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Organizational Networking, Leadership, and Community Engagement: A Case Study of the Revitalization of an Impaired Watershed in Richmond, Virginia

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Abstract

Green infrastructure is a necessary component of urban environments designed to mitigate climate instability and provide healthier living environments for urban residents. Discrimination and socio-economic status are some of the determining factors in the provision of green infrastructure, availability of green spaces, and outdoor programming available in urban communities. This paper describes an exploratory case study of the partnerships between municipal and nonprofit organizations involved in the revitalization of an impaired watershed in Richmond, Virginia. Preliminary findings suggest networking between agencies and nonprofits with strong mission alignment can increase organizational capacity by sharing specialized training and resources. Success may also be impacted by the institutional knowledge maintained in the network system and the ability to engage the community over a sustained time period.

Keywords: green infrastructure, networking, institutional knowledge, community engagement

Chapter 1: Introduction

Part I: Introduction to Green Infrastructure and Urban Environments

The provision of green infrastructure is a vital component of urban landscapes which support physical and mental health (Lachowycz & Jones, 2012). Environmental benefits provided by permeable surfaces and natural vegetation play an increasingly important role in assuring people can thrive (Wilson, 2020), while also preserving or adapting essential ecosystem functions (Filazzola, et al., 2019). It is not always the case that green infrastructure systems designed to meet environmental needs and sustainable growth are in the best interests of community members (Anguelovski, 2016). Development of green infrastructure in urban areas is affected by economics, political boundaries and agendas that may not represent the desires of the inhabitants (Acedo et al., 2017), and may be affected by the degree to which residents can organize and leverage resources on their own behalf (Perrotti, et al., 2020).

The health and wellbeing of residents in urban areas is impacted by the availability and quality of resources in parks and greenspaces (Cohen, et al., 2016). Access to greenspace has been found to differ among many communities due to complex relationships including geography, age group, gender, socioeconomic status, ethnicity, and cultural values (Lachowycz & Jones, 2012). Factors which impact access and usage for urban residents include physical barriers such as safe transportation, the quality of amenities provided within greenspace (Rigolon, 2016), and motivations such as social support systems (Lachowycz & Jones, 2012). Feelings of connection, comfort, and safety also play a significant part in community engagement in park spaces (Swierad, & Huang, 2018). The facilitation of greening projects by community members can be limited by a community's level of social capital, but involvement in

the stewardship of park spaces is one way to strengthen community resilience (Campbell, et al. 2021).

Outline of the Study

The objective of this case study is to explore how networks of governmental and nonprofit organizations have coordinated to plan, install, and maintain green infrastructure with the involvement of community members in the revitalization of an impaired watershed (generically referred to as the watershed) in Richmond, Virginia. It is the goal of this research to investigate and describe the interactions of the organizations and their contributions toward the success of the watershed revitalization, and to outline lessons learned for the support of future green infrastructure projects.

The purpose of the study is to better understand how local government agencies and nonprofits work together and engage to establish community-centric green infrastructure. Specifically, the study attempts to address two main questions:

1. How have municipal and nonprofit organizations coordinated efforts to implement the watershed revitalization plan?

2. What methods have been employed to engage community members to participate in planning, installation of projects, and programming?

The target population for this research is defined as: present and past managers, employees, and volunteers of organizations involved in facilitating projects and activities occurring within the watershed. Outcomes will focus on the results of document research, quantitative data collected through surveys, and qualitative themes established through interviews. It is expected this exploratory research will show results consistent with existing networking theories; a shared understanding of purpose and goals, strong leadership, and

consistent community engagement over time have created conditions for success in the revitalization of the watershed. It is the intention that the study will help provide steps for future coordination of local-scale green infrastructure programs.

The next section will provide an overview of problems within urban environments such as: health issues associated with a lack of green infrastructure, and discriminatory practices that have led to a lack of access to greenspace in urban areas among ethnically diverse populations and residents with low socio-economic status. It is necessary to understand this background information to appreciate the necessity of involving local leaders and residents in green infrastructure planning and sustaining a participatory role in the development of community assets such as parks and greenspaces.

Part II: Context, Problem, and Response

Definitions

For the purposes of this study **greenspace** will be defined as a public area with some mix of vegetation, including grass, plants, and trees (Taylor & Hochuli, 2017; Lachowycz & Jones, 2013). The term **green infrastructure** is utilized to describe the combination of vegetation and soil structure, along with engineered technology used to manage needs such as storm and wastewater management (Hoover & Hopton, 2019). **Ecosystem services** are those processes provided by nature that humans and wildlife benefit from (Hoover & Hopton, 2019), and can be both active and passive such as: interception of rainwater, reduction in summertime temperatures provided by a tree canopy, or absorption of carbon dioxide and carbon sequestration by trees. **Social-ecological system (SES) framework** is a tool integrating both biological and social needs into resource development based on resiliency (Colding & Barthel, 2019). A **watershed** is a term used to describe all the freshwater creeks and streams in a geographic area that lead to a larger

body of water (National Oceanic and Atmospheric Administration, 2021). **Health** is a state of mental, physical, and social wellbeing (World Health Organization, 2021).

Park Infrastructure and the Urban Landscape

Urban landscapes create significant challenges for residents of metropolitan areas to access greenspace. The built environment of large cities is especially prone to compactness, designed without sufficient greenspace to meet the health and mental wellness needs of residents (Jim, 2013). The population of the United States is currently 332.8 million people, and as of October 2021 has a net gain of one person every 29 seconds (U.S. Census Bureau, n.d.). In data released in 2020, 86% of the US population reported residency in a metropolitan area (Barrett, 2021). Racial and ethnic minorities in 2018 made up 43% of the urban population in the United States (Castillo & Cromartie, 2020).

Public green space (PGS) is a valuable resource to provide not only environmental services, but also physical activity and social interactions which have a benefit to mental health (Sugiyama, et al., 2018). Urban neighborhoods comprised of people of color who are economically disadvantaged have less greenspace and trees than neighborhoods with majority white residents (Casey, 2017). The average park size in 25 cities across the U.S. with populations of greater than 100,000 residents is 8.8 acres (Cohen, et al. 2016), but urban neighborhoods in the U. S. that are racially and economically segregated are more likely to have a higher prevalence of impervious surface and fewer trees (Casey, 2017). Access to parks with sufficient space and amenities to accommodate exercise are especially limited in many urban neighborhoods comprised of non-white, ethnic minority, and low socioeconomic populations throughout the United States (Rigolon, 2016). A recent study showed under-utilized parks in low

income neighborhoods have fewer supervised activities and less marketing of activities to residents, which contributes to their lack of use (Cohen, et al. 2016).

Policy, Environmental Conditions, and Health

Public policies in the Richmond area have historically denied investment in communities comprised of non-white residents through a practice known as redlining (Komp, 2019). Researchers in Richmond recently compared a historic redlining map to temperature extremes and found a correlation between areas which were historically considered high risk for lending and high midsummer temperatures, which increases risk of heat-related diseases (Saverino, et al. 2021). There is a statistical correlation between extreme temperature events and premature deaths in the United States and internationally, especially in vulnerable older populations and those with underlying health conditions (Sarofim, et al., 2016). Other illnesses reported by higher summer temperatures also include respiratory, cardiovascular, and kidney disease. Adaptive strategies such as utilizing air conditioning help mitigate extreme temperatures, but electrical grids may also be impacted during extreme heat events (Sarofim, et al. 2016).

Demographically, people in low income communities experience greater direct and indirect health risks due to abrupt changes in temperature (Ebi, et al., 2018). According to the 2019 U.S. Census Report on Community Resilience, 16.5% of Richmond, Virginia households do not have a vehicle compared to 6.1% of the State of Virginia as a whole, and just over 20% live in poverty (U.S. Census, 2019). The percentage of population in Richmond with three or more risk factors which reduce resiliency to the impacts of extreme weather events and other natural disasters is 25.3% of the population (U.S. Census, 2019).

Compounding Inequities

Although investment in green infrastructure is normally perceived positively, some communities may fear that upscaling neighborhoods may result in unwanted repercussions. Environmental justice advocates warn developers and municipalities with sustainable development agendas may not necessarily be meeting the most critical needs of community members (Anguelovski, 2016). When residents are displaced from communities due to increasing property values, rents, and property taxes after developers construct high end infrastructure and greenspaces, a process called ecological gentrification, it can exacerbate social justice issues and displace residents into even worse living conditions. Assistance in mobilizing community members who may not have the capacity to act on their own has been the work of social justice advocates in order to assure that residents not only have remediation of toxic pollutants, but also have access to ecosystem services provided by green infrastructure without being displaced from their neighborhoods (Anguelovski, 2016).

