	FEMA Region (if applicable)	Who found Guide?	Student Responsible for Guide Assembly	Database Used (e.g. Google)	Date of Search	Link to Guide	Scale of Plan, is it Multiscaled?	Predictable Planning	Housing Buyout	Checkboardi ng	Housing Demolition/Reco nstruction	Disposal of Waste	Infrastructure Demolition/Reco nstruction	Ree Mtr																																								
Town of Erie Open Space Management Plan	community needs assessment: assessment of landscape typologies, specific properties detailed, Land Planning, Focused on ecology, maintaining public uses, consideration of climate change, implementation: fiscal considerations, remediation, Management, innovative management using goals/cover age: "Side note: look at the 'what this is/is not pg' see if we want to implement something similar"	Suburban	High Plains: smooth to slightly irregular plains having a high percentage of cropland. Grama-buffalo grass dominates. https://www.eneco.gov/ent+research/region+domto ad+file+state+region+Bayan e+24	8	Claire	Abby	Google Search	5/26/2021	https://www.eneco.gov/DocumentCenter/View/111336/Town-of-Erie-Open-Space-Managem nt-Plan	Town	p. 30: has disaster mitigation as one of 13 main objectives p. 39 -40: details how disaster mitigation works p. 49-53	no info	no info	no info	no info	no info	p. 39, 53, discusses waste management p. 123-124: waste reduction	no in																																							
Open Space Management Plan	Community Needs Assessment: specific properties detailed, Planning: specific site details, land use designations, Management: on-going analysis to see if interventions work, education/outreach	Suburban	High Plains: smooth to slightly irregular plains having a high percentage of cropland. Grama-buffalo grass dominates. https://www.eoa.gov/ent+research/region+domto ad+file+state+region+Bayan e+24	8	Claire	Abby	Google Search	8/26/2021	https://www.suorloropolu.edu.gov/home/homespelli xhaddocuments/12353335441471013070000	City level	p. 10-11: flood control facilities/strategies in legislation	no info	no info	no info	no info	no info	no info	no in																																							
Open Space Management Plan	Land planning, implementation: using advisory board/partnerships, Management	Rural with a city and several smaller towns	Southern Rockies: Coniferous Forests, Douglas-fir, ponderosa pine, aspen, and juniper-elm woodlands and aspen. High Plains: smooth to slightly irregular plains having a high percentage of cropland. Grama-buffalo grass dominates. https://www.eoa.gov/ent+research/region+domto ad+file+state+region+Bayan e+24	8	Claire	Abby	Google Search	5/26/2021	https://www.bouldercounty.org/open-space/management/	County level with management plan for individual sites	See climate change mitigation policy p. 2, 4, 5, also look at individual sites for case by case	no info	no info	information on a case by case basis, no overarching policy or guide	no info	3-14 of the OSM Masterplan talks about construction costs	no in																																								
San Lake City: Open Space Acquisition Strategy	community needs assessment: ecological/social data layers, Land Planning: land acquisition strategy, implementation: public participation	Urban	Central Basin and Range: a desert that is extremely biodiverse due to variety in topography, geology, etc. Almost no water drains to the ocean. https://us.wilddata.org/wiki/Great_Basin_Desert	8	Gamata	Abby	Google Search	?	http://www.wilddata.com/open-space/GS/next/step/y11.17.30.pdf	City level	guide does not focus on individual houses but on larger tracts of land p. 17, 18 show specifics	no info	no info	no info	no info	no info	no in																																								
Missoula Conservation Lands Management Plan	Community needs assessment, Land planning: partnership with community, integrated with other community plans like transportation, etc. implementation: extensive info on how to manage natural resources, Maintenance of natural resources	Urban	Middle Rockies: Coniferous Forest, Douglas fir, subalpine fir and Engelmann spruce forests and aspen areas, grasslands, scrub-bush areas. https://www.landscapes.org/europe/natural_spaces/missoula-landscapes/conservation-lands-management-plan/	8	Claire	Abby	Google Search	6/3/2021	https://www.cimissoula.mt.us/DocumentCenter/View/4499/Conservation-Lands-Management-Plan/Title	City level	p. 11 summarizes importance of conservation as mitigation p. 23-24 further details	no info	no info	no info	p. 66-67 general waste disposal	no info	no in																																								

Literature Review Details

Relevant FEMA Case Studies

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LUMBERTON, NORTH CAROLINA

CATEGORY: Land Planning
SUBCATEGORY: Assistance from Committed Partners

Introduction

Lumberton, NC, a city comprised of 20,928 (2019) people, is located in the state's coastal plain. The City of Lumberton partnered with North Carolina State University's Coastal Dynamics Design Lab (CDDL) following Hurricane Matthew (2016), and has continued this relationship over time.

The CDDL worked in collaboration with city officials and community members to create and implement the Lumberton Community Floodprint. Strategies for Resilient and Usable Open Space. The document includes open space design concepts informed by policy research, hydraulic modeling, vulnerability assessments, land planning analysis, and community engagement. The document also includes potential funding options to help achieve identified goals. Floodprint provides the city with an in-depth analysis of local conditions as well as site-specific recommendations to strategically use its open space to support the city's long term goals spanning community health, resilience, culture, and economic vitality.

One open space solution proposed as a result of the Floodprint research and engagement process is the Lumberton Loop. This recreational trail connects an 8.52-mile path comprised of 108 properties totalling 806 acres.

The initial buyout funding resulted in a checkerboard pattern. Following a spatial analysis, faculty identified remaining parcels, that if purchased in a second phase of buyouts, would create a continuous path for the proposed Lumberton Loop. Faculty developed an application for the remaining properties as well as an award-winning 1.93 million dollar, building resilient infrastructure and communities grant, that will be used to restore stream channels, construct wetlands, reforest floodplains, remove roadways, and create multi-modal paths.



Lumberton Loop Trail System.
Image: NCSSU, Coastal Dynamics Design Lab.



Lumberton (Existing Conditions). Image: NCSSU, CDDL.



Lumberton Proposed Design. Image: NCSSU, CDDL.

