TRAILS KC PLAN

KANSAS CITY
MISSOURI

a comprehensive citywide trail system for kansas city, missouri

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ORDINANCE NO. 081052

Approving the Trails KC Plan as a guide for future shared-use trail development and corridor preservation within the City of Kansas City, Missouri; and authorizing the Director of Public works to adopt design/engineering standards.

WHEREAS, the FOCUS Kansas City Plan, recommends the development of trails as a means to create a connected city, improve neighborhood liveability and positively impact the image of the City; and

WHEREAS, throughout the country, trails are recognized as effective tools that help shape communities, creating multiple benefits, including, alternative transportation facilities, economic development, recreational opportunities, health benefits, and improved community image and quality of life; and

WHEREAS, trails are an integral component to developing a bike-friendly, multi-modal and sustainable community, promoted in several City initiatives including the Green Solutions Policy, adopted under Resolution No. 070830 on August 9, 2007, and the Climate Protection Plan, adopted under Resolution No. 080754 on July 24, 2008; and

WHEREAS, representatives of a Mayor-appointed steering committee and a technical committee of local, regional and statewide departments worked in partnership with community members to develop and refine the Plan; and

WHEREAS, legal notice of the public hearing before the City Plan Commission was published on September 1, 2008, in conformity with state and local laws; and

WHEREAS, the City Plan Commission unanimously voted to approve the Trails KC Plan on September 16, 2008; and

WHEREAS, it is considered to be in the community interest to adopt the Trails KC Plan as a guide for shared-use trails development; NOW, THEREFORE,

BE IT ORDAINED BY THE COUNCIL OF KANSAS CITY:

Section 1. That the Trails KC Plan is hereby approved as a guide for future shared-use trail development and corridor preservation within the City of Kansas City, Missouri. A copy of the Trails KC Plan is attached hereto as Exhibit A incorporated herein by reference.

Section 2. That the Trails KC Plan is consistent and complies with the FOCUS Kansas City Plan, adopted on October 30, 1997, by Committee Substitute for Resolution No. 971268, and is adopted as a supplement to the FOCUS Kansas City Plan.

Section 3. That the Council finds and declares that before taking any action on the proposed plan, all public notices have been given and hearings have been held as required by law.

Section 4. That the Director of Public Works is authorized to develop and adopt design/engineering standards for the construction of the trails.

I hereby certify that as required by Chapter 80, Code of Ordinances, the foregoing ordinance was duly advertised and public hearings were held.

Secretary, City Plan Commission

Approved as to form and legality:

M. Margaret Sheahan Moran
Assistant City Attorney

Authenticated as Passed

Mark Funkhouser, Mayor

Vickie Thompson, City Clerk

NOV 20 2008
Date Passed

CREDITS and acknowledgments

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The Honorable Mark Funkhouser

CITY MANAGER
Wayne A. Cauthen

KANSAS CITY
MISSOURI

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table of CONTENTS

Maps:

EXECUTIVE SUMMARY

The Trails KC Plan is the City of Kansas City, Missouri's vision for developing a first-class shared-use trail system for pedestrians, bicyclists, and equestrians, for both commuting and recreation. Trails are recognized locally and throughout the country as effective tools to create strong, vibrant communities and create the quality of life that attracts and retains residents and businesses. While there is overwhelming support for the development of trails in our community, Kansas City is "trails poor" and is missing out on the many benefits and competitive advantages that trails provide, including:

- transportation alternatives
- economic development
- recreation
- health
- conservation opportunities.

The Trails KC Plan outlines the critical components necessary to construct, manage and maintain a first-class, citywide trail system that will accomplish the following milestones within 15 years of adoption:

- Transform Kansas City's meager 30 miles of disjointed trails into a 230-mile interconnected, regional system of trails
- Develop a trail system integrated with the City's on-street bicycle facilities to create a comprehensive alternative transportation network
- Make critical connections between trails with 26 miles of on-street facilities where trails cannot be safely accommodated
- Construct more than 40 miles of equestrian trails open to the public
- Create connections to Kansas City's neighboring communities, creating a regional comprehensive recreation and transportation system.

EXECUTIVE SUMMARY

RANKING OF AMENITIES THAT INFLUENCE MOVING TO A NEW COMMUNITY

1. Highway Access
2. **Walking/Jogging/Bike Trails**
3. Sidewalks on Both Sides
4. Park Area
5. Playgrounds
6. Shops Within Walking Distance
7. Lake
8. Near Public Transportation
9. Day Care Center
10. Business Center
11. Basketball Courts/Soccer Field
12. Card-Operated Gate (No Guard)
13. Baseball/Softball Field
14. Golf Course
15. Club House
16. Security Guard at Gate
17. Tennis Courts
18. Equestrian Facilities

NAR/NAHB Consumers Survey, 2002

Line Creek/2nd Creek Trail – old rail bed

Implementation of the Trails KC Plan will support recently-adopted policies and initiatives including the Climate Protection Plan and the Mayor's goal to reach Platinum designation from the League of American Bicyclists by 2020, thereby establishing Kansas City as a leader in trails development.

In addition to strong citizen involvement during the planning process, the Mayor-appointed steering and technical committees representing a diverse set of stakeholders and technical advisors were instrumental in the development of the Trails KC Plan and unanimously endorsed it for adoption. The Plan is divided into six chapters, each of which provides an integral piece of the toolkit needed to develop a successful trail system. The following outlines the fundamental points of each chapter.

CHAPTER 1 – INTRODUCTION

Provides a review of the important benefits a quality trail system brings to a community and takes a critical look at how Kansas City stacks up against other cities in the development of a trail system. This chapter also outlines the planning purpose and process.

KEY HIGHLIGHTS

- In a national survey, trails ranked 2nd in amenities that influence moving to a new community (only highway access rated higher).
- Kansas City has 30 miles of shared-use trails compared to more than 195 miles in Johnson County. Liberty, which has 1/16 the population of Kansas City, has 24 miles of trails.

CHAPTER 2 – KANSAS CITY'S TRAIL SYSTEM

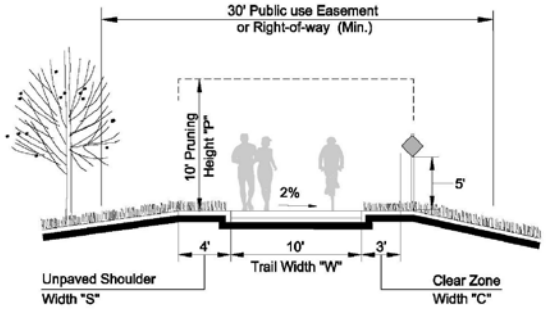
Kansas City has been plagued by the lack of an official, adopted trails plan. Corridors had been identified through regional planning efforts, but no coordinated citywide system of trails had been developed and adopted. This chapter defines the trail system hierarchy (types and levels of trail facilities), methodology for determining system size, and provides recommended trail corridors in a systems map. The chapter also defines a level of service standard for shared-use trails to guide and evaluate Kansas City's progress.

KEY HIGHLIGHTS

- "Citywide Trail" is a public, non-motorized shared-use trail facility that serves as a primary or regional trail. Provides major connections throughout Kansas City and to neighboring communities.
- "Neighborhood Connector Trail" is a public, non-motorized shared-use "local trail" that connects neighborhoods to the Citywide Trails. Locations of proposed neighborhood connectors are not identified in the plan, but criteria/guidance is provided for their development.
- "On-Street Connector" is a combination of on-street bicycle facilities and sidewalks and only identified where off-street, shared-use trails are not feasible.
- Major trail corridors include the Katy Trail, Blue River Trail, Line Creek/2nd Creek Trail, and the Shoal Creek Trail.
- Recommended Level of Service/Facility Standard – 0.4 miles/1,000 service population.

CHAPTER 3 – TRAIL DESIGN GUIDELINES AND STANDARDS

Kansas City has lacked comprehensive design and engineering standards for trails, which can compromise trail performance, durability, continuity and maintenance. This chapter outlines design standards to govern the development of the Trails KC system and addresses trail surface material, easements, trail width, slope, crossings, etc.



KEY HIGHLIGHT

- Cross sections for all standards are included in Appendix B and are recommended for adoption as part of the City's approved engineering standards – KCMO Standards, Drawings, Specifications and Supplements to APWA – via administrative review by the Department of Public Works.

CHAPTER 4 – DEVELOPMENT AND IMPLEMENTATION PLAN

A major impediment to the development of trails in Kansas City is the lack of a strategic plan and a single entity responsible for coordinating and constructing trails. If trail building continues as its current pace, it would take more than 60 years to complete construction of the system. Chapter 4 outlines major strategies for management, acquisition, funding, maintenance and evaluation of Kansas City's comprehensive trails program based on a 15-year build-out strategy.

KEY HIGHLIGHTS

- Designate a "Primary Point of Contact" (PPOC) within the City to lead the development of the Trails KC system, creating an entity accountable for design, development, construction, maintenance and performance measurements.
- Develop in-house team dedicated solely to designing and constructing bike/ped facilities producing a cost and time savings for trail construction and maintenance.
- Pursue development of a maintenance endowment to fund on-going maintenance needs.

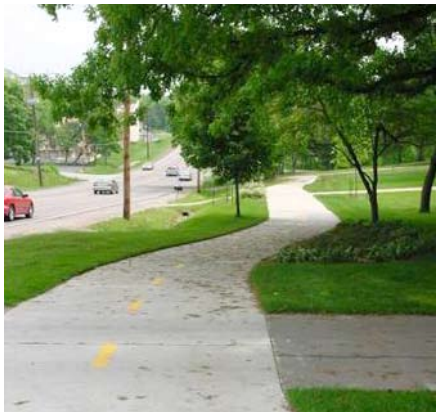
CHAPTER 5 – PRIORITY PROJECTS PLAN

This chapter is aimed to help kick-start the initial implementation of Kansas City's trails program by identifying priority projects for the first 5 years. It provides cost estimates for each trail segment and status of the project (i.e., funded/ opportunities for funding; design completed or underway, leveraging opportunities, etc). Additionally, it also establishes evaluation criteria for future prioritization of trail projects.

KEY HIGHLIGHTS

- FY 2008-2009 has more than $4.1 million in funded projects.
- More than 52 miles of Citywide Trails will be built by FY2012-2013.
- Use of the unpaved "interim" trail surface standard can accelerate implementation due to significant cost savings, while also preserving the trail corridors.

EXECUTIVE SUMMARY



CHAPTER 6 – IMPLEMENTATION AND POLICY RECOMMENDATIONS

Summarizes recommendations presented throughout the plan document into a comprehensive list of actions necessary to develop and sustain a successful trail system in Kansas City. Recommendations are provided that address organizational, funding and technical issues.

KEY HIGHLIGHTS

- Adopt "complete streets" policy directive that all infrastructure projects integrate bike/ped accommodations.
- Adopt the Trails KC alignments into the Major Street Plan as part of the City's multi-modal transportation system.
- Allocate annual City appropriation for development of the trail system.
- Pursue new funding resources including private/in-kind/trails dedication and in-lieu fee program.
- Support regional efforts to establish a regional trails organization "trails authority" and regional funding mechanism.
- Incorporate funding for trails into the wet weathers program.
- Establish a "Friends-of-Kansas City Trails" group that can assist in programming/fundraising/education and outreach.
- Conduct an update to the Bike KC Plan to create a bike/ped system with on-street facilities integrated with trails to create a comprehensive transportation network.
- Implement pilot project(s) to investigate viability of sustainable trail surface materials.
- Adopt performance measures for the Trails KC system and conduct regular assessments in order to evaluate progress.

While Kansas City lags behind other cities in trails development, we have a tremendous opportunity to develop a first-class trail system that rivals that of any other in the country. Kansas City's trail system can provide not only recreational opportunities, but also, the ability to get to work, school and errands by walking or biking. In order to create the comprehensive trail system desired by Kansas Citians, bike/ped facilities must become a priority. Adoption and implementation of the Trails KC Plan is the first step in providing Kansas City residents and visitors with a fully connected and comprehensive trail system that can be enjoyed and treasured today and for generations to come.

Kansas City's Major Taylor Bike Troop

INTRODUCTION

Trails have played an integral role in the history of Kansas City, Missouri. From the Lewis and Clark expedition along the Missouri River to the convergence of the historic Santa Fe, Oregon and California Trails in Kansas City, trails have influenced the development of our city. Today, trails are recognized locally and throughout the nation as effective tools that help shape communities and create the quality of life that attracts and retains residents and businesses.

Benefits of Trails

Trails are more than a mere amenity or popular trend; they help shape and sustain strong, vibrant communities, providing a resource not only for current residents but for future generations. Trails offer a wide-range of benefits for communities, including:

- **Transportation.** Trails provide alternative routes for a variety of transportation trips, commuting to work or school, shopping trips, etc., getting people out of their cars and onto the trails. Not only can trails help reduce vehicle trips but also the associated congestion and air pollutants (1/3 of all ground-level ozone is created by cars and trucks). Reducing air pollutants is critical in Kansas City, where in 2007, ozone monitors violated the EPA standard. Throughout the US, 1/4 of all trips are 1 mile or less, but 3/4 of these trips are made by car.[1] A trail system that is linked with an on-street network to create a comprehensive bikeway system can help to transfer vehicle trips to the healthier alternative modes of walking and biking. In addition, trails provide alternative transportation routes for the 1/3 of the population that cannot drive vehicles (youth, people with disabilities, seniors, and residents who cannot afford a car), thereby creating new opportunities for residents with mobility challenges.
- **Economic and Community Development.** Trails often serve as an economic stimulus for a community. Studies have shown that a trail can bring at least $1 million annually to a community.[2] In North Carolina, a $6.7 million investment in trails is reported to have generated an annual economic impact of $60 million.[3] The popularity of the Katy Trail (350,000 estimated visitors each year) and the success of its adjacent communities such as Rocheport and Augusta, Mo. serve as prime examples of the economic impact of trails.

INTRODUCTION

RANKING OF AMENITIES THAT INFLUENCE MOVING TO A NEW COMMUNITY

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13. Baseball/Softball Field
14. Golf Course
15. Club House
16. Security Guard at Gate
17. Tennis Courts
18. Equestrian Facilities

NAR/NAHB Consumers Survey, 2002

Existing Brush Creek Trail

- **Recreation.** Trails are one of the top recreational amenities that residents want, tourists look for and relocating businesses desire for their workforce. Trail-related recreation is important because people of all fitness levels and ages can participate and it can be a group or individual activity.
- **Health and Physical Activity.** The Center for Disease Control reports that "there is now scientific evidence that providing access to places for physical activity increases the level of physical activity in a community."[4] As Missouri has the 17th highest rate of adult obesity, and almost 65% of Kansas City residents over 18 are overweight (30.7%) or obese (34.0%),[5] it is critical to provide more opportunities for physical activity. Improving access to trails offers a tremendous opportunity to increase physical activity and improve the health of Kansas City residents.
- **Corridor Conservation for Multiple Uses.** The development of trail corridors also serve as a means of preserving natural resources and wildlife areas from encroaching development while providing educational and cultural opportunities within these corridors.
- **Improved Community Image and Quality of Life.** Trails are a desired community resource. In a national study conducted by the National Association of Realtors (NAR) and the National Association of Home Builders (NAHB), trail availability ranked higher than 16 other options, including proximity to parks, tennis courts, soccer fields, shops and public transit. Only highway access rated higher.[6]

The Current State of Trails in Kansas City

The Kansas City region has long desired a well developed trail system. Trail and bikeway planning in Kansas City dates back to 1899, when the Kansas City Times published a map of popular Kansas City bicycle paths. Almost a century later, in 1980, the City's Parks and Recreation Commission published a Bikeways Plan that recommended a combination of on-street and off-street bikeways throughout the city. More recently, trail planning has been initiated at the regional level, including the 1991 and 2002 MetroGreen Plans and the 1999 Northland Trails Vision Plan. The most recent planning effort was completed in 2002, when the City adopted Bike KC, a citywide bike system map, which included primarily on-street bikeways with some off-street trails. In addition, the FOCUS Plan, Kansas City's comprehensive plan, recommends the development of trails as an important means to create a connected city.

While Kansas City has a long history of active trail planning, implementation has been marginal. Past planning efforts did not succeed in the development of trails in Kansas City because of two key factors:

1. The plans were not adopted as official plans for Kansas City; and/or
2. The plans did not include implementation recommendations such as cost estimates, funding plan, and roles/responsibilities.

MetroGreen and Northland Trails Vision Plan are regional plans that were not adopted by Kansas City and therefore, the City did not make a commitment to implement these plans. The Bikeways Plan and Bike KC Plan, although adopted plans (by Parks Board and City Council respectively), were little more than maps of proposed bikeways. These plans lacked design standards/guidelines and implementation strategies, and therefore little action has been taken to implement these plans.

Lacking a focused citywide trails plan, Kansas City lags behind other cities in the region, as well as its peers in the development of trails. To date, only 30 miles of shared-use trails and 6.5 miles of on-street bikeways exist within the city limits. By comparison, Johnson County, Kansas has over 196 miles of shared-use trails. Without an adopted trails plan, the City has little guidance and cohesiveness in identifying trail corridors, which has created major impediments to the development of a successful trail system in Kansas City, including:

- loss of greenways and potential trail corridors to development
- lack of coordination and prioritization in trail development
- lack of funding dedicated to trail planning and construction.

Johnson County, KS Trail System

CITIZEN SATISFACTION

Less than 1/3 of Kansas City residents are satisfied with walking and biking trails in the city.

Kansas City Citizen Survey Report, City Auditor's Office, 2008

TRAIL SYSTEM COMPARISON - BY LAND

City	Square Miles	Miles of Trails	Trail Miles per Square Mile
Lincoln, NE	75	108	1.44
Minneapolis, MN	55	56	1.02
Liberty, MO	27	24	0.89
Colorado Springs, CO	186	105	0.56
Portland, OR	134	71	0.53
Johnson County, KS	477	196	0.41
St. Louis County, MO	508	111	0.22
Springfield-Greene County, MO	375	43	0.11
Kansas City, MO	**317**	**30**	**0.09**

TRAIL SYSTEM COMPARISON - BY POPULATION

City	Population (2006)	Miles of Trails	Trail Miles per 1000 Persons
Liberty, MO*	27,982	24	0.86
Lincoln, NE	241,167	108	0.45
Johnson County, KS	516,731	196	0.38
Colorado Springs, CO	372,437	105	0.28
Springfield - Greene County, MO	254,779	43	0.17
Minneapolis, MN	372,833	56	0.15
Portland, OR	537,081	71	0.13
St. Louis County, MO	1,000,510	111	0.11
Kansas City, MO	**447,306**	**30**	**0.07**

* Liberty, MO population data (2003 estimate from Census)

INTRODUCTION

Shared-use trail bridge in Portland, OR

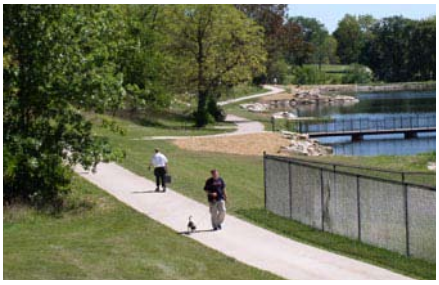
BUILD IT AND THEY WILL COME

Portland, OR reports daily bicycle trips jumped 400% from 2,850 in 1992 to 12,046 in 2006 after it expanded its bike network from 83 miles to 263 miles.

DESIRE FOR TRAILS

82% of surveyed Kansas City area residents think cities should develop a connected system of walking/biking trails.

MARC 2005 Regional Walking and Biking Survey



Plan Purpose

Even though Kansas City is "trails poor," Kansas City residents recognize the many benefits of trails and have expressed a desire to increase the miles of trails within the city. Further, many trail users lament that they are forced to travel to Johnson County or Smithville to use trails because Kansas City does not have adequate facilities.

Despite Kansas City's lack of adequate trail facilities, more than half of all area residents surveyed in 2005 had used walking and biking trails in the last year.[7] This confirms a high use of trail facilities by local residents and further suggests a strong community desire for more trail facilities. Cities around the country report that if additional trail facilities are provided, trail usage will increase. The strong local interest in trails suggest that by building new, more convenient trail facilities, more Kansas Citians will use and enjoy trails, and those that use trails already, will frequent them more often.

Due to the documented community benefits, desire, and need for a comprehensive trail system, the Public Improvements Advisory Committee (PIAC) allocated funds for the development of the Trails KC Plan. The purpose of the Plan is to guide and prioritize the development and maintenance of a comprehensive multi-use trail system that serves the needs of pedestrians, bicyclists and equestrians, for commuting and recreational use. The Plan identifies regional trail corridors that create major connections throughout Kansas City, Mo. and to trail systems in neighboring cities and counties.

The Plan will serve as an implementation resource for policy-makers, planners, landscape architects, engineers and other groups involved in the development, design and maintenance of trails in Kansas City. It includes the following key components to ensure effective trails development:

- Design and construction standards and criteria for public trail facilities
- Funding and maintenance options to ensure a sustainable system
- Institutional processes needed to manage trail planning and construction
- Policy recommendations to facilitate plan implementation
- A five-year plan of priority projects to facilitate and kick-start implementation.

Planning Process

The Trails KC Plan planning process was not only initiated by the Kansas City community, through the Public Improvements Advisory Committee (PIAC) process, but also guided by local citizens to ensure that their needs were addressed in the Plan. City Planning and Development Department staff provided project management services; however, the planning process was a collaborative effort of the larger community.

Past community-driven trails planning efforts, such as MetroGreen and the Northland Vision Trails Plan, served as a base from which the Trails KC Plan effort started. A mayor-appointed steering committee, representing a wide range of community interests, from neighborhood leaders to developers, walking and bicycling enthusiasts to local business owners, as well as environmental advocates, worked together, along with a technical committee, to guide the direction and recommendations outlined in the Plan. In addition, the community at-large, through a series of public meetings, one-on-one meetings, letters of support for trails and trail funding, etc., provided essential feedback. Due to the active participation of diverse groups of stakeholders, the Trails KC Plan represents the needs and interests of Kansas Citians and provides a vision for the future of our community.

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TRAILS SYSTEM

Citywide Trail

Trails System Hierarchy

Citywide Trail (n). a public, non-motorized, shared-use trail facility that serves as a primary or regional trail. Provides major east/west, north/south connections throughout Kansas City, Mo. and to trail systems in neighboring cities. Also known as: Class I bikeway, shared-use path, MetroGreen type 4 facility.

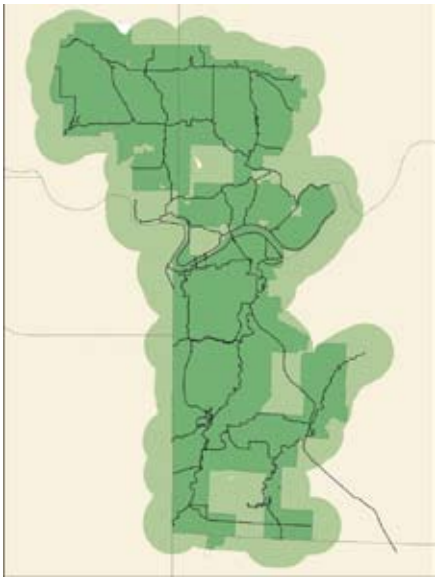
The Trails KC system consists of a hierarchy of trails. At the top of this hierarchy are the primary or regional "Citywide Trails." A combination of minor trails and connectors work to support the regional Citywide Trails. These include:

- **On-street connectors** – a combination of on-street bicycle facilities (bike lanes, shared lane markings, bike routes, etc) and sidewalks. On-street connectors are only identified as part of the Trails KC system where off-street, shared-use trails are not feasible.
- **Equestrian trails** – public equestrian facilities in corridors adjacent to Citywide Trails.
- **Neighborhood connector trails** – public, non-motorized, shared-use "local" trails that connect neighborhoods to the regional Citywide Trails. The Plan does not identify the locations of proposed neighborhood connectors, but does include criteria for their development to ensure effective connectivity throughout the city.
- **Bike KC routes** – while not a part of the Trails KC Plan, the on-street bike facilities identified in the City's adopted Bike KC Plan will work in tandem with the Citywide Trails routes to provide an integrated off-street/on-street bicycle system for Kansas City (see Appendix A - map).

On-street connector

Equestrian trail

Neighborhood connector trail



99% of Kansas City residents will be within 15 min./2 mi. of the Trails KC system.

kansas city's

TRAILS SYSTEM

Recommended Trail System for Kansas City, Missouri

To develop an appropriate trail system for Kansas City, several key factors must be considered:

- local desire/need/public support for trails
- population trends
- budgetary conditions
- land resources/opportunities.

Kansas City's vast geographic size (13th largest in US) far exceeds its current population (39th largest), which presents a challenge to efficiently provide trails and other public facilities to a widely-dispersed population. Despite this challenge, the City's large expanses of undeveloped land present a great opportunity to preserve trail corridors in anticipation of future development and population growth. Further, the strong desire for trail facilities that exists within Kansas City, coupled with the thousands of acres of river valleys and miles of levee tops under public ownership, provide great opportunities for trail-building.

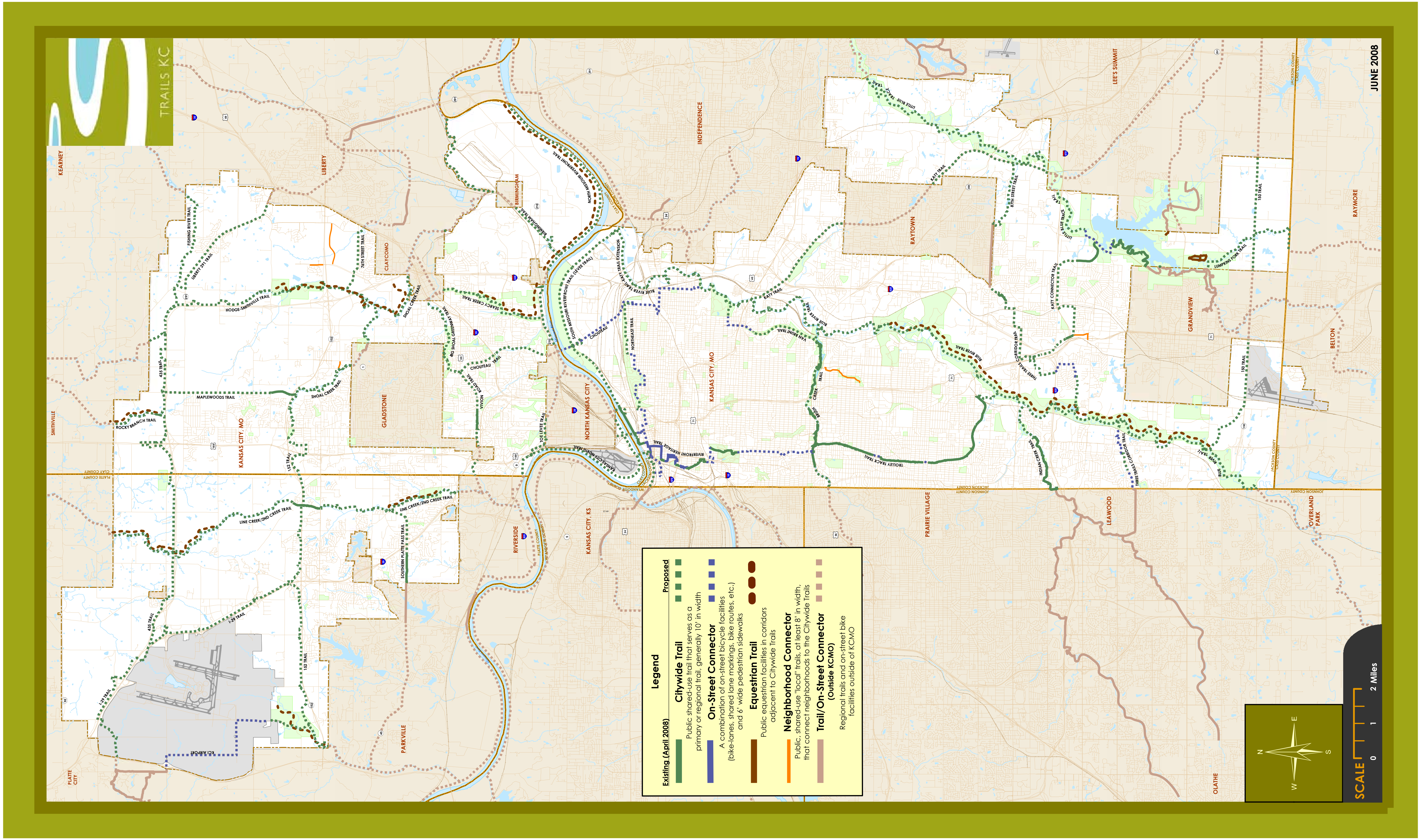
Building on these determining factors and the groundwork of past trails planning efforts, the project team and steering and technical committees worked to identify trail corridor opportunities that could create the "spine" of the trail system for Kansas City. A guiding factor for this effort was the 15 minute/2 mile rule. Numerous studies indicate that most people consider a 15 minute walk or 2 mile bicycle ride a convenient trip to use a trail. For Kansas City to achieve this goal, a system of about 212 miles of trails would be needed.

The map on page 17 shows the recommended Trails KC system for Kansas City. The system includes:

- 230 miles of Shared-Use "Citywide Trails" (90%)
- 26 miles of On-Street Connectors (10%)
- 41 miles of Equestrian Trails

The Trails KC alignments are designed to preserve regional trail corridors and are intended to serve as a general guide for the location of the trail corridors. As land is developed, the exact trail location should follow the general alignment, but can be moved within a development to better address topography, lot layout, etc., so long as it provides the intended connectivity, meets the design standards and off-road evaluation criteria shown on page 33, and is approved on the site plan.

A major focus of the system is to provide connectivity. Trail usage increases dramatically when trails are interconnected, providing recreational users a variety of loops and routes, while also providing transportation users a means to move around the city. Kansas City's future trails system will therefore serve the needs of many user groups, especially as a complimentary on-street bicycle system is developed in conjunction with trails.


TRAILS KC
JUNE 2008
Legend
Existing (April 2008)
Proposed
Citywide Trail
Public shared-use trail that serves as a primary or regional trail, generally 10' in width
On-Street Connector
A combination of on-street bicycle facilities (bike-lanes, shared lane markings, bike routes, etc.) and 6' wide pedestrian sidewalks
Equestrian Trail
Public equestrian facilities in corridors adjacent to Citywide Trails
Neighborhood Connector
Public, shared-use "local" trails, at least 8' in width, that connect neighborhoods to the Citywide Trails
Trail/On-Street Connector
(Outside KCMO)
Regional trails and on-street bike facilities outside of KCMO
SCALE
0
1
2 Miles
KANSAS CITY, MO
NORTH KANSAS CITY
KANSAS CITY, KS
INDEPENDENCE
RAYTOWN
GRANDVIEW
LEE'S SUMMIT
GLADSTONE
RIVERSIDE
PARKVILLE
LIBERTY
KEARNEY
SMITHVILLE
PLATTE CITY
CLAYCOMO
BIRMINGHAM
PRAIRIE VILLAGE
LEAWOOD
OVERLAND PARK
OLATHE
BELTON
RAYMORE

TRAIL CORRIDOR HIGHLIGHTS: NORTHLAND

HODGE-SMITHVILLE TRAIL

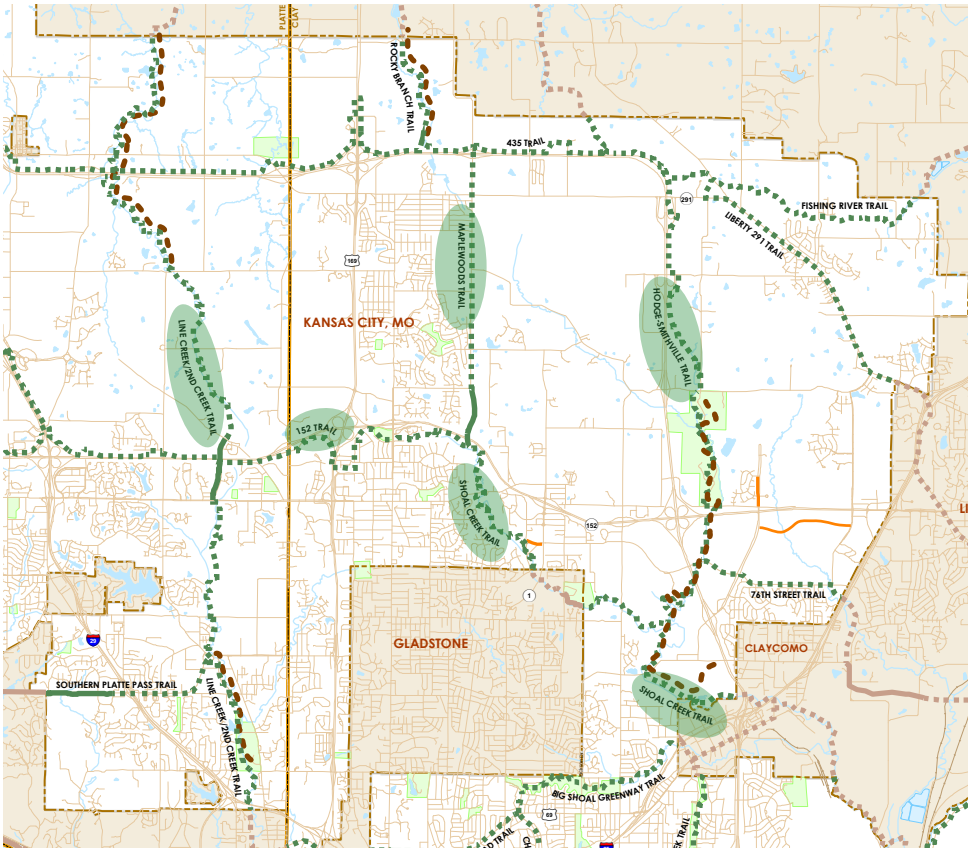
- 9.5 miles
- Runs through the 2nd largest city park and eventually connects to over 29 miles of trails around Smithville Lake
- Includes both shared-use trail and equestrian trail facilities
- Follows a scenic and meandering stream corridor with destinations to the Shoal Creek Museum, neighborhoods, recreation fields and future retail

LINE CREEK/2ND CREEK TRAIL

- 15 miles
- Follows the historic interurban rail line with wonderful views of the Line Creek Valley and the Downtown skyline
- Includes both shared-use and equestrian trail facilities
- Traverses through some of the most picturesque areas in the Northland

SHOAL CREEK AND MAPLEWOODS TRAILS

- 10.8 miles
- Follows rolling hillsides and woodlands along the creek edge
- Alignment works with the future parkway and connects neighborhoods to Maplewoods College, NKC schools, City of Gladstone, and future retail and neighborhoods




Hodge-Smithville Trail – existing service road


Line Creek/2nd Creek Trail – old rail bed


Shoal Creek Trail – existing ATV trail

kansas city's

TRAILS SYSTEM

Blue River Trail – existing conditions

Katy Trail – bridge over Blue Ridge Cut-off

Levee Trail – existing levee conditions

TRAIL CORRIDOR HIGHLIGHTS: SOUTH OF THE RIVER

BLUE RIVER TRAIL

- 29 miles
- Longest stretch of trail corridor in Kansas City that extends from Johnson County to the Missouri River and Independence, MO
- Traverses through one of the most picturesque areas of the city, with woodlands, scenic bluffs and riverside views

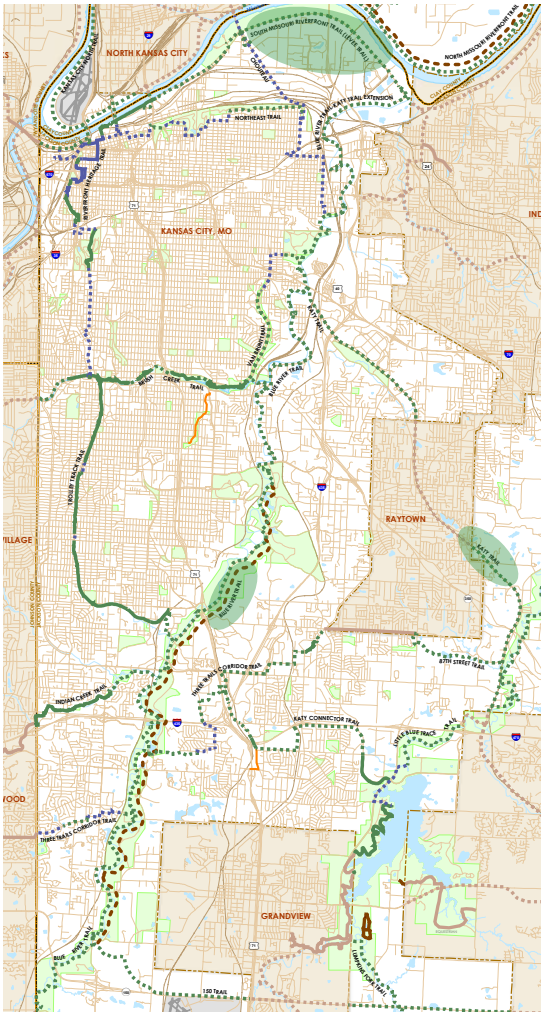
KATY TRAIL

- 7.5 miles
- Kansas City extension of the statewide Katy Trail
- Runs along the old Rock Island Railroad corridor

LEVEE TRAIL (SOUTH MISSOURI RIVERFRONT TRAIL)

- 6.5 miles
- Connects to the existing Riverfront Heritage Trail which crosses the MO/KS state line
- City-owned levee top provides views of the Missouri River

The proposed trail system has been endorsed by the steering and technical committees and received overwhelming support from the community. The project team also vetted the proposed system against accepted trail system benchmarks and systems in other cities (see tables on page II) to ensure the reasonableness and feasibility of constructing the system. Based on this analysis, the recommended trails system is an achievable plan that will fulfill not only the existing need for trails, but also the trail needs of Kansas City's future population.



Trail Facility Standard/Level of Service Guideline

A community's need or demand for trails and other recreational facilities is expressed as a baseline level of service (LOS) or facility standard ratio (miles or acres per 1,000 persons). This LOS/facility standard, in turn, helps guide cities as they plan for and evaluate land acquisition and facility construction activities. Prior to 1996, the National Recreation and Parks Association (NRPA) established national standards for recreational facilities including trails. Many cities, including Kansas City, adopted the NRPA's recommendations as the local standards.

In its 1996 edition of Parks, Recreation, Open Space and Greenway Guidelines, the NRPA adopted the philosophy that a standard should not be universal, rather, facility standards should be determined locally based on the unique demands and values of its community members. Following the guidance of the NRPA, Kansas City Parks Department, in its Park System Master Plan, 2017 Traditions and Trends, adopted a new trail facility standard – implementation of MetroGreen and the Bike KC Plan, the only citywide planning efforts that had been completed to date.

