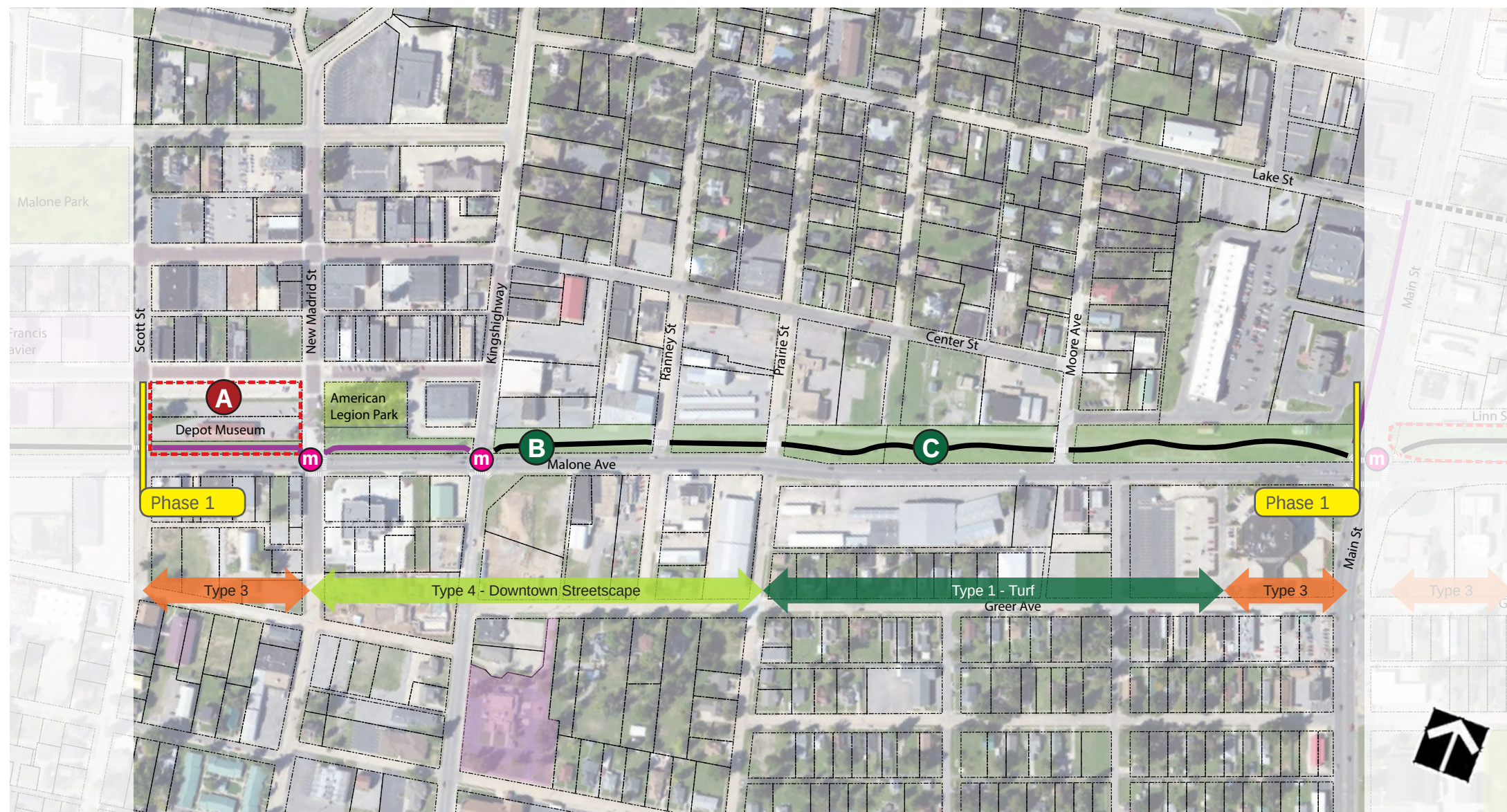
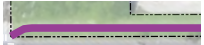
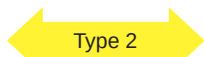
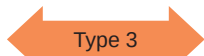
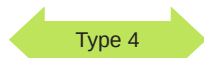




Legend

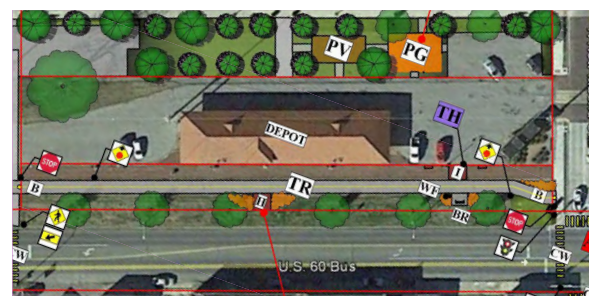
-  Concrete Trail
-  Asphalt Trail
-  On-Street Bicycle Facility (Bike Lane or Sharrows)
-  Crushed Stone Trail
-  Signalized Intersection Crossing: Trail to cross at existing signalized intersection. Intersections not labeled are "minor". See typical details for major and minor intersection crossings.
-  New Intersection Crossing: New midblock or intersection signalized crossing such as HAWK signal.
-  Landscape Type 1 - Turf
-  Landscape Type 2 - Native Meadow / Wildflowers
-  Landscape Type 3 - High Profile Shrub / Perennial
-  Landscape Type 4 - Downtown Streetscape

A Depot Museum Trailhead

The Depot Museum Trailhead will provide the central trailhead location for the trail. Addition of green space, a playground, seating areas, and other amenities will further enhance the Depot Museum.

Crosswalks and pedestrian signals for the trail should be provided at the intersections of New Madrid Street and Kingshighway.

Right: Conceptual plan of the Depot Museum Trailhead.



B Scott Street to Prairie Avenue

The trail alignment from Scott Street to Prairie Street should create a streetscape environment suitable for the downtown context. The trail should be setback from Malone a minimum of 10' and follow the existing railbed when possible. Amenities such as street trees, special paving, and seating should be located on both sides of the trail. The trail should be screened from the parking lot and driveway on the north side of the right-of-way.

C Prairie Avenue to Main Street

The segment between Prairie Street to Main Street is relatively flat with a wide right-of-way. The trail alignment should be curved with tree plantings on both sides of the trail.

Existing trees should be preserved where possible, especially between Prairie Avenue and Moore Avenue.

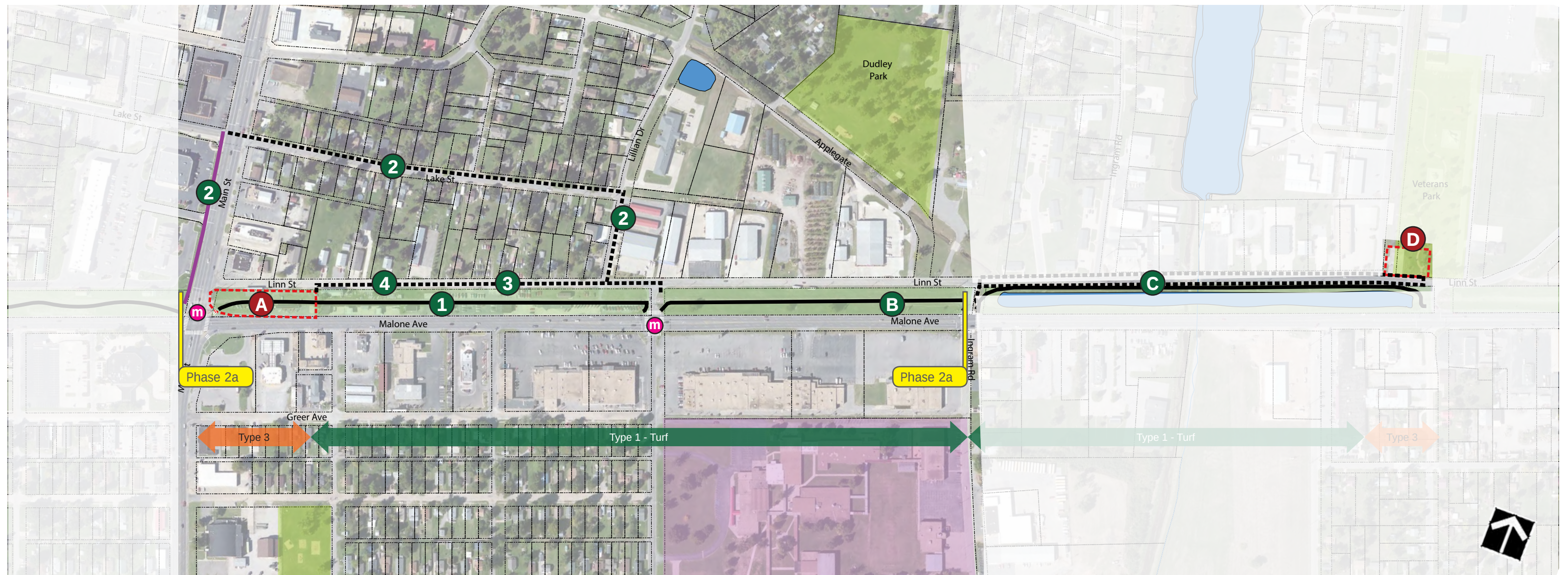
Phase 1 to end at Main Street. Crossing Main Street will require enhancements including crosswalks and pedestrian signals.

SIKESTON RAIL-TO-TRAIL MASTER PLAN

Phase 1 - Conceptual Trail Alignment

January 2017

Final Draft
1-9-17



A Main Street Trailhead

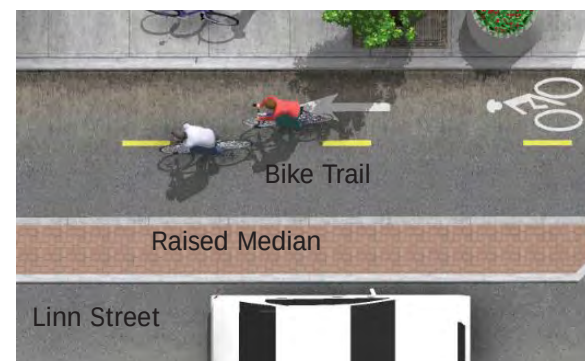
Add parking and trailhead amenities at existing vacant lot at the intersection of Main and Linn. Intersection to be improved to accommodate trail crossing.

1 Option 1: Current ROW

Trail alignment to follow existing railbed through the center of existing business sites. Fencing should be placed on each side of the trail to screen trail and provide safety barrier.

3 Option 3: One-Way Linn St

Convert Linn Street to a one-way street (eastbound). Convert remaining right-of-way to 10' wide trail with separation from Linn Street.



4 Option 4: Sharrows

Provide sharrows and signage for bicycle route on Linn Street. Upgrade sidewalk on north side of Linn Street for pedestrian use.

B Pine Street to Ingram Road

Trail alignment to utilize existing railbed. Provide street trees on north and south side of trail.

D Veterans Park Trailhead

Existing parking lot to be utilized for trailhead parking. Add trail connection to parking lot.

2 Option 2: Lake Street

Trail alignment to utilize on-street connection via Lillian Drive and Lake Street. Sharrows and signage to be provided for bicycle route. Pedestrians to utilize sidewalks. Provide crosswalks and pedestrian signals at the intersection of Lake and Main. Provide minimum 8' wide sidepath along the west side of Main Street.

C Temp Connection to Park

Provide temporary on-street connection to Veterans Park until Phase 3 is finished. Provide sharrows and signage for bicyclists. Pedestrians to utilize sidewalks.

Left: Example of a trail separated from one-way traffic (Option 3). Source: NACTO

SIKESTON RAIL-TO-TRAIL MASTER PLAN

Phase 2a - Conceptual Trail Alignment



1 Sunset Drive to Westgate St and Connection to West End Park

The trail should follow the existing rail bed alignment due to the raised rail bed. There is limited opportunity for other alignment options or to curve the trail.

On the south side of the trail, existing utility lines preclude the use of canopy trees. Understory trees should be used to screen Malone Avenue.

A connection from the trail to West End Park should be made just east of Sunset Drive.

2 New Signalized Intersection at Clayton Ave and Malone Ave

A new signalized intersection with pedestrian crossings should be installed at Clayton Ave and Malone Ave. The intersection will provide neighborhood access from the south to West End Park and the trail.

3 Westgate Street to Railroad

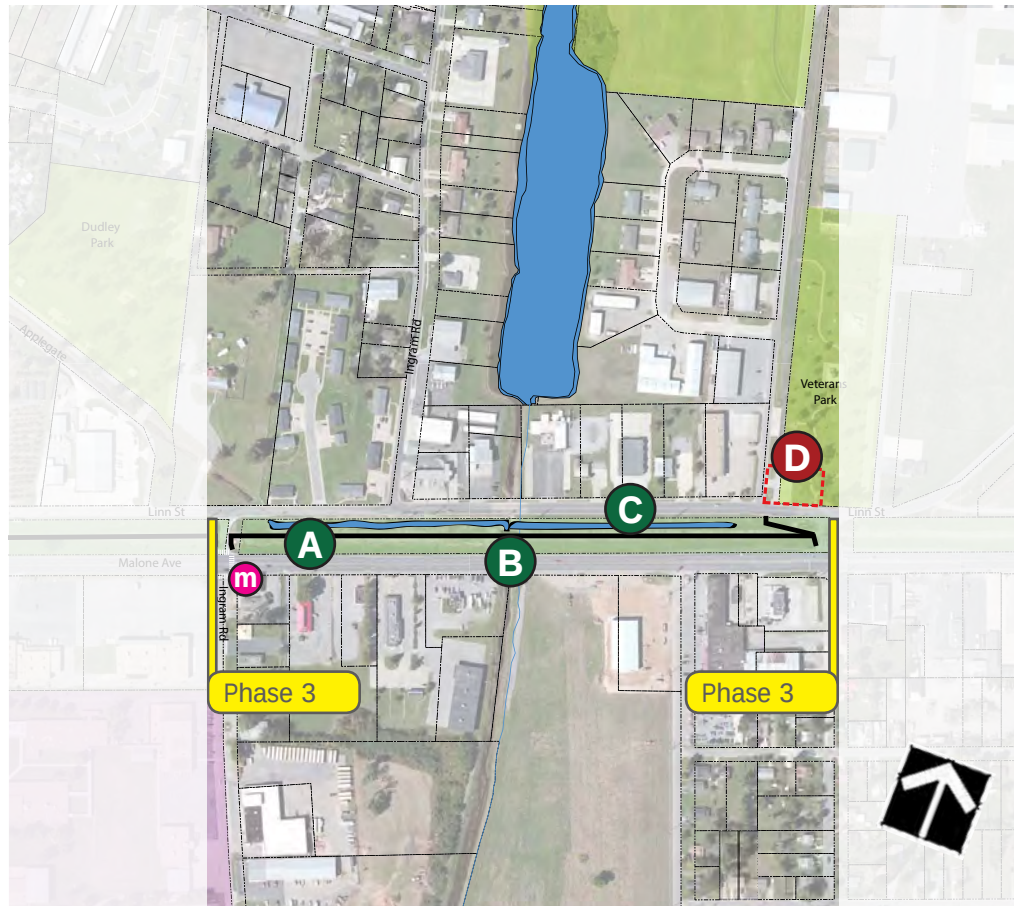
The relatively flatness of this section creates an opportunity to curve the trail to provide additional interest for users. The trail should be screened from the land uses on the north side of the right-of-way with canopy and understory trees. Street trees should be planted on the south side of the trail.

4 Railroad Crossing

Coordination with the railroad will be required to comply with the railroad's standards and requirements for a trail crossing of the railroad tracks. There is a precedent for a pedestrian railroad crossing at Salena Street. The default trail crossing option should follow the Salena Street precedent unless additional options are required by the railroad (see report text for additional information).

5 Railroad to Scott Street

The relatively flatness of this section creates an opportunity to curve the trail to provide additional interest for users. The trail should be screened from the land uses on the north side of the right-of-way with canopy and understory trees. Street trees should be planted on the south side of the trail.



Phase 3 - Option 1 Trail Alignment

A Option 1: Current Railbed

Trail alignment to utilize current railbed. Plant street trees along south side of trail. Railing may be required between trail and existing drainage channel.

B Option 1: New Bridge

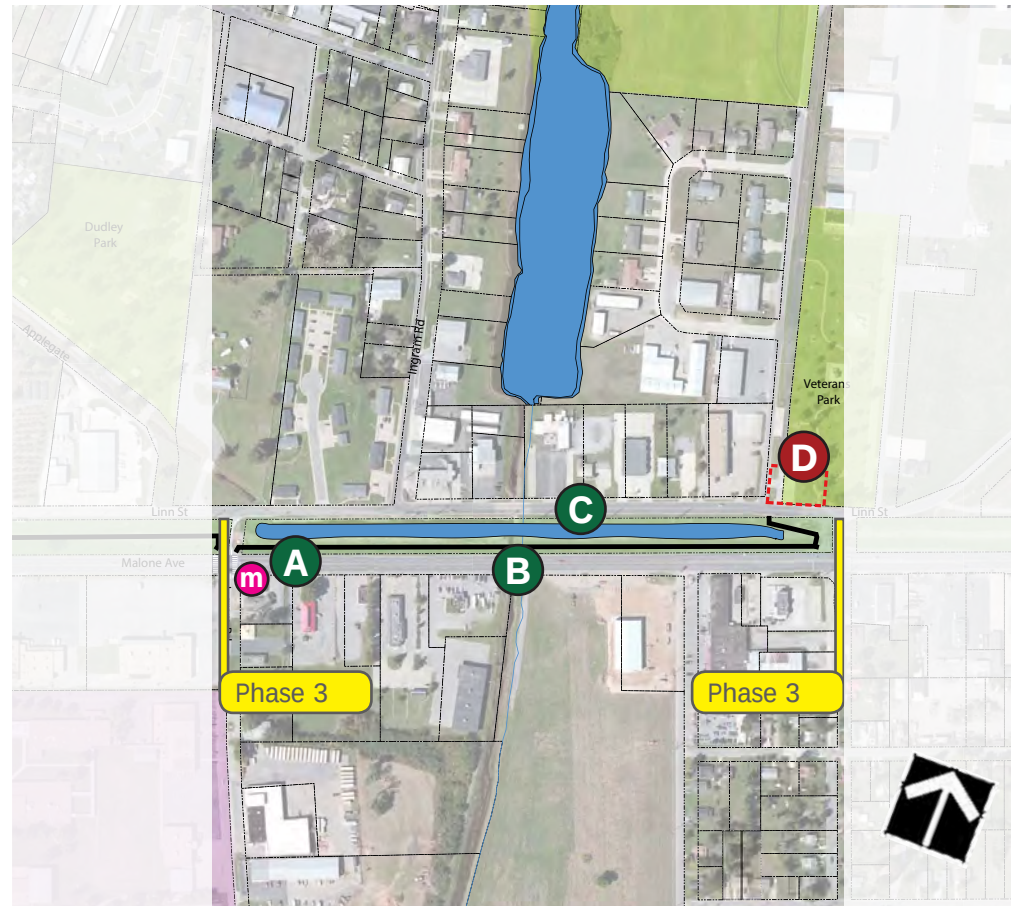
New bridge over existing drainage channel.