Case Study Focus: Assistance from Committed Partners

The Lumberton Community Floodprint highlights what can be achieved when communities partner with interdisciplinary design teams, such as the CDDL at North Carolina State University. The design team produced a graphic language that helped to convey the open space management strategy to multiple stakeholders, including potential funding organizations. Key partners include the City of Lumberton, the Conservation Fund, the North Carolina Office of Recovery and Resiliency, the North Carolina Division of Emergency Management, the North Carolina Department of Transportation, North Carolina State Parks, and the Lumber River Conservancy (See Callout Box: The Role of Land Trusts in Open Space Management).

Publications like the Lumberton Floodprint can position towns and communities to understand important underlying conditions, and based on that information, develop conceptual design strategies and identify the resources required to carry them out. The CDDL purposely targets communities that may not have access to the resources needed to perform the research and analysis necessary to apply for needed funding. As a result, the CDDL plays a crucial role in ensuring that innovative open space strategies can be funded and implemented.

Key Takeaways:

- Design documents like Floodprint present a holistic approach to community needs assessment, land planning, and implementation.
- A long-term partner, like CDDL, can assist an under-resourced community address unique challenges like checkerboarding by identifying strategic parcels, that when purchased with additional grants, provide a continuous set of properties that can be programmed in a manner that serves as a community-wide asset (See Tip: Engaging with Faculty and Extension Agents at Land Grant Universities and Minority Serving Institutions).

Call-Out Box: Buyouts, Managed Retreat, and Resettlement in an Era of Climate Change

Buyouts are increasingly mentioned as part of a managed retreat strategy (Freudenburg et al. 2016; Hino et al. 2017; Mach et al. 2019; Pinter and Rees 2021). Using buyouts for this purpose requires a long-term vision. Additionally, managed retreat requires a willingness to commit the time needed to disinvest in hazardous areas and invest in other, less vulnerable locations. A managed retreat strategy requires: 1) accessing additional funds to address the buyout of non-FEMA eligible housing; 2) acquiring and demolishing infrastructure, including roads, water, sewer, and public facilities; and 3) identifying sites where supporting infrastructure, critical facilities, and replacement housing can be built (See Tip: Resources to Develop and Implement a Managed Retreat Strategy).

Case study examples like those described in Lumberton, NC demonstrate the value of developing a plan that identifies multiple buyout grants, including the strategic identification of properties that remained after an initial buyout. The Charlotte-Mecklenburg, NC, Tulsa, OK, Harris County, TX, and Linden, NJ cases demonstrate the value of establishing local and state-funded buyout programs that provide more flexibility by aligning eligibility with local community needs and goals. These examples offer lessons for those communities that are considering the development of a managed retreat strategy.

In some cases, communities have used FEMA hazard mitigation funds to relocate their town versus acquiring and demolishing at-risk housing, which provides a useful example of how this work aligns with managed retreat strategies. Specific lessons can be drawn from actions that occurred following the 1992 Midwest floods (Pinter and Rees 2021). Efforts undertaken in Valmeyer, Illinois and Pattonburg, Missouri, for instance, required pulling together multiple funding sources to include those needed to rebuild replacement infrastructure, purchase developable land, and build public facilities on a new site. Other examples of relocation include those underway in Isle de Jean Charles, Louisiana and Newtok, Alaska (see Images 8 and 9).



Images 8 and 9. Buyouts and managed retreat in Isle de Jean Charles, Louisiana. The photos show the sentiments of a homeowner who has chosen to stay in the Isle de Jean Charles community as well as replacement housing located in Houma, Louisiana, more than 20 miles inland. The construction of replacement housing following buyouts is often given limited attention, which can prove problematic for communities that want to retain residents and the associated tax base. Images: Gavin Smith.

Situating buyouts in a larger climate change adapt for how selective or targeted buyouts and the rest and accommodate strategies. While the purchase open spaces and further a broader disinvestment be repurposed as greenways and water retention place. This approach is being used in areas where hazard areas has chosen to remain in place. Example: Mecklenburg County, NC and the Tulsa, OK case st

Achieving multiple goals spanning hazard mitigatio sustained coordinative actions across plans that m hazard mitigation plan and climate change adaptal part of this process. This assessment should involu plan's development and maintenance over time at managed retreat strategy. See Call-Out Box: Identifying Goals in Community Plans that Align with Open Space Management.

Tip: Accessing the Resources to Develop and Implement a Managed Retreat Strategy

For more information regarding how to identify and procure assistance to create and implement a managed retreat strategy, see the Ready to Fund Resilience Toolkit at <https://adaptationprofessionals.org/ready-to-fund-resilience-toolkit/#:~:text=The%20Ready%20to%20Fund%20Resilience,in%20the%20Resilience%20ecosystem%20Program%20and%20the%20Managed%20Retreat%20Toolkit%20at%20https://www.georgetownclimate.org/adaptation/toolkits/managed-retreat-toolkit/introduction.html>.



Ready-to-Fund Resilience
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Checklist: Creating an Open Space Management Team

Most communities that have developed successful open space management strategies have identified, nurtured, and maintained diverse teams comprised of individuals and organizations within and outside their jurisdictions, assigned them clear responsibilities, and coordinated their actions over time. The creation and long-term maintenance of an open space management team requires an ongoing commitment to: 1) identify individuals and organizational representatives, 2) establish an organizational structure (i.e., task force, committee, or other type), 3) identify roles and responsibilities (including clear lines of authority and decision-making procedures), 4) monitor and report progress, 5) establish clear lines of communication among team members and the public, and 6) involve members of the community in the decision making process.

The type of organizational structure adopted by a community may be informed by other activities already underway. For instance, an open space management committee may be organized across functional areas like finance, planning and design, compliance/legal/contracting, communication and public engagement, and other issues as identified. An individual should be assigned to lead the overall effort and others tasked to oversee functional areas. In some cases, the group may decide to establish committees to address issues like memorialization, ecological restoration, organizing volunteer assistance, or environmental justice.

The hypothetical organizational structure depicted in Figure 5 reflects a community with staff or volunteers to fill these positions. In smaller jurisdictions this may prove difficult to achieve and it is incumbent on the community to identify individuals who can play these roles, such as county officials, quasi-governmental agency staff, or others as identified. It is up to those assuming leadership roles to think through these issues and create a team that works for their community's unique local conditions.



Figure 5. Hypothetical Open Space Management Organizational Structure.

