

# POLICY PLANNING & ACTION

Regional Green Infrastructure Policy Framework



June 2019

# ACKNOWLEDGEMENTS

## TEAM

### MARC

Kym Bledsoe

Tom Jacobs

Alecia Kates

Andrea Repinsky

Kitty Steffens

### Hoxie Collective

Christina Hoxie

## ADVISORY COMMITTEE

### Michael Beezhold

Senior Water and Natural  
Resources Planner

### Jon Birkel

Hunt Midwest

### Sarah Crowder

Heartland Tree Alliance

### Daniel Erickson

Platte County, Missouri

### Matt Garrett

Johnson County, Kansas

### Kathy Gates

Kansas City Native  
Plant Initiative /Westport  
Garden Club

### Jim Harpool

Evergreen Real Estate

### Ginny Moore

The Conservation Fund

### Brian Nowotny

Jackson County, Missouri

### Gloria Ortiz-Fisher

Equity Network / Westside  
Housing Organization

### Michael Park

City of Lee's Summit,  
Missouri

### Dennis Randolph

City of Grandview, Missouri

### Kristin Riott

Bridging the Gap

### Amy Roberts

City of Kansas City, Missouri  
Health Department

### Terry Rynard

KC Parks - Kansas City,  
Missouri

### Andy Sauer

Burns and McDonnell

### Scott Schulte

Vireo / Heartland  
Conservation Alliance

### Allison Smith

Kansas Department  
of Transportation

### Tom Stiles

Kansas Department of  
Health and Environment

### Lisa Treese

City of Kansas City, Missouri  
Water Services

### Stephen VanRhein

Missouri Department  
of Conservation



# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	2
<b>BACKGROUND AND PROCESS</b> .....	6
Background and Rationale .....	7
Framework and Playbook.....	8
Integrated Planning Process .....	10
Policy Sources.....	16
Policy Framework Process .....	18
<b>POLICY RECOMMENDATIONS</b> .....	19
<b>NEXT STEPS</b> .....	24
Roles .....	25
Implementation .....	26
Success Stories .....	28
Ecological Value and Regional Vision.....	36





# EXECUTIVE SUMMARY



## PURPOSE, BENEFITS & PRIORITIES

Fulfilling our regional vision requires great commitment and care among community members. A resilient state of health and equity means a new level of cooperation between public, private and nonprofit organizations, and a well-informed relationship between people and nature to grow thriving heartland communities.

The Green Infrastructure Framework integrates ecological processes into the heart of the region's cultural and economic fabric. It sets the stage for quality of life that is based on regeneration and offers a conservation planning and design approach to grow our communities in ways that simultaneously create a healthy environment; neighborhoods that are connected, affordable and safe; and new educational and economic opportunities. The green infrastructure process of analysis and engagement stimulates integrating living systems with human aspirations.

### It starts with water.

Valuing every drop of water means increasing the health of the soil that it falls upon; catching it, cleaning it and reusing it where it falls; and making sure it doesn't carry pollutants into streams. Commitment to the value of water means that it is considered first in every response to comprehensive planning and design of urban and rural environments. It also means that local and regional leadership and policies support integrated decision-making to increase the ecological function of watersheds.

Green, or living, infrastructure solutions, are solutions that simultaneously help to alleviate the pressures of wet-weather events while providing important function to our communities. In addition to providing the ecosystem services of cleaning the air and slowing and cleaning water, living systems also improve the economic value of our built environment and connect people to nature and to the value of water. Green infrastructure is a functional component of urban design that provides greater return on investment than gray infrastructure. When it is designed and managed to meet local needs for rainwater, stream health and reduction of the heat island effect, it also provides the same benefits to communities downstream.

When green infrastructure is an integrated part of land use, it is also a significant factor of equitable community development and mobility planning. Reducing setbacks, parking requirements and street widths allows infill development and

complete and green street retrofits to be more affordable to build and maintain. Complete and green streets are right-sized and safe for all modes of travel while putting the pedestrian first. This means that managing precipitation and air quality on every street are key considerations. Linking communities through trails and complete green streets not only increases quality of life and economic attraction, but it also provides health benefits and increases equitable mobility opportunities to access education and jobs.

## GREEN INFRASTRUCTURE IS AN ESSENTIAL AND FUNCTIONAL COMPONENT OF URBAN DESIGN THAT PROVIDES A GREATER RETURN ON INVESTMENT THAN GRAY INFRASTRUCTURE.

Since integrated processes require such a wide variety of participation and perspectives to be successful, commonly held regional policy may provide consistent guidance across jurisdictions, sectors and practices. During the Regional Green Infrastructure Policy Study, three overarching policy recommendations emerged from stakeholder discussions:

- 1 Development of a package of model, local green infrastructure-friendly ordinances
- 2 Updates to local stormwater management planning guidelines and engineering standards
- 3 Integration of conservation and transportation at the plan, program and project levels

Progress on the three priorities was framed within a larger context of supporting strategies. Substantial needs were noted regarding regional collaboration, leadership development and capacity building, communications and education, tools and data, integrated regional/local planning, funding and implementation.

Overall, the implementation of this study's recommendations will require continued dialogue among the diverse communities of our region to craft effective new policy and catalyze broad-reaching green infrastructure implementation.

# EXECUTIVE SUMMARY

## GOALS

The Green Infrastructure Framework for the nine-county Greater Kansas City region integrates multiple human and social benefits with natural resource conservation and restoration. The purpose of the framework is to provide the structure to illustrate the presence and health of the natural systems together with the layered opportunities for the protection, connection and enhancement of area communities.

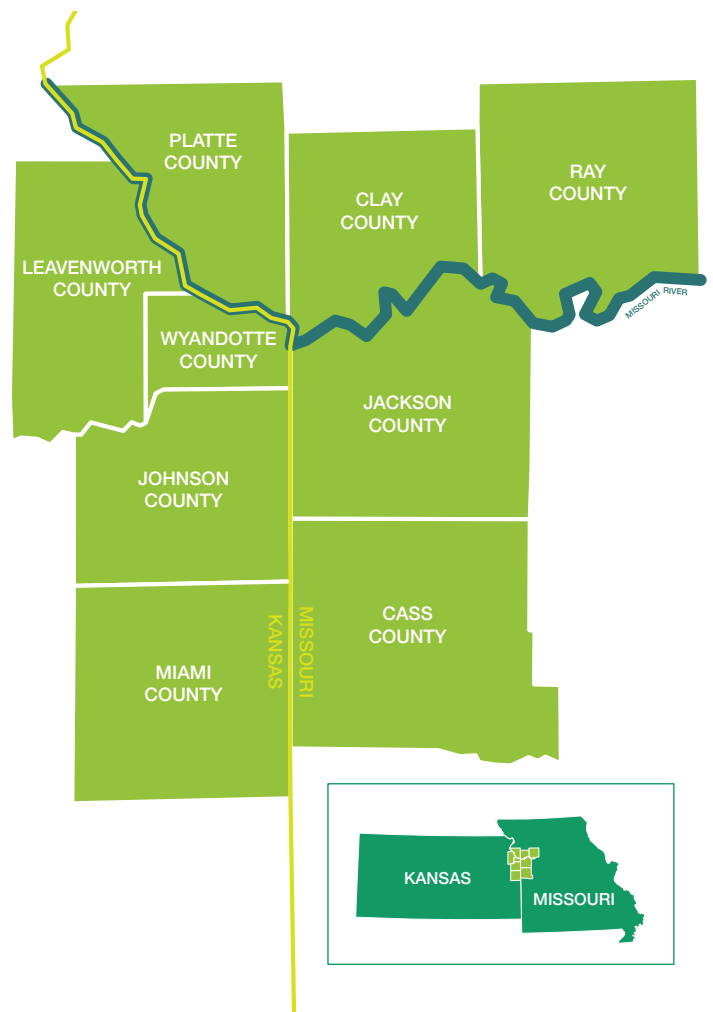
Community stakeholders articulated a need for a flexible green infrastructure framework to address place-based priorities and issues of public health and social inequity, linking priority ecological areas with communities of greatest need. The framework illustrates integrated solutions and benefits across multiple geographic scales. It also recommends environmental planning processes, partnership development opportunities and highlights unique successes in Playbook opportunity areas.