C Option 1: Flood Storage Area

Existing space is available between the trail alignment and Linn Street for stormwater storage. This area can be excavated and used as stormwater storage as the existing drainage channel backs up. This option has less space for stormwater storage.

D Veterans Park Trailhead

Existing parking lot to be utilized for trailhead parking. Add trail connection to parking lot. Use Rectangular Rapid Flash Beacon (RRFB) and crosswalks to cross Linn Street.



Phase 3 - Option 2 Trail Alignment

A Option 2: Malone Edge

Trail alignment to follow north edge of Malone Avenue. Trail should be set back a minimum of 10' from Malone Avenue. Plant street trees between trail and Malone Avenue.

B Option 2: New Culvert or Bridge

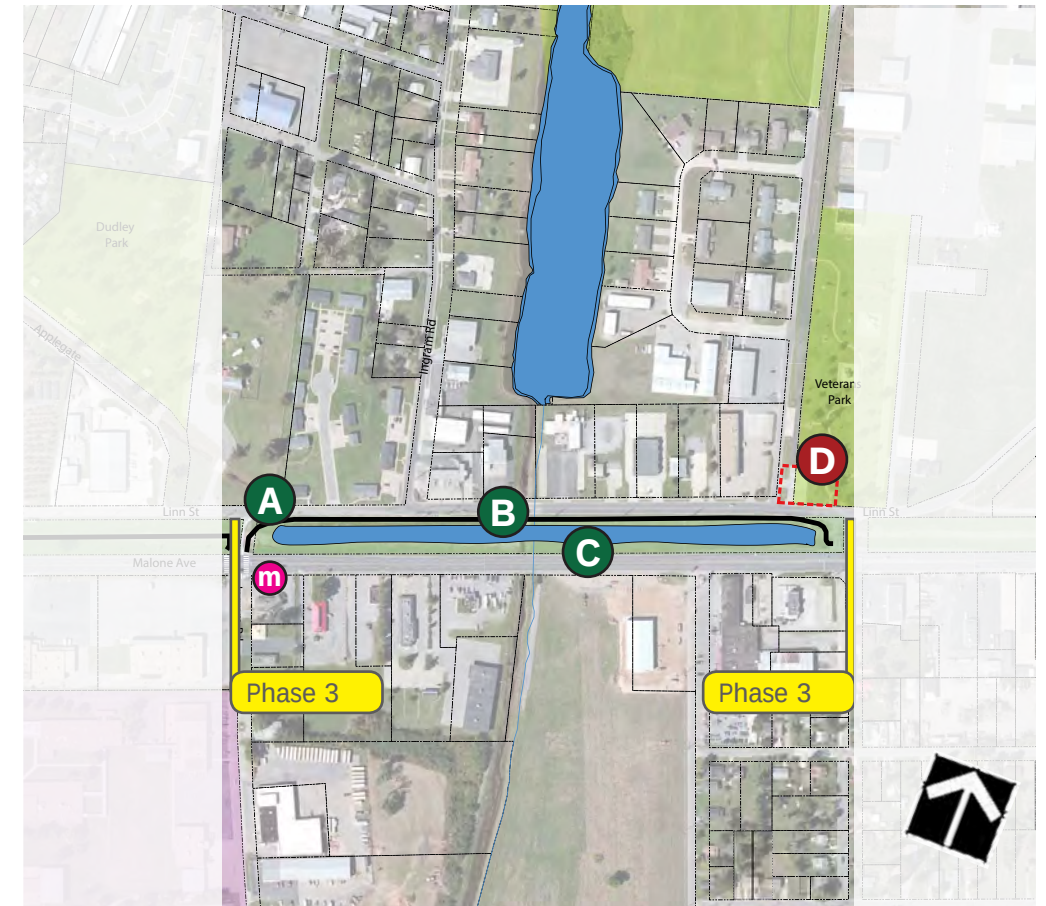
A new culvert or a new bridge will need to be installed.

C Option 2: Flood Storage Area

A trail alignment adjacent to Malone Avenue will allow significant opportunity to create a stormwater detention area. Edges of detention should be stepped to allow plantings, especially street trees.

D Veterans Park Trailhead

Existing parking lot to be utilized for trailhead parking. Add trail connection to parking lot. Use Rectangular Rapid Flash Beacon (RRFB) and crosswalks to cross Linn Street.



Phase 3 - Option 3 Trail Alignment

A Option 3: Linn Street Edge

Trail alignment to follow south edge of Linn Street. Trail will likely need to have retaining wall and railing on south edge of trail.

B Option 3: New Culvert or Bridge

A new culvert or a new bridge will need to be installed.

C Option 3: Flood Storage Area

A trail alignment adjacent to Linn Street will allow significant opportunity to create a stormwater detention area. Edges of detention should be stepped to allow plantings, especially street trees.

D Veterans Park Trailhead

Existing parking lot to be utilized for trailhead parking. Add trail connection to parking lot. Use Rectangular Rapid Flash Beacon (RRFB) and crosswalks to cross Linn Street.



1 Selma Street to Country Club Drive

The existing condition of this section of trail is very wide open with light industrial on the north side of the right-of-way.

The relatively flatness of this section creates an opportunity to curve the trail to provide additional interest for users. The trail should be screened from the parking lot and land uses on the north side of the right-of-way with canopy and understory trees.

2 Country Club Drive to Mitchell Drive

The trail should follow the existing rail bed alignment due to existing slopes as the trail approaches St. Johns Ditch. The right-of-row topography flattens near Mitchell Drive and there may be an opportunity to curve the trail. Street trees should be planted between the trail and Malone Avenue. East of St. Johns Ditch, the trail should be screened from the land uses on the north side of the right-of-way with canopy and understory trees.

3 New Pedestrian Bridge at St. Johns Ditch

A new pedestrian bridge will be required at St. Johns Ditch. (See report text for additional information)

4 Mitchell Drive to Lambert's Cafe

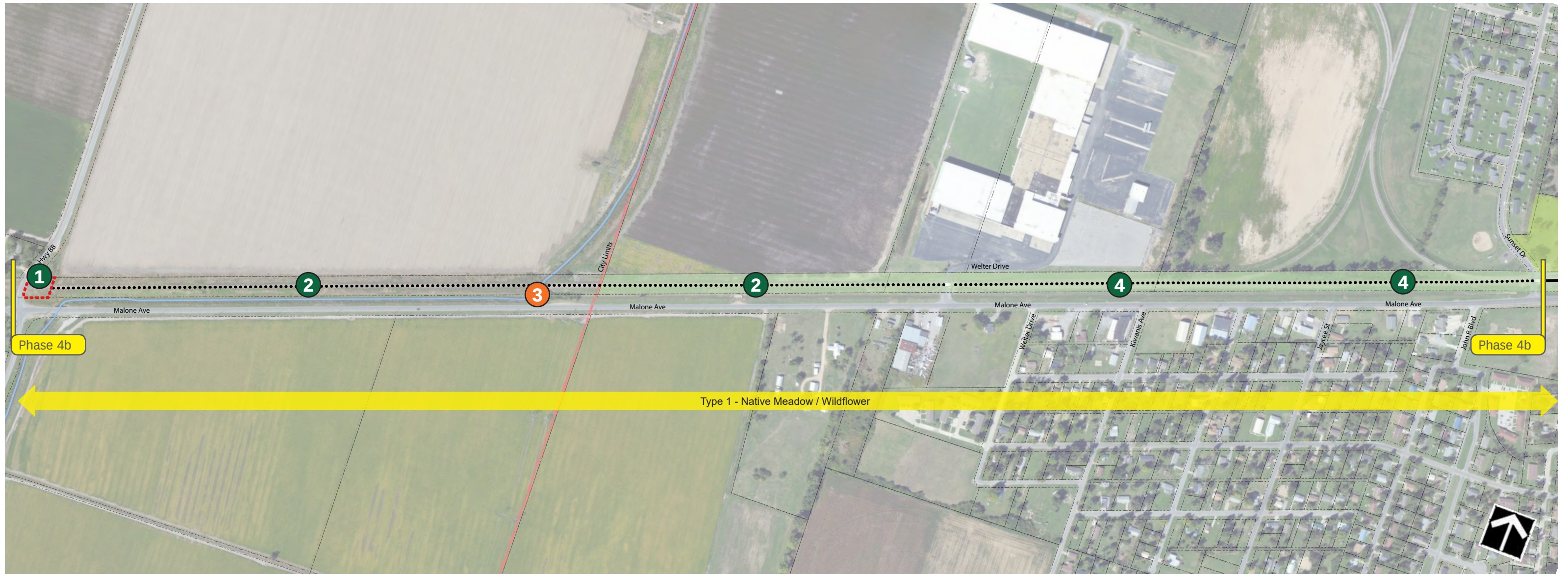
The existing condition of this section of trail is very wide open with light industrial on the north side of the right-of-way.

The relatively flatness of this section creates an opportunity to curve the trail to provide additional interest for users. The trail should be screened from the parking lot and land uses on the north side of the right-of-way with canopy and understory trees.

5 Phase 4a Extension and Mid-Block Crossing at Lambert's Cafe

Phase 4a should end at Edwards Avenue until there is an agreement or funding to extend the trail into Miner.

A mid-block crossing should be provided to connect to Lambert's Cafe. The mid-block crossing should be a signalized crossing such as a HAWK signal or equivalent.



1 Trailhead at Hwy BB

A trailhead with parking should be located at Hwy BB and Malone Avenue. Very few, if any, amenities should be provided at this trailhead. Parking surface could be gravel or other low cost options.

2 Hwy BB to Welter Drive

The trail should follow the existing rail bed alignment due to existing slopes on either side. There is limited opportunity for other alignment options or to curve the trail. Existing slopes also preclude tree and other plantings in the right-of-way. Agricultural fields to the north offer good viewsheds for trail users. Native grasses and forbs should be evaluated for use in the right-of-way to help with lower maintenance

3 New Pedstrian Bridge at Drainage Ditch

A new pedestrian bridge will be required at the drainage ditch. (See report text for additional information)

4 Welter Drive to Sunset Drive

The trail should follow the existing rail bed alignment due to the raised rail bed. There is limited opportunity for other alignment options or to curve the trail.

The trail should be screened from the land uses on the north side of the right-of-way with canopy and understory trees. On the south side of the trail, existing utility lines preclude the use of canopy trees. Understory story trees should be used to screen Malone Avenue. Native grasses and forbs should be evaluated for use in the right-of-way to help with lower maintenance and provide additional buffer from adjacent uses.

SIKESTON RAIL-TO-TRAIL MASTER PLAN

Phase 4b - Conceptual Trail Alignment

LEGEND/KEY

- TR

TRAIL ROUTE
- PG

PLAYGROUND
- PV

PAVILION
- AC

ARTERIAL ROAD CROSSING
- CC

COLLECTOR ROAD CROSSING
- CW

PEDESTRIAN CROSSWALK
- B

TRAIL BOLLARDS
- I

TRAILHEAD INFORMATION
- H

HISTORICAL MARKER
- BR

BIKE RACK

TH

TRAILHEAD LOCATION

WF

WATER FOUNTAIN/DOG BOWL

OT

OVERSTORY SHADE TREE

UT

UNDERSTORY ORNAMENTAL TREE

SG

SHRUBS/ NATIVE GRASSES & FLOWERS

SS

STOP SIGN

SA

STOP AHEAD SIGN

CS

CONTINENTAL CROSSWALK STRIPING

NOTE: ITEMS SHOWN ARE CONCEPTUAL IN NATURE AND ARE SUBJECT TO CHANGE AND DO NOT REPRESENT FINAL RECOMMENDATIONS

- PS

PEDESTRIAN CROSSWALK SIGNAL
- TH

TRAILHEAD LOCATION
- WF

WATER FOUNTAIN/DOG BOWL
- OT

OVERSTORY SHADE TREE
- UT

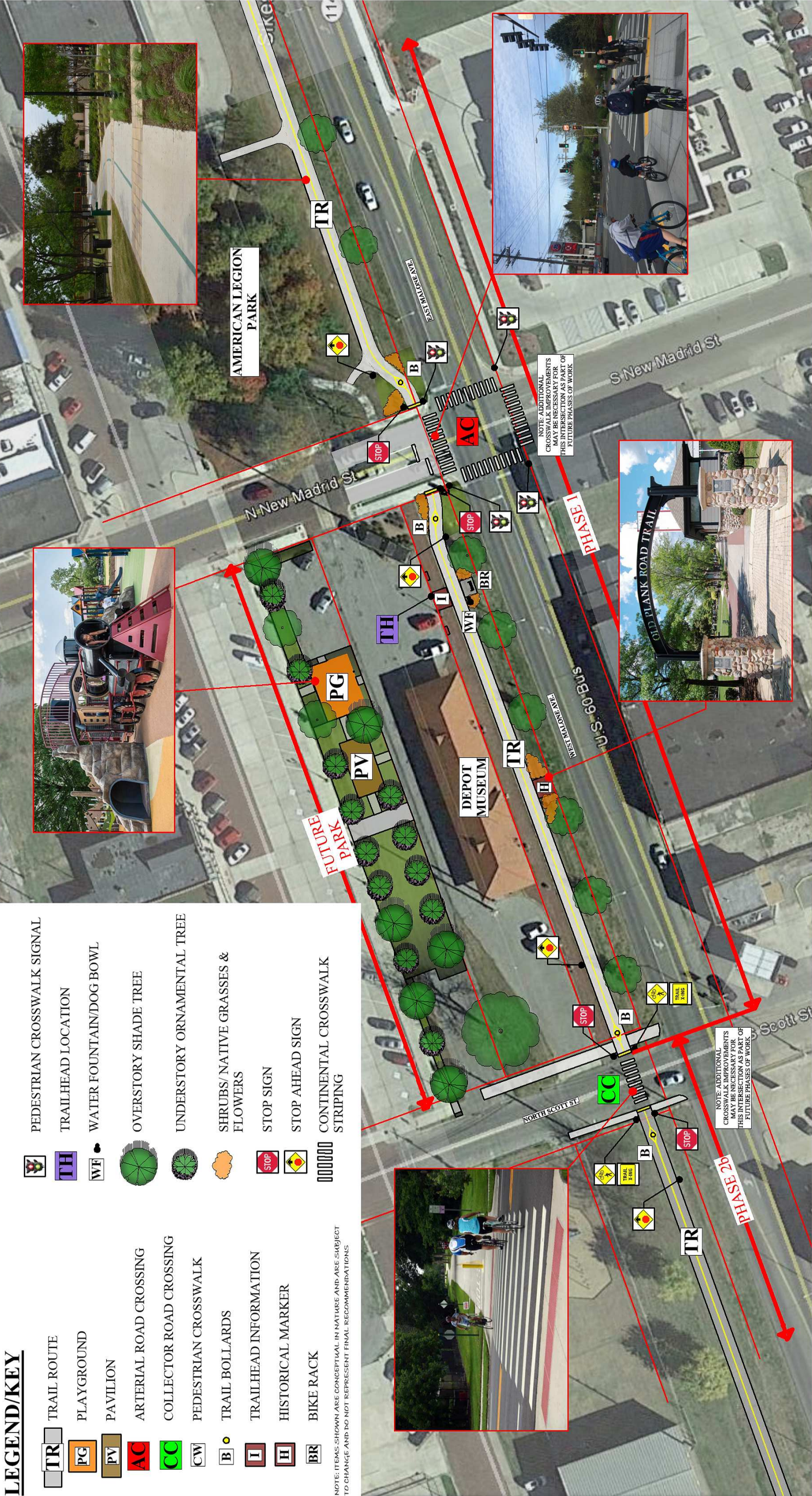
UNDERSTORY ORNAMENTAL TREE
- SG

SHRUBS/ NATIVE GRASSES & FLOWERS
- SS

STOP SIGN
- SA

STOP AHEAD SIGN
- CS

CONTINENTAL CROSSWALK STRIPING



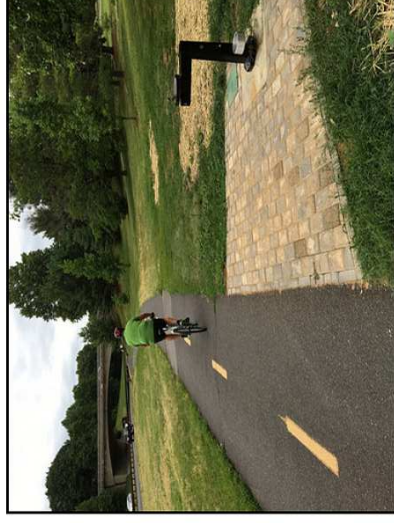
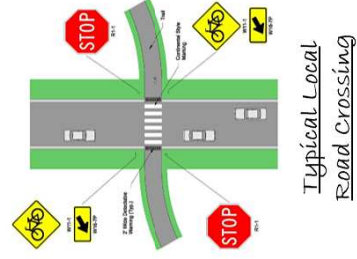
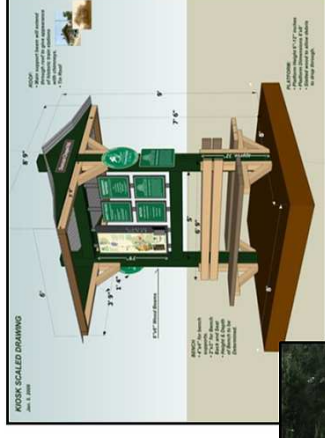
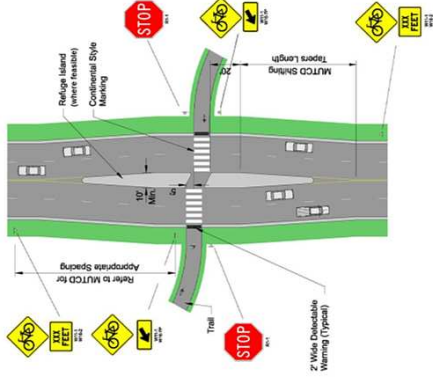
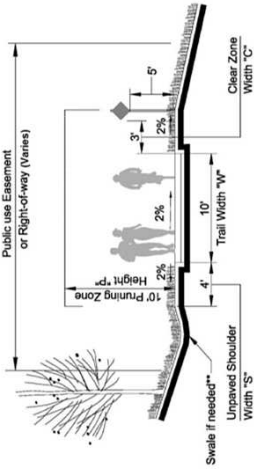
SIKESTON RAIL-TO-TRAIL MASTER PLAN

