GREEN INFRASTRUCTURE: IMPLICATIONS OF IMPLEMENTING THE METROGREEN
REGIONAL GREENWAY PLAN

by

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A REPORT

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Abstract

Green infrastructure is a new term with old principles that address the protection of valuable open space through the use of connected natural areas. Through implementation of green infrastructure, communities can experience environmental, social, and economical benefits such as increased biodiversity, improved human health, and increased property values. In order to determine the specific opportunities and constraints municipalities face when implementing green infrastructure, MetroGreen was examined. MetroGreen is a greenways plan for the Kansas City Metropolitan area. The plan was studied as a whole, as well as in more detail in two different municipalities: Platte County, MO and Lenexa, KS. Eight planners, landscape architects, Park and Recreation employees, and public administrators involved with MetroGreen were interviewed to document their experiences. From these interviews three categories were identified as being closely related to successful implementation of regional green infrastructure: management, education, and funding. It was found that in order to implement green infrastructure successfully, leadership of a civic-advisory group, private entity, or non-profit organization is needed; regional dedicated funding is crucial; principles should relate to broader societal issues such as stormwater and health; partnerships should be created at all levels through city, county, and citizen organizations to aid in connectivity; and public support can contribute a significant amount to the progress made. These findings serve as an analysis of regional implementation of green infrastructure, in order for professionals and community members to learn from the experiences of MetroGreen.

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Chapter 1 - Introduction

In the United States, population is increasing and expected to reach 392 million people by 2050. This increase in people will influence the type of growth that is occurring in and around urban areas (Annual Editions, 2010). More so, tactless development practices influenced by growing populations can create an even greater impact on the environment. More than 4,000 acres of open space is lost to development everyday (Benedict & McMahon, 2006). The continual development and fragmentation of valuable open space can be protected with green infrastructure, a new term that describes a proactive approach to the preservation and connectivity of important natural areas. For this reason, it is important to educated professionals and community members about how green infrastructure can successfully be implemented within a city, county, or metropolitan area.

This report examines the evolution and benefits of green infrastructure and greenways, as well as factors associated with implementation, to provide a better understanding of where green infrastructure and greenways are headed in the future. The report also provides a case study for further understanding of green infrastructure. MetroGreen, a greenways plan for the Kansas City Metropolitan Area, is examined in order to answer the question of what specific opportunities and constraints municipalities face when implementing green infrastructure. In answering this question, this report provides professionals and community members with an understanding of unusual successes, hardships, and nuances that are found outside the confines of standard principles and practices of green infrastructure planning.

During initial investigation of MetroGreen, Platte County, MO and Lenexa, KS were identified through research and conversations with a planner at Mid-America Regional Council,

a non-profit organization supporting regional collaboration within the Kansas City metropolitan area. The two municipalities were identified as representing successful implementation of the MetroGreen Plan. Interviews then took place with planners, Parks and Recreation employees, landscape architects and public administrators involved with those particular projects and the planning process of MetroGreen as a whole. These interviews provided the basis for which conclusions were made about the unique opportunities and constraints faced during the implementation process of MetroGreen.

Chapter 2 - Green Infrastructure Background

In order to gain a better understanding of green infrastructure planning, it is important to address three areas. The first area is definition. Because the term "green infrastructure" was developed fairly recently, many different terms are used throughout the literature, often representing similar ideas. The term greenway is the most common term which overlaps green infrastructure, therefore these two terms will be defined. Secondly, benefits associated with green infrastructure will be discussed. These benefits address the environmental, social, and economic aspects of green infrastructure. Lastly, the factors associated with implementing green infrastructure plans will be presented.

Definitions

Green infrastructure carries many different meanings to a variety of individuals. For the purpose of this report, green infrastructure will be used to represent greenspace networks. More comprehensively, Benedict and McMahon define green infrastructure as natural areas and open spaces that are interconnected, conserve ecosystem processes, protect clean air and water, and yield benefits to people and wildlife (Benedict and McMahon, 2006). The green infrastructure system consists of hubs, links, and conduits (Figure 2.1).

Figure 2.1 Green Infrastructure System
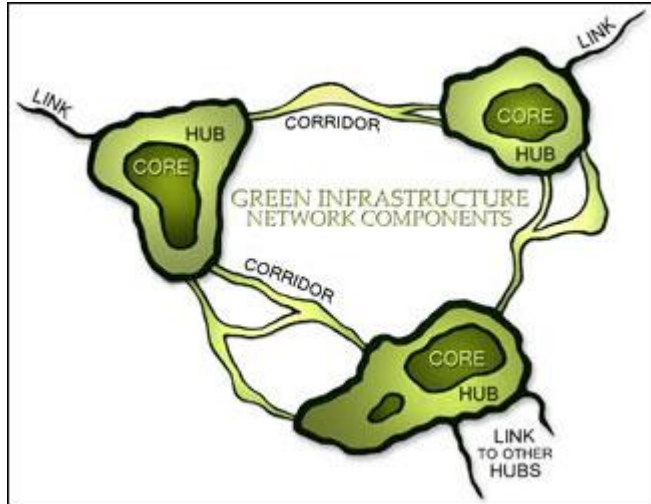
Source: The Conservation Fund

Similarly, a greenway is defined by another author in several ways. Greenways can be open space created along natural features such as rivers and streams, natural areas for pedestrian and bicycle usage, pieces of land used to connect recreational areas such as parks and historical areas, and areas linear in nature, such as greenbelts (Little, 1990).

These two terms are often recognized as similar ideas. Green infrastructure is a network of greenways; however others believe green infrastructure encompasses larger goals. Some identify greenways as important links in green infrastructure, however there are several distinctions between the two terms. Firstly, green infrastructure is based more on ecology rather than recreation. Secondly, green infrastructure includes important destinations in addition to connections. And thirdly, green infrastructure "can be designed to shape urban form and provide a framework for growth --- a framework that pre-identifies ecologically significant lands and suitable development areas" (Benedict & McMahon, 2006, p. 35). Despite these distinctions identified, much of the greenway literature is presented from a strong ecological perspective (Ahearn, 1995). This report will view greenways and green infrastructure as mutually inclusive

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due to the consideration that much of the literature presents greenways from a comprehensive perspective; much like the manner in which green infrastructure is described throughout recent literature (Benedict & McMahon, 2006).

A variety of literature explores the historical beginnings of green infrastructure (Benedict & McMahon, 2006; Fabos, 2004; Little, 1990). This concept can date back to the early 1900s when Olmsted first established the idea of linked parks. Over time this idea has evolved. More recently, it has been claimed that the greenway movement started around the late 1980s (Fabos, 2004). The term greenway was thought to be created by William Whyte in 1959, author of *Securing Open Space for America* (Little, 1990). The term green infrastructure became more prominent in literature after the President's Council on Sustainable Development selected green infrastructure as one of several areas that addressed sustainable community development in 1999. An importance of the term is that it acknowledges the need, not just want, for green infrastructure. "The name 'green infrastructure' implies something that we *must have* instead of green space that is something *nice to have*; it emphasizes the inter-connection of natural systems instead of separate parks and reaction sites; and it demands responsible intervention to save critical lands and actively practice conservation, regeneration and/or stewardship, instead of something that will take care of itself" (Walmsley, 2006, p. 257). Because the overlying concept has been around for over a century, many terms have been used to describe the idea such as ecological networks, wildlife corridors, and greenbelts. This has caused much of the literature to be uncoordinated, creating difficulties in research (Ahern, 1995). For this research, a great extent of the remaining literature was obtained by using more specific terms found within the concepts of green infrastructure and greenways.

Benefits of green infrastructure

There are three common benefits associated with green infrastructure: ecosystem health, human health, and protection of cultural resources (Fabos, 2004). From a wider perspective these three benefits can fit into the three components of sustainability: environmental, social, and economical. Some research has been conducted using these three characteristics as a basis for analyzing green infrastructure. Environmental, social, and economical benefits will be discussed in the following sections, with the idea that green infrastructure is also closely associated with terms such as parks, open space, trails, and nature.

Environmental

The principles of green infrastructure alone suggest that implementation of such networks is beneficial to the environment. Conservation and connectivity through green infrastructure attempts to preserve important ecological functions and processes while counteracting the harmful effects of urbanization, sprawl, and development. Unfortunately, there is limited primary literature addressing the direct influence of green infrastructure on the environment. Rather, most primary literature is written with broader concepts in mind, such as the impact of stream buffers on water quality and the effect of corridors on biodiversity. The two commonly cited environmental impacts from green infrastructure are preservation of habitat and assistance in stormwater management (Ahern 1995; Benedict & McMahon, 2006). Table 2.1 describes the primary environmental benefits found from the literature review.

Table 2.1 Primary Environmental Benefits of Green Infrastructure

Findings	Area Investigated	Method	Study
Ecological network plans provide improvement in ecological systems	Phoenix, Arizona	Patch content, corridor content, and network structure analysis	Cook 2002
Local conservation action, such as greenways, are essential for addressing biodiversity in urban areas	Washington D.C. (Cameron Run Watershed)	Landscape characterization, land cover/habitat analysis, policy and program analysis, regional greenway analysis	Bryant 2006
Riparian forests adjacent to 'receiving waters' beneficial for nutrient removal and reduction of diffuse-source pollution	Maryland (Rhode River drainage basin)	Quantitative nutrient analysis	Peterjohn and Correll (1984)

In a study conducted by Cook (2002), it was found that by implementing a plan for open space with an emphasis on ecological networks, a significant increase in ecological value was created. These ecological values encompassed a range of components which included patch and corridor size, diversity, and naturalness. This idea provides a general overview of how green infrastructure plans can affect the broader ecological system.

Bryant addressed this view in a more specific light through discussion of habitat loss and its affect on biodiversity. Since green infrastructure is striving to preserve lands in a natural state, this also means providing sufficient habitat for flora and fauna, therefore maintaining biodiversity. Bryant (2006) states that habitat loss is the greatest threat to biodiversity. The second greatest threat is the invasion of alien species. This is particularly important because biodiversity can provide, not only, a diverse array of species, but also resources for people such as food, medicine, and shelter (Benedict & McMahon, 2006). After a study conducted for the

Cameron Run Watershed in Washington, D.C., it was found that in urban areas, greenways are essential for addressing biodiversity (Bryant, 2006).

Rosenburg et al. (1997) go further and address the idea of corridors, or habitat patches. While development can often fragment habitats, corridors can keep them connected and can often provide more benefits than just the movement of species. In addition to species movement, habitat patches, corridors, and urban greenways, especially along streams, can provide benefits such as adequate and diverse habitat, lower sedimentation and erosion, and a means for more educational opportunities (Rosenburg et al., 1997). This could be important, not only to educate people about biodiversity, but also to educate people about green infrastructure.

The second most commonly cited benefit of green infrastructure is its impact on stormwater management. Ahearn (2005) identifies several different greenway typologies, one of them being water resource related, which includes three activities: protection, restoration, and management. By providing open, undeveloped space, green infrastructure is able to filter water in an efficient manner. A study, conducted by Peterjohn & Correll (1984), identified riparian forests along stream corridors as being beneficial to water quality due to the process of removing excess nutrients and pollutants, which can be harmful in large quantities. These excess nutrients and pollutants can come from areas such as fertilizer for agriculture and runoff from road systems. The open spaces that filter these pollutants are indispensable for protecting water quality.

In addition to being a natural water filter, green infrastructure can be used as a method for flood mitigation. Forests and wetlands are especially effective at collecting rainfall, without increasing sedimentation and erosion (Benedict & McMahon, 2006). Scientists at the Centre for Ecology and Hydrology in Bangor, England found that "woodland was 60 times more effective

at absorbing water than soil on grazed land" (Benedict & McMahon, 2006, p. 66). This fact highlights the importance of the need to maintain and preserve natural amenities, such as trees. Green infrastructure planning provides the means to preserve these amenities.

Social

Social impacts associated with green infrastructure address two ideas commonly seen in literature. The first is the idea that nature has a significant impact on human well-being. The second addresses the idea that green infrastructure, used recreationally, can yield health benefits associated with physical activity. Table 2.2 describes the primary social benefits found from the literature review.