How Interagency Networking Can Play a Role

Governmental agencies with strategic plans to provide better green infrastructure may be hampered in their efforts by barriers such as a lack of scientific knowledge, organizational bureaucracy, lack of funding, and poor interdisciplinary coordination (Johns, 2019). Nonprofit organizations may represent an opportunity to bridge the divide between provision of policies and some of these barriers, as well as engaging communities where government agencies may not be effective in community outreach (Shea, 2011). As nonprofits take on roles to provide services previously supervised by governmental agencies to meet the needs of the public, it is increasingly important that they also network with other nonprofits with similar goals and to implement strategies to best allocate time and resources (Johansen and LeRoux, 2012). Research has shown advocacy effectiveness can be increased by engaging in strategic political networking

and community networking can contribute to overall organizational effectiveness. By identifying and leveraging the available skill sets and assets of multiple organizations working simultaneously on complex problems, capacity is increased regarding advocacy and outcomes in the community (Johansen and LeRoux, 2012).

Restatement of the Problem

The urban landscape that has resulted from racism, lack of infrastructure investment, and an increasing level of environmental instability has left communities of color, especially poor communities, without well-designed green infrastructure. Greenspaces in communities are necessary in order to: provide environmental services, promote activity that contribute to healthy lifestyles, and provide spaces and opportunities for community engagement. Lack of facilitation and trust between governmental decision-makers and residents of economically disadvantaged neighborhoods, especially for communities of color, must be recognized. Environmental justice advocates, municipal managers and nonprofit organizations involved in large-scale greening projects must navigate many planning decisions and challenges over a long period of time, and strategizing with the right organizations and leveraging resources is critical but often overlooked. Community members have often been given a minimal role in the planning process, leading to government agencies and nonprofits working at cross purposes to what is really desired in the community. Networking in order to strengthen both community advocacy and organizational effectiveness is the premise of this research.

Restatement of the Solution

As the literature review and research will indicate, a strong network of nonprofits acting as intermediaries between government institutions and communities can increase capacity to provide specialized services, and aid in transference of decision-making to community members.

Cohesion between organizations, methods to mediate group dynamics, and a level of communication to prevent complications arising from multiple organizations operating in the same space are necessary for this type of networking to be sustainable. It is the goal of this case study to provide guidelines, based on the examination of activities and behaviors of participants in the watershed revitalization, so that future projects can benefit and likewise contribute to community building as well as the development of green infrastructure.

The Case Study Setting: An impoverished watershed in Richmond, Virginia

A community scale project was initiated in 2011 by the City of Richmond and coordinated with several nonprofits to improve an impaired stream running through a neighborhood which is one of the historically redlined areas previously described. To maintain the anonymity of the participants in the case study, the name of the watershed and neighborhood has been withheld. There was an assessment of green infrastructure needs for the region, and further recommendations made by a coalition of stakeholders were developed with the assistance of an outside planning agency. Community members, government officials, and other stakeholders were involved in the process to develop a plan for restoring the watershed and improving community access. Goals included walkable routes to the local elementary school, improvements in lighting and pedestrian access, restoration of eroded streambeds, trails for exercise, community gardening space, and events for local residents. One of the stated outcomes is the project should become an example for implementing other green infrastructure projects in Richmond.

Part III: Outline

The following chapter, the literature review, will focus on organizational networking, historical context, and examples of how successful inter-organizational networks have organized

in various capacities to resolve complex problems. These diverse situations illustrate effective planning and strategic approaches to problem solving, crisis management, and using flexibility to adapt to quickly changing conditions.

The subsequent methodology section of the research will describe in detail the data collection, analysis, and results of both survey and interviews of participants in the watershed rehabilitation. The concluding chapter will discuss the case study and implications for greenspace development and discuss the implications for inter-agency networking.

Chapter 2: Literature Review
Part 1: Introduction

In his early account of American democracy, the French political theorist Alexis de Tocqueville argued that having free associations of individuals under a centralized government with limited administrative control of citizens' actions was what gave strength to democracy in the United States (Woldring, 1998). The sector of associations known as nonprofits have typically worked to fill voids of societal needs previously avoided by government or for-profit organizations, but are now increasingly important as partners with federal, state, and private organizations (Collins, 2011). Since the mid-1980s coordination between public and private organizations has increased in the United States, which can be attributed to both shrinking of government, and the increasingly complex problems communities and society face (Buffett, & Eimicke, 2018). The responsibility of protecting urban natural resources, creating livable cities, and addressing environmental social justice issues are increasingly becoming the responsibility of nonprofit networks working as intermediaries with governmental agencies (Rigolon, 2019). The literature reviewed herein provides an overview of the operational benefits to mid-level networking between government agencies and nonprofit networks to plan, implement, and manage green infrastructure, with an emphasis on community engagement and participation.

Government and Nonprofit Partnerships

The term cross-sector social partnerships (CSSPs) is used to describe collaborations between businesses, governmental bodies, and nonprofits, and attempts to utilize the assets of each sector to address complex problems from unique angles (Selsky et al., 2010). There are concerns whether inter-agency organizing in this manner effectively increases the organizational capacity of nonprofits (Shumate, Fu, & Cooper, 2018). Nonprofits typically enter partnerships in order to maximize use of resources, gain knowledge, and improve management strategy. Mezzo-scale empirical research of domestic U.S. nonprofit organizations and international nonprofits showed interagency partnerships with governmental bodies did not increase organizational capacity for nonprofits. Findings did indicate an increased strategic planning capacity for nonprofits partnered with governmental organizations over time (Shumate, Fu, & Cooper, 2018). This study supports the concept that a partnership with a government agency might be most useful to a nonprofit organization in the policy and planning stages of the development of a project. Disseminating out information and coordinating to enact upon the different tasks of a project may be better suited to nonprofits that can specialize, fundraise, and adapt more quickly to needed changes.

Example: Adapting to Economic Downturns

New York City's parks were in steep decline from the depression through the late 1970s but through the mid-1990s several key strategies were put in place that brought about significant improvements by partnering with nonprofits (Eimicke, 2018). First, the vast park system which was underfunded was divided into smaller components, with key parks having their own Chief Executive Officer and Administrators, who were overseen by a Park Commissioner. The first Administrator of Central Park under the restructuring, Betsy Rogers, initiated a concept to

partner with private organizations to fulfill the mission of restoring the park. She then became

the first CEO of The Central Park Conservancy, Inc. (CPC), which is a nonprofit partner with the

New York City Department of Parks and Recreation. The collaboration was initially an informal

arrangement but as the organization gained stability, they raised funds, created a comprehensive

strategic plan, took over the maintenance and restoration, and formal contracts were established

in 1998. Continued cooperation with the Department of Parks and Recreation along with support

from multiple mayors, has allowed the partnership to bring stability and measurable goals

outlined in the strategic plan (Eimicke, 2018). In this case a nonprofit organization was

supported by the municipality up to the point it was able to increase community support and

build capacity to function on its own. If the Parks and Recreation Department had been

managing the physical restoration of the park it may have been slowed or stalled by lack of

resources. This example illustrates how decentralized management supported by a nonprofit

allows for independent leadership and decision-making with flexibility to raise funds, manage

day to day operations, and recruit volunteers on a scale that would not be economically feasible

for the parks and recreation department alone because their publicly funded budgets are

distributed among many resources. The CPC has been able to bridge the divide between the

limited capacity of the city to finance and manage public lands on one side and community

support and capacity building on the other.

Networking Among Other Nonprofits

The National Council of Nonprofits report an increase in demand on services provided by

nonprofit organizations with limited operational capacity to act on their own (Chandler &

Kennedy, 2015). One method nonprofits are increasingly turning to in order to increase

awareness and shared understanding of social problems is to network or collaborate with other

nonprofit organizations with similar focus areas. This also has been found to increase operational

resources such as diversity of mindset, financial support, and social capacity which allows small

organizations to increase their collective impact on complex issues (Chandler & Kennedy, 2015).

Applying this type of organizing to advocate for better land management practices and green

infrastructure projects can be successful on a regional scale. Networks allow organizations

operating over a wide geographic area to have unified messaging about the problem which they

can use to address policymakers, and to educate the public to adopt changes in behavior.

Example: Collaborating in Times of Crisis

Since February of 2020, the beginning of the COVID-19 pandemic, networking has been

invaluable to agencies that steward public lands in the San Francisco Bay Area (Burke, 2021).