As previously discussed, the local community determined that it was necessary to develop a comprehensive trails plan for Kansas City, and thereby re-evaluate the existing trails facility standard. The analysis conducted during the planning process found the existing trail facility standard to be inadequate. The proposed trail system revises the shared-use trails facility standard, better reflecting the needs of the Kansas City community.

RECOMMENDED NEW TRAIL FACILITY STANDARD (SHARED USE TRAILS):
Implementation of the Trails KC Plan = 0.4 miles/1000 service population

TRAIL FACILITY STANDARD COMPARISON

	1993 Standard	Existing Standard	New Recommended Standard
Source	A Plan for Parks, Recreation, Boulevards and Greenways	Park System Master Plan, 2017 Traditions and Trends	Trails KC Plan
Facility Standard Recommendation	0.5 miles/1000 persons	Implement Metro-Green and Bike KC!	Implement Citywide Trails system
Miles of Trails in Plan	N/A	72.3 miles	230 miles
Facility Standard (Miles/1000 Persons)	0.5 miles/1000 persons	0.15 miles/1000 persons	0.4 miles/1000 persons

[1] In A Plan for Parks, Recreation, Boulevards and Greenways (1993), the Kansas City, Mo. Parks and Recreation Department adopted a trail facility standard of 1 mile per 2,000 people or 0.5 miles per 1,000 people.

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trail design

GUIDELINES and STANDARDS

There is a strong sentiment among Kansas City residents that trails be developed in a manner that compliments the natural environment while preserving quality greenways and providing linkages within the community. In order to accomplish this, design guidelines/standards are necessary. Design guidelines/standards ensure continuity within a trail system, and most importantly, that trails are built to a standard that ensures durability, manageability, and strong resiliency to the elements, while minimizing long-term maintenance costs.

Currently, the City of Kansas City's design and engineering standards are limited to one insufficient trail cross-section and specification. The following chapter provides standards that address various trail environments, surfaces, width, grades, etc., to ensure that trails are properly designed and constructed. Details of all recommended standard sections/design guidelines are provided in Appendix B.

The specific design of trails should incorporate features necessary to accommodate multiple user groups including:

- Bicyclists of all skill levels
- Pedestrians
- Equestrians (parallel soft surface paths)
- In-line skaters and skateboarders
- Children on tricycles and in strollers
- Seniors
- People with disabilities
- Recreational users and commuters.

trail design GUIDELINES and STANDARDS

To keep these diverse user groups coming back, the trail design must:

- Create a compelling trail experience and linkages to key destinations
- Manage viewsheds
- Be laid out (shaped) consistent with user expectations
- Be fun and sustainable
- Be educational and safe
- Develop a connected and attractive network.

In addition to designing for multiple users, elements of quality trail design/ construction adhere to sound technical practices. The following guiding principles provide the underlying rationale for actions related to protecting, restoring, and managing natural environments associated with trail development:

- Avoid sensitive ecological areas and critical habitats
- Take full advantage of viewsheds and topography
- Utilize existing utility, right-of-way, railroad corridors, levees
- Provide buffers to avoid/protect sensitive stream areas/crossings
- Provide on-going maintenance of the trails and adjoining natural systems.

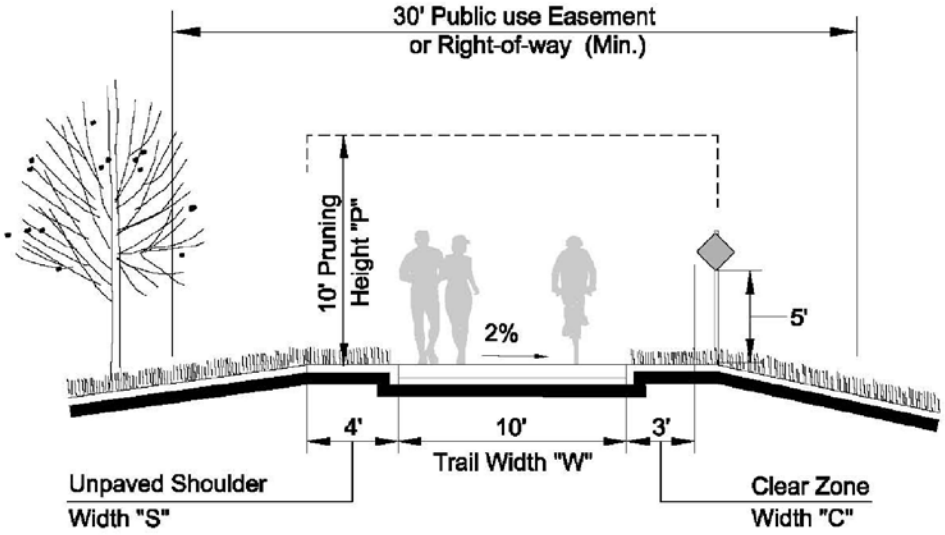
Citywide Trail Design Standard

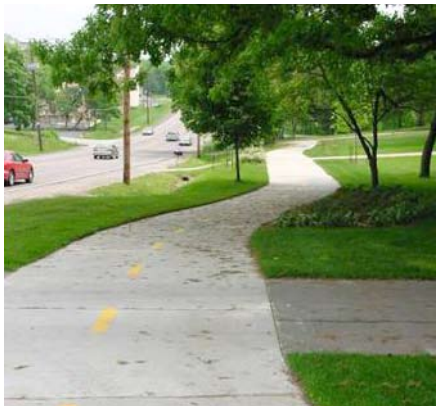
The Citywide Trail standard is a paved, shared-use trail. Paved, shared-use trails provide for a wide variety of recreational and transportation uses, and have the highest degree of accessibility to people of all abilities. Generally, the most expensive of all trail types to develop, they are most applicable to high-intensity use areas and allow the greatest flexibility for all user types.

Application and development opportunities for Citywide Trail design standards include:

- Abandoned railroad corridors
- Rail-with-trails corridors
- Waterways, including levees
- Parks, greenways, stream corridors, stream buffers zones
- Utility corridors, such as sewer, water, overhead power lines
- Street and highway corridors, as part of an intermodal design concept, provided that separation from the roadway is adequate to distinguish the trail from a widened sidewalk.

The Citywide Trail "standard" section, shown below, is the basic design guideline for the Trails KC system. However, in order to adequately accommodate the array of trail environments described above, additional guidelines are necessary. These additional guidelines and their applicability are provided on page B-1.





trail design GUIDELINES and STANDARDS

SURFACE

- Pavement alternatives and guidelines for use are provided on page B-14
- Trail surface proposals will be evaluated by City staff for compatibility with: existing environmental and soil conditions; durability; maintenance requirements; topography; cost; and level of service for user groups
- Innovative, environmentally-friendly and sustainable pavement surfaces are also recommended for the trails system
- The City should consider pilot projects to test new and innovative pavement options that are cost-effective, sustainable and user-friendly. Additional pavement guidelines are provided on page B-14

WIDTH

- Typical standard is 10-foot minimum. In intense use areas, a 12-foot width should be considered
- Maintain a 3-foot minimum clear recovery zone
- Consider a parallel 4 to 8-foot soft surface trail in congested areas or for equestrian uses/shared use. A parallel, soft surfaced trail may also be advisable for some pedestrians, including walkers and runners, because of lower impact. If possible divide hard and soft-surfaced parts of the trail

GRADE CHANGES AND SITE AMENITIES

- Establish an 8.33% overall maximum grade
- Individual segments may include grades greater than 8.33%. Steeper grades shall be considered (staff approval required) for short stretches due to topographic conditions prohibiting trail construction in accordance with the maximum grade established
- Other design considerations to grade, sight distance, shoulder widths, drainage, signage, design speed, vertical and horizontal alignments and crossings should be reviewed and implemented following the most recent AASHTO *Guide for the Development of Bicycle Facilities* manual

Citywide Trail Section Types and Usage

In addition to the Citywide Trail "standard" section, more detailed guidelines are necessary to address the varying environments through which Citywide Trails will traverse. The following provides a description of when these additional sections should be used. Details are provided in Appendix B.

WITHIN EXISTING DEVELOPMENT SECTION

This section should be followed when a Citywide Trail runs parallel to major urban streets or near urban/developing areas. A key requirement of this section is the separation requirement between the roadway and trail edge (10' preferred, 8' minimum).

GREENWAY SECTION

Applicable when trails traverse through environmentally significant places and may be developed either on public or private land. This section differs from the standard section in that it allows for more narrow unpaved shoulder widths in order to minimize disturbances in environmentally sensitive areas.

STREAMSIDE SETBACK ZONE SECTION

This section is applicable for trails in floodways and floodplain areas that have streamside setback designations. Trails should be accommodated in the middle zone of the setback zone, however, where this is not possible, the appropriate mitigation and approvals, as stipulated in the streamside setback ordinance, are required. Trails through these areas will follow contours and with the use of natural surface will have minimal negative impact to the native vegetation.

UNDERPASS AND UNDER BRIDGE SECTIONS

These sections outline criteria for grade-separated crossings of a roadway or railroad (refer to page 39 for further guidelines on when grade-separated crossings are needed). The distance and vertical clearance of the passage will determine the necessary lighting, ventilation, drainage and clear zones needed for safe trail accommodations.

Low-water crossing

Bridge crossing

Railroad corridor with fence buffer

Trail underpass with railroad buffer

BRIDGE SECTION VS LOW-WATER CROSSING SECTION

These sections provide additional grade-separated crossing opportunities. All water crossings should be based on reasonable design flow standards, as well as, site characteristics and environmental considerations (i.e., fisheries, spawning, bank erosion).

Low-water crossings should be considered when:

- The floodplain is broad enough to pass over and around a low-water crossing in a 20-100 year storm event without creating an obstruction or erosion.
- Design of the crossing should accommodate a 5- 20 year flow to pass through opening/pipes without damage to nearby stream banks or ecology.

Bridge crossings should be considered when:

- Stream flows prohibit low-water crossings due to frequency of flooding and large water flows throughout the year.
- Stream banks are too steep and access to stream edge is complex and restricted due to vegetation and stream bank protection.

The low-water crossing will generally cost less but will be inundated for short periods of time several times a year. The high bridge will cost more but will be open for all except the most severe flood events (see pages B-7 and B-9 for additional design considerations).

RAILROAD BUFFER SECTIONS

These sections are outlined for rails-with-trails scenarios for both traditional rail lines and light rail. A key requirement of these sections is the separation requirement between the tracks and the trail.

In addition to these Citywide Trail sections, Appendix B also outlines trail slope sections, drainage sections, and detailed pavement sections. Where additional details/ guidance are needed but not addressed in Appendix B, please refer to AASHTO *Guide for the Development of Bicycle Facilities* manual.

Railroad corridor without fence (wetland and native planting used as a buffer)

Citywide Trail "Interim" Standard Alternative

Due to the limited funding available in the first few years of implementation of the Trails KC system, the steering and technical committees, as well as the public, considered the viability of using an interim trail standard (unpaved surface). Use of an interim standard would allow the City to open up trail corridors with less funding and in less time, increasing the public's access to trails and thus increasing trail usage throughout the city. While many stakeholders have expressed support for use of an interim standard, valid concerns have also been identified. The primary concern being that if an unpaved trail is constructed, it will never get upgraded to a paved surface. It is therefore recommended that use of the interim standard should be carefully evaluated by staff and community feedback assessed to determine appropriate use and applicability. Steering and technical committee feedback included the following possible terms/conditions for use of an interim standard:

- Only allowable for trails constructed by a public agency (i.e., not acceptable for trails constructed by private developers)
- Require that the trail be upgraded to the Citywide Trail standard within an established timeframe, (i.e., 2-3 years)

SURFACE

- Crushed or granulated stone is the typical material of choice. Other possible surfaces include soil cement and recycled materials (see page B-14 for details)

WIDTH

- Typical standard is 10-foot minimum. In intense use areas, a 12-foot width should be considered
- Maintain a 3-foot minimum clear recovery zone adjacent to trails with bicycle/equestrian uses

GRADES CHANGES AND SITE AMENITIES

- Establish an 8.33% overall maximum grade
- Individual segments may include grades greater than 8.33%. Steeper grades shall be considered (staff approval required) for short stretches due to topographic conditions prohibiting trail construction in accordance with the maximum grade established
- Other design considerations to grade, sight distance, shoulder widths, drainage, signage, design speed, vertical and horizontal alignments and crossings should be reviewed and implemented following the most recent AASHTO *Guide for the Development of Bicycle Facilities* manual

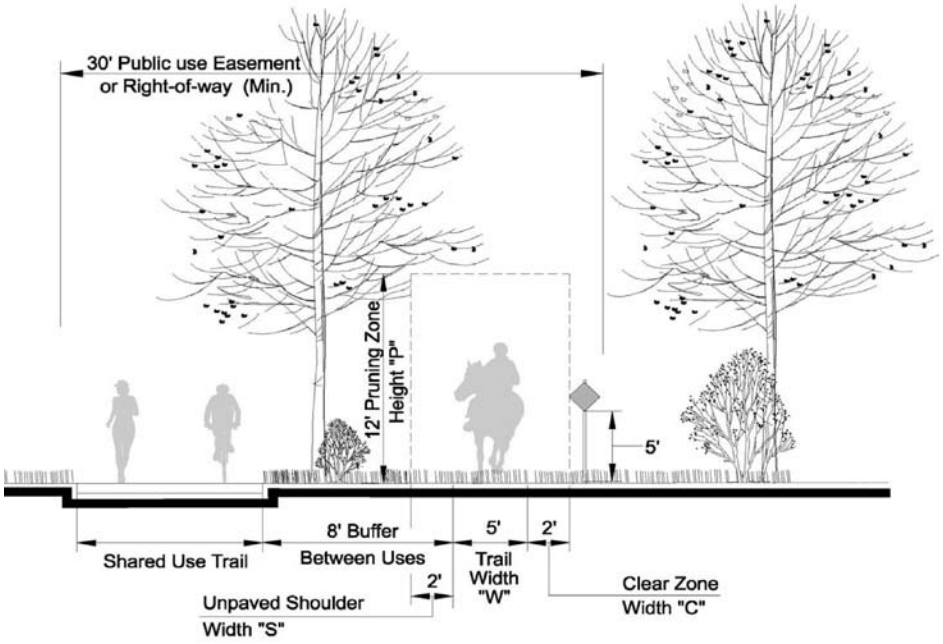
QUALITY VERSUS QUANTITY
Feedback from Public Meetings

- 71% support use of "interim" standard (8 miles for $2 million)
- 29% support building to "finished" standard (4.5 miles for $2 million)

56 total responses

Equestrian Trail Design Standard

The equestrian trail design standard allows for a natural and narrow corridor which can be accommodated in sensitive areas. Properly designed, they can also accommodate hikers and mountain bikers.



SURFACE

- In most settings, compacted native soil is appropriate. Crushed or granulated stone is also an option when a higher intensity use is found. Other possible surfaces include soil cement and recycled materials

WIDTH

- Typical standard is 5-foot minimum. In intense use areas, an 8-foot width should be considered
- For corridors that accommodate an equestrian trail and a Citywide Trail, an 8-foot buffer should separate the two
- Maintain a two-foot minimum clear recovery zone adjacent to trails with bicycle/equestrian uses

GRADES CHANGES AND SITE AMENITIES

- Establish a 10% overall maximum grade
- Maximum grade for shorter slopes (100 feet) should be 20%
- Switchbacks should be used for surmounting slopes greater than the above parameters
- Edge protection is not usually required, but where safety is of great concern, fences should be installed

In addition to the aforementioned standard equestrian section, Appendix B provides details regarding stream fords and pavement requirements.

On-Street Connector Design Standards

The Trails KC system include 26 miles of on-street connectors where no safe, off-street trail accommodations could be made. These on-street routes were identified for their light to moderate traffic loads, moderate speeds and continuity to trails and other bicycle and pedestrian facilities. All on-street connectors must provide pedestrian accommodations (min. of 6' wide sidewalk) and an on-street bicycle facility. A toolbox of on-street connector standards are provided in Appendix B, including standards for:

- Bike lanes
- Shared lane markings (MUTCD compliant)
- Bike routes
- Bike boxes.

The City's Bicycle & Pedestrian Coordinator will use a combination of vehicular mix and traffic volumes, posted and design speeds, as outlined in the on-street facility guidelines (page B-18 to B-30), to determine the appropriate facility type for each on-street connector.

Bike lane

Signed bike route

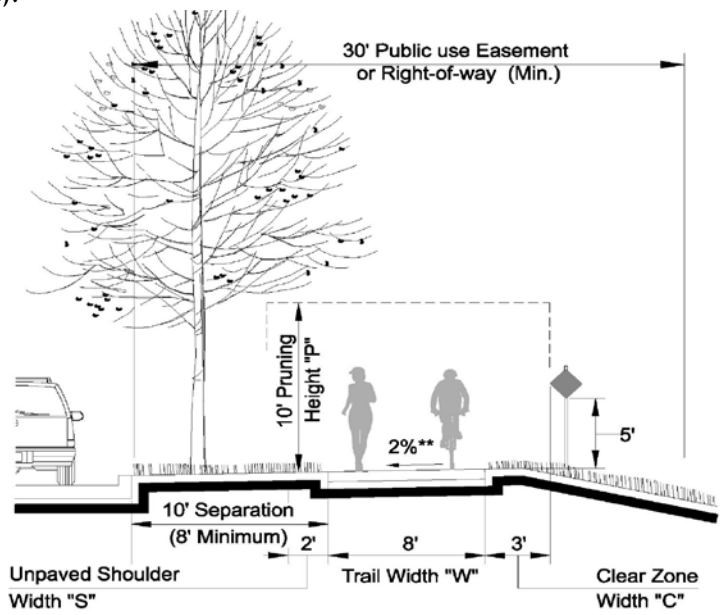
Bike box

Bike lane with parallel parking

See page 49 for additional information on neighborhood connectors.

Neighborhood Connector Trail Design Standard

Neighborhood connector trails are used to provide a shared-use facility that links neighborhoods and commercial districts to the Trails KC system. These public, shared-use trails must accommodate bicyclists, pedestrians and other users in a safe, cost-effective manner. To accomplish these goals, the neighborhood connector trail standard allows for an 8' wide trail (wider trails may be necessary based on user volume).



SURFACE

- Pavement alternatives and guidelines for use are provided on page B-14
- Trail surface proposals will be evaluated by City staff for compatibility with: existing environmental and soil conditions; durability; maintenance requirements; topography; cost; and level of service for user groups
- Innovative, environmentally-friendly and sustainable pavement surfaces are also recommended for the trails system

WIDTH

- Typical standard is 8-foot minimum. In intense use areas, a wider width should be considered
- Maintain a three-foot minimum recovery zone

GRADE CHANGES AND SITE AMENITIES

- Establish an 8.33% overall maximum grade
- Individual segments may include grades greater than 8.33%. Steeper grades shall be considered (staff approval required) for short stretches due to topographic conditions prohibiting trail construction in accordance with the maximum grade established
- Other design considerations to grade, sight distance, shoulder widths, drainage, signage, design speed, vertical and horizontal alignments and crossings should be reviewed and implemented following the most recent AASHTO *Guide for the Development of Bicycle Facilities* manual

Off-Road vs. On-Road Evaluation Criteria

The Trails KC system is primarily an off-street system (90% off-street, 10% on-street). To ensure the system is functional and responsive to the safety and well-being of trail users, requirements for safety, accessibility, access management and crossings for both the off-street and on-street facilities must be established.

While the Trails KC Plan aims to provide a cohesive system of off-street trail facilities, this should not be done if the trail cannot safely accommodate users. In addition, Kansas City has often allowed developers to construct off-street trails (sidepath facilities) in lieu of dedicating right-of-way for bike lanes on designated Bike KC routes. While trails and on-street bike facilities are complimentary, they do not serve the same function. Any proposal to move a Bike KC route to an off-street location must be critically analyzed.

The following tools provide guidance to determine whether an off-street or on-street trail is the more appropriate facility:

STEP 1: REVIEW CROSSING MATRIX

If a trail alignment exceeds the recommended number of crossings, an alternative off-street alignment that minimizes crossings should be considered.

TRAIL-ROADWAY CROSSINGS

Number of Crossings/Mile	Guideline
0	Ideal condition for safe shared-use trail.
1-4	Use special care to treat the crossings.
5-8	Caution - Consider alternative route or substituting with on-street connector. Must be approved by City Staff prior to use.
8+	Undesirable - Consider alternative route or substituting with on-street connector. Must be approved by City Staff prior to use.

STEP 2: DETERMINE APPROPRIATE TRAIL WIDTH

If an off-street trail facility is determined to be the most appropriate, the proper trail width must also be considered. The Citywide Trail standard is a 10-foot trail; however, if trail volumes are high, a wider facility may be necessary in order to safely accommodate users. The following matrix should be used to determine appropriate trail width.

TRAIL-WIDTH MATRIX (LOS)

Trail Volume (one direction per hour)		Trail Width (feet)					
		10	12	14	16	18	20
	25	B	B	B	A	A	A
	50	Ⓒ	B	B	A	A	A
	75	Ⓒ	B	B	B	A	A
	100	D	B	B	B	A	A
	150	D	Ⓒ	C	B	B	B
	200	E	D	Ⓒ	C	B	B
	250	F	D	D	Ⓒ	C	C
	300	F	E	E	D	Ⓒ	Ⓒ
	400	F	F	F	E	E	E
	500	F	F	F	F	F	F
	600	F	F	F	F	F	F
	800	F	F	F	F	F	F
	1000	F	F	F	F	F	F

Minimum LOS standard = LOS "C"

STEP 3. CONDUCT BLOS CALCULATIONS

If no safe off-street alignment can be identified, an on-street facility should be considered. To determine if an on-street facility can more safely accommodate users than an off-street facility, Bicycle Level of Service (BLOS) calculations should be conducted. BLOS calculations are based on the perception of comfort and safety of bicyclists and are similar to the comfort/convenience type performance measures used for other transportation modes. Significant considerations include the presence and width of a paved shoulder or bicycle lane, vehicular traffic volumes and speed in adjacent lanes, percentage of heavy vehicles, surface conditions and the type of roadway. The following formula and matrix should be used to evaluate whether an on-street facility is appropriate.

Bicycle Level of Service (BLOS) ranges assocated with level of service (LOS) designations:

BLOS Range	≤1.50	1.51-2.50	2.51-3.50	3.51-4.50	4.51-5.50	> 5.50
LOS Level	A	B	C	D	E	F

$$\text{Bicycle LOS} = 0.507 \ln(Vol_{15}/L) + 0.199\, SP_t(1+10.38HV)^2 + 7.066(1/PR_5)^2 - 0.005\, W_e^2 + 0.760$$

Vol_{15} = volume of directional traffic in 15 minute time period
L = total number of through lanes
SP_t = effective speed limit = 1.1199 ln (SP_p-20) + 0.8103, SP_p is posted speed
HV = percentage of heavy vehicles
PR_5 = FHWA's five point surface condition rating (5 = best)
W_e = average effective width of outside through lane = $W_t + W_1 - \sum W_E$
W_t = total width of outside lane and shoulder/parking pavement
W_1 = width of paving from outside lane stripe to pavement edge
$\sum W_E$ = width reduction due to encroachments in outside lane

STEP 4. IDENTIFY APPROPRIATE ON-STREET FACILITY

If an on-street facility is determined to be a safer accommodation, the type of on-street facility must be evaluated. Appendix B provides further guidance as to when a variety of on-street options (bike lane, shared lane marking, etc) are most appropriate. Once the type of facility is determined, design guidelines for crossings must also be considered.

On-Street Connector – Bike Lane with Curbs – Section Options

Roadway Functional Class	Local Roads, Collectors.....Arterials															
AADT	< 5,000 AADT						5,000 - 10,000 AADT						> 10,000 AADT			
Posted Speed	< = 30 MPH		35/40 MPH		> 40 MPH		< = 30 MPH		35/40 MPH		>40 MPH		< = 40 MPH		> 40 MPH	
Vehicular Mix	trucks		trucks		trucks		trucks		trucks		trucks		trucks		trucks	
	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%
Bike Lane Width	**4'**	**4'**	**5'**	**5'**	**5'**	**5'**	**4'**	**4'**	**5'**	**5'**	**6'**	**6'**	**5'**	**5'**	**6'**	**6'**

Signalized crossing with continental striping

Signed and marked crossing

Signed and enhanced crossing

Grade-separated crossing

Design Guidelines for Crossings

The greatest safety hazard to trail users occurs when a trail crosses a roadway, railroad, stream, or another trail. It is important that crossings are visible to all involved. There are two types of crossings: at-grade and grade-separated. Pages B-26 to B-30 provide detailed crossing recommendations, including the following matrix to determine whether an at-grade or a grade-separated crossing is the most appropriate and what level of signage/signalization/markings are needed.

	Roadway Functional Class	Local Roads, Collectors………………………………Arterials											
	Roadway ADT	< 9,000 ADT			9,000 - 12,000 ADT			12,001 - 15,000 ADT			> 15,000 ADT (1)		
	Posted Speed	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH (1)
Roadway Type (Number of Lanes)	2	‖‖‖‖	‖‖‖‖	✱	‖‖‖‖	‖‖‖‖	✱	‖‖‖‖	‖‖‖‖	◘	‖‖‖‖	✱	◘
	3	‖‖‖‖	‖‖‖‖	✱	‖‖‖‖	✱	✱	✱	✱	◘	✱	◘	◘
	>= 4 with median	‖‖‖‖	‖‖‖‖	✱	‖‖‖‖	✱	◘	✱	✱	◘	◘	◘	◘
	>= 4 without median	‖‖‖‖	✱	◘	✱	✱	◘	◘	◘	◘	◘	◘	◘

Legend

‖‖‖‖	Signed and Marked Crossings	A signed and marked crossing consists of a crosswalk, signing, and often no other devices to slow or stop traffic.
✱	Signed and Enhanced Crossings	A signed and marked crossing can be enhanced for crossings of multi-lane higher volume roadways with features such as: median refuges, and/or active warning devices like solar powered flashing beacons or in-pavement flashers.
◘	Signalized Crossings	New signalized crossings may be recommended for crossings that meet MUTCD warrants. There are numerous signal types, including "half-signals", which should be considered.

GUIDELINES and STANDARDS

AT-GRADE CROSSINGS

At-grade crossings are appropriate where motorized traffic volumes are low, trails cross roadways with existing traffic signals or local conditions restrict the ability to implement a grade-separated crossing.

CROSSING LAYOUT

Wherever possible, trails should cross roadways and railroads at right angles. In cases where trails approach the roadway at a skew, the trail should be routed to achieve a right-angle crossing wherever possible.

It is important for motorists and trail users to be able to see each other at roadway crossings. A motorist needs to be able to stop in time if a trail user is in the road, and a trail user needs to be able to judge his or her ability to cross the street safely. The AASHTO *Policy on Geometric Design of Highways and Streets* "Green Book" offers detailed information on determining and planning sight distances at roadway crossings.

Appendix B provides recommended guidelines for arterial, collector, local road, signalized intersection and roundabout at-grade trail/roadway crossings. Signage, striping and signals are the safety components of these at-grade crossings.

Roadway crossing

90° railroad crossing

GRADE-SEPARATED CROSSINGS

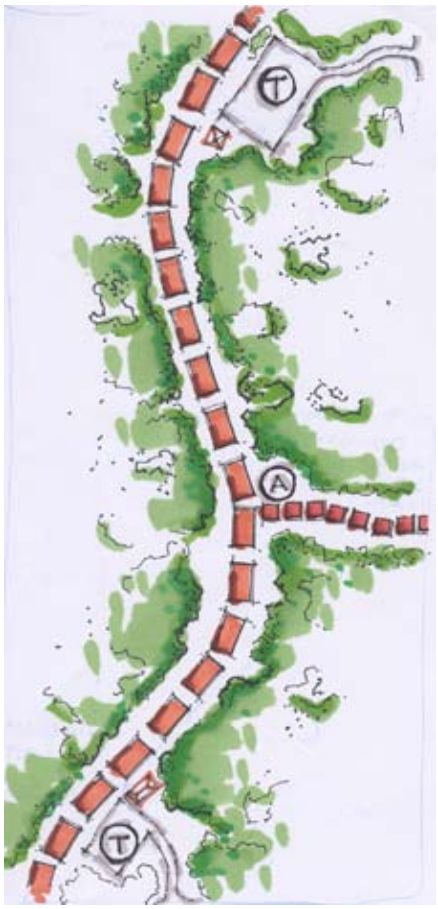
Grade-separated crossings are much safer than at-grade crossings, and should be used where high traffic volumes/speeds exist on the roadway or trail (>15,000 average daily trips and/or > 40 mph). Appendix B provides design guidelines for a variety of grade-separated crossings, including:

- Underpasses
- Bridges (both trail only and trail on vehicular bridge)
- Multi-modal underpass (box culvert or pipe).

TRAIL INTERSECTIONS WITH OTHER BICYCLE AND PEDESTRIAN FACILITIES

Where trails cross other trails or intersect local sidewalks, users sometimes face specific hazards that require design considerations. This is especially true when trails accommodating different user groups intersect. Items to consider:

- Offset the trail intersection and create two, three-way intersections rather than one four-way intersection
- Design the physical connection between the two trails surfaces to be level and smooth
- Use signs or barriers to indicate the desired direction of travel and yield/stop requirements
- See details on pages B-23 to B-25 for more information.




Access point along Vivion Trail

Trail Amenities

Besides the trail itself, there are other facilities that increase the quality of the user experience. These support services are known as trail amenities, and they fall into these three general types:

- Trailheads (T) and access points (A)
- Directional and interpretive signage
- Rest areas/interpretive facilities.

The importances of these amenities are sometimes overlooked, but they should be incorporated into the initial and final planning of all trail projects. The quantity, spacing, specific facilities, and size of these trail amenities will vary depending on a trail's proximity to other towns and neighborhoods, the traffic volume of the trail, the type of use, and environmental and maintenance considerations.

TRAILHEADS AND ACCESS POINTS

Trailheads refer to areas specifically designed as primary means of accessing a trail. These areas may include interpretive maps, restrooms, water fountains, parking, picnic facilities and other recreational amenities. Access points refer to minor connections between the trail and opportunities for connections with nearby parks, neighborhoods, local destinations, other communities, and roadways.

When developing trailheads and access points, it is important that designers recognize all user groups that are using the trails, as well as people with disabilities. Therefore, it is recommended that accessible pathways be provided to all trailheads and access points, whenever possible. Furthermore, built facilities, such as restrooms and parking lots, should be designed according to the ADA accessibility guidelines.

Katy Trail trailhead

Specific trailhead locations and access points have not been identified for the Trails KC system, however, the following guidelines should be followed when planning for/building these facilities:

- Trailheads should be placed at appropriate terminus of a trail corridor and any place where a large concentration of trail users is expected
- Major trailheads should at least include parking and a trail map, but also may include restrooms, drinking water, picnic facilities, bicycle parking, horse tie-ups, and other recreational amenities

- Trailheads could be developed in conjunction with other associated uses (i.e. existing parking lots in parks, commercial center parking lots near or on trail corridors, utility access roads, etc.)
- Trail access points should be placed wherever trail access is expected, such as at adjacent communities, neighborhoods, schools, commercial areas, and parks. Limited parking may also be included. However, since trail access points are designed to give access from local amenities to the trail, it may be unnecessary
- Trailheads should be developed to provide adequate space for equestrians where shared use corridors exist, and should provide parking and turn-around space for trailers.

DIRECTION AND INTERPRETIVE SIGNAGE

Signage increases awareness, safety and comfort on trails. The inclusion of signage in the Trails KC system is an important amenity not to be overlooked. Signs should be designed to create continuity within the trails system and graphically represent the system that is being used.

There are approximately six basic types of signage:

DIRECTIONAL/WAY FINDING SIGNS

Directional signs address the following:

- Distance
- Direction
- Destination.

Directional

CAUTIONARY SIGNS

Cautionary signs warn of upcoming roadway crossings, intersections, steep grades, blind curves, and other potential trail hazards.

Cautionary

INFORMATIONAL SIGNS

Informational signs may include a map with orientation. They may also acknowledge groups and individuals that contributed to the funding, maintenance or construction of the trail.

Informational

trail design

GUIDELINES and STANDARDS

REGULATORY SIGNS

Regulatory signs tell the "rules of the trail" by prohibiting certain uses or controlling when trails are open or closed.

Regulatory

INTERPRETIVE SIGNS

Interpretive signs offer educational information on the trail environment or historical characteristics of the area.

Interpretive

OBJECTIVE SIGNS

Objective signs provide information about the actual trail conditions, including grade, surface and obstacle height. This allows users to make more informed decisions about which trails best meet trail user needs and abilities.

Objective

Signage for the Trails KC system should incorporate these six types/uses of signage. When determining the types and frequency of signage to be installed, the safety and other needs of the users must be balanced with the initial costs and on-going maintenance requirements. Signage design should be coordinated with the City's Public Works and Parks & Recreation Departments. On-street signs generally must conform to the *Manual of Uniform Traffic Control Devices* and therefore may need to differ in size and style from trailside signs.

An integral component of signage is the defining logo/name of the trail system. This logo/trail system name is found on directional/way finding signage as well as informational and interpretive signage. In order to create a compelling "brand" for Kansas City's trail system, the City of Kansas City held a logo/naming competition. This logo and trail system name, "Trails KC", were selected as the winning "brand" and should be utilized on all signage/promotional materials.

REST AREAS/INTERPRETIVE FACILITIES

Rest areas are generally small trail amenities located along the trail. Rest areas are places to stop and rest off of the trail. They may also serve as interpretive areas or overlooks.

Interpretive facilities should offer the opportunity to educate the user on various highlights of the trail or the trail environment (history, landscape, native plants, geologic, local history or local economy). Some trails may capitalize on many interpretive opportunities, while other trails may offer them as educational diversions incorporated into rest areas. Each trail's interpretive program is different and the extent of interpretation should be based on the use of the trail.

The following design guidelines offer some general suggestions regarding rest areas and interpretive facilities:

- Trail rest areas should at least include a seating area and a place to park (bike, stroller, wheelchair, horse, etc.) They may also include drinking water, restroom facilities, and signage (hitching post for equestrian use)
- Interpretive facilities should include signage with ample graphics, to engage users of all ages (signage should be ADA accessible)
- Interpretive facilities/rest areas should be placed in areas where there are significant cultural, historical, natural, or native aspects.

Compliance with the Americans with Disabilities Act

The Americans with Disabilities Act (ADA), passed in 1992, is a federal statute that regulates design standards for disabled access. Although it is not required that all trails in Kansas City conform with ADA standards, it is recommended that sections of the trails system be classified as ADA zones and trail designs in these sections should strive to meet applicable ADA standards. Objective signage should be utilized to distinguish between trails that are ADA accessible and those that are not.

Adoption of Trail System Standards

These trail design guidelines and standards are a means to ensure that all trails built within the Trails KC system are safe, properly constructed to minimize maintenance, and create an integrated, consistent system. In order to ensure that these guidelines are followed, it will be necessary to adopt the standard sections, details and paving specifications found in Appendix B as part of the City's approved engineering standards – KCMO Standards, Drawings, Specifications and Supplements to APWA. It is recommended that these standards be adapted administratively by the Department of Public Works per standard operating procedures. Adoption will ensure that all new Citywide Trails, On-street Connectors, Equestrian Trails and Neighborhood Connector Trails are designed and constructed in accordance with these standards, and will become the City's new trail standards for all departments and private entities to follow and implement.

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IMPLEMENTATION and DEVELOPMENT PLAN

Build-out Strategy: 15-Year Implementation Plan

The current rate of trail-building in Kansas City has not satisfied the needs of the community. If trail-building continues at the current rate, it would take approximately ***60 years*** to complete the proposed system. The public, steering committee, and technical committee agree that a 60-year build-out is unacceptable. Instead, ***a 15-year build-out strategy is recommended***. While this is an aggressive strategy, it is achievable. If the community adopts and implements this strategy, Kansas City could meet its trail standard by 2025, elevating Kansas City to the class of cities that are known and respected for their commitment to outdoor recreation and alternative transportation facilities, and it could meet the Mayor's initiative of achieving Platinum status by 2020.

"We have lots of work to do to make Kansas City more bike-friendly. We have bike trails and bike lanes that go for a mile or two and then abruptly stop, giving way to busy streets. But we're taking steps to change all that and make Kansas City a much better place to bike."

– Councilmember Russ Johnson

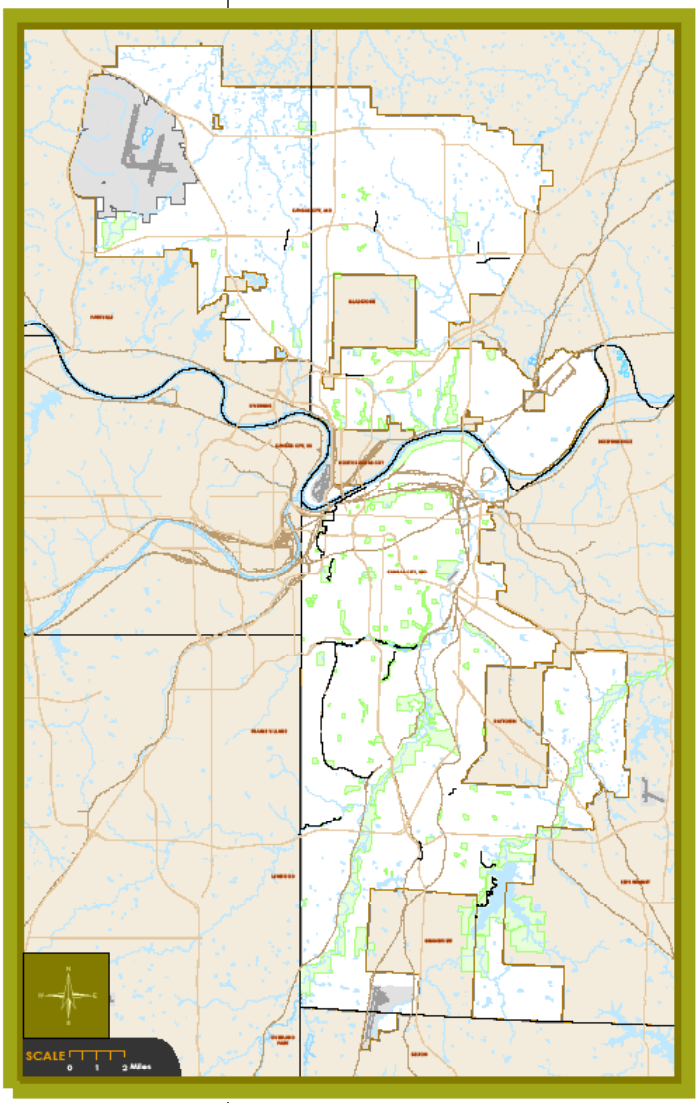
The following sections outline the necessary elements to effectively implement a comprehensive trail system in Kansas City.