Preliminary goals and strategies were developed by engaging a diverse group of regional stakeholders representing municipalities, counties, healthcare providers, arts organizations, environmental nonprofits, developers, K-12 education, neighborhoods and business leaders. The dialogue was informed by an inventory of the current state of ecological resources and intersections with development patterns and community health and equity data. The vision of our region is for all capital – financial, natural, human, social and built – to support strong communities of people. The stakeholders considered the regional vision, the unique attributes of their communities, and how green infrastructure provides opportunities to become more resilient.

**THE FLEXIBLE GREEN INFRASTRUCTURE FRAMEWORK ADDRESSES PLACE-BASED PRIORITIES AND ISSUES OF PUBLIC HEALTH AND SOCIAL INEQUITY, LINKING PRIORITY ECOLOGICAL AREAS WITH COMMUNITIES OF GREATEST NEED.**

### The policy recommendations were informed by the following green infrastructure goals for water, land and air:

- ◆ Improve health of rivers and streams
- ◆ Connect people to water – education, advocacy, access
- ◆ Improve quality of life with green infrastructure amenities
- ◆ Improve local habitat
- ◆ Establish conservation priorities
- ◆ Regulate the microclimate with living systems
- ◆ Improve air quality
- ◆ Reduce energy consumption






# GREEN INFRASTRUCTURE GOALS



**IMPROVE HEALTH  
OF RIVERS  
AND STREAMS**



**CONNECT PEOPLE  
TO WATER – EDUCATION,  
ADVOCACY, ACCESS**



**IMPROVE QUALITY  
OF LIFE WITH GREEN  
INFRASTRUCTURE AMENITIES**



**IMPROVE  
LOCAL HABITAT**



**ESTABLISH  
CONSERVATION  
PRIORITIES**



**REGULATE THE  
MICROCLIMATE  
WITH LIVING SYSTEMS**



**IMPROVE  
AIR QUALITY**



**REDUCE ENERGY  
CONSUMPTION**





# BACKGROUND AND PROCESS



# PROCESS AND FINDINGS

## BACKGROUND AND RATIONALE

### Here we grow...

The Green Infrastructure Framework sets the stage for quality of life that is based on principles of regeneration and offers a conservation planning and design approach to grow our communities in ways that simultaneously create a healthy environment; neighborhoods that are connected, affordable and safe; and new educational and economic opportunities. Green infrastructure is fundamental to clean air, clean water and public health, making it an essential element of a sustainable city.

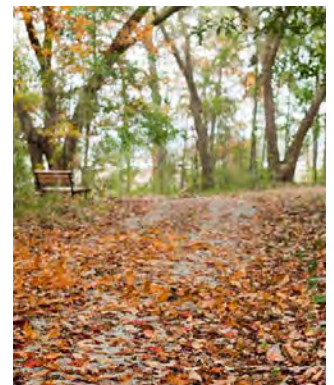
Green infrastructure is widely recognized as the low-hanging fruit of resilience. The ecosystem services of green infrastructure provide demonstrable benefits. Trees and green infrastructure cool the city, save energy, clean rain water, improve air quality, make streets more walkable, improve habitat and sequester carbon. Environmental restoration and conservation strategies also hold powerful potential to revitalize neighborhoods, improve public health and spur economic development.

Healthy, meandering stream corridors create valuable community assets. They protect public health and safety by reducing the risk of flooding locally and downstream; offer trails for recreation and transportation; create urban air conditioners, mitigating urban heat islands; increase

biodiversity, creating opportunity to reduce stress; and reduce airborne particulates and ground-level ozone.

Tree-lined streets increase walkability, add character and are shown to enhance retail sales. Bioretention cells may be included in parking lots, in the streetscape amenity zone and in corner curb extensions, increasing safety for pedestrians. Native plantings on rights of way reduce emissions (and costs) associated with mowing while also cleaning the air and water, and creating habitat for pollinators. And, use of infiltration-based strategies along roadways reduces polluted runoff, improving stream health.

Native plantings on school grounds and at community centers create outdoor learning labs – to study, for example, how native landscapes support a 3,000-mile migration of monarch butterflies to a patch of forest in northern Mexico. School gardens (for rain, food or monarchs) illustrate how what we plant matters, for humans and other species. Green infrastructure not only protects water quality and attenuates flooding, but also can produce food and fruit for food-insecure families, provide habitat for imperiled grassland communities and create vibrant places for people to gather. Ultimately, such places nurture new models to link education, community and environment.



# BACKGROUND AND PROCESS

## FRAMEWORK AND PLAYBOOK

The Green Infrastructure Framework provides a flexible and informative structure to show the presence and health of the natural systems, and the layered opportunities for protection, connection and enhancement of our communities' social and physical fabric.

The Playbook demonstrates replicable approaches for implementing green infrastructure for ecological and socio-economic benefits using community scales of analysis. A project may fall within an area of high ecological value and socio-economic need, indicating potential factors for a multi-benefit green infrastructure solution. In addition to factors that show value and need, three other criteria provide guidance for prioritizing implementation – momentum, accessibility and proximity to other areas of need. Because these criteria are based on considering projects underway, visibility to community members and visitors, and diverse partnerships, they help to increase the impact and benefits of green infrastructure solutions implemented.



### Rock Island Corridor Playbook

The Playbook for the Rock Island Corridor provides a testing ground for integrated green infrastructure projects along a regional multi-modal transportation project. The Rock Island Corridor spans 17.7 miles through four watersheds, providing an ideal connection to the Katy Trail. Additionally, the corridor is a potential future commuter rail connection to the Harry S. Truman Sports Complex, the city of Raytown, and the city of Lee's Summit.

After initial suitability analysis of the full corridor, indicators of health and livability related to green infrastructure were collected for the northern portion of the corridor. Some of the factors used to evaluate beneficial strategies and locations for the strategies that can positively impact ecological and social connectivity are:

- ◆ Ecological-hydrologic zones.
- ◆ Existence of community hubs and service providers.
- ◆ Land available to develop green infrastructure components that manage stormwater.
- ◆ Adjacent communities that have deferred stormwater infrastructure maintenance, unmet mobility needs or high prevalence of asthma and diabetes.

These factors, paired with local stakeholder interviews, resulted in the design of connected strategies that respond to the place and people and have support from local organizations to carry them out, such as:

- ◆ Continuous trails linking activity centers and neighborhoods.
- ◆ Stream bank stabilization to increase water quality and stabilize water quantity for healthy habitat.
- ◆ Advocacy, education, and training programs on green infrastructure benefits, landscape maintenance and job opportunities for all ages.
- ◆ Development of green stormwater infrastructure components that increase land use potential and density along the corridor without increasing the strain on the environment and infrastructure.
- ◆ Access to safe outdoor active recreation options.





## Shawnee Mission School District Playbook

The Playbook for the Shawnee Mission School District was designed to support the district's goal of developing sustainable sites using state-of-the-art ecological design principles that provide functional stormwater benefits.

The intent of the landscape design is to increase student achievement, improve environmental quality and serve the community. As a centrally located metropolitan school district, straddling seven watersheds and sharing its eastern border with Missouri, the district embraces this opportunity to lead and provide models of adaptive landscape management.