No existing policies were in place to safeguard peoples' health as they turned to parks as a

coping mechanism when other facilities were closed, and parks were being over-run while also

facing staff shortages. A regional conservation coalition had been operating since the early 1990s

and was undergoing reorganization to focus on climate change and social justice just at the time

quarantines began to take place. The new organization's name is TOGETHER Bay Area, and at

the request of the associate director of Sonoma County Parks, they quickly organized an online

meeting of area land managers to discuss strategic ways to address park safety. The organization

also met with nonprofit executive directors who partner with public land managers. TOGETHER

Bay Area quickly became the center of communications over weekly virtual meetings, facilitated

communications to the public, and coordinated groups to identify common problems and

brainstorm solutions that would work across the system. A website was developed to

communicate critical information and organizations and public media outlets pushed the site on

their social media. It took a great burden off the managers who could then focus on keeping the

parks maintained and safe. TOGETHER Bay Area then worked to capitalize on their newfound

coalition to survey, evaluate, and report how the regional economy and climate change were

affecting residents and began to organize their priorities into a report that was distributed to the

state legislature (Burke, 2021). Important social capacity functions of this coalition and

resiliency building were: facilitating understanding of a common goal, acting as a central

coordinator, consolidating resources, and dispatching information to the community efficiently

using public information channels. This example exhibits a collaborative mechanism for

organizations to coordinate and mobilize resources through a central hub and convey information

concerning an issue they all have in common.

Organizational Effectiveness

At the managerial level nonprofit decision-makers achieve higher operational

performance by using strategic techniques to network with other organizations, and by

networking with community members and donors they show transparency and gain trust

(Johansen & LeRoux, 2012). For a network or collaboration to be effective there have to be a

number of capacities the member organizations are capable of as a whole, including a shared

vision (McDonald, 2011). McDonald attests that in any collaboration, an actor represents the

goals of their constituent organization as well as their own personal motivations. Collaborations

may alter organizations' power dynamics, or that of individual representatives, and require a

great deal of open-mindedness to new actors and ideas. A collaboration with a diversity of actors

who can help bridge differences and find commonality of purpose will be more successful

(McDonald, 2011). This is especially apparent when green infrastructure projects built with the

intention of creating better functioning systems within the urban environment have unintended

consequences on communities. By having a diversity of actors in the process from the beginning, concerns and risks can be mitigated while the project is still in the design phase.

Engaging Community

Green infrastructure projects can experience a host of issues including funding shortages, power dynamics, and social inequities (Campbell, et al., 2021). Networking with civic groups can often help shape green infrastructure plans to meet the needs of community, help navigate through complex social infrastructure, and act as bridges between municipalities and communities. They typically help to represent the mindset that better reflects their community when it comes to issues such as environmental inequity, and associations including civic groups help build strong community culture and social capital (Campbell, et al., 2021). Managers and planners will better serve the needs of local communities, whose demographics are changing and becoming more diverse, and will gain public support for investment in parks if they engage residents (Khazaei, et al., 2019).

Example: Failure to Engage

Creating urban gardens in abandoned lots has been a popular way to address food injustice but has left communities vulnerable to changing policies leading to a lack of trust and participation. Researchers evaluated community perceptions of two urban farms in the Baltimore area using qualitative research methods (Poulsen, 2016). In one case a community farm took over an abandoned lot, cleaned up the trash, and began attending community association meetings and discussing their plans in the neighborhood before they began their farm operations. They offered produce for sale in the community, but after failing to sell much produce, they found out from community members there were concerns about the food safety since the site had been a dumping ground. Although the farmers had a difficult time convincing the neighbors that

the food was in fact safe they had other positive impacts such as community clean up events and

held educational opportunities at the farm, which eventually led to regular visitation by locals

and built a type of social network (Poulsen, 2016).

In the second case a commercial venture was established by a partnership between a

community organization and a commercial farming company that provided expertise on

production farming (Poulsen, 2016). The overall goal was to provide jobs in the community,

exclusively for formerly incarcerated residents. Community involvement in the planning process

was limited and although some residents initially viewed the concept with a positive attitude

there was little communication about the business plan and there were no means for people in the

community to purchase the food grown in their neighborhood. Researchers noted that the urban

agricultural farm run for profit did little to support community members because its consumers

resided outside the area. Even though the intention was to provide jobs, it did little to build social

equity (Poulsen, 2016). The takeaway from these experiences is that good intentions from

outside organizations wanting to benefit communities do not necessarily meet community needs.

By engaging with community members early in the conceptual stage of a plan, organizers may

be able to get feedback that can be implemented if the planning approach has some flexibility.

Social Network Analysis

Communication is essential internally and externally in effective operations management.

Using Social Network Analysis (SNA), a systematic method of mapping and measuring

relationships between actors, researchers sought to quantify communication networks in a park

system in New Delhi and compare relationships to performance indicators (Paul, et al., 2017).

The parks in the study were managed by four different organizations and ranged in size from 32

acres to 100 acres. The measures that were used were the distance between the bottom and top of

the managerial hierarchy, how influential the topmost decision-makers were, and how close the

relationships were between actors in the network. The pattern that emerged among the

management of the four parks was workers were most satisfied when they had a strong leader

who interacted with employees and had built trust among them. The parks with compact

networks were better maintained with fewer visitors reporting improvements that needed to

occur. The researchers also indicated that higher collaboration and communication occurred in

the more compact networks (Paul, et al., 2017). Although other potential variables might exist

such as inequitable funding, the indication is that a poorly maintained park would potentially see

improvements if the communication network was adjusted to put leadership in closer connection

to employees and to provide more opportunities for employees to interact.

Actor-Network Theory

Structures and processes of social networks are poorly documented but by using Actor-

Network Theory (ANT) researchers studied intersectoral networks in Montreal to better

understand how the policies, actions, and interventions could be traced to subsequent changes to

living environment (Bilodeau, et al., 2019). They determined several characteristics of collective

action over time could be isolated using ANT. It was theorized that sociotechnical networks, or

constantly evolving networks of people and resources, interact at various capacities to solve

problems. Their actions could be separated into three major functions that networks engage in

that produce change: "setup and governance; self-representing and influencing others; and

aligning the actors and resources necessary for the action" (Bilodeau, et. al., 2019). In the initial

organizational stage, networks or organizations can imbed methods to track interventions from

inception until measurable results appear in the targeted community, while also monitoring

intermediate stages. This would allow program managers to show funders progress or change

interventions that are not being effective. Tracking and documenting changes is often an overlooked aspect of green infrastructure planning and implementation. Without documentation it is difficult to measure whether outcomes are being met, especially across vastly different disciplines such as physical health, mental wellbeing, and environmental changes such as runoff.

Conclusion

Several key components emerging from the literature review are that networks require leadership, communication, and common vision among members in order to succeed. Previous studies indicate networks between specific entities such as governmental agencies, nonprofits, and civic organizations can be tailored for specific needs so long as the overall structure of the network provides flexibility in order to function optimally. Research questions in the survey and interviews addressed these concepts among the participants to determine if there was a high degree of common vision, flexibility, and communication among network members.

Chapter 3: Methods and Findings

Part 1: Introduction

This case study is based on exploratory research design with a mixed method approach to data collection. It should only be interpreted as a preliminary stage of observation into how inter-organizational networks coordinate with one another and community members in the implementation and stewardship of community-based greenspace. Three methods of data collection were utilized: existing publications, a survey, and semi-structured interviews. The targeted survey population were individuals involved in the design and implementation of a watershed revitalization program in Richmond, Virginia. The geographic area of the case study was delineated by the boundaries of the watershed, and the neighborhoods contained within it. The project area historically lacked investments such as parks, greenspaces, safe walking routes,

street trees, and contains a creek which directly connects to the James River. For the purposes of

this study and the confidentiality of the participants, the area will only be referred to as the

watershed or by units within the watershed including the creek, park, elementary school,

community center, and surrounding neighborhoods.

Flow of Study

The primary objective of the case study was to gain insight from published documents

and experiences of participants in both the survey and semi-structured interviews that support

answers to the two proposed research questions:

1. How have municipal and nonprofit organizations coordinated efforts to implement the

   watershed revitalization plan?

2. What methods have been employed to engage community members to participate in

   planning, installation of projects, and programming?

The initial phase of the case study, collecting documents and developing the research

questions, began in August of 2021. The project proposal was reviewed and approved by the

University of Richmond Internal Review Board in October, and surveys were sent in the same

month. Interviews and data analysis were performed in November. The following are

descriptions of the data collection process, followed by analysis and the discussion of the results.