Table 2.2 Primary Social Benefits of Green Infrastructure

Study	*Area Investigated*	*Method*	*Findings*
Open space enhances quality of life though variety, sociability, and cultural diversity	London Borough of Greenwich	Qualitative: Discussion groups, surveys, interviews	Burgess, Harrison, & Limb (1988)
Experience of nature in urban environment is source of positive feeling and beneficial services	Amsterdam	Qualitative: Surveys	Chiesure (2003)
Nature has a vital role in human health and well-being	N/A	Literature Review	Maller, Townsend, Pyror, Et. Al (2005)
Mixed associations with physical activity and parks or recreation variable; Increased physical activity with proximity to parks or recreation	N/A	Literature Review	Kaczynski & Henderson (2007)
Park features may have significant implications for physical activity; trail have strongest relationship with park use for physical activity	Ontario, Canada	Quantitative: data collection, logistic regression	Kaczynski, Potwarka, & Saelens (2008)

Burgess, Harrison, & Limb (1988) used the Greenwich Open Space Project in London to assess the value of open space, particularly in an urban setting, from residents' perspectives. From discussion and a survey, four main themes were identified: the importance of sensory contact with nature, the social and cultural meaning associated with open space, the perceived dangers of urban open space, and "everyday realities" of open space such as management, lack of diversity and variety (Burgess, Harrison, & Limb, 1988, p. 456). The authors state that the most prominent theme from the four groups was the personal fulfillment experienced from the "sensuous pleasure of being outside in open spaces" (p. 460). Many of the participants described experiencing nature as a way to escape, as well as a way to socialize. It was determined that people like spaces in which a diverse range of social and physical activity can occur (Burgess, Harrison, & Limb, 1988). These ideas all relate back to green infrastructure because they stress the importance of nature and diversity within a natural setting to better enhance a person's quality of life and well being.

Similarly to the previous study, key themes and values associated with nature were found through a survey conducted by Chiesure (2003). It was found that the majority of people choose to visit parks because it is a way to relax and be in nature; which is greatly associated with restorative and spiritual emotional dimensions (Chiesure, 2003).   Maller et al. (2005) also addressed the importance of nature for a person's well being. The authors state that humans use nature not only for material needs, but also for "psychological, emotional and spiritual needs" (p. 47). Through an extensive literature review, Maller et al. (2005) concluded that contact with nature provided numerous health benefits including lower blood pressure and cholesterol, less stress, and a positive attitude. The authors concluded that parks should be an essential health resource in preventing diseases in urban areas.

In addition to parks and nature providing benefits to the well-being of those who use them, parks and open space also provide benefits in terms of physical activity. "Physical inactivity has consistently been linked to greater obesity prevalence and numerous related chronic diseases" (Kaczynski, Potwarka & Saelens, 2008, p. 1451). In this study, it was found that parks with more facilities and amenities were more likely to be used for physical activity. Also, facilities such as paved trails were 26 times more likely to be used for physical activity (Kaczynski et al., 2008). This is significant for green infrastructure systems which can commonly incorporate such trails.

In a complete literature review, Kacynski & Henderson (2007) found a variety of results, identifying 50 studies that connected locations and settings of parks with physical activity. The findings highlight their varying results. The authors found no strong results when comparing the association between proximity to park spaces and physical activity. However, combining all the variables, more positive and mixed associations were made than no significant associations. 20 studies, out of the 50 total, reported positive associations between physical activity and parks or recreation settings, while another 20 studies reported mixed findings. Trails, parks, and open space were studied most often. Of these 27 studies specific to location, 16 of them found positive associations with physical activity (Kacynski & Henderson, 2007). More often than not, areas included in green infrastructure, such as trails, parks, and open space provide a means for people to be physical active.

It is evident that an increase in physical activity will result in increased health. Logically, parks, trails, and open space should increase physical activity because these spaces provide alternate travelling methods as well as places to play sports, walk, and run. For the most part, studies have verified this assumption. In addition to physical health, green infrastructure is also

beneficial to human health, providing a way for people to "escape" from the stresses of the working world. To add to both the physical and mental health amenities, green infrastructure also provides areas for which people can interact with each other on a social level. From these findings, green infrastructure can be found as a mechanism for providing numerous social benefits, ensuring a higher quality of life for residents who access and enjoy them.

Economical

There is an enormous amount of literature identifying the economic benefits parks, open space, and greenways provide to property values. Most studies employed the hedonic pricing model as the methodology for determining impact of parks, open space, and greenways on land values. The method is developed from the idea that property, in particular, residential property, is made of many characteristics. All of the characteristics have some impact on the value of the good. Particularly important to this idea is the fact that environmental qualities, such as parks, open space, and greenways can be considered one the characteristics that influence value. Table 2.3 describes the primary economical benefits found from the literature review.

Table 2.3 Primary Economical Benefits Studies of Green Infrastructure

Study	*Area Investigated*	*Method*	*Findings*
Distance from greenbelt has a negative impact on price of residential property	Boulder, CO	Hedonic Pricing Model	Correll, Lillydahl, and Singell (1978)
Adjacency to greenbelt creates property value premiums in two of three neighborhoods	Austin, TX	Hedonic Pricing Model	Nicholl & Crompton (2005)
Urban recreation park acres increase nearby property values	Roanoke, VA	Hedonic Pricing Model	Poudyal, Hodges & Merrett (2008)
"Permanent" open space increases residential land values 3 times more than "developable" open space	Howard County, MD	Hedonic Pricing Model	Geoghegan (2002)
Open space valued for prohibiting development rather than other benefits	Central Maryland	Hedonic Pricing Model	Irwin (2002)

Correll, Lillydahl and Singell (1978) conducted one of the first studies which examined the impact of greenways on property values. The study focused on residential properties found within 3,200 feet from three greenbelts located in Boulder, CO, and found that property values decreased by an average of $4.20 for every foot of distance from a greenbelt. The author concluded with policy suggestions stating that the relationship between greenbelts and an increase in property values is dependent on how developers and planners integrate access to this amenity in a neighborhood (Correll, Lillydahl, & Singell, 1978).

Nichols and Crompton (2005) conducted a similar study with three neighborhoods (Barton, Lost Creek, and Travis areas) in Austin, TX. The impact of the greenbelt for the Barton area was very significant; resulting in a $44,332 rise in property value. The Lost Creek area saw a price fall of $3.97 a foot with distance to entrance of closest greenbelt. Lastly, the Travis area experienced a significant increase of $14,777 on sales price. Similar to policy suggestions made by Correll, Lillydahl & Singell, emphasizing the importance of how greenways are implemented;

developments in these neighborhoods were made after greenways had been put into place, possibly contributing to the high land values associated. These results are important because they clearly express the premiums associated with adjacency or distance of greenways to properties (Nichols & Crompton, 2005).

Poudyal, Hodges, and Merrett (2008) conducted a study that addressed a similar but unique question of how park size influences adjacent property values and welfare of a society. The authors found that an increase in park size by 100 ft^2 equated to an approximate increase of $80 in houses nearby. From the first hedonic model employed, it was found that both nearness and size of urban parks had a small but significant positive impact on property values, and that as property values increase, demand for park space does as well. Using the second stage hedonic model, the authors identified how parks increase the welfare of a society finding that "increasing the current average size of the urban recreation park (35.12 acres) in the city by 20% (42.15 acres) resulted in an increase in consumer surplus of $160 per household" (Poudyal, Hodges, & Merret, 2008, p. 982). This finding shows that homeowners could be more willing to pay for amenities such as neighborhood parks and "can establish cooperative funds to establish new parks or expand existing ones" (Poudyal, Hodges, & Merret, p. 982). This idea proves interesting, especially concerning the importance of finding and sustaining funding for green infrastructure.

Geoghegan (2002) and Irwin (2002) take a different approach in quantifying the value of green infrastructure, by looking at the economic values of different types of open space. Geoghegan (2002) specifically looked at residential location choice and the difference between "permanent" and "developable" open space. Permanent open space is represented by land that often has been protected through conservation easements, meaning the development rights have

been sold. Developable open space is often privately owned, with the ability to sell and develop. Geoghegan found that permanent and developable permanent space produce positive coefficients in terms of changing property value. The study concluded that permanent open space is valued more than developable open space because residents are willing to pay a larger amount to live near permanent open space (Geoghegan, 2002).

Irwin (2002) came to a similar conclusion, however also included the degree to which open space was valued for certain attributes versus not being developable.   Based on the assumption of resident's perceptions of open space, six classifications were made:

- Privately owned cropland
- Privately owned pastureland
- Privately owned forest
- Privately owned land protected from development
- Non-military open space owned by government
- Open space owned by military

After employing the hedonic model, Irwin found that preserved open space, safe from future development, held a high premium. Numerical values obtained for different types of open spaces varied. From one acre of land converted from pastureland to conservation land, an increase in residential value by $3,307 occurred. One acre conversion to non-military land, or land able to be used by the public, resulted in a $994 increase. However, converting land from pastureland to low density residential, commercial, or industrial; as well as a conversion of pastureland to forested land all decreased sales price of property. Irwin suggests that the data illustrates that the demand for preservation of open space is mostly encouraged due to the lack of development rather than particular types of the open space. This study reiterates the idea that

permanent open spaces have a higher value compared to developable open space, due to the fact permanent open space will remain undeveloped.

In addition to the economic benefits seen through residential property values, there are additional benefits that influence locations of commercial properties. Many businesses view proximity to parks, open space, and trails as a benefit. A survey given to CEO's in the mid-1990s cited quality of life of employees as the third most important factor in locating a business. Close proximity to recreation, parks and open space can provide quality of life enhancements (Benedict & McMahon, 2006). Another economic benefit produced by green infrastructure is one that can impact the economy of communities. Green infrastructure can boost tourism for outdoor recreational activities such as fishing, hunting, and watching wildlife. "Setting aside new wildlife and birding trails as part of a green infrastructure approach can help communities benefit economically from this growing nature-based industry" (Benedict & McMahon, 2006, p. 72).

In general, parks, greenways, and open space possess qualities that can influence the value of property. Through these various studies a wide variety of factors that influence property values can be understood. These factors address policy issues, the impact on property values before or after greenway implementation, and the higher value of permanent open space in comparison to developable open space.

Conclusions

Greenways and green infrastructure provide a variety of benefits to communities as well the people who use them. They promote biodiversity, improve water quality, and provide a mechanism for stormwater management. Greenways also provide many social benefits including the enhancement of mental and physical health. Implementing greenways in a community can

bring a variety of economic gains, including an increase in property values. To conclude, greenway planning is a method for creating many benefits in a community (Ahern, 1995). The following section will include a discussion on how such benefits can be achieved through implementation.

Implementation

"A plan is only as good as its implementation" (Leung, 2003, p. 26). This is particularly true for a concept that is not as well recognized, such as green infrastructure. Successful green infrastructure plans are often implemented in a variety of ways and can be difficult to accomplish (Jongman & Pungetti 2004; Schwarz, Flink, & Searns 1993). Bardach (1977) states that while creating good policies and programs for the public is hard to do on paper, it is harder to appeal to elected officials, and even harder to implement in such as way that satisfies all people (Jongman & Pungetti, 2004, p. 213).

In order to be successful, according to Washington D.C.'s Conservation fund, green infrastructure should be designed holistically, thought of strategically, publically planned and implemented, funded for initially, and serve as the guideline for conservation (Walmsley, 2006). Benedict and McMahon also identify ten similar principles (2006, p. 37):

- Connectivity is crucial
- Context is important
- Should be based upon sound science and land-use planning theory and practice
- Should be the framework for conservation and development
- Should be planned and protected prior to development
- A critical public investment that should have funding up front
- Should incorporate benefits to nature and people
- Respects the landowners and stakeholders needs

- Require making connection to activities within, and beyond, the community
- Requires long-term commitment

These principles are important to realize when preparing for implementation of green infrastructure. There has not been very much literature that identifies, in detail, the implementation process of greenways because many regional systems have been planned for recently, and implementation has just recently started (Jongman & Pungetti, 2004). Despite this lack in literature, one study delved into case studies and identified two critical factors concerning greenway implementation: creating greenways with multiple objectives in mind and creating organizations that are effective for implementing greenways (Jongman & Pungett, 2004, p. 214). It was found that successful projects tended to stem from multiple objectives that differ from the traditional concepts of parks and recreation. These objectives proved to be beneficial for several reasons including gaining political support for implementation. "Contemporary policies and incentives, for instance transportation, neighbourhood revitalization, or biodiversity protection…may enhance greenway network implementation" (Jongman & Pungett, 2004, p. 216).

The author also identified organization of institutions as having a profound effect on implementation, especially since the initiator of a greenway project is often not the only implementer. Because of regional greenways span in size and complexity, various numbers of partnerships will and should be created. It is these partnerships that often relate strongest with the complete implementation of a greenway (Jongman & Pungett, 2004). Stemming from this, the author identified three types of structure found when implementing greenways: centralized agency, regional organization empowering local levels, and subordinate regional agency. These three types of institutional structures carry different benefits and advantages. Centralized

authority can often accomplish faster, with a larger base of money. However, implementation can be difficult due to lack of interest at local levels. Regional organizations that empower local jurisdictions can increase coordination to aid leadership at the local level. However, this type of structure allows cooperation to be optional, often greatly delaying the implementation process. Lastly, subordinate regional agency are good for implementing smaller projects at the local level, but often can lead to a lack of joint vision between other jurisdictions (Jongman & Pungett, 2004).