The Center for Academic Achievement (CAA) in Shawnee Mission School District hosts pilot strategies for stormwater management, native plantings, food production and walking trails connecting adjacent neighborhoods. The landscape is

designed with raingardens and detention basins that handle the rainfall of 100-year flood events (7.9" of rain in 24 hours). The Playbook shows how to maintain and adapt the CAA's current green infrastructure system so that performance of the landscape continues to improve over time.

This study also provides the district a way to consider their budget for landscape maintenance and the return on investment that green infrastructure provides over time.

Lastly, the Playbook shows how to prioritize district-wide school sites for future green infrastructure projects to optimize social and environmental benefits. While the strategies relate to the pilot projects at CAA and the Shawnee Mission School District, they also have broad applicability for other school districts seeking a roadmap for implementing green infrastructure strategies at a site and district scale.

# BACKGROUND AND PROCESS

## INTEGRATED PLANNING PROCESS

The Framework and Playbook demonstrate how particular data sets and a planning process may generate local, multi-benefit green infrastructure solutions that increase the vitality of both human and ecological communities. However, the highest potential of these solutions occurs when the process stimulates cross-sector linkages. For example: transportation system solutions that are appropriate to sensitive habitat corridors, address environmental justice concerns, slow and clean rainwater, and influence transit-oriented development with place-based solutions for mobility challenges; or stream setbacks that protect water quality and habitat, while providing new pedestrian trails and bikeways to schools and employment centers. Comprehensive multi-benefit solutions like these are only effectively implemented when all affected stakeholders and areas of expertise are actively represented in the project planning and budgeting.

Green infrastructure solutions are alive and require stewardship. Integrated planning, design and maintenance processes not only restore environmental capacity to provide healthy ecosystem services related to flood control and carbon sequestration, but also address the threats of invasive plants and insects on the food system, as well as the impacts of development practices on connected watersheds. The stewardship, education and job opportunities nested in these processes are important components to the long-term success and community benefits of sustainable, multi-benefit green infrastructure projects.

Considering the unique attributes and state of our region's watersheds, soil types, geologic formations and habitat corridors is just as important as navigating the connections and barriers between states, cities, counties, neighborhoods, business districts and geographically defined organizations. Each built project or educational program offers an opportunity to address protection of valued resources and enhanced provision of resources where there is need.

### Data

The Ecological Value map helps us understand where green infrastructure could be most effective for protecting and improving existing high-value resources. Ecological value is attached not only to types of ecological systems such as streams, lakes, wetlands, floodplains and glades but also to ecosystem service attributes such as forest patch size, water purification potential, water flow regulation potential and other benefits tied to land cover data. The darkest colors show the greatest overlap of these value criteria, and therefore the highest estimated ecological value.

Additional data can be used to select sites for green infrastructure installation that will optimize benefits. Areas in need of green infrastructure, or where green infrastructure installations may prevent water or air pollution, erosion, and/or other impacts, were mapped. Criteria for the Green Infrastructure Need Map include impervious surfaces, areas near highways, steep slopes, subwatersheds with impaired streams, and activity centers lacking trees or other natural land cover.

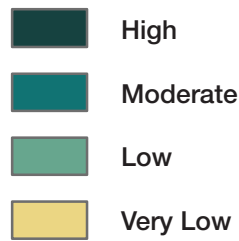
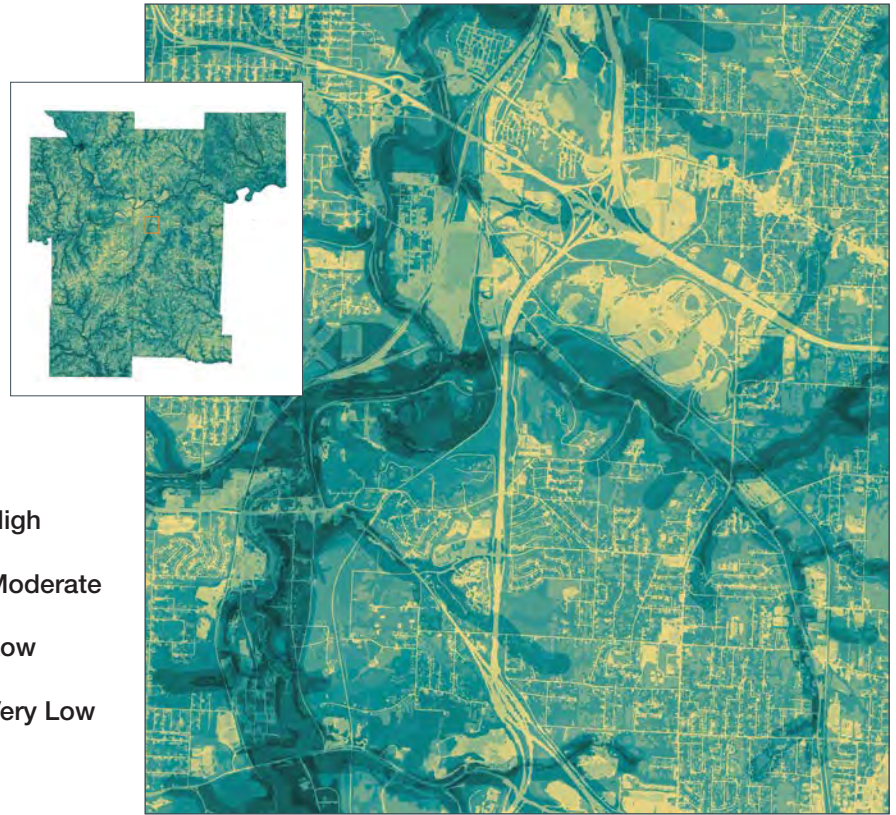
Another step can be taken to further prioritize green infrastructure projects in areas where people are more vulnerable to change in environmental and economic factors. Criteria include zero-vehicle households, minority population, low educational attainment, households below poverty, areas with a trend of population decline, and people who live more than ½ mile from any park.

### People

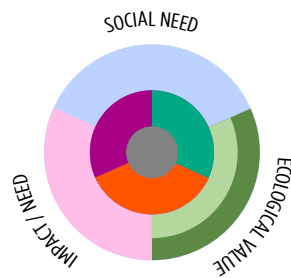
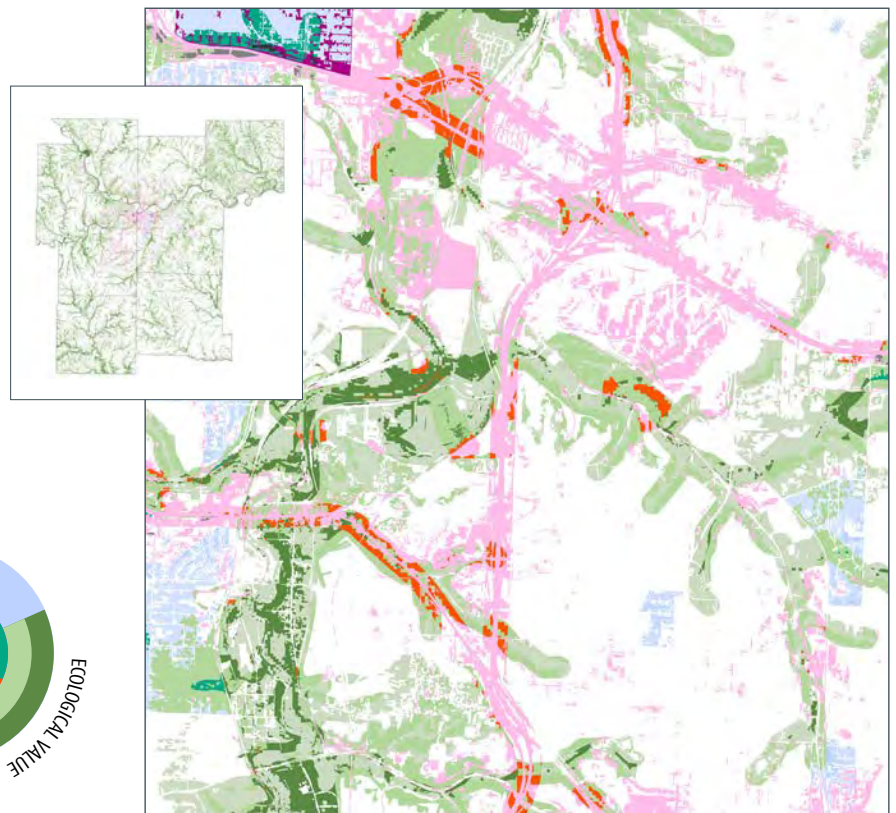
While each integrated process and set of project outcomes has its own unique set of multidisciplinary partners, every green infrastructure planning and design process should strive to have public and private partners, as well as representatives of human health, social systems, water, habitat, education, arts, equitable mobility, land use, land management, economic development, financial support, public policy and governance.