Data Collection

Document Analysis

A preliminary search of published documentation was utilized to create a list of

organizations to solicit for survey participants. Data sources included published materials related

to the planning and implementation of green infrastructure and community engagement projects

that were most relevant to the geographic area of the study. Additions of published documents

continued throughout the term of the study as new documents were found through online

research or were provided to the primary researcher by interview participants. Documents

included those produced during initial planning phases by an environmental planning

organization, as well as those developed by a stakeholder coalition that was formed to establish

goals and to seek community partners. To protect the confidentiality of participants, titles and

site-specific content of the documents have been withheld. Elements in the text the author felt

had relevancy to the research questions were utilized to code the documents. These themes

included: networking, community engagement, statements of problems the plans sought to

remediate, reports of activities, and future goals (See Appendix A). Sub-themes for each of these

categories were safety and human health, environmental quality, and community access.

Survey Distribution

The primary objective of the survey was to make initial contact with the population of

individuals who are present or past members of organizations known to have been involved in

the planning and implementation stages of the watershed restoration or have participated in

programming at one of the sites within the watershed. Email solicitation was the method chosen

to recruit survey participants. In October of 2021, a form letter containing an open link to the

survey was sent to seventy individuals among twenty-five organizations known to be involved in

the watershed restoration. Source material for individual email addresses included publications,

websites, and referrals from other individuals. A record was kept in Excel of contact information,

dates that emails were sent, response date, and further record of contact. To maintain

confidentiality, the names of people and their affiliate organizations have been withheld.

The survey was administered using Qualtrics XM (See Appendix B) with an open link

provided in the email solicitation. A consent form imbedded in the survey assured participants

were above 18 years of age and had some involvement in activities within the watershed. The first group of questions inquired about the type of organization the respondent was affiliated with, primary activities they engaged in, and length of time the respondent was engaged in activities in the watershed. The second series of questions asked respondents to use a 5-point Likert scale to agree or disagree with questions on networking, communication, management style, planning, and engagement of the community in activities. The final questions were open-ended and asked participants to respond to how their activities had been affected by the COVID-19 pandemic.

Interviews

The survey concluded by asking respondents if they would be willing to participate in an interview. Of the five survey respondents, three indicated they would be willing to be interviewed. One of the respondents declined to participate citing time and relevancy to their mission as factors in their decision. Both final interviewees had extensive experience working on projects and programming in the watershed area and work for nonprofit organizations. Semi-structured interviews were recorded using a Searick Digital Voice Recorder (model: R3) in early November 2021 and were subsequently transcribed by the researcher (See Appendix C). One interview took place on site at the park and one took place via Zoom. Interview questions were designed to last 45 minutes for the researcher to gather details about organizational networking and community engagement within the watershed boundaries. Transcripts were then coded with pre-determined themes to identify how and by what methods the interviewees or their organizations were able to network, fund, engage community, and fulfill short-term and long-term goals (See Appendix C).

Results

Documentation

The outcomes of community initiatives can be difficult to measure because of their multi-faceted nature (Baum, 2001). Published documents were utilized to assist the researcher in evaluating if the objectives set by the watershed coalition were enacted upon by comparing published objectives to survey responses and interviews. Published materials also helped to inform the researcher of the organizations involved in the watershed restoration design and their documented activities. Published documents were used as a basis to determine if there was a shared sense of understanding of the problems, common objectives being met among the various organizations, the progress of goals, and steps taken to engage the community.

Survey

A total of five respondents completed the survey in full, representing a 7.14% response rate to the distributed email solicitations. One additional respondent requested further information to be provided as required by their institution's protocols before being able to participate in the survey. After the information was provided the respondent declined to further engage, citing time as a factor. Responses relating to experience and organizational background are summarized in Table 1. Of the completed surveys, two respondents indicated they worked with elementary school aged children (5-10 years old), and three indicated they worked with adults between (25-55 years old). One survey respondent worked for a state operated organization, one for a for-profit organization, and three worked for nonprofits.

Table 1

Survey Participant Summary of Experience

Participant ID	Type of organization	Years of participation	Type of participation	Leadership	Interacts with
1	Government	6 months to 1 year	Volunteer	No	Adults
2	Nonprofit	Over 5 years	Project manager	Yes	Elementary school students
3	Nonprofit	Over 5 years	Project manager	Yes	Adults
4	Nonprofit	Over 5 years	Supervisor	Yes	Adults
5	For profit	Over 5 years	Project manager	Yes	Elementary school students

Four of the five respondents could be classified as very experienced (5 years or more) and were in positions of decision-making and leadership roles. All respondents indicated that they engaged in activities in the park. Three of the respondents indicated they also engaged in activities at the adjacent elementary school, as well as the neighborhoods in the periphery of the park. Additionally, in response to Question 17 of the survey, one of the survey participants wrote in that they offered specialized training to volunteers in the pruning and planting of trees.

Question 8 asked respondents to identify the types of activities they engaged in, which can be used as an indicator of how well the network is following the coalition goals outlined prior to the revitalization of the area. The most reported activities were planning, planting and maintaining trees, and safe walking/bicycling routes at 4 reports each (See Table 2). Secondary activities reported by survey participants were trash removal and educational programming, followed by stormwater management, fundraising, gardening, and food production at 2 reports each. Environmental advocacy, groundskeeping, sports and physical exercise, cultural arts, school activities, and natural history were each reported as activities once by one of the five participants in the survey. In comparison to the short-term goals outlined in the document summary, there is indication from the survey responses that organizations were engaging in the goals identified in the watershed restoration plan and did not report activities that would conflict with those goals.

Table 2

Frequency of Engagement in Activities in the Watershed

Type of activity	Frequency	Percentage
Planning	4	80%
Planting and maintaining trees	4	80%
Safe walking bicycling routes	4	80%
Trash removal	3	60%
Educational programming	3	60%
Stormwater management	2	40%
Fundraising	2	40%
Gardening	2	40%
Food production	2	40%
Environmental advocacy	1	20%
Groundskeeping	1	20%
Sports and physical exercise	1	20%
Cultural arts	1	20%
After school activities	1	20%
Natural history	1	20%
Research	0	0%

Several of the survey questions were grouped into matrixes with options on a Likert scale for respondents to indicate the agreement or disagreement with statements concerning leadership, coordination, networking, and community engagement (See Appendix B). The primary researcher separated responses between those participants who had participated in activities for a significant amount of time in managerial or supervisory roles to the individual who reported a short-term participatory role as a volunteer (See Table 3).

Table 3

Selected Watershed Survey Responses: Frequency Distribution Based on Role

Watershed Survey Responses: Frequency Distribution Based on Role	Manager/Supervisor					Volunteer				
Planning and Communication	Highly Agree	Somewhat Agree	Somewhat Disagree	Highly Disagree	Don't Know/Prefer Not to Answer	Highly Agree	Somewhat Agree	Somewhat Disagree	Highly Disagree	Don't Know/Prefer Not to Answer
The most successful project outcomes are due to precise planning.	1	3				1				
Stakeholders should be engaged with before planning can begin on a new project.	2	2				1				
Project goals are best achieved by communicating with all the project participants at several times throughout the process.	4					1				
I have observed a high level or organization in the area where I participate in activities.	1	2	1				1			
There has been a facilitator for the activities I have engaged in.	2	1	1			1				
There is an efficient way for participants in activities to communicate with facilitators.		2					1			
Networking and Community Engagement	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Don't Know/Prefer Not to Answer	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	Don't Know/Prefer Not to Answer
The organization I primarily work with has benefited from interacting with other organizations in the watershed.	3	1				1				
The organization I primarily work with shares common goals with these other organizations.	4					1				
I have effective communication with representatives of these other organizations.	3	1				1				
Little is accomplished by working with representatives of these other organizations.				4					1	
There is strong communication between the organization I am affiliated with and community leaders in the watershed.		3	1					1		
My organization makes regular inquiries among community members to better understand their needs.		3		1				1		

Note. Dark Grey boxes indicate higher frequency of response, light grey indicate less.

Some tentative conclusions indicate agreement among all participants on planning, communication throughout the timeline of a project, that benefits were experienced in partnering with other organizations, and that respondents had common goals with other organizations involved in the watershed restoration. There was less consistent agreement on the perceived level of organization, facilitation, and recruitment of community members in activities within the watershed. The volunteer who had six months to one year of experience agreed with the majority of managers in the first block of questions, but deviated on the community engagement questions, possibly due to the short period of their involvement.