Conceptual Design Details
Sikeston Depot - Trailhead

January 2017

Final Draft
1-9-17





NOTE: ITEMS SHOWN ARE CONCEPTUAL IN NATURE AND ARE SUBJECT TO CHANGE AND DO NOT REPRESENT FINAL RECOMMENDATIONS

Crosswalk with Pedestrian Activated Flashing Beacon (RRFB)

Rest Area with Water Fountain

Arterial Road Crossing - Signalized

SIKESTON RAIL-TO-TRAIL MASTER PLAN

January 2017

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1-9-17

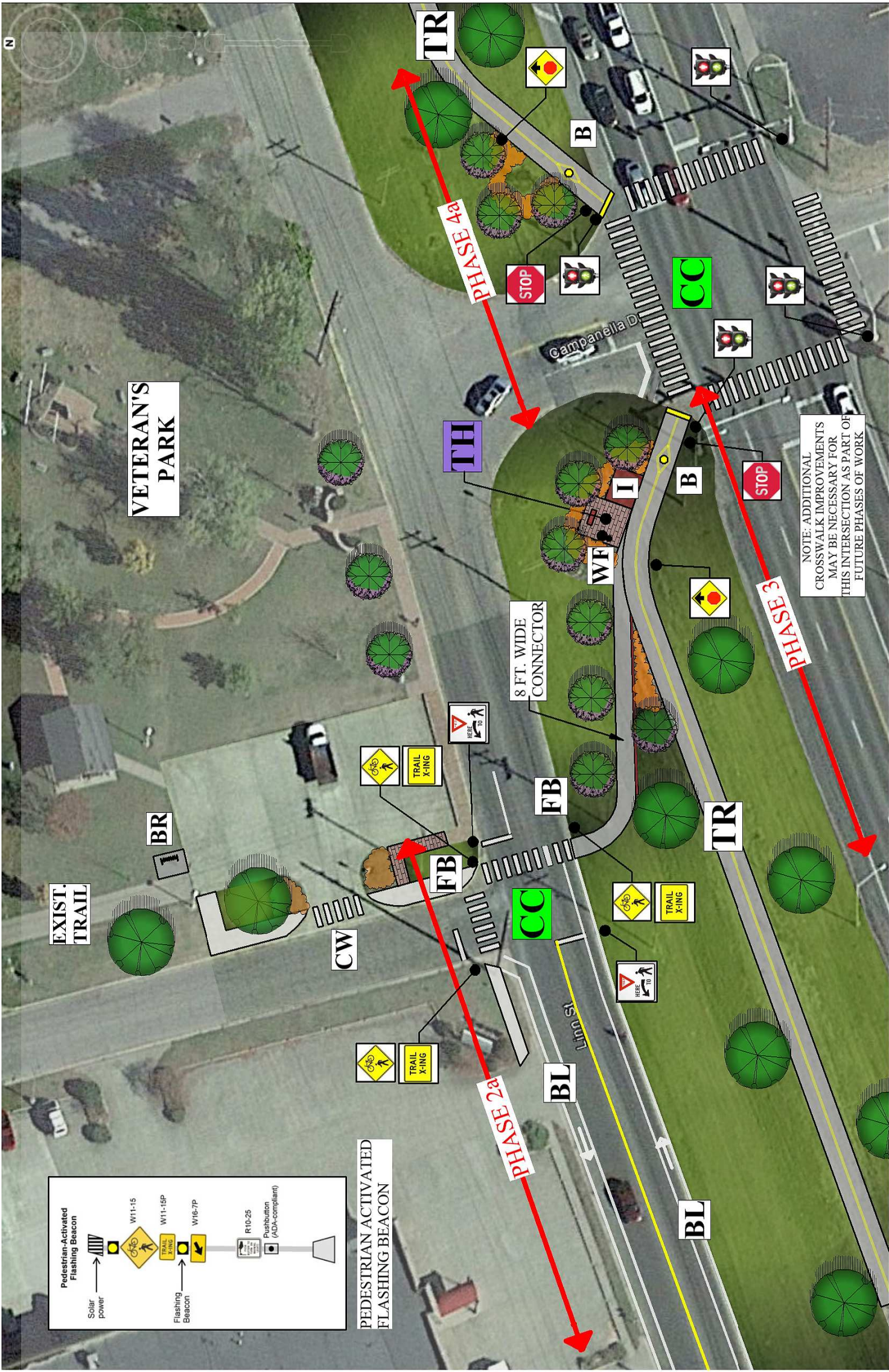
Conceptual Design Details

Sections - Crossings - Design Images

LEGEND/KEY

-  TRAIL ROUTE
-  COLLECTOR ROAD CROSSING
-  PEDESTRIAN CROSSWALK
-  TRAIL BOLLARD
-  TRAILHEAD INFORMATION
-  TRAILHEAD LOCATION
-  PEDESTRIAN CROSSWALK SIGNAL
-  WATER FOUNTAIN/DOG BOWL
-  BIKE RACK
-  OVERSTORY SHADE TREE
-  UNDERSTORY ORNAMENTAL TREE
-  SHRUBS/NATIVE GRASSES & FLOWERS
-  STOP SIGN
-  STOP AHEAD SIGN
-  TRAIL CROSSING SIGN
-  YIELD TO PEDESTRIANS SIGN
-  PEDESTRIAN ACTIVATED FLASHING BEACON
-  BIKE LANE/SHARROW
-  CONTINENTAL CROSSWALK STRIPING

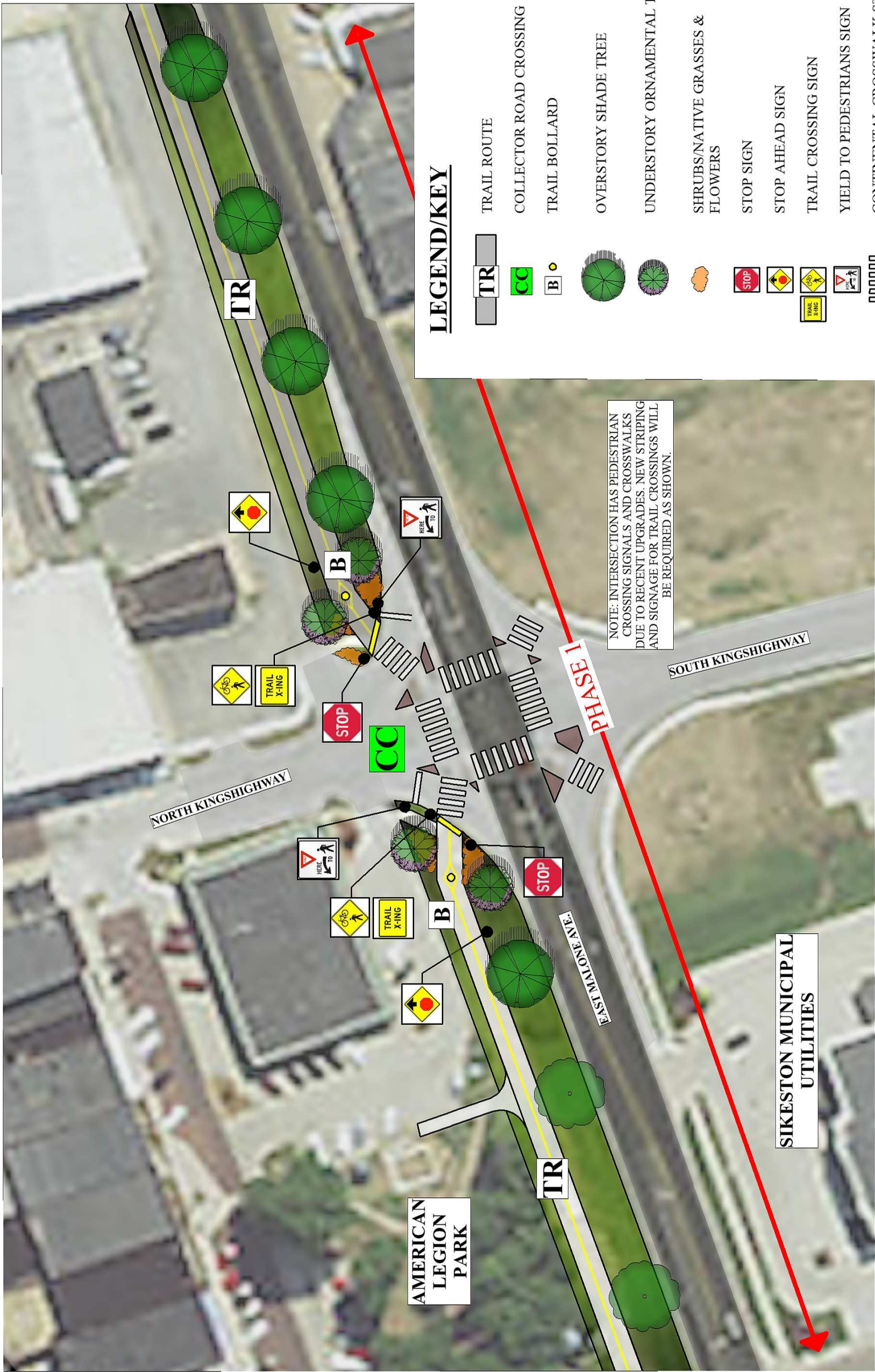
NOTE: ITEMS SHOWN ARE CONCEPTUAL IN NATURE AND ARE SUBJECT TO CHANGE AND DO NOT REPRESENT FINAL RECOMMENDATIONS



SIKESTON RAIL-TO-TRAIL MASTER PLAN

Conceptual Design Details
Veteran's Park - Trailhead/Crossing

January 2017



NOTE: ITEMS SHOWN ARE CONCEPTUAL IN NATURE AND ARE SUBJECT TO CHANGE AND DO NOT REPRESENT FINAL RECOMMENDATIONS



Trail Perspective - Depot/New Madrid Street Crossing

Trail Corridor Landscape Treatments



TYPE 1 - Turf



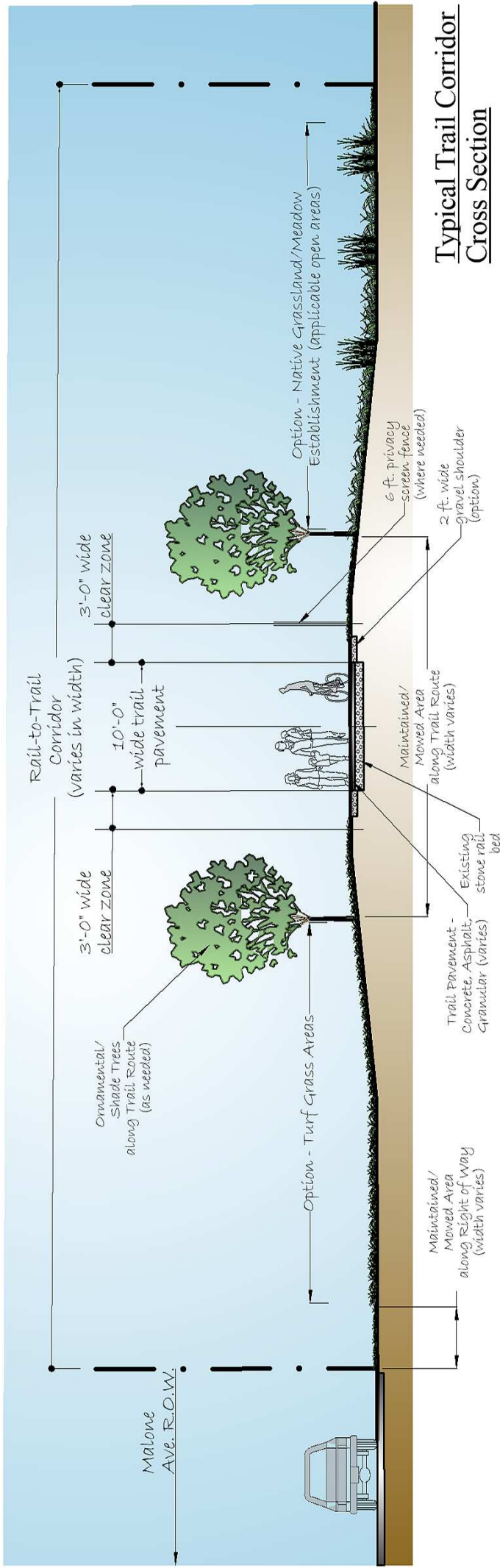
TYPE 2 - Native Meadow/Wildflowers



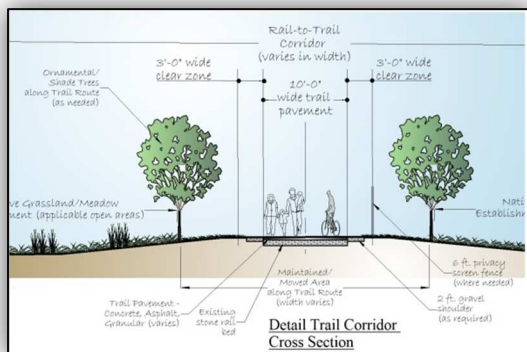
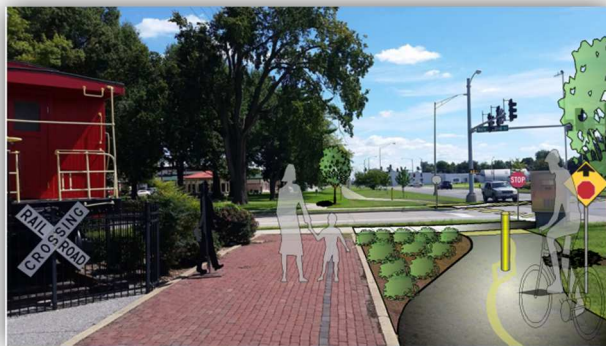
TYPE 3 - High Profile Shrub/Perennial Planting



TYPE 4 - Downtown Streetscape Planting



NOTE: ITEMS SHOWN ARE CONCEPTUAL IN NATURE AND ARE SUBJECT TO CHANGE AND DO NOT REPRESENT FINAL RECOMMENDATIONS



Sikeston Rail to Trail Master Plan

Trail Design and Development Guidelines

Prepared by:
Gateway Design Studio &
The i5 Group

January 9, 2017



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Trail Design and Development Guidelines

The following trail design and development guidelines will address the necessary project criteria essential to implementing The Sikeston Rail-to-Trail Master Plan.

Best Practices

Well designed and built trails, sidewalks, and on-street treatments are significant to any trail users means of connection within a community. Proper planning and details make all the difference between a successful trail facility and an expensive mistake. It is important that City of Sikeston and potential contractors be familiar with the implementation in pedestrian facilities and trail design/construction as each phase of the project is constructed.

Trails

The Sikeston Rail-to-Trail project is an important means of further developing an active community within the City of Sikeston. Many trails today serve as recreation and fitness corridors where citizens use the system to walk, bike and jog. It is the intent that this trail will not only serve for recreation and fitness purposes but also begin to develop and spread throughout the city, serving as an off road transportation means for those who live, work or shop along the trail system. The goal is to allow users to become comfortable commuting on the trail in order to reduce the need for vehicular transportation and help residents to live a healthier lifestyle. Some of the following recommendations are referenced from the [Rails to Trails Conservancy](http://www.railstotrails.org) website (www.railstotrails.org) and [The Manual on Unified Traffic Control Devices](#) (MUTCD) is provided as general guidelines for the purpose of providing direction and recommendations for this Master Plan. The ideal trail system provides a safe place for recreation and a functional option for those who use non-motorized transportation.

Trail Materials

As the popularity of trails grows, many cities are faced with a variety of decisions regarding trail design. Municipalities must balance the initial cost of development and the long-term maintenance cost with the goal of providing the best service in the most cost-effective manner possible. The following are three common types of trail pavement materials proposed for this project.