In addition to objectives and organization structure, there are other factors that affect implementation including "wealth, environmental attitudes, administrative capacity, resident's attachment to place and social capital" (Jongman & Pungett, 2004, p. 220). These issues can be further addressed in an implementation process that strives to build public support, gain funding, and maintain and sustain greenway objectives (Schwarz, Flink, & Searns, 1993). Much can be learned through individual case studies that identify both repetitive and unique happenings through the implementation process of green infrastructure

Learning from Stories

Because of the increasing popularity of green infrastructure within the last two decades, research on implementing green infrastructure plans is constantly evolving. In order to grasp a better idea of how such plans can be accomplished successfully, "stories" from key personnel provide firsthand knowledge for success. Some suggest that knowledge from experience, often told in stories, can provide rationality to future decisions. Stories are a main source of information and planners learn far more from these stories than "scientific experiments" (Forester, 1999, p. 37). With this information, planners are then able to make practical judgments, a rationality based on good information, knowledge and experience (Forester, 1999).

For this reason, MetroGreen is a good case study from which to obtain those stories and useful knowledge.

MetroGreen

MetroGreen is a regional greenway action plan for metropolitan Kansas City (Appendix A). The plan has roots dating back to George Kessler's parks and greenways plan in 1892, as well as the plan created in 1991 by the Prairie Gateway Chapter of the American Society of Landscape Architects. The MetroGreen plan was created in 2002 with the assistance of Mid-America Regional Council, incorporating many of the green infrastructure principles. This is a 100 year plan set to develop more than 1,000 miles of corridors. In order to accomplish the implementation of the plan, each corridor must undergo land protection, master planning, design development, construction, and maintenance. In general, the strategies to implement the plan are a joint public/private effort proving to elicit a variety of complexities. The following section discusses the history of MetroGreen in depth.

MetroGreen History

The history and development of the Kansas City area has played a significant role in the development of MetroGreen. Dating back to the 19th century, the Kansas City area became a center for activity because of the confluence of the Kansas and Missouri Rivers. This location lead way for people to explore and expand into the Western Frontier, such as Lewis and Clark, who travelled the Missouri River in 1804. The rivers also paved the way for many traders, such as French fur trappers. Due to this type of trading, the first permanent settlement in the area was created in 1821. To further expand the economic advantages of trade, the Sante Fe Trail was created that same year. The prospect of settling new lands and the search for gold led way to the

California Trail in the 1840's, which followed the same route as most of the Oregon Trail. The California and Oregon Trail brought in thousands of people to the Kansas City area. These historic trails have had a tremendous impact on the development of Kansas City as well as the United States (Figure 2.2). However, these are not the only trails that have impacted how MetroGreen has developed (MetroGreen, 2002).

Figure 2.2 Historic United States Trails
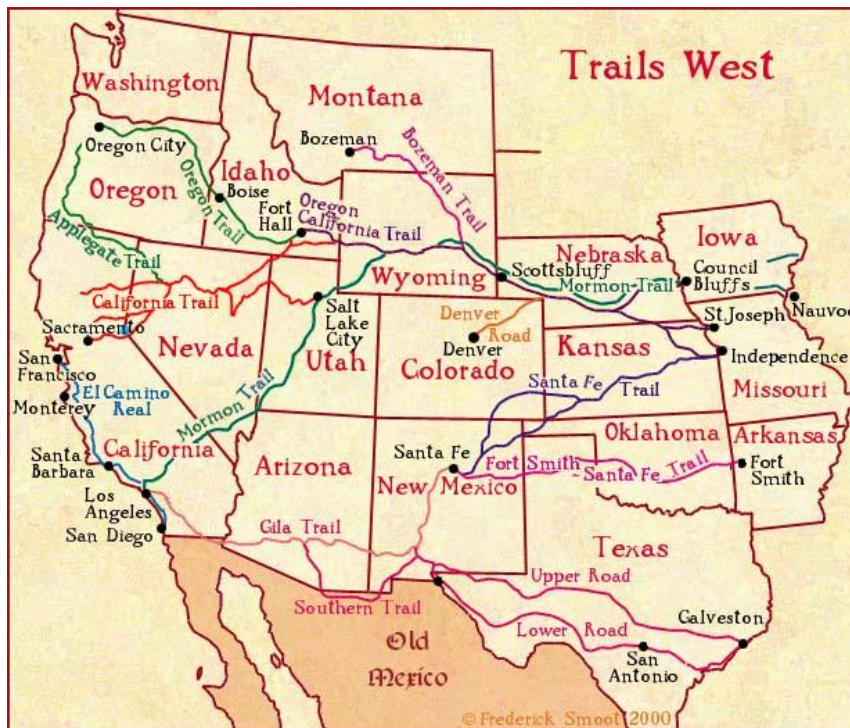
Source: The Most Important Historic Pioneer Trail

42 years after Kansas City's incorporation in 1850, a regional park plan was created by George Kessler with the help of August Meyer, emphasizing the importance of implementing a network of park space and boulevards within the City (MetroGreen, 2002). Kessler, a landscape architect by background, had previously worked with Fredrick Olmsted, known for his ideology based around the importance of connecting parks. The plan was adopted in 1893 by the Board of Park Commissioners, at a time when the City Beautiful Movement was in full swing. After

thousands of people streaming through the Kansas City area settled, the city was left blighted and ill-planned (George E. Kessler). The Kessler Plan sought strategies to reverse this, incorporating landscaping, architecture, and urban design to create a more beautiful Kansas City. Natural features and amenities were used to develop boulevards and park space. Boulevards were placed along ridges or waterways, and parks were situated in areas where development could not occur (MetroGreen, 2002). In less than 30 years, the plan was fully implemented. The building of new parks and boulevards guided the way for the cities residential and commercial growth. The following list includes the key themes of the plan (MetroGreen, 2002, p. 6-7):

- A network of parks and boulevards
- The joining of old and new neighborhoods to improve communities and property values
- A hierarchy of local parks throughout city
- Took into account future growth
- Addressed blight through urban renewal
- Geared towards residential needs
- Funded through benefit districts and special assessments
- Adopted by charter amendment allowing land to be bought or through donation

Kessler's Plan proves to have had a long lasting impact on the development of park systems within the Kansas City area, which can be seen through the MetroGreen Plan. Much of MetroGreen's present day influence comes from the 1991 American Society of Landscape Architect's Vision Plan, which was presented in Kansas City during the ASLA National Conference. This plan expanded upon Kessler's, by incorporating suburban areas with an inner 90 mile greenway loop and an outer 140 mile greenway loop that used natural waterways and

park space. In addition, it also identified important areas to utilize, such as open space in rural areas and cultural features of a community (MetroGreen, 2002).

Key Partnerships

The 1991 ASLA Vision Plan required that a future master plan be created which would provide more detail and be able to be circulated to a variety of stakeholders. This initiative was supported by the Mid-America Regional Council, which has been proactive working with this plan, organizing the creation of the current MetroGreen Plan in 2002. MARC is a non-profit association which supports regional collaboration across 2 states, 9 counties, and 120 cities in the Kansas City area to ensure a high quality of life for all who reside in the community (Mid-America Regional Council).

In 2001, the MetroGreen Initiative began, with the help of MARC, Greenways Incorporate, Patti Banks Associates, ETC/Leisure Vision, and the Trust for Public Land (MetroGreen, 2002). This team led several public workshops to receive citizen input as well as provide educational information about greenways. At these workshops, the public was able to view county maps for which they could make comments and sketch ideas. Community members were also given the chance to provide input through a formal survey taken throughout the Kansas City region. 1,247 surveys were taken and indicated a strong desire for benefits that the MetroGreen plan could provide. The survey results highlighted several ideas including the support and need for preserving water quality though methods such as buffers, the need or want for educational opportunities about water quality and flooding, and the desire for more places to walk and bike in the community (MetroGreen, 2002).

In addition to public workshops, two other groups were formed to provide input: MetroGreen Technical Advisory Committee and the MetroGreen Civic Leadership Board. The

Technical Advisory Committee was made up of members from planning municipalities and park and recreation agencies; those primarily responsible for implementation of greenways, while the MetroGreen Civic Alliance was made up of civic leaders within the private sector (MetroGreen, 2002). Through these various activities and groups, and the expansion of the Kessler and 1991 ALSA Vision, the MetroGreen Plan, a 100 year plan proposing a 1,144 mile greenway system, was created and finalized in 2002. In addition to this plan, MARC produced a Natural Resource Inventory in 2004, which delineated important natural resources and features for which environmental planning could be based from.

The key players when implementing the plan is largely placed upon the vast amount of municipalities located within a seven county area (Figure 2.3). A planner at MARC, stated that while this is a regional plan, it is implemented at the local level, which means the community needs to buy into it and provide funding. MARC is charged with providing information and advocacy to municipalities that support the implementation of these greenways. This can be seen through publications, such as the Annual Update, written by MARC, and the biannual MetroGreen Forum, which provides a venue for topics of interests to be presented and where stakeholders can share and spread information.

Figure 2.3 Seven County MetroGreen Area
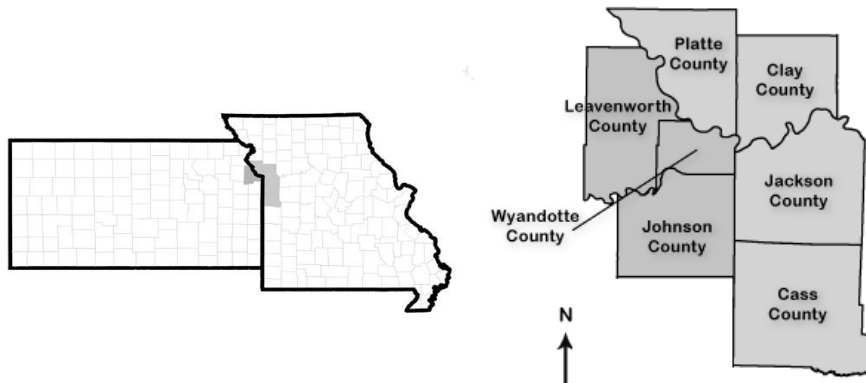
Source: (Briechle, 2009)

MetroGreen Goals and Objectives

The goal of the MetroGreen plan is to preserve the natural landscape of the Kansas City area while providing guidance to the differing interest of land development and land conservation in order to form an interconnected greenways system. Similarly, the MetroGreen Plan lays out seven goals for which it wishes to accomplish (MetroGreen, 2002, Chapter 1 p.8-11):

- Preserve and protect stream corridors through the metropolitan area
- Link people to outdoor resources close to where they live and work
- Link MetroGreen corridors to on-road bicycle and pedestrian facilities to create an interconnected alternative transportation network for non-motorized use
- Provide opportunities for Kansas Citians to learn about the region's natural landscapes and celebrate their heritage through interpretive programs and cultural facilities located within MetroGreen corridors
- Protect the native habitat of plants and animals throughout the Metro region

- Implement the vision of a metropolitan greenspace system first envisioned by George Kessler in 1893, and as articulated in 1991 by the American Society of Landscape Architects
- Make MetroGreen an integral part of a healthy and vibrant economy

In essence, the goal of MetroGreen is to create a system of greenspace that allows the environment to benefit while still enhancing the quality of life for community members. The objectives stated with these goals are a good means for basing progress, as the implementation process can be quite difficult.

Implementation

Two common hardships at the regional level for implementing a greenway are funding and the multijurisdictional nature of the plan. In order to implement MetroGreen successfully, there needs to be one or several organizations willing to do a multitude of activities including promoting development, educating citizens, searching for funding, organizing events, and facilitating the collaboration of multiple jurisdiction (MetroGreen, 2002). MARC currently serves as this organization, providing support and promoting advocacy throughout the region. In addition, local municipalities such as counties and cities need to possess a motivated and proactive approach if greenways are wanted to be successfully completed.

To evaluate which trails should be developed and in what order, a priority system was created. In total 16 priority corridors were created, each falling under one of the following categories: Stream and river, roadway, or abandoned rail. The majority, 57%, of the MetroGreen priority corridors are waterways, with roadway corridors making up 30%, and abandoned trails accounting for 13% of the system (Mid-America Regional Council). These trails are then classified as Priority 1, 2, or 3, to determine which should be developed first. Priority 1 trails

indicate that funding is available to acquire land, design, and develop. Priority 2 trails are areas that have not been funded, but because of public and local government input, they have been identified as trails important to develop in the next 5 to 15 years. Lastly, Priority 3 areas are those to be developed in 15 to 25 years to finish the complete greenway systems (MetroGreen, 2002). There are a variety of strategies for ensuring implementation. Key methods for funding greenway planning and implementation include regulatory and voluntary initiatives, such as land dedications and easements; local funding through mechanisms such as taxes and development fees; and state and federal funding. A more extensive list can be viewed in Appendix B (Briechle, 2009).