The Ecological Value map identifies areas where multiple ecological value criteria overlap — places where green infrastructure networks could be most effective for protecting and improving existing high-value resources. Darker areas have a higher number of attributes suited to conservation. Lighter areas may be better suited for restoration, mitigation or development compatibility.



Locations where ecological needs intersect with social needs are ideal places to focus attention and investment. In these places, the connection between the ecological functions of the land and the communities and people who live there are most direct. Social needs can be varied and wide-ranging, but generally include measures of community health, mobility, economic opportunity and equity. In this trivariate map each color represents a different combination of intersection.







**GREEN INFRASTRUCTURE  
IS ALIVE AND REQUIRES  
STEWARDSHIP.**



# BACKGROUND AND PROCESS

## KEY DECISION POINTS

The phases of the green infrastructure integrated planning process follow a traditional sequence:

<b>PHASE 1</b>	Define a study area
<b>PHASE 2</b>	Identify priority water, ecological and human assets and needs
<b>PHASE 3</b>	Engage with stakeholders to set goals and identify challenges and opportunities
<b>PHASE 4</b>	Identify and evaluate places with the strongest intersections of opportunity and need, and design comprehensive green infrastructure strategies
<b>PHASE 5</b>	Determine responsibilities and implement strategies

The key decision points in each phase provide the opportunities for integration and comprehensive analysis. During Phase 1, key decisions include identifying places that provide community connections to the project area and defining a broad group of stakeholders. Stakeholders ideally span all perspectives of integrated green infrastructure: neighborhoods, businesses, social service agencies, health care agencies, educational partners, along with experts in land use, development, transportation, habitat, water and air quality.

During the second phase of the process, preliminary analysis of the intersection of human and ecological strength and need starts to give more detail to the study area and the stakeholders involved. This likely involves site visits to ground truthing the data and focus group interviews to understand whether there is interest and capacity to work together.

During the third phase, the multisector, multidisciplinary stakeholders are convened, and in addition to goals, challenges and opportunities, partnership roles are

preliminarily determined for project implementation. Challenges and opportunities also include the long-term maintenance and management of green infrastructure projects, which may involve workforce training programs, certification and community education. Each beneficial opportunity identified may lead to additional partners being brought into the process.

During the fourth phase, all input is evaluated to design projects that are most viable and will have the most positive and equitable impact on ecological and human health. Opportunities for projects to physically and educationally link are priorities in this refinement and design development process.

Finally, implementation of integrated green infrastructure projects looks more diverse than traditional implementation. Since community benefit and ownership are paramount, community members must be involved in the education, advocacy, design and ongoing care of these projects.

## BACKGROUND AND PROCESS

The following illustration shows components of integrated green infrastructure solutions at a community scale. The same process may be applied at a larger regional ecosystem scale, to connect large conservation areas, or at a site scale such as the example of Shawnee Mission School District's Center for Academic Achievement. Components include: landscape and habitat connections, pathways for people and vehicles, waterways, and potentially built elements that are designed for efficiency and comfort.

**STREET TREES** are integral to complete streets. Trees make streets more walkable, provide shade to save energy, and intercept and soak in rainwater.

**RAIN GARDENS** and native landscaping absorb stormwater runoff from rooftops and driveways in residential neighborhoods.

**NATIVE PLANTS** have deeper root systems that help soil absorb and retain water. Using native plants reduces the need for lawn chemicals and irrigation.

**STREAMSIDE CORRIDORS** are home to well-used trails and beautiful natural areas. Planting stream buffers with trees or native plants — and removing invasive plants like shrub honeysuckle — cleans the air and water and creates valuable wildlife habitat.







**GREEN ROOFS** on commercial buildings save energy, absorb water and reduce urban heat islands.

**BIORETENTION** features strategically located in parking lots reduce ecological impacts of runoff by collecting, storing and filtering stormwater.

**COMPLETE STREETS** accommodate all users, including pedestrians, cyclists and transit riders. Adding green infrastructure improves the streetscape, facilitates alternative transportation and enhances environmental quality.

**PARKS** are great places for recreation and social gatherings. Transforming mowed areas with strategically located native landscaping creates habitat for monarch butterflies, reduces mowing costs, absorbs rainwater, and reconnects residents with our natural history.

# BACKGROUND AND PROCESS

## POLICY SOURCES

The Green Infrastructure Framework and Playbook expand the definition of green infrastructure beyond stormwater to incorporate the use of integrated, nature-based solutions that realize multiple benefits and solve community challenges. Preliminary policy measures were drafted during these initial planning processes. However, to assess the universe of regional policy, planning, and strategies that intersect with green infrastructure, the team collected policy from the following plans and strategies as well:

### MetroGreen®



The MetroGreen Action Plan is an expansion of George Kessler’s original “greenprint” plan and the American Society of Landscape Architect’s 1991 vision of metropolitan Kansas City’s connected green spaces. The report focuses on greenways, trails and open space; environmental stewardship; urban growth management; and a future development strategy. It details a recommended development plan and funding strategies.

---

### Regional Transportation Plan (RTP)



The RTP directs the transportation decision-making process in ways that help achieve comprehensive regional goals. The plan, RTP 2050, which is currently in the process of being updated, serves as a blueprint for the management of the region’s transportation system. It describes the current and evolving surface transportation needs of the metropolitan area, and broadly categorizes transportation investments ranging from road and transit improvements to projects that enhance bike, pedestrian and freight movement. This 30-year plan includes policy direction to implement climate protection, energy and natural resource conservation restoration as a part of future transportation investments.

---

### Eco-Logical Action Plan



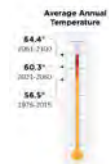
In early 2008, MARC was awarded funding from the Federal Highway Administration’s Eco-Logical grant program, which supports making infrastructure more sensitive to wildlife and ecosystems through greater interagency cooperation and watershed-based conservation and restoration. This effort is reflected in the RTP.

## Clean Air Action Plan



The Clean Air Action Plan is the Kansas City region's comprehensive, community-based voluntary strategy for reducing ozone pollution. Green infrastructure strategies are highlighted in the plan, among other strategies, because they reduce ozone formation from reduced emissions from mowing, and from heat island mitigation.

## Climate Resilience Strategy



The regional climate resilience strategy provides a high-level blueprint for increasing resilience in the face of expected changes in climate. Trees and green infrastructure were identified as the ideal starting point for resilience, because they reduce increased risks associated with heat waves, drought and flooding.

## Stormwater management standards and planning guidelines



Regional watershed/stormwater planning and management initiatives promote cooperation among communities in addressing stormwater management and water quality protection. Engineering standards and planning guidelines developed in 2003 by the American Public Works Association (APWA) and MARC represents a consensus among local government public works and planning officials from around the region on joint actions for improved watershed planning and stormwater management in metropolitan Kansas City.