Crushed Stone

Crushed stone is popular as a trail surface because it holds up well under heavy use and can complement the aesthetic of the natural landscape. It can also accommodate nearly every trail user (with the exception of inline skaters) if crushed and compacted properly. Because crushed stone can be made of nearly any type of rock, including limestone and sandstone, it is one of the most accessible trail surface types. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

In this case the Rail-to-trail corridor can take advantage of the existing stone base of the railroad bed and add a layer of crushed stone gravel (3/8" minus) on top with minimal expense. Typically a profile of 4-6 inches of material on top of the rail bed is recommended. Note that gravel trails might create issues with weather related rain and snowfall due to the loose nature of the material and some year-round maintenance requirements. Gravel trails provide the least expensive means to implement a trail system and many users prefer the natural appearance and feel to the material. Savings compared to asphalt is roughly half of the cost depending on the conditions and use.

Asphalt

Asphalt works well for bicycle commuters and inline skaters, which is a reason it is often used in urban areas. It also requires regular, minor maintenance such as crack patching, yet has a life expectancy of 7 to 15 years. Asphalt is a flexible surface that requires uses to remain pliable and will last longer with heavy use. However, those installing asphalt should be conscious of the possibility of environmental contamination during construction. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

Due to seasonal cracking and deterioration over time, the asphalt trail does require ongoing maintenance in order to sustain a usable surface. It is recommended that a well compacted crushed stone base of minimum 4 inches be installed with a wearing course of 2-1/2 inches asphaltic concrete be placed on top.

NOTE: The stone base and asphalt thickness may be subject to change pending further engineering and geotechnical investigation depending on the existing soil conditions encountered for the trail.

Concrete

Concrete is usually the longest lasting of the hard surface materials, but it is also one of the most expensive. Well-maintained concrete can last 25 years or more. The surface is appropriate for urban areas with severe climate swings and a susceptibility to flooding. However, the hard surface is taxing on runners' lower limbs, and is thus unpopular with that significant user group. Adjacent soft-surface treads can accommodate runners where concrete is necessary for the main trail. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

Concrete is recommended along the more heavily used sections within the downtown district specifically near the Sikeston Depot Museum as part of Phase 1. Typically concrete may cost approximately two times more than asphalt but with the savings in maintenance, labor, and materials the life expectancy and return on investment is greater. Concrete trails are recommended to be constructed with a 4 inch base of crushed stone installed with a minimum 3000 psi, 4 inch layer of concrete cast-in-place with reinforced welded wire fabric. As with the asphalt trail, the thickness of the stone base and concrete may be subject to change pending further engineering and geotechnical investigation.

Sidewalk Width and Material

All sidewalks as part of the trail system and within Right of Ways should be the minimum width of 5 feet regardless of location and roadway classification. This width provides adequate room for pedestrians and those with disabilities to pass. In some cases areas which require increased pedestrian traffic and/or where people may gather, the width of the sidewalk may need to be increased to accommodate the specific condition and surroundings.

As with the trail concrete surfacing; sidewalks are recommended to be constructed with a 4 inch base of crushed stone with a minimum 3000 psi, 4 inch layer concrete cast in place with reinforced welded wire fabric.

Trail Design Criteria for User Type

This multi-use trail project has the potential to attract a varied group of users who are anticipated to walk, jog or bicycle. The goal is to accommodate them all. In the case of this master plan study; permitted uses determined during the planning phase include walking, jogging, bicycling and inline skating. Good trail design balances the needs of the users with the distinctive characteristics and objectives of the project. The following are some guidelines pertaining to the width of the trail sections and the trail users.

Width

The American Association of State Highway and Transportation Officials' (AASHTO) design guidelines provides standards for multi-use trail widths. AASHTO recommends a minimum of 10 feet for multi-use trails; however, where heavy use is anticipated, a 12 to 14-foot width is recommended.

Occasionally, providing separate, parallel paths (or treads) for different users may be desirable. For example, a primary, hard-surfaced path can be provided exclusively for bicyclists, with softer shoulders set aside for pedestrians. Single

shoulders should be at least 5 feet wide, while dual shoulders (one on each side) should be between 2 and 2.5 feet wide. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

In the case of this project all main trail sections are to be designed to a minimum 10 foot width. Connection paths to the trail may include sidewalks which previously were mentioned as to be a 5 foot minimum width. Where possible the hard surface trail should provide soft gravel shoulders on both sides as an option. The following are some additional guidelines; (Refer to Appendix C, Page 29)

- (8) Eight feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic circumstances.
- (10) Ten feet is recommended in most situations and will be satisfactory for moderate to heavy use.
- (12-14) Twelve to fourteen feet is recommended for heavy use situations with high concentrations of numerous users. A separate track (5' minimum) can be provided for pedestrian use.

Lateral Clearance

- A (2) two foot or greater shoulder on both sides of the path should be provided. An added foot of lateral clearance (total of 3 feet) is required by the MUTCD for the installation of signage or other furnishings.
- If bollards are used at intersections and access points, they should be colored brightly and/or enhanced with reflective materials to be visible at night. (See Page 13)

Overhead Clearance

- Clearance to overhead obstructions should be 8 feet minimum, with (10) ten feet recommended.

Striping

- When striping is required, use a (4) four inch dashed yellow centerline stripe with (4) four inch solid white edge lines. (See Page 17)
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

Types of Trail Users

In addition to trail width, accommodating the many users of a multi-use trail requires planning for surface type, vertical clearance and trail amenities. Some uses may seem incompatible with the desired design and feel of the trail; however, when properly planned, trails can effectively accommodate a variety of users.

Pedestrians

Pedestrians include walkers, hikers, joggers, runners, bird watchers and dog walkers. These users tend to have fewer design requirements than other users. Most prefer softer surfaces (such as rubber, mulch or crushed stone) to lessen impact on their knees, though some users, such as power walkers and those pushing strollers, may prefer more compact surfaces. The minimum recommended vertical clearance for pedestrians is 8 feet.

Benches, drinking fountains, shaded rest areas and restrooms are valuable amenities to pedestrians. Where dogs are permitted, consider providing dog-friendly drinking fountains, bag dispensers and trash bins to encourage people to pick up after their dogs. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

It is recommended that most of the trail surface be constructed of hard surface to accommodate a variety of users. The exception is crushed stone surfacing located at the outer western and eastern sections of the trail system due to cost factors. Trail amenities such as benches, drinking fountains and rest areas are to be located at the trail head locations as depicted on the plans.



Bicyclists

Bicyclists fall into a number of subcategories, including recreational, commuting and touring. The AASHTO's Guide for the Development of Bicycle Facilities is viewed as the national standard for bikeway design which requires guidelines for trail projects receiving federal or state transportation funds.

Bicyclists generally prefer hard surfaces and require a vertical clearance of at least 8 feet, with 10 feet needed for overpasses and tunnels. Adequate sight distances for cyclists are critical for user safety; AASHTO recommends that multi-use trails provide a minimum sight distance of 150 feet. Ideal grades over long distances for bicyclists are less than 3 percent (typical for former railroad corridors), although up to 5 percent is acceptable. In addition to the amenities suggested for pedestrians, bicycle racks and bicycle lockers located at transit nodes or places of employment are recommended. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

It is anticipated that the majority of bicyclists will be recreational users with some possibly commuting. The requirements for cyclists will be critical in the design of the trail system in order to allow for both safety and enjoyment. Design of the crossings at major intersections will be critical in order to assure adequate sight distance and proper signalization is provided for both bicyclists and pedestrians.

Inline Skaters

Paved multi-use trails that accommodate pedestrians and bicyclists are likely to attract inline skaters as well. Inline skaters require the same trail width (minimum of 10 feet) and hard surfaces as bicyclists and the same vertical clearance as pedestrians (8 feet). Consider locating benches at trailheads to facilitate changing in and out of skates. (Source: Rails-to-Trails Conservancy)



RECOMMENDATIONS:

Though not anticipated to be a large user group; it is possible that some inline skaters might be using this trail system. It is expected that they will mostly be using the hard pavement sections of the trail and likewise will be requiring the same safety measures designed for pedestrians and cyclists for intersection crossings and signalization.

Accessibility

Accessibility is an important part of trail development, because it is key to ensuring that trails are available to all groups, including the young, elderly and people with disabilities. Because trails are transportation and recreation facilities, accessibility is mandated by the federal Americans with Disabilities Act of 1990 (ADA), which requires certain design standards for facilities to be in compliance with the law. ADA compliance is important to keep in mind as a trail enters the design and construction phases.

New trails and those undergoing rehabilitation must be in compliance with the 2010 ADA Standards for Accessible Design, which determine width, surface, slope and other factors. Federal and federally funded facilities must also be in conformance with the Uniform Federal Accessibility Standards.

In 2013, the Access Board announced that it will supplement its rulemaking on public rights-of-way to include shared use paths—pedestrian and bicycle facilities designed for recreation and transportation that are physically separated from roadways (many rail-trails are considered shared use paths). The Board proposes to apply forthcoming guidelines to shared use paths to ensure these facilities are accessible to and usable by individuals with disabilities. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

Accessibility will be a critical component to the development of this trail system. Connections to the trail sections will require full compliance to ADA requirements for trail users to navigate. Since the majority of the trail sections are flat due to the existing rail bed; this condition will allow for minimal design modification providing ideal conditions for those with disabilities to use the trail. Careful planning will be necessary for accessibility to key areas which include designated trailheads and the Sikeston Depot Museum.

Crossings

The design of crossings will be one of the most important components of the trail design. Safety, in particular, will be a priority when designing a crossing, since there is potential for conflict between wide varieties of users. Three types of crossings are addressed as part of the planning of this trail system: midblock, adjacent path and complex. These crossings can include public roadways, private driveways and railroads.

Midblock Crossings



This type of crossing is the simplest and most common, and it involves a trail crossing a roadway or railroad when there are no other adjacent intersections or crossings. There are two types of midblock crossings: perpendicular crossings, which occur when the trail and the roadway intersect at right angles, and skewed crossings, which occur most often when the trail and the roadway intersect at an angle. Skewed crossings usually require a swerve in the trail path so that the trail crossing is perpendicular to the roadway. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

Several midblock crossings exist along the trail system. Careful attention must be given in order to allow for clear visibility. In some cases there may be skewed crossings in which the trail alignment will need to be modified in order to intersect at a right angle. Signalization may be required such as a **Rectangular Rapid Flash Beacons (RRFB)** at specific types of crossings and intersections. These warning signs and lights have been found to increase motorist compliance to crosswalks from 18% to 88%. RRFB are recommended at “uncontrolled intersections” meaning that the right of way is not regulated in either direction by a signal or sign.

Adjacent Path Crossings

These crossings occur most often when a trail, running parallel to a roadway, crosses an existing roadway intersection. Due to the presence of turning vehicles, this type of crossing presents more challenges than a midblock crossing. Appropriate signage, traffic signals and distance between the roadway intersection and the trail crossing often play important roles in the design of adjacent path crossings. (Source: Rails-to-Trails Conservancy)



RECOMMENDATIONS:

Several critical intersection crossings will need to be addressed as part of this trail system. Most notably are major intersection crossings located at New Madrid, Kingshighway, Main Street and West Street. Signage will be necessary for all crossings notifying the user of the approaching intersection. Signalization will be dependent upon the type of intersection. For major intersections it is recommended that pedestrian type signals be installed with call buttons which are sequenced with the traffic lights.

Complex Crossings

This category acts as a catch-all for most crossings that cannot be categorized as midblock or adjacent path crossings. Due to the nonstandard challenges these crossings often present, the AASHTO guide instructs engineers to treat these crossings on a case-by-case basis.

One of the advantages of using a trail is that it provides a dedicated right-of-way that minimizes interactions with vehicles and signalized intersections. An important consideration to remember when designing a trail crossing is that many trail users, especially cyclists desiring to maintain momentum, may have a low tolerance for long delays at crossings. In addition, children using the trail may not be aware of traffic rules. Crossings should also be ADA accessible so they can be used by all trail users. (Source: Rails-to-Trails Conservancy)

An example of a complex crossing would be at the connection point to the existing Veteran's Park and the existing trail to the recreation complex. This crossing will require a spur off the main trail which will tie into a perpendicular intersection at Lynn Street with a RRFB signal.

Railroad Crossings

Railroads present a significant barrier and early coordination is critical to the success of a trail project. As a note, an example at grade railroad crossing is the sidewalk located along West Salcedo Road.



RECOMMENDATIONS:

Complex crossings for this trail system likely will include the existing railroad crossing west of town as part of Phase 2B development. This crossing is unique in that it will require further design and coordination with the railroad authorities and MODOT in order to meet the necessary compliance and safety requirements. Early discussion with the noted agencies will be necessary during the planning and design of this trail section in order to assure that a crossing is reviewed and approved in order to continue the trail system westward. With all interactions allow at least 12 months for railroad reviews and permitting.

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.

(Source: KC Trail Master Plan 2008)

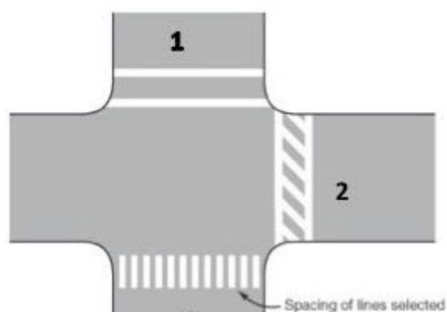
Crossings as Rest Areas

Depending on the crossing and the nature of the roadway being intersected, crossings can act as rest points. Having rest areas at crossings where people can stand or sit will also alert drivers of pedestrian and cyclist activity in the area, encouraging them to slow down and create a safer environment for all. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

Several noted trailheads are located near or adjacent to crossings along the trail system and are intended to be designed rest areas. While these nodes along the trail serve as rest points; they will also act as indicators for motorists to recognize crossings at these locations. Key trailhead locations are located at Main Street and Veteran's Park which are adjacent to major intersection crossings.

Crosswalk Striping



Credit: Federal Highway Administration

The thermoplastic striping used to demarcate a crossing on a roadway is one of the most important design considerations at intersections. While standard crosswalk markings such as zebra, parallel-line or hybrid "ladder" crossings are effective at alerting drivers to crossing traffic, standard crosswalks along a multi-use trail often leave a gray area.

Instead of striping a standard crosswalk, some trails use nonstandard crosswalk patterns in locations where cyclists are expected to ride across a roadway instead of dismounting and walking across it. One example is where crossings are marked with parallel dashed lines instead of parallel solid lines. Nonstandard striping indicates to drivers and trail users that the crossing is different than a standard crosswalk. Crossings are typically striped by the

road's managing agency, usually a local or state department of transportation or public works. Any provision for nonstandard striping or any striping at all must be made with the managing agency. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

While there are variations of crosswalk markings, three are mentioned below (see diagram to the left):

1. Two transverse lines
2. Zebra stripe
3. Continental stripe.

Striping for marked crosswalks are vital for trail mobility and safety since it indicates to users that the location is safe and they have the right-of-way in that area. Studies have shown that motorists will respond to noted crosswalks when properly installed.

The "Two transverse lines" are the least visible of the three crosswalk types and are not recommended in this case. It is recommended that either the "zebra" or the "continental" stripe design be used, especially for mid-block and major intersection crossings. Crosswalks located in situations known as "midblock" are where there is not a signalized intersection nearby and that vehicular traffic will only stop at the crosswalk if a pedestrian or bicyclist is crossing. These types of crosswalks require particular attention to best practice applications.

Alerting Drivers and Trail Users to a Crossing

An important issue when designing a crossing is ensuring that drivers, who control the fastest and heaviest vehicles involved in the crossing, are aware of the presence of trail users. The first and most obvious tool is signage, both on the intersecting road and along the trail itself, to warn road and trail users of an upcoming crossing.

Signage is not the only, or often the best, way to create safer crossings. The [Manual on Uniform Traffic Control Devices \(MUTCD\)](#) states that "the use of warning signs should be kept to a minimum, as the unnecessary use of warning signs tends to breed disrespect for all signs." In addition to signs, pavement treatments and other more permanent traffic-calming measures on both the road and the trail are alternative methods to improve driver and trail user recognition of crossings.

On the road, different pavement treatments, including coloring or special materials, can alert drivers. If a more drastic change is necessary, speed tables or speed humps can be used as traffic-calming measures near trail crossings. When considering textured pavements or traffic calming, be sensitive to the needs of trail users.

Another option to reduce speed at crossings is the use of medians, both on the trail and on the intersecting roadway. Low medians on a trail can narrow the pathway as it approaches a crossing, forcing trail users to slow down while still allowing access for emergency vehicles. Medians on the intersecting roadway can reduce the speed of crossing automobiles and provide a refuge for trail users as they cross a street. (Source: Rails-to-Trails Conservancy)

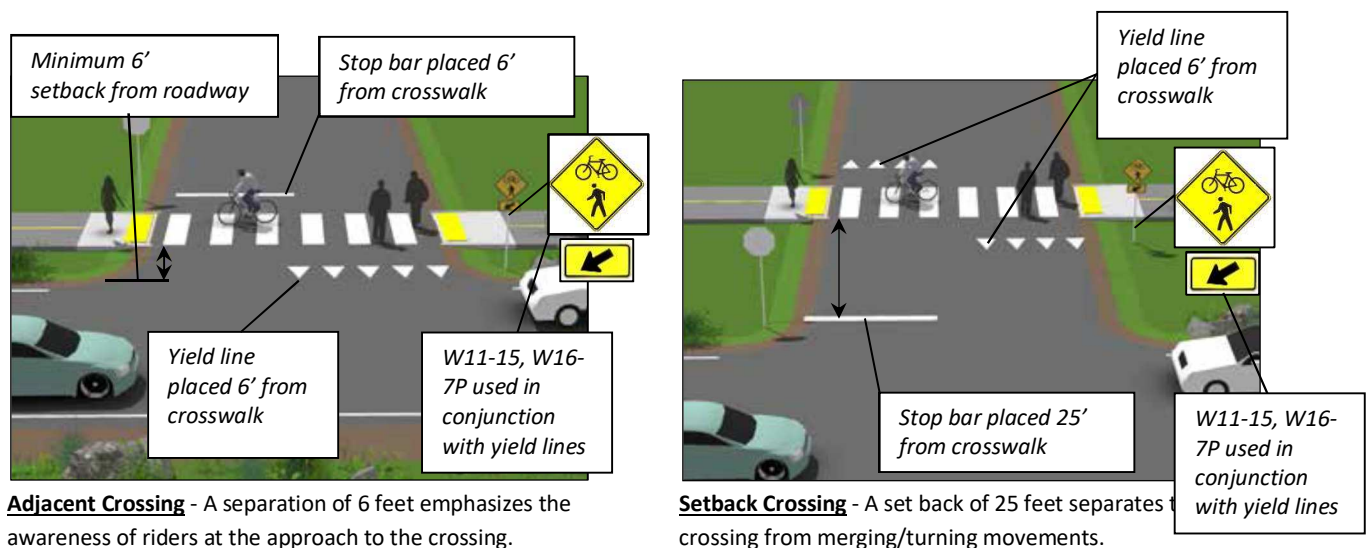
RECOMMENDATIONS:

Visible crossing indicators for both motorists and trail users are critical and recommended at all designated locations noted on the plans. In the case of high use traffic areas; signage, pavement marking and medians may be necessary. Other areas will require at a minimum signage and pavement marking designating approaching crosswalks as part of the trail system.