In response to the final question asking respondents to reply if they had perceived any issues related to the COVID-19 pandemic, responses varied from none to activities being diminished and difficulty in meeting with community members, which could also affect the perceptions of the survey respondent who had been involved in the restoration for the least amount of time.

Semi-Structured Interviews

The following are narrative summaries of the key points made in interviews conducted with the two survey participants. They are identified as X and Y and have both been involved in planning and engaging with other organizations and the City of Richmond for an extended period. Their experiences and insights help to create a more informed picture of the logistics behind the watershed revitalization over the last decade.

Interviewee X

Interviewee X had been associated with youth engagement in the area for a total of 17 years and is a key figure in the day-to-day activities in the park. They indicated a religiously based calling to work with youth in the area after observing that children did not have the same educational opportunities or outdoor experiences that were available to children in wealthier areas. After becoming engaged as a stakeholder they utilized their extensive background in business management to network and advocate for an area where outdoor learning could take place adjacent to the elementary school. They were involved as a stakeholder in the creation of the sitemap, planning, and have assisted with acquiring funds, soliciting sponsors for donated materials, and have engaged volunteers from abroad and in the community to install the various park features. Some of the park amenities they mentioned that have been installed include interpretive signage, a bioswale, a community garden, pathways, and a bridge that crosses the creek. A wooded nature play area is currently under construction.

A short-term goal that was met early in the process was the planting of trees along the stream buffer. Interviewee X indicated the success of the tree planting: "We planted trees as a stream buffer, so those trees are up and mature and good, absolutely beautiful at this point in time." Additionally, one of the other survey participants included the following statement in their comments of the interaction of their group in the tree planting process: "We often give trees to

volunteer groups and have guided their planting, but X has organized these activities and X does the community engagement needed to gain community support. We are outside expert volunteer help".

Although activities have been going on for the last decade, it was only recently that a nonprofit was established to ensure the continuation of the programming and community engagement opportunities will continue. Although they are currently working under an umbrella organization to get off the ground, the organization will soon be established as a 501(c)(3) nonprofit organization. They have also engaged park and recreation managers to help outline a job description to ensure that the role they have filled is described and someone could carry it on in the future. They noted that many other capital funded park projects are being financed as part of a master plan, but in writing their job description they hope to help illustrate the need for the role they have had in the installation, maintenance, networking, and engagement of the community.

One of the long-term goals that has recently been accomplished was to engage more formal elementary school participation in the park through a partnership with nonprofit organizations that have established outdoor education programming. Interviewee X expressed this recent accomplishment: "We had all the fourth graders out here and second graders out here in the school last week from Monday, Tuesday and Wednesday. So, we were able to do a lot of work in the stream talking about pollinators and it was just a wonderful thing to see. So now the park is being able to live out its true purpose".

Interviewee Y

Interviewee Y was also involved early in the process as a stakeholder, and their organization became involved as a partner due to a common shared mission with improving

water quality and access to the area's streams and rivers. They helped to acquire grants and have

taken on both short-term and long-term goals to help improve water quality and increase public

awareness of the importance of the watershed. They were also involved in the drawing up of

proposed park features and noted how when the process began people didn't know there was a

park, but over time the area has developed from a vacant greenspace into a park with amenities

such as trails and a bridge over the stream so that people have a safe way to access the park.

One of the early projects that they assisted with was a community engagement effort to

distribute water barrels for people to use to capture runoff from their roofs. Acting as an

intermediary, their organization obtained the barrels and helped distribute them in the

community by attending neighborhood association meetings to get support for distributing

approximately 100 rain barrels in the community. When asked about the process they responded:

"The City of Richmond were the ones who had the rain barrels. Basically, they had partnered

with different middle schools across the city to decorate them and build them, but the city itself

could not install them for people on private property. So that was a partnership. They got the

barrels, they built them, and then we handled using our volunteers to actually get them".

They also mentioned how their organization has taken on several long-term projects in

the watershed over the years: "Then somehow between there and now but probably right after

the watershed plan was finished, elements of the plan needed sort of champions to take things on

and not just sit on the shelf as a plan. So, we've had several different grants that have worked in

that neighborhood."

They have now worked on a long-term project to create a streetscape with tree plantings

and sidewalks. One of the difficulties Y mentioned in the interview was that when engaging in

long-term planning there is a lot of turnover that occurs in organizations and neighborhoods

through time, which can sometimes cause delays in getting permits for projects when the institutional knowledge of a project is lost. Interviewee Y also stressed that community engagement can be more difficult in a population where people move frequently, so communication must be consistent. They said that many community members were enthusiastic about the recently completed street improvement project and noted that the area had a problem with drainage or other issues for a long time. Interviewee Y also stressed the need for dedication to finish the long-term projects so that needs established by the community come to fruition.

Major Takeaways

Several themes were common among both interview subjects. The need for a consistent presence in the area was mentioned by both participants. For instance, Interviewee X said that their management style had always been hands-on and involved. They said that they had a good connection with many nonprofit organizations and the parks and recreation department, so it helps facilitate the projects. Interviewee Y independently stated that Interviewee X had the ear of the city council and had been consulted on the recent streetscape project when it was being reviewed for approval. Having a long-term connection to an area also brings credibility and seems to help make the network function smoothly, with X near the center of involvement with other organizations. There is not a formal networking system, but the major players know which organizations are capable of certain projects. For instance, Interviewee X said they put someone in their own organization in touch with Y in order to initiate some of the outdoor education programming. They said having the schools come to the park to engage in outdoor learning was a long-term goal that was met by being able to facilitate the partnership between a couple of different organizations who had the capacity to teach the outdoor education curriculum. Both participants also agreed they benefit by working with other organizations because no

organization can fulfill all the parts. Interviewee Y brought up the community engagement piece and said that they are engaging in a partnership with another organization in order to facilitate community outreach to residents because they have better local presence in the community.

Limitations

Inherent issues associated with data collection by email solicitation are failure to contact a representative sample of potential candidates and nonresponse of individuals (Fricker, 2002). The primary researcher attempted to address the issue of missing contact with potential candidates by utilizing two additional approaches. The first was to imbed a request in the emailed solicitation asking recipients to forward the survey request to others in their organizational partnerships, a technique commonly known as snowball sampling (Mertler, 2019). The second method was to include a survey question which asked respondents to identify organizations that were part of their organizational network and how frequently they were in contact. The intention of both approaches was to expand the pool of respondents and contact a greater proportion of the desired population. Additional methods of solicitation that may have resulted in more overall response, such as social media and in-person requests, may not have increased participation by the target audience. Although a representative sample from the survey was not obtained for conducting quantitative analysis, Qualtrics XM generated data was still utilized as an observational tool and directed the researcher to make adjustments to interview questions developed in the third stage of data collection.

Interviews were conducted with participants who both work under nonprofit organizations. Although the researcher attempted to reach out to both the school district and park and recreation department through email and attempted introduction through an intermediary, no representation in the data is given from the government side of networking. Likewise, in order to

facilitate a better understanding of the viewpoint of the community, representatives from community associations or residents who have participated as volunteers would have created a more holistic view of the networking and engagement process. Future research into the communication and associations among the wider network would create a more complete picture of the inter-agency networking process and impact on the community.

Conclusion

The research conducted provides insight into several key indicators of processes and interactions engaged in by the network of nonprofit organizations involved in the watershed restoration. The interviews especially showed insight into the complexity of engaging in a project for the long-term, with many moving parts that are difficult to track. Projects benefited from the presence of a central figure to facilitate activities with community members, as well as the formal and informal involvement of several other nonprofits with special training or close association with the community. There was a consensus that there needs to be continuity and documentation so in the event that changeover occurs there is transference of institutional knowledge. There was also concern for follow through when long term projects are being conducted in neighborhoods of historically marginalized populations, and the need for consistent communication.

Although none of the participants explicitly stated they were following a particular networking methodology, there are some parallels that can be drawn. The next section will discuss the implications of this research in broad terms by comparing the interactions of the participants in the case study to existing network theory and illustrating a framework for how the results can be interpreted for future research and planning.

Chapter 4: Discussion

Part I: Review

The Research Problem

In urban neighborhoods of non-white residents, especially those of low socioeconomic status, there are fewer investments in greenspaces such as parks, fewer planted trees and shrubs to help intercept storm water, and less recreational programming available to residents in their local parks (Rigolon, 2016). Racially motivated disinvestment has been a topic of concern for health officials and environmental justice advocates because of health and equity ramifications related to inadequate green infrastructure (Jim, 2013). As municipalities are being called to rectify the conditions in neglected urban areas, there are several factors that planners and managers need to keep in mind as areas are rejuvenated. At the forefront is addressing community needs by involving local residents in participation of the entire process of planning, installation, and service design.