With much support in place, such as a plan, framework, and an organization willing to carry out the plan, much of the hardship of implementation comes from funding. MARC has received funding from various sources including philanthropic support from Hall Family Foundation and William T. Kemper Foundation, grants from the U.S. Environmental Protection Agency, Grad Harris Philanthropic Fund of the Greater Kansas City Community Foundation, and the Missouri Department of Natural Resources (Briechle, 2009). For development of trails done at the local level, similar funds can be used; however, it is important to obtain long-term funding. The ability of municipalities to obtain funding depends on "taxing capacity, budgetary resources, voter preferences and the political will of the governing body" (MetroGreen, 2002, p. 50). These funding opportunities range from special districts, taxes, and fees, to donations of land. Each of these funding options proves to be different in difficulty to implement, as well as the variable in the amount of money accrued. However, in general, funding options should be based upon the needs of a community and take full advantage of local resources (MetroGreen, 2002).

Connections to Green Infrastructure Principles

With the background of history, goals, objectives, and implementation factors of the MetroGreen Plan, it is important to make connections back to the underlying theme, green infrastructure. In order to do so, green infrastructure principles mentioned earlier in the report will be associated with MetroGreen (Table 2.4)

Table 2.4 Green Infrastructure Connections

Green Infrastructure Principles	*MetroGreen Connections*
Connectivity is crucial	Plan links greenways through identification of priority corridors
Context is important	Establishment of the Natural Resource Inventory from which environmental data is obtained and MetroGreen in based upon
Based upon sound science and land use planning theory and practice	
Framework for conservation and development	Plan has roots dating back to late 19th century influencing development; utilizes NRI, which provides good framework for conservation and development
Planned and protected prior to development	Successful at protecting a significant amount of undeveloped stream and river corridors
Public investment funded up front	Plan identifies funding sources, several municipalities successful at obtaining dedicated funding
Incorporate benefits to nature and people	Plan seeks to link people and community amenities together while protecting environmentally sensitive areas
Respect landowner and stakeholder's needs	Plan offers support to municipalities to educate and engage landowners and stakeholders
Making connections to activities within, and beyond, the community	Plan is regionally focused, based throughout the Metropolitan Kansas City area, but also identifying state wide connections
Require long-term commitment	Plan is set as a 100 year plan, addressing current as well as future needs

Firstly, connectivity is essential in green infrastructure. It is clear that MetroGreen accomplishes this goal due to the linking of greenways being an underlying principle for the MetroGreen plan. The ability of MetroGreen to connect people to areas of interest yields a system that must be highly connected. To view MetroGreen's connected system, please refer to

Appendix A. The 16 priority corridors identified in the plan allow regional connections to be made through a variety of trail types.

The next two principles are very similar in the context of MetroGreen: context matters and sound science and land-use planning theory should be used. These principles refer to the dynamic nature of regional greenway system. Specifically, those who are planning for green infrastructure should be cognizant of the larger picture, such as how natural resources in one area interact with the surrounding areas. MARC accomplishes this, using sound science, through the Natural Resource Inventory. This provided the "scientific" information about the areas water resources as well as upland resources (i.e. vegetation, slope), which lead way to a conservation plan. MetroGreen can greatly benefit from this information, especially when it is connected with recreational opportunities (Briechle 2009). In addition to the NRI in 2004, the rich history of the MetroGreen Plan, dating back to Kessler's Plan, supports these principles as well. Kessler left a legacy concerning his land use planning that is still seen today. This historical expertise and experience is beneficial in creating a unique and successful plan.

The forth principle provides that green infrastructure should be the framework for conservation and development. As stated earlier, the Kessler Plan had a strong impact on development in the late 19th century and MetroGreen carries this same quality. "The NRI served as the framework for conservation planning and restoration by indicating locations for commercial, residential, and industrial development, examining transportation corridors, and assessing how conservation interests can enhance the community's development potential" (Briechle, 2009, p. 12).

The fifth principle states that green infrastructure should be planned and protected prior to development. MetroGreen has been very proactive in encouraging municipalities to protect

sensitive environmental areas, such as stream corridors. If these areas are identified early, as the MetroGreen Plan is doing, then development will be directed towards other areas. By December 2007, 9,700 acres of priority greenways, 8,300 acres of "blueways", and 8,000 acres through stream setback ordinances, have all been protected (Briechle, 2009). This step is very significant in protecting lands from potential development.

The sixth principle states that green infrastructure needs to be a critical public investment with funding shown up front. MetroGreen has seen some success at identifying money to assist with the planning process. In addition, MARC is familiar with what funding opportunities exist within the region. However, a large portion of up front funding comes from the local municipalities. As later discussed, some of these municipalities have been successful in obtaining this dedicated funding.

MetroGreen does incorporate the seventh principle of providing benefits to both nature and people. In essence, people and nature are at the core of the plan. It is a way to link people and communities together while still preserving, conserving, and revitalizing land that has been identified as important to an ecosystem. Streams, another core principle of the plan, possess characteristics appealing to people and as well as provide a diverse habitat for which nature can flourish.

The next principle deals with respecting the right of landowners and stakeholders needs. MARC in relation to MetroGreen provides a system of support for which local municipalities can use. This support can then help municipalities engage in thoughtful communication with the public, such as landowners and stakeholders, in order to take into account all perspectives, needs, and wants of the community.

Requiring connections to be made within and beyond the community is another green infrastructure principle. MetroGreen does attempt to make connections with in a community. In addition, large projects are occurring too, such as the Katy trail which is a rails-to-trails project spanning through much of Missouri.

Lastly, green infrastructure requires long-term commitment. This can be seen through both the plan as well as the implementation of the plan. MetroGreen, in some form, has been around for 20 years. Still, work is occurring on that plan, which perfectly showcases why it should be a long-term commitment. Also, greenways will not maintain themselves for the future. They require upkeep and maintenance. For this reason, MetroGreen is recognized as a 100 year plan.

Chapter 3 - Methodology

The MetroGreen plan was studied in this report as a whole, as well as locally, through two municipal jurisdictions within the MetroGreen plan, in order to find out what specific opportunities and constraints are created when implementing green infrastructure. In return, the unusual successes, hardships, and nuances found outside the confines of standard principals and practices of green infrastructure planning were assessed. Green infrastructure is important to a community's social, environmental, and economical success, and this report will provide beneficial information to those who wish to implement this crucial infrastructure within their community.

This report is designed as a qualitative case study. Qualitative research involves four different components, including "an emphasis on natural settings, a focus on interpretation and meaning, a focus on how the respondents make sense of their own circumstances, and the use of multiple tactics" (Groat and Wang, 2002, p. 176-177). The report employed qualitative research to allow for flexibility in conclusions, dependent on how key personnel perceived the successes and hardships of the MetroGreen plan. A case study also is employed to connect a real–life example, MetroGreen, with a broader idea, the evolution of green infrastructure planning. The research consisted of a theory building structure which includes explanatory and exploratory purposes (Yin, 2003). Largely, the research was exploratory, identifying successes, hardships, and nuances of green infrastructure planning based on experiences of MetroGreen implementation. Relative success is defined, in this case, based upon the level of implementation progress or sustained maintenance of the green infrastructure system.

Sample

MetroGreen was identified as a suitable case study for a couple reasons. Firstly, the regional span of the plan, over seven counties in the Kansas City Metropolitan Area, provides a framework for which other metropolitan areas can relate closely. Secondly, MetroGreen is located within a reasonable traveling distance, which eased the data collection process. Two municipalities within the MetroGreen area were chosen, Platte County and Lenexa, KS based upon preliminary conversations with Mid-America Regional Council staff. MARC is the primary agency supporting MetroGreen, and for this reason was used as the first contact for this research. Based on staff insight and experience working with municipalities within the seven county area, they were able to identify Lenexa, KS and Platte County, as examples of successful implementation of MetroGreen because they had exhibited measurable progress implementing the plan. Interviews with these municipalities and professional allowed for implementation of green infrastructure to be evaluated based upon their specific experiences concerning MetroGreen.

Strategy

After these municipalities were identified, the strategy to conduct the qualitative research was based upon grounded theory (Charmaz, 2006). Grounded theory provides a suitable strategy because the research question addresses ideas that have not been determined; therefore conclusions are created through the on-going process of research. Through semi-structured interviews with eight planners, Parks and Recreation employees, public administrators, and landscape architects that facilitate the planning and implementation of MetroGreen, their experiences concerning MetroGreen were recorded. A semi-structured interview was used to allow peoples' experiences to shape the interview (Appendix C). Two initial contacts for Platte

County and Lenexa, KS were identified by a planner at MARC. During interviews with these contacts, they were asked to identify key people that would be beneficial to the purpose of this research. This snowball sampling technique allowed 6 more professionals with experience implementing and/or planning MetroGreen (planners, Parks and Recreation employees, landscape architects, or public administrators) to be identified. This sampling technique was effective because it allowed key professionals to be identified by other professionals most familiar with MetroGreen implementation.

Coding and memoing was used to examine all interviews. Each interview was coded into key concepts that arose during conversation (See Table 4.1). A memo was written summarizing these key points after each interview (Appendix D). Interviewing stopped after key themes came close to, or reached saturation, meaning the key themes became repetitive. From the findings, which are later discussed, it is apparent that many of the themes from each interview were very similar and can be put into 3 categories: management, education, and funding. Once there was enough information obtained from the interviews about these categories, a good stopping point was created and a beginning for constructing conclusions was created. After all interviews took place, the formulated memos were analyzed. The compilation of these memos then provided the basis for formulating ideas about the unusual successes, hardships, and nuances that have occurred throughout the implementation process, and aided in the creation of policy recommendations (Charmaz, 2006).

At the end of this research, a clearer understanding of the implementation process for green infrastructure was documented. The success of implementing the MetroGreen Plan is largely dependent on municipalities' level of connection and partnerships to others in their region, funding sources, and public support and education. The identification of Platte County,

MO and Lenexa, KS provided unique examples for how the above factors were accomplished. These findings can inform professionals and community members about aspects of the green infrastructure implementation process that are not always found in current literature. With this information in hand, professionals and community members can learn from MetroGreen in order to better implement green infrastructure in their community.

Chapter 4 - Findings

This chapter provides the findings found through interviews with planners, Parks and Recreation employees, public administrators, and landscape architects involved in the planning and implementing of MetroGreen. The first section will focus on specific municipalities, Platte County, MO and Lenexa, KS, by providing examples of how implementation of MetroGreen is accomplished in each jurisdiction. The next section will provide information from interviews of other individuals whom have had experience in the MetroGreen planning process. Lastly, an identification of the main themes and lessons learned about the green infrastructure implementation process will be discussed.

Platte County, MO

Platte County is located in the Northwest portion of the 7-county MetroGreen Area (Figure 5.1). According to the 2010 U.S Census Bureau, the current population totals 89,322 people. It is projected to increase to 104,054 people by 2020, representing one of the higher rates of growth in comparison to surrounding counties (Platte County Parks and Recreation, 2009).

Figure 4.1 Platte County within the MetroGreen area
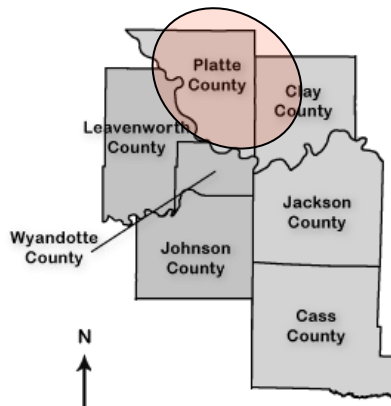
Source: Briechle, 2009

An initial Parks Master Plan of Platte County was created in 2000. From this plan, 880 acres of open space was acquired, 15 miles of trails were developed, various partnerships were made, and many grants and funding opportunities were utilized. In 2009, a master plan update was initiated to ensure that the community's needs and wants for recreational spaces were met. Three goals came out of this planning process including preserving natural resources, presenting opportunities for health and wellness, and providing safe recreational spaces for children. During this process a survey was done, finding that 73% of households had been to at least one park, trail, or recreational facility in Platte County within the last year. Walking and hiking trails were found to be visited the most and were also found to be the highest facility needed by households (Platte County Parks and Recreation, 2009).

Platte County's main funding source for ensuring the implementation of the Parks Master Plan is a one-half cent sales tax. This funding source was originally established in August of 2000 and renewed in 2009 for another ten years. It is this continual dedicated funding source that depicts how much residents of Platte County value parks and recreational opportunities.