Shared-Use Paths along Roadways

Shared Use Paths along roadways, also called Side-paths, run adjacent to a street. Because of operational concerns it is generally preferable to place paths within independent rights-of-way away from roadways. However, there are situations where existing roads provide the only corridors available.

Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path. The AASHTO Guide for the Development of Bicycle Facilities cautions practitioners of the use of two-way side-paths on urban or suburban streets with many driveways and street crossings. In general, there are two approaches to crossings: adjacent crossings and setback crossings, illustrated below.



(Source: LaFourche Multiuse Path Master Plan & Feasibility Study)

RECOMMENDATIONS:

The establishment of a shared use path adjacent to a road is not a substitute for the provision of on-road accommodation such as paved shoulders or bike lanes, but may be considered in some locations in addition to on-road bicycle facilities. To reduce potential conflicts in some circumstances, it may be better to place one-way side-paths on both sides of the street.

- Regulation for side-paths should follow that for general design practices of shared use paths.
- A high number of driveway crossings and intersections create possible conflicts with turning traffic. Consider alternatives to side-paths on streets with a high incidence of intersections or heavily used driveways.
- Where a side path terminates special attention should be given to transitions so as not to encourage unsafe wrong-way riding by bicyclists.
- Crossing design should give emphasis to visibility of users and clarity of likely yielding behavior. Crossings may be STOP or YIELD controlled depending on sight lines and bicycle motor vehicle capacities and speeds.

(Source: LaFourche Multiuse Path Master Plan & Feasibility Study)

Additional References and Guidelines

- AASHTO. Guide for the Development of Bicycle Facilities. 2012.
- NACTO. Urban Bikeway Design Guide. See entry on Raised Cycle Tracks. 2012.

On-Street Connector Design Standards

The Master Plan recommends several options as part of Phase 2 and 3 which include “Sharrows” or “Bike Lanes” to be implemented in order to accommodate trail users along Lynn Street between Main Street to Pine Street and further connecting to Veteran’s Park. These potential on-street routes were identified for their light to moderate traffic loads, moderate speeds and continuity the trail system to other trail and park facilities. All on-street connectors should provide pedestrian accommodations (min. of 5 ft. wide sidewalk) and an on-street bicycle facility. Bike lanes or sharrows should be a minimum 5 ft. wide in a one way direction. Sharrows should be clearly marked with striping, signs and bike logos to properly indicate the lane for bicyclists and motorist. Shared lane markings are to be MUTCD compliant. (Refer to Appendix D, Figure 9C-3)



Credit: Kansas City Trail Master Plan

Trail Amenities

As the trails are developed and used, amenities such as benches, trash receptacles, drinking fountains, educational or historical signage will be necessary to install. In order for users to learn and navigate the trail system wayfinding and signage will be critical. Other amenities such as fitness equipment could be added in the future to enhance the trail experience.

Signage and Wayfinding

Trail information signs are proposed in order to display the trail system and trailhead locations but also to provide City Park and Recreation news and activities. These kiosk type signs are to be clearly located at the trailheads and key entrances. In addition, interpretive signs may be planned for special locations along the trail such as the historical Sikeston Depot or the Sikeston Historical Homes walking tour. Other directional signs are to be located throughout the trail for orientation and information to trail users. Signage should be readily visible, consistent in design and intended to enhance the trail experience.



RECOMMENDATIONS:

(Source: MUTCD “2009 Edition” with Revision Numbers 1 and 2 incorporated, dated May 2012 – Part 9 Traffic Control for Bicycle Facilities)

Reference: Section 9B.01 Application and Placement of Signs (See Appendix D for illustrations)

Standard:

- Bicycle signs shall be standard in shape, legend, and color.

- All signs shall be retro-reflectorized for use on bikeways, including shared-use paths and bicycle lane facilities.
- Where signs serve bicyclists and other road users, vertical mounting height and lateral placement shall be as provided in Part 2.
- Where used on a shared-use path, no portion of a sign or its support shall be placed less than 2 feet laterally from the near edge of the path, or less than 8 feet vertically over the entire width of the shared-use path (see Figure 9B-1).
- Mounting height for post-mounted signs on shared-use paths shall be a minimum of 4 feet, measured vertically from the bottom of the sign to the elevation of the near edge of the path surface (see Figure 9B-1).
- *Signs for the exclusive use of bicyclists should be located so that other road users are not confused by them.*
- *The clearance for overhead signs on shared-use paths should be adjusted when appropriate to accommodate path users requiring more clearance, such as equestrians, or typical maintenance or emergency vehicles.*

Reference: Section 9B.02 Design of Bicycle Signs (See Appendix D for illustrations)

Standard:

- If the sign or plaque applies to motorists and bicyclists, then the size shall be as shown for conventional roads in Tables 2B-1, 2C-2, or 2D-1.
- The minimum sign and plaque sizes for shared-use paths shall be those shown in Table 9B-1, and shall be used only for signs and plaques installed specifically for bicycle traffic applications. The minimum sign and plaque sizes for bicycle facilities shall not be used for signs or plaques that are placed in a location that would have any application to other vehicles.

Option:

- Larger size signs and plaques may be used on bicycle facilities when appropriate (see Section 2A.11).

Site Furniture and Accessories

Site furniture planned for this project consists of benches, trash receptacles, bollards and bike racks. These elements are important to the trail system in providing users a place for rest, waste disposal, controlled access and security of their bikes.



RECOMMENDATIONS: At a minimum bench seating and trash receptacles are to be provided at all trailhead locations. Additional items may include bike racks for users to lock their bikes while visiting the downtown district or other off-trail points of interest. Painted steel bollards are to be placed at all trail and roadway crossings.



Trailheads

Four main trailhead locations are proposed as part of the trail system; they include the Sikeston Depot Museum, Main Street Intersection, Veteran's Park connection and at West End Park. The Sikeston Depot is to serve as the main trailhead site for visitors to park and use the trail. These trailheads serve as important places for orientation/wayfinding and rest for users of the of the trail system.

RECOMMENDATIONS: Trailheads are to be developed with amenities such as special pavement and landscaping for improved enhancement of these significant areas.

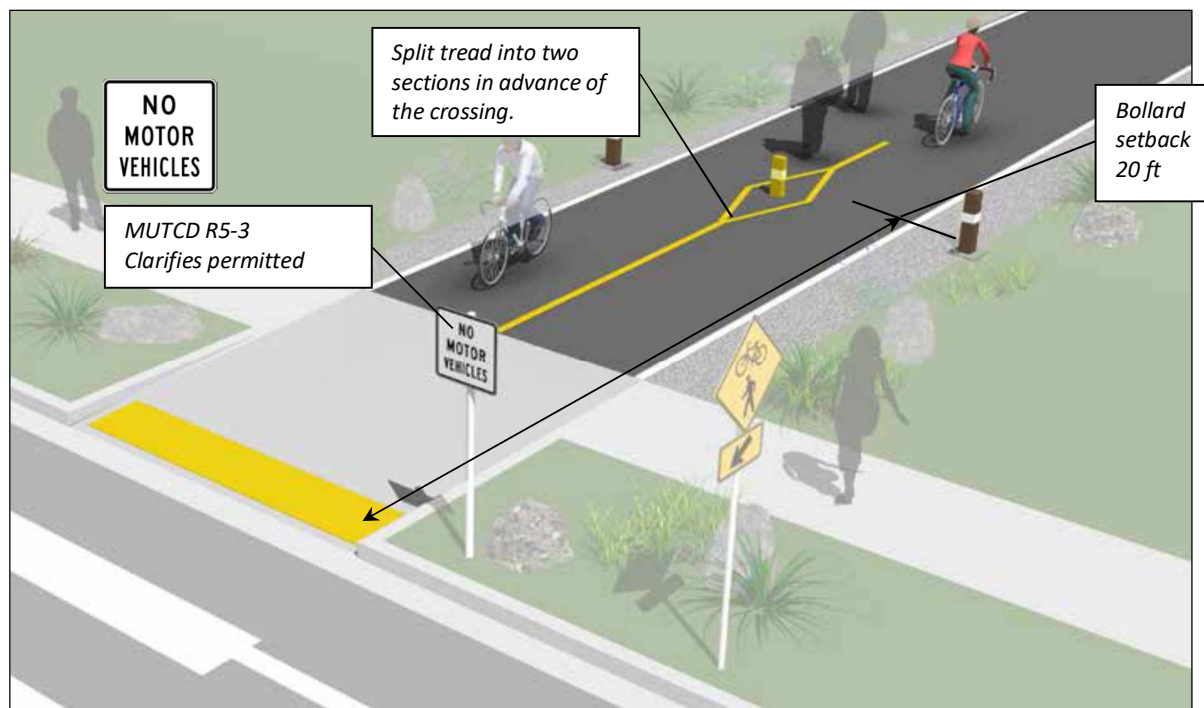
Further use of interpretive or historical signage may be incorporated in order to offer an educational component.

Bollards

Bollards are physical barriers designed to control motor vehicle access to trails. Sometimes physical barriers are still ineffective at preventing access, and can create difficulties to legitimate trail users. Alternative design policies use signage, landscaping, and curb cut design to reduce the possibility of motor vehicle access. Bollards are effective in stopping unauthorized motor vehicle entry and should be used at all major access points and trail heads.

RECOMMENDATIONS:

- Bollards should be a minimum height of 40 inches and a minimum diameter of 4 inches.
- Bollards should be set back from the roadway edge a minimum of 20 feet.
- When more than one post is used, an odd number of posts spaced 6 feet apart are recommended.
- Posts should be permanently reflectorized for night time visibility and painted a bright color for improved daytime discernibility.
- Striping an envelope around the post is recommended.
- Lockable, removable bollards allow entrance by authorized vehicles. Where used, the top of the mount point should be flush with the path surface.
- “No Motor Vehicles” signage (MUTCD R5-3) may be used to reinforce access rules.
- Vertical curb cuts ought to be used to inhibit motor vehicle access.
- Consider specific surveillance and enforcement equipment at specific intrusion sites.



(Source: LaFourche Multiuse Path Master Plan & Feasibility Study)

Pre-existing Railroad Bridges



Several railway trestles constructed of timber and steel exist along the trail corridor and appear to be in poor condition. A structural evaluation will help determine the condition of the existing footings or piers that support these structures, the trestle superstructure and its approaches. It is important to note that the live load for the future trail will be substantially less than that which the trestle was built to support. Reducing the live-load rating could result in a different evaluation of the bridge's capacity and capability. However, it is anticipated that none of the existing

railroad trestles or bridges can be used for this project unless determined by further structural analysis. It is recommended that a structural engineer be procured before completing any future bridge designs.

Bridge Design

For new bridges, the selection of type and design is often driven by the type of foundation best suited to the site, given local soils, the span for the bridge and load-bearing requirements. A bridge on a multi-use trail should be able to support at least 12,500 pounds. Its superstructure can be made of wood, metal, concrete, high-strength metal alloys, steel cable or

rope, while its decking can be made of wood or concrete poured over corrugated metal. The decking of a biking/pedestrian bridge should be durable and non-slip. If the chosen decking is treated wood planks, they should be laid perpendicular to the trail to prevent bike tires from catching on an edge and throwing the bicycle off balance. Bridge widths should, at a minimum, match the width of the trail. To allow use by emergency vehicles, the bridge should be at least 10 feet wide. Typical railing height for bridges is 42 to 48 inches. Sight lines onto the bridge should be free of obstructions, and the approach to the bridge should be wider than the trail to accommodate potential congestion on and near the bridge. (Source: Rails-to-Trails Conservancy)

Prefabricated Bridges

Constructed from wood, steel, high-strength metal alloys or concrete, “prefab” bridges have several advantages, including low cost, minimal disturbance to the project site and, usually, simple installation that requires minimal skill and expertise. In addition, the bridge can be manufactured in advance of other construction. (Source: Rails-to-Trails Conservancy)

RECOMMENDATIONS:

It is recommended for this project that all new bridges for the trail system be constructed of pre-fabricated steel and designed to accommodate the specific location and ditch crossing along the corridor. There are three crossings as part of the trail system which will need new bridge structures; two of the bridges are located along the eastern portion of town and a possible single bridge crossing along the western section of the trail as part of Phase 4. Careful planning will be necessary to assure that the design meets or exceeds the minimum criteria for live loads, decking material, railing height, width and approaches to the bridge in order to assure safety for trail users.

Landscape Improvements

It is important that the design of the landscape along the trail system provide attractive seasonal color, shade opportunity and openness for security reasons. Below are descriptions of four landscape types which would be developed along the trail corridor as each phase is implemented.

Type 1 Landscapes – Turf with Trees



This type landscape consists of primarily turf grass with some trees along the trail; typically a more maintained landscape area emphasizing open space and minimal planting. Turf grass could be installed as sod or seed primarily of a Turf-type Fescue blend. Trees could be either over-story shade trees or ornamental flowering.

Type 2 Landscapes – Native Meadow/Wildflowers

This type landscape would comprise of native meadow grasses and natural preservation of existing vegetation that is deemed valuable to the existing environment. Landscape treatment in this area would include introduction of native grasses and wildflowers in certain areas over a period of time. Maintenance is minimal with mowing perhaps 2-3 times a year as this landscape would be more sustainable.



Type 3 Landscapes – High Profile Areas



Type 3 landscape would consist of landscape development of high profile areas with shrubs and perennials in addition to ornamental trees. Areas would include trail heads, major intersections and crossings. Shrubs would be a variety of flowering and evergreen types that are native or drought tolerant. Perennials and ornamental grasses would be native or hardy for Southeastern Missouri. Regular maintenance of mulching, weed control, watering for these areas would be required in order to assure the landscape is kept attractive and sustainable.

Type 4 Landscapes – Downtown Streetscape Planting

This type landscape comprises of development of the more urban and downtown areas. Plant material would be similar to the Type 3 Landscape for high profile areas but more suited for urban roadways and smaller planting areas. Dwarf shrubs and perennials would be used in planting areas as well as street trees along the trail and adjacent roadway. Plant material should be salt and drought tolerant and massed in designated areas in order to create the most impact and reduce maintenance. Regular maintenance of these areas will be required in order to keep the landscape in a high profile condition.

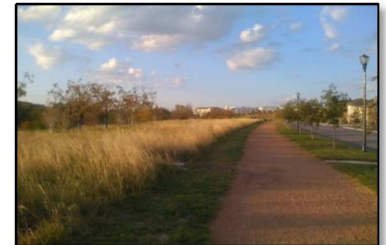


RECOMMENDATIONS:

Proposed landscape improvements include when possible, the use of native trees and shrubs suitable for the region and locally available. Special attention must be made to assure that the landscape materials be low maintenance and drought tolerant to conditions without the need for irrigation. Trees should have a raised branching habit and shrubs must be dwarf or compact in nature. Native perennial flowers and shrubs can be featured for accent seasonal color along the trail, ADA ramps and trailhead locations. Shade trees planted along the trail should be at a minimum size of 2.5 inches in caliper and be spaced 50 to 100 feet apart depending on the location. Ornamental trees should be a minimum size of 2 inches in caliper and spaced a minimum of 20 feet apart. It is recommended that shrubs be at a minimum of 18 inches height and container grown. Perennials and grasses should be at a minimum of 1 gallon container size when planted.

Natural Resource Preservation and Enhancement

Certain portions of the trail corridor can provide for the preservation of existing trees and vegetation based on further evaluation for each specific phase. Preservation and enhancement of open space areas will be a critical factor for development of the trail system. The objective of providing natural resource enhancement is to replace certain unattractive portions of the trail corridor with a more ecologically sustainable and native plant environment for trail users to enjoy and appreciate.



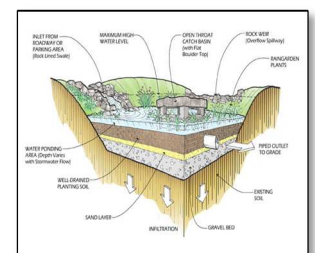
RECOMMENDATIONS:

Trees or plants determined to be dead, in poor condition or undesirable should be removed as required. Enhancement of the trail along the corridor can include establishment of native meadow grasses and wildflower areas suited for more of the open space and flat areas within the right of way. These natural resource areas should focus on establishing native grasses, perennials and forbs found in Missouri.

Other Design Factors

Storm Water Management

Overall the storm water management of this project site is anticipated to be minimal due to the trail being developed primarily along existing conditions of the rail bed. However, plans do conceptually depict a future storm water detention facility for the trail section between Pine and Ingram south of Lynn Street impacting part of the Phase 3 development. Several conceptual options for the trail alignment and storm water facility have been presented for this area as part of the Master Plan. Further study and engineering will be necessary for this section of trail in order to provide a final recommendation.