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Case Studies

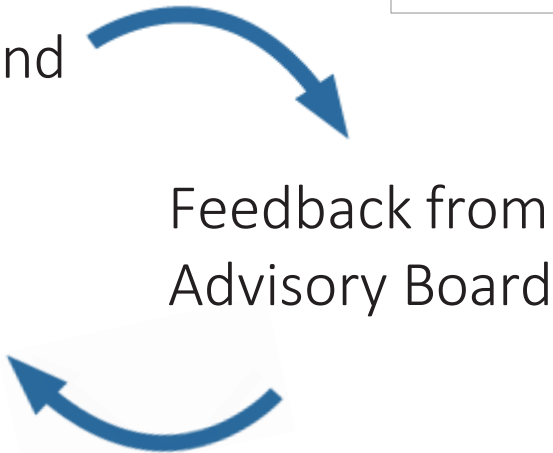
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Advisory Board Feedback

Open Space Management Guide

Introduction

Thank you for taking the time out of your extremely busy schedules to provide much appreciated feedback on the draft Open Space Management Guide. Your answers to the following questions will help us improve the document. To make this process as efficient as possible, we have included a short list of questions that we would like you to answer in the next two weeks (due date: November 21st). We ask that you frame your responses based on the intended audience as defined below.

Intended audience. As noted in the introduction of the Open Space Guide:

"The guide is written for local government officials in urban, suburban, and rural areas to include those communities possessing varied levels of financial, technical, and administrative capabilities. The guide is also intended for state and federal officials who provide supporting resources that local governments need to address open space management-related challenges. The emphasis on design-based options should appeal to landscape architects and land use planners who often take on this task as local officials or consultants. The materials are also intended to help residents, environmental and social justice non-profits, recreational groups, and others gain insights and inspire them to engage in the open space management process."

Please keep in mind the focus of the document is on FEMA-funded buyouts and the management of the resulting open space. While many other buyout programs and open space management activities exist, this guide does not address them, per se.

Overview of Questions

Next, we pose five questions addressing the following topics: 1) Organization of the Document, 2) Topics / Content Addressed, 3) Usefulness of the Document, 4) Expert Feedback, and 5) Additional Thoughts and Final Comments. While we appreciate all comments, feel free to write down bulleted responses in the spaces provided following each question. If you are compelled to write a longer narrative that includes additional details, that is certainly appreciated. If appropriate, please list specific documents (with a full reference) that further address your comments so we can consider reviewing them for additional insights and to include them in our guide's reference section.

Based on your responses, we may ask individual follow up questions at a later to clarify your comments or seek additional information. You are welcome to skip any question and are free to stop filling out the questionnaire at any time. Nor will your comments be attributed to you in the guide or shared with others outside the research team.

Once complete, please email your responses back to Gavin Smith at gsmith@openroadsandcopy.com and copy Claire Hunkel (clairehunkel@openroadsandcopy.com) and Abby Black (abbyblack@openroadsandcopy.com).

1. Organization of the Document

What do you think about how the document is organized? What did you like? What could be improved? Please be specific (i.e., reference the name of case study, call out box, fig, etc.).

2. Topics / Content Addressed

Do you think we covered the key topics surrounding FEMA-funded open space management activities? Are there any topics you think might be missing? If so, what are they? Are you aware of documents that address this missing information? If so, please provide a complete reference if possible.

3. Usefulness of the Document

a. Which parts of the document do you think are particularly useful? Why do you think this is the case? Please be specific, to include noting where the item you describe can be found in the document (i.e., name of case study, call out box, fig, etc.).

b. Are there parts of the document that seemed unclear or were not useful? If so, why do you think this is the case? Please be specific, to include noting where the item you describe can be found in the document (i.e., name of case study, call out box, fig, etc.).

a. Useful parts of the guide:

b. Unclear parts of the guide or parts of the guide that are not useful:

4. Expert Feedback

Based on your area of expertise, are there issues or topics included in the guide that could offer additional insights that should be added or factual statements that need to be corrected? Please be specific, to include a brief narrative of what should be added or corrected and where the proposed additions or changes fit in the document (i.e., document header, page number).

5. Potential Follow up Questions

Are you willing to answer any follow up questions should members of the research team reach out to you?

YES _____ NO _____

THANK YOU!

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OPEN SPACE MANAGEMENT GUIDE Building Community Capacity to Program FEMA-Funded Housing Buyout Land

February 2023

Lab: [Gavin Smith's Lab](#)

Gavin Smith · Andy Fox · Travis Klondike · [Show all 9 authors](#) · Samata Gyawali

Research Interest Score 1.1

Citations 0

Recommendations 1

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Description and figures

Disaster-related losses continue to rise across the United States and these losses are increasing rapidly due to climate change. As federal, state, and local government officials seek to develop strategies to reduce these losses, it is widely recognized that the acquisition of hazard-prone housing (i.e., "buyouts") and the conversion of the land to open space represents one of the most effective risk reduction and adaptation techniques. Significant attention has been placed on developing educational and training materials tied to the development and implementation of buyout grant programs. However, limited consideration has been given to the assemblage of useful information and the creation of actionable guidance that informs communities about how to develop and implement an open space management strategy for buyout lands. The Open Space Management Guide seeks to fill that void. While this guide is focused on buyouts funded by the Federal Emergency Management Agency (FEMA), many of the lessons provided are applicable to the growing number of state and locally supported buyout programs, several of which are discussed in this document. This guide is based on three interrelated parts: 1) applying land use planning and landscape design procedures and processes; 2) framing open space

maintenance within FEMA's supporting resources to develop and implement an A does not provid ... [Read more](#)

Related research

A comparative analysis of hazard-prone housing acquisition programs in US and New Zealand communities