Management Strategy

Currently, Kansas City does not have a formal, standardized process for designing/constructing public-use trails and there is no particular entity overseeing/coordinating all trails development within the city. In addition, no mechanism exists to define citywide trail priorities and to ensure resources are dedicated toward designing/constructing those priority trails. Each City department and trail organization may have its own priorities, but these are not always integrated nor coordinated, creating the fragmented trail system that currently exists within Kansas City.

EXISTING SHARED-USE (04/2008) TRAILS IN KANSAS CITY – A DISCONNECTED SYSTEM

Brush Creek Trail (not continuous)	7.0 miles
Indian Creek Trail	2.2 miles
Line Creek Trail	0.8 miles
Longview Lake Trail	2.7 miles
Longview Parkway Trail	1.0 miles
Maplewoods Parkway Trail/Shoal Creek Trail	0.8 miles
Maplewoods Parkway South Trail	0.2 miles
Penn Valley Park Trail	1.0 miles
82nd Street Trail	1.2 miles
Riverfront Heritage Trail (includes 2.5 mi. on-street segments)	5.0 miles
Santa Fe Trail	0.4 miles
Shoal Creek Parkway Trail	0.4 miles
Southern Platte Pass Trail	0.9 miles
Town Fork Creek Trail	1.3 miles
Triangle Trail/ Katy Connector	0.9 miles
Trolley Track Trail	6.3 miles
Vivion Trail	0.6 miles
TOTAL	**30 miles**



trails IMPLEMENTATION and DEVELOPMENT PLAN

Dissatisfied with the way trails are developed today, trail stakeholders (the public, committee members and City departments) concluded that it was critical to define an effective management strategy and review/approval process that addresses two key issues:

- Who is responsible for trails development in Kansas City?
- How are projects identified, prioritized, and evaluated to create a cohesive, connective trails system and to ensure compliance with the design guidelines and other recommendations of the Trails KC Plan?

The following management strategy builds upon existing assets in the community, yet provides the additional guidance and structure needed to ensure effective coordination and proactive implementation of the Trails KC Plan.

ROLES/RESPONSIBILITIES

The City of Kansas City will provide the primary oversight role for acquisition, planning, construction, maintenance, etc. for the Trails KC system (citywide trails, equestrian trails and on-street connectors). In order to be successful, the City must invest resources in a trails program, both financially and programmatically, to address community concerns about the City's ability and commitment to a trails system. Despite its primary function, the responsibility of implementing the Trails KC Plan will not lie solely with the City. Community involvement and resources will be needed to ensure the goals of the Trails KC Plan and the 15-Year Build-out Strategy will be met.

Specific roles/responsibilities needed for the effective development of a trails system for Kansas City are outlined below:

PRIMARY POINT OF CONTACT (PPOC):

A single point of contact should be designated within the City to lead the development of the trails system and coordinate with the various groups/entities involved in trails. As the Trails KC system is one piece of a larger integrated bicycle/pedestrian system, the City should designate a PPOC that is responsible for implementation of the City's entire bicycle/pedestrian system. The authority and responsibilities of the PPOC should be clearly defined such that all City departments and other entities involved in trails development acknowledge and understand roles/responsibilities.

Specific responsibilities shall include oversight of the following: trail dedications, design review, community coordination and education, fundraising, goals/priority-setting, construction and maintenance activities, and regular program evaluations. These activities will require the participation of many entities, however, the PPOC should provide direction and coordination of these efforts to ensure the effective implementation of the Trails KC Plan.

DEPARTMENTAL LIAISONS:

Currently, several City departments plan for, design and build trails. This expertise is an asset to the implementation of the trails system; however, it has created confusion in the community in regards to who is in charge of trails. In order to ensure effective coordination, each department should establish a trails liaison that will work with the City's PPOC to implement trails projects that comply with the Trails KC Plan. Defining specific roles for each department in interdepartmental memorandums of understanding (MOUs) will ensure clear understanding of roles/responsibilities.

ADVISORY TASK FORCE (BICYCLE/PEDESTRIAN ADVISORY COMMITTEE):

In June 2008, City Council passed Ordinance 080515 which established the Bicycle Pedestrian Advisory Committee. The committee is comprised of community members, as well as City employees who serve in an advisory capacity. The committee is charged with advising the Mayor/City Council on ways to make the city more bicycle and pedestrian friendly. This includes oversight of the implementation of the Trails KC Plan through an annual review of its progress.

"FRIENDS-OF-KANSAS CITY TRAILS" GROUP:

In addition to the Task Force, trails development in Kansas City will depend on the active involvement of dedicated citizens. The establishment of a "Friends" group can help to organize and sustain several important activities, including: fundraising; partnership development such as adopt-a-trail opportunities and volunteer trail-building activities; educational and awareness programming; as well as serving as advocates for trails in Kansas City. Consideration should be given towards establishing the group as a non-profit entity that could also serve as a land trust in order to receive grant funding, corporate funding, and grants of land/easements.

IMPLEMENTATION and DEVELOPMENT PLAN

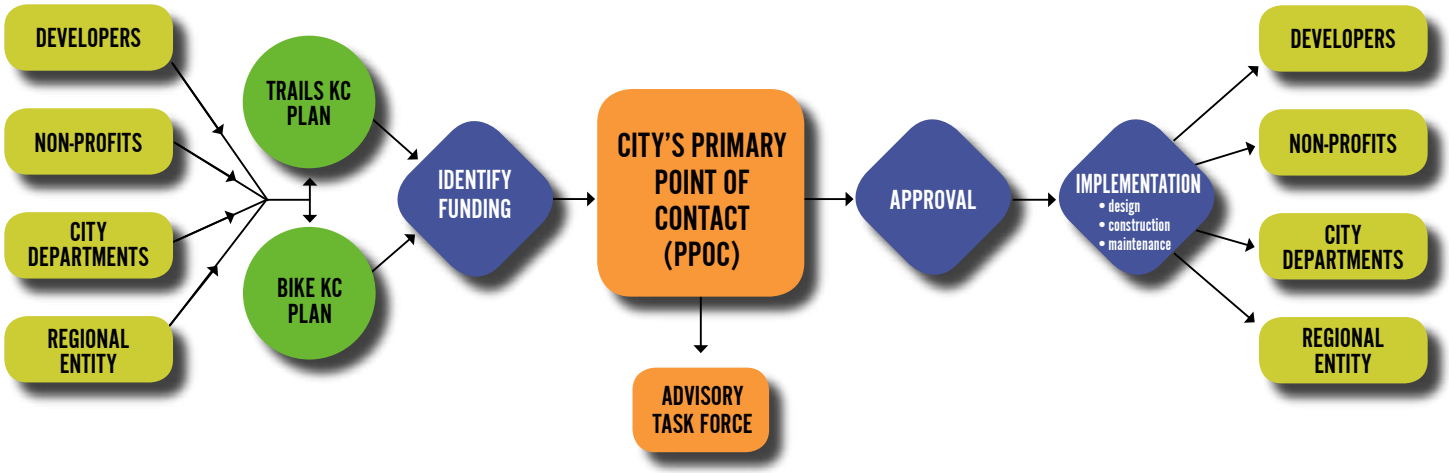
TRAIL-BUILDERS:

Currently there are many entities involved in designing/building trails in Kansas City (several City departments, counties, private developers, non-profits). This activity should be encouraged, however, trail building entities will be required to coordinate their efforts with the City's PPOC to ensure consistency throughout the system. Holding regularly-scheduled trails development meetings that are open to the departmental liaisons and other "trail-builders" would help to facilitate the communication and coordination needed for effective plan implementation and trail building.

TRAILS AUTHORITY:

There has been significant discussion among trail advocates regarding the development of a independent trails authority, whether regional or local, that would manage trails development in lieu of the City. This option holds merit and should be considered further as future regional funding sources are pursued. In the absence of such an entity, the City of Kansas City must serve in this capacity.

PROJECT REVIEW PROCESS FLOWCHART



TRAILS KC SYSTEM PROJECT REVIEW/APPROVAL PROCESS

All public and private entities designing/building a trail facility in the Trails KC system shall consult the Trails KC Plan for guidance and submit the project for review/approval to the City's PPOC. Projects shall be reviewed for compliance with Trails KC design guidelines/standards to ensure connectivity and consistency throughout the trails system.

Public-use trails (both Citywide Trails and neighborhood connector trails) designed/built by private entities will be reviewed/approved within the existing plan review/permitting process that is well-known and understood by developers, landscape architects and engineers. The City's review and permitting process is designed with a centralized processor who distributes plans to the proper departments for reviews of their specific responsibilities. In the case of plans that include public-use trails, a plan set will be sent to and reviewed by the City's PPOC for trails. The system could also be modified to direct plan submittals to a trails authority if such an entity is created in the future.

The following steps will be required in order to implement this new review/approval process:

1. Develop and distribute information to educate developers and designers of the new review and permitting requirement.
2. Modify the appropriate sections of the Development Process Requirements Checklist to include the requirement for the permitting of all public-use trails.
3. Modify the appropriate sections of Information Bulletin No. 110 and 159 to reference the Trails KC Plan and Standards and to direct the review of the plans to the City's PPOC.

While the City will take the lead role in the development of the Trails KC system, its role in the acquisition, development and construction of neighborhood connector trails will be limited. The purpose of neighborhood connector trails is to provide connectivity between residential and commercial areas to a Citywide Trail, which promotes the City's circulation principles as stated in the Kansas City, Mo. Development Ordinance: "create an integrated system of lots, streets, trails, and infrastructure that provides for efficient movement of pedestrians, bicycles and automobiles within the subdivision and to and from adjacent development."

To achieve this, it is recommended that the Development Code be amended to include a requirement that all developments within ¼ mile of a Citywide Trail alignment (constructed or planned) be required to provide a connection to the Citywide Trail. Connections can be either a public, shared-use trail, i.e., "Neighborhood Connector", sidewalk, and/or an approved on-street bicycle facility (bike lane, bike route, etc). Neighborhood priorities will be used to define opportunities for connections to be made from neighborhoods into the regional trail system. Refer to area and neighborhood plans and trails plans such as the *6th District Pedestrian Intermodal Transportation Connector Plan* for additional guidance on desired locations of neighborhood connectors. In rare cases, the City may accept ownership and maintenance of a neighborhood connector trail, however, the City must weigh the costs/benefits of such a role as it increases the City's risk and maintenance responsibilities.

HISTORIC TRAILS REVIEW
Trail design/construction drawings for segments of the Trails KC system that are a part of a historic trail must be reviewed and certified by the National Park Service, as these trails may have more specific design standards.

IMPLEMENTATION and DEVELOPMENT PLAN

Property Acquisition Strategy

The majority of public-use trails built in Kansas City have been on public property so land acquisition has not been a major issue to date. While the Trails KC system corridors were selected, in part, to reduce the impacts on private property owners and to reduce the cost of property acquisition, 60% of the system, is on private property. In order to effectively secure trail facilities in these corridors and those owned by other governmental agencies, an acquisition strategy and/or guidelines are needed. Use of these guidelines will standardize acquisition procedures and thereby reduce associated costs, liabilities and time requirements.

ACQUISITION ALTERNATIVES

When trail alignments are on property owned by another public entity, the use of the right-of-way must be obtained with an intergovernmental agreement. Current agreements exist with MoDOT, Platte County, Jackson County, and other public entities, and can be used to develop future agreements as needed.

TRAILS KC SYSTEM (OFF-STREET TRAILS)

- Publicly-owned land: 40%
- Privately-owned land: 60%

For the Trails KC corridors (including both Citywide Trails and equestrian trails) on private property, three methods are acceptable for property acquisition: permanent easements, right-of-way dedication, and licenses. The relationship of the parties in a shared-use corridor will be driven to a great extent by which entity holds the dominant property interest.

PERMANENT TRAIL EASEMENTS

Allowing the most flexibility to the private property owner and reducing the acquisition costs to the City, permanent trail easements provide the best arrangement for trail acquisition. The City should standardize an easement agreement that addresses the following issues:

- Access needs related to maintenance, future improvements or modifications to the trail
- Exclusive use or uses compatible guarantee
- Perpetuity clause
- Air rights if there is any potential need for a structure
- Purpose of the easement and identification of all conceivable activities, uses, invitees, police enforcement, and vehicular types allowed to avoid any need to renegotiate in the future
- Ownership of all structures and fixtures installed as part of a trail are property of the City
- Subsurface rights for use by utility franchises
- Maintenance responsibilities.

FEE SIMPLE LAND ACQUISITION

Holding fee simple title to land is the most complete ownership interest one can have in real property. While it is the most straightforward, the cost of land for trails through a fee simple acquisition is higher than with an easement, and therefore, is not the preferred strategy.

LICENSES/LEASES

Licenses and leases should only be allowed when the trail alignment is on railroad right-of-way, and only if the first two property acquisition options are infeasible. Licenses and leases are usually fixed-term agreements that provide limited rights to the City for use of the property. Typically, these are employed in situations when the property cannot be sold or the owner wants to retain use of and everyday control over the property. The City still obtains permission to build and operate the trail, but will have little control over the property, and may be subject to some requirements that impact trail development and operation. Critical issues to define in the license/lease agreement include:

- Acceptable term with an option to renew
- Broadly defined purpose of the license/lease and identification of all conceivable activities, uses, invitees, police enforcement, and vehicular types allowed
- Maintenance responsibilities
- Limits on other uses of licensed property
- Access needs related to maintenance, etc. of property owner
- Trail management plan.

IMPLEMENTATION and DEVELOPMENT PLAN

PAYMENT ALTERNATIVES

With 60% of the trail system on private property, trail acquisition could be an expensive undertaking. In an effort to minimize costs, several options, in addition to pursuing the donation of trail easements, promise an opportunity to cut the costs associated with acquisition.

DEDICATION REQUIREMENTS FOR NEW DEVELOPMENT:

Residents and employees associated with new development create a demand for various facilities, such as streets, sidewalks, parks and trails. It is a standard practice for cities to require new development to pay its "fair share" of the cost of providing these new facilities. Kansas City currently requires developers to build sidewalks and internal streets as part of the development.

In addition, Kansas City imposes a parkland dedication requirement on new residential development to ensure sufficient parkland is acquired/built as the city grows. Kansas City also collects an arterial street impact fee to help pay for the cost of providing new arterial streets to serve growing areas. It is recommended that the City implement a trails dedication and improvement requirement to ensure that new development contributes its "fair share" towards the acquisition and construction of the Trails KC system.

LAND TRUSTS:

A land trust is an organization that works with landowners in order to protect/preserve land for a variety of conservation purposes. Land trusts employ various strategies to acquire land and easements. They are often successful at acquiring land through donations or at a reduced price as property owners are able to receive tax benefits from the donation/reduced sales price. In addition, they are successful at raising funds that can be used for trail acquisition. Locally, the Platte Land Trust is an organization that could assist in the acquisition of Kansas City's trail corridors.

LEGAL LIABILITY/RISK REDUCTION

Liability and risk reduction are important areas of concern for trail operators and adjacent property owners. It is important to plan for and address these property owner concerns so that the trail acquisition process runs smoothly and so that the trails system is a good neighbor to its adjacent private property owners. Traditional concerns include:

- Trail users might not be considered trespassers if the property owner invites and permits trail use within a portion of their property, and thus the land owner would incur a higher duty of care to trail users than they would otherwise owe to trespassing persons
- Incidents of trespassing might occur with greater frequency due to the proximity of a trail
- Trail users might be injured by activities on the private land
- Injured trail users might sue the property owner even if the injury is unrelated to activities occurring on the property.

In response to the concerns of private property owners, state legislation has been enacted throughout the country to limit a landowner's liability. Section 258.100 of the Missouri State Statutes provides immunity from civil liability for adjoining landowners. Specifically it states that any person owning land adjoining a trail that has been granted (whether by deed, easement, grant or reservation of rights) to a political subdivision for use as a public hiking, biking or recreational trail that is part of a dedicated system of trails is immune from civil liability for injuries to a person or property trespassing or entering on that land without implied or expressed permission. Sections 537.346 and 347 provide further protection, stating that a property owner that allows persons onto his land for recreational purposes does not assume responsibility or liability for any injury on the premises, provided he does not charge a fee. These statutes provide protection for property owners, such that liability concerns should not be a hindrance to acquiring land for trails on private property.

Trail operators must also work to minimize their liability. Adherence to the trail system's design and maintenance requirements (see Appendix B) is one critical tool. In addition, use of signage that educates trail users of the allowed activities and trail corridor usage is a prudent liability protection strategy. Trail users should be warned at the trailhead and at any other entrances to stay off the private property, particularly in the absence of physical barriers between the trail and the property. A well-designed trail should have the effect of reducing both trespassing, as well as risk of being held responsible for injuries sustained by trespassers.

IMPLEMENTATION and DEVELOPMENT PLAN

Funding Strategy

Historically, Kansas City has not made significant investments in the development of trails. The majority of trails have been federally-funded with the City providing a match, primarily with Public Improvement Advisory Committee (PIAC) funds. Employing this funding strategy, trails have developed at an anemic rate. In order to implement the Trails KC Plan utilizing the recommended 15-year build-out strategy, a comprehensive funding strategy is necessary.

COSTS

The development of the Trails KC Plan will be a long-term infrastructure investment for the City. Major cost categories include: planning/design, acquisition, construction and maintenance. The City has several options for developing the trail system that will impact the overall cost of the system.

The first option is to contract with private design and construction firms (City staff serving as a project/contract manager). This is the approach the City has used to-date.

The second approach is to utilize in-house design staff and construction crews for segments of the trail system that do not present serious engineering/construction challenges and volunteer crews for construction of the equestrian trails. Many jurisdictions employ the in-house approach, including Clay County, and have been successful at building trails with significant cost savings when compared to the cost of contracting out the work.

The following cost estimates, utilizing both approaches (contractors vs in-house crews), are provided in order to assist in budgetary planning and decision-making.

Cost Estimate (Contractor Approach)		**Cost Estimate (In-house Crews Approach)**	
Construction	$89.3 M	Construction	$64.8 M
Design	$6.8 M	Design	$5.0 M
Acquisition	$13.2 M	Acquisition	$13.2 M
Total	**$ 109.3 M (FY2008 costs)**	**Total**	**$ 83.0 M (FY2008 costs)**

Maintenance costs range from $165,000 in first year to $2.5M at full build-out.

Optional Bike/Pedestrian Missouri River Crossing on Independent Citywide Trails Legacy Bridge ..... $29.8 M

Note: both approaches only include costs for unfunded segments of the trail system. Funds have already been secured for 30 miles of the system (22 miles of Citywide Trails and 8 miles of On-street connectors at a value of more than $10 million).

As the trail system grows, maintenance costs will also grow. Maintenance costs will range from $165,000 in the first year of implementation to $2.5 million at full buildout. Trail pavement will also require replacement after 15-20 years, so on-going capital maintenance funds will be needed to sustain the system. Alternatives for funding maintenance are outlined on page 66.

LEVERAGING (COST CUTTING OPPORTUNITIES)

It will be critical for Kansas City to capitalize on multiple opportunities to reduce costs. Due to the significant cost reductions gained by utilizing in-house construction crews, it is recommended that the City pursue this alternative. In addition, the steering and technical committees identified several other leveraging opportunities that deserve investigation, including: partnerships with county park departments with in-house crews/dedicated funding; in-house design crews; in-house right-of-way staff; partnerships with equestrian organizations for equestrian trail-building; establishment of a non-profit trails organization that can plan/build trails; and partnerships with community organizations for adopt-a-trail programs to reduce maintenance costs. Regardless of what opportunities are pursued, the City will need to increase its investment in trail development and identify and secure funding from a variety of sources to ensure the effective build-out and maintenance of the trails system.

FUNDING RESOURCES

Implementation of the Trails KC system will require a comprehensive funding strategy that utilizes multiple funding sources. Kansas City must maximize opportunities from the traditional funding resources that are currently used to construct trails. It will also be critical to the success of the trail system to identify and secure new resources of funding. The tables on pages 56-63 provide a comprehensive list of funding opportunities, both existing grant funding programs and partnership opportunities, as well as innovative approaches that other cities have successfully used to build their own trail systems.

Funding opportunities are broken out into three primary categories:

EXISTING FUNDING RESOURCES - CURRENTLY USED WITHIN KCMO

While trail builders in the City are utilizing these programs/resources, there is great potential to increase the level of funding that can be secured.

EXISTING FUNDING RESOURCES - NOT USED WITHIN KCMO

The City has typically used a few major funding sources for development of trails, however, there are many funding sources/programs that exist that the City has not pursued. These resources present great opportunities for expanding our base and level of funding for trails.

NEW/INNOVATIVE FUNDING RESOURCES

In order to secure sufficient funding for the development of the Trails KC system, the City must investigate and consider new and innovative approaches to securing additional funding. Many of these alternatives are currently used by other cities to successfully build their trail systems.

HOW DO OTHER CITIES/ COUNTIES FUND TRAIL PROGRAMS?

St. Louis, MO –
1/10th of 1 cent sales tax in two counties ($10.6M = 2008 revenues)

Johnson County, KS –
2% of property taxes to Park District for parks/trails ($20M/year)

Colorado Springs, CO –
1/10th of 1 cent sales tax ($6M/yr) & State Lottery proceeds for open space acquisition/outdoor recreation ($1M/yr)

Lincoln, NE –
trail acquisition and construction requirement for new development

IMPLEMENTATION and DEVELOPMENT PLAN

EXISTING FUNDING RESOURCES - CURRENTLY USED WITHIN KCMO

Federal	Most of the federal funding sources are administered through the Missouri Department of Transportation (MoDOT) and the Mid-America Regional Council (MARC). Most, but not all, of these funding programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections.
Surface Transportation Program (STP)	The Surface Transportation Program (STP) provides states with flexible funds which may be used for a wide variety of projects on any Federal-aid Highway including the NHS, bridges on any public road, and transit facilities. MARC has the official Roadway Functional Classification Map with the eligible routes. Bicycle and pedestrian improvements are eligible activities under the STP. This covers a wide variety of projects such as on-road facilities, off-road trails, sidewalks, crosswalks, bicycle and pedestrian signals, parking, and other ancillary facilities. The modification of sidewalks to comply with the requirements of the Americans with Disabilities Act is also an eligible activity.
Transportation Enhancements (TE)	This program funds projects that serve a transportation need and can be used to build a variety of pedestrian, bicycle, streetscape and other improvements that enhance the cultural, aesthetic, or environmental value of transportation systems. For the funding of the Bruce R Watkins extensive landscaping, Kansas City negotiated an arrangement to have its TE funds dedicated to that one project for multiple years. A similar agreement for the 15-year plan could assist the City's trail development effort.
Congestion Mitigation Air Quality (CMAQ)	Funds are used to pay for transportation projects, including bicycle and pedestrian improvements that improve air quality.
National Park Service (NPS) Challenge Cost Share Program (CSSP)/ National Trails	The NPS awards matching funds, up to $30,000, for projects that preserve or improve the natural, cultural, or recreational resources of the NPS. Trails designated as National Trails, such as the Santa Fe Trail, by the NPS increase the chances of funding success under this program, and also give the trails preferential treatment in other federal and state funding sources.

EXISTING FUNDING RESOURCES - CURRENTLY USED WITHIN KCMO, continued

City	
Public Improvement Advisory Committee (PIAC) Funds	The competition for PIAC funds makes these funds very difficult to obtain, but this program has been a good source of funding for trail projects in some council districts. In the future, City staff should consider submitting an annual allocation request to be funded through the citywide pool or to ask each district to contribute an equal share of neighborhood funds towards the development of the trails system.
Parkland Dedication In-Lieu Funds	Developers are currently either dedicating land for parks or paying a fee in-lieu of dedication. The construction of trails within park property is an eligible uses of these funds.
Development Funds	Tax Increment Financing (TIF) Plan areas, Transportation Development Districts (TDD) and Community Improvement Districts (CID) capture tax increment or additional taxes for the benefit of the project area. These funds are eligible for infrastructure improvements, including trails. Examples of this use include the 152 Trail and the Three Trails Corridor Trail that are slated for development in the next few years.
Volunteers, Corporate and Civic Resources	
Non-profit Partners/ "Friends-of-Trails Group"	Kansas City River Trails, Inc. is an excellent example of how civic volunteer groups can promote and develop trails in the city. This non-profit entity has worked collaboratively with various City departments for funding and implementation assistance and has used its private status to acquire matching corporate funds and grants that the City may not have been able to obtain. The establishment of a "Friends-of-Trails" group could provide such assistance for the entire Trails KC system.

IMPLEMENTATION and DEVELOPMENT PLAN

EXISTING FUNDING RESOURCES - NOT CURRENTLY USED WITHIN KCMO

Federal	
Safe Routes to School (SR2S)	Grants are used to identify and reduce barriers and hazards to children walking or biking to school. This program includes funding for construction.
National Highway System (NHS)	This program funds improvements to rural and urban roads that are part of the National Highway System (NHS), including the interstate system. Bicycle and pedestrian facilities within NHS corridors are eligible activities for NHS funds. The Paseo Bridge crossing, and portions of the I-435 Trail, I-29 Trail, 152 Trail, and the Katy Connector Trail, as well as any trail crossings of a NHS Route would be eligible for these funds.
Highway Safety Improvement Program	Funds projects designed to achieve significant reduction in traffic fatalities and serious injuries on all public roads and pedestrian/bike pathways. Included within this program is the Railway-Highway Crossings program.
Land and Water Conservation Fund (LWCF)	Land and Water Conservation Fund is a federally funded program that provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for ROW acquisition and construction. These funds are administered by MoDNR.
Recreational Trails Program (RTP)	Administered by the Missouri Department of Natural Resources (MoDNR), the RTP of the Federal Transportation Bill provides funds to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. These funds are available for both paved and unpaved trails, but may not be used to provide shoulders or sidewalks along roads. These projects are currently limited to $100,000 requests.
Rivers, Trails and Conservation Assistance (RTCA) Program	The RTCA Program is a National Park Service program which provides technical assistance via direct staff involvement, to establish and restore greenways, rivers, trails, watersheds and open space. The program provides planning assistance – there are no implementation monies available.
National Recreation Trail (NRT) Program	NRTs are designated by the Secretary of Interior to recognize exemplary trails of local/regional significance. Through designation, trails are recognized as part of America's national system of trails. Designation brings various benefits including promotion, technical assistance, networking and access to funding.
Federal Transit Administration (FTA)	The FTA funds could be used for various elements of the Trails KC system. In addition to traditional transit projects, including intermodal facilities such as bicycle parking at park and ride and transit stations, the funds could be used to secure right-of-way for transit/trail corridors.

EXISTING FUNDING RESOURCES - NOT CURRENTLY USED WITHIN KCMO, continued

National Scenic Byways Program	Provides grantfunding for byways-related projects, including National Scenic Byways, All-American Roads and state-designated byways. The Riverfront Heritage Trail is part of the Spirit of Kansas City Byway and thus eligible. Other possibilities: trails along boulevard and park-way system, Blue River Road and historic trail routes.
Corps of Engineers (COE) Civil Works Program	The Civil Works Program has funded flood control projects such as the Blue River. Funds can also be used for recreational projects such as trails within COE flood control projects (up to 10% of total project costs with a 50% local match requirement).
Transportation, Community and System Preservation Program	This program provides federal funding for transit oriented development, traffic calming and other projects that improve the efficiency of the transportation system, reduce the impact on the environment, and pro-vide efficient access to jobs, services and trade centers. The program is intended to provide communities with the resources to explore the integration of their transportation system with community preservation and environmental activities.
New Freedom Initiative	SAFETEA-LU creates a new formula grant program that provides capital and operating costs to provide transportation services and facility improvements that exceed those required by the Americans with Disabilities Act.
National Endow-ment for the Arts	Funding through this program is available for development of design guidelines, artwork, signage, and landscaping.
On-System Bridges	Bridges shown as structurally deficient or functionally obsolete are eligible for these funds, administered through MARC. Work necessary to correct a safety (functional) defect is eligible, which could be used for improvements for safe bicycle and pedestrian facilities on stream crossings.
State	
Local Landmark Parks Program	Swope Park receives state funds for its status as Kansas City's Local Landmark Park. These funds can be used for improvements to the park, including the trail corridor that runs through it.
City	
General Funds	To date, the City has not made a commitment to fund trails develop-ment through the use of general funds. A dedicated annual allocation could greatly advance the development of the trails system. Funds could be used for the following: staff to design and construct trails, equipment, materials, property acquisition, maintenance. The greatest opportunity may be in funding dedicated staff as in-house construction crews can construct many of the trail corridors at a lower cost than if the projects are bid out. The performance of Clay County's in-house crews serves as a good example of this opportunity.
Dual-use Easements	Partnering with the Water Services Department and other utilities in developing areas of the city, public utility easements could be obtained with a portion of the easement to be used for trails. Maintenance access roads could also serve a dual use.

EXISTING FUNDING RESOURCES - NOT CURRENTLY USED WITHIN KCMO, continued

Local Foundations	
	Local foundations aligned with sustainability, greenways, exercise, trails, or bicycling include (This is not a complete list, but is a starting point to begin the search for private funds). • Block Foundation and the Meyer Memorial Trust • Hall Family Foundation • Hallmark Corporate Foundation • Blue Cross Blue Shield Foundation of Missouri • Miller Nichols Foundation • J.B. Reynolds Foundation In addition, the Eastland Foundation, established under the Greater Kansas City Community Foundation is raising funds for the development of the Little Blue Trace Trail.
National Foundations	
American Greenways Program	Generally a limited source of funds administered by The Conservation Fund, the American Greenways Program, provides funding for the planning and design of greenways. Applications for funds can be made by local regional or state-wide non-profit organizations and public agencies.
	Regional and national foundations aligned with sustainability, health greenways, exercise, trails, or bicycling are a good opportunity, especially for significant projects like the Katy Trail.

NEW/INNOVATIVE FUNDING RESOURCES

Federal	
National Park Service Centennial Fund	The National Park Service (NPS) celebrates its centennial in 2016. In preparation, the NPS is preparing legislation to appropriate funds for designated NPS projects. Currently, historic trails such as the Santa Fe Trail are not included in the draft legislation; however, this presents an opportunity to pursue.
Taxes /Fees	
Trails Dedication and In-lieu Fee Requirement	Cities around the country require new development to pay its "fair share" of the cost of providing public facilities, including trails, to service the needs of new development. This requirement could help ensure that as the city grows, adequate land and funds are secured to accommodate the new development's demand for trail facilities. Future proceeds could also be bonded which could help expedite trails development/produce economy of scale.
Trails Tax	There are numerous taxing tools available for trail development that can be used individually or in combination: • Sales tax (regional or local) • Property tax • Gas tax • Specific purchase tax (e.g. bike purchases) There is a willingness from the public to pay for the trails. At the April 2007 public meetings, 94% of the hundred attendees said they would be willing or very willing to pay an additional small monthly fee and/or tax to fund trail development in the city. There are also opportunities to reduce the reliance on the residents of Kansas City by using a program such as the fee on rental cars that helped finance Kansas City's downtown arena. **A 1/8 cent sales tax within Kansas City, MO would generate about $9 million per year, and cost the average consumer $4 per month.**
Combined Tax	A combined tax initiative also presents opportunities for securing trails funding. Incorporating trails development into the City's Wet Weather Solution Program is an opportunity to include trails as part of the green solutions approach to combining the City's stormwater/sewer problems. Several trails corridors are proposed in areas where Wet Weather Solution actions are needed, so synergy can be achieved by combining the two programs. In addition, the Wet Weather Solution program is large enough that including a trails component doesn't perceptibly change the magnitude of the tax, yet will make the overall tax package more attractive to the public. Tax renewals/initiatives to consider for a combination tax: • KCMO (Green Solutions Tax) – Relates to separating storm and sanitary flows, stream protection and greenways. Kansas City currently has authorization to impose up to 1/2-cent sales tax for stormwater and/or local parks. • Platte County Parks Renewal – The renewal of the parks sales tax • Clay County Parks Tax – An initiative to fund parks and trails with a sales tax • Regional Parks Tax – An initiative for a regional parks 1/10 cent sales tax that would be used for parks and trails.
Real-Estate Transfer Fee	A real-estate transfer fee could be charged for each real-estate transaction recorded within the city to generate trails funding. The amount generated, based on rates from other municipalities that have implemented a similar fee would not be significant, but could be used to for specific funding needs.

NEW/INNOVATIVE FUNDING RESOURCES, continued

Partnerships	
City-County Partnerships	Many Trails KC corridors are on county land or are part of a larger system that includes priorities of Clay, Platte and Jackson Counties. Kansas City must collaborate with County agencies to more effectively build out the regional system and help each entity achieve mutual goals. Clay and Platte Counties not only have dedicated funding that can be used for trails, but they also have in-house crews that are building trails for less money than the cost of trails in Kansas City.
Rock Island "Katy" Trail Coalition	MARC is working with several jurisdictions to create a Rock Island Trail Coalition consisting of local cities and counties to investigate options to rail-bank the Rock Island Railroad right-of-way and preserve the corridor for a connection to the Katy Trail. Although no funding has been identified, the combined resources and the high-profile of this critical connection may garner financial support from federal, state and local sources, both private and public.
Volunteers, Corporate & Civic Resources	
Land Trusts	A land trust is an organization that works with landowners in order to protect/preserve land for a variety of conservation purposes. Land trusts employ various strategies to acquire land and easements. They are often successful at acquiring land through donations or at a reduced price as property owners are able to receive tax benefits from the donation/reduced sales price. In addition, they are successful at raising funds that can be used for trail acquisition. Locally, the Platte County Land Trust is an organization that could assist in the acquisition of Kansas City's trail corridors.

NEW/INNOVATIVE FUNDING RESOURCES, continued

Volunteers, Corporate & Civic Resources	
Volunteer Groups	The community has expressed a great interest in assisting with the construction and maintenance of the Trails KC system. Groups such as Saddle and Sirloin, Northland Trails and Greenways and Kit-tyhawk Ranch Riders have proven experience building equestrian trails. Boy Scout troops across the country are active in trail-building activities. Local homeowners associations and other organizations such as Earthriders, Girl Scouts, and Tiffany Springs Park Partners, have expressed interest in supporting the development of Kansas City's trails system. In addition, the creation of an Adopt-a-Trail program could help offset on-going maintenance costs through neighborhood groups/companies that commit to keep sections of trail free of litter and debris.
Community Service Workers	Many jurisdictions utilize individuals fulfilling community service requirements and/or inmates on work detail to perform maintenance and other activities.
Individual Sponsorships	Individuals, businesses, or corporations are interested in sponsoring sections of trail or project elements. Kansas City has been successful in the past in obtaining grants and donations from private parties to assist in developing other types of park and recreation facilities and there is great opportunity to extend this to the trails system. Support can come in the form of cash donations, donations of services, equipment, labor, discounted materials, contribution of employee volunteer time. Naming rights, plaques or other forms of recognition are typically placed on constructed pieces in the trail corridor or at a prominent entry point. Sponsorship is also a good way to fund trail elements such as benches, trash receptacles, and interpretive areas.

IMPLEMENTATION and DEVELOPMENT PLAN

The following chart illustrates a possible funding scenario for one year of plan implementation, based on historic levels of funding received. The chart demonstrates not only the need for securing multiple funding sources, but also the necessity to identify new funding alternatives.

FISCAL YEAR 2011-2012 FUNDING SCENARIO

FUNDED PROJECTS (secured funding sources)		UNFUNDED PROJECTS (possible funding sources)	
Federal/State		**Federal/State**	
TE (Heart of America Bridge Trail)	$ 500,000	CMAQ	$ 500,000
MoDOT (Chouteau Trail)	TBD	TE	$ 1,000,000
		Rec Trails Program/Other	$ 100,000
Developer Participation		MoDOT	$ 2,500,000
TIF Projects (6th District/152 Trails)	TBD	**Federal/State**	**$ 4,100,000**
Total	**$ 500,000 +**	**Local**	
		PIAC	$ 1,200,000
		General Fund	$ 500,000
		Parkland Funds	$ 50,000
		Local	**$ 1,750,000**
		Developer Participation	
		Trails Dedication/In-lieu Fee	$ 100,000
		Developer Participation	**$ 100,000**
		Community Participation	
		Grants/In-kind/Sponsorships/CIDs	$ 250,000
		Community Participation	**$ 250,000**
		Cost Reduction/Leveraging Opportunities	
		In-house Crews/County Partnerships	$ 564,000
		Equestrian Trail-Building Crews	$ 75,000
		Cost Reduction/Leveraging Opportunities	**$ 639,000**
		Total	**$ 6,839,000**
		Funding Needed	**$ 7,225,000**
		Gap	**$ 386,000**
		Voter Approved Initiatives (Gap Fillers)	
		Sales Tax/Property Tax/Other	TBD
		Combined Funding with KC One/Green Solution	TBD
		Other (Federal/Local/Community/Etc)	TBD

Funded:

3.1 miles of Citywide Trails

Unfunded:

8.4 miles of Citywide Trails
1.7 miles of Equestrian Trails
0.7 miles of On-Street Connectors

Maintenance Strategy

No dedicated funding currently exists for trail maintenance in Kansas City and some trails do not have an identified, responsible entity assigned to trail maintenance. This is unacceptable as the City moves forward with the development of a comprehensive trails system. Construction of a trails system, like any other major infrastructure program, is a long-term investment for a city and requires proper maintenance. The following outlines the key ingredients of a maintenance program for Kansas City.

MAINTENANCE ROLES

The City will be the responsible party for the maintenance of all trails in the Trails KC system (the City will only accept responsibility for Citywide Trails built by private entities after property acquisition has occurred and the project has been accepted by the City). With the Trails KC Plan identifying a finite number of trails and defining standards for those trails, the programming and logistics of maintaining the trails is more manageable for the City. If a regional trails authority or another entity is created, transition of maintenance responsibility could be considered, although a cooperative agreement with the City should be entered into to ensure maintenance is adequately funded and performed.

The City's PPOC should be responsible for oversight of the trails maintenance program. In addition, the steering and technical committees have recommended that each and every trail segment should have a designated entity responsible for its maintenance. One approach for consideration includes:

- Parks and Recreation Department – responsible for performing regular maintenance (litter pickup, mowing, etc) on all Citywide Trails and equestrian trails.
- Public Works Department - responsible for performing maintenance (street cleaning, re-striping, signage maintenance) on all on-street connectors. In addition, Public Works would be responsible for Citywide Trail pavement replacement/repairs.
- Partner Agencies – some Trails KC corridors are owned/maintained by other entities (KCATA/Counties). The City should coordinate with these partner agencies to ensure effective and consistent maintenance throughout the entire Trails KC system.