RECOMMENDATIONS:

If necessary, minor storm management may be implemented on a specific area basis. It is recommended that BMP (best management practices) be followed by providing for the control, treatment and discharge of impacted storm water. This would include the use of bio-swales, rain gardens or small bio-retention basins to mitigate the runoff.

These measures among other things will help regulate the hydrologic cycle, provide nonpoint pollutant treatment, resource conservation, and natural habitat creation.

Trail Markings

(Refer to Appendix D for illustrations)

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012 – Part 9 Traffic Control for Bicycle Facilities)

Reference: Section 9C.01- Functions of Markings

Markings indicate the separation of the lanes for road users; assist the bicyclist by indicating assigned travel paths, indicate correct position for traffic control signal actuation, and provide advance information for turning and crossing maneuvers.

Section 9C.02 - General Principles

Bikeway design guides (see Section 9A.05) should be used when designing markings for bicycle facilities.

Standard:

- Markings used on bikeways shall be retro-reflectorized.

Guidance:

- Pavement marking word messages, symbols, and/or arrows should be used in bikeways where appropriate.
- Consideration should be given to selecting pavement marking materials that will minimize loss of traction for bicycles under wet conditions.

Standard:

- The colors, width of lines, patterns of lines, symbols, and arrows used for marking bicycle facilities shall be as defined in Sections 3A.05, 3A.06, and 3B.20.
- Figures 9B-7 and 9C-1 through 9C-9 show examples of the application of lines, word messages, symbols, and arrows on designated bikeways.

Option:

- A dotted line may be used to define a specific path for a bicyclist crossing an intersection (see Figure 9C-1) as described in Sections 3A.06 and 3B.08.

Section 9C.03 - Marking Patterns and Colors on Shared-Use Paths (Refer to Appendix D, Figure 9C-2)

Option:

- Where shared-use paths are of sufficient width to designate two minimum width lanes, a solid yellow line may be used to separate the two directions of travel where passing is not permitted, and a broken yellow line may be used where passing is permitted (see Figure 9C-2).

Guidance:

- Broken lines used on shared-use paths should have the usual 1-to-3 segment-to-gap ratio. A nominal 3-foot segment with a 9-foot gap should be used.
- If conditions make it desirable to separate two directions of travel on shared-use paths at particular locations, a solid yellow line should be used to indicate no passing and no traveling to the left of the line.
- Markings as shown in Figure 9C-2 should be used at the location of obstructions in the center of the path, including vertical elements intended to physically prevent unauthorized motor vehicles from entering the path.

Option:

- A solid white line may be used on shared-use paths to separate different types of users. The R9-7 sign (see Section 9B.12) may be used to supplement the solid white line.
- Smaller size letters and symbols may be used on shared-use paths. Where arrows are needed on shared-use paths, half-size layouts of the arrows may be used (see Section 3B.20).

Section 9C.04 Markings for Bicycle Lanes (Refer to Appendix D, Figure 9C-3)

Support:

- Pavement markings designate that portion of the roadway for preferential use by bicyclists. Markings inform all road users of the restricted nature of the bicycle lane.

Standard:

- Longitudinal pavement markings shall be used to define bicycle lanes.

Guidance:

- If used, bicycle lane word, symbol, and/or arrow markings (see Figure 9C-3) should be placed at the beginning of a bicycle lane and at periodic intervals along the bicycle lane based on engineering judgment.

Section 9C.07 Shared Lane Marking (Refer to Appendix D, Figure C9-9)

Shared Lane Marking may be used to:

- A. Assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist's impacting the open door of a parked vehicle,
- B. Assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane,
- C. Alert road users of the lateral location bicyclists are likely to occupy within the traveled way,
- D. Encourage safe passing of bicyclists by motorists, and
- E. Reduce the incidence of wrong-way bicycling.

Standard:

- Shared Lane Markings shall not be used on shoulders or in designated bicycle lanes.

Guidance:

- The Shared Lane Marking should not be placed on roadways that have a speed limit above 35 mph.
- If used in a shared lane with on-street parallel parking, Shared Lane Markings should be placed so that the centers of the markings are at least 11 feet from the face of the curb, or from the edge of the pavement where there is no curb.
- If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb.
- If used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter.

Additional References and Guidelines

- AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
- FHWA. *Manual on Uniform Traffic Control Devices*. 2009.
- Flink, C. *Greenways: A Guide to Planning Design and Development*. 1993.

APPENDIXES

APPENDIX A – MASTER PLAN EXHIBITS AND DETAIL PLANS

APPENDIX B – IMPLIMENTATION/PHASING OUTLINE

Sikeston Rails to Trails Master Plan - Phasing Outline

PHASE 1 - Trail Section from Depot Museum to Main Street

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2450	S.Y.	10 ft. wide Asphalt Trail Pavement	Kingshighway to Main Street
7965	S.F.	10 ft. wide Concrete Trail Pavement	Scott Street to Kingshighway
345	S.F.	Concrete Sidewalks/Pads	Am. Legion Park/Main Street
8		Traffic signals, pedestrian signals and callers	Connections
32		Signs, stock, aluminum, reflectorized	at New Madrid Intersection
2		Trail Head Kiosk Sign	at crossings
1		Trail Monument Sign	at Depot Trail Head & Main St.
			East Side Main Street
			Intersection
1		Historical Depot Marker Monument Sign	at Depot Trail Head
12		Metal Pipe Bollards, painted, concrete filled	at crossings
1		ADA Pedestal Drinking Fountain w/Pet Bowl	at Depot Trail Head
1		Water line connection to Drinking Fountain – Assumes nearby water source	at Depot Trail Head
675	L.F.	Ornamental Fencing - 5 ft. High, Metal w/Pickets	Kingshighway to Prairie Ave.
4		Architectural Benches - 6 ft.	at Depot Trail Head
2		Metal Arch. Trash Receptacles - 50 gal.	at Depot Trail Head
1		Bike Rack - 10 ft.	at Depot Trail Head
1		Pavement Marking	at Crossings
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
800	S.F.	Shrubs/Perennials - Landscaping	at Depot Trail Head
55		Trees - 2-2.5" cal. - Landscaping	

PHASE 2a - Option 1: Existing ROW & Connection to Veteran's Park

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2800	S.Y.	10 ft. wide Asphalt Trail Pavement	Main Street to S. Ingram
3050	S.F.	Concrete Sidewalks/Pads	Lynn Street – connection to
			Veteran's Park/Trail Head
2		Traffic signals, pedestrian signals and callers	Main Street Intersection
1		Misc. Curb/Pavement Improvements at Main Street	Main Street Intersection
14		Signs, stock, aluminum, reflectorized	at crossings
1		Trail Head Kiosk Sign	Main Street Trail Head
1		Trail Monument Sign	West Side Main Street Trail
			Head
4		RRFB Crossing w/Signs	Lynn St./Veteran's Park
			Crossing
5		Metal Pipe Bollards, painted, concrete filled	at crossings
1		ADA Pedestal Drinking Fountain w/Pet Bowl	Main Street Trail Head
1		Water line connection to Drinking Fountain - Assumes nearby water source	Main Street Trail Head
1400	LF	White vinyl privacy fence - 8 ft.	Along South side of Lynn St.
2		Architectural Benches - 6 ft.	Main Street Trail Head
1		Metal Arch. Trash Receptacles - 50 gal.	Main Street Trail Head
1		Bike Rack - 10 ft.	Main Street Trail Head
1		Pavement Marking	at crossings
0.6	MILE	Bike Lane/Sharrows	Veterans Park Connection -
			along Lynn Street - S. Ingram
			to Campanella Dr.
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
400	S.F.	Landscaping - Shrubs/Perennials	at Main Street Trail Head
50		Landscaping - Trees - 2-2.5" caliper	

PHASE 2a-Option 2: Lake Street Option

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2300	S.Y.	10 ft. wide Asphalt Trail Pavement	Lillian Dr. to S. Ingram
4200	S.F.	Concrete Sidewalks/Pads	8 ft. wide sidewalk along west side Main St. to Lake Street/Lillian Drive Sidewalk Connection/Trail Head
4		Traffic signals, pedestrian signals and callers	Main St./Lake St. Intersection
1		Misc. Curb/Pavement Improvements at Main Street	Lake Street Intersection
14		Signs, stock, aluminum, reflectorized	at crossings
1		Trail Head Kiosk Sign	at Main St. Trail Head
1		Trail Monument Sign	at Main St. Trail Head
5		RRFB Crossing w/Signs	Lynn St. @ Lillian & Campanella
8		Metal Pipe Bollards, painted, concrete filled	at crossings
1		ADA Pedestal Drinking Fountain w/Pet Bowl	at Main St. Trail Head
1		Water line connection to Drinking Fountain - Assumes nearby water source	at Main St. Trail Head
2		Architectural Bench - 6 ft.	at Main St. Trail Head
1		Metal Arch. Trash Receptacle - 50 gal.	at Main St. Trail Head
1		Bike Rack - 10 ft.	at Main St. Trail Head
1		Pavement Marking	at crossings
1.3	MILE	Bike Lane/Sharrows	Lake Street & Lillian Drive
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
400	S.F.	Landscaping - Shrubs/Perennials	at Main Street Trail Head
50		Landscaping - Trees - 2-2.5" caliper	

PHASE 2a - Option 3: One Way Lynn Street (east bound) and Connection to Veteran's Park

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2770	S.Y.	10 ft. wide Asphalt Trail Pavement	Lillian Dr. to S. Ingram
2550	S.F.	Concrete Sidewalks/Pads	Lynn St./Veteran's Park Connection/Trail Head
1065	L.F.	3 ft. wide Curbed Concrete Median	Lynn Street
14		Signs, stock, aluminum, reflectorized	at crossings
1		Trail Head Kiosk Sign	at Main St. Trail Head
1		Trail Monument Sign	at Main St. Trail Head
5		RRFB Crossing w/Signs	Lynn St. @ Lillian & Campanella
7		Metal Pipe Bollards, painted, concrete filled	at crossings
1		ADA Pedestal Drinking Fountain w/Pet Bowl	at Main St. Trail Head
1		Water line connection to Drinking Fountain - Assumes nearby water source	at Main St. Trail Head
1065	LF	White vinyl privacy fence - 8 ft.	Along South side of Lynn St.
2		Architectural Bench - 6 ft.	at Main St. Trail Head
1		Metal Arch. Trash Receptacle - 50 gal.	at Main St. Trail Head
1		Bike Rack - 10 ft.	at Main St. Trail Head
1		Pavement Marking	at crossings
0.6	MILE	Bike Lane/Sharrows	North Side Lynn Street
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
400	S.F.	Landscaping - Shrubs/Perennials	at Main Street Trail Head
50		Landscaping - Trees - 2-2.5" caliper	

PHASE2a - Option 4: Sharrows and Connection to Veteran's Park

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2770	S.Y.	10 ft. wide Asphalt Trail Pavement	Lillian Dr. to S. Ingram
8575	S.F.	Concrete Sidewalks/Pads	North Side Lynn Street to Lillian
2		Traffic signals, pedestrian signals and callers	Main Street Intersection
1		Misc. Curb/Pavement Improvements at Main Street	Main Street Intersection
14		Signs, stock, aluminum, reflectorized	at crossings
1		Trail Head Kiosk Sign	at Main St. Trail Head
1		Trail Monument Sign	at Main St. Trail Head
5		RRFB Crossing w/Signs	Lynn St. @ Lillian & Campanella
7		Metal Pipe Bollards, painted, concrete filled	at crossings
1		ADA Pedestal Drinking Fountain w/Pet Bowl	at Main St. Trail Head
1		Water line connection to Drinking Fountain - Assumes nearby water source	at Main St. Trail Head
1065	LF	White vinyl privacy fence - 8 ft.	Along South side of Lynn St.
2		Architectural Bench - 6 ft.	at Main St. Trail Head
1		Metal Arch. Trash Receptacle - 50 gal.	at Main St. Trail Head
1		Bike Rack - 10 ft.	at Main St. Trail Head
1		Pavement Marking	at crossings
1	MILE	Bike Lane/Sharrows	Lynn St. East & West Bound
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
400	S.F.	Landscaping - Shrubs/Perennials	at Main Street Trail Head
50		Landscaping - Trees - 2-2.5" caliper	

PHASE 2b - Trail section from Depot Museum to Roberta Rowe/West-End Park

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
5955	S.Y.	10 ft. wide Asphalt Trail Pavement	Scott St. to Sunset Drive
3500	S.F.	Concrete Sidewalks/Pads	Sidewalks at West side of Scott St. & East side of Stoddard/ Westend Park Trail Head
4		Traffic signals, pedestrian signals and callers	West Street Intersection
1		Misc. Curb/Pavement Improvements	West Street Intersection
1		Railroad Crossing	
23		Signs, stock, aluminum, reflectorized	at crossings
1		Trail Head Kiosk Sign	West-End Park Trail Head
1		Trail Monument Sign	West-End Park Trail Head
2		RRFB Crossing w/Signs	Scott Street crossing
15		Metal Pipe Bollards, painted, concrete filled	at crossings
1		ADA Pedestal Drinking Fountain w/Pet Bowl	West-End Park Trail Head
1		Water line connection to Drinking Fountain - assumes nearby water source	West-End Park Trail Head
1400		White vinyl privacy fence - 8 ft.	North side of corridor from Olive St. to Railroad Crossing
2		Architectural Bench - 6 ft.	West-End Park Trail Head
1		Metal Arch. Trash Receptacle - 50 gal.	West-End Park Trail Head
1		Bike Rack - 10 ft.	West-End Park Trail Head
1		Pavement marking	at crossings
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
400	S.F.	Landscaping - Shrubs/Perennials	at West-End Park Trail Head
50		Landscaping - Trees - 2-2.5" caliper	

Phase 3 - Trail Section from Pine Street to Campanella Drive

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2000	S.Y.	10 ft. wide Asphalt Trail Pavement	Pine St. to Campanella Dr.

480	S.F.	Fabricated pedestrian bridge w/foundation walls	Ditch crossing
925	S.F.	Concrete Sidewalks/Pads	Veteran's Park Trail Head
1		Traffic signals, pedestrian signals and callers	South Ingram Intersection
4		Signs, stock, aluminum, reflectorized	at crossings
1		Trail Head Kiosk Sign	Veteran's Park Trail Head
1		RRFB Crossing w/Signs	at Lynn Street Crossing
5		Metal Pipe Bollards, painted, concrete filled	at crossings
1		Architectural Bench - 6 ft.	Veteran's Park Trail Head
1		Metal Arch. Trash Receptacle - 50 gal.	Veteran's Park Trail Head
1		Bike Rack - 10 ft.	Veteran's Park Trail Head
1		Pavement marking	at crossings
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
500	S.F.	Landscaping - Shrubs/Perennials	Veteran's Park Trail Head
72		Landscaping - Trees - 2-2.5" caliper	

Phase 4a - Trail section from Campanella Dr. to Edwards Ave.

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
2640	S.Y.	10 ft. wide Asphalt Trail Pavement	Campanella Dr. to Mitchell St.
2190	S.Y.	10 ft. Crushed Stone Trail Pavement -	Mitchell to Edwards Ave.
1150	S.F.	Fabricated pedestrian bridge w/foundation walls	St. John Ditch crossing
1		Traffic signals, pedestrian signals and callers	Selma St. crossing
4		Signs, stock, aluminum, reflectorized	at crossings
7		Metal Pipe Bollards, painted, concrete filled	at crossings
1		Pavement marking	at crossings
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
100		Landscaping - Trees - 2-2.5" caliper	

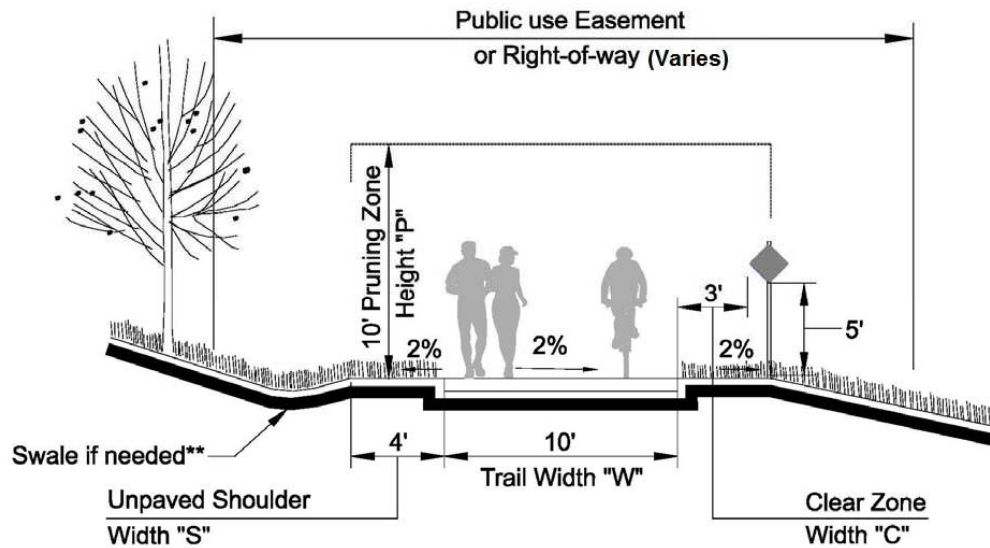
Phase 4a – LAMBERTS EXTENSION - Trail section Edwards Ave. to Lamberts Crossing

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
1111	S.Y.	10 ft. wide Asphalt Trail Pavement	Edwards Ave. to across West entrance of Lamberts Café
1		HAWK pedestrian crossing signal	East Malone at West entrance of Lamberts Café
4		Signs, stock, aluminum, reflectorized	at crossings
2		Metal Pipe Bollards, painted, concrete filled	at crossings
1		Pavement marking	at crossings
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor
300	S.F.	Landscaping - Shrubs	
32		Landscaping - Trees - 2-2.5" cal.	