Article

Full-text available

April 2021

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Audience

Various locations

Various capacity



Government Officials

Federal, State, Local



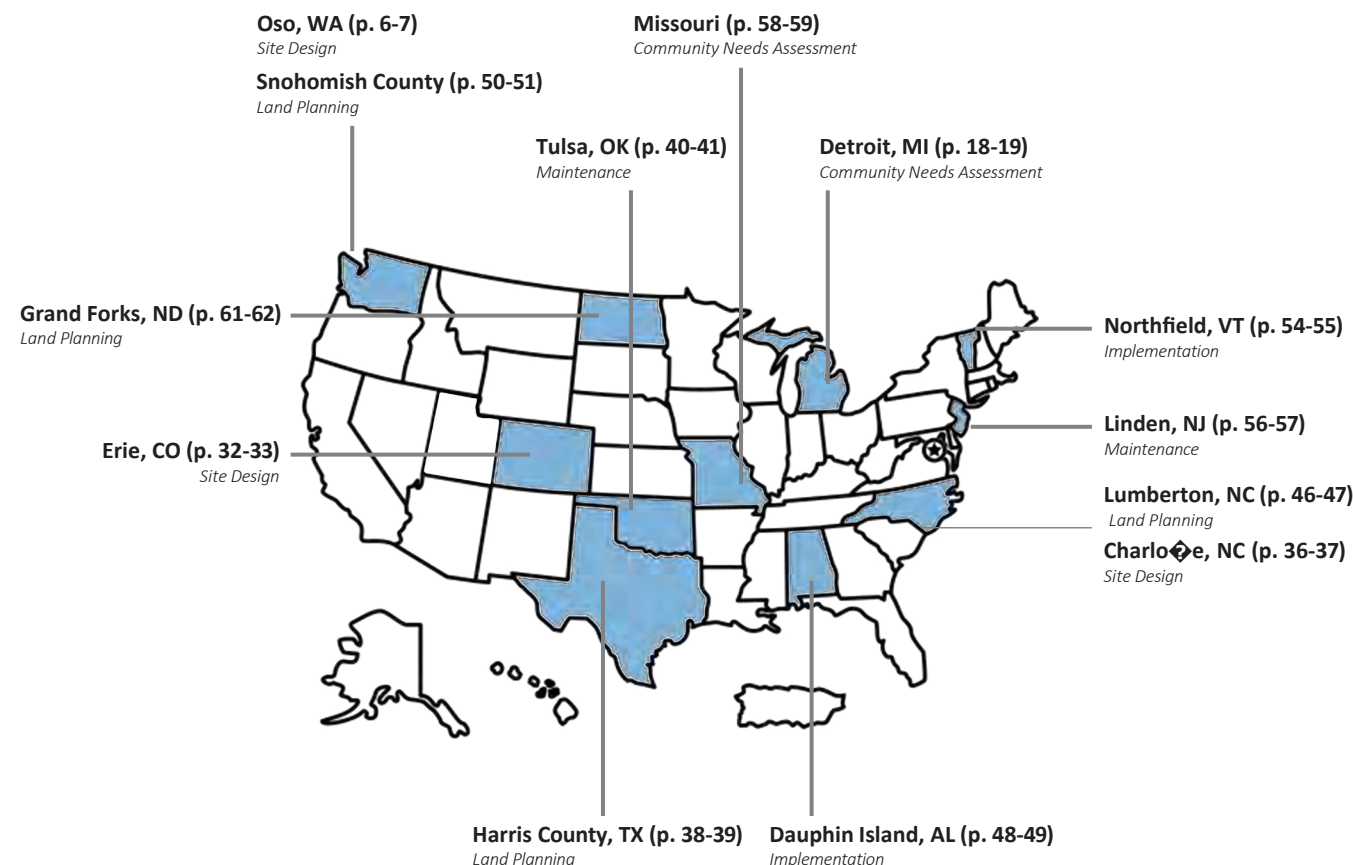
Professionals

Landscape Architects, Land Use Planners, Emergency Managers, Floodplain administrators



Community

Individual Residents, Non-profits, Others as identified (see Open Space Management Team)



Case Study Locations

Overall Goal

**Apply Planning
and Design
Principles**

**Follow FEMA
Guidance on
Land Useage**

**Describe
Available
Resources**



*Empower Communities to Successfully Manage
Open Space from FEMA Buyouts*

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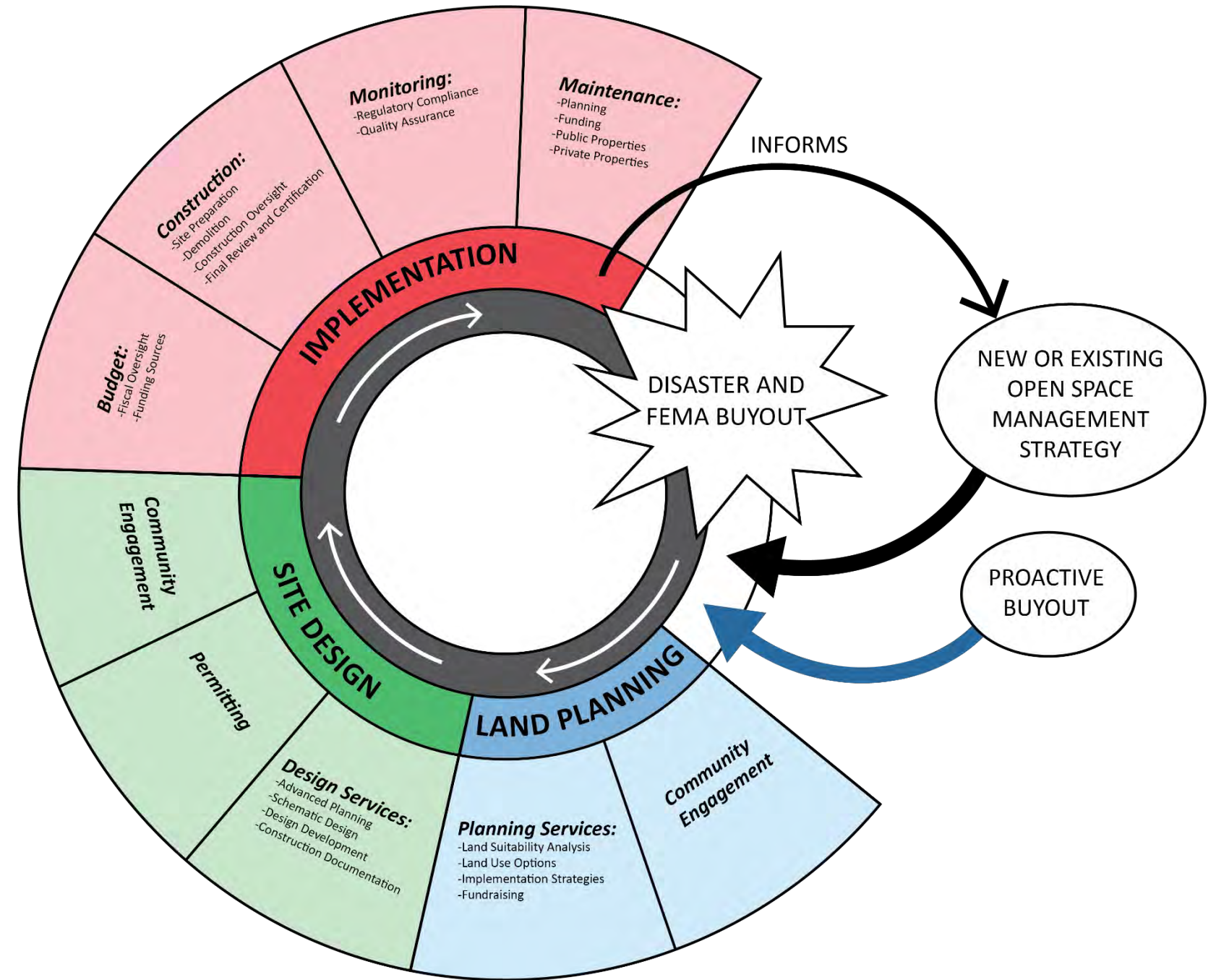
Checklists