Even with dedicated funding for maintenance, the City will need to partner with volunteers, local businesses, and homeowners associations to keep the trails in a satisfactory condition. Feedback from the public meetings indicates that there is ample interest in community partnerships. To kick-start and help sustain community participation in trails maintenance, a volunteer plan should be initiated that includes an official adopt-a-trail program.

EMPHASIS ON MAINTENANCE

Almost 2/3 of Kansas Citians want the overall maintenance of city streets, buildings, and facilities to receive the most emphasis from city leaders over the next two years.

Kansas City Citizen Survey Report, City Auditor's Office, 2008

MAINTENANCE FUNDING

Kansas City does not currently have dedicated funding for trails maintenance. Today, the Parks and Recreation general operations budget is used to fund maintenance for those trails that have been constructed in park and boulevard areas, or when major capital repairs are needed, funding is sought through various grant/funding programs, such as the City's PIAC process. Trails that do not fall under the jurisdiction of the Parks and Recreation, KCATA, or the counties have no funds programmed for maintenance.

A maintenance program and funding plan are critical elements for a successful trails system. Kansas City can pursue two viable approaches to fund a trails maintenance program – a traditional pay-as-you-go approach or a maintenance endowment.

- The **traditional pay-as-you-go method** is similar to the current street maintenance plan, where maintenance needs are identified and projected annually. Budget requests are submitted annually to cover the identified maintenance needs, however, actual funding received is subject to changing priorities and economic trends.
- Through a **maintenance endowment program**, a sum equal to 20-25% of the construction cost of a project would be secured prior to construction and allocated into a trails maintenance fund. This could be either an endowment established through a private entity (i.e., Greater Kansas City Community Foundation), a City trust fund, or a combination of the two. The interest earned from the endowment fund would then be used to fund ongoing maintenance. While the upfront costs are higher for the maintenance endowment, the City would not need to identify funding on an annual basis to keep up with maintenance expenses.

The following table illustrates the cost of each maintenance funding approach for the initial implementation period of the Trails KC Plan.

MAINTENANCE FUNDING ALTERNATIVES

Alternate A: Pay-As-You-Go

	FY2008/09	FY2009/10	FY2010/11	FY2011/12	FY2012/13	Totals
Maintenance Miles	15	24.4	37.8	47.9	56.8	56.8
Maintenance Funding Needed ($11,000/mile)	**$165,000**	**$268,400**	**$415,800**	**$526,900**	**$624,800**	**$2.0 M**

Alternate B: Maintenance Endowment

	FY2008/09	FY2009/10	FY2010/11	FY2011/12	FY2012/13	Totals
Maintenance Miles	15	24.4	37.8	47.9	56.8	56.8
Maintenance Funding Needed (25% of construction costs for unfunded trail sections)	**$165,000**	**$277,500**	**1.34 M**	**1.33 M**	**1.7 M**	**4.8 M**

In order to establish and sustain a viable trails system, it is critical that Kansas City adequately plans for and funds trails maintenance.

MAINTENANCE GUIDELINES

In addition to assigning maintenance responsibilities to a particular entity and allocating sufficient funding for maintenance, maintenance guidelines are also necessary to sustain a successful trails system. The following maintenance checklist provides guidance on the elements of an effective maintenance program. This program should promote not only trail repairs/replacement but preventive maintenance. Maintenance managers/operators should construct a maintenance plan based on the information provided in the following checklist. Conducting regular condition surveys/inspections on trail corridors will help to determine the need/frequency of maintenance activities.

INVEST IN MAINTENANCE

Good maintenance begins with sound planning and design. However, cities must invest in an effective O&M program.

MAINTENANCE CHECKLIST

Maintenance Activity	Maintenance Frequency	
	On-going/Regular	Periodic/As-Needed
Trail Surface Treatment (repair/replacement)		X
Erosion, Slopes and Drainage Control		X
Vegetation Pruning		X
Sweeping (On-Street Connectors)	X	
Sweeping (Citywide Trails) / Snow Removal		X
Mowing	X	
Litter Removal	X	
Signage Replacement/Repair		X
Vandalism/Illegal Dumping		X
Trailheads/Other Amenities	X	X

In order to ensure programmed maintenance activities are sufficient, Kansas City should conduct regular conditions surveys as well as periodic audits of the trails maintenance program (see next section – Evaluation Strategy – for additional details). Trail users should also be provided an opportunity to share input regarding trail conditions/maintenance needs through user surveys or an interactive website. Maintenance managers must also consider the types of users of each trail. If a trail is used as a transportation corridor, snow removal must be incorporated into the maintenance plan. Maintenance must therefore be tailored to each trail.

Evaluation Strategy – Performance Measures

Performance measures are a means of gauging the effectiveness of the Trails KC system. The following items will be tracked and scored to evaluate the City's performance in implementing the Trails KC system. Without this progress review, it will be difficult to determine when or if changes need to be made to the implementation plan.

1. SYSTEM COMPLETION (ANNUALLY)

- Miles of Trails KC system constructed (Citywide Trails, Equestrian Trails and On-Street Connectors)
- Miles of priority projects constructed
- Miles of Neighborhood Connector Trails constructed
- Miles of Citywide Trails per 1,000 service population ratio (comparison to trails standard of 0.4 miles/1,000 service population)

This information will be used to evaluate the investment in and effectiveness of the implementation plan. Although not integral to the Trails KC Plan, the miles of Neighborhood Connector Trails will be used as a measure of the effectiveness of the Citywide Trails to generate secondary trails as well as provide a summary of the total mileage of public, shared-use trails built in Kansas City.

2. TRAIL USAGE (EVERY THREE YEARS)

- User counts/volumes
- User satisfaction survey results

This information will be used to evaluate the trail user's experience and to determine the level of usage on the Trails KC system. Due to the costs involved with generating this information, and the time to construct trails, this information will be scored once every three years. Volunteers could be instrumental in monitoring trail usage.

3. BICYCLE FRIENDLY COMMUNITY (BFC) BENCHMARK (ANNUALLY)

- League of American Bicyclists review

The League of American Bicyclists National BFC program provides a series of education, engineering, enforcement and encouragement benchmarks that are evaluated through a simple application format that leads to Bronze, Silver, Gold and Platinum award levels. In May 2008, Mayor Mark Funkhouser announced a goal for the City of Kansas City to reach Platinum designation by 2020. This benchmark will measure the City's performance in reaching Platinum designation (combination of implementation of the Trails KC Plan, Bike KC Plan and other bike/ped initiatives).

4. MAINTENANCE (EVERY THREE YEARS)

- Trail condition ratings

This information will be used to determine if trail maintenance is adequate or whether additional investment in trails maintenance is needed. Due to the costs involved with generating this information, and the time to construct trails, this information will be scored once every three years.

5. ECONOMIC IMPACT (AS STRATEGIC TARGETS ARE MET – 50 MILES, 100 MILES BUILT)

Trails provide an economic stimulus for communities as outlined on page 9. By conducting an economic impact analysis, the economic benefits of Kansas City's trails system can be quantified and evaluated over time.

BASELINE CONDITIONS

In order to have an effective evaluation system, the City must conduct an initial assessment in 2008 in order to establish the baseline conditions from which all future scorecards will be evaluated. Both the baseline data as well as the score-card data gathered should be accessible to the general public.

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five-year PRIORITY PROJECTS plan

Without an approved trails plan, Kansas City lacks several tools needed for effective trails development. One necessary tool is criteria to evaluate and prioritize potential trails projects. This section is intended to guide the implementation of Kansas City's trails system by providing the following:

- Criteria to evaluate projects
- A recommended five-year plan of priority projects.

Trail Project Evaluation Criteria

The project team and steering and technical committees identified a need to create evaluation criteria as well as to identify priority projects to kick-start the first 5 years of implementing the Trails KC Plan's 15-year build-out strategy. Use of these tools will ensure that Kansas City's trails system effectively develops as a network, creating connectivity throughout the city. The five-year priority project plan will assist the City when attempting to secure funding as well as other resources needed for timely and effective planning, design and construction.

In order to identify priority projects for development, the project team and steering and technical committees established the following criteria to evaluate and prioritize projects within the Trails KC system:

PLANNED PROJECTS/PARTNERSHIP OPPORTUNITIES

Many projects have considerable planning/design completed, significant opportunities to partner with other agencies, private developers, etc., and/or funding secured for construction and are thus strong projects for early implementation.

CONNECTIVITY

Trails of limited length have limited usage. By improving connectivity, the aim is to increase Kansas Citians access to trails and thus increase trail use. Trails that can connect two existing trails or extend an existing trail are high priorities.

PRESERVATION OPPORTUNITIES

Some trail corridors are a means to preserve Kansas City's most pristine and fragile environments from overdevelopment. Benefits to prioritizing these corridors include: educational opportunities, habitat preservation, stormwater solutions and improved water quality.

BARRIER REMOVAL

Barriers such as the Missouri River, interstates/highways, and railroad crossings are major impediments to bicycle and pedestrian use. By addressing these difficult areas early, bicycle and pedestrian use increases greatly, thereby creating additional demand for trails development and other bike/ped facilities, which are easier to implement.

five-year PRIORITY PROJECTS plan

DESTINATIONS

In order to establish an effective trails system, trail users must be able to go somewhere. Trails that not only improve connectivity of the system, but connect users to jobs, public open spaces, and other destinations are strong projects for early implementation.

CONSTRUCTABILITY

To maximize funding in the first five years, a premium is placed on trail corridors that are "ready to go" such as trails along maintenance roads, in areas cleared for construction, or in areas of relatively flat terrain.

VISIBILITY

Trails that have high visibility, such as the Trolley Track Trail, are good projects to prioritize because they increase people's awareness of the trails system and thus increase the number of users.

Five-Year Priority Projects

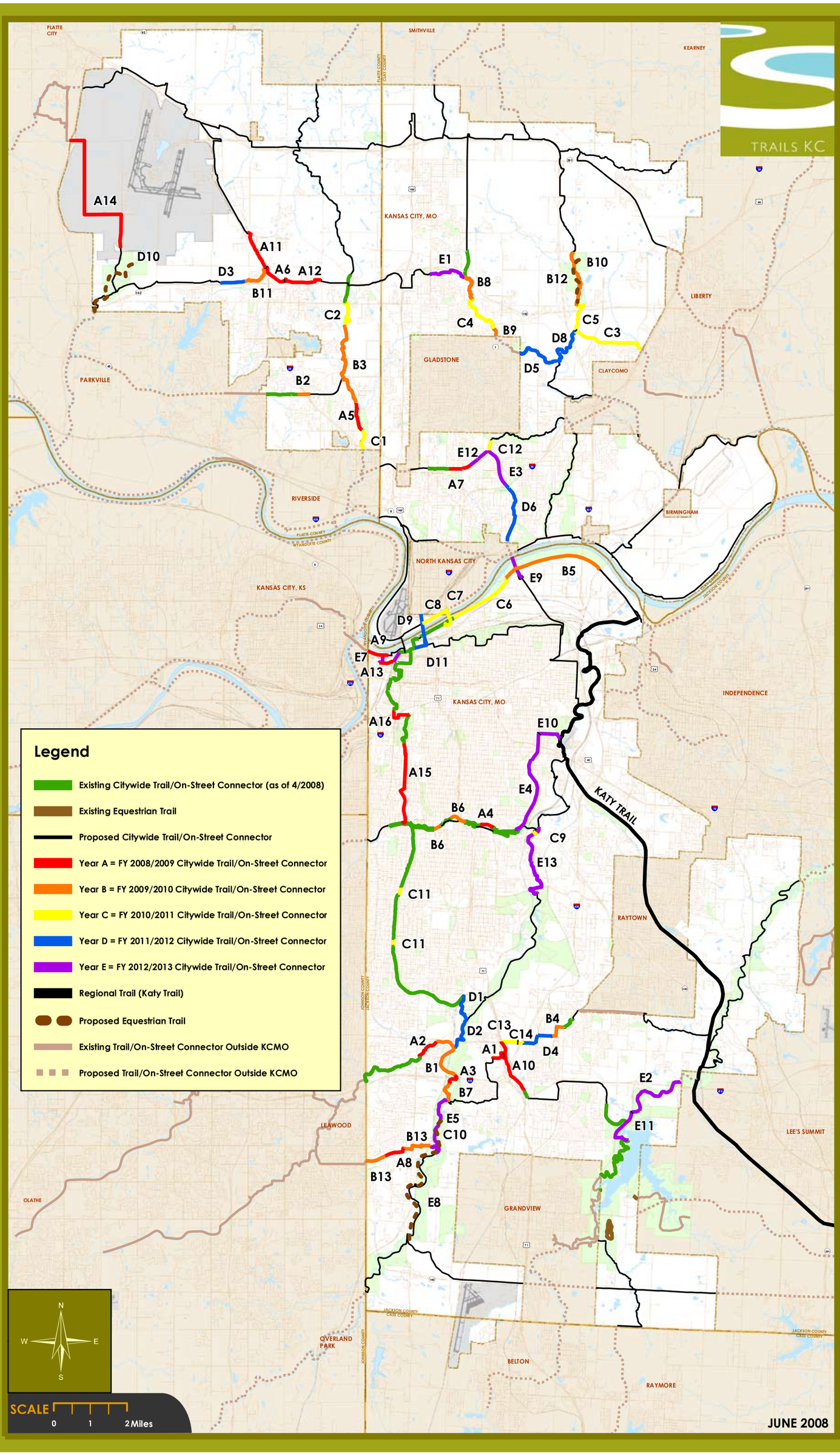
The following map and table illustrate the recommended priority projects for construction during the first five years of implementation of the Trails KC Plan. The steering and technical committees selected these projects for their compliance with the trail project evaluation criteria, and because they can effectively kick-start the development of a connected and comprehensive trail system for Kansas City. Public meeting participants affirmed the committees' selections and provided additional recommendations which have been incorporated into the five-year plan.

If implemented as proposed, Kansas City could see the following results in five years time:

- Expand the Trails KC system from 26 miles to 80 miles
- Construct 8 miles of equestrian trails
- Create major linkages between trail corridors with 14 miles of on-street connectors
- Connect the existing Indian Creek and Trolley Track Trails so that a bicyclist could ride from Olathe to the Plaza (over 28 miles of continuous off-street trail)

FAVORITE PRIORITY PROJECTS: Feedback From Public Meetings

1. Katy Trail
2. Shoal Creek Trail
3. Blue River Trail
4. Line Creek/2nd Creek Trail
5. South Missouri Riverfront Trail (Levee Trail)


TRAILS KC
PLATTE CITY
SMITHVILLE
KEARNEY
KANSAS CITY, MO
LIBERTY
GLADSTONE
CLAYCOMO
PARKVILLE
RIVERSIDE
BIRMINGHAM
NORTH KANSAS CITY
KANSAS CITY, KS
INDEPENDENCE
RAYTOWN
LEAWOOD
LEE'S SUMMIT
OLATHE
GRANDVIEW
OVERLAND PARK
BELTON
RAYMORE
KATY TRAIL
A14
D10
A11
D3
A6
A12
B11
E1
B8
B12
B10
C2
C4
B9
C5
C3
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C14
A2
A1
D4
B1
A3
A10
E2
B7
E5
E11
B13
C10
A8
B13
E8
Legend
Existing Citywide Trail/On-Street Connector (as of 4/2008)
Existing Equestrian Trail
Proposed Citywide Trail/On-Street Connector
Year A = FY 2008/2009 Citywide Trail/On-Street Connector
Year B = FY 2009/2010 Citywide Trail/On-Street Connector
Year C = FY 2010/2011 Citywide Trail/On-Street Connector
Year D = FY 2011/2012 Citywide Trail/On-Street Connector
Year E = FY 2012/2013 Citywide Trail/On-Street Connector
Regional Trail (Katy Trail)
Proposed Equestrian Trail
Existing Trail/On-Street Connector Outside KCMO
Proposed Trail/On-Street Connector Outside KCMO
N
W
E
S
SCALE
0
1
2 Miles
JUNE 2008

five-year PRIORITY PROJECTS plan

OFF-STREET CITYWIDE TRAILS

FY2008-2009 (Year One)

Map ID	Trail Name	Length	Funded	Unfunded	Note
A1	Three Trails Corridor Trail	0.6	TBD	$ -	• Funded - City/MoDOT funds - construction underway
A2	Indian Creek Trail	0.7	$ 461,750	$ -	• Funded - Design complete
A3	Blue River Trail	0.4	$ 615,000	$ -	• Funded - Design underway
A4	Brush Creek Trail	0.4	$ 701,295	$ -	• Funded - Design underway
A5	Line Creek/2nd Creek Trail	0.8	TBD	$ -	• Funded • Design and some clearing/construction could be done in-house
A6	152 Trail	0.8	TBD	$ -	• Funded - Developer constructing (Cousins Development)
A7	Vivion Rd	0.6	$ 615,000	$ -	• Funded - Design complete
A8	Three Trails Corridor Trail	0.6	$ 350,000	$ -	• Funded - Design complete (on Avila property)
A9	Riverfront Heritage Trail	0.6	$ 1,355,000	$ -	• Funded - Design complete
A10	Katy Connector Trail	1.6	TBD	$ -	• Funded - Design complete
A11	I-29 Trail	1.2	TBD	$ -	• Funded - TIF funded, developer constructing
A12	152 Trail	1.1	TBD	$ -	• Funded - TIF funded, developer constructing
	TOTAL (Rounded)	**9.4**	**$ 4,100,000**	**$ -**	

FY2009-2010 (Year Two)

Map ID	Trail Name	Length	Funded	Unfunded	Note
B1	Indian Creek Trail	0.6	$ 667,000	$ -	• Funded - Design underway • R/R issues need to be resolved • Some minor gaps near Lydia (change order into contract)
B2	Southern Platte Pass Trail	0.3	TBD	$ -	• Funded - City/MoDOT funds • Tied to 64th Street/I-29 MoDOT improvements
B3	Line Creek/2nd Creek Trail	2.6	TBD	$ 260,000	• Funded • Condemnation needed for some parcels • Design and easement acquisition could be done in-house
B4	Three Trails Corridor Trail	0.6	$ 355,000	$ -	• Funded - Design to start in 2008
B5	Levee Trail (South Missouri Riverfront Trail)	2.8	$ -	$ 310,000	• Not funded (Parkland in-lieu funds are an option) • Sections can be opened up - existing levee top/access roads • COE coordination necessary
B6	Brush Creek Trail	0.7	$ 1,300,010	$ -	• Funded - Design underway
B7	Blue River Trail	1.8	$ 680,000	$ -	• Funded - Design underway
B8	Shoal Creek Trail	0.9	$ -	$ 353,000	• Not funded (Parkland in-lieu funds are an option) • Opportunity to construct during pkwy construction • Opportunity to partner with Clay County to reduce cost
B9	Shoal Creek Trail	0.2	$ 300,333	$ -	• Funded - Design underway (Partnership with Gladstone)
B10	Hodge/Smithville Trail	2.1	$ -	$ 191,000	• Not funded (Parkland in-lieu funds are an option) • Most of trail can be opened up as-is, signage/aggregate needed • Can use existing maintenance road & sewer easement • Opportunity to partner with Clay County (RTP app pending)
B11	152 Trail	0.8	TBD	$ -	• Funded - TIF funded, developer constructing
	TOTAL (Rounded)	**13.4**	**$ 3,300,000**	**$ 1,110,000**	

five-year PRIORITY PROJECTS plan

OFF-STREET CITYWIDE TRAILS

FY2010-2011 (Year Three)

Map ID	Trail Name	Length	Funded	Unfunded	Note
C1	Line Creek/2nd Creek Trail	0.6	$ 200,000	$ 367,000	• Partially funded • Construction may occur early due to partnership opportunities • Design could be done in-house
C2	Line Creek/2nd Creek Trail	0.9	TBD	$ 573,000	• Partially funded • Design/easement acquisition can be done in-house
C3	76th Street/Flintlock	2.0	TBD	$ -	• Funded - TIF funded, developer constructing
C4	Shoal Creek Trail	1.4	$ -	$ 549,000	• Not funded - Good connectivity • Opportunity to partner with Clay County to reduce cost
C5	Hodge/Smithville Trail	1.0	$ -	$ 566,000	• Not funded - Good connectivity - alignment established • Opportunity to partner with Clay County and developer
C6	Levee Trail (South Missouri Riverfront Trail)	1.9	$ -	$ 404,000	• Not funded - Good connectivity • Requires COE approval (Water Services/Parks)
C7	Paseo Bridge	0.9	$ 750,000	$ 2,495,000	• Not funded - partial funding from CMAQ
C8	North Missouri Levee Trail	0.3	$ -	$ 183,000	• Not funded • Requires COE/NKC Levee District approval • Dependant on MoDOT/NKC requirement for Paseo
C9	Brush Creek Trail	0.1	$ 200,000	$ -	• Funded • Requires COE/UPRR approval • WSD Colorado Bridge project funding the Blue River crossing
C12	Vivion Road Trail	0.3	TBD	$ -	• Funded for design
C13	Three Trails Corridor Trail	0.6	$ -	$ 202,000	• Not funded - Good connectivity
C14	Three Trails Corridor Trail	0.1	$ 1,575,000	$ -	• Funded by TE grant and CID
	TOTAL (Rounded)	10.1	$ 2,730,000	$ 5,340,000	

FY2011-2012 (Year Four)

Map ID	Trail Name	Length	Funded	Unfunded	Note
D1	Trolley Track Trail	0.8	$ -	$ 932,000	• Not funded • Alternative route options may require coordination with Solid Waste schedule for capping/design, R/R, GSA for use of levee top • Major connection to Blue River and Indian Creek Trails
D2	Blue River Trail	1.1	$ -	$ 687,000	• Not funded - Major connection to Trolley Track and Indian Creek Trails
D3	152 Trail	0.7	TBD	$ -	• Funded - Developer constructing • Construction may occur early due to development schedule
D4	Three Trails Corridor Trail	0.7	TBD	$ -	• Funded - Developer funded
D5	Shoal Creek Trail	1.3	$ -	$ 493,000	• Not funded - Good connectivity to Gladstone
D6	Chouteau Trail	1.7	TBD	$ -	• Funded - Part of MoDOT parkway project
D8	Hodge/Smithville Trail	1.5	$ -	$ 708,000	• Not funded • Good connectivity to Shoal Creek Trail
D9	HAB	1.1	$ 500,000	$ 2,500,000	• MoDOT obligated to fund, partial funding secured from TE
	TOTAL (Rounded)	8.9	$ 500,000	$ 5,320,000	

FY2012-2013 (Year Five)

Map ID	Trail Name	Length	Funded	Unfunded	Note
E1	152 Trail	1.1	$ 25,000	$ 384,000	• Not funded for construction • PIAC funded easements/surveying
E2	Little Blue Trace Trail	1.9	$ 150,000	$ 1,184,000	• Not funded for construction (Parkland in-lieu funds are an option) • PIAC funded easements/surveying • Opportunity to partner with County/Eastland Foundation
E3	Chouteau Trail	1.1	$ -	$ 733,000	• Not funded - Good connectivity • Opportunity to partner with Clay County to reduce cost
E4	Van Brunt Trail	2.6	$ -	$ 990,000	• Not funded (Need to determine if any parkland in-lieu funds are available) • Design and construction could be done in-house to reduce costs
E5	Blue River Trail	2.2	$ -	$ 1,214,000	• Funded for design - Good connectivity
E12	Vivion Road Trail	0.6	$ -	$ 1,300,000	• Not funded - Good connectivity
E13	Blue River Trail	2.6	$ -	$ 925,600	• Not funded - Design underway as part of COE project
	TOTAL (Rounded)	9.5	$ 180,000	$ 6,730,000	

TOTAL 5-YR OFF-STREET MILES	51.3		
TOTAL 5-YR OFF-STREET COST		$ 10,810,000	$ 18,500,000

REGIONAL TRAILS

Map ID	Trail Name	Length	Funded	Unfunded	Note
	Katy Trail	16.3	$ -	$ 16,700,000	• Right-of-way acquisition, design and construction
	TOTAL (Rounded)	16.3	$ -	$ 16,700,000	

EQUESTRIAN

FY2008-2009 (Year One)

Map ID	Trail Name	Length	Funded	Unfunded	Note
	None	0.0	$ -	$ -	
	TOTAL (Rounded)	0.0	$ -	$ -	

FY2009-2010 (Year Two)

Map ID	Trail Name	Length	Funded	Unfunded	Note
B12 ●	Hodge Park Equestrian Trail	1.5	$ -	$ 75,000	• Not funded for construction (RTP grant pending)
	TOTAL (Rounded)	1.5	$ -	$ 75,000	

FY2010-2011 (Year Three)

Map ID	Trail Name	Length	Funded	Unfunded	Note
C10 ●	Blue River Equestrian Trail	1.4	$ -	$ 70,000	• Not funded for construction • Possible partnership opportunity with Saddle and Sirloin Club
	TOTAL (Rounded)	1.4	$ -	$ 70,000	

FY2011-2012 (Year Four)

Map ID	Trail Name	Length	Funded	Unfunded	Note
D10 ●	Tiffany Springs Park Equestrian Trail	1.7	$ -	$ 85,000	• Not funded for construction
	TOTAL (Rounded)	1.7	$ -	$ 85,000	

FY2012-2013 (Year Five)

Map ID	Trail Name	Length	Funded	Unfunded	Note
E8 ●	Blue River Equestrian Trail	3.7	$ -	$ 185,000	• Not funded for construction • Possible partnership opportunity with Saddle and Sirloin Club
	TOTAL (Rounded)	3.7	$ -	$ 185,000	

TOTAL 5-YR EQUESTRIAN MILES	8.3		
TOTAL 5-YR EQUESTRIAN COST		$ -	$ 415,000

five-year PRIORITY PROJECTS plan

ON-STREET CONNECTORS

FY2008-2009 (Year One)

Map ID	Name	Length	Funded	Unfunded	Note
A13	Riverfront Heritage Trail	0.4	TBD	$ -	• Funded - CIMO Bridge project
A14	KCI Airport	4.4	TBD	$ -	• Funded - KC Bike Program change order (signage only) • Sidewalks not included
A15	Trolley Track Trail	2.4	TBD	$ -	• Funded - KC Bike Program change order (signage only) • Sidewalks not included
A16	Riverfront Heritage Trail	0.7	TBD	$ -	• Funded - KC Bike Program change order (signage only) • Sidewalks not included
	TOTAL (Rounded)	7.9	$ -	$ -	

FY2009-2010 (Year Two)

Map ID	Name	Length	Funded	Unfunded	Note
B13	Three Trails Corridor	1.5	$ -	$ 66,600	• Not funded for construction
	TOTAL (Rounded)	1.5	$ -	$ 67,000	

FY2010-2011 (Year Three)

Map ID	Name	Length	Funded	Unfunded	Note
C11	Trolley Track Trail	0.4	$ -	$ 16,400	• Not funded for construction
	TOTAL (Rounded)	0.4	$ -	$ 16,000	

FY2011-2012 (Year Four)

Map ID	Name	Length	Funded	Unfunded	Note
D11	Riverfront Heritage Trail	0.7	$ -	$ 32,100	• Not funded for construction
	TOTAL (Rounded)	0.7	$ -	$ 32,000	

FY2012-2013 (Year Five)

Map ID	Name	Length	Funded	Unfunded	Note
E7	Riverfront Heritage Trail	0.6	$ -	$ 500,000	• Not funded for construction
E9	Chouteau Trafficway	0.6	$ -	$ 29,100	• Not funded for construction
E10	Van Brunt	1.0	$ -	$ 46,800	• Not funded for construction
E11	Little Blue Trace	1.5	$ -	$ 67,400	• Not funded for construction - Major connection
	TOTAL (Rounded)	3.7	$ -	$ 643,000	

TOTAL 5-YR ON-STREET MILES	14.2		
TOTAL 5-YR ON-STREET COST		TBD	$ 758,000

Funding the Priority Projects in the Five-Year Plan

Securing additional funding for the first few years of implementation will be a challenge, so the initial years of the five-year plan are more conservative and include only a few miles of unfunded trails. By the third year, it is expected that Kansas City's trails program will have gained momentum through the development of new partnerships and identification of additional funding resources. Therefore, a more aggressive strategy is proposed for years three - five, which include more miles of currently unfunded trails than in earlier years.

FIVE-YEAR PLAN BUDGET

	FY2008/09	FY2009/10	FY2010/11	FY2011/12	FY2012/13	Totals
Design/Construct						
Shared Use Trails	FULLY FUNDED	$1,110,000	$5,340,000	$5,320,000	$6,730,000	$18,500,000
On-Street Conn.		$67,000	$16,000	$32,000	$643,000	$758,000
Equestrian		$75,000	$70,000	$85,000	$185,000	$415,000
Subtotal	**$ –**	**$1,252,000**	**$5,426,000**	**$5,437,000**	**$7,558,000**	**$19,673,000**
Acquisition	$ –	$350,000	$420,000	$360,000	$230,000	$1,360,000
Maintenance (Endowment)						
Shared Use Trails	$165,000	$277,500	$1,335,000	$1,330,000	$1,682,500	$4,790,000
On-Street Conn.	$ –	$16,750	$4,000	$8,000	$160,750	$189,500
Equestrian	$ –	$87,500	$105,000	$90,000	$57,500	$340,000
Subtotal	**$ 165,000**	**$381,750**	**$1,444,000**	**$1,428,000**	**$1,900,750**	**$5,319,500**
Total Funding Needed **	**$ 165,000**	**$1,983,750**	**$7,290,000**	**$7,225,000**	**$9,688,750**	**$26,352,500**

Regional 5-Year Priority Katy Trail	
Acquisition	$7,500,000
Design/Construction	$9,250,000
Total	$16,700,000

* Cost savings estimated at 25-30% with use of in-house crews for off-street and volunteer crews for equestrian

** Using the traditional pay-as-you-go method for maintenance, total five-year funding needed – $23.3 million.

five-year PRIORITY PROJECTS plan

Hodge-Smithville corridor

Levee top

Interim Standard Alternative

To accelerate implementation of the five-year plan, the committees and the public have evaluated the viability of building trails to an "interim standard," i.e., unpaved trails, as discussed on page 29. As costs are less than building paved trails, this option would stretch precious dollars further in the early years when funding is tightest, allowing more miles of trails to be completed in a shorter time frame, and thus getting more people out on the trails. The following trail corridors are prime candidates for use of the interim standard:

- Hodge-Smithville Trail – existing maintenance road and sewer easement could easily be opened up with minimal improvements
- South Missouri Riverfront Trail (Levee Trail) – parts of the levee top are already accessible and could accommodate bike/ped traffic with few improvements

While use of the interim standard is a means to implement the five-year plan with fewer resources, it should be viewed as an interim solution. All trails built to interim standards should be upgraded to paved trails that meet the Trails KC Plan design guidelines.

Annual Evaluations

While the five-year plan will serve as the City's initial implementation plan, additional project and development opportunities will surface that are not foreseeable at this time. These new opportunities should be evaluated against the priority project criteria. If they adequately comply, the projects should be considered for integration into the five-year plan. In addition, the five-year plan should be evaluated annually to determine whether adequate progress has been made and to make adjustments based on new opportunities that were previously unknown.

The five-year priority projects plan is only as strong as the City's commitment to it. Therefore it is recommended that upon adoption of the Trails KC Plan, the City begin to identify and commit the necessary resources and staff towards its implementation.

Kansas City can make great strides in the development of a first-class trail system if priorities are defined and the community comes together behind a common purpose. The revitalization of downtown is a prime example of the community's ability to get things done when a common goal is established. With the success of Kansas City's downtown, many in the community now stress the importance of extending that success into our neighborhoods and to take steps to make the City more sustainable or "green." A first-class trail system can take Kansas City a long way in attaining both these goals.

IMPLEMENTATION and policy recommendations

To create a first-class trail system, bike/ped facilities must be a priority for Kansas City, not an afterthought. Recently-adopted City policies suggest that Kansas City is moving in the right direction:

- Mayor Funkhouser recently announced a goal to achieve platinum designation from the League of American Bicyclists by 2020
- City Council passed several resolutions calling for "green solutions" and the incorporation of sustainable practices in City activities
- City Council passed a resolution directing the City Manager develop a plan to open up the City-owned/maintained levees to recreational use.

The implementation of the Trails KC Plan can be a major contributor to achieving these goals, while providing Kansas City residents and visitors with a trail system that can be enjoyed by generations to come.

The following provides key implementation and policy recommendations that are fundamental to the development of the Trails KC system. These recommendations should serve as a guide/checklist to facilitate the initial implementation of Kansas City's trail system and as a means to achieve the goal of becoming a bicycle, pedestrian and equestrian-friendly city.

IMPLEMENTATION and policy recommendations

ORGANIZATIONAL:

- Designate a Primary Point of Contact (PPOC) responsible for oversight and development of the Trails KC Plan. This should include development of clearly defined authority/responsibilities (page 46)
- Designate Trails Liaisons for each City Department involved in trails planning/construction. Each department should also have clearly defined roles outlined in interdepartmental memorandums of understanding (MOUs) that, in concert, will advance the development of an integrated trail and on-street system (page 47)
- Establish a Bicycle/Pedestrian Advisory Committee, per Ordinance 080515, that will help set goals for the City's trails program, evaluate the implementation of the Trails KC Plan, and provide an annual performance report/audit to City Council (page 47)
- Establish a "Friends-of-Kansas City Trails" group that can undertake several important roles including: fundraising, organizing adopt-a-trail and volunteer trail-building opportunities, educational and awareness programming (page 47)
- Establish guidelines for an adopt-a-trail program (page 47)
- Support regional efforts to establish a regional trails organization "trails authority" and regional funding mechanism that can plan/fundraise/construct trails (page 48)
- Implement organizational review process that requires all trail projects within Kansas City be reviewed/approved by the City's Primary Point of Contact (PPOC) for trails (page 49)
- Modify necessary plan review/permitting checklists and processes to incorporate permitting/inspection requirements for public-use trails (page 49)
- Investigate opportunities to establish a land trust or partner with existing land trusts to acquire land for trail corridors (page 52)
- Develop staffing plan and dedicate resources necessary to create an in-house crew capability to design, construct, and maintain trail facilities (page 54)
- Develop maintenance plan/adopt maintenance guidelines that clearly defines maintenance roles/responsibilities (page 67)

FUNDING:

- Utilize Five-Year Priority Projects Plan to guide and develop a funding strategy (page 72)
- Allocate annual City appropriation for development of the trail system (page 59)
- Implement a trail dedication/in-lieu fee requirement to secure trail easements/fund trail construction in developing areas (page 52)
- Work to maximize funding levels from existing funding sources (PIAC, parkland dedication in-lieu fee, federal sources) (page 55)
- Actively pursue new funding sources (page 55)
- Actively pursue leveraging opportunities (dual-use easements/City-County partnerships that utilize County construction crews or cost-sharing agreement) (page 55)
- Support integration of trails into the Wet Weather Solutions Program funding plan (green solutions) (page 61)
- Initiate effort to secure private funding/grants/support for trails-cooperative effort with Friends-of-Kansas City Trails (page 63)
- Pursue partnerships with volunteer organizations that are interested in building trails (Northland Trails and Greenways/Saddle and Sirloin) (page 63)
- Support/pursue development of a regional funding mechanism and/or a dedicated funding source (sales tax/property tax/gas tax/specific purchase tax, i.e., bike purchases) (page 61)
- Develop a maintenance endowment program to ensure dedicated funding for maintenance (page 66)
- Incorporate maintenance costs into any sales tax/fee program to ensure maintenance needs are funded in addition to construction needs (page 61)

IMPLEMENTATION and policy recommendations

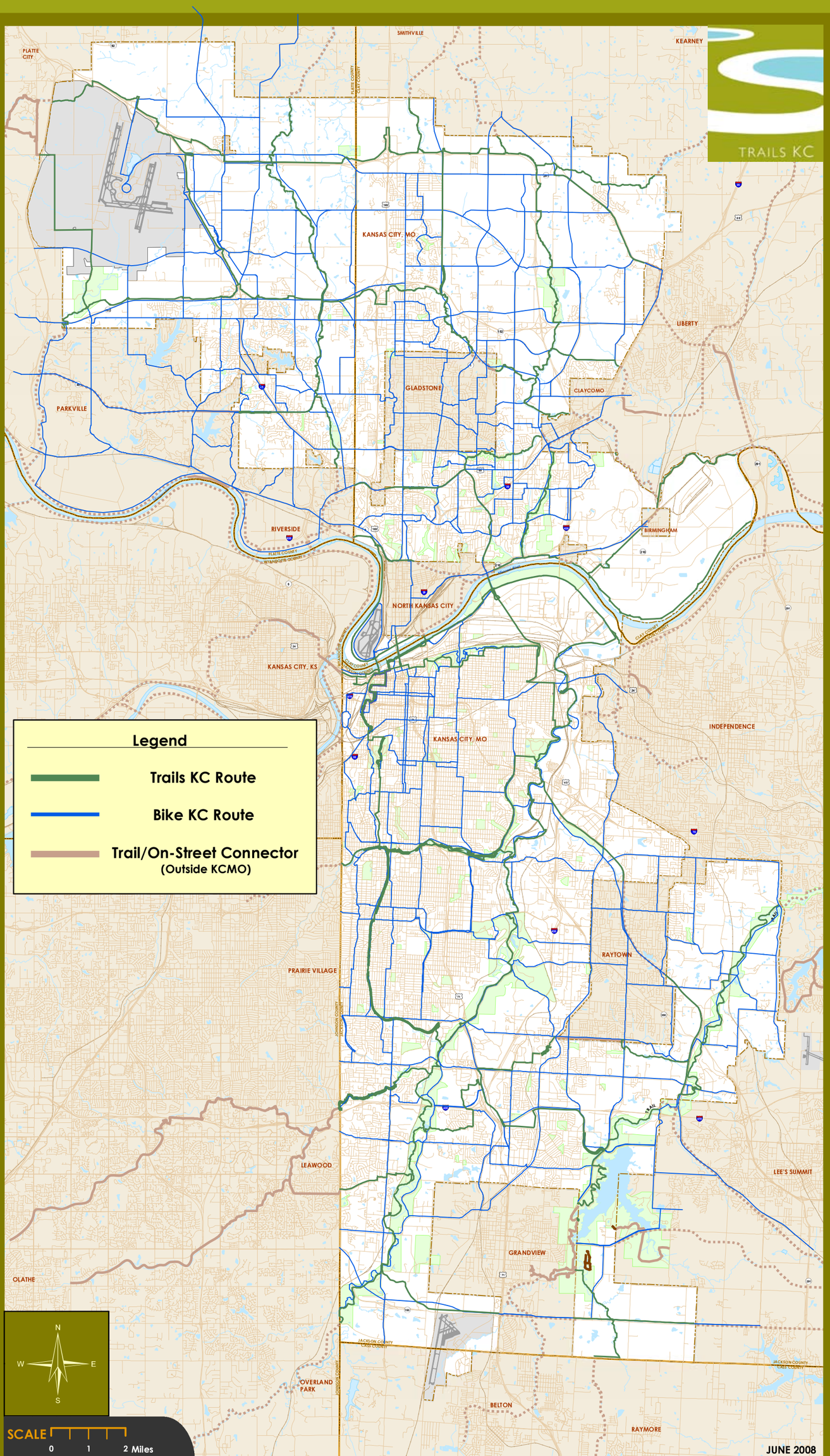
TECHNICAL:

- Adopt the Trails KC Plan corridor alignments as an amendment to the Major Street Plan to ensure trail easement dedication and/or other methods of corridor preservation during development review (page 52)
- Adopt a new trail facility standard (0.4 miles/1000 persons) and amend all existing City documents to reflect the new facility standard (page 21)
- Conduct a nexus study to identify the demand for trails created by new development and to aid in the creation of a trails dedication/in-lieu fee requirement (page 52)
- Establish criteria in the Development Code to ensure connections between neighborhoods/destinations and the Trails KC system are established (page 49)
- Adopt design guidelines/standards as part of the – KCMO Standards, Drawings, Specifications and Supplements to APWA (page 43)
- Adopt policy directive that all infrastructure projects integrate bike/ped accomodations (i.e., restriping streets, bridges with sidewalks/bike lanes/shared use facilities/sufficient clear space for trails to pass under the bridge)
- Evaluate the construction of unpaved "interim standard" trails into the five-year priority projects plan as a means to open up corridors for trail use more quickly and when funding is limited (page 80)
- Incorporate off-road vs on-road evaluation criteria into trails planning/design process (page 33)
- Adopt a 15-Year Build-out Strategy for implementation of the Trails KC Plan (page 45)
- Institute proactive easement acquisition strategy for priority trail segments (page 50)
- Develop a standardized easement agreement to facilitate easement acquisition (page 51)
- Utilize Trail Project Evaluation Criteria to identify and prioritize trail corridors and guide trail development (page 71)
- Conduct annual evaluation of the 5-Year Priority Projects Plan to evaluate progress and identify new opportunities (page 80)
- Conduct an update to the Bike KC Plan to create an integrated bike/ped/equestrian facility plan (one vision/one plan)
- Adopt performance measures for the Trails KC system and conduct regular assessments in order to evaluate progress and to identify programming needs and changes (page 68)
- Conduct a baseline conditions assessment (including user counts) in 2008 in order to establish a baseline/framework for future evaluation of the Trails KC system (page 69)
- Apply for National Trails Program designation as trail segments are constructed (page 58)
- Institute requirement that all historic trails receive certification from the National Park Service (page 49)
- Develop informational piece about liability issues/acquisition strategies to provide to adjacent land owners (page 53)
- Implement pilot project(s) to investigate the viability of sustainable trail surfaces (page 26)

1. US Department of Transportation, Federal Highway Administration, Research and Technical Support. Nationwide Personal Transportation Survey. Lanham, MD: Federal Highway Administration, 1997.
4. Department of Health and Human Services, Centers for Disease Control and Prevention. Active Environments. www.cdc.gov/nccdphp/dnpa/physical/health_professionals/active_environments/
5. Kansas City Health Department. Community Health Assessment 2007. 2007:178.
2. Sjoquist, Gary. The Economic and Social Benefits of Trails. National Trails Training Partnership. www.americantrails.org/resources/economics/MNecon.html
3. North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation. The Economic Impact of Investments in Bicycle Facilities: Study Overview. April 2004:4.
6. National Association of Realtors and National Association of Home Builders. Consumers Survey. April 22, 2002.
7. Mid-America Regional Council. 2005 Regional Walking and Biking Survey. July 2005. http://www.marc.org/bikeped/survey.htm

APPENDIX A

integrated trails kc/bike kc map


TRAILS KC
PLATTE CITY
SMITHVILLE
KEARNEY
KANSAS CITY, MO
LIBERTY
GLADSTONE
CLAYCOMO
PARKVILLE
RIVERSIDE
BIRMINGHAM
NORTH KANSAS CITY
KANSAS CITY, KS
INDEPENDENCE
RAYTOWN
PRAIRIE VILLAGE
LEAWOOD
LEE'S SUMMIT
GRANDVIEW
OLATHE
OVERLAND PARK
BELTON
RAYMORE
Legend
Trails KC Route
Bike KC Route
Trail/On-Street Connector
(Outside KCMO)
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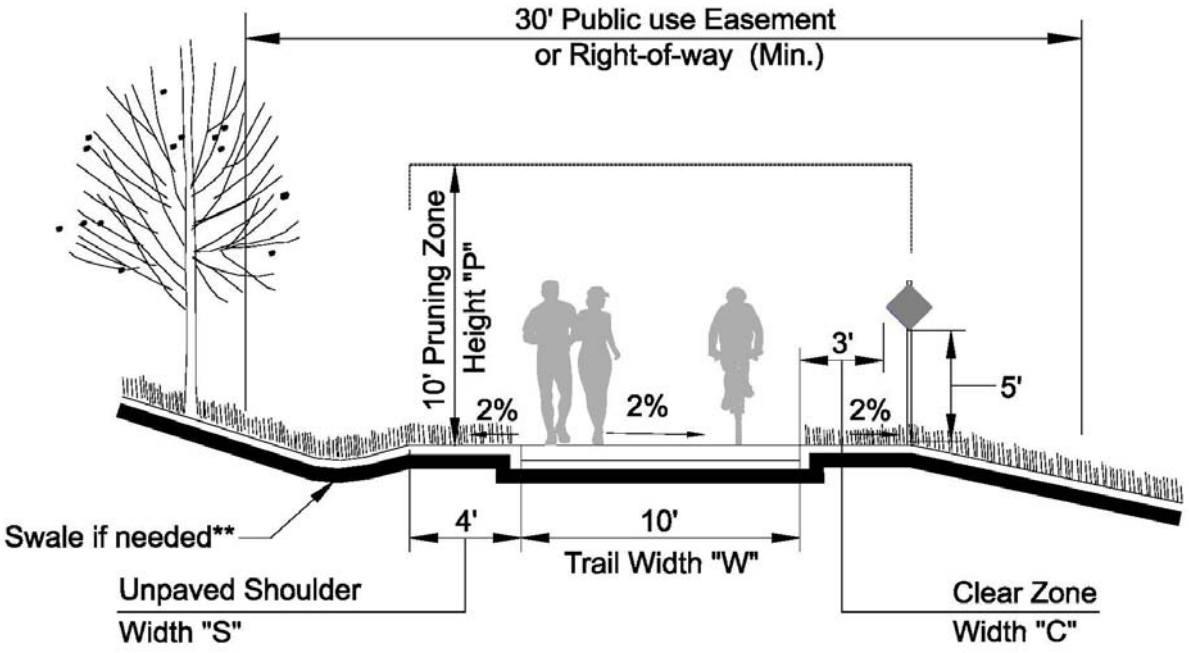
1
2 Miles
JUNE 2008

APPENDIX B

standard sections/ design guidelines



Citywide Trail - Standard Section

Note: All dimensions shown for one side of the trail apply to the other as well.

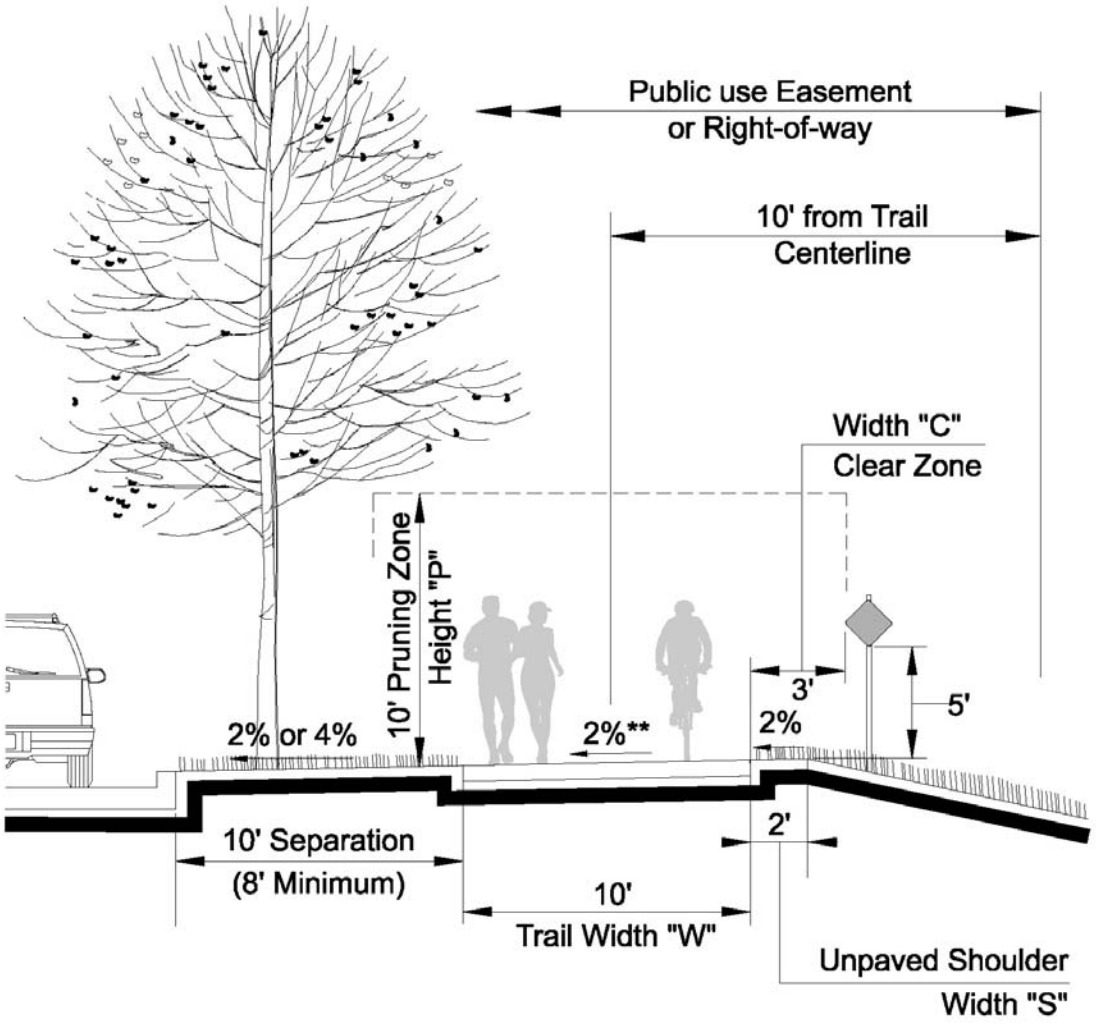
Section Options

"W" = Paved Width* (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
10	4	3	10	Standard Section
12	2	3	12	High volume
14	2	3	14	High volume

* Refer to LOS Section in Trails KC Plan for appropriate width determination.
** If drainage swales are necessary, refer to B-17 for guidelines.
The standard permanent trail easement width is 30', however narrower widths may be allowed provided that the permanent easement varies to accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items. All requests to be submitted to City Engineer or designee for approval.

Additional Guidelines

- See drainage section for swale requirements.
- New tree plantings and landscaping must be designed honoring the clear zone requirements at time of planting and allowing for plantings future growth.
- Maintain adequate line of sight through areas of heavy undergrowth – See AASHTO for further guidance.
- See trail underpass for vertical clearance to obstructions.
- Trails abutting traffic lanes shall be separated from traffic by an approved concrete barrier. The barrier must have appropriate extension/railing to maintain the 48" required height. (See bridge section.)
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Within Existing Development Section

Note: All dimensions shown for one side of the trail apply to the other as well.

Section Options

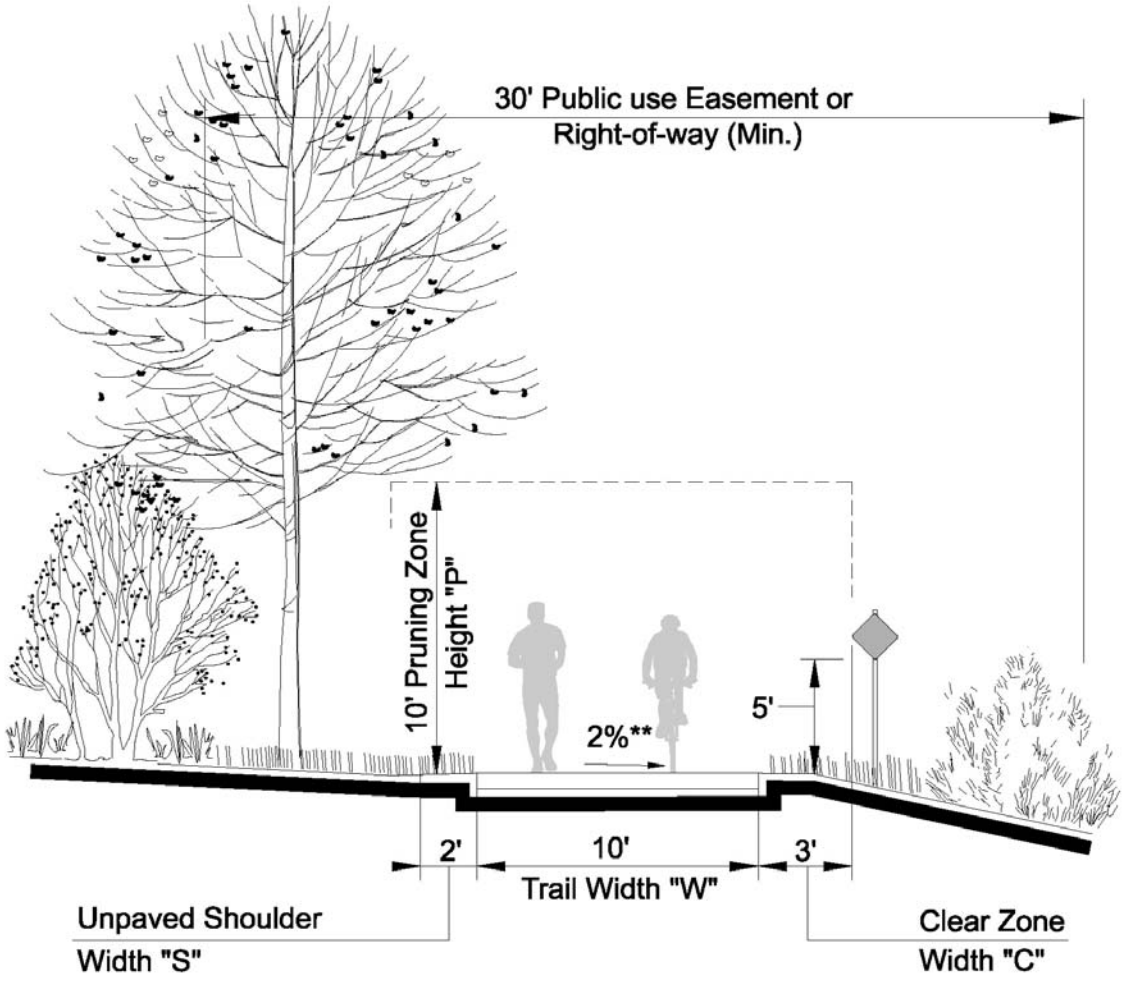
"W" = Paved Width* (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
10	2	3	10	Standard Section
12	2	3	12	High volume
14	2	3	14	High volume

* Refer to LOS Section in Trails KC Plan for appropriate width determination.

** When trail is not parallel to a roadways, the standard permanent trail easement width is 30', however narrower widths may be allowed provided that the permanent easement varies to accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items. All requests to be submitted to City Engineer or designee for approval.

Additional Guidelines

- See drainage section for swale requirements.
- Landscaping must be designed honoring the clear zone and line of sight requirements at time of planting and allowing for plantings future growth.
- Maintain adequate line of sight through areas of heavy undergrowth – See AASHTO for further guidance.
- See trail underpass for vertical clearance to obstructions.
- Trails abutting traffic lanes shall be separated from traffic by an approved concrete barrier. The barrier must have appropriate extension/railing to maintain the 48" required height. (See bridge section.)
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Greenway Section

Note: All dimensions shown for one side of the trail apply to the other as well.

Section Options

"W" = Paved Width* (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
10	2	3	10	Standard Section
12	2	3	12	High volume
14	2	3	14	High volume

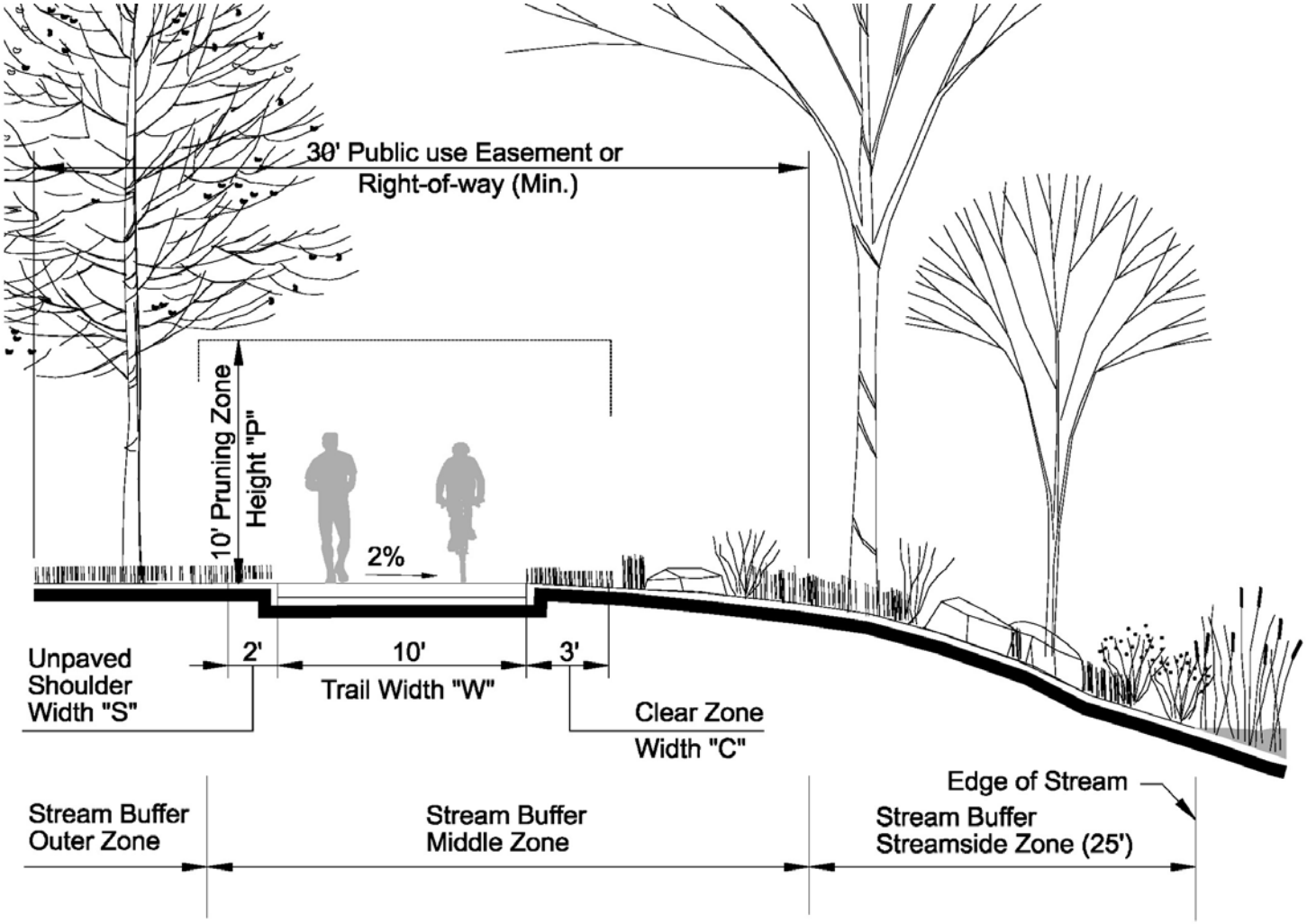
* Refer to LOS Section in Trails KC Plan for appropriate width determination.

** When trail parallels roadways, the 2% cross-slope drains to curb.

The standard permanent trail easement width is 30', however narrower widths may be allowed provided that the permanent easement varies to accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items. All requests to be submitted to City Engineer or designee for approval.

Additional Guidelines

- See drainage section for swale requirements.
- Landscaping must be designed honoring the clear zone and line of sight requirements at time of planting and allowing for plantings future growth.
- Maintain adequate line of sight through areas of heavy undergrowth – See AASHTO for further guidance.
- See trail underpass for vertical clearance to obstructions.
- Minimize footprint of trail development to protect high quality natural resources and environmentally sensitive areas.
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Stream Buffer Section

Note: All dimensions shown for one side of trail apply to the other as well.

Section Options

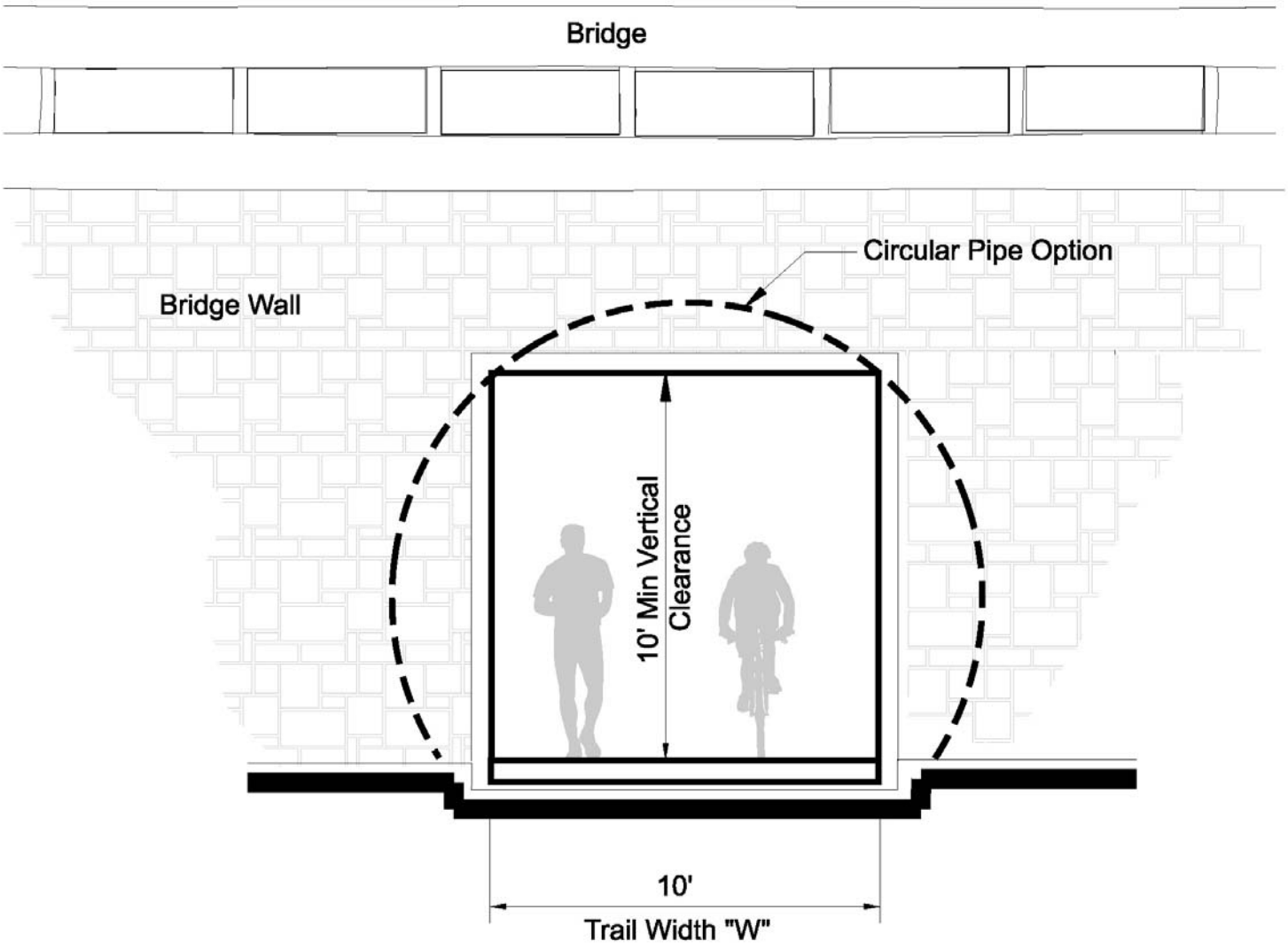
"W" = Paved Width* (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
10	2	3	10	Standard Section
12	2	3	12	High volume
14	2	3	14	High volume

* Refer to LOS Section in Trails KC Plan for appropriate width determination.

The standard permanent trail easement width is 30', however narrower widths may be allowed provided that the permanent easement varies to accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items. All requests to be submitted to City Engineer or designee for approval.

Additional Guidelines

- See drainage section for swale requirements.
- Tree planting and landscaping must be designed honoring the clear zone requirements at time of planting and allowing for future growth.
- Maintain adequate line of sight through areas of heavy undergrowth – See AASHTO for further guidance.
- See trail underpass for vertical clearance to obstructions.
- See new development code for further information.
- Minimize footprint of trail development to protect high quality natural resources and environmentally sensitive areas.
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Underpass Section

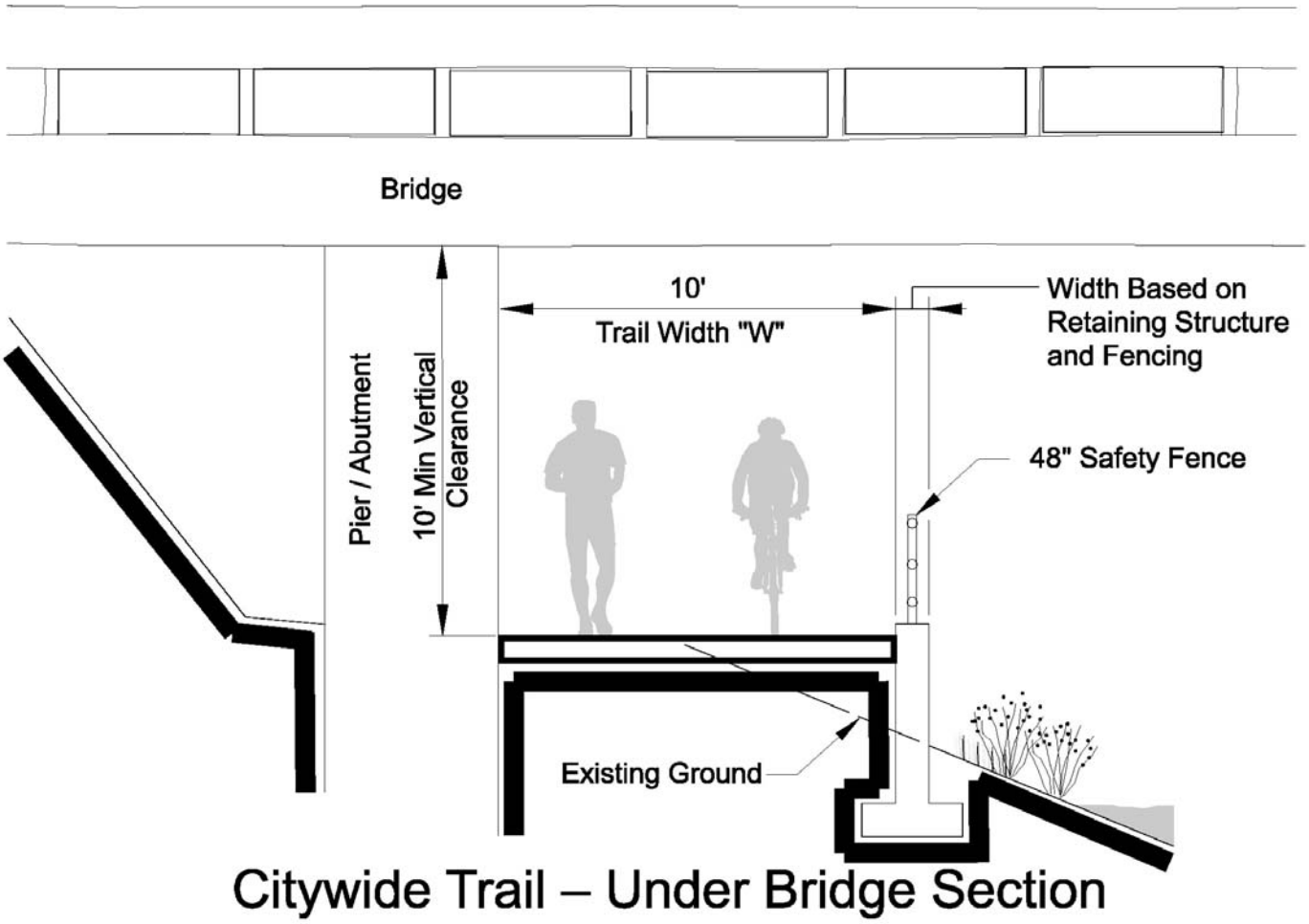
Section Options

"W" = Paved Width* (ft)	Note
**	Standard Section

** Match trail width of mainline trail abutting the underpass

Additional Guidelines

- All structures (cast in place and precast) must be designed by a professional engineer licensed in Missouri.
- Daytime trail lighting is required if length of underpass is greater than 50'. Minimum of 10 foot-candles horizontally and 5 foot-candles vertically at 4.9', with a 3:1 max/min ratio. Follow guidance in Section 3.5 of *The American National Standard for Roadway Lighting ANSI/IESNA RP-8-00*. Nighttime safety lighting should be considered in critical areas.
- For enclosed underpasses over 100' in length, air quality (ventilation), fire-fighting, and emergency responders' access must be addressed and documented.
- Lighting fixtures should be positioned on the sidewalls or corners of the tunnel to maintain vertical clearances.
- A plan for accommodating local drainage and low-flow drainage must be included when using this design.
- Existing trail structures with less than 10' vertical clearance may be acceptable, with City Engineer or designee approval.
- Substantial length structures (over 200') shall include 2' shoulders on each side of the trail.
- Underpasses must be designed to allow the free movement of air and must drain by gravity.
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Under Bridge Section

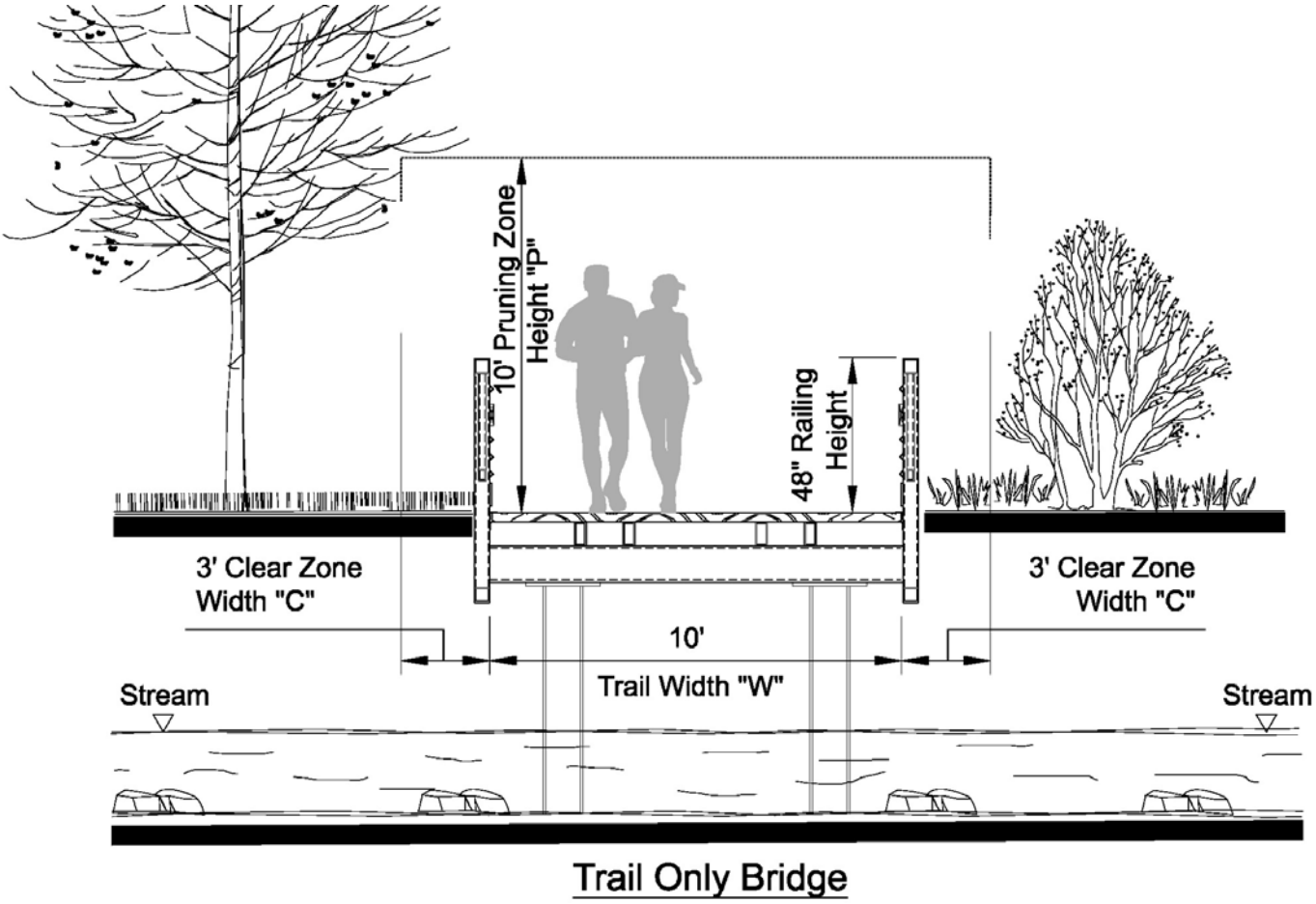
Section Options

"W" = Paved Width* (ft)	Note
**	Standard Section

** Match trail width of mainline trail abutting the underpass – where feasible, continue shoulders and clear zones.

Additional Guidelines

- All structures (cast in place and precast) must be designed by a professional engineer licensed in Missouri.
- Hydraulic performance of the channel must meet KCMO and FEMA requirements. All designs to be completed by a professional engineer licensed in Missouri.
- Daytime trail lighting is required if length of underpass is greater than 50'. Minimum of 10 foot-candles horizontally and 5 foot-candles vertically at 4.9', with a 3:1 max/min ratio. Follow guidance in Section 3.5 of *The American National Standard for Roadway Lighting ANSI/IESNA RP-8-00*. Nighttime safety lighting should be considered in critical areas.
- A plan for accommodating local drainage and low-flow drainage must be included when using this design.
- Existing trail structures with less than 10' vertical clearance may be acceptable, with City Engineer or designee approval.
- Substantial length structure (over 200') shall include 2' shoulders on each side of the trail.
- See trail underpass for vertical clearance to obstructions.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trail Only Bridge

Citywide Trail – Bridge Section

Note: All dimensions shown for one side of the trail apply to the other as well.

Section Options

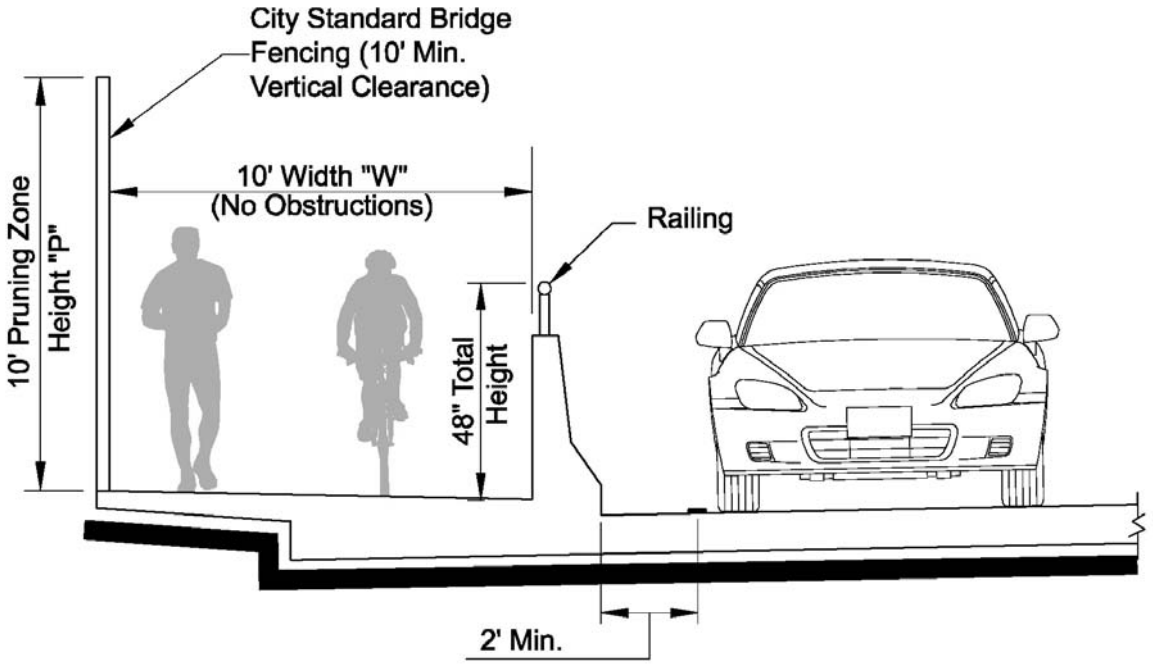
"W" = Paved Width* (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
**	3'	10'	Standard Section

* Refer to LOS Section in Trails KC Plan for appropriate width determination.

** Match trail width of mainline trail abutting the bridge – Consider 12' width and higher loadings for enhanced ambulance access in secluded areas

Additional Guidelines

- All structures (cast in place and precast) must be designed by a professional engineer licensed in Missouri.
- Hydraulic performance of the channel must meet KCMO and FEMA requirements. All designs to be completed by a professional engineer licensed in Missouri.
- Appropriate signage must alert trail users to the narrow section and to flooding conditions.
- Single span bridges are preferred for most creek and ditch crossings, but boardwalks and multiple span bridges are acceptable. Review of final post placement within the creek, ditch, or floodplain will need approval by City Engineer or designee.
- AASHTO standards will apply on new major river crossings or major river bridge reconstructions.
- Refer to MARC's policy on major river crossings.
- Design for 10,000 pound vehicle loading, and 85 psf live loading.
- Existing trail structures with less than 10' vert. clearance may be acceptable, with City Engineer or designee approval.
- Any variance to the standards must have prior approval from City Engineer or designee.