The Solution

Place-making is an important aspect of urban development that considers community needs as basis for developing green infrastructure so as to increase access and quality of life without pressuring residents to move from their neighborhoods due to gentrification and the associated rising property values, rental costs, and taxes (Eldridge, et. al., 2019). By utilizing a combination of community engagement strategies, funding sources, and partnerships with both local and regional organizations, support networks can be developed centered around green development that meet residents' needs (Eldridge, et. al., 2019). Support systems built through local nonprofits can assist in the stewardship of parks, engagement in park activities, and can mobilize community participation. Municipalities that selectively network with nonprofits may

be able to establish better long-term project sustainability as well as maintaining an active interest by the community.

The Case Study and Discussion of Findings

The case study presented in this paper focused on exploratory research into partnerships between agencies, individuals, and nonprofits that took place to facilitate restoration of an impoverished watershed in Richmond, Virginia over the period of a decade. The project was of interest because members of the communities within the watershed were engaged in the planning and implementation of greenspace enhancements and the site is meant to be a model for future developments. The primary researcher's intention was to examine the interactions between organizations to address the following questions:

1. How have municipal and nonprofit organizations coordinated efforts to implement the watershed revitalization plan?

2. What methods have been employed to engage community members to participate in planning, installation of projects, and programming?

The primary researcher utilized existing publications, surveys, and semi-structured interviews to identify both quantitative data and qualitative themes related to networking and community engagement in the watershed revitalization. Although the pool of respondents to the survey was too limited to address these questions with any statistical significance, there were some trends in the survey results that warrant mentioning:

- Agreement on the need for advanced planning, stakeholder engagement, and communication throughout the timeline of a project.

- Agreement about the benefits of networking with other organizations, a sense of shared mission, and the ability to communicate with partners in other organizations.

- Inconsistent responses toward the perceived level of facilitation and communication with participants in activities within the watershed.

- Inconsistent responses concerning strategy and recruitment success in community engagement.

Two interviews were conducted with members of the nonprofit network who have been active in planning and engaging in activities in the watershed. Subsequent analysis of interview text resulted in observation of the following themes:

- Planning and executing projects within the watershed while also involving the community was key, but was difficult to sustain due to people moving into or from neighborhoods during the timeframe of the project.

- Networking with other organizations increases organizational capacity by allocating resources, providing specialized training, and by putting the highest and best use of peoples' talents to work for common goals.

- Short-term projects facilitated by nonprofits helped to establish legitimacy of the watershed revitalization effort with the parks and recreation department and community members.

- There is a need to maintain institutional knowledge of long-term projects among networking agencies and stakeholders.

- Consistent participation for long periods of time is necessary to attain long term goals.

This case study showed the achievements of the project by comparing survey and interview responses to the goals originally established in the planning and community input phase. Initially organizations participating in the network worked to achieve some of the short-term projects and gained further support for the long-term plans. Some of the long-term

infrastructure and programming goals established in 2012, such as creating green streets and engaging elementary school students in the space for school programs, are now coming to full fruition. It was suggested that long-term projects needed support and mission focus to see the projects through, as well as an institutional knowledge of the projects throughout the entire process.

Part II: Implications

During this exploratory research project, the primary researcher observed six key components planners and practitioners should consider utilizing when developing green infrastructure projects. The author will explain how each are supported by themes that emerged in the case study, will draw comparisons to the existing literature, and will show how the components can be used as a framework for planners and facilitators of future projects, or to evaluate how past projects and their outcomes align with this concept.

Consensus

A proposed project requires relevancy and a reason for change to occur. One of five conditions of collective impact theory (Kania and Kramer, 2015) is that organizations need to agree on common purpose and mission in order to solve issues. Since first developing the theory which was published in 2011, the authors have adapted the concept of collective impact to also be more conscious of equity (Kania and Kramer, 2015). This relates to the subject of green infrastructure development and potential impacts to communities, such as gentrification, and the need for community participation in planning and development to prevent such consequences (Anguelovski, 2016). Planners of greenspace initiatives should plan heavily on the front end of projects to create partnerships, either formal or informal, with organizations that align with a

common purpose. The community must also be engaged to come to a consensus concerning

desired outcomes.

The area in Richmond where the watershed revitalization occurred was significantly

under-developed for greenspace and outdoor accessibility and was in a community that was

known to have been part of the redlined districts described previously in this paper. There was a

common interest among community organizations, planners, and environmental groups focused

on water quality to improve the area with green infrastructure development. Designs associated

with the watershed involved participants from the local neighborhoods in order to facilitate input

on the designs to mitigate stormwater, improve the living environment, create increased

opportunities for outdoor activity and increase safety along pedestrian and bicycling routes.

The planning mechanism

A strategic plan, mandate, or design concept is a useful tool that can be referred to by the

network participants. Even though a small pocket park may seem like a simple effort, by

utilizing strategic plans and working with regional planners the project may be better financially

supported if it fits into a regional strategic plan. In this case study, the mechanism was the

strategic plan for Richmond, as well as the watershed plan developed by the environmental

planning organization and coalition. The nonprofits working in the watershed utilized the plan to

initiate efforts and build support for long term investment, building on their early successes. The

nonprofit organizations working within the watershed also used fliers and community education

programs to educate residents about the benefits of the watershed restoration to gain support. The

city now has an opportunity to involve other neighborhoods in the process of designing new

parks and services that will meet the needs of local residents, while also providing environmental

services.

The most important consideration in this phase is assuring plans have been developed with a priority for social equity, otherwise special interest groups may overpower the strategic planning process (Schrock, et al., 2015). Even if an organization has the best interests of the environment and people in mind if the local community is not involved in the decision-making at several points through the process they may become inadvertently disadvantaged by the development plans, such as being driven from the area because of rising taxes or housing prices.

A third party to aid in facilitation and mediation

An intermediary agency can assist in coordinating between government and communities to determine the desired outcomes and can provide the impartiality needed to bring together ideas from multiple sources. In collective impact this may be described as the 'backbone organization' (Kania and Kramer, 2015). In the watershed case study, a green infrastructure planning organization was initially engaged to begin the project facilitation. It was then handed over to the stakeholder coalition that took action to see that projects moved forward.

Municipalities that engage a third party may find that it creates a bridge to provide outreach to community members who may be initially distrustful or do not believe that a plan will be acted on due to past treatment by a government organization. A third party can be neutral on issues that are raised and help to build consensus among participants.

Long-term participation

Key participants are needed who are heavily involved in the mission, act to recruit people to participate, and are involved for a long period of time to maintain an institutional knowledge of the project. In this case study, participants in the coalition were members of nonprofits that 'championed' certain projects, to use the phrase by interviewee Y, depending on the specialty that was required. Skills may include fundraising or being able to engage residents because they

already operate in the community. The individual identified as interviewee X has been a

presence in the area for 17 years, was a stakeholder in the coalition, and is deeply committed to

seeing the long-term projects come to fruition. They are also actively engaged in documenting

what needs to happen to maintain stewardship of the park in the future.

Commitment of participants is an important aspect of gaining support for parks and

projects and can be facilitated through the creation of organizations such as 'friends' groups for

parks. Residents with long term association with a space may be more likely than an employee

with a municipality to help see that goals are met.

Communication

Behind the scenes organizations are needed for coordinating planning, permitting,

community education, and to provide specialized training. In the watershed project, many

organizations have come together for periods of time to provide services and to physically install

the projects. The parks and recreation department would also fall into this category with regular

maintenance and upkeep of the park grounds. It is important that these groups have a

communication channel among one another and with key facilitators to make sure they are not

working at cross-purposes to the central mission.

There were mixed results in survey participant agreement about the facilitation of

communication across inter-agency channels. It may be beneficial to have a formal

communication strategy and method of documenting activities so that if a project needs to

change hands at a certain point in the process there will be a framework to follow. Interviewee X

expressed that they were going to provide the City of Richmond with a job description for their

role in the park so that the city would have more of a concept of their role.

Community engagement and networking experience

Volunteers and members of the community must feel there is some benefit to their involvement. Some inertia may be an impediment to engagement if people feel disenfranchised from the community. In the watershed case study activities such as tree planting, community gardening, and clean-up efforts, have enabled area residents to become active participants in altering their environment and to develop a sense of community space. The local elementary school is now also participating in programming available at the park, and many youths engage in helping to garden and clean up the park because they are given incentives for helping out, such as access to bicycles. It cannot be stressed enough that community engagement in activities and planning will determine the success and use of community greening projects. If a space is built for local residents, they will access it and become more invested in continued care and respect for the area.