In addition to the Parks Master Plan, Platte County, in conjunction with Clay County, MO, created the Northland Trails Vision Plan, a comprehensive trail system between the two counties. The goal of the plan is to guide a transportation system for pedestrians, bicyclists and equestrians between counties. With the implementation of this plan, mobility would increase, more recreational opportunities would be offered, additional environmental protection would be created, and the economy would benefit from increased community amenities and tourism (Clay County Economic Development Commission, 1998)

There are 4 main trails developed currently in Platte County: Prairie Creek Greenway, Missouri Riverfront Trail, Southern Platte Pass, and Weston Bluffs (Appendix E). All of these trails, with the update of the Master Plan in 2009, are expected to expand. Prairie Creek Greenway is located south of Platte City, MO and includes several prairie restoration areas that are burned on a rotational basis. Opening in 2006, the trail is currently 4 miles of paved surface and is planned to total 7.8 miles. The land acquired for the trail was made possible through partial funding by the Missouri Department of Natural Resources Recreation Trail Program grant and though the donation of land and construction by local developers (Platte County Parks).

The Missouri Riverfront Trail was developed, starting in Riverside, MO and extending for 3.25 miles along a levee across multiple jurisdictions. The completed trail will be 11 miles long, located along the Missouri River. Platte County, the City of Riverside, the City of Parkville, the Riverside/Quindaro Bend Levee District, and the U.S Army Corps of Engineers all worked together to accomplish the project. While a majority of the project was funded by the one-half cent sales tax, $100,000 dollars came from a Missouri state grant (Platte County Parks).

Southern Platte Pass serves as a 2 mile multi-modal transportation corridor along Highway 45. The trail connects two cities, Parkville and Kansas City, while serving as a

connector to 3 schools, 2 retail areas, and a community center. Because of this projects transportation emphasis, partial funding was received through the Federal Transportation Enhancement Fund administered by Missouri Department of Transportation (Platte County Parks).

Lastly, Weston Bluffs is a 3.25 mile gravel trail that follows the Missouri River and is adjacent to the Weston Bend State Park. Along this trail, there are 6 different educational displays used to showcase the Lewis and Clark expedition. Similar to the previous trails, Platte County partnered with the City of Weston and the Missouri Department of Natural Resources to complete this trail in 2004.

It is evident that for each of these projects many partnerships and a variety of funding sources were found. During an interview with two Platte County planners, more information was obtained about these projects, as well as how they perceive Platte County's strengths and hardships concerning implementation of greenways.

Platte County has used the MetroGreen plan through a number of ways. First and foremost, the county uses the MetroGreen plan as a general source to refer to concerning the various plans they have made in the past. In addition, Platte County uses support from MARC for things such as publicity for the plan, common signage, regional trail maps, and different funding options.

A general theme stemming from the interview with Platte County was public support. When discussing greenways, an employee of Platte County Parks and Recreation, emphasized that a huge reason why parks and trails have been successful is because of public support. "The citizens of the county really support the parks and trail program. They really do. That has given us the ability to build the trail system…and the renewal of the sales tax…So, tremendous amount

of support and energy is behind developing facilities like that in our County." When asked what creates a successful greenway plan, a citizen supported plan was the first suggested item. Further into the interview a similar idea was presented when talking about a smoother process of greenway implementation. "When we go to land owners, when we seek funding, when we work with elected officials; [community support] may make that process smoother. It may make it go faster if they already know about it before we come in to talk about one of those particular issues. You can't underestimate the power of public will."

As mentioned earlier, Platte County has created many partnerships through various trail projects. With this being said, it is not surprising that partnerships came up as another theme throughout the interview. These partnerships come in a variety of forms including elected officials, planning and zoning departments, cities, developers, and other counties. Platte County Parks and Recreation Department possesses a supportive partnership with the Platte County Planning and Zoning Department. This is seen through the adoption of the Northland Trails Vision and its connection with planning and zoning regulations in the county. "One of the great things about that plan is that it correlates with our Planning and Zoning Department. When there is a property, such as a greenway, and it is in County jurisdiction and correlates with the Plan, than the Subdivision Regulations require that a developer would show that trail on their development plan." This has lead to even greater partnerships in which developers will actually build portions of the trail, such as the case with the Prairie Creek Greenway. While the plan might match with County Zoning, areas located within cities do not possess the same Subdivision Regulations and Trail Plan that would give them the same tools to work with developers. Therefore, the Park and Recreation Department of Platte County believe more coordination with the cities would be beneficial when implementing the greenways.

40

In total, Platte County Parks and Recreation found that property acquisition was the hardest aspect of implementing greenways. Secondly, funding and political situations are often the next challenge. They state, however, most importantly "if we don't have civic engagement, the other three [factors] fail. With good civic engagement, the other three can come into place." It is evident that these statements are largely influenced by the successes Platte County has experienced, with a strong public support and dedicate funding for parks and trails.

Lenexa, KS

Lenexa, Kansas is located in the north central part of Johnson County (Figure 4.2). According to the 2010 U.S Census Bureau, Lenexa has a population of 48,190 people. The dynamic area continues to grow with its densest development located to the east of Interstate 435.

Figure 4.2 Lenexa, Kansas
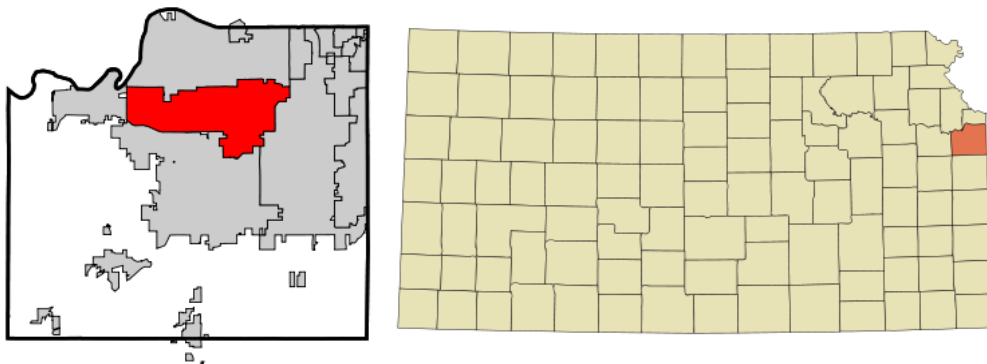
Source: Arykan, 2007

Unlike Platte County, Lenexa, KS is implementing a framework of greenways from a largely ecological perspective, concerned with stormwater management. A program initiated by the public works sector in 1998, named Rain to Recreation, is a stormwater management effort used to address flooding and water quality. This program came about due to two different

factors. First, Lenexa was experiencing localized flooding which was costing the City a substantial amount of money. Secondly, National Pollutant Discharge Elimination System (NPDES) Phase II was being acknowledged as something that would be implemented in the future, and the City would have to abide by those standards. Proactively, Lenexa began to view stormwater issues through a lens of how these issues could best be fixed to enhance their community. From a watershed management study, the City would save $25 million dollars by three actions: using a watershed based approach to stormwater management, prevention rather than reaction, and fewer hard infrastructures such as curbs, gutters, and pipes. The ultimate goals of the Rain to Recreation program are to limit flooding, protect water quality, restore the natural environment, and provide the public recreational and educational opportunities (National League of Cities). An 1/8 sales tax present from 2000- 2010, a stormwater utility fee from an annual tax created based off of impervious surface, and a development charge were used initially to fund large capital improvement projects such as Lake Mize and Lake Lenexa. Currently, most projects are funded and largely in maintenance mode, therefore funding options such as the sales tax are not needed and have expired.

Implementation of the program occurred at a variety of levels, one of them being through land use regulations. An erosion sediment control ordinance and a stream setback ordinance were implemented. Based upon interviews with a planner and public administrator from Lenexa, both in different divisions within the city, more detail and perspective was gained about the stream setback ordinance and Rain to Recreation program.

The stream setback ordinance was put into effect after Patti Banks, a design firm, produced a preliminary stream asset inventory. This inventory essentially ranked the level of environmental quality of each stream corridor. The ordinance requires developers west of

Interstate 435 to preserve a given amount of land around stream corridors. If the stream is identified in the Parks and Trail Plan (Appendix F), the developer can dedicate that corridor to the City in return for lower excise tax, a chance to take common property out of the responsibility of a Homeowner's Society, and a high quality of life amenity close to selling properties. Since the ordinance was driven by development, the implementation of trails tended to be piecemeal. Also, the greenways plan tended to be too general, making it difficult to know if trails and access to them were being developed in the right places. For this reason, the Lenexa Trail Alignment Analysis was created, providing a more specific plan to guide development of trails. "Most planning documents are pretty general. This is one of the more specific ones that I have seen. I think it is a really good tool for actually implementing what is a very general plan, through the planning system."

According to a planner in Lenexa, the biggest motivation for greenways in Lenexa is stormwater management. "In Lenexa, we really did a good job of selling the whole idea of 'by addressing stormwater runoff early you decrease flooding.' I think there's an interest in greenways in protecting people from flooding." Lenexa also does implement a wide variety civic engagement opportunities to increase the public's awareness and interest. These include celebrations such as Waterfest, storm drain marking events, rain garden classes, and a bi-monthly newsletter. For Lenexa, trails have been put on hold currently, because the city budget is not able to provide matching funds for grants. Despite this current lag in the economy, land will still be able to be preserved due to the ordinance, and when funds are present, trails can be developed.

During the interview, the complexity of how municipalities are divided was briefly mentioned. Lenexa has undergone some reorganization in the past. So, many planners and engineers were divided, placing some employees in Municipal Services while other employees

were place in the Community Development Department. Overlap in these areas can be seen in things like maintenance of trails, which creates a complicated web of responsibility. This can often make greenway implementation difficult because of the array of groups you need to identify with.

When asked about the lessons learned for Lenexa, a large portion of the response was about the stream setback ordinance. "I think we were able to demonstrate that it was going to benefit the public and the city, and that is not going to have a negative impact on development. So, I guess overcoming that perception that a stream setback ordinance negatively impacts development was a challenge." It was proven to be beneficial to the community in two ways. "First of all we already had one large RodRock development, where they [the developer] had kept lots back from the stream corridor and it pretty closely matched up with what we [the city] would have told them to do had the ordinance been in place already." The second way was by showing the city how much money could be saved, thus giving value to the ordinance.

When interviewing a public administrator from the Municipal Services in Lenexa, they thought that the Rain to Recreation program did not have a significant connection to MetroGreen. "As far as the MetroGreen program and how it relates to the Rain to Recreation program, there is some commonality, but not a lot. To me the MetroGreen program is more of a master planning effort…. Rain to Recreation really deals with more specific best management practices like bioretention swales and wetlands." Nevertheless, Municipal Services does a lot of data collecting and testing to record the effectiveness of best management practices concerning stormwater management.   While there are no general conclusions to be made about the effectiveness of Rain to Recreation due to the short time span of 4 years, data has been promising.

People on Board with MetroGreen

To provide an alternate view to specific municipalities' experiences, several planners and landscape architects involved in various stages of the planning process, such as during the ALSA update in 1991, the MetroGreen update in 2002, and the present happenings of MetroGreen, were interviewed.

A landscape architecture serving on the Community Assistance Team during the 1991 ASLA Vision gave MetroGreen an average score in terms of success, claiming that while some areas have been successful, others have not. Their definition of a successful greenway plan "isn't necessarily that you set aside a specific corridor of land, or an area for preservation. It is that a community is aware of it, appreciates it, and values it." Similar to above interviews, this idea of civic engagement, community appreciation, and public education proves to play a very significant role in the success of greenways in the mind of professionals. The landscape architect also mentioned the idea of MetroGreen being part of a larger whole "because it is more than just trails. It is about open space, connectivity, linking people to cultural, historical, and recreational assets in the city and region. And yes, trails are a way of doing that, but it is also about the benefits of open space that are not trail related, but that are experiential, as well as health impacts, and now that water quality is so much more of an issue, it has picked up that greenway aspect."

When speaking of lessons learned from MetroGreen, the landscape architect spoke of the need for a champion of sorts, such as a "Friend's of" organization. They suggest that if some sort of private group were to champion MetroGreen, the plan would have the resources to "negotiate for land, access, conservation easements, and actually do trail building." Overall, his

perspective emphasized the importance of community buy-in and partnership to the continual success of greenway implementation.

The next interviewee, a landscape architect, was part of the same process for the 1991 ASLA vision plan. Their concern with the implementation of MetroGreen stemmed from the difficulty of crossing over state, county, city, and political boundaries, as well as securing regional dedicated funding sources as other regional greenways have done. "When you look at other communities that have done something similar, that have really been successful implementing, there has been some kind of regional funding mechanism. We've never had that. A smaller, piece meal community or county, trying to design and build little portions is not going to be linked as a network without a bigger overall coordinated effort." To conclude, he mentioned the importance of political will and buy-in, suggesting that this is very hard to accomplish in a bi-state region.