Vehicular Bridge

Citywide Trail – Bridge Section

Note: All dimensions shown for one side of the trail apply to the other as well.

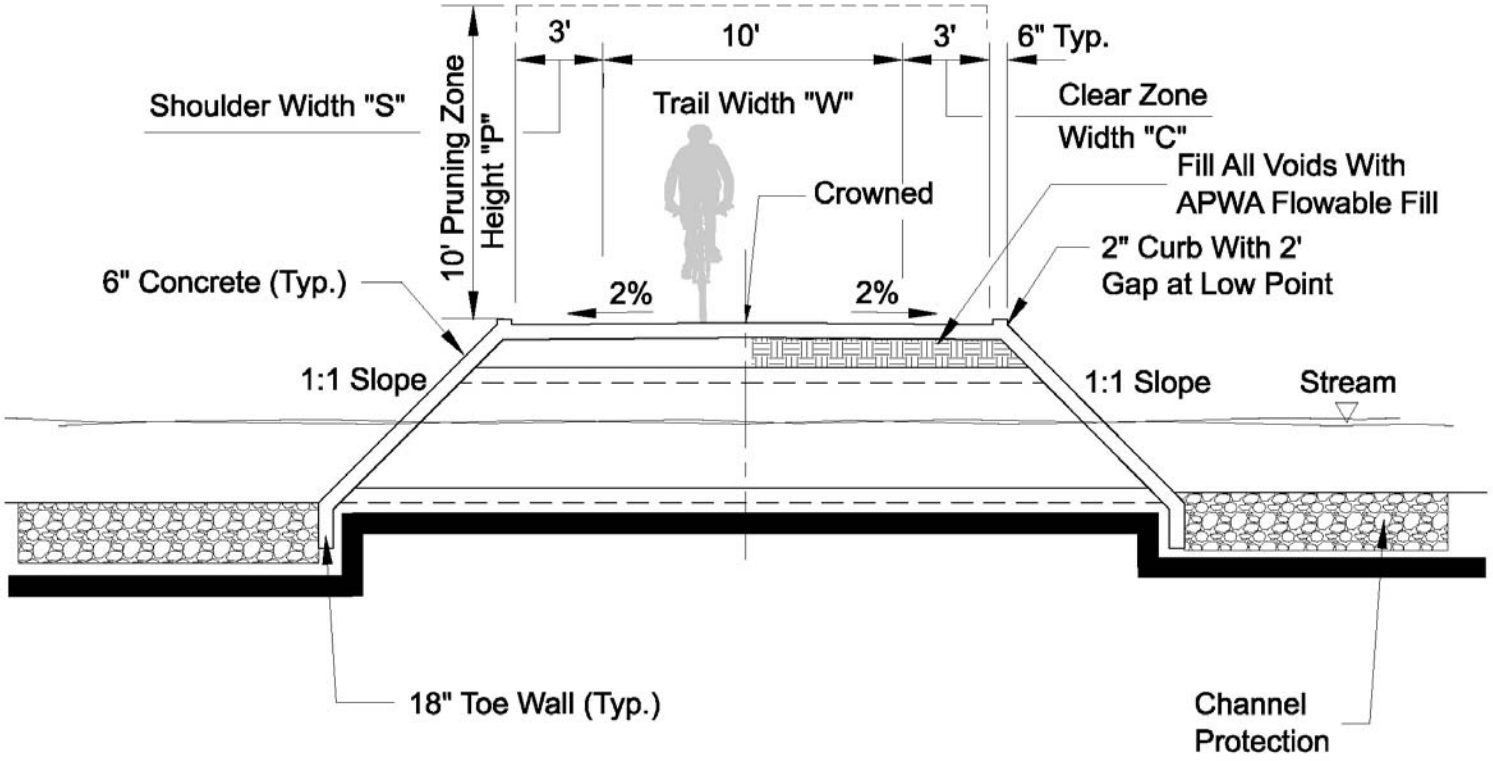
Section Options

"W" = Paved Width* (ft)	Note
**	Standard Section

* Refer to LOS Section in Trails KC Plan for appropriate width determination.
** Match trail width of mainline trail abutting the bridge.

Additional Guidelines

- All structures (cast in place and precast) must be designed by a professional engineer licensed in Missouri.
- Appropriate signage must alert trail users to the narrow section.
- AASHTO standards will apply on new major river crossings or major river bridge reconstructions.
- Refer to MARC's policy on major river crossings.
- Refer to City standards for roadway requirements.
- Drainage design and snow removal operations must be addressed in design.
- Trails abutting traffic lanes shall be separated from traffic by an approved barrier. The barrier must have appropriate extension/railing to maintain the 48" required height. (See bridge section.)
- Existing trail structures with less than 10' clearance may be acceptable, with City Engineer or designee approval.
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Low Water Crossing Section

Note: All dimensions shown for one side of the trail apply to the other as well.

Section Options

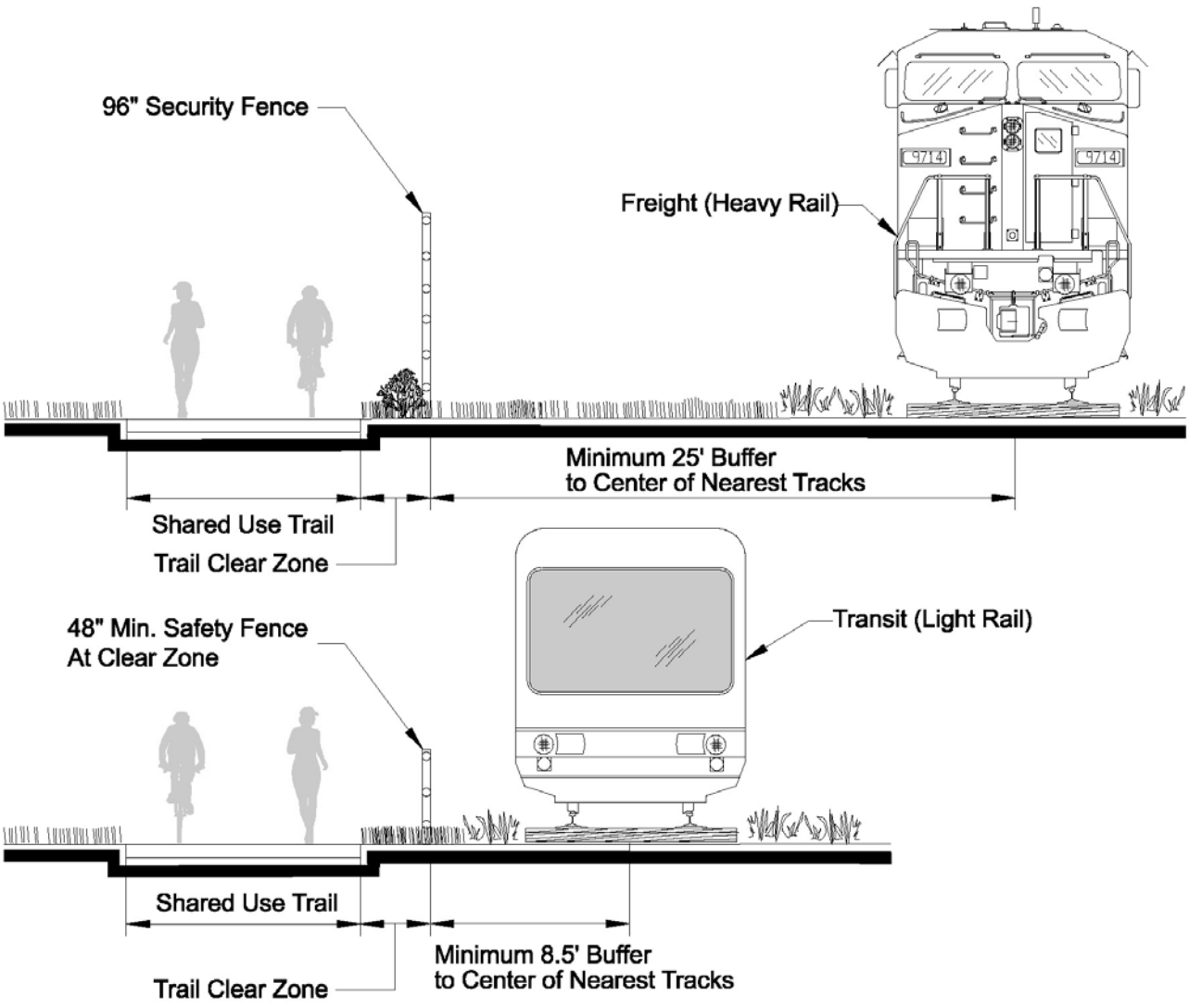
"W" = Paved Width* (ft)	"S" = Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
**	3	3	10	Standard Section

* Refer to LOS section for appropriate width determination

** Match width of mainline trail abutting the low water crossing.

Additional Guidelines

- All structures (cast in place and precast) must be designed by a professional engineer licensed in Missouri.
- 18" diameter circular pipes are the minimum size allowable; however, low profile wood bridges, precast arches, and reinforced concrete culverts are allowable.
- Appropriate signage must alert trail users to trail closure when inundated.
- Maintain adequate line of sight through areas of heavy undergrowth – See AASHTO for further guidance.
- Striping must be used to define the edge of trail.
- In FEMA regulated streams, FEMA requirements must be met. An engineer must provide hydraulic modeling that meets FEMA rise requirements for use of low-water crossings.
- Any variance to the standards must have prior approval from City Engineer or designee.



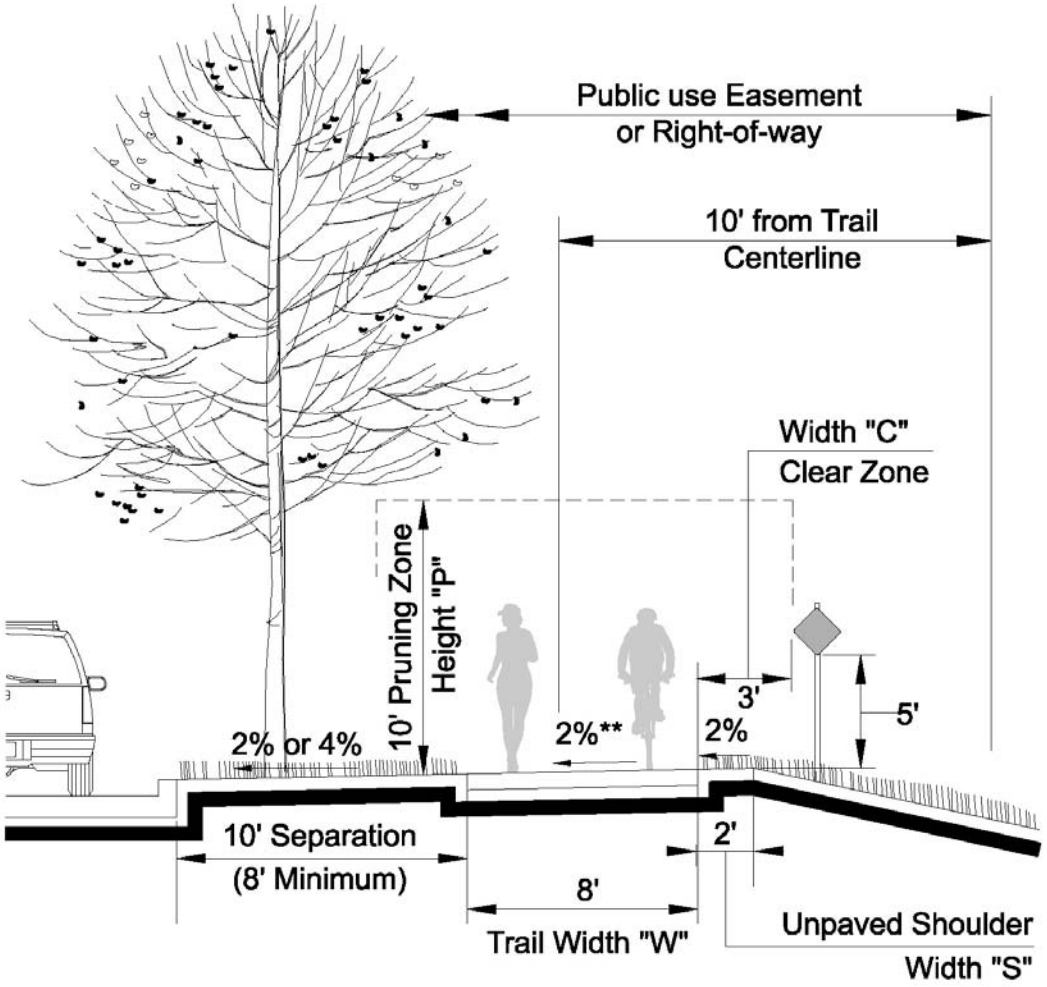
Citywide Trail – Railroad Buffer Sections

Section Options

- Shared use trail dimensions to follow the appropriate trail sections for the specific type of trail. Refer to other sections for trail specific widths and other dimensions.
- The use of landscaping, swales and other natural barriers may be an acceptable option to the security fence depending on the specific information of the area, and the railroad company.

Additional Guidelines

- Refer to the Railroad Strategies section for more information.
- Any variance to the standards must have prior approval from City Engineer or designee.



Neighborhood Connector (Public Shared Use Trail) Standard Section

Note: All dimensions shown for one side of the trail apply to the other as well.

Section Options

"W" = Paved Width* (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
8	2	3	10	Standard Section
10	2	3	10	High volume
12	2	3	10	High volume

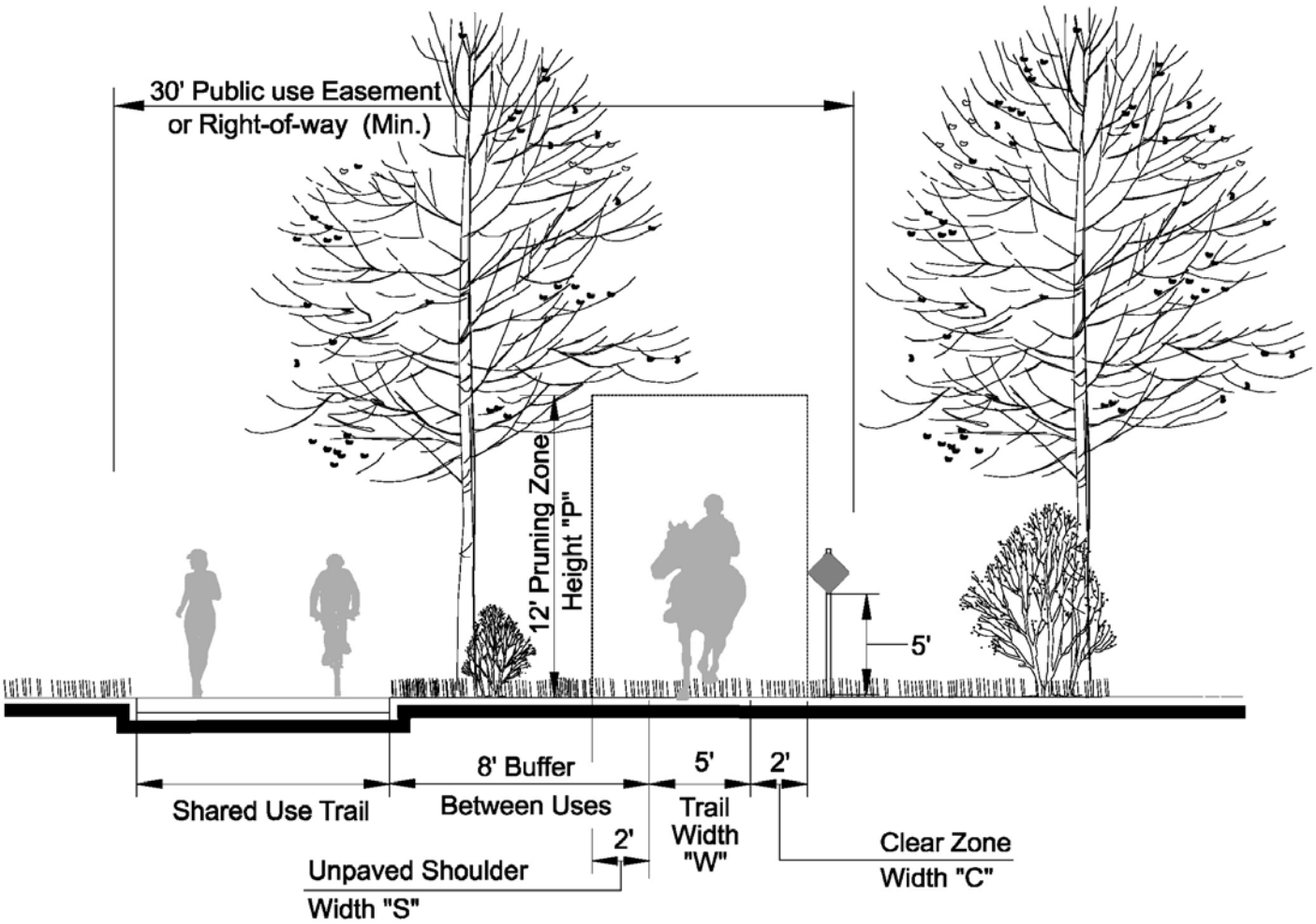
* Refer to LOS Section in Trails KC Plan for appropriate width determination.

** When trail parallels roadways, the 2% maximum cross-slope drains to curb as shown.

The standard permanent trail easement width is 30', however narrower widths may be allowed provided that the permanent easement varies to accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items. All requests to be submitted to City Engineer or designee for approval.

Additional Guidelines

- In special circumstances, the 30' public use easement or right-of-way may be reduced with City Engineer or designee approval, (e.g. abutting other right-of-way or easements, constrained corridors, etc.
- See drainage section for swale requirements
- Tree planting and landscaping must be designed honoring the clear zone requirements at time of planting and allowing for plantings future growth.
- This section applies to any public shared use trail not on the Trails KC system.
- Any variance to the standards must have prior approval from City Engineer or designee.



Equestrian Trail and Citywide Trail Section

Note: All dimensions shown for one side of the trail apply to the other as well.

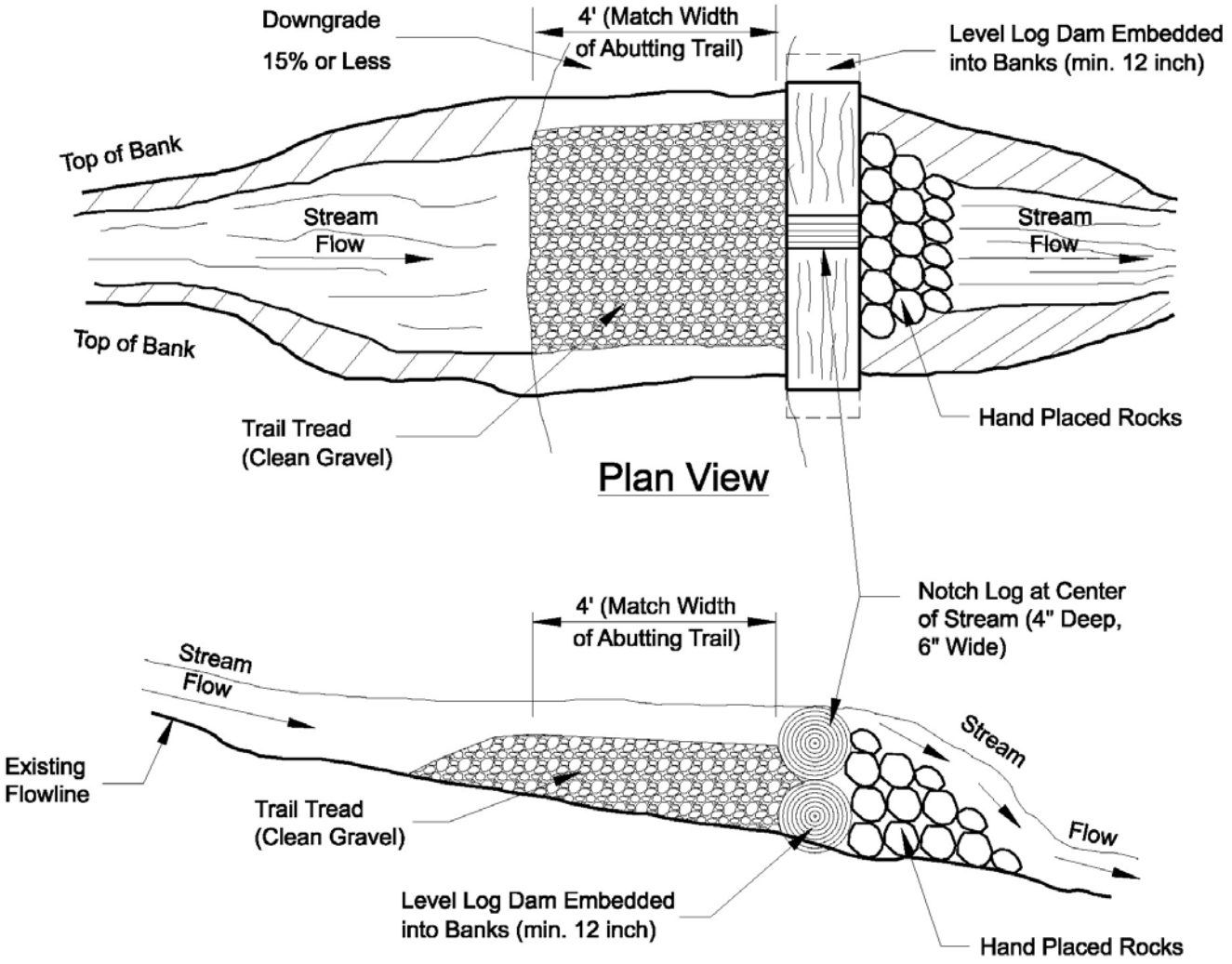
Section Options

"W" = Width (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
5	2	2	12	Standard Section

The standard permanent trail easement width is 30', however narrower widths may be allowed provided that the permanent easement varies to accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items. All requests to be submitted to City Engineer or designee for approval.

Additional Guidelines

- See drainage section for swale requirements.
- Landscaping must be designed honoring the clear zone and line of sight requirements at time of planting and allowing for plantings future growth.
- Provide an 8' buffer between shared use paths and equestrian trails.
- See trail underpass for vertical clearance to obstructions.
- Any variance to the standards must have prior approval from City Engineer or designee.



Citywide Trail – Equestrian Stream Ford Detail

Section Options

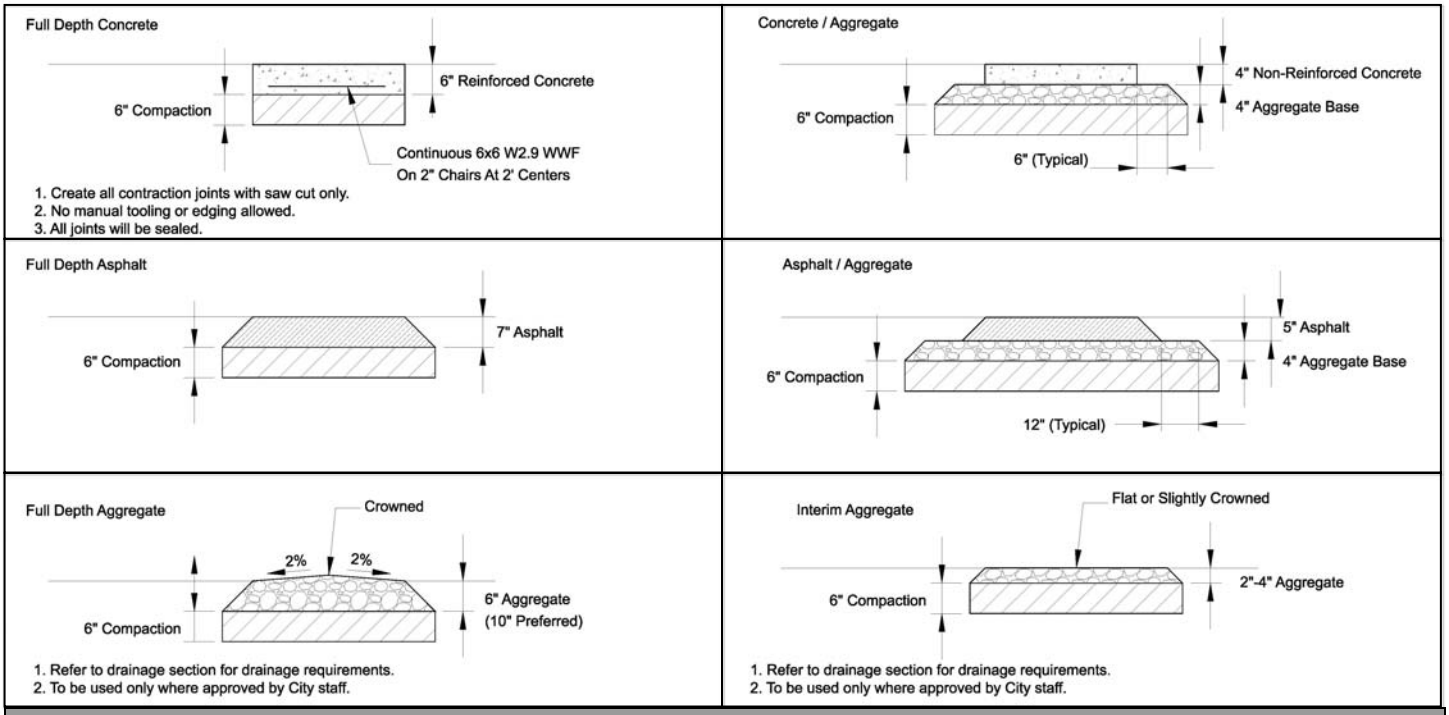
"W" = Paved Width* (ft)	"S" = Unpaved Shoulder Width (ft)	"C" = Clear Zone Width (ft)	"P"= Pruning Height (ft)	Note
**	0	0	12	Standard Section

* Refer to LOS Section in Trails KC Plan for appropriate width determination.
** Match trail width of mainline trail abutting the crossing

Additional Guidelines

- Fords to be used only when the streams do not have suitable channel beds for crossings.
- Appropriate signage must alert trail users to trail closure in high water events.
- In FEMA regulated streams, FEMA requirements must be met. An engineer must provide hydraulic modeling that meets FEMA rise requirements for use of low-water crossings.
- All state and federal permits must be met.
- To be used only in approved low velocity streams, generally less than 6 fps and depths less than 2' for a 10-year storm. 8" maximum normal flow depth over tread.
- Any variance to the standards must have prior approval from City Engineer or designee.

Pavement Sections (Non-equestrian)



Innovations	Innovative pavements, binders and materials that provide cost or environmental benefits while providing a stable, slip-free, durable, and easily maintained surface are encouraged. The pavement section shall be submitted for approval along with documentation of the performance of the proposed pavement. Examples: • Rubberized asphalt • Polymer modified asphalt • Resins • Porous concrete

Note:

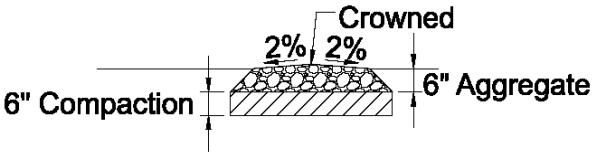
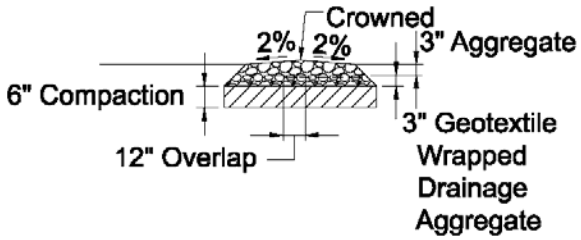
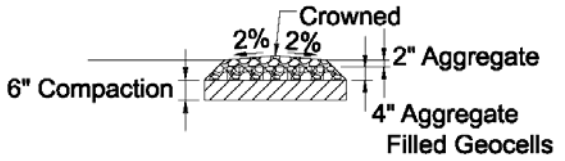
1. Trail pavement selections must be submitted for approval.
2. Base Compaction and stabilization - 6" Compaction, 95% Maximum Standard Density. Base compaction shall meet the requirements of KCMO Spec. 2200 for pavement subgrades. Geotextiles and geogrids are encouraged as a stabilization element. The designer is encouraged to review these for cost savings or increased stability. If construction work space and access is condusive, flyash and other subgrades stabilization methods may be used.
3. Excavation width is the same as the compacted subgrade width.
4. Each individual trail pavement must be designed based upon site-specific subgrade conditions. As a general rule, trails should be designed to support a minimum design load of 10,000 to 12,500 pounds, which is the weight of a light maintenance truck or ambulance.
5. Extensions of trails shall match the existing trail material unless otherwise approved by City Engineer or designee.
6. Aggregate (Surface or Base) shall be MoDOT Type 5 Aggregate.
7. Asphalt shall be KCMO Type 3-01 or 3-01R.
8. Concrete shall meet the requirements of KCMO Specification 2208.2 for paving.
9. All areas disturbed by trail construction shall be graded and backfilled with native topsoil and seeded at a rate of 8-10 lbs. per 1,000 sq.ft. with tall fescue seed mix in shaded and wooded areas and local Buffalo grass seed(2-4 lbs. per 1,000 sq.ft) /sod/plugs for all sunny locations. All other KCMO Specifications shall be met.

Pavement Selection (Non-Equestrian)

The following is a guide for the appropriate pavement type to be used in different situations on the trail system. The designer should consider bidding alternate pavement types in areas with multiple options.

Surface Type	Upland Location		Stream Buffer Location		Bridge Approach and Floodplain Locations
Profile Grade	<=3%	>3%	<=3%	>3%	All
Aggregate	Acceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable
Asphalt	Acceptable	Unacceptable	Acceptable	Unacceptable	Unacceptable
Concrete/Aggregate	Acceptable	Acceptable	Acceptable	Acceptable	Unacceptable
Reinforced Concrete	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Porous Concrete	Acceptable	Acceptable	Unacceptable	Unacceptable	Unacceptable
Rubberized Asphalt	Acceptable	Acceptable	Unacceptable	Unacceptable	Unacceptable

Pavement Sections (Equestrian)

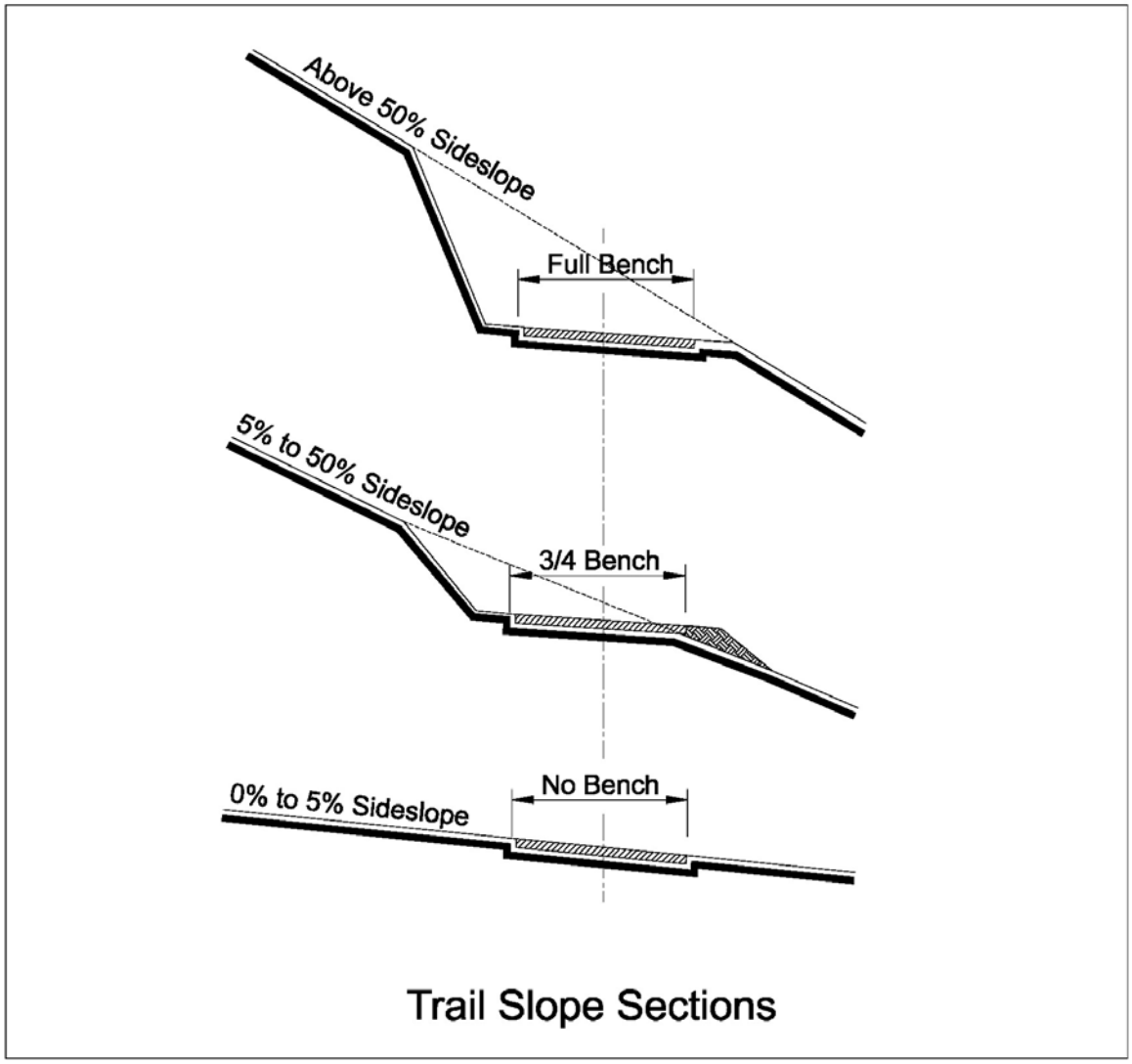
Unpaved	Grass		Refer to drainage section for ditch requirements.
Applications:			
Trail Grade	**Upland Locations***	**Stream Buffer Locations**	**Floodplain Locations**
0 - 7%	Gravel Loam and Gravel Clay Soil Types Only	Gravel Loam and Gravel Clay Soil Types Only	n/a
7.1 - 15%	Gravel Loam and Gravel Clay Soil Types Only	n/a	n/a
Aggregate			Refer to drainage section for ditch requirements.
Applications:			
Trail Grade	**Upland Locations***	**Stream Buffer Locations**	**Floodplain Locations**
0 - 7%	All Soil Types	All Soil Types Except Clay	n/a
7.1% - 15%	All Soil Types Except Clay	All Soil Types Except Clay	n/a
Aggregate with Geotextile			Refer to drainage section for ditch requirements.
Applications:			
Trail Grade	**Upland Locations***	**Stream Buffer Locations**	**Floodplain Locations**
0 - 7%	All Soil Types	All Soil Types	Silt/Sand, Loam, & Clay Soil Types
7.1 - 15%	All Soil Types	All Soil Types	Silt/Sand, Loam, & Clay Soil Types
Aggregate with Geocells			Refer to drainage section for ditch requirements.
Applications:			
Trail Grade	**Upland Locations***	**Stream Buffer Locations**	**Floodplain Locations**
0 - 15%	All Soil Types	All Soil Types	All Soil Types
Innovations	Innovative pavements, binders and materials that provide cost or environmental benefits while providing a stable, slip-free, durable, and easily maintained surface are encouraged. The pavement section shall be submitted for approval along with documentation of the performance history.		

***** Upland locations are the areas with low water potential. Stream buffer locations have medium water potential and floodplain locations have high water potential.

1. Base Compaction and stabilization - 6" Compaction, 95% Maximum Standard Density. Base compaction shall meet the requirements of KCMO Spec. 2200 for pavement subgrades. Geotextiles and geogrids are encouraged as a stabilization element. The designer is encouraged to review these for cost savings or increased stability. Flyash and other pozzolans are not acceptable as subgrade stabilizers.
2. Each individual trail pavement must be designed based upon site-specific subgrade conditions. As a general rule, trails should be designed to support a minimum design load of 10,000 to 12,500 pounds.
3. Aggregate (Surface or Base) shall be MoDOT Type 5 Aggregate.
4. Drainage aggregate shall be MoDOT Type UD-1 Aggregate.
5. Pavement selection: The table above is a guide for the appropriate pavement type to be used on the trail. In some cases, more than one type would be acceptable. With the fluctuations in material and installation costs, the designer should consider bidding alternate pavement types in areas with multiple options. Innovative pavement types are encouraged.

Trail Drainage – Sheet Flow

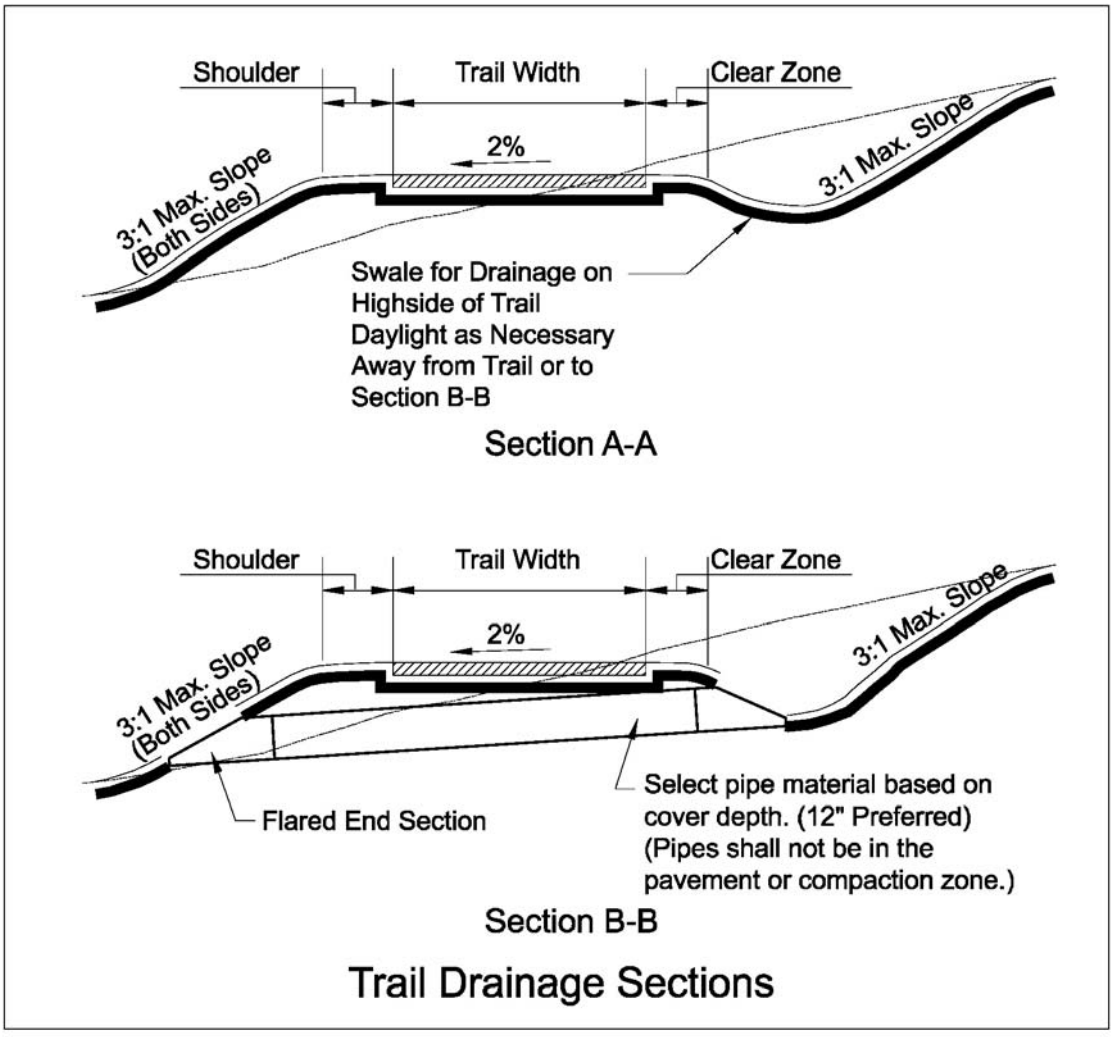
- Paved trails shall be cross-sloped at 2% maximum to provide cross drainage while meeting ADA requirements.
- Trail drainage on asphalt or concrete surfaces should be accomplished by sheet flow across the slope of the trail wherever possible.
- On existing slopes greater than 4:1 (25%), retaining walls may be necessary to stabilize the slopes, unless a suitable rock shelf is present.