Call-Out Boxes

Tips

Matrices

Appendices



Open Space Management Process Diagram

Case Study Example

NORTHFIELD, VERMONT

CATEGORY: Implementation

SUBCATEGORY: Diverse Partnerships

Introduction

In 2011, Tropical Storm Irene caused major flooding of the river valleys in southern Vermont. The intense rain and rapid runoff caused rivers to rise quickly, flooding homes and businesses with little warning. In central Vermont, the Dog River flooded during Irene, and 156 residences and businesses were acquired with funding from the Hazard Mitigation Grant Program (HMGP). The Two Rivers Ottawaquechee Planning Commission, a regional planning organization, helped local governments administer the funds. The highest concentration of buyouts were located in two towns, Stockbridge and Northfield, where 18 and 16 properties were acquired, respectively.

In Northfield, most of the town's buyouts focused on parcels adjacent to the Dog River. The town then used the properties to create a community park. Northfield partnered with state agencies, community organizations, and foundations to finance the design and implementation of the park. These diverse partnerships enabled Northfield to access a broad range of technical support and funding.



Dog River Park. Image: Google Street View.

Case Study Focus

Diverse Partnerships

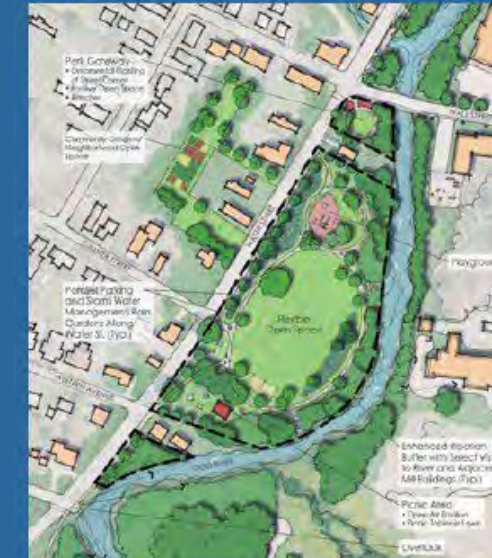
This case study highlights that municipalities benefit from diverse partnerships. Northfield, Vermont is a town of nearly 6,000 residents in the Green Mountains. Following Hurricane Irene, the Vermont Downtown Action Team (VDAT) was created. The VDAT, which was comprised of those tasked with marketing, urban design, and planning, created reports and recommendations for eight Vermont communities, including Northfield. The report suggested the creation of a Riverside Park from 4 acres of land assembled from buyout properties.

"The report identified that "a successful park will depend upon multiple partners... including funding partners, maintenance/service partners, and events/programming partners."

-VDAT Report, 2013

Town residents, the regional commission, state and federal government agencies, design firms, high school students, and philanthropic organizations pooled their expertise and resources to create Dog River Park.

The park plan restored the river's natural floodplain and provided open space for passive



Dog River Park plan. Image: VDAT.

recreation. Organizations involved in the buyout and restoration of the floodplain included the Lake Champlain Basin Project, Friends of the Winooski River, Northfield Historical Society, the Dog River Conservancy, and Norwich University. Other organizations like the Dog River Park Committee, a Subcommittee of the town's Conservation Commission, oversee the management and maintenance of the park and acts as a liaison between the Town and those who use the open space. The committee created a maintenance plan and budget in which they accounted for volunteer labor and the collecting of fees for using the park's pavilion.



Buyouts in Northfield along the Dog River. This heatmap illustrates the cluster of acquired parcels along Water St, the Dog River, and Union Brook. Image: ArcGIS.

Key Takeaways:

- The Dog River Park plan incorporated multiple sources of funding and resources to create and maintain a community asset.
- A subcommittee of interested town residents (Vermont Downtown Action Team) proved capable of assisting with the administration and maintenance of the park.
- A maintenance plan, including the identification of those who are responsible for funding and administering it, is crucial to the success of any municipally-owned park.
- The VDAT plan linked open space management, hazard mitigation, and other disaster recovery goals.

Case Study Lessons

Themes:

- Site Design
- Community Needs Assessment
- Land Planning
- Implementation
- Maintenance

Subcategories:

- Memorialization
- Environmental Justice
- Environmental Design
- Multi-Objective Planning
- Conveying Complex Funding Structure
- Creative Funding Strategies
- Assistance from Committed Partners
- Neighborhood Parks
- Ecological Restoration
- Diverse Partnerships
- Applying the Community Rating System (CRS)