Part III: Conclusion

The scope of this study was to examine how managers and practitioners networked to plan, install, and manage a watershed revitalization plan, and efforts made to engage the community. The ultimate goal of this research is to assist planners and managers to successfully implement future projects by focusing efforts on partnerships that both support the efforts of planners, recreation agencies, and nonprofits with a focus on engaging community members.

Green Infrastructure planning is beginning to require designers to practice problem-solving not just for engineering solutions to environmental concerns, but also involve multifunctionality and an understanding of social systems (Hansen and Pauleit, 2014). Key takeaways from this case study were that organizations do find benefit from coordinating with one another and can assist with specialization of tasks to fulfill a mission. It was also clear that projects require long-term commitment and dedication by the various participating partners:

government, nonprofit, and community. This is sometimes challenging due to employee turnover and engaging communities that might change over time. Initiating short-term projects with lots of community participation can help to keep residents educated and engaged while long-term projects are in the planning, permitting, and funding stages. Communication with community members is needed frequently because membership in communities can change throughout the time it takes to complete a project.

The watershed restoration case study is a starting point for future research into some of the following areas to support future green infrastructure projects: the development of management systems which span across different agencies, tracking and assessing implementation of projects among multiple partners, understanding community participation and barriers, and creating more efficient communication channels among the various agencies and the communities they serve. Other types of inter-agency networks may also benefit from this type of cross-sector management and community engagement as well.

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Appendix A:

Summary of Document Analysis

Themes	Sub-themes	Summaries From Documents
Problems	Human Health and Safety	Concern for human health due to obesity rates and lack of exercise in the general population. Lack of safe routes for pedestrians and bicyclists including street trees, lighting, and street crossings. Concern for vehicular traffic congestion around the school and potential for accidents.
	Environmental Quality	A lack of pervious surfaces for stormwater infiltration, causing periodic local flooding. Pollution runoff and pet waste getting into the waterways, making them unsafe for human contact.
	Community Access and Interaction	Access from neighborhoods to the elementary school and community center impeded by the creek. A lack of programming, outdoor education opportunities, and community gathering space.
Short-Term Goals	Human Health and Safety	Evaluate the diversity of existing trees and plant new shade trees along streets. Construct pathways through the park to provide opportunities for exercise and access. Improve access to the school via construction a bridge over the stream in the park.
	Environmental Quality	Mitigate erosion in the creek with stones to help create habitat and slow water. Installation of native plant gardens such as bioswales to help intercept and clean stormwater. Plant tree buffers along riparian areas. Install rain barrels in neighborhoods. Install trash receptacles, pet waste stations, and signage.
	Community Access and Interaction	Create community engagement events to educate and involve the public. Create outdoor learning stations and provide programming and educational opportunities. Provide site preparation and provision of tools for a community garden. Train volunteers in tree care and monitor the survival of trees along the stream buffer. Add community amenities such as benches, picnic tables, barbeques, and bike racks.
Long-Term Goals	Human Health and Safety	Improve non-vehicular transportation routes to the elementary school with lighting, sidewalks, safe intersections, and bike-friendly paths. Create green streets with tree canopies and infrastructure for stormwater management.
	Environmental Quality	Daylight piped culverts and restore riparian areas outside the park for natural drainage and include educational signage. Restore the creek and streambanks for improved water quality, wildlife habitat, and human enjoyment. Preserve existing wooded parcels and increase canopy cover to mitigate heat islands, and help with stormwater infiltration.
	Community Access and Interaction	Identify open areas and vacant properties to redevelop for pocket parks and improved community connection to the watershed. Create outdoor education opportunities through informative signage and programming. Connect the neighborhood to the school, recreation center, and creek. Promote community building, education and engagement. Engage the elementary school in outdoor learning opportunities.

Summary of Document Analysis Continued…

Desired Outcomes	Human Health and Safety	Improved environmental awareness and community health through access to outdoor recreation and access to the James River. Walkable watershed that incorporates design and function for people, non-vehicular transportation, and stormwater mitigation. Becoming a community where walking and bicycling are integral parts of the transportation system. Improve health and wellbeing in the community by encouraging healthy lifestyles, and exercise.
	Environmental Quality	A restored and accessible creek including bank stabilization, wildlife habitat, and established riparian buffer. Use of low impact best management practices that can be an example for other projects in the City of Richmond and beyond. Educate the public about the watershed so it will be taken care of in the future.
	Community Access and Interaction	Meet social goals such as health, safety, beauty, and community building. Support regional park improvements, trail connections, and community access to the James River. Creek could serve as a revitalizing force brining the community together around the adjacent school and community center.
Community Engagement	Human Health and Safety	Holding walk through events for identifying safety needs with police. Motivate renters and owners in the neighborhoods to maintain clean properties. Hold public events to get input about walking routes, concerns, and desired park amenities.
	Environmental Quality	Install water barrels at residences in the community. Hold stream cleanup, trash removal, and tree planting events. Hold educational community events to apply art to storm drain covers. Create stewardship opportunities for community members to care for trees and property.
	Community Access and Interaction	Dedicate trees and benches to local residents and community history. Create community gardening spaces. Hold a festival to educate and engage community residents. Planners should attend neighborhood association meetings. Produce and distributed educational fliers.
Networking	Human Health and Safety	Coordinate with city police to hold bike rodeos and bi-annual walk through events. Partner with the Richmond Regional Housing Authority. Enlist the help of Richmond's Clean City Commission to supply materials, fliers, and bulk waste pick up for trash removal events. Partnership between the government and private sector to build on the city's master plan.
	Environmental Quality	Form partnerships to fund watershed restoration projects. Create standards for street tree planting to ensure long-term survival and review current standards with city staff and Urban Forestry Commission. Enlist local businesses to sponsor and help care for trees. Engage staff from nonprofit network to assist with funding using grant programs.
	Community Access and Interaction	Enlist local community members as leaders for events. Partner with the school to engage in clean-up events. Ask neighborhood associations to engage volunteers in clean-up events, and to report vacant properties that are a dumping concern. Form a coalition to consult with city agencies and organizations.

Appendix B:

Organizational Networking, Leadership, and Community Engagement Survey

Hello!
You are being asked to participate in a survey on organizational networking and community engagement as described below. Please read the following information carefully to make an informed decision about your willingness to participate. The survey should take approximately 15 minutes to complete.

Purpose:
The purpose of this research case study is to determine how government, private, and nonprofit organizations have coordinated to revitalize the (name removed) watershed in Richmond, Virginia. You will be asked questions concerning your experiences, your associations with other organizations, and community engagement with residents living in the (name removed) watershed. Participation is completely voluntary.

Contact Information:
This research is being conducted by Julie Roller, a master's degree student in the School of Continuing and Professional Studies at the University of Richmond. If you have any questions, you may reach her at julie.roller@richmond.edu.

Possible Risks and Benefits:
There are no more than minimal risks associated with engaging in this survey. Minimal risks are those associated with everyday life. Should you feel uncomfortable at any time you are entitled to skip questions or conclude the survey without penalty. There are no physical or monetary benefits to participating in this survey, but your responses could help in the development of best practices for planners and practitioners of future initiatives.

Information Confidentiality:
Your responses will be kept confidential to the best of the researcher's ability. All personal information and responses will be kept on a secure drive. In published materials and presentations your responses concerning yourself, your organization, and other individuals will be coded using unique identifiers (person A etc.). Quotes will not be published without your express permission in order to maintain your anonymity. However, because absolute confidentiality cannot be assured you are cautioned against disclosing information or opinions that could place you at risk of criminal or civil liability or be damaging to your financial standing, employability, educational advancement, or reputation.

Use of Information:
The information collected in this research will be used to analyze the network of organizations involved in the revitalization of the (name removed) watershed, and to evaluate the level of community engagement in decision making and hands-on activities. A research paper and presentation of results will be produced by December of 2021. Results might be included in a

future conference presentation, academic journal, or other outlet.

Protections and Rights:
Should you have any questions about this research or the survey process, please contact the Chair of the University of Richmond's Institutional Review Board (IRB) for the Protection of Human Subjects of Research at (804) 484-1604, or irb@richmond.edu.

Consent:
I understand the research being conducted, that my responses are voluntary, and I can skip questions or discontinue the survey at any time. I understand the content of the survey will be kept confidential and responses will only be used as described. I confirm I am 18 years of age and give my consent to participate.