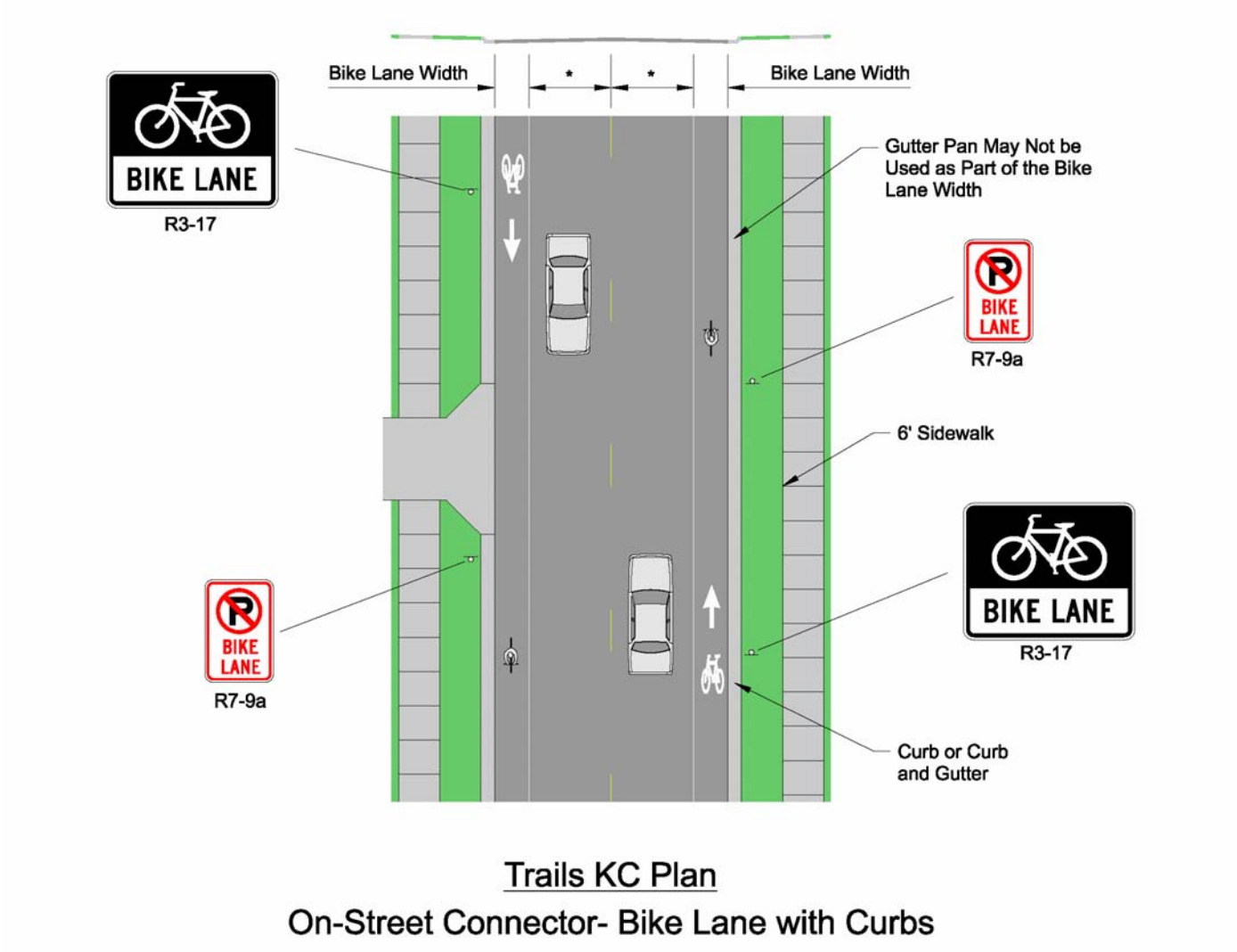
Trail Slope Sections

Trail Drainage – Swales & Pipes

- In areas that require a swale section, the swale should be day lighted at the earliest opportunity, and the concentrated flows shall be dissipated.
- In areas where trail run-off is high or highly-erodible soils exist, rain gardens and native vegetation should be used with bio-swales.
- Swales may be used for bio-swales and other environmentally friendly treatments; however the safety of trail users and the function of the trail may not be reduced.
- Aggregate trails shall be crowned with 6” deep (minimum) swales outside the shoulders to minimize erosion.
- Trail drainage structures should be sized to minimize the impacts to the environment and to provide a maintainable trail. Overtopping of the trail is acceptable, except in urban areas.
- To provide ease in maintenance, 18” is the minimum pipe diameter. Smaller sizes may be approved by City Engineer or designee provided the design of the pipe accounts for maintenance.
- Refer to City Specifications for approved pipe types. Pipes must be backfilled according to City standards, or manufacturers’ recommendation if no standard has been adopted.



On-Street Connectors



Trails KC Plan

On-Street Connector- Bike Lane with Curbs

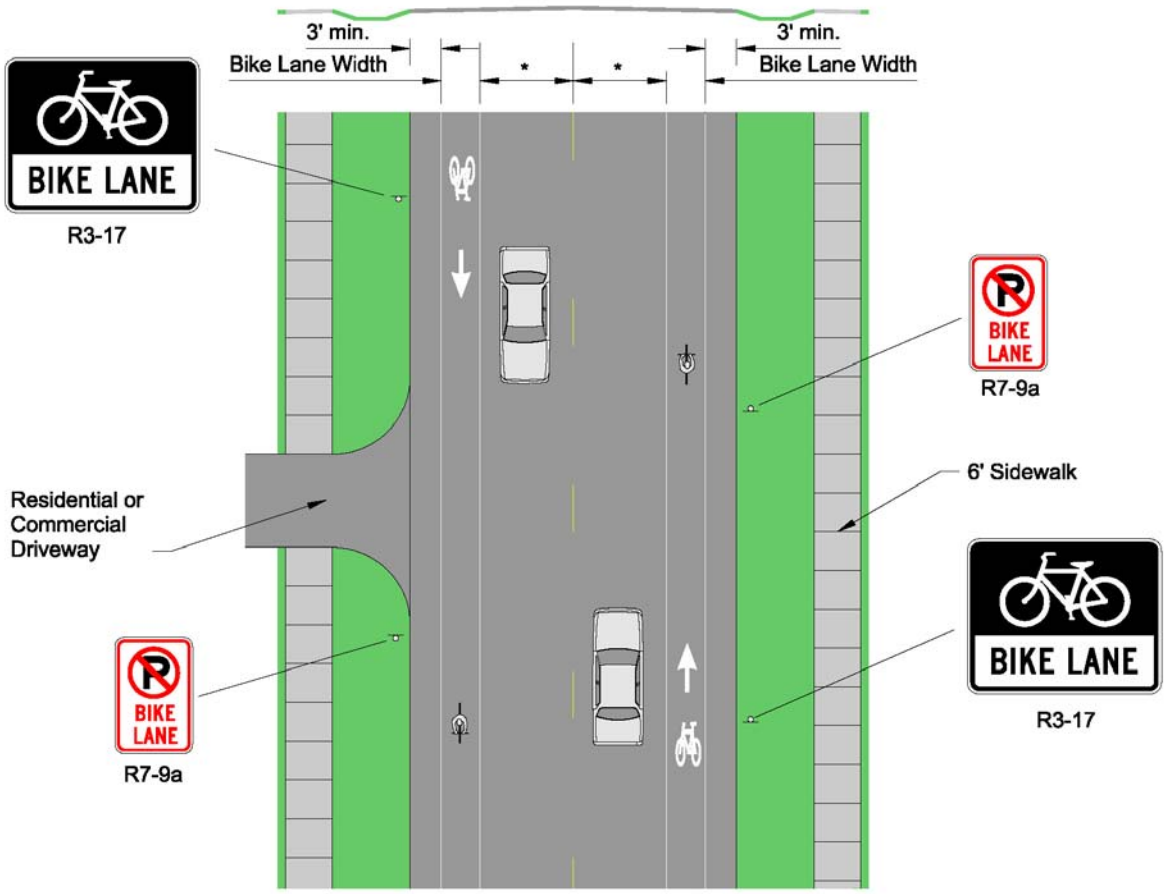
Section Options

Roadway Functional Class	Local Roads, Collectors…….....Arterials															
AADT	< 5,000 AADT						5,000 - 10,000 AADT						> 10,000 AADT			
Posted Speed	< = 30 MPH		35/40 MPH		> 40 MPH		< = 30 MPH		35/40 MPH		>40 MPH		< = 40 MPH		> 40 MPH	
Vehicular Mix	trucks		trucks		trucks		trucks		trucks		trucks		trucks		trucks	
	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%
Bike Lane Width	**4'**	**4'**	**5'**	**5'**	**5'**	**5'**	**4'**	**4'**	**5'**	**5'**	**6'**	**6'**	**5'**	**5'**	**6'**	**6'**

* Follow city requirements for roadway lane widths.

Additional Guidelines

- All KCMO standards not shown shall apply.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Drainage structures within or abutting the bike lane must meet City standards for bicycle safety.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan

On-Street Connector- Bike Lane without Curbs (Shoulder)

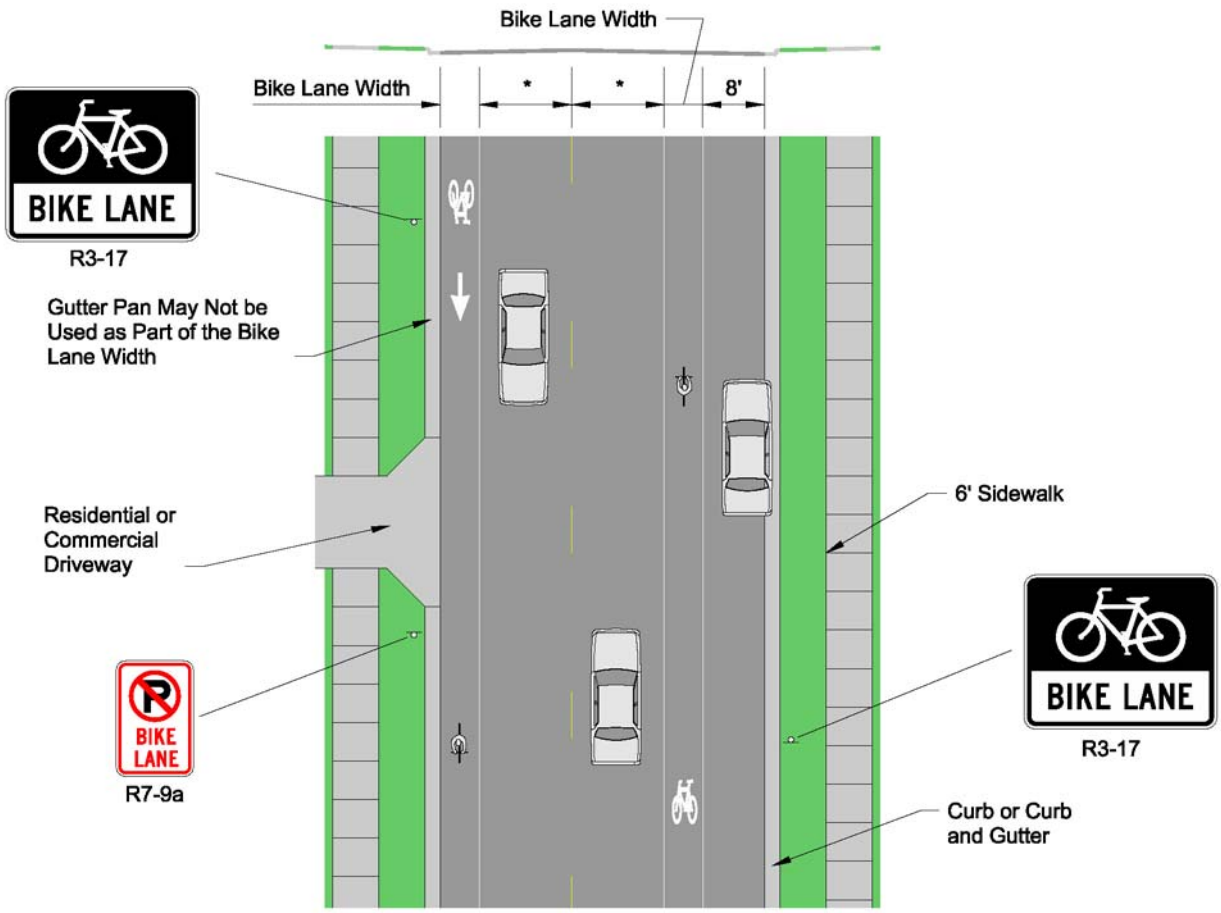
Section Options

Roadway Functional Class	Local Roads, Collectors…….....Arterials															
AADT	< 5,000 AADT						5,000 - 10,000 AADT						> 10,000 AADT			
Posted Speed	< = 30 MPH		35/40 MPH		> 40 MPH		< = 30 MPH		35/40 MPH		>40 MPH		< = 40 MPH		> 40 MPH	
Vehicular Mix	trucks		trucks		trucks		trucks		trucks		trucks		trucks		trucks	
	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%
Bike Lane Width	**4'**	**4'**	**5'**	**5'**	**5'**	**5'**	**4'**	**4'**	**5'**	**5'**	**6'**	**6'**	**5'**	**5'**	**6'**	**6'**

* Follow city requirements for roadway lane widths.

Additional Guidelines

- Rumble strips are not recommended for use along streets with bike lanes.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Drainage structures within or abutting the bike lane must meet City standards for bicycle safety.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan

On-Street Connector - Bike Lane with Parallel Parking on One Side

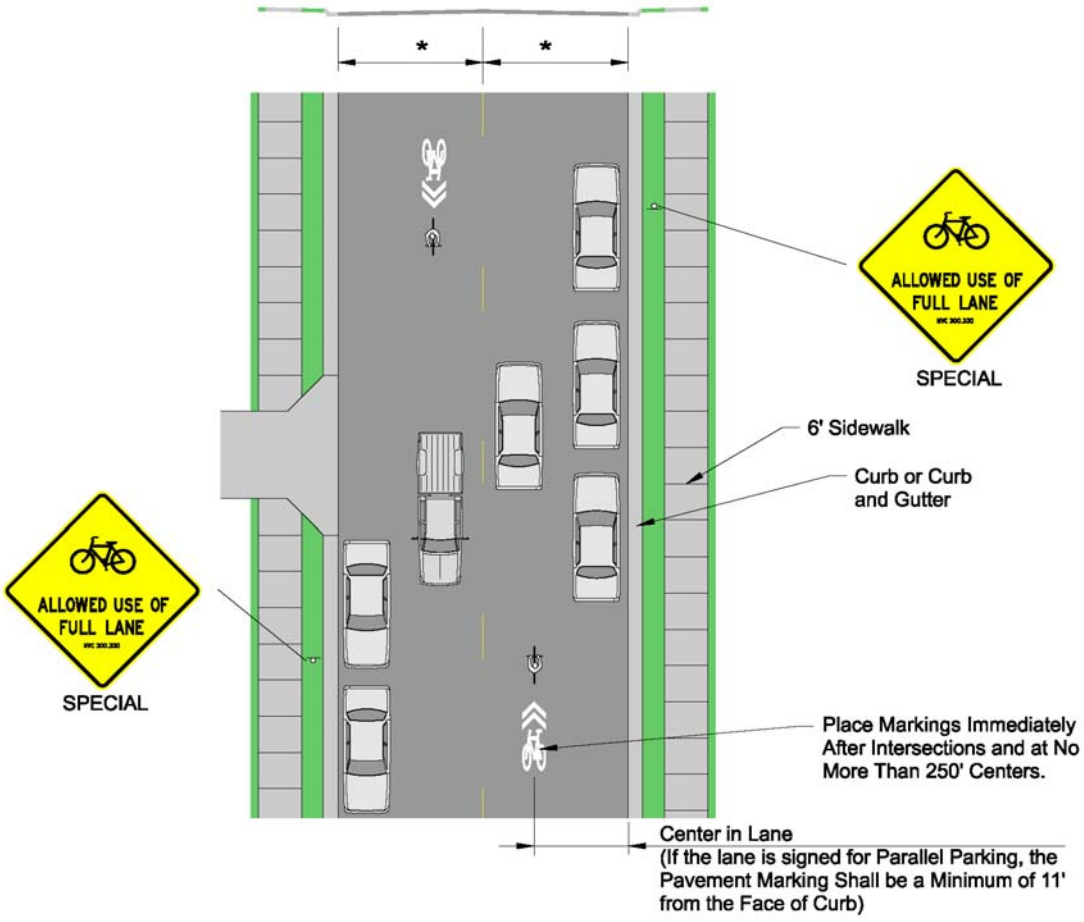
Section Options

Roadway Functional Class	Local Roads, Collectors……..Arterials															
AADT	< 5,000 AADT						5,000 - 10,000 AADT						> 10,000 AADT			
Posted Speed	< = 30 MPH		35/40 MPH		> 40 MPH		< = 30 MPH		35/40 MPH		>40 MPH		< = 40 MPH		> 40 MPH	
Vehicular Mix	trucks		trucks		trucks		trucks		trucks		trucks		trucks		trucks	
	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%
Bike Lane Width	**5'**	**5'**	**6'**	**6'**	**8'**	**8'**	**6'**	**6'**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

* Follow city requirements for roadway lane widths.
X = Not Recommended

Additional Guidelines

- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Drainage structures within or abutting the bike lane must meet City standards for bicycle safety.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan

On-Street Connector - Shared Lanes Markings

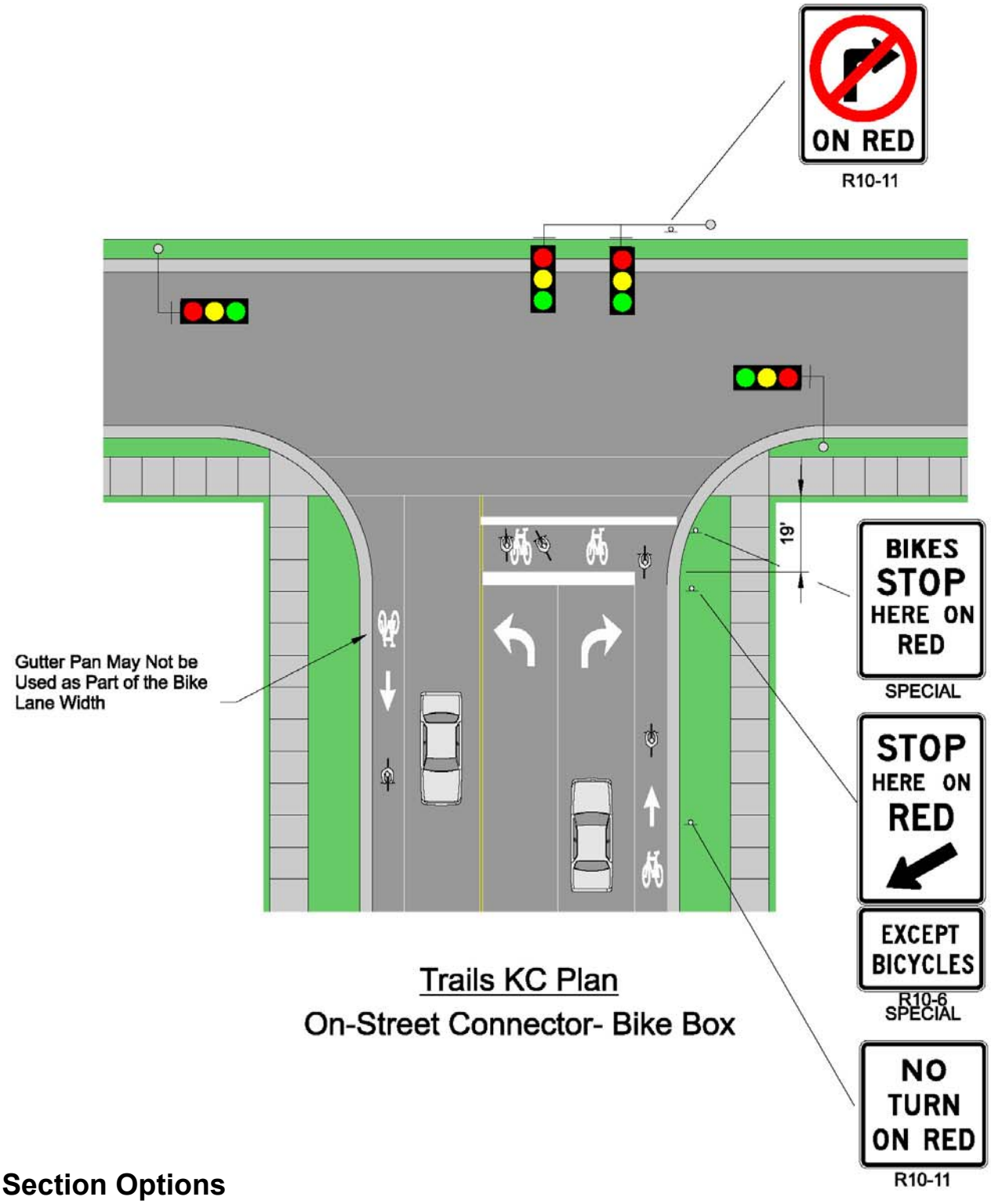
Section Options

Roadway Functional Class	Local Roads, Collectors……..Arterials															
AADT	< 5,000 AADT						5,000 - 10,000 AADT						> 10,000 AADT			
Posted Speed	< = 30 MPH		35/40 MPH		> 40 MPH		< = 30 MPH		35/40 MPH		>40 MPH		< = 40 MPH		> 40 MPH	
Vehicular Mix	trucks		trucks		trucks		trucks		trucks		trucks		trucks		trucks	
	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%	<10%	>10%
Shared Lane Width**	**12'**	**13'**	**14'**	**14'**	**X**	**X**	**14'**	**14'**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

* Follow city requirements for roadway lane widths.
**Signed Parallel Parking not included.
X = Not Recommended

Additional Guidelines

- Markings not adopted by MUTCD. Use allowed in KCMO as a test case. Follow NCUTCD for further details on the shared lane marking.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Drainage structures within or abutting the bike lane must meet City standards for bicycle safety.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan

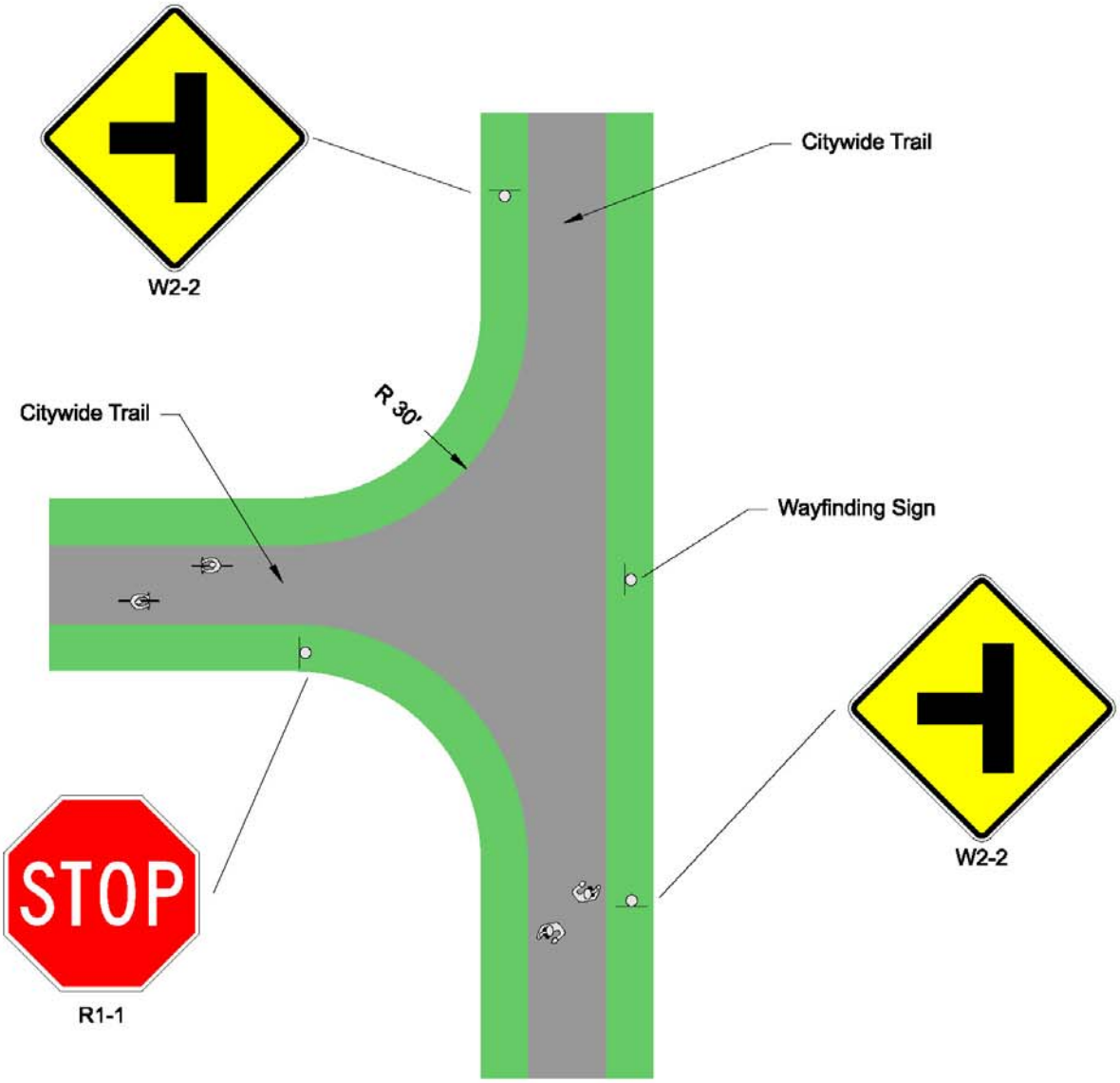
On-Street Connector- Bike Box

Section Options

- Bike Boxes are appropriate to use at signalized intersections in conjunction with bike lanes. Refer to other On-Street Connectors for appropriate applications.

Additional Guidelines

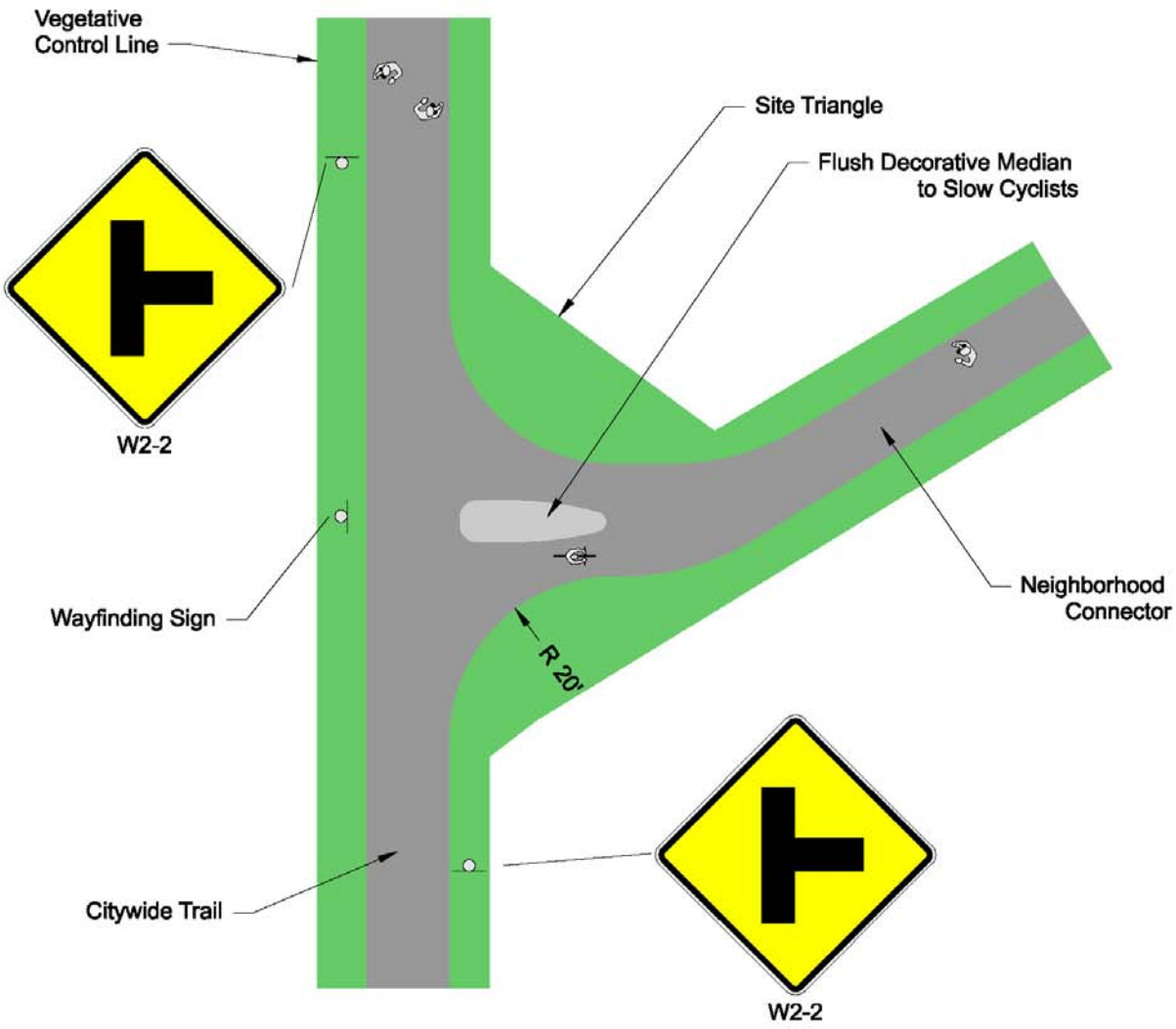
- Designer to stagger stop location signs to maintain proper visibility.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Drainage structures within or abutting the bike lane must meet City standards for bicycle safety.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan
Citywide Trail Intersection

Additional Guidelines

- Abrupt grade changes must be curved vertically to meet AASTHO guidelines.
- If one of the trails is unpaved and the other isn't, then the last 20 feet of the unpaved trail must be paved to reduce gravel migrating to the paved trail.
- When connecting Citywide Trails to Citywide Trails, the connections must be at acceptable angles to provide sight distance and to reduce the speed of the bicyclists on the connector trail.
- All access points to the Citywide Trail must be approved by City Engineer or designee.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.

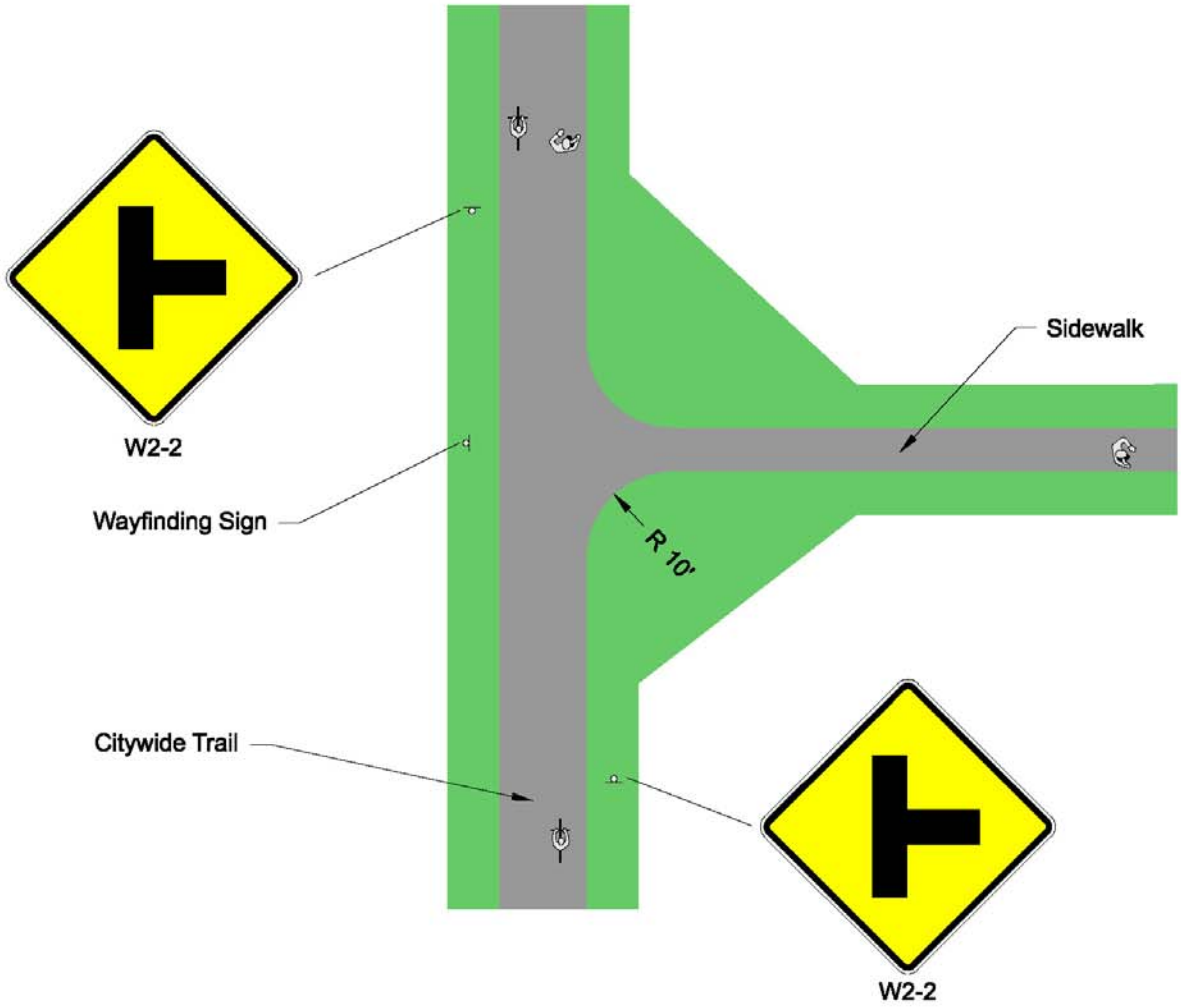


Trails KC Plan

Neighborhood Connector Intersection

Additional Guidelines

- Abrupt grade changes must be curved vertically to meet AASTHO guidelines.
- If the Neighborhood Connector is unpaved and the Citywide Trail is paved, then the last 20 feet of the Neighborhood Connector must be paved to reduce gravel migrating to the Citywide Trail.
- When connecting Neighborhood Trails to Citywide Trails, the connections must be at acceptable angles to provide sight distance and to reduce the speed of the bicyclists on the connector trail.
- All access points to the Citywide Trail must be approved by City Engineer or designee.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan
Sidewalk Intersection

Additional Guidelines

- Abrupt grade changes must be curved vertically to meet AASTHO guidelines.
- If the sidewalk is unpaved and the Citywide Trail is paved, then the last 20 feet of the sidewalk must be paved to reduce gravel migrating to the Citywide Trail.
- When connecting sidewalks to Citywide Trails, the connections must be at acceptable angles to provide sight distance and to reduce the speed of the bicyclists on the connector trail.
- All access points to the Citywide Trail must be approved by City Engineer or designee.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.

Crossings Recommendations[1]

For each trail-roadway crossing, an engineering study is needed to determine the proper location. For each engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc. may be needed at other sites.

Legend

IIIIIIIII	Signed and Marked Crossings	A signed and marked crossing consists of a crosswalk, signing, and often no other devices to slow or stop traffic.
✱	Signed and Enhanced Crossings	A signed and marked crossing can be enhanced for crossings of multi-lane higher volume roadways with features such as: median refuges, and/or active warning devices like solar powered flashing beacons or in-pavement flashers.
◘	Signalized Crossings	New signalized crossings may be recommended for crossings that meet MUTCD warrants. There are numerous signal types, including "half-signals", which should be considered.

	Roadway Functional Class	Local Roads, Collectors……..…….....Arterials											
	Roadway ADT	< 9,000 ADT			9,000 - 12,000 ADT			12,001 - 15,000 ADT			> 15,000 ADT (1)		
	Posted Speed	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH (1)
Roadway Type (Number of Lanes)	2	IIIIIIIII	IIIIIIIII	✱	IIIIIIIII	IIIIIIIII	✱	IIIIIIIII	IIIIIIIII	◘	IIIIIIIII	✱	◘
	3	IIIIIIIII	IIIIIIIII	✱	IIIIIIIII	✱	✱	✱	✱	◘	✱	◘	◘
	>= 4 with median	IIIIIIIII	IIIIIIIII	✱	IIIIIIIII	✱	◘	✱	✱	◘	◘	◘	◘
	>= 4 without median	IIIIIIIII	✱	◘	✱	✱	◘	◘	◘	◘	◘	◘	◘

(1) Grade separated crossings required above these limits.