## Regional Forestry Framework



The framework builds upon the regional i-Tree eco study in 2013, showing that the region's 250 million trees provide about \$320 million/year in ecosystem service benefits. A set of integrated strategies are identified to support work at the regional scale, in diverse sectors from air and water quality, transportation, energy and parks. At the local scale, the framework is organized to provide a variety of flexible tools for local communities to advance a sustainable forest and green infrastructure conservation agenda. Opportunities are grouped into four principle categories: policy and planning; design; operations and maintenance; and community engagement and education.



### FOR MORE INFORMATION

These documents can be downloaded at [www.marc.org/Environment/Plans-Studies](http://www.marc.org/Environment/Plans-Studies)



# BACKGROUND AND PROCESS

## GREEN INFRASTRUCTURE POLICY FRAMEWORK PROCESS

During 2018, the process to develop a policy framework was defined by two Green Infrastructure Advisory Committee meetings and two regional stakeholder workshops. The team's process started with the collection of existing policy recommendations from identified policy sources. The first Advisory Committee meeting reviewed the organization and content of existing policy recommendations and regional indicators for tracking progress. Policy was organized into five categories:

- ◆ Transportation
- ◆ Air Quality
- ◆ Water Resource Management
- ◆ Habitat Conservation and Restoration
- ◆ Land Use and Development

Focus group conversations were convened after this meeting to expand and clarify the Habitat Restoration and Conservation category of policy and strategies.

Both stakeholder workshops were three and a half hours in length. The first workshop organized participants in small groups around the following topic areas:

- ◆ Sustainable Land Use
- ◆ Transportation
- ◆ Habitat Restoration and Conservation

The presentations and facilitated breakout dialogue were designed to achieve the following outcomes:

- ◆ Review and add to existing policy and strategy list.
- ◆ Determine appropriate regional and local measurements for success.
- ◆ Determine priorities among policies and strategies.

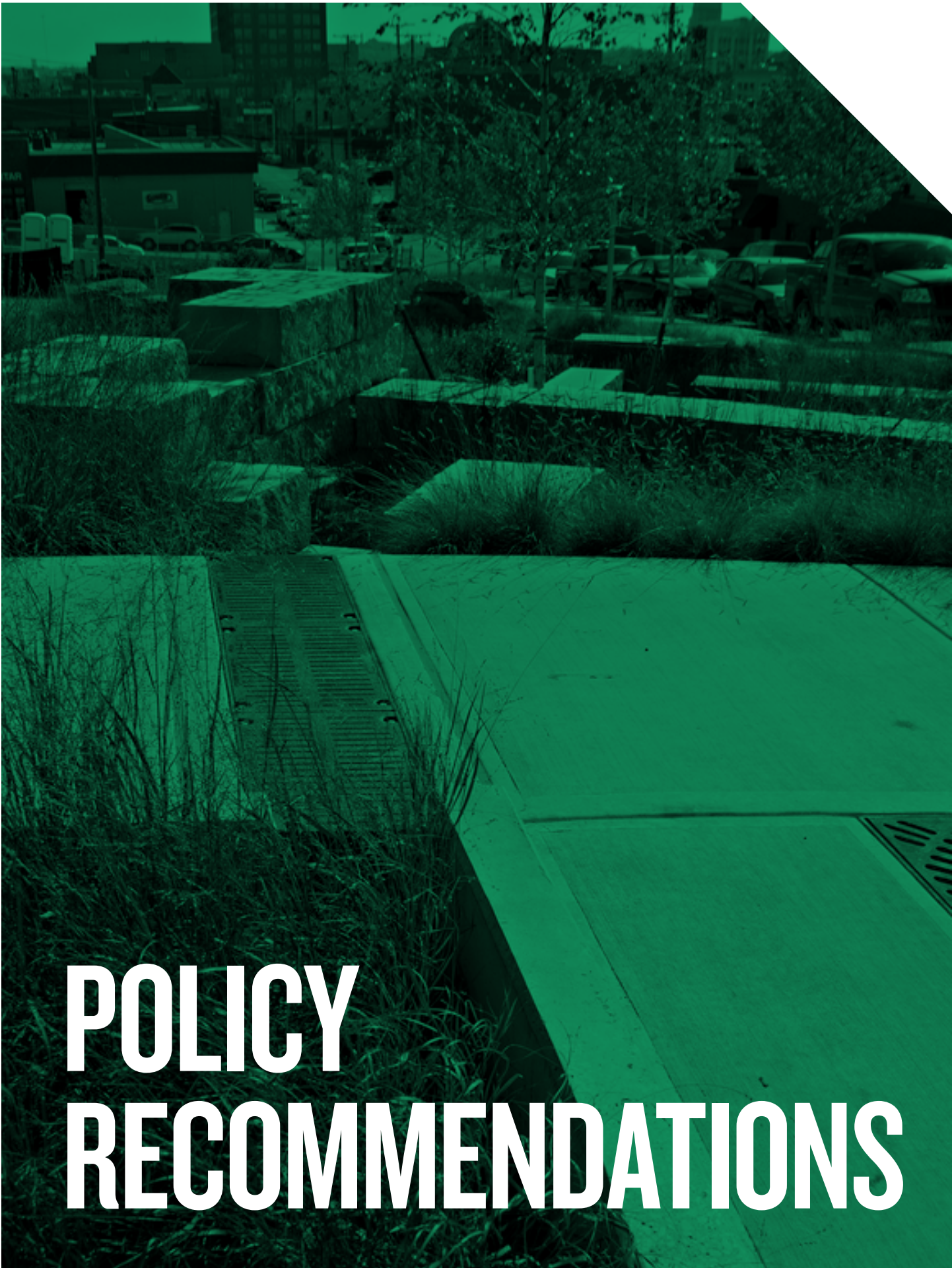
The feedback from the first workshop led to reorganizing the Policies and Supporting strategies in the following categories:

- ◆ Ordinances and Standards (policy)
- ◆ Leadership and Collaboration
- ◆ Data and Tools
- ◆ Integration
- ◆ Education
- ◆ Land Conservation and Land Use

The second workshop organized participants into small groups of diverse perspectives and organizational affiliations. Using the comprehensive list of Policy and Supporting Strategies, the dialogue of this workshop was designed to achieve a more detailed level of outcomes:

- ◆ Reach consensus on priority policy and strategy recommendations.
- ◆ Determine pathways and tools needed to implement policy by governing agency.
- ◆ Discuss accountability methods for assuring that policy is stimulating healthy change and providing multiple benefits.





# **POLICY RECOMMENDATIONS**



# POLICY RECOMMENDATIONS

A set of more than 50 policy and planning recommendations was developed and prioritized in two community stakeholder workshops. Three overarching policy recommendations emerged from stakeholder discussions: development of a package of model, local green infrastructure-friendly ordinances, updates to local stormwater management planning guidelines and engineering standards, and better linking of conservation and transportation planning. Descriptions of each recommendation along with additional context and rationale is provided below.

## 1. Model ordinances

MARC will work with local governments and area stakeholders to develop model ordinances to eliminate barriers to green infrastructure, or conversely, to incentivize its application. Key policy questions were raised for the following local government ordinances:

### Trees and urban forestry

Under what conditions, and to what degree may trees be protected during the (re-)development process? What tree replacement policies should be required to sustain ecosystem services? What are the roles and responsibilities of different city departments in protecting, planting, maintaining and monitoring the urban forest? What incentives or practices enable the community to protect and enhance its urban tree canopy?

### Weeds and landscaping

Native plants create habitat, improve water and air quality, and sequester carbon. Yet, in some instances, landscaping ordinances effectively constrain or even ban their use because of the definition of a weed, or maximum plant height requirements (e.g., 6" - 18"). Clarify how native landscapes can be established and managed without sacrificing other community health and safety goals.



### Invasive species

A variety of invasive species, from Bradford Pear to Bush Honeysuckle, have substantially impaired the quality and health of natural ecosystems. What regulations might govern or restrict the use of invasive species to achieve stated policy goals?