Case Studies	Theme	Subcategory	Key Takeaways
Oso, WA	Site Design	Memorialization	<p>Coordination among residents; local, state, and federal government officials; and the design firm who donated their time and expertise was critical to the success of the project.</p> <p>Memorialization of buyout sites can achieve commemorative, recreational, educational, and ecological objectives.</p> <p>Funding for projects like memorials can be raised from multiple sources, including federal, state, and local governments, as well as non-governmental organizations.</p>
Detroit, MI	Community Needs Assessment	Environmental Justice	<p>Open space management can address a community’s environmental justice needs.</p> <p>Community non-profit organizations can help define open space management planning goals.</p> <p>Buyout properties can serve as an important part of a larger urban stormwater management program.</p> <p>Collective ownership of resources on buyout parcels benefits residents.</p> <p>Land trusts can serve as partners for open space management and lessen the administrative burden on municipalities.</p>
Erie, CO	Site Design	Environmental Design	<p>Proactive, environmentally focused open space management design is an effective way to protect a rapidly growing community from natural hazards like floods and wildfires.</p> <p>Appropriately programmed open space land can result in low-maintenance alternatives.</p> <p>Collaborating with community partners can foster locally-specific options.</p>
Charlotte/Mecklenburg, NC	Site Design	Multi-Objective Planning	<p>Buyout properties provide an opportunity to reuse and recycle materials with the help of local partners like Habitat for Humanity.</p> <p>Well-planned open space management strategies can achieve multiple objectives, including improved water quality, flood risk reduction, environmental education, and ecological restoration.</p> <p>The use of local stormwater management fees to purchase hazard-prone housing allows local governments to create eligibility criteria that reflects local conditions.</p>

Checklist Example

- **Corporations** (monetary and labor donations, including business sponsored employee service events; provider of expertise, including financial management).
- **Small Business Owners** (community fundraising – percent of sales donated to open space management activities).
- **Landscaping Company** (provider of labor, plants, and materials like mulch; provider of open space design drawings; installation of plantings and implementation of design plans).
- **Consultants, including Landscape Architecture, Planning, Architecture, and Engineering firms** (provider of expertise, including review and creation of open space designs, land planning, construction, and stormwater management to include water retention areas and wetlands construction).

Next, a series of tips and call-out boxes are used to discuss how to engage with consultants, an often important, but under-referenced member of an open space management team. Examples include: 1) how to effectively interview them to ascertain if their skills and expertise align with community needs and local conditions, 2) the potential roles they should play, and 3) how to contract with consultants as part of a community's open space management process.

Checklist: Questions to Ask During an RFP Interview

The following set of questions may be used during the interview process to assess a prospective consultant's competence, experience, and fit with a community's unique local needs and conditions. The questions are not meant to be exhaustive, and community officials may have other issues they want to address. Rather, this checklist is intended to provide a starting point for ongoing conversations as community officials contract various open space management activities.

- Q1. Describe your firm's knowledge of and experience with key open space management tasks. Specific areas to describe should include: 1) community assessment, 2) site design, 3) land planning and programming, 4) participatory planning techniques (to include how residents and other organizations are engaged and how their input is incorporated into the design process throughout the life of the project), 5) preparing construction documents, 6) overall project implementation and management (including the identification of funding, technical assistance, and supportive policies to implement and maintain project designs), and 7) site maintenance.
- Q2. Describe your firm's knowledge of and experience with creating and implementing an open space management strategy that complies with FEMA, state, and local buyout rules and regulations (see Call-Out Box: Legal Aspects of Open Space Management for specific compliance issues to discuss with the consultant, including their knowledge of and experience with these items).
- Q3. Describe your firm's knowledge of and experience with creating and implementing an open space management strategy in the surrounding area, to include your understanding of local plants and ecosystems, soil types, drainage, local and state regulations tied to buyout lands, and any other factors you think are relevant.
- Q4. Describe your firm's knowledge of and experience with working in a community of our size and governmental capacity. If your firm has not worked with a similar community, please

discuss the relevant local factors and conditions you would address to help inform an open space management strategy that is appropriate for our community.

- Q5. Describe your firm's approach to co-creating the local knowledge needed to successfully develop, implement, and maintain the open space management program. This should include how you will work with not only local officials, but also residents to glean relevant information.
- Q6. Provide at least one recommendation from a former client you have worked with on open space management activities. If possible, reach out to other cities or towns in your state or region who have been through a buyout to see if they have contracted out open space management services and whether they were satisfied with their consultant(s).
- Q7. Describe how your firm would develop an open space management strategy that requires limited maintenance. This question may be relevant for smaller communities and those with limited resources to maintain the open space over time. Issues worthy of discussion include how the design accounts for the maintenance of walkways, playground equipment, ball fields, and other public infrastructure; connectivity of the open space maintenance strategy to local departmental capacities; type of drainage infrastructure proposed (and its associated maintenance requirements); mowing schedules; and plant selection, including their ongoing maintenance requirements.
- Q8. Describe how your firm will assist our community build the local capacity required to assess not only the long-term maintenance of the site, but also the capacity to develop and implement an open space management strategy on our own in the future.
- Q9. Describe how your firm would design, implement, and maintain an open space management strategy that includes the conversion of the land back to its natural state. Relevant topics to discuss may include the firm's familiarity with and application of wetlands restoration techniques, xeriscaping, and the use of native plant species appropriate for the site, to include how the firm would address the presence of exotic species, their removal, and the steps taken to limit their return. An additional question may include how the firm proposes to work with local community organizations like garden clubs, as well as agriculture extension agents, to assume some of the required maintenance activities tied to the suggested approach.
- Q10. Provide examples of your firm's past work, to include site design drawings, cost estimation procedures, participatory planning processes, and other activities you think are important (see Call-Out Box: Contracting Consulting Services Across the Open Space Management Process for a comprehensive list of activities and the Checklist: Cost Estimating Open Space Management Actions).
- Q11. Discuss how your firm's open space management work has assessed a community's needs, including how you have addressed environmental justice as part of this process. A firm's commitment to understanding the physical, social, economic, and ecological conditions of a site and how this knowledge should inform design options is critically important. Most design firms are comfortable addressing the physical and ecological conditions. Firms that can situate these conditions in the existing social-economic setting, including issues tied to equity, inclusion, and empowerment represent the type of partner a local government should consider. See the Detroit, MI case study, which focuses on how an environmental justice lens can be applied to open space management issues.

Call-Out Box Example

Call-Out Box: Contracting Consulting Services Across the Open Space Management Process

In this call-out box, contracting activities are described, including the actions spanning the open space management process. Each of the three tasks in the open space management process (Land Planning, Site Design, and Implementation), as well as their components and subcomponents are described in the context of a hypothetical request for proposals. Case studies that focus on each of the three tasks are parenthetically referenced. It is important to note that some or all of the components described can be undertaken by a local unit of government should they identify the resources needed to do so.

Land Planning

Land planning involves the collection and analysis of key contextual information used to inform the overall open space management process, including site design and implementation. For more detail, see Lumberton, NC, Snohomish County, WA, and Grand Forks, ND case studies.