Note:

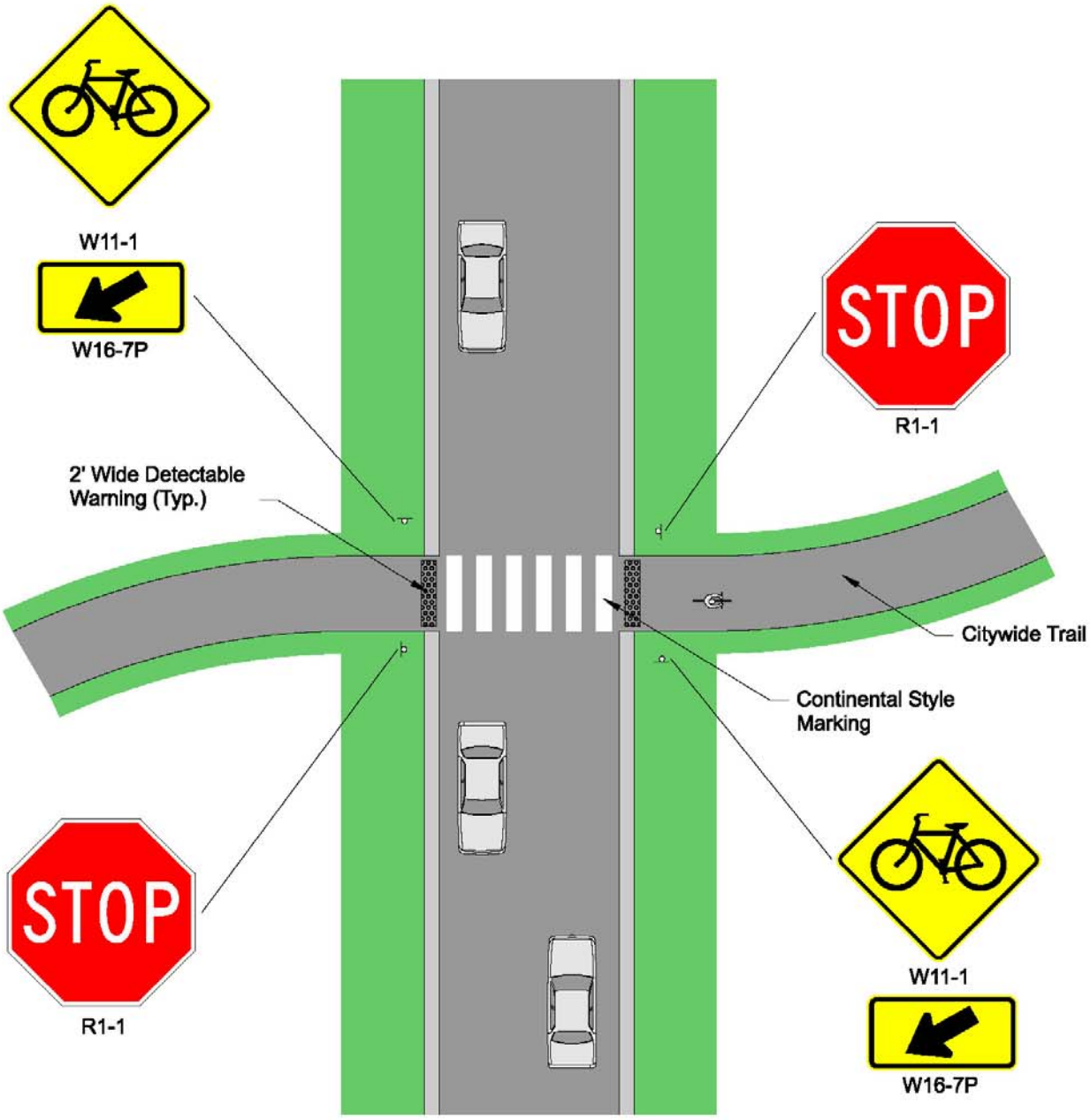
- Crosswalks should not be installed at locations that could present an increased risk to pedestrians and bicyclists such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalks alone **will not** make crossings safer, nor will they necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed, to improve the safety of the crossing.

- Grade-separated crossings may be used for any crossing where topography, existing structures, special traffic circumstances, etc. make it the most feasible. However, City Engineer or designee prior approval is required.

- **These are general recommendations; an engineering analysis should be used in individual cases for deciding which treatment to use.**

[1] This table is based on information contained in the U.S. Department of Transportation Federal Highway Administration Study, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations," February 2002.

Trail-Roadway Crossings

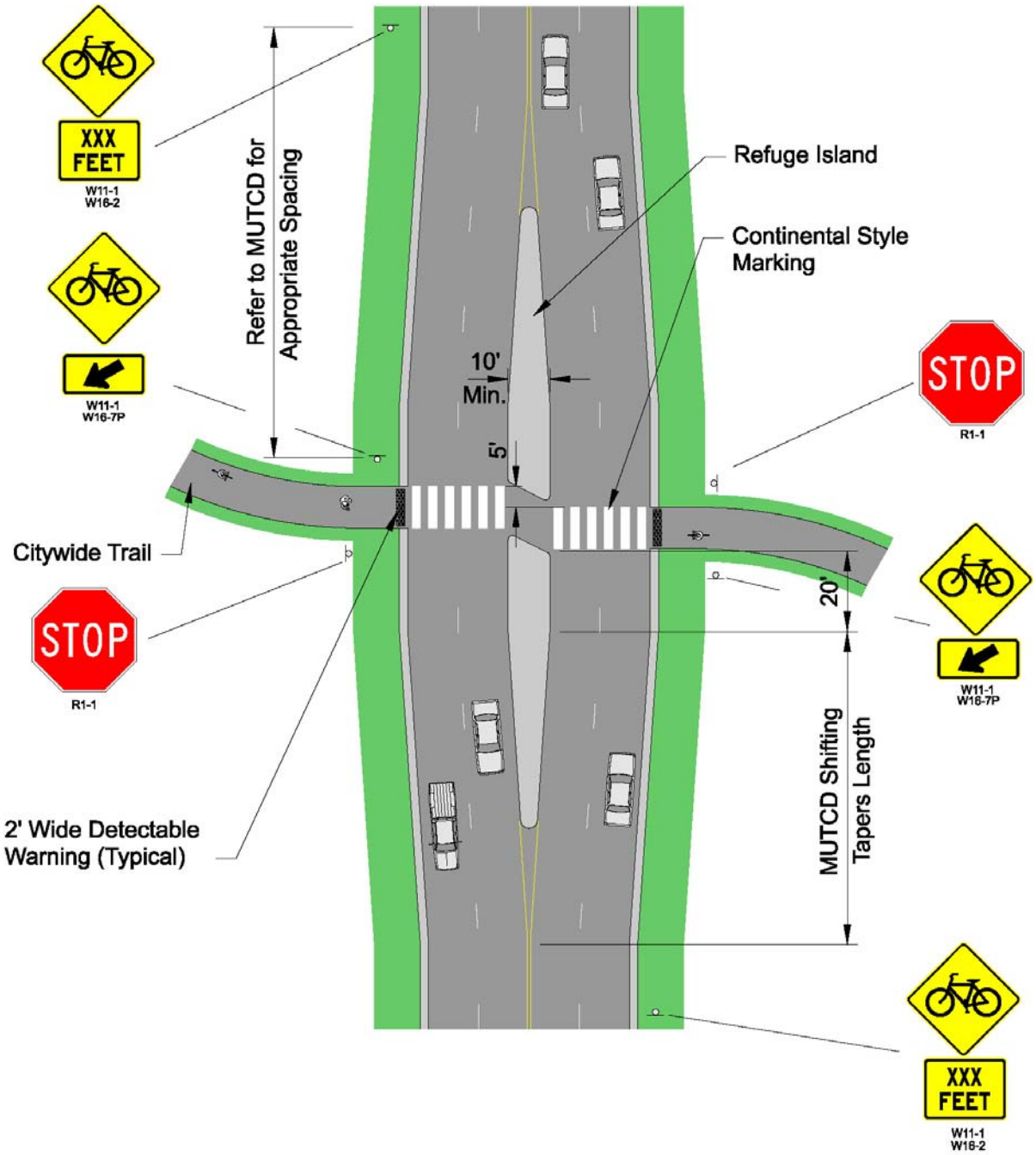


Trails KC Plan

Trail-Local Road Crossing

Additional Guidelines

- Minimum line of sight:
  - 155’ (25mph)
  - 250’ (35 mph)
  - 360’ (45 mph)
- Refer to the Crossing Recommendation Table for additional information on appropriate crossing treatment.
- Refer to Sidewalk Intersection Crossing Detail for trail/sidewalk intersections.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.

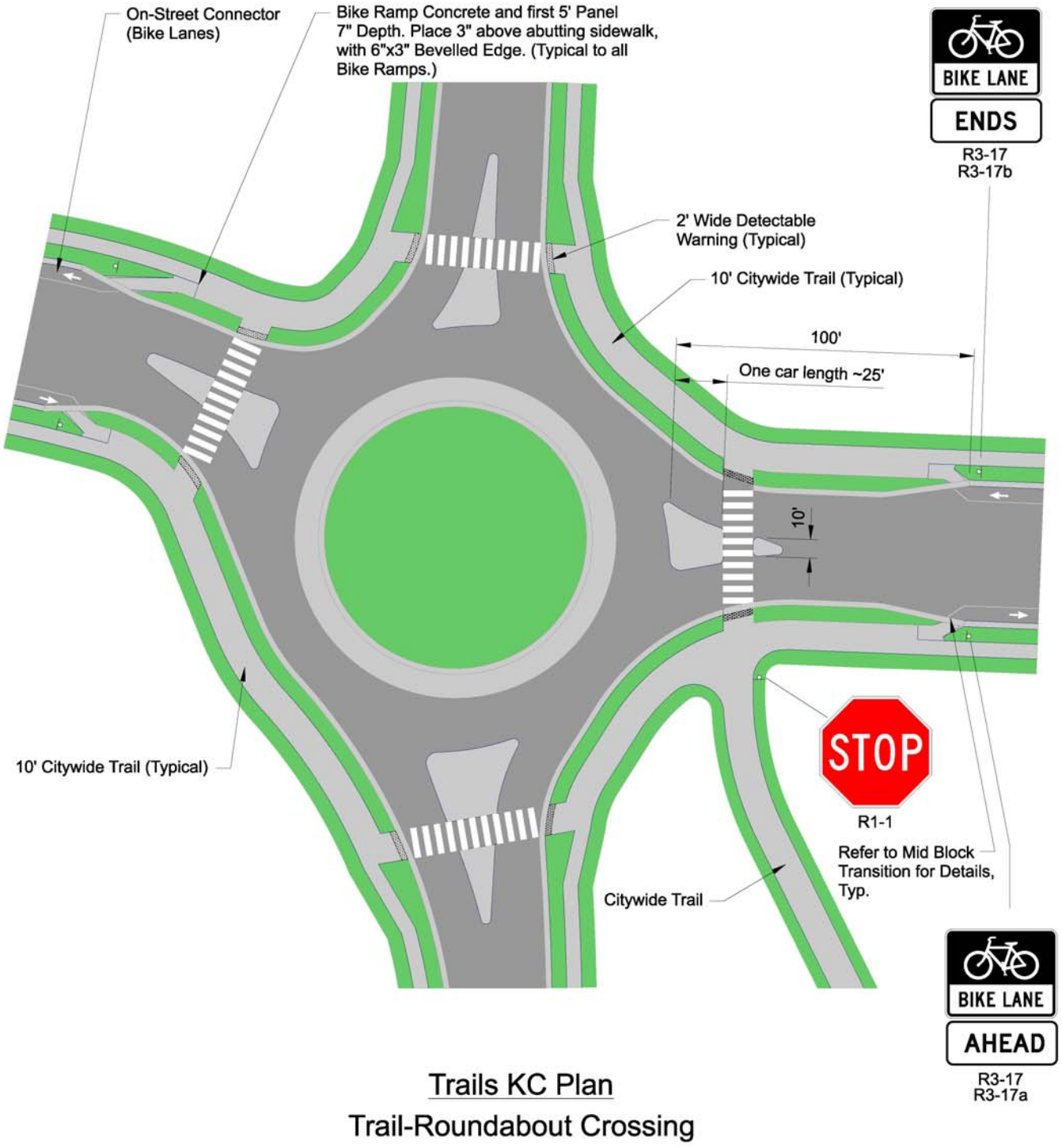


Trails KC Plan

Trail-Minor Arterial Road Crossing

Additional Guidelines

- Minimum line of sight:
  - 155’ (25mph)
  - 250’ (35 mph)
  - 360’ (45 mph)
- Refer to the Crossing Recommendation Table for additional information on appropriate crossing treatment.
- Refer to Sidewalk Intersection Crossing Detail for trail/sidewalk intersections.
- A raised median or crossing island must be at least 10 ft in width to adequately accommodate pedestrians, bicyclists, especially tandem bikes and bikes with child carrying trailers. A two-way center turn lane is not considered a median.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.

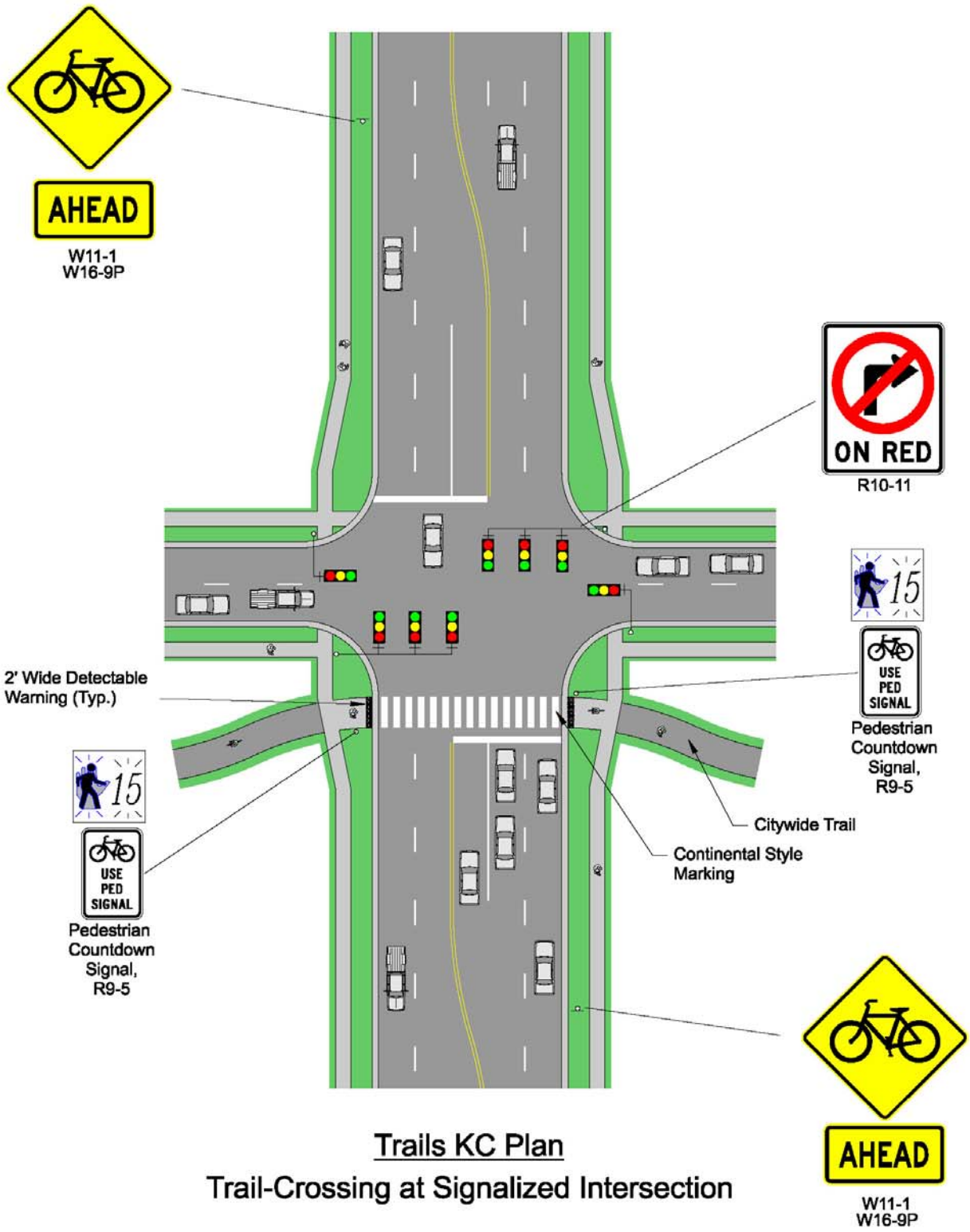


Trails KC Plan

Trail-Roundabout Crossing

Additional Guidelines

- Bike lanes are not acceptable within the roundabout.
- Refer to the Crossing Recommendation Table for additional information on appropriate crossing treatment.
- A raised median or crossing island must be at least 10 ft in width to adequately accommodate pedestrians, bicyclists, especially tandem bikes and bikes with child carrying trailers. A two-way center turn lane is not considered a median.
- On roundabouts, the trail should follow the pedestrian crossings, with signing following AASHTO's Roundabout Guidelines. Bicyclists uncomfortable with merging with traffic can dismount and traverse the roundabout as a pedestrian using the sidewalks.
- Bike lanes should be terminated 100' upstream of the roundabout roadway in order to merge with vehicles. Bike lanes may not continue through the roundabout.
- Refer to MUTCD and AASHTO for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.



Trails KC Plan

Trail-Crossing at Signalized Intersection

Additional Guidelines

- Refer to the Crossing Recommendation Table for additional information on appropriate crossing treatment.
- Push-buttons must be ADA compliant.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Any variance to the standards must have prior approval from City Engineer or designee.

APPENDIX C

railroad and levee issues

Railroad Strategy

Railroads present a significant barrier and early coordination is critical to the success of a trail project. As Kansas City is a national hub for railroads, the Trails KC system interacts with every major railroad and shortline throughout the city as shown on the following page.

Trail - Heavy Rail Crossings

The strategy with the railroads is to limit at-grade trail crossings to previously permitted roadway crossings and make new crossings grade-separated.

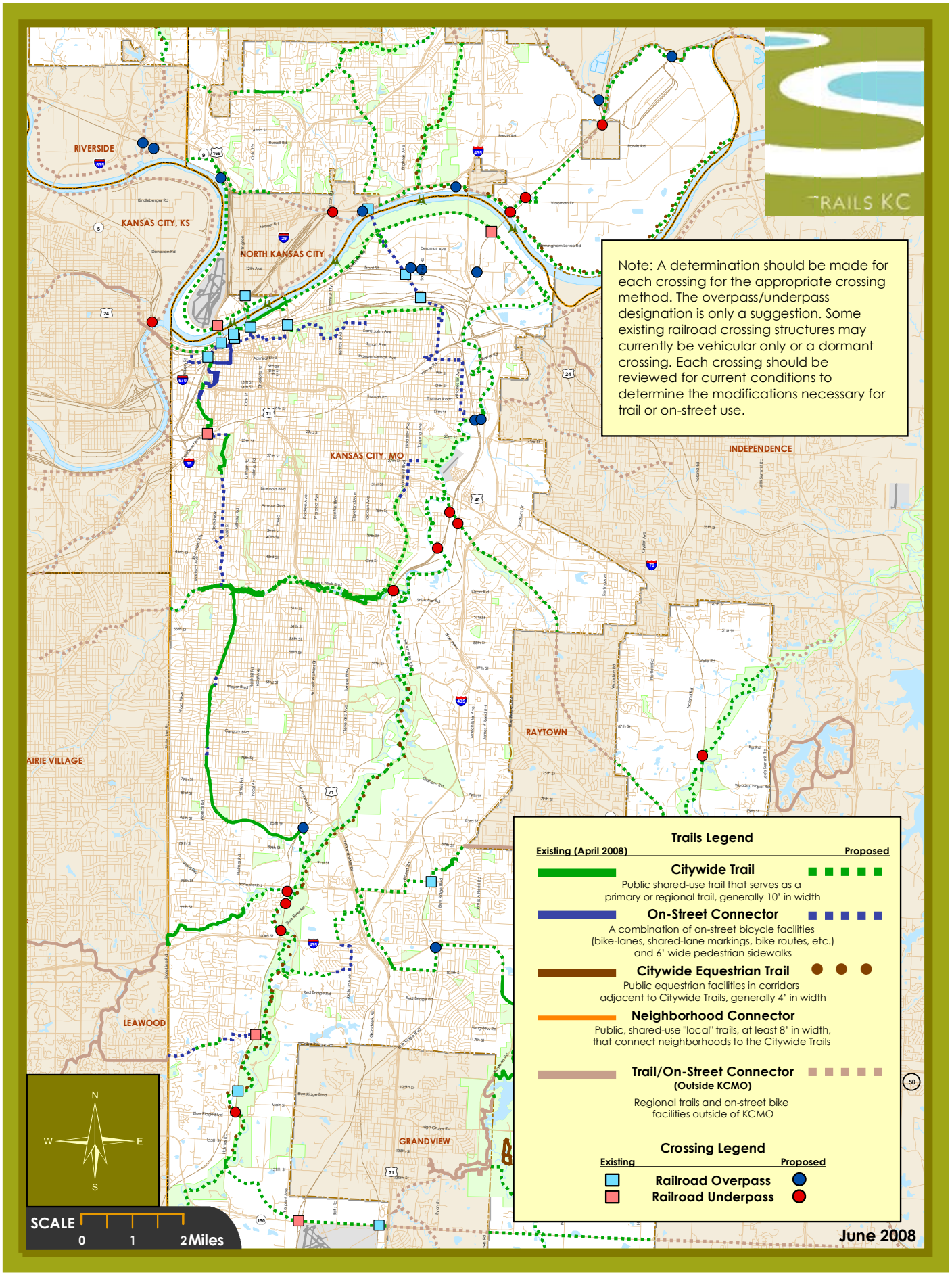
- Grade-separated
  - Overpass - Where topography, space and surrounding development allows, trails bridging over the railroads are the preferred method of crossing, whether they are on existing or new structures
  - Underpass - Trail underpasses through existing structures are acceptable. Creating new underpasses is discouraged and should only be used where no other reasonable option exists
- At-grade
  - Due to the safety concerns, at-grade crossings are discouraged
  - Railroads generally do not allow at-grade trail crossings unless they are immediately adjacent to an existing public crossing or are on spurs with infrequent rail traffic. Even then the crossing will need to be signalized
  - All other reasonable options must be considered and documented prior to attempting this type of crossing

TRAIL - LIGHT RAIL (TRANSIT) CROSSINGS

- Alignments and crossings should be developed in coordination with future light rail plans

PARALLEL TRAILS

- Rail with Trails
  - Trails paralleling the tracks on railroad right-of-way are generally not allowed by the railroads, but cases throughout the country show it can be done successfully
  - Trails may parallel the tracks outside of the right-of-way, but a fence or barrier, such as landscaping or a drainage ditch, along the right-of-way should be considered to discourage trespassing
  - In light rail corridors parallel trails are acceptable, provided a safety fence or other barrier separates the two, if required by the transit agency
- Rails to Trails
  - Rails to trails conversion projects are encouraged whenever possible
  - Rock Island corridor is a prime example (extension of Katy Trail)
  - Grandview has identified the rail line adjacent to Richard-Gebaur as a rails to trails option. If this line is no longer used for heavy rail, its conversion is supported


TRAILS KC
RIVERSIDE
KANSAS CITY, KS
NORTH KANSAS CITY
KANSAS CITY, MO
INDEPENDENCE
RAYTOWN
LEAWOOD
GRANDVIEW
Note: A determination should be made for each crossing for the appropriate crossing method. The overpass/underpass designation is only a suggestion. Some existing railroad crossing structures may currently be vehicular only or a dormant crossing. Each crossing should be reviewed for current conditions to determine the modifications necessary for trail or on-street use.
Trails Legend
Existing (April 2008)
Proposed
Citywide Trail
Public shared-use trail that serves as a primary or regional trail, generally 10' in width
On-Street Connector
A combination of on-street bicycle facilities (bike-lanes, shared-lane markings, bike routes, etc.) and 6' wide pedestrian sidewalks
Citywide Equestrian Trail
Public equestrian facilities in corridors adjacent to Citywide Trails, generally 4' in width
Neighborhood Connector
Public, shared-use "local" trails, at least 8' in width, that connect neighborhoods to the Citywide Trails
Trail/On-Street Connector
(Outside KCMO)
Regional trails and on-street bike facilities outside of KCMO
Crossing Legend
Existing
Proposed
Railroad Overpass
Railroad Underpass
N
W
E
S
SCALE
0
1
2 Miles
June 2008

APPENDIX C

railroad and levee issues

COORDINATION

- The PPOC will establish regular communications with the railroads to coordinate trail opportunities and interactions
- After the Trails KC Plan is adopted the PPOC should contact each railroad to explain the trails plan and philosophy and begin the discussions about the individual crossings
- Individual trail crossings should be discussed with the railroads as that trail segment has funding targeted for it. For these segments, the typical approval process is as follows:
  - Site visit – meet on site to discuss the merits of the crossing. The railroad will want to know what other options exist and why this crossing is preferred
  - Preliminary Plan submittal – An initial submittal of plans to the railroad to confirm the proposed design elements of the trail. Some railroads, such as the UP, have design guidelines for trails and crossings on their right-of-way and these should be reviewed carefully prior to submitting the plans
  - Note – Some railroads may require a plan review fee. This should be discussed prior to plan submittals
  - Final Plan submittal – The submittal of final plans to the railroad, including hydraulic information if appropriate, for their technical review
  - Permits and Right-of-way – The railroad will require insurance, permits, maintenance agreements, and lease agreements for the trail
  - Construction – The contractor will be required to have the appropriate permits, insurance, and flagging operations during constructing. Generally the city will be required to pay for the flagging operation
- With all interactions allow at least 12 months for railroad reviews and permitting

Contact list for the railroads within Kansas City – note that these positions change often. The railroads also have general contact information on their website:

UP – Union Pacific Railroad	Dave McKernan .....(314) 331-0682
BNSF – Burlington Northern Santa Fe	Bruce Chinn .....(417) 829-0376
KCS – Kansas City Southern Railways	Sri Honnur .....(816) 983-1138
KCT – Kansas City Terminal Railroad	Chuck Rodgers .....(913) 551-2127
NS – Norfolk Southern	David Orrison.....(404) 529-1259
ICE – Iowa Chicago & Eastern Railroad	Tim Carlson .....(605) 782-1561

APPENDIX C

railroad and levee issues

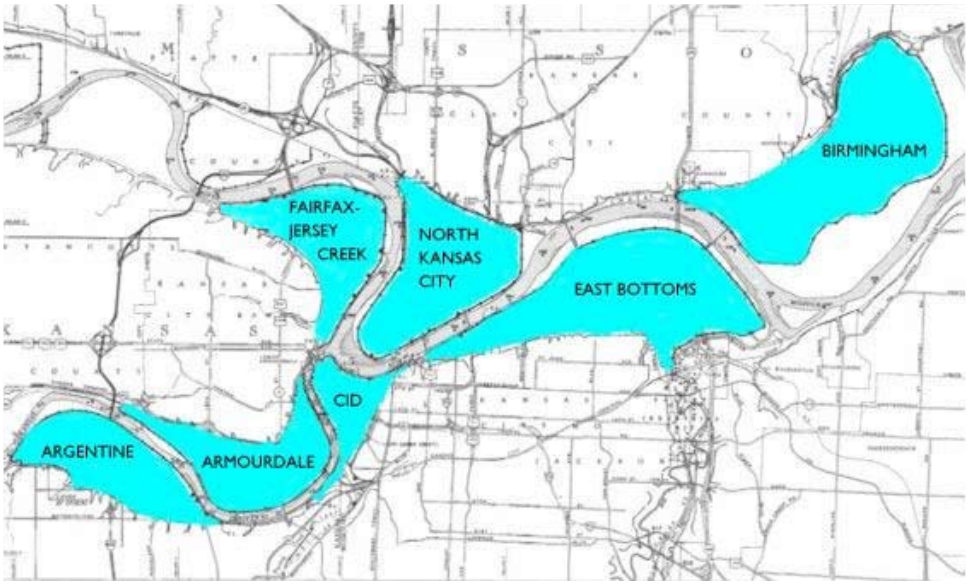
Levee Strategy

Levees present a potential barrier but also provide an opportunity to easily add public access to long segments of trails along rivers.

There are seven levee districts in the Kansas City area, four with direct interaction with the Trails KC Plan. The levee districts are the decision making bodies for the levee properties and should be the first point of contact. The US Army Corps of Engineers (USACE) is the permitting agency for levee improvements once approval is granted by levee district.

State Statutes and Resolution 071159 will assist the PPOC in the negotiations to open these resources to the public as trails.

LEVEE DISTRICTS



TYPICAL SECTIONS

For levee top trails, the typical section will be dictated by the existing levee top.

- The levee tops will generally be an aggregate surface – USACE will generally not allow asphalt or concrete surfacing on the levee
- Levee tops less than eight feet in width should only be considered a one-way facility
- Utility crossings on levees create humps in the top that may not meet ADA. Proper signing should be used to alert trail users to this situation

For trails within the levee structure or within the USACE defined critical area, which can be as much as 500' from the centerline of the levee, the typical section and trail design will need to follow USACE requirements. These requirements will vary from site to site, due to the river flow and levee characteristics.

ACCESS

- Safety information (signage) at the access points is critical to inform the trail users regarding trail use during high-water events
- Access points to the levee will be limited by the flood-fighting requirements of the levee
- Where ever reasonably possible, use the existing levee ramps and access points
- New access ramps will require detailed hydraulic and geotechnical designs

Missouri Revised Statutes Chapter 246 Provisions Relating to All Drainage and Levee Districts

Section 246.283

Authority to cooperate with other entities to develop bike trails.

246.283. Any district formed pursuant to the laws of this state shall have authority to cooperate with other entities, public and private, in the development of bikeways and bike trails; provided, however, that no power of condemnation of land shall be used by the district for the purpose of bike trails. *(L. 1994 S.B. 633) Effective 7-12-94*

KCMO CITY COUNCIL RESOLUTION NO. 071159

Directing the City Manager to submit a plan within 90 days to open levees owned and/or maintained by the City for public recreational usage. (Enacted 10/25/07)

APPENDIX C

railroad issues

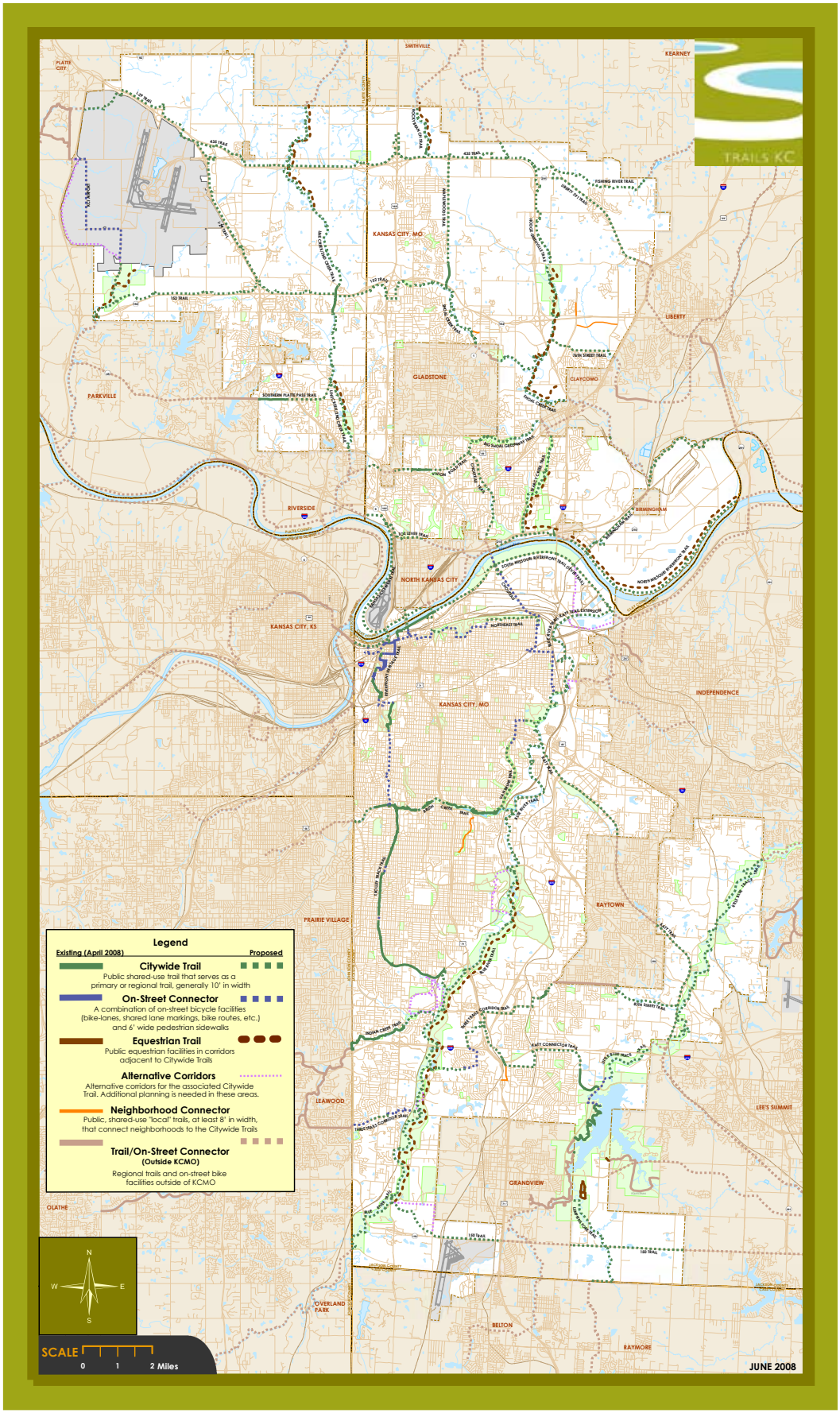
COORDINATION

- The PPOC will coordinate all trail interactions with the Levee Boards to keep the communication constant and consistent
- An operation and maintenance agreement will be required
- There will be times when some segments of these trails will be closed for levee maintenance and flood –fighting operations
- With all levee interactions, allow 12 months for reviews and permitting

Contact list for the Levee Districts within Kansas City – note that these positions change often, and some Levee Boards meet infrequently. Contact the Kansas City Division of the US Army Corps of Engineers for more up to date contacts.

Armourdale	Larry Brennan	(913) 342-2382
Birmingham	Robert McKinley	(816) 460-5636
Central Industrial District	Richard Gaskin	(816) 513-3468
Fairfax-Jersey Creek	Larry Brennan	(913) 342-2382
Northeast Industrial District (East Bottoms)	Richard Gaskin	(816) 513-3468
North Kansas City	Jerry Brandt	(816) 781-4788
Riverside Quindaro Bend	Kevin Street	(816) 587-1125

APPENDIX D alternate routes



APPENDIX E

glossary of terms

The following Glossary of Terms is meant to clarify the definitions of key items in the Trails KC Plan, it is not meant to detail every technical term, as many terms are defined in the referenced guidelines.

Bike/Bicycle – Every vehicle propelled solely by human power upon which any person may ride, having two tandem wheels, except scooters and similar devices. The term "bicycle" for this publication also includes three and four-wheeled human-powered vehicles, including tricycles for children. (AASHTO definition, modified as shown.)

Bike Box – Provide preferential treatment for bicyclists by designating an area between the stop bar and the crosswalk for the bicyclists to queue at a signal. It is primarily used in the Trails KC Plan where a bike lane ends at a three way stop.

Bike KC Routes – On-street bike facilities identified in the City's adopted Bike KC Plan.

Bike Lane – A portion of a road striped and signed for one-way bicyclist preferential use.

Citywide Trail – A public, non-motorized shared-use trail facility that serves as a primary or regional trail. Provides major east/west, north/south connections throughout Kansas City, Mo. and to trail systems in neighboring cities. Also known as: Class I bikeway, shared-use path, MetroGreen type 4 facility.

Connectivity – Proposed trail segments that connect to other trails, especially trails already constructed are valued higher than trails that do not.

Departmental Liaisons – Working directly with the PPOC and the BPAC, these specific staff members are responsible to coordinate their department's trail work within the Trails KC organizational plan.

Equestrian Trails – Public equestrian facilities in corridors adjacent to Citywide Trails.

Friends-of-Kansas City Trails – A citizen's group of trail advocates that will work with the PPOC and the BPAC to help develop and maintain the Trails KC system.

Greenway – A natural/undeveloped linear corridor following a stream or river that provides recreational, educational, cultural, environmental and water quality benefits.

Intermodal Corridor – A corridor encompassing multiple modes of transportation; e.g. bicyclists, motorized vehicles, pedestrians, transit, etc.

APPENDIX E

glossary of terms

Land Trust – An organization that is structured as a 501c(3) that can acquire, own, and manage land to protect/preserve it for conservation purposes. Land donated to land trusts is eligible for a tax deduction for the property owner.

Low Water Crossing – A crossing of a stream that will be inundated with water on a regular basis.

Neighborhood Connector Trails – Public, non-motorized shared-use "local" trails that connect neighborhoods to the regional Citywide Trails.

On-Street Connectors – A combination of on-street bicycle facilities (bike lanes, shared-lane markings, bike routes, etc) and sidewalks that make critical connections between shared-use Citywide Trails.

Paved Trail – A trail with aggregate, asphalt, concrete or innovative surfacing. (Not grass/turf.)

Pedestrian – A person walking, using mobility devices, skating, jogging, or other means of travel other than a bicycle.

PPOC – Primary Point of Contact (PPOC) is the coordinator of the Trails KC Plan.

Rail-With-Trail – Any corridor that has parallel railroad or transit tracks and a shared-use trail.

Shared-Use Trail – A trail that allows multiple users and uses, such biking, jogging, commuting, and recreation (non motorized).

Shared Lane Marking – A arrow-like pavement marking indicating to both the motorist and the bicyclists where the bicyclist is allowed to ride in a travel lane that is shared by both motorists and bicyclists.

Shoulder – The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface courses. (AASHTO definition)

Signed Bike Route – A roadway that is designated through signage as a preferred bicycle facility. Travel lanes are shared by both motorists and bicyclists.

Stream Buffer – A buffer zone around streams and rivers that restricts new development/land use activities as a means of protecting public safety and public infrastructure investments while mitigating the adverse environmental impacts that development can have on streams and associated natural resource areas. (See City Development Code for additional information and details regarding designated stream buffer locations).

Trail – An off-street path (paved or unpaved) surface suitable for walking, cycling, or equestrian use. For the purpose of this plan, trails are for non-motorized use.

Viewshed – An area with exceptional scenic views of natural or cultural resources.