Phase 4b Option 1 - Trail section from West-End Park to Highway BB along Existing Rail Bed

<u>QUANTITY</u>		<u>DESCRIPTION</u>	<u>NOTES</u>
8330	S.Y.	10 ft. Crushed Stone Trail Pavement	Sunset Dr. to Hwy BB
400	S.F.	Concrete Sidewalks/Pads	Trail Head at BB
650	S.F.	Fabricated pedestrian bridge w/foundation walls	Ditch crossing
1		Trail Head Kiosk Sign	Trail Head at BB
8		Signs, stock, aluminum, reflectorized	at crossings
7		Metal Pipe Bollards, painted, concrete filled	at crossings
1		Pavement marking	at crossings
1		Seeding utility mix, 7 lb. per M.S.F., tractor spreader	Trail Corridor

APPENDIX C - STANDARD SECTIONS AND GUIDELINES



Trail - Standard Section C-1

Source: Modified from Kansas City
Trail Master Plan 2008

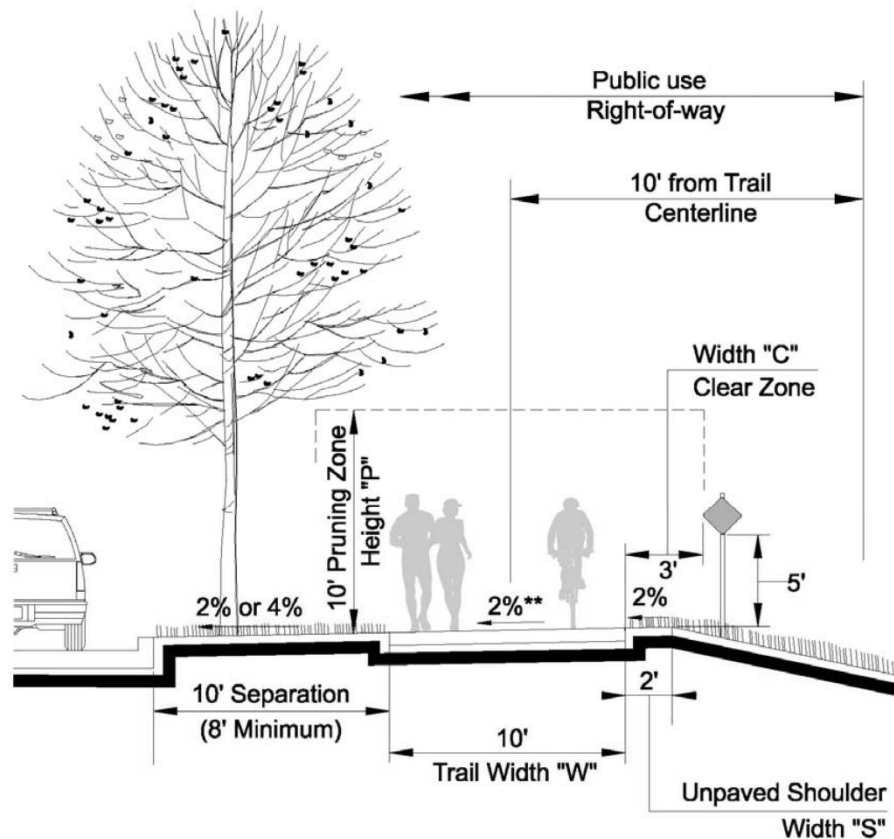
Section Options

"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

- If drainage swales are necessary, refer to Trail Drainage Sections C-7 for guidelines.
- The trail Right of Way may vary depending on locations; however narrower widths may exist and the corridor must accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items.

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 all areas – See AASHTO for further guidance.
- 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.)



Trail – Within Existing Development Section C-2

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

Source: Modified from Kansas City
Trail Master Plan 2008

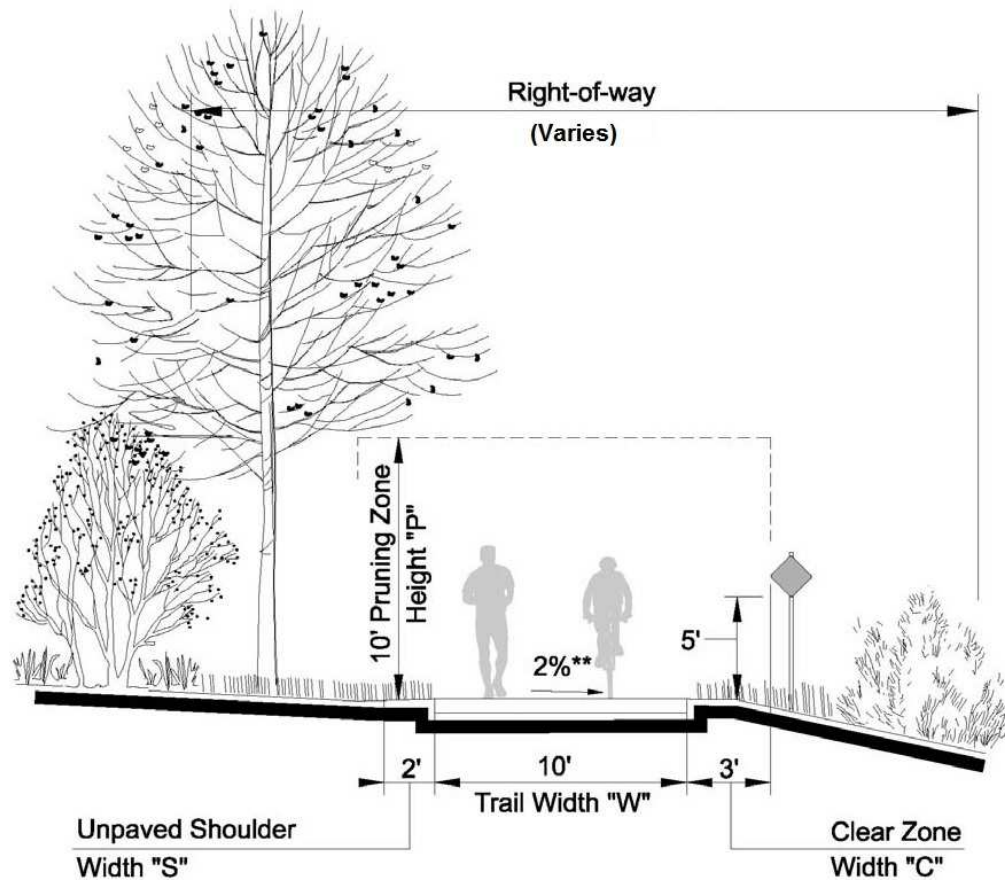
Section Options

"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

- If drainage swales are necessary, refer to Trail Drainage Sections C-7 for guidelines.
- The trail Right of Way may vary depending on locations; however narrower widths may exist and the corridor must accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items.

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 all areas – See AASHTO for further guidance.
- 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.)



Trail – Corridor Section C-3

Source: Modified from Kansas City Trail Master Plan 2008

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

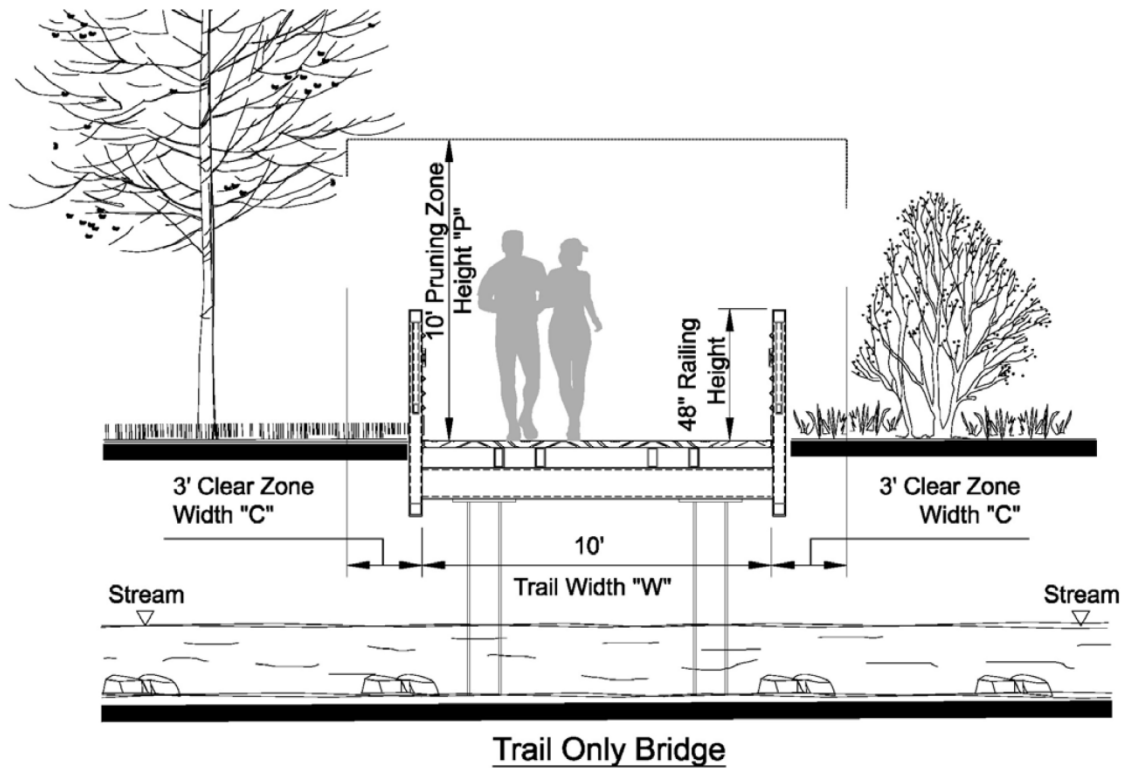
Section Options

"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

- If drainage swales are necessary, refer to Trail Drainage Sections C-7 for guidelines.
- The trail Right of Way may vary depending on locations; however narrower widths may exist and the corridor must accommodate trail signage, shoulders, drainage items and other trail appurtenances as well as the suitable access for the maintenance of these items.

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 all areas – See AASHTO for further guidance.
- 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.)



Source: Modified from Kansas City Trail Master Plan 2008

Trail – Bridge Section C-4

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

** 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 local 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.
- Review of final post placement within the creek, ditch, or floodplain will need approval by City Engineer or designee.
- Design for 10,000 pound vehicle loading, and 85 psf live loading.

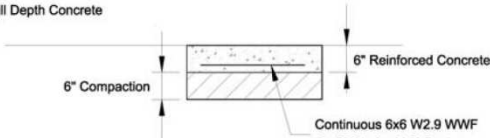
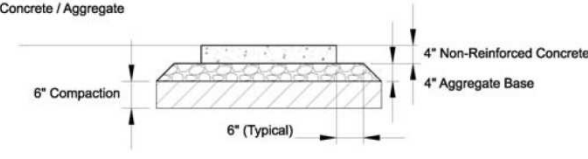
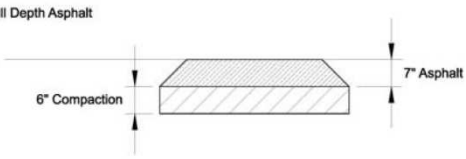
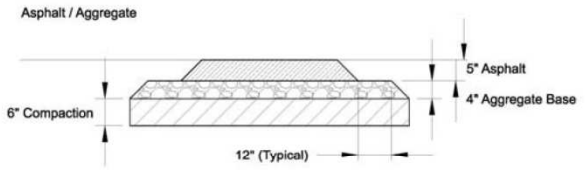
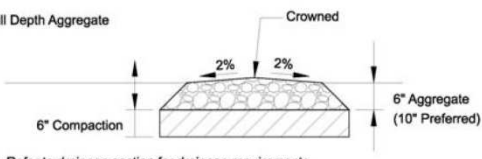
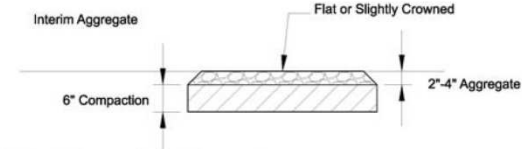
** When trail parallels roadways, the 2% maximum cross-slope drains to curb as shown.

- ## Section Options

Additional Guidelines

- 34

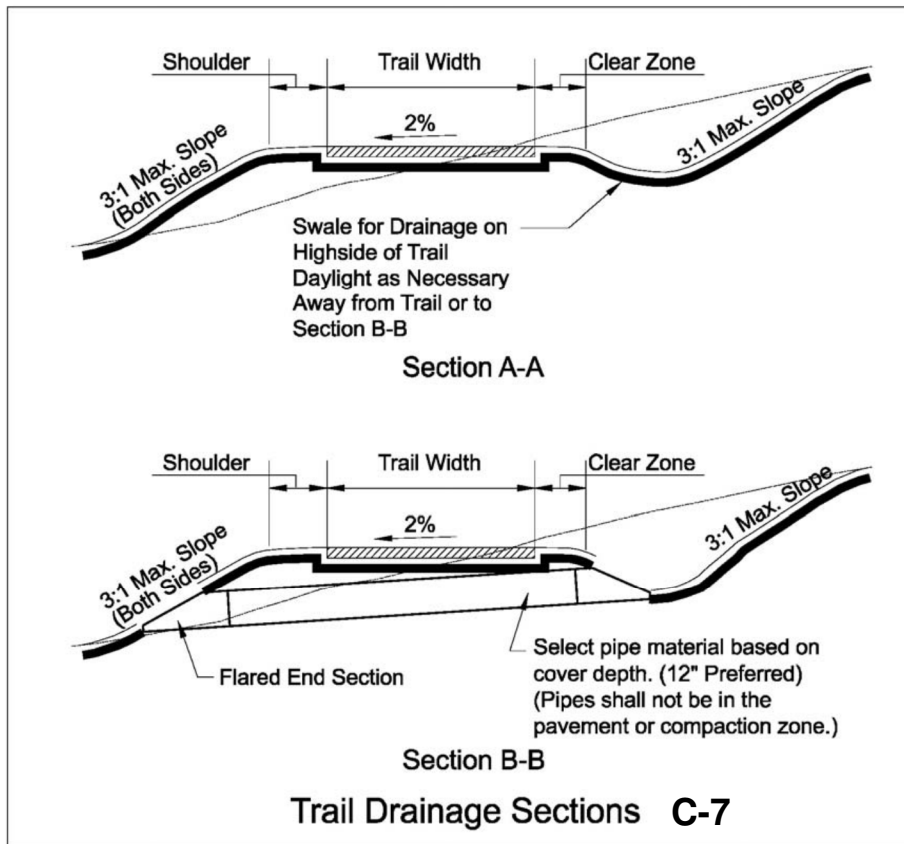
Pavement Sections C-6

Full Depth Concrete  6" Compaction 6" Reinforced Concrete Continuous 6x6 W2.9 WWF On 2" Chairs At 2' Centers 1. Create all contraction joints with saw cut only. 2. No manual tooling or edging allowed. 3. All joints will be sealed.	Concrete / Aggregate  6" Compaction 4" Non-Reinforced Concrete 4" Aggregate Base 6" (Typical)
Full Depth Asphalt  6" Compaction 7" Asphalt	Asphalt / Aggregate  6" Compaction 5" Asphalt 4" Aggregate Base 12" (Typical)
Full Depth Aggregate  6" Compaction Crowned 2% 2% 6" Aggregate (10" Preferred) 1. Refer to drainage section for drainage requirements.	Interim Aggregate  6" Compaction Flat or Slightly Crowned 2"-4" Aggregate 1. Refer to drainage section for drainage requirements.
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. Examples: • Rubberized asphalt • Polymer modified asphalt • Resins • Porous concrete	

Source: Modified from Kansas City Trail Master Plan 2008

Note:

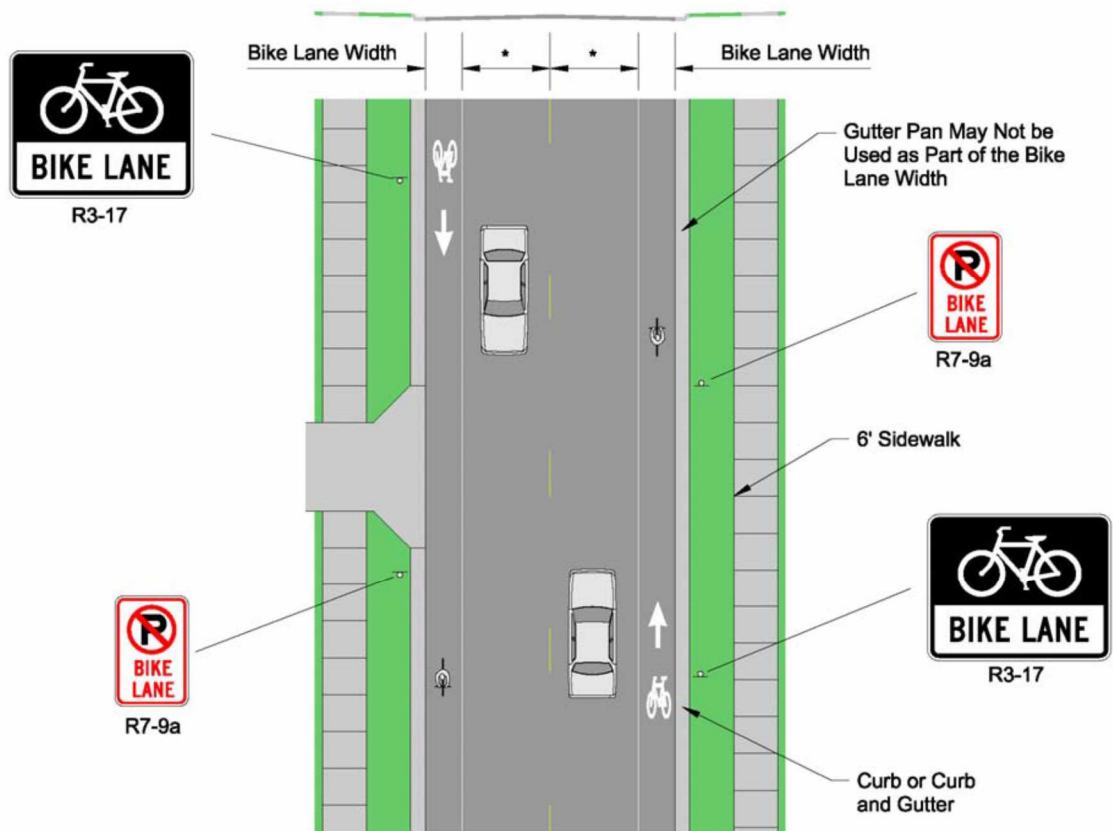
1. Base Compaction and stabilization - 6" Compaction, 95% Maximum Standard Density. Base compaction shall meet the requirements of MoDOT or Geotechnical Soils Report for pavement subgrades. Geotextiles and geogrids are encouraged as a stabilization element. The designer is encouraged to review these for cost savings or increased stability. If construction work space and access is conducive, flyash and other subgrades stabilization methods may be used.
2. Excavation width is the same as the compacted subgrade width.
3. 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.
4. Extensions of trails shall match the existing trail material unless otherwise approved by City Engineer or designee.
5. Aggregate (Surface or Base) shall be MoDOT Type 5 Aggregate.
6. Asphalt shall be Type C or as determined by a Soils Engineer.
7. Concrete shall meet the MoDOT requirements for paving.
8. 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 a utility seed mix of tall fescue for all lawn disturbed areas within the trail corridor. All other local requirements and Specifications shall be met.