### Planning and zoning updates

Local planning and zoning regulations may impede the application of ecologically-sensitive site design. Planning guidance including control of impervious area, volume of rain handled on site, parking maximums, and setbacks are needed to supplement engineering design standards and specifications, ensuring that public and private infrastructure creates multi-benefit, contextually-sensitive solutions.

## RECOMMENDATION

Develop a suite of model ordinances related to trees, weeds, landscaping, invasive species and planning and zoning updates using an inclusive stakeholder process. Ideally, this process would be linked to a process in one or more local communities interested in adopting appropriate revisions. It would also complement stormwater standards and specifications described below.



## 2. Stormwater engineering standards and planning guidelines

In 2003, the Kansas City Chapter of the APWA adopted standards for stormwater management known as Section 5600, while also endorsing the MARC/APWA Manual to Protect Water Quality. Those efforts were the product of a collaborative regional effort to reduce flood risks and protect water quality in the aftermath of the 1998 flood. Since that time, substantial changes in technology, best management practices and integrated planning/design approaches compel the region to revisit these standards.

These standards are silent on several key policy questions. What stormwater management requirements should be instituted for redevelopment projects? How can stormwater management practices advance complementary community goals related to transportation, housing, parks, public health, food security, ecosystem vitality or social equity? What standards should be required to ensure proper maintenance of green infrastructure? To what degree do stormwater standards prepare the region to be more climate resilient? And, how are stormwater management standards embedded within emerging goals of “one water” or integrated watershed management?

### **RECOMMENDATION**

Update existing standards and planning guidelines, rooted in the approach articulated within the Green Infrastructure Framework to benefit both upstream and downstream communities with greater ability to meet needs for rainwater, stream health, and reduction of the heat island effect in addition to equitable economic development. A multidisciplinary, cross-sector stakeholder process would be implemented to fund, scope, develop and adopt amended engineering standards and planning guidelines.



# POLICY RECOMMENDATIONS

## 3. Linking Conservation and Transportation

In 2008, the MARC Board of Directors adopted an Ecological Action Plan. The integration of green infrastructure into transportation policy, programs, projects and practices creates an opportunity to address mobility and environmental quality at the same time. Four key efforts provide important antecedents for this agenda. To date, approximately 350 miles of MetroGreen corridors have been developed, with another 90,000 streamside acres protected by stream buffer requirements. Regional complete street policy includes “green” streets within its purview. MARC’s Planning Sustainable Places program provides a platform for integrated environmental, land use and transportation planning. And, pilot native landscaping efforts along highway rights of way provide habitat for migrating monarch butterflies.

Opportunities exist to build from previous successes. While stream buffers and greenways are protected, most area streams are designated as impaired. While integrated land use/transportation projects are increasing in visibility, the environmental dimensions have been largely ignored.



And, while transportation facilities are one of the region’s most significant classes of runoff-generating impervious areas, no requirements exist to protect water quality from transportation facilities. As the Long Range Transportation Plan is updated, including specific recommendations for green infrastructure is pivotal to regional progress on handling wet-weather events, increasing air quality and providing other balanced ecosystems services that increase the quality of life for community members.

### RECOMMENDATION

Fully integrate green infrastructure conservation and restoration goals into the regional transportation plan, capital improvement plans, policies, programs, performance measures and evaluation criteria.

#### Opportunities exist to:

- ◆ Include green infrastructure-focused projects on the project list for the long-range transportation plan
- ◆ Strengthen project evaluation criteria in the project selection process to provide incentives for inclusion of green infrastructure in transportation facilities
- ◆ Allocate additional funds in the Planning Sustainable Places program to support projects focused at the nexus of green infrastructure, transportation and land use
- ◆ Link approaches to improve water quality with transportation planning and design by developing stormwater quality requirements for transportation facility design, along with an in-lieu fee system for projects unable to implement water quality protection measures within their project area
- ◆ Include integrated green infrastructure projects specifically in capital improvement plans
- ◆ Convert transportation rights of way to native landscaping, with a focus on multi-benefit solutions that simultaneously advance environmental, watershed and mobility goals

## ADDITIONAL STRATEGY RECOMMENDATIONS

Progress on the three priorities was framed within a larger context. Substantial needs were noted regarding regional collaboration, leadership development and capacity building, communications and education, tools and data, integrated regional/local planning, funding and implementation of multi-benefit projects.

### **Regional collaboration and leadership**

A formalized collaborative, cross-sector regional forum is needed to convene connected policy, planning and funding needs. The forum could help build regional leadership and facilitate higher levels of coordination among area conservation agencies and organizations.

### **Data and tools**

Planning tools are foundational to the advancement of this framework. Investment in tools and data like the natural resources inventory, performance metrics and indicators, and geospatial analysis is critical for the region to identify and address integrated ecosystem, human health and social equity values and needs.

### **Communication and education**

Many barriers to green infrastructure implementation are related to uneven public and professional understanding and support. In response, a comprehensive green infrastructure communications strategy, strategic professional development (with a focus on green infrastructure maintenance), certification programs for construction and maintenance standards, as well as public recognition of exemplary efforts provide wider understanding of successful practices and replicable models.

### **Integrated planning**

At the regional scale, multiple plans reflect the importance of green infrastructure conservation and restoration. At the local level, comprehensive plans may include green infrastructure elements in each topic area of recommendations to explicitly identify how green infrastructure may help address local goals and objectives. Interjurisdictional cooperation on integrated watershed management, or “one water” plans, offers another substantial opportunity to address water quality and quantity goals along with other community goals.

### **Project implementation**

Stakeholder discussions focused on land use, watersheds, transportation and parks are key areas of momentum, potential funding and public influence. Opportunities to advance more integrated, multi-benefit projects exist within each of these areas. Increased levels of cross-sector collaboration and leadership are envisioned as development of common ordinances for land use and zoning, as well as standards for public streetscapes and landscapes. Coordination between nonprofit education and advocacy programs with projects on public land and waterways also provides visibility and access to green infrastructure projects for wider educational benefit and recreation opportunities.



A photograph of a dirt path leading through a field of tall grass and plants, with a green-tinted sky. The path is the central focus, leading the eye from the foreground into the distance. The plants on either side are dense and appear to be a mix of grasses and larger leafy plants. The sky is a uniform, bright green color, suggesting a clear day or a specific lighting condition. The overall mood is serene and forward-looking.

# NEXT STEPS

# NEXT STEPS

## ROLES

As outlined in the Policy Recommendations section, each of the prioritized policy recommendations and each of the strategy recommendations have their own sets of actions for implementation. Designing adoptable model ordinances requires inquiry on the key questions related to updates that enhance community and environmental benefits in contextually appropriate ways. But perhaps most importantly, implementation requires willing local communities interested in piloting this work for the region. Likewise, a successful update of stormwater engineering standards and planning guidelines first needs a group of cross-sector stakeholders committed to fund, scope, develop and adopt the new standards and guidelines.

Coordinated regional planning policy and implementation will benefit from agreement and commitment between regional, local and nonprofit partners. Regional partners include the regional council, watershed associations, federal

agency representatives, and educational partners including K-12 districts and higher education. Local partners include municipal departments, county departments, transportation authorities and businesses. Nonprofit partners often cross jurisdictional boundaries and provide specific knowledge and services for people, air, water, and land.

While the regional partners play coordinating roles, the participation of each sector is crucial to leveraging funding, sharing policy and best practices, and propagating positive environmental outcomes that cross jurisdictional boundaries. Identifying the champions from each sector to coalesce a formalized collaborative, cross-sector regional forum is one of the first steps to implementing the policy recommendations. This group will work to connect policy, planning and funding needs while helping to build regional leadership and facilitate higher levels of coordination between all sectors.