Component: Request for Proposals

A Request for Proposal (RFP) is often created in response to either regulatory compliance needs like updates to local hazard mitigation plans or as part of voluntary aspirations like the development of an open space management strategy. While there are several options available for selecting consultants to assist with a community's regulatory compliance needs, the role of RFPs in addressing voluntary needs may not be as well defined, and as a result, it is important to clearly articulate specific needs and anticipated outcomes, so that respondents to the RFP understand what is expected of them. For instance, a community may be interested in the inclusion of nature-based solutions in their open space management strategy or assessing losses avoided (See Tips: Procurement Guide for Nature Based Solutions and Assessing Losses Avoided Following Buyouts).

If a community is unsure of what these needs may be, officials can begin by reviewing this call-out box and the Checklist: Questions to Ask During a Request for Proposal Interview. Local officials are also encouraged to talk with other jurisdictions that have used consultants to develop and implement open space management strategies on FEMA-funded buyout lands. Ideally, the jurisdictions questioned are representative of communities of similar size and administrative capacity, although important lessons can be gathered by talking with communities that are recognized as leaders in the field.

- **Subcomponent: Procurement.** Defining the relationship between community officials and consultant is an important part of the process. "Professional planners usually function in a technical and advisory capacity to decision makers, providing data, defining alternative courses of action, forecasting impacts, and structuring strategies for the implementation of formal plans" (Marsh, 2010).

Component: Community Engagement Strategy

Creating a community engagement strategy is critical to ensuring that stakeholder concerns and ideas are heard, understood, and acted upon, to include, but not limited to, previous owners of buyout lands, nearby residents who remain, and adjacent communities. Providing opportunities for meaningful discourse between community members and planners can produce contextually specific information that would otherwise not be available to inform the planning process and help to foster a dialogue between members of a community about how projects may impact individuals, neighborhoods, and the larger jurisdiction. Seeking input from members of the community can also help to uncover the values of a place and this information is vital to the overall design process.



Image 4. Pocket park in coastal Mississippi following Hurricane Katrina. This image represent actions taken by coastal towns to repurpose lands where homes once stood using resources other than those associated with FEMA buyout funds. Image: Gavin Smith.

The methods used to capture this information should be contextualized regarding community size; administrative, technical, and fiscal capacity; cultural norms; and access to data and analytical tools like Geographic Information Systems (GIS). While every project should assess the appropriate balance of "intake" (extracting information from stakeholders for analysis) versus "dissemination" (sharing information back to stakeholders), the most effective community engagement strategies involve multiple iterations and the use of varied methods to ensure that the input of multiple audiences have been captured and used to inform the planning process and associated design outcomes. Ultimately, community engagement strives for goals guided by community values, plans-of-action, and an overall vision that can inform more detailed designs.

Component: Planning Services

Planning services include assessing relevant contextual factors, conducting an analysis of the land's suitability for varied open space design options, developing differing land use options, creating implementation strategies, and identifying funding to carry out these ideas.

- **Subcomponent: Contextual Assessment.** Contextual assessments include background research that examines past and existing site characteristics, plans, policies, and projects to familiarize those involved in the development of the open space management strategy with the range of past and current conditions that help define a community. This is important because it establishes a baseline inventory of data and themes that can guide the direction of further analysis. Understanding the historical context of the site may include cultural as well as physical and ecological conditions. Understood relative to open space, items worthy of study include the cultural history of the homes and land acquired (this information can be used to inform contextually sensitive design options tied to memorialization, social justice, ecological restoration, and other issues as identified). Physical elements may include topography, soils, hydrology, climate, vegetation, habitat, existing infrastructure (e.g., stormwater, roads, water, sewer, and power systems) and nearby public facilities like parks, greenways, and schools. These items are documented and used to inform potential open space design options.

Tip Example

Tip: Engaging with Faculty and Extension Agents at Land Grant Universities and Minority Serving Institutions

Land Grant Universities and Minority Serving Institutions are comprised of faculty and extension agents who are experts in a range of disciplines that are related to the development and implementation of an open space management strategy. In addition, many employees embrace the mission of the land grant university, which includes an emphasis on deep community engagement and the practical application of knowledge in the field. Minority Serving Institutions, like Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges and Universities, maintain a rich tradition of public service and may prove particularly adept at assisting minority communities develop, implement, and maintain an open space management strategy, including those that have been historically marginalized (see the Lumberton, NC and Linden, NJ case studies). In order to accomplish these aims, faculty often rely on graduate students to assist them, which provides an opportunity to educate and train the next generation of scholars and practitioners who are capable of and committed to advancing disaster resilience.



Image 7. Students visit buyout site in Charlotte, North Carolina. Image: Gavin Smith.

Tip: Procurement Guide for Nature Based Solutions

An additional reference that may prove useful when developing requests for proposals tied to buyouts and open space management is titled "A Procurement Guide to Nature-Based Solutions." This guide, written by the Nature Conservancy, can be found at: http://nrcsolutions.org/wp-content/uploads/2018/02/NBS_Procurement_Guide.pdf

Tip: Assessing Losses Avoided Following Buyouts

As part of a community's monitoring of buyout lands, local governments may choose to assess the "losses avoided" following future flood events by estimating the monetary savings accrued by converting the land to open space before a future flood event occurs. This information can be used to inform residents as well as external funders about the risk reduction benefits of buyouts. Given the technical nature of conducting this assessment, the process may be undertaken by state agencies, FEMA, or consultants. The assessment may be further strengthened by collecting personal testimonials from residents who have participated in a buyout and are willing to discuss how they benefited from the process by moving out of harm's way. A collection of losses avoided studies can be found at: Hazard Mitigation Assistance Loss Avoidance Study Summaries | FEMA.gov.

Call-Out Box: Cost Estimating Open Space Management Actions

Identifying costs associated with developing and caring for public landscapes is essential to decision-making processes regarding the highest and best use(s) of publicly owned open space. This call-out box provides a general discussion of open space management components commonly referred to as "cost estimating" because there are significant and highly variable factors that affect costs. Examples include a project's location, physical size, desired uses, programmatic scope, physiographic and ecological constraints, reliance on municipal staff versus private consulting services, the availability of qualified contractors, fluctuations in material prices and availability, and access to locally and regionally sourced materials. Additional cost variables to consider include the quality of workmanship, overtime, productivity (as measured by the daily output of labor hours), the season of year, weather, local union restrictions, and an owner's special requirements and restrictions (RSMeans 2022).