Moving forward, the next person interviewed was highly involved in the 2002 MetroGreen update. When talking about the success of greenway plans, he talked about the discrepancy between what the public wants, and where municipalities typically put money. "From a public point of view, if you poll the general citizens, it [greenways] would poll very high, probably in the top three things that they would like to see. If you looked at it from a funding and priority level to build from the local agencies, I would say it is probably below number 10." To counteract this way of thinking, he thought that if greenways were part of a larger issue, such as health, than local agencies would be more apt to support and fund those endeavors. If a community could identify these larger issues, "the elected officials would see the tie of having these amenities in their communities."

Very similar to many of the interviews, a dedicated funding source was coined as the hardest issues to overcome. A citizen based advocacy group, he suggests is "the direction it needs to go." He mentioned that, while nothing was official, there is an organization forming currently that is trying to fill some of these missing links.

The last person interviewed is presently involved in the MetroGreen plan and had some interesting perspectives that summed up and made connections between much of the above findings. As many can conclude, there have been several themes or overarching issues that can be addressed including the need for dedicated funding, civic engagement and education, the relationship to politics, the need for extensive and comprehensive partnerships, and the idea that greenways should be looked at from more than just a parks and trail perspective.

During discussion, the interviewee agreed that the MetroGreen Plan has had 'modest' success. In areas such as Lenexa, and Platte County, implementation of the MetroGreen principles have gone above and beyond, but the lack of cohesiveness, and the lack of ability to retain the same development tools, slows down the whole process.

One large theme he brought out was the need to connect MetroGreen to broader concepts, such as green infrastructure and watershed management. "I think that general practice is that MetroGreen is still viewed as a parks deal and an amenity, rather than a fundamental infrastructure need, and it is prioritized as such in general terms." If MetroGreen were connected to issues such as watershed management, it would be more successful, such as the case with Lenexa. "So you look at the different ways people would considered greenways, and so maybe alternative transportation was one, or some sort of mobility kind of amenity would be another, or a green infrastructure thing. From the local government perspective, those work areas typically reside in very different places. It could be planning, public works, water, transportation,

depending on the particular local government in question, and how they are organized." This statement relates to complexities such as those formed by the reorganization of Lenexa. Also, during the interview it was mentioned that public works (municipal services) do not readily view MetroGreen as a primary strategy for stormwater management. While Lenexa has proved to be adapting this to some degree, there still might be a missing link connecting the idea that greenways and green infrastructure can also mean stormwater management. With that larger context in mind, regional greenway plans might have a better chance of being implemented more efficiently.

Lessons Learned

The following table summarizes the findings from each interview. All findings were compared and condensed into key themes.

Table 4.1 Interview Findings

Involvement with MetroGreen	*Findings*
Platte County (two parks and recreation employees)	Partnership, funding, and public support key for successful implementation
Lenexa, KS (planner and public administrator)	Civic engagement and broad ecological goals, such as stormwater management are important; multiple division within city can create hardship of viewing common goal
1991 ASLA Vision (landscape architect)	MetroGreen has had average success; concept needs to be connect to broader goals; champion organization needs to be formed
1991 ASLA Vision (landscape architect)	Largest difficulty is crossing over many boundaries; dedicated funding is essential for success; Coordination and political buy-in is needed
2002 MetroGreen Plan Update	Successful implementation requires connection to a larger issue such as health; funding is important; there is a need for a citizen based advocacy group
Current Planner	MetroGreen has had modest success due to lack of cohesiveness; concept should be connected to broader goals such as watershed management

There are five major themes that can be concluded from these interviews about the implementation of MetroGreen.

In the long term, it is viewed as beneficial to operate a greenway system under the leadership of a civic-advisory group, private entity, or non-profit organization.

Many interviews mentioned this idea of creating another group for which to promote MetroGreen. While MARC is serving as a part of this role currently, another entity created that was solely focused on greenway and green infrastructure implementation could lead to more success. This would allow more focus to be put on other aspects of a successful implementation process such as funding, civic engagement and education.

To implement a greenway system efficiently and cohesively, regional dedicated funding is crucial.

MetroGreen is the perfect case study of why regional dedicated funding is so important. A general conclusion was made from some of the interviews that MetroGreen has had mild success due to lack of cohesiveness. This lack of cohesiveness is partly influenced by a lack of funding. Platte County, for example, has been successful at obtaining funding, therefore being very proactive implementing greenways. Green infrastructure requires funding. While there are a variety of funding sources, through state and federal funds, dedicated funding at the local level is essential at minimum. With a regional funding source, more coordination could occur, creating a more connected and timely implemented greenway system.

Greenways are typically more accepted when they relate to a broader societal issue or goal such as stormwater management or health.

Two broader societal issues were mentioned throughout several interviews: health and watershed management. When people think of greenways, primarily the first image that comes to mind is trails. Unfortunately, this narrow view of greenways is often viewed at a lower priority than other quality of life factors, such as emergency services. For this reason, green infrastructure and greenways needs to be tied closer to issues that resonate strongly with elected officials and the public. Connecting health and watershed management with the MetroGreen plan is an effective way to attract more significant attention to the implementation of this system.

Partnerships between planners, developers, cities, counties, and citizens are crucial to the creation of a system with multiple linkages.

In a regional system, collaboration between all levels is a must. This allows professionals, stakeholders, and the public to determine the best solutions for creating a system that will benefit both citizens and the environment. Without collaboration, the system would be disjointed. Through many interviews, partnerships were seen at both the local level and regional level, which MARC plays a significant role in organizing.

With overwhelming citizen support, a great deal can be accomplished.

This conclusion largely stems from interviews with Platte County, but can be seen in Lenexa as well. When public are in support of something, this usually means that they value it. When something is valued, such as green infrastructure, more thought, interest, and investment is going to be put into it. So, things such as a dedicated funding sources are more likely to occur,

ensuring implementation. In addition, educating the public so they are aware of the benefits associated with green infrastructure can enhance the support it receives. Lenexa exemplifies this idea by providing numerous educational opportunities to citizens in order for them to understand how greenways affect stormwater and flooding.

Chapter 5 - Conclusions

The implementation of greenways and green infrastructure provide a community with a mechanism to preserve and protect environmentally sensitive lands while still appealing to the interests of people residing within a community. One important conclusion made from this report is the need to apply green infrastructure principles to implementation. Informing the public that greenways can be associated with larger issues is one way to continue this application.

There is one conclusion made from MetroGreen that is fairly similar to findings from the literature. One study mentioned, concluded that connecting greenways to multiple objectives and creating effective organizations, were two critical factors in implementing greenways (Johgman & Pungett, 2004). This conclusion can be made from MetroGreen as well. Several interviews identified the need to connect the plan to other issues. Lenexa, KS has done so, through the Rain to Recreation, by stressing stormwater management with a recreational approach. Other interviews stressed the importance of a champion for MetroGreen, which would aid in the implementation, as a collective whole, through difficult processes such as funding and land acquisition. Largely, these two issues are why those interviewed saw MetroGreen as having modest success. Additionally, these two factors can lead way to support other lessons learned such as civic education, supportive partnerships, and regional dedicated funding. When these elements are seen within communities, such as that of Platte County, MO, and Lenexa, KS, success of greenway implementation is evident.

Other regional greenways are beneficial to look at and learn from as well. They offer different perspectives, programs, and issues that perhaps MetroGreen never experienced.

Through interviews, several other plans were identified, including those in Springfield, MO and St. Louis, MO. When talking about these plans with certain participants, they were seen as being very successful. The one main element different from MetroGreen was the ability to create an effective organization to champion the plan. In Springfield, MO, Ozark Greenways Incorporated was used to support Springfield's Parks, Open Space, and Greenways Plan. The Great River Greenway District was created in 2000 to support greenways in St. Louis, MO. Both of these organizations have been successful at obtaining funding, which in large part leads to more implementation. In addition, they provide opportunities to reach out to the public. Looking further into both of these regional greenway plans might provide a well rounded and comprehensive outlook on greenways and green infrastructure implementation.

In addition to studying different regional greenway plans, there are several other areas of regional green infrastructure that would be interesting to study. The first is management of a green infrastructure plan. There are a variety of ways this can be done; through organizations such as MARC and Greenways Incorporated in Springfield, MO; land trusts; civic advisory groups; etc. It would be beneficial to look into these groups, or identify others, and analyze what management techniques work the best when dealing with regional green infrastructure.

Lastly, it could be beneficial to look at County and City relationships in terms of successful implementation of green infrastructure. Because of Platte County's leadership, much progress has been made. However, how does this affect the cities in Platte County? Similarly, Johnson County has been very active in developing trails. So, how do they successfully implement green infrastructure county wide while communicating with cities? Perhaps these county/city relationships are the key to implementing systems more efficiently.

Policy Recommendations

Three main recommendations about how to implement green infrastructure can be made from the findings of this report: management, education, and funding.

Management is a significant indicator of the amount of interest there is for implementing green infrastructure. Largely, in order to have substantial success, there needs to be the formation of a centralized agency, made of citizens, professionals, and stakeholders that are dedicated to champion the cause. With this group of people, a long range plan can be created for a regional area, and implementation can begin to occur. In addition to this organization, cities and counties need to be an active part of the process. Regional plans can be vague in nature; therefore implementing specific county green infrastructure plans could provide more direction essential to implementation. The following recommendations, addressing education and funding, are geared towards a regionally formed centralized agency, counties, and cities; ready to implement green infrastructure.

Education is perhaps the most crucial component for various levels of management to first address. This element is needed for elected officials, professionals, and the public in order to inform them about the broader societal issues that green infrastructure addresses. A centralized agency should relay information to elected officials, showing real benefits a community can gain from green infrastructure. If elected officials are on board with implementing green infrastructure in a community, regulations and ordinances will be much more likely to follow. The centralized agency should provide support to professionals who create such regulations and ordinances at the county and city level. Streamwater setbacks, land dedication, and conservation easements are all types of regulatory support that communities at a local level may use. In addition, the centralized agency should promote cohesiveness between cities and counties by

creating annual, bi-annual, or quarterly forums. For more specific educational opportunities, counties can lead communication between cities in a similar fashion, ensuring that strong connections are made.

The centralized agency should also support programs, events, and passive information promoting the use of greenways, and provide a better understanding of the benefits associated, besides solely recreational opportunities. This can be done through activities such as guided trail tours, races and marathons with environmental initiatives or causes, festivals promoting sound stormwater management, passive educational signs, art installments along trails, and various publications sent to citizen through mail and internet. Execution of these programs should occur at the local level, addressing specific needs of the community. However, the centralized agency should assist in this process.

In order to be successful at obtaining dedicated funding, the centralized organization needs to connect and emphasize green infrastructure to a larger issues such as transportation. This opens up many federal funding sources, such as through the Federal Highway Administration. The U.S Environmental Protection Agency also provides money for environmental improvements. So, connecting a greenways plan to broader social, environmental, and economical benefits will present more funding sources. In addition to federal funding, it is important that there is some funding at the local level. Often times matching funds are require in order to obtain certain types of federal funding. Therefore, the community, at the county or city level, needs to express an interest in green infrastructure by being willing to dedicate funding locally. Implementing some sort of sales tax for green infrastructure has yielded great results in many communities and also signifies the public's want and interest for such systems.

These are some general recommendations that could be made for a regional area wishing to implement green infrastructure. However, it is important to note that decisions promoting green infrastructure should directly correlate with a community's unique needs. If the public is lacking interest in such a system, the centralized agency should focus mostly on education. If a community is experiencing flooding issues, regulation and funding should be geared towards that cause. It is the job of the centralized agency to ensure that these unique qualities are identified and there is connectedness between adjacent communities. Below is a summary table of key policy recommendations, organized by three audiences: the centralized agency, county, and city (Table 5.1). Without the cooperation of all these key groups, green infrastructure will not be able to be implemented efficiently and cohesively.

Table 5.1 Green Infrastructure Policy Recommendations

Audience	*Key Policy Recommendation*
Centralized Agency	Educate elected officials of green infrastructure
	Provide support to professionals with adoption of regulations and ordinances, and funding
	Promote green infrastructure through programs, events, and passive information
County	Plan and implement county-wide green infrastructure plan
	Coordinate city/county connections
	Maintain strong communication with adjacent counties
	Seek dedicated funding
City	Adopt regulatory measures
	Educate citizens through events and written materials
	Assess community needs in relation to greenways

Final Conclusions

Green infrastructure provides a community with immense quality of life benefits: opportunities to socialize through play, conversation, and exercise; enhancements to the environment through protected open spaces and better stormwater management; and an increase in property values, making certain locations desirable for residents and businesses. Sometimes these benefits are looked at individually. However, the goal of green infrastructure is to look at these benefits with a more comprehensive outlook. Education of the public, professionals, and government officials will be the one factor that allows for this to occur. Green infrastructure, while a fairly new term, will ensure that regional greenway plans, such as MetroGreen, become implemented to benefit all types of people, including future generations, within a regional area.