## AGREEMENT BETWEEN REGIONAL, LOCAL AND NONPROFIT PARTNERS

REGIONAL	LOCAL	NONPROFIT
<ul style="list-style-type: none"><li>◆ MARC</li><li>◆ Watershed Associations</li><li>◆ Federal Agencies</li><li>◆ Educational Partners</li></ul>	<ul style="list-style-type: none"><li>◆ Municipal Departments</li><li>◆ County Departments</li><li>◆ Transportation Authorities</li><li>◆ Businesses</li></ul>	<ul style="list-style-type: none"><li>◆ Cross-jurisdictional</li><li>◆ Specifically attuned toward people, air, water and land</li></ul>



# NEXT STEPS

## IMPLEMENTATION

The following shows how each sector's concurrent work complements implementation of a regional, green infrastructure framework:

### Regional

- 1 Support increased coordination among nonprofit organizations in conservation planning
- 2 Provide data, indicators, mapping and integrated project development tools
- 3 Identify additional data needs
- 4 Develop communications strategy
- 5 Share success stories
- 6 Integrate green infrastructure across all regional plans
- 7 Assess transportation and conservation shared goals, policy and funding
- 8 Convene cross-sector regional forum
- 9 Develop educational program
- 10 Develop ordinances and standards with local communities
- 11 Support watershed-based leadership
- 12 Establish common metrics and indicators of green infrastructure success

### Local

- 1 Identify political champions
- 2 Share success stories
- 3 Develop certification programs and performance contracts for construction and maintenance of Green Infrastructure projects
- 4 Restore park land connected to education and advocacy strategy
- 5 Focus strategically on activity centers, corridors, conservation areas and neighborhoods that provide exemplary integrated Green Infrastructure projects
- 6 Participate in cross-sector, regional forum and regional education programs
- 7 Adopt updated ordinances and standards
- 8 Update comprehensive plans and watershed plans for conservation and restoration

### Nonprofit

- 1 Finalize native landscape management plan apply to vacant lots and workforce training
- 2 Finalize integrated watershed plan for the Blue River and replicate in other watersheds
- 3 Build workforce capacity for Green Infrastructure maintenance and ecosystem restoration
- 4 Participate in cross-sector, regional forum and regional education programs
- 5 Connect conservation planning with federal agencies and funding
- 6 Monitor conditions of land and waterways with high value and need
- 7 Establish roles for agencies to play in land acquisition and management
- 8 Link watershed planning with food systems, human health and social welfare



**OUR COLLECTIVE  
SUCCESS  
IMPROVES LIVES.**



# SUCCESS STORIES

Another important part of advancing coordinated work is sharing the successes of the region. These successes not only celebrate accomplishments but provide opportunities to replicate great ideas in similar circumstances and identify policy that will streamline consistent outcomes. Following are success stories from rural, suburban and urban areas in the Greater Kansas City region.

## BIG BULL

### RURAL

Big Bull Creek parkland totals 2,060 acres and is located between Edgerton and Gardner, Kansas, in southwest rural Johnson County. Given the size and scale of Big Bull Creek Park, the decision was made to organize the park into large core habitat areas (Prairie, Savanna and Forest). Research has shown that the best way to attract and sustain healthy and diverse ecosystems is to provide large contiguous habitats. By creating these large core habitat zones, the public is given the best chance to see and interact with a broad range of native wildlife – perfect for photographers, hikers and bird watchers. The large habitat sizes were also created so park users can fully immerse themselves in nature.

For all new improvements within the park, the primary goal will be to address stormwater near its source. That starts with using “Better Site Design” techniques, as outlined by the Center for Watershed Protection, to minimize disturbed areas, limit soil compaction and reduce the amount of any new impervious cover. Improvements in both water quality and quantity are expected where agricultural areas are restored to native prairie and savanna landscapes. Creek and tributary stabilization, roadway bioswales and stormwater storage wetlands are other strategies that will be used to keep all rainwater on site.







## METROGREEN AND STREAM SETBACK ORDINANCES

### RURAL, SUBURBAN and URBAN

Stream setbacks and buffer areas increase riparian habitat and water quality while decreasing stream bank erosion and stormwater runoff. These managed areas on public lands and conservation easements can also provide recreation and education opportunities.

Many municipalities in the Greater Kansas City region have adopted and implemented stream setback and buffer ordinances. Independence, Missouri, has also created two tools to assist communities in making their stream setback work successful. One is “The Tool Kit for Implementing Stream Buffer and Setback Regulations,” which educates municipalities interested in adopting or modifying a stream

buffer ordinance, provides guidance for preserving natural resources in stream corridors and describes experiences and lessons learned from Independence and others. The other is a “Stream Corridor Protection and Adaptive Management Manual,” which provides guidance for corridor maintenance and management, prescribes short- and long-term planning strategies for conservation and restoration of riparian corridors, helps city staff and citizens understand the importance of stream corridors and provides educational resources on how streams function.



# SUCCESS STORIES

## COMPLETE STREET POLICY

Complete and green streets are streets, highways and bridges that are planned, designed, operated and maintained with the consideration of the needs and safety of all travelers. This includes people of all ages and abilities who are walking; driving vehicles such as cars, trucks, motorcycles or buses; bicycling; using transit or mobility aids; and trucking logistics.

The design of this principle changes based on the local context. However, ensuring the provision of safe facilities for all users is a core tenet of complete streets. These policies create streets and spaces that balance the needs of a range of transportation users and support the surrounding community.



### SUBURBAN – MAIN STREET, GRANDVIEW, MISSOURI

#### Timeline:

Grandview's Main Street Improvement Project was a four-phase effort that extends from the West Frontage Road of Interstate 49 to the Kansas City Southern Railroad just east of 8th Street. The project began in 2011 and concluded in 2016.

#### Funding:

Grandview accomplished Main Street's improvement using City Transportation Sales Tax funds and Federal Highway funds.



## URBAN – 20TH STREET, KANSAS CITY, MISSOURI

### Timeline:

The 20th Streetscape project began in the spring of 2016 and was completed that fall.

### Funding:

Funding was provided by the city of Kansas City, Missouri and the Tax Increment Finance (TIF) Commission, which allocated funding through the 22nd and Main TIF plan.



# SUCCESS STORIES

## TROOST MAX - KCATA BUS RAPID TRANSIT

### URBAN

Troost MAX travels from downtown to the Crossroads district, Hospital Hill and south along Troost to Bannister. Troost MAX offers local service south of 75th Street. A comprehensive community involvement effort encouraged community input and stakeholder involvement. The final design phase developed bid documents for the fabrication of the MAX shelters and MAX markers, and the construction of the MAX stations, including sidewalk and streetscape improvements.

Troost MAX incorporates green features and technologies. The MAX fleet includes five hybrid electric buses. Hybrid buses operate on battery power from start-up until a speed of 25 mph at which time a diesel engine supplies power and

recharges the batteries. This action reduces nitrous oxide emissions and increases fuel economy by 10%-20%. Other green features at select stations and park-and-rides include:

- ◆ Rain gardens at several MAX stations to capture and filter water run-off.
- ◆ Posts or bollards that include solar-powered lighting.
- ◆ Recycling receptacles.
- ◆ Solar-powered trash compactors.
- ◆ Pervious concrete that allows water to soak through to the subsoil, reducing the amount of polluted water that runs off of the pavement surface.







## VACANT LOT STRATEGIES

### URBAN

Many urban neighborhoods are faced with the challenge of addressing vacant lots and abandoned homes. Increasingly, these neighborhoods are defining strategies to put these vacant lots back to productive use. The Marlborough Community Coalition is assessing Land Bank lots in five neighborhoods for development potential, as well as potential for parks, trails, and conservation areas to restore healthy waterways and provide trail connections and outdoor recreation opportunities.