Matrix Example

Appendix 5: Open Space Management Team Template

The Open Space Management Team Template is intended to document and track the actions of those involved in the open space management process to make sure the range of actions are appropriately assigned, temporally coordinated, and monitored over time, to include holding individuals and organizations accountable.

Name of Team Member	Organization	Roles and Task Assignment	Order of Task	Date Completed

Appendix 6: Open Space Management Resource Matrix

The Open Space Management Resource Matrix is intended to link the members of the open space management team to specific tasks and the resources required to achieve them. Other actions and subtasks may be added to the matrix based on local needs and conditions. Fill in cells for each category with team members you have identified. Indicate if they will help with Funding, Technical Assistance, or Policy, and list those resources by name, if possible. A "notes" column is provided in order to allow you to capture additional contextual information that may assist other members of the team. Completing this task should help identify the resources needed to assist with all aspects of open space management and to assign team members responsible for their acquisition and management.

OPEN SPACE MANAGEMENT RESOURCE MATRIX					
		Funding	Technical Assistance	Policy	Notes
LAND PLANNING	Community Engagement				
	Land Suitability Analysis				
	Land Use Options				
	Implementation Strategies				
	Fundraising				
SITE DESIGN	Community Engagement				
	Advanced Planning				
	Schematic Design				
	Design Development				
	Construction Documentation				
	Permitting				
IMPLEMENTATION	Project Reporting and Fiscal Oversight				
	Construction, Administration, and Monitoring				
	Mobilization and Site Preparation				
	Demolition, Construction, Oversight				
	Final Review and Certification				
	Funding Identification				
	Closeout and Review				
	Delegation of Management and Maintenance Roles				
	Monitoring				
	Regulatory Compliance				
	Quality Assurance				
	Maintenance				

Appendix Example

Appendix 1: Review of the Open Space Management Literature

There is a small but growing academic literature focused on the issues surrounding buyouts and open space management, although significant research gaps remain. The practitioner-based literature has focused on general guidance associated with the eligible uses of the land or an overview of final products rather than the process required to undertake such efforts or a discussion of how to manage the land over time. Nor has much been written about actionable guidance for use by local governments and others. The intent of discussing this literature is to provide additional information for practitioners and to inform identified shortfalls discussed in this guide that could lead to new applied research and much needed changes in public policy.

Much of the literature describes the rationale or importance of planning for open space management, including ecosystem restoration (Conrad et al. 1998; Highfield et al. 2019), reconnecting members of the community to existing natural resources through recreational infrastructure (Coastal Dynamics Lab 2019; Flink 2020; Kihlslinger and Salvesen 2017; Brand and Nicholson 2016; Freudenberg et al. 2016), economic development (Hanso and Lemanski 1995), municipal finance (BeDor et al. 2020), and the memorialization of communities following a buyout (Zavar 2019). The ability to achieve these outcomes, while highly laudable, are often constrained as research suggests that most buyout properties end up as vacant lots rather than parks or greenways (Zavar and Hagelman 2016) and the scattered spatial patterns associated with buyouts significantly limit design alternatives (Coastal Dynamics Design Lab 2019; Ben Dor et al. 2020; Smith et al. 2014). Furthermore, while the costs of maintaining buyout properties often remain uncertain, research shows that they can prove significant, especially for smaller communities (Ben Dor et al. 2020).

Most of the practice-based literature emphasizes “success stories” that describe the product (i.e., greenways, ballfields, wetland restoration, etc.) and attendant risk reduction or losses avoided (FEMA 2019; FEMA 1998) rather than the process required to achieve these goals. Less attention has been



Image 13. Christchurch, New Zealand buyout property with intact landscaping. This type of open space management was part of an effort to commemorate individual sites and allow former residents to harvest fruits and flowers after their land was sold. *Image: Gavin Smith.*

placed on a critical description of key open space management challenges and the actions required to address them. In one notable exception, The Environmental Law Institute has described varied open space management approaches (emphasizing environmental restoration) based on management intensity (no intervention, minimal action, rehabilitation, and reestablishment) and provides descriptive vignettes of communities that have adopted these approaches (2017). However, the guide describes management options broadly, with limited attention placed on the steps communities of differing capabilities undertook to achieve their goals, including how open space management strategies were designed and funded, the organizations that undertook the varied tasks required, and how the properties are managed over time.

Following major disasters design teams often create visually appealing renderings of options that are unattainable, with less attention paid to clear implementation mechanisms, including detailed drawings, financing, and the programming required to make these ideas a reality. As a result, many of the preliminary drawings and general plans remain unrealized, unless those skilled in grants writing, design, and technical assistance continue to help years after the buyouts have occurred (Smith and Nguyen 2021). Compounding this problem is the lack of federal funding provided to communities to support the design and implementation of open space management strategies once the homes are acquired and demolished. Instead, communities are left to figure out the land programming, site design, and associated financing, which has led to an uneven approach to managing the resulting open space. Communities with fewer financial and technical resources often struggle with the management of the buyout lands (Smith et al. 2021). In addition, a homeowner’s deep attachment to a place can lead some to oppose the buyout offer, leaving a set of checkerboarded properties.

The academic literature also shows that historically marginalized groups are often excluded from decisions surrounding the buyout process, including how open space is utilized (Baker et al. 2018; Binder and Greer 2018; De Vries and Frasier 2012; Elliott et al. 2020; Frasier et al. 2003; Nguyen 2020). The combination of exclusionary planning processes and the creation of unattainable designs furthers the gap between those communities that do or do not have the resources to develop, implement, and maintain an effective open space management strategy.



Image 14. Christchurch, New Zealand landscape post buyout. This image was taken eight years after the acquisition of more than 8,000 properties and prior to the development and implementation of regional regeneration (open space management) plans. Most of the buyout properties are contiguous, which allows for a wide range of design options. *Image: Gavin Smith.*

Overall Goal

**Apply Planning
and Design
Principles**

**Follow FEMA
Guidance on
Land Useage**

**Describe
Available
Resources**



*Empower Communities to Successfully Manage
Open Space from FEMA Buyouts*

Questions?