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Appendix A MetroGreen Map
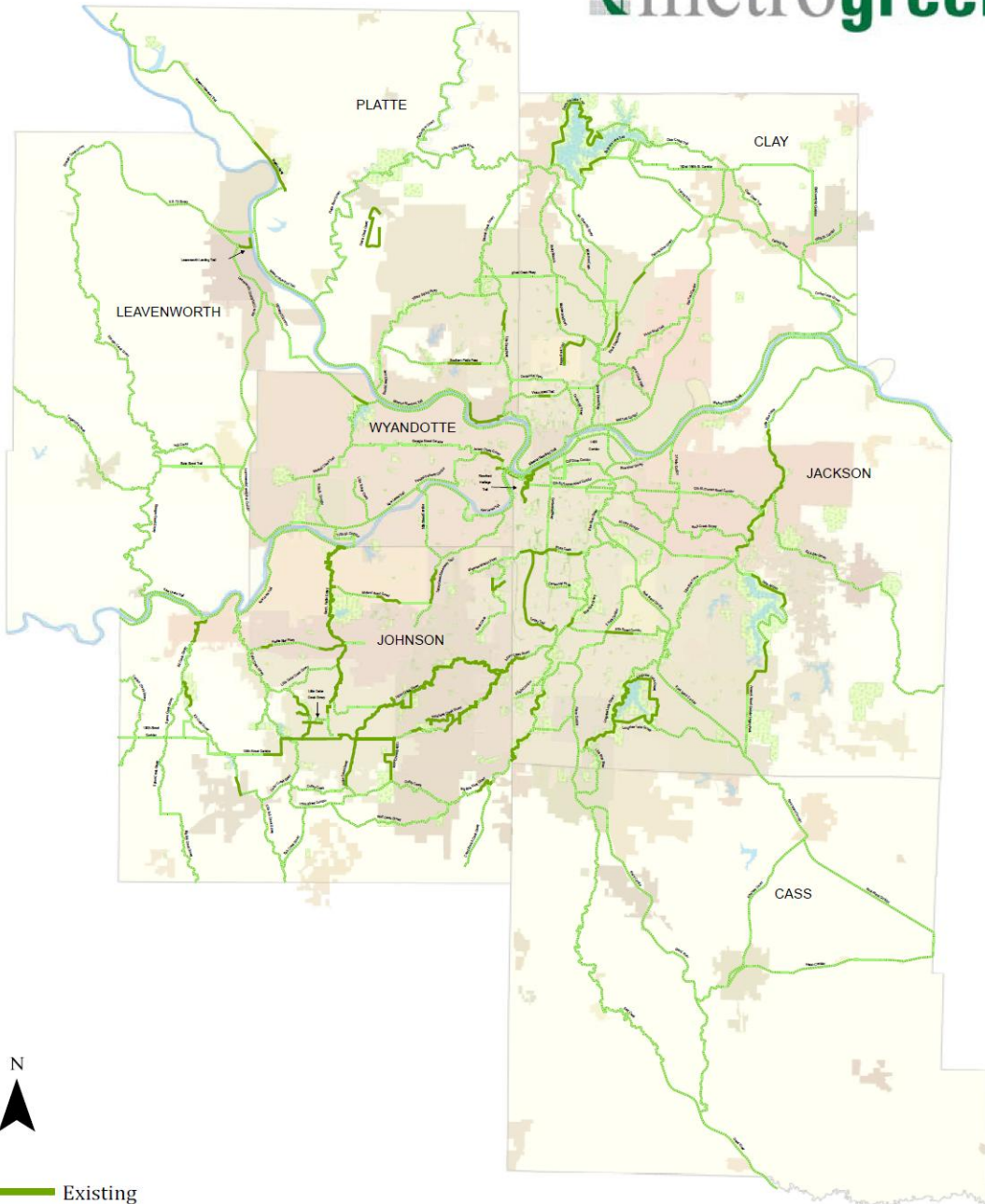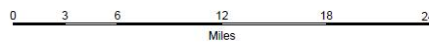
Source: MetroGreen, 2002

Appendix B – Implementation Strategies

MetroGreen Implementation Strategies		Conservation	Connection	Restoration
Regulatory and Voluntary Strategies				
Stream Setback Ordinances		●		
Parkland/Trail Dedications		●	●	
Conservation Easements		●	●	
Tree and Vegetation Protection Ordinances		●		
Local Funding				
Taxes				
Sales		●	●	●
Compensation Use		●	●	●
Property		●	●	●
User Fees				
Stormwater Utility Fees and Sewer Bill "Round-up"		●		●
Development Fees				
Fee in lieu of Construction				●
Real Estate Transfer		●	●	●
Tax Increment Financing		●	●	
Impact Fee		●		●
Excise Tax		●		●
Other Fees				
Carbon Credits		●		●
State and Federal Funding and Assistance				
Land and Water Conservation Funds		●		
Recreational Trail Program			●	
USDA Programs		●		●
Section 319 and Kansas WRAPS				●
U.S Army Corps of Engineers				●
Federal Highway Administration		●	●	●
U.S Environmental Protection Agency Grants		●		●
National Park Service			●	●
U.S Fish and Wildlife Service				●

Source: Briechle, 2009

Appendix C- Questions

The following is a list of question used as a basic guideline for interviews conducted. Some of these questions were changed, depending on the background of the interviewee and their involvement with MetroGreen.

- What is your involvement in the implementation of greenways from the MetroGreen plan?
- How would you define success of a greenway plan?
- How successful do you believe the MetroGreen Plan has been? Failures?
    - KC region
    - Locally
- Has implementation brought benefits into your community? If so, what benefits has it brought?
- What has the city done to ensure implementation of the MetroGreen Plan?
- How does the city plan on sustaining the greenways? Maintenance? Expansion?
- What has been the hardest aspect of implementing the MetroGreen Plan?
    - property acquisition
    - funding
    - politics
    - civic engagement
- Do you have any suggestions for a smoother implementation process?
- Are there aspects of the implementation process you didn't expect?

Appendix D - Memos

These memos provide a brief summary of all interviews. Bolded areas are where key points were made, and for which themes and categories were identified.

Participant A and B

These two participants were interviewed at the same time and were planners working for Platte County, MO. Much of the interview consisted of Platte County's history developing portions of trails that match with the MetroGreen Plan. Platte County has been successful at obtaining **dedicated funding** for such development largely due to **public participation**, which was strongly emphasized in the interview. Platte County uses MARC and the MetroGreen Plan as a way to influence specific county plans, publicity, and funding sources.

The success of a greenway plan, is defined by **citizen support**. In addition to this, a greenway plan is successful if it is **protected open space that people use and enjoy**. The hardest part of implementing the greenway plans is property acquisition, with funding and politics coming after that. However, without **citizen engagement**, all three of the previous mentioned items fail.

Both participants talked briefly about the Northland Trails Vision Plan that coordinated trail planning within the county, as well as Clay County, an adjacent county. One unique characteristic is that the plan **coordinates with the County's Planning and Zoning Department**, requiring developers to dedicate or show specific trails on their development plan. The downside to this is, this only works for county governed land. The participants suggest that more **coordination with cities** would be beneficial.

Participant C

This participant worked as a planner in Lenexa, KS. To begin, they spoke a lot of the Rain to Recreation program and how the city implemented that through regulations and plans, such as the Stream Setback ordinance and the Trail Alignment Analysis. Rain to Recreation came about due to severe flooding in the city. **Politicians were able to see the economic**

benefits to the city, and **developers** viewed such things as the stream setback ordinance as an enhancement to their development as well as a money saver through decreased taxes. This support easily allows Lenexa to follow within the principles of the MetroGreen Plan.

During the interviewed, it was mentioned that Lenexa has undergone some restructuring at the government level. Public works was divided into Municipal Services, which includes engineers and public administrators, and Community Development, which includes planners. Even though these different sectors contribute to Rain to Recreation, they appear to have very distinct duties and maintenance responsibility, leading to **an intricate web of responsibility**.

Lenexa, KS does very well at **educating citizen** about stormwater management with events and newsletters. These educational opportunities provide **ecological knowledge**, in order for resident to have a better understanding of how to protect environmental systems

Participant D

This participant works on the municipal services side of Lenexa, KS, having direct interaction with the Rain to Recreation program. This participant **didn't identify MetroGreen as having a lot of commonality** with the Rain to Recreation Program. MetroGreen was described as a master planning effort to create trails and protect habitat, while Rain to Recreation really dealt more with best management practices.

The participant talks about the creation of Rain to Recreation, which was largely due to **flooding**. Initially, the program was funded through several different methods including a sales tax, stormwater tax, and stormwater utility fee. However, these are not all necessary now due to larger stormwater structures being fully constructed. Since the program is still in its early stages, **trends** about the effectiveness of the program have not been able to be created. However, in 10 to 20 years, trends will be possible to identify.

Participant E

This participant, a landscape architect, was involved in the original MetroGreen project in 1991 as part of the Community Assistance Team. They describe MetroGreen as **more than just trails**. The plan is also about open space, connectivity, linking people to cultural, historical, and recreational assets. Connecting MetroGreen to these **broader perspectives** reinforces the plan. A plan can be successful if the community is aware of it, appreciates it, and values it. The real success of a greenway plan comes when citizens become the **protectors.**

In general, MetroGreen has had average success, depending on the area. This participant identified the **public valuing the plan** as one of the hardest issues to overcome during the planning and implementation process. This includes things such as the public offering time and energy to see the plan through. Once this happens, **politicians will then follow**. With such as wide variety of politicians, with varying interest, they need to be **continually educated** about the value of greenways.

The biggest lesson or point to be taken from the MetroGreen experience is the need to have a **champion** for it, such as a private entity. Even a **"Friend's Of" Organization** would be beneficial for providing a larger vision and persuasion to the larger public. This could possibly be done with the assistance of the ASLA Chapter. Ultimately, however, people in a community **need to buy into the plan** and become the leaders for its implementation

In summary, MetroGreen will be most successful is it is viewed with broad perspectives, and is support by the people of a community. With community support, whether this is in the form of private entities or citizens, politicians will likely follow. Educating politicians about the benefits of greenway implementation is essential to this as well.

Participant F

This participant, a landscape architect, was involved in the original MetroGreen project in 1991 as part of the Technical Advisory Committee. When they were involved with MetroGreen there was some initial synergy that lead to very little outcomes. They describe the whole process as lacking a sustained effort. The missing piece to creating a sustained effort is a **regional funding mechanism.** Regional funding allows things such as **crossing major rivers,**

jurisdictions, states, and county able to be done. So, in essence a bigger overall **coordinated effort** and funding is needed to implement greenways regional.

This participant identified overland connections and **political boundaries** as being the hardest issues to overcome during the implementation process. In addition to this concern, resident concerns, such as **"Not in my back yard"** issues were identified as being an obstacle as well. Despite this, often times residents will become proponents for trail development once they **realize the value** and use of such infrastructure.

The one lessons of MetroGreen, as identified by the participant, was the need to **obtain regional funding** in order to more efficiently. In order to form this sort of funding, **political will and buy-in** is essential. This can be a challenging for MetroGreen because of the bi-state nature.

In summary of this interview, for MetroGreen, the hardest thing about implementation is crossing boundaries: both natural, political, and geographical in nature. These boundaries create hardships because they make obtaining regional funding difficult. Political will and buy-in is essential for obtaining funding. Lastly, in order to lessen NIMBY issues, residents need to first realize the value of greenways, which they can do through use.

Participant G

This participant, a landscape architect, was involved in the 2002 update of the MetroGreen Plan, assisting MARC staff to form civic leadership, coordinate local agencies, and create a citizen based advocacy group (which never really was accomplished). Success of a greenway plan generally comes from **funding**. They suggest that while **citizens poll greenways high, funding and priority are generally very low** from local agencies because this often goes to other amenities such as police, fire, and school. In order to improve the implementation process, greenways have got to be part of a **larger perspective** such as health care. If a strong case is made for these larger issues, **elected officials would see the value** of greenways in their communities.

The hardest issue to overcome is a **dedicated funding mechanism.** This ensures promptness. The direction that would ensure this would be a citizen based advocacy group, or leaders in the private community supporting the greenway cause. Currently, this is happening in the Kansas City area with a specific group, BikeWalk KC working on funding and education.

The primary lesson learned from MetroGreen was the need to maintain momentum. After the initial planning of MetroGreen, it was handed to the local NPO. If there had been a **priority to accomplish and fund the plan**, it most likely would have been completely already. Now, due to the economy, there is a very slim chance that funding the whole plan is possible.

Participant H

The last participant interviewed was a planner at MARC, currently involved with MetroGreen. To begin, they stated that MetroGreen has only had **modest success** due to a lack of local energy in certain areas. They spoke of the **connection** between some MARC related actives, such as the Stormwater Management BMP, stormwater design standards, Natural Resource Inventory, for which MetroGreen could potentially relate with. So, it is essentially connecting MetroGreen to **broader perspectives** through **regulatory methods**.