○ Yes (1)

○ No (2)

Q2 Great! Let's begin by finding out some basic information about the organization you are affiliated with and what experience you have. Even though you may work in many locations, please limit your responses to experiences in connection to the (name removed) watershed.

Q3 How long have you been engaging in activities having to do with the (name removed) watershed? Experiences may include but are not limited to: planning, environmental advocacy, installation of amenities, storm water management, transportation, planting trees, maintenance of park grounds, community engagement, educational programming, or promoting walkability.

○ For the last 6 months or less (1)

○ Over 6 months, up to 1 year (2)

○ Over 1 year, up to 3 years (3)

○ Over 3 years, up to 5 years (4)

○ Over 5 years (5)

○ I am no longer actively participating, but was active from (please type dates): (6)

Q4 When engaging in activities involving the (name removed) watershed I am/was a representative of one of the following types of organizations:

○ Local government (1)

○ School district (2)

○ Religious association (3)

○ Nonprofit organization (4)

○ Medical facility (5)

○ For-profit business (6)

○ Other (please type in): (7) _____

○ I prefer not to answer (8)

Q5 Can you provide the name of the organization?

○ Yes (please type in) (1) _____

○ I prefer not to answer (2)

Q6 When engaging in activities involving the (name removed) watershed I work/worked primarily as a_____.

○ Volunteer (1)

○ Staff Person (2)

○ Project Manager (3)

○ Instructor (4)

○ Department head or supervisor (5)

○ Other (please type in): (6) _____

○ I prefer not to answer (7)

Q7 Indicate any of the areas where you have/had an active role (choose all that apply):

☐   (name removed) Park (1)

☐   (name removed) Recreation Center (2)

☐   (name removed) Elementary School (3)

☐   (name removed) Arboretum (4)

☐   Other (please type in) (5)

_____

☐   I prefer not to answer (6)

Q8 Indicate the types of activities you primarily engage/engaged in (choose all that apply):

☐   Planning (1)

☐   Environmental advocacy (2)

☐   Stormwater management (3)

☐   Safe walking/bicycling routes (4)

☐   Fundraising (5)

☐   Planting and maintaining trees (6)

☐   Gardening (7)

☐   Trash removal (8)

☐   Groundskeeping (9)

☐   Sports and physical exercise (10)

☐   Creative arts (11)

☐   Food production (12)

☐   Educational programming (13)

☐   Natural history (14)

☐   Other (please type in) (15)

_____

Q9 What age group have you primarily interacted with?

○ Pre-school (4 and younger) (1)

○ Elementary school (5-10) (2)

○ Middle school (11-13) (3)

○ High school (14-18) (4)

○ Adults (25-55) (5)

○ Adults 56+ (6)

Q10 Have you had leadership responsibilities in your role?

○ No (1)

○ Yes (2)

Q11 Please indicate your level of agreement with the following statements:

	Highly Agree (1)	Somewhat Agree (2)	Somewhat Disagree (3)	Highly Disagree (4)	Don't Know or Prefer Not to Answer (5)
The most successful project outcomes are due to precise planning. (1)	○	○	○	○	○
Stakeholders should be engaged with before planning can begin on a new project. (2)	○	○	○	○	○
Project goals are best achieved by communicating with all the project participants at several times throughout the process. (3)	○	○	○	○	○
It is most efficient to communicate with just a few people about project goals and let them facilitate how to accomplish the rest. (4)	○	○	○	○	○
It is best to be open-minded about the project goals and see what the participants want to engage in. (5)	○	○	○	○	○

Q12 Please indicate your level of agreement with the following statements:

	Highly Agree (1)	Somewhat Agree (2)	Somewhat Disagree (3)	Highly Disagree (4)	Don't Know or Prefer Not to Answer (5)
I have observed a high level of organization in the area where I participate in activities. (1)	○	○	○	○	○
I know what I will be doing before I show up to an activity. (2)	○	○	○	○	○
There has been a facilitator for the activities I have engaged in. (3)	○	○	○	○	○
There is an efficient way for participants in activities to communicate with facilitators. (4)	○	○	○	○	○
I prefer to work independently rather than in a group. (5)	○	○	○	○	○

Q13 Answer the following statements as they best fit your overall experience interacting with other organizations involved in the (name removed) watershed, whether in the past or present. Skip this question if you prefer not to answer.

	Strongly Agree (1)	Somewhat agree (2)	Somewhat disagree (3)	Strongly disagree (4)	Do not know, or prefer not to answer (5)
The organization I primarily work with has benefited from interacting with other organizations involved in the watershed. (1)	○	○	○	○	○
The organization I primarily work with shares common goals with these other organizations. (2)	○	○	○	○	○
I have effective communication with representatives of these other organizations. (3)	○	○	○	○	○
It is difficult to contact people in leadership roles of these other organizations. (4)	○	○	○	○	○
Little is accomplished by working with representatives of these other organizations. (5)	○	○	○	○	○
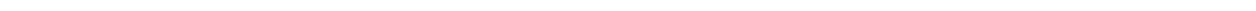
Q14 Please enter the name of up to 10 organizations you have interacted with in any capacity involving the (name removed) watershed. Indicate the level of interaction that best fits the relationship. Skip this section if you prefer to not answer.

	Interact with the organization on a monthly basis or more (1)	Interact with the organization several times per year (2)	Interact with the organization once annually (3)	Interacted with the organization one to two years ago (4)	Interacted with the organization more than two years ago (5)
1. (1)	○	○	○	○	○
2. (2)	○	○	○	○	○
3. (3)	○	○	○	○	○
4. (4)	○	○	○	○	○
5. (5)	○	○	○	○	○
6. (6)	○	○	○	○	○
7. (7)	○	○	○	○	○
8. (8)	○	○	○	○	○
9. (9)	○	○	○	○	○
10. (10)	○	○	○	○	○

Q15 The remaining statements relate to the amount of recruitment and participation by community members living in the (name removed) watershed.

Q16 Based on your experience, please indicate your level of agreement to each statement.

	Strongly Agree (1)	Somewhat agree (2)	Somewhat disagree (3)	Strongly disagree (4)	Do not know, or prefer not to answer (5)
There is strong communication between the organization I am affiliated with and community leaders in the watershed. (1)	○	○	○	○	○
My organization makes regular inquiries among community members to better understand their needs. (2)	○	○	○	○	○
My organization has a formal strategy to involve community members in decision-making roles. (3)	○	○	○	○	○
My organization successfully recruits participants from the community to engage in activities within in the watershed. (4)	○	○	○	○	○
It is difficult to find ways to get community members to participate in activities in the watershed. (5)	○	○	○	○	○

Q17 How do you feel the COVID-19 pandemic has affected your ability to network with other organizations and the community?

Q18 Do you have any other comments you would like to provide?

Q19 May I contact you to set up an in-person interview?

⭕ Yes (Please provide contact information in the box below) (1)

_____

⭕ No, Thank You. (2)

Appendix C:

Example of Coding: Interviewee Y

1	I was just a stakeholder that was invited since we were a nonprofit in	
2	Richmond. So I attended those initial stakeholder meetings. And then	Planning/Outcomes
3	somehow between there and now but probably right after the watershed	
4	plan was finish, elements of the plan needed sort of champions to take	
5	things on and not just sit on the shelf as a plan.	
6		
7	So we've had several different grants that have worked in that	Community Engagement
8	neighborhood. So anything from we've done community engagement with	
9	giving out free rain barrels, we partnered with the city of Richmond and	Partnerships
10	had our volunteers install rain barrels. On probably close to 100 different	
11	homes in the ▉▉▉▉▉▉▉▉▉ neighborhoods.	
12		
13	We did some workshops around the river homes to educate about native	Community Education
14	plants and things they can do at home. What else did we do? We did some	
15	veggie growing workshops with kids. I'm listing all the things- we did trash	Community Engagement
16	cleanups there. We did a planting with the seniors at the community	
17	center.	
18		
19	And then the park which used to not nobody even knew that it was the	Lack of recognition
20	park. It was just a green space and nobody knew what it was. We helped	
21	with the install of the trail that went through the area by the creek and	Short term goals
22	planted trees along there and installed a Pet waste station.	
23		
24	There were several green streets that were called out in the ▉▉▉▉	Long term goals
25	▉▉▉▉▉ for both creating safer walking paths for students that	
26	were walking to the school, but also for greening effort and to deal with	Safety
27	stormwater. And so I was the one of the champions of that project, taking	Multi-purpose
28	it, getting grants for conceptual design and then getting a grant for	Leadership in funding and
29	construction design and getting a grant to actually install that which finally	install of green projects
30	happened this year.	