Likewise, the Urban Neighborhood Initiative has defined a guide and resource program for residents to adopt lots in their neighborhoods and create new community amenities

through designing native gardens, natural playgrounds, gathering areas, and other ecologically-friendly beautification that stimulates local team-building, neighborhood pride and increased knowledge of environmental stewardship.

**Partners:**

Mid-America Regional Council Environmental Programs, Heartland Conservation Alliance, The Conservation Fund, Urban Neighborhood Initiative Green Space and Urban Farms Action Group, Giving Grove, KC Community Gardens, Hoxie Collective



## SUCCESS STORIES



**RACHEL MORADO GREEN INFRASTRUCTURE SITE**

Photo Credit: City of Kansas City, Missouri

## MUNICIPAL GREEN INFRASTRUCTURE PROJECTS

### URBAN

The five neighborhoods of the Marlborough Community Coalition in southern Kansas City, Missouri were identified as one of the pilot areas for municipal green infrastructure projects when KCMO negotiated its consent decree with the EPA to reduce polluted outfalls from the combined stormwater and sewer infrastructure system. The first pilot projects were neighborhood scale bioswales along residential streets, designed and planted with native vegetation to contain and filter stormwater along the streets.

The next major green infrastructure project in Marlborough was along a primary transportation corridor, Paseo Boulevard. The median was redesigned as a bioswale to capture, convey and filter stormwater along this on this civic and residential spine through the neighborhoods.

The third project type was redesign of three major parks in Marlborough (Arleta Park, Rachel Morado Park and the new regional bioretention pond and park at 81st Terrace and

Troost). These parks were redesigned with community input to become examples of native planting, green infrastructure designed to reduce flooding of surrounding residential properties, and physical reconnection of neighborhoods through trails, recreation, and education opportunities.

KCMO Water Services, in partnership with Bridging the Gap, also created the KC Green Stewards local workforce development program and piloted it in Marlborough. This program is designed to support the City of Kansas City, Missouri, in day-to-day maintenance and monitoring of 230 constructed green infrastructure installations in the areas of the city served by the combined sewer system.

#### **Partners:**

KCMO Water Services, KCMO Parks and Recreation, KCMO Public Works, Marlborough Community Coalition, The Conservation Fund, Heartland Conservation Alliance, Vireo, Bridging the Gap



**WABASH & 74TH STREET**



**ARLETA PARK GREEN INFRASTRUCTURE**



Photo Credit: City of Kansas City, Missouri



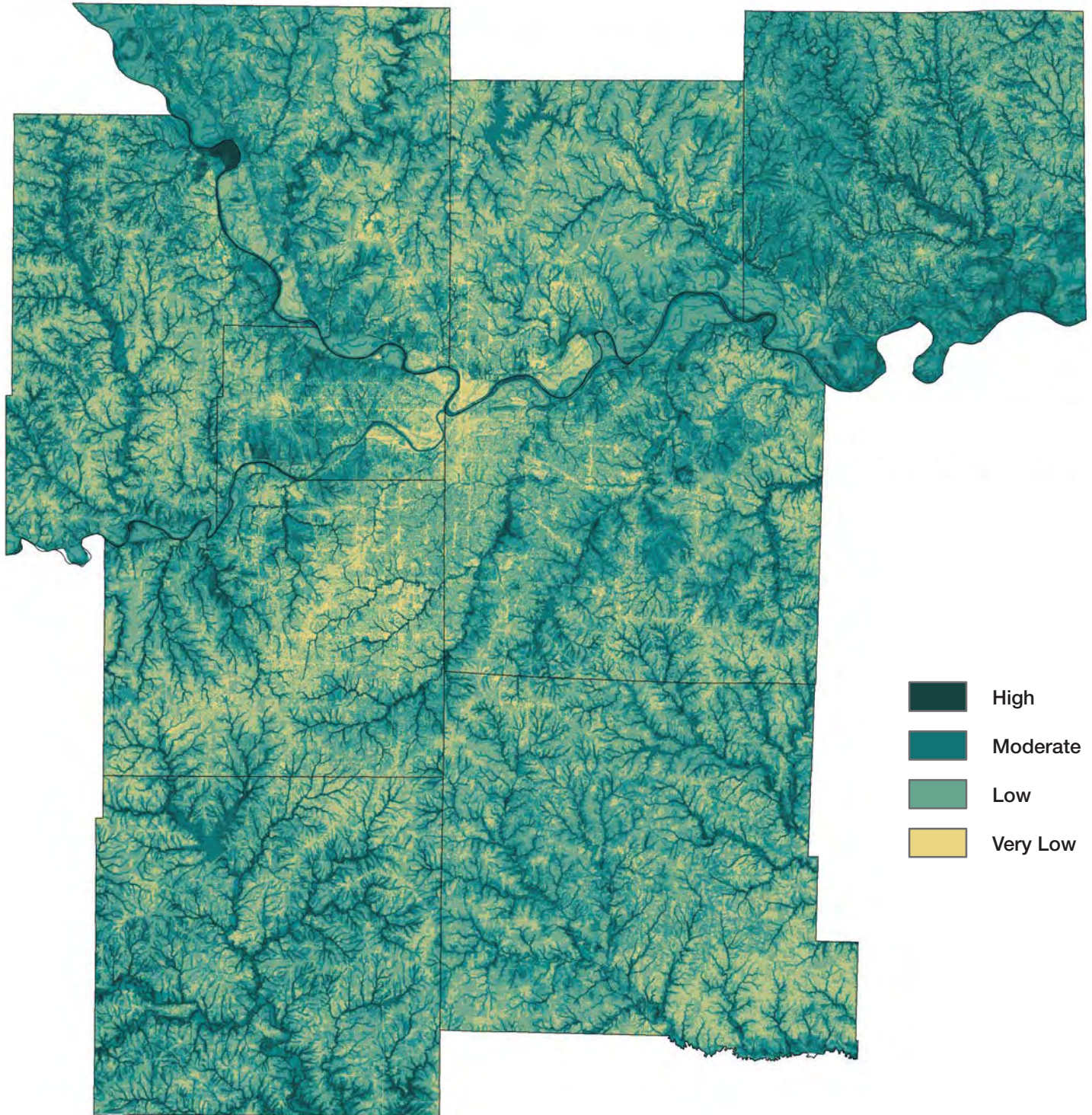
**DR. MARTIN LUTHER KING JR. BLVD.  
& 77TH STREET**



**ARLETA PARK**



# ECOLOGICAL VALUE



# REGIONAL VISION

## A REGION OF ECOLOGICAL ASSETS

The map on the left shows the water and land areas of the region with the highest ecological value.

Ecological Value criteria are defined by the presence of streams, lakes, wetlands, floodplains, glades, caves and karst, forest, and large herbaceous areas, along with

weighted combinations of ecosystem service benefits for clean water and wildlife.

The darkest colors show the greatest overlap of these value criteria, and therefore the highest ecological value.

## A LAND OF OPPORTUNITY

In May 2018, the MARC Board of Directors endorsed an updated version of the shared vision for our region — one that balances a thriving economy, social equity and a healthy environment, meeting today's needs without compromising the needs of future generations:

“Greater Kansas City is a region of opportunity. Its robust economy, healthy environment and social capacity support the creativity, diversity and resilience of its people, places and communities.”



Formed at the confluence of rivers, trails and trains on the border of two states, Greater Kansas City is a place of interconnection, where people of all backgrounds are welcome and where commerce and ideas flow as freely as the rivers and streams that run through and define it. Our people thrive here, in safe, walkable and well-maintained neighborhoods. We have abundant opportunities for education, and work in fulfilling jobs at businesses that can compete with any in the world. We enjoy, protect and preserve our region's natural beauty. We care for our neighbors and our communities. We lead by example. Our region has the strength to not only bounce back from adversity, but bounce forward, confidently, into the future.





# GREEN BROWN WHITE