They expressed the hardship it has been to regionally implement such as plan, especially for MARC, since the project is **unfunded.** They mentioned that there had been talk about a **land trust or land conservancy** to assist in implementation, but funding for these entities is hard as well.

Another subject touched was the ability to be more **environmental proactive**, such as at the beginning of the transportation planning process to produce better outcomes in the future. Greenways can be a result of this proactive thinking and connection to **broader ideas**. MetroGreen can be used to identify where such proactive thinking can take place, so it results in **a connected system** rather than disjointed.

The lessons learned from MetroGreen include the ability to raise **support and awareness for green infrastructure.** In total, roughly ¼ of the system has been completed, so progress has been made, but there is still more to accomplish. Lastly, they speak of the variety of ways that people can view green infrastructure and where the topic should actually fall in organized government. It is because of these many groups that it isn't common practice for green infrastructure to be viewed as a primary strategy for things such as stormwater management. **Educating people** that MetroGreen is more than just parks and trails is needed for this to happen.
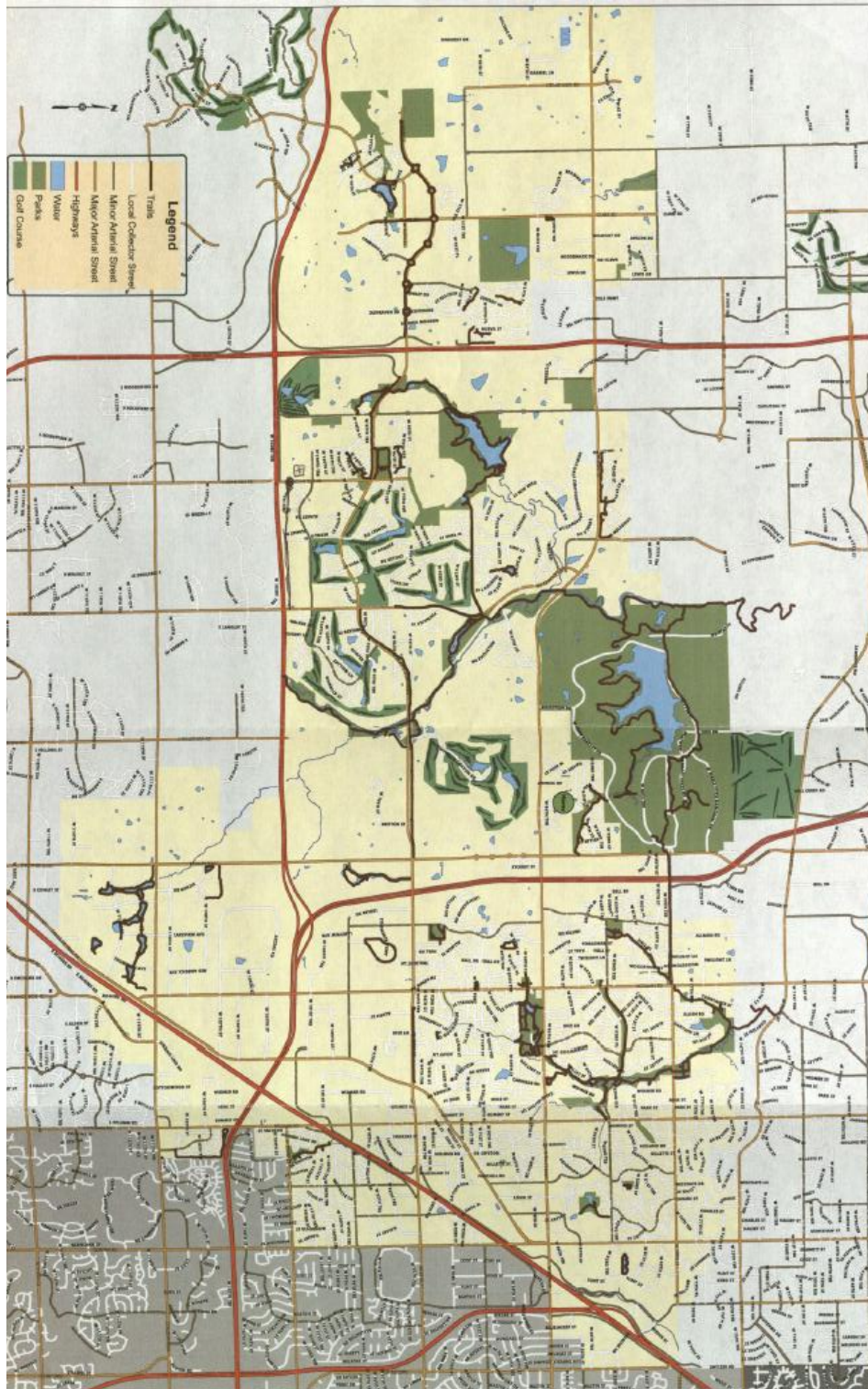
Appendix E – Platte County Parks Map
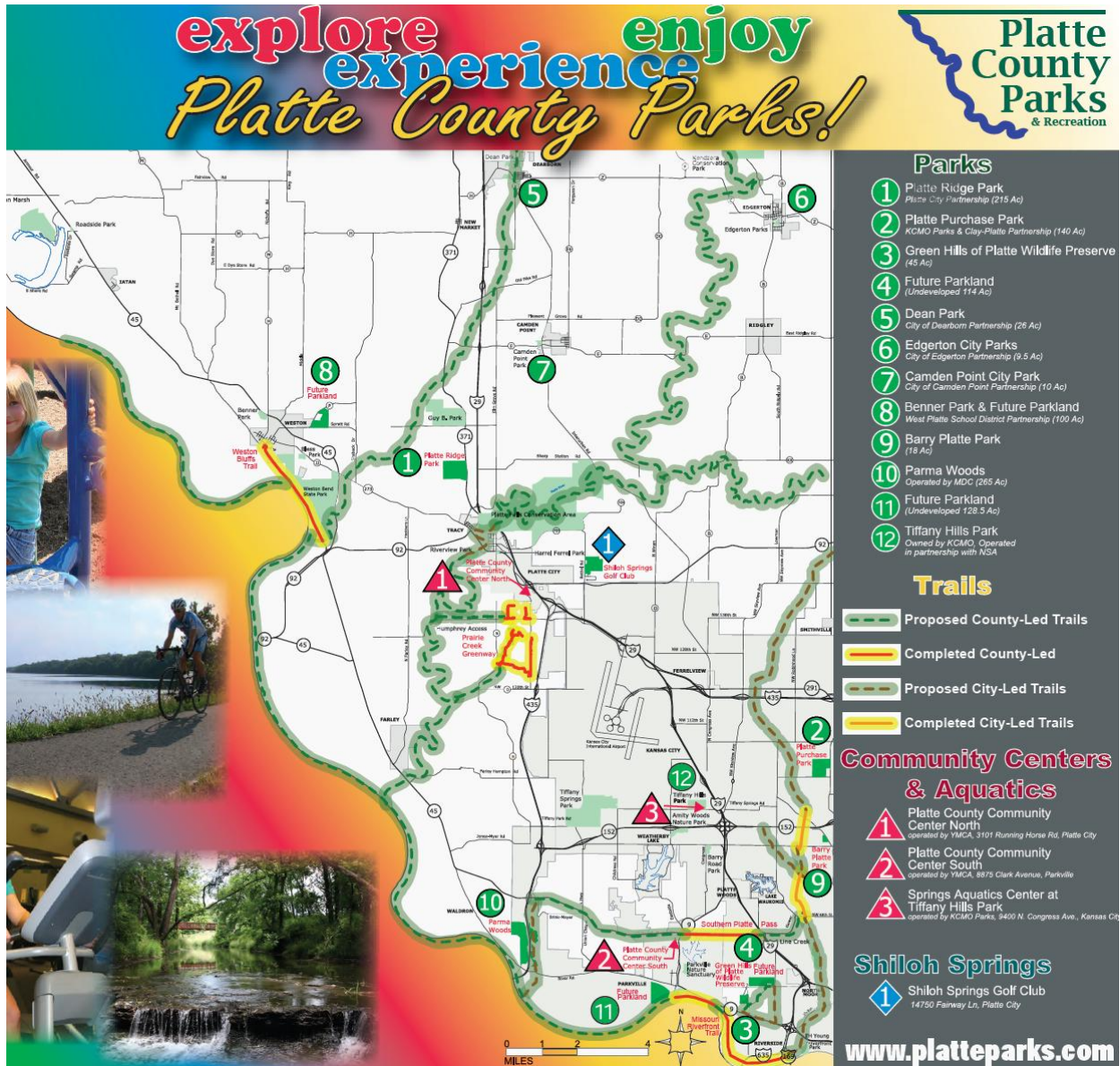
Source: Platte County Parks

Appendix F – Lenexa, KS Parks and Trails Plan
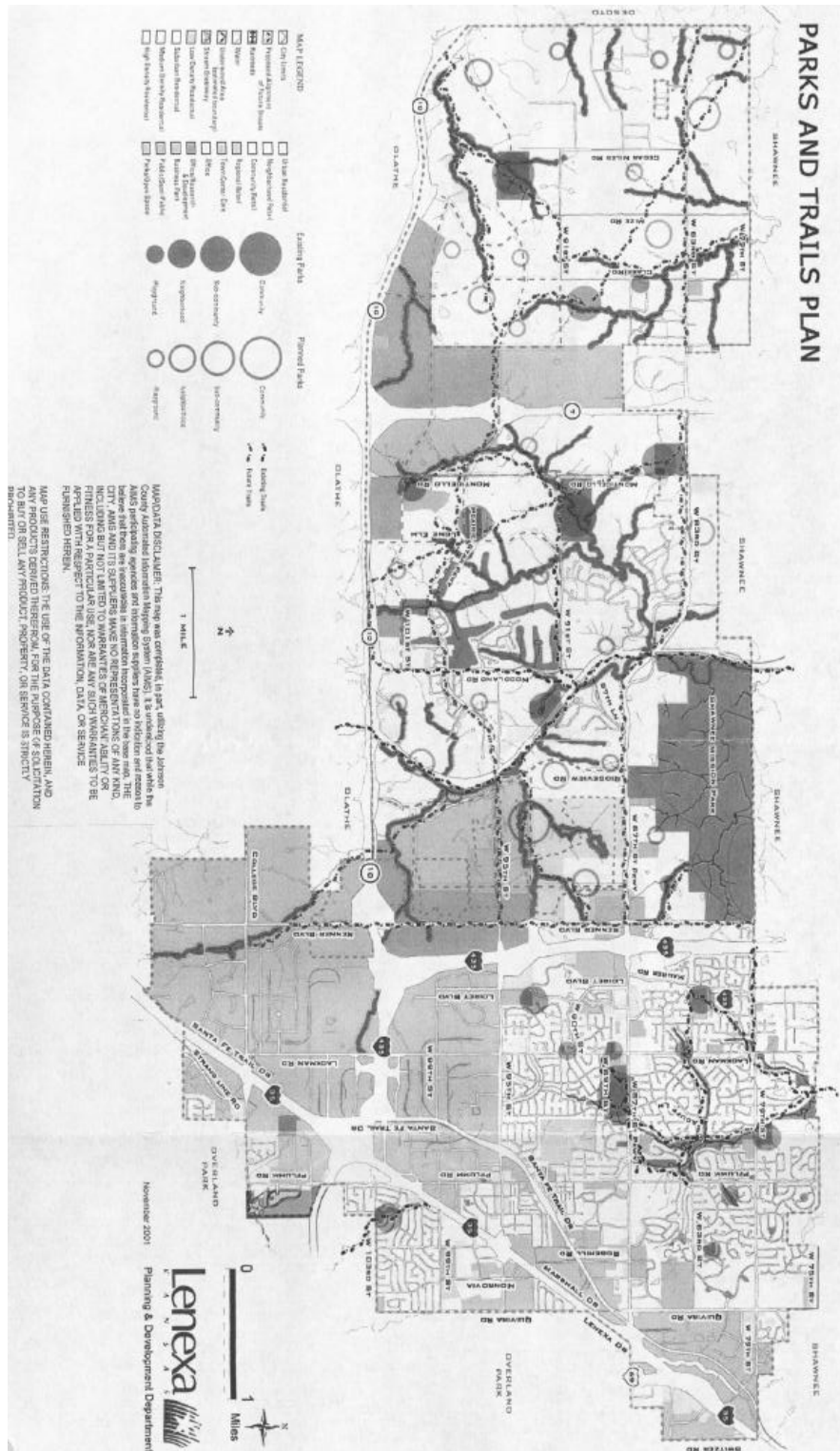
Source: Document provided by Lenexa, Kansas Staff

Appendix G – Lenexa, KS Developed Trails

Source: Document provided by Lenexa, Kansas Staff