Source: Modified from Kansas City Trail Master Plan 2008

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, if applicable, 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 CONNECTOR – BIKE LANE WITH CURBS

Section Options

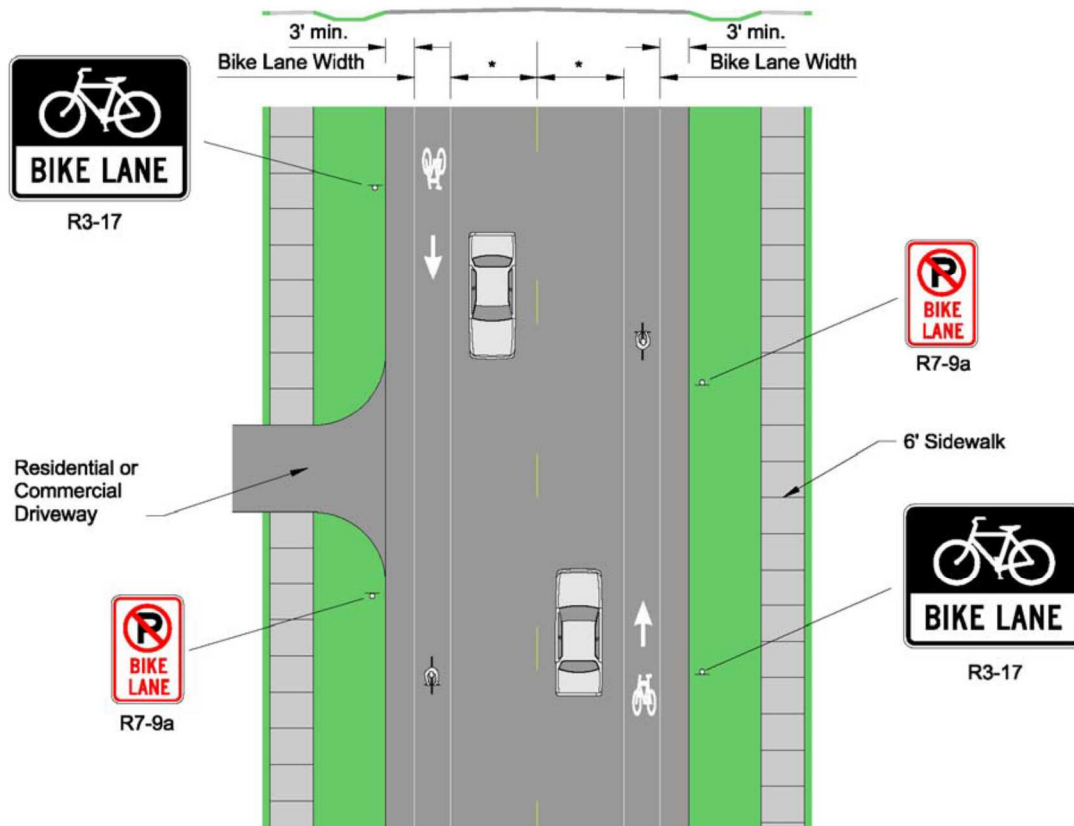
Roadway Functional Class	Local Roads, Collectors.....Arterials															
AADT	< 5,000 AADT						5,000 - 10,000 AADT						> 10,000 AADT			
Posted Speed	< = 30 MPH		35/40 MPH		> 40 MPH		< = 30 MPH		35/40 MPH		>40 MPH		< = 40 MPH		> 40 MPH	
Vehicular Mix	trucks		trucks		trucks		trucks		trucks		trucks		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

- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.
- Drainage structures within or abutting the bike lane must meet MoDOT standards for bicycle safety.

Source: Modified from Kansas City Trail Master Plan 2008



ON-STREET CONNECTOR – BIKE LANE WITHOUT CURBS (SHOULDER)

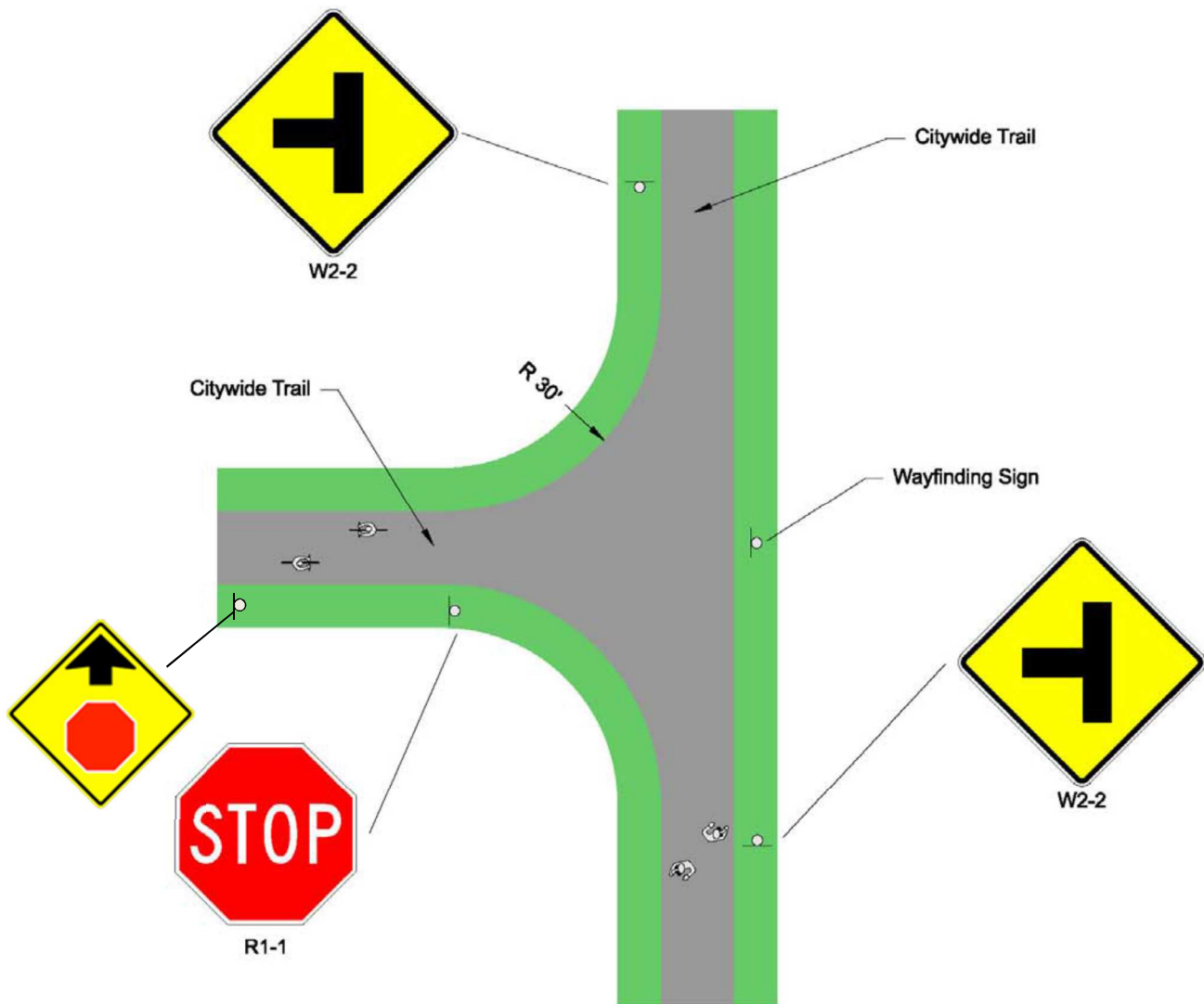
Source: Modified from Kansas City Trail Master Plan 2008

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'

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 MoDOT standards for bicycle safety.

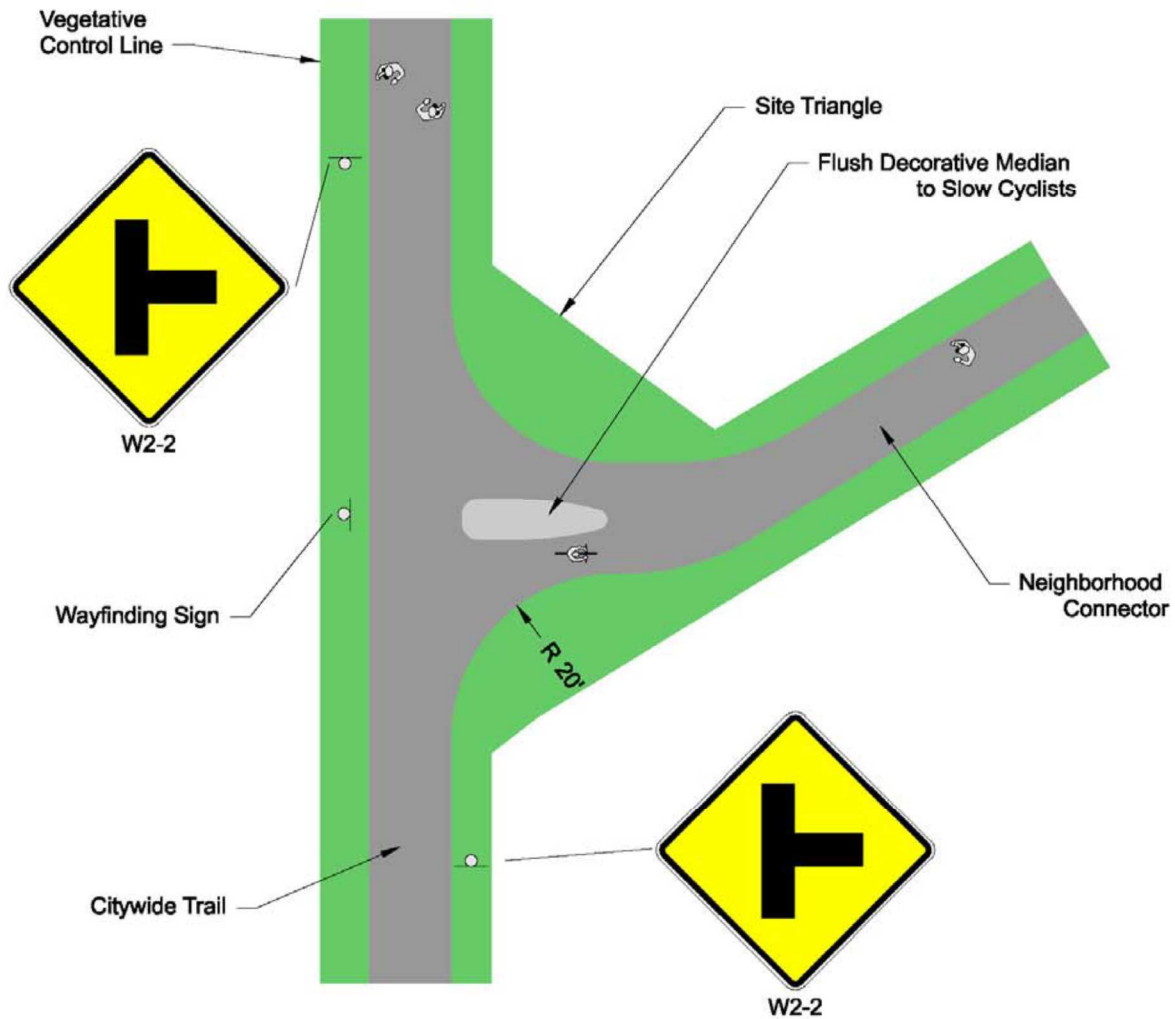


TYPICAL TRAIL INTERSECTION

Source: Modified from Kansas City Trail Master Plan 2008

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 to other trails systems, 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 trail must be reviewed and approved by City Engineer or designee.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.

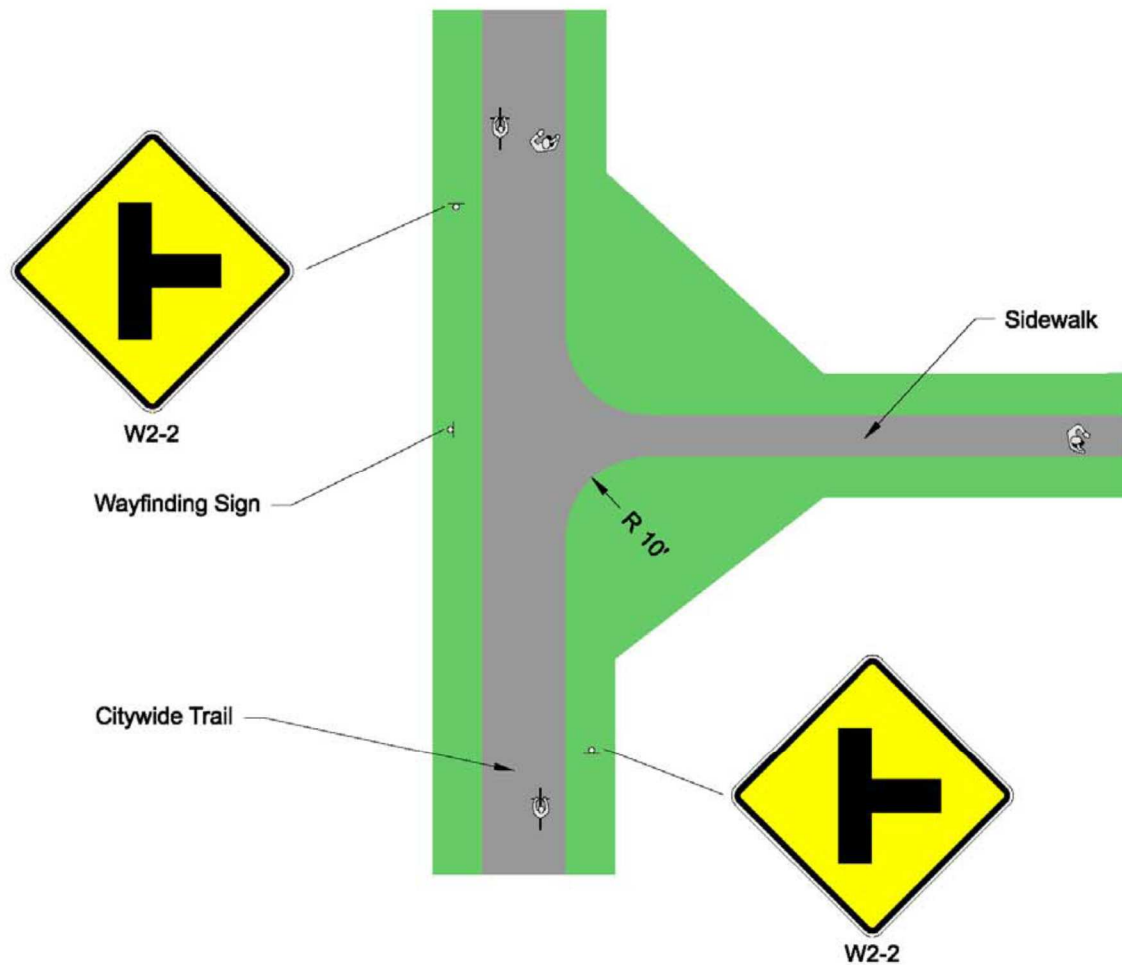


NEIGHBORHOOD CONNECTOR INTERSECTION

Source: Modified from Kansas City Trail Master Plan 2008

Additional Guidelines

- Abrupt grade changes must be curved vertically to meet AASTHO guidelines.
- If the Neighborhood Connector is unpaved and the trail system is paved, then the last 20 feet of the Neighborhood Connector must be paved to reduce gravel migrating to the paved trail.
- When connecting to other trails systems, 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 trail must be reviewed and approved by City Engineer or designee.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.



TYPICAL SIDEWALK INTERSECTION

Source: Modified from Kansas City Trail Master Plan 2008

Additional Guidelines

- Abrupt grade changes must be curved vertically to meet AASTHO guidelines.
- If the Neighborhood Connector is unpaved and the trail system is paved, then the last 20 feet of the Neighborhood Connector must be paved to reduce gravel migrating to the paved trail.
- When connecting to other trails systems, 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 trail must be reviewed and approved by City Engineer or designee.
- Refer to MUTCD for details on signing and marking placement, spacing, materials, etc.

Crossings Recommendations (1)

For each trail-roadway crossing, an engineering study should be done to determine the proper location.

For each engineering study as needed, 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													
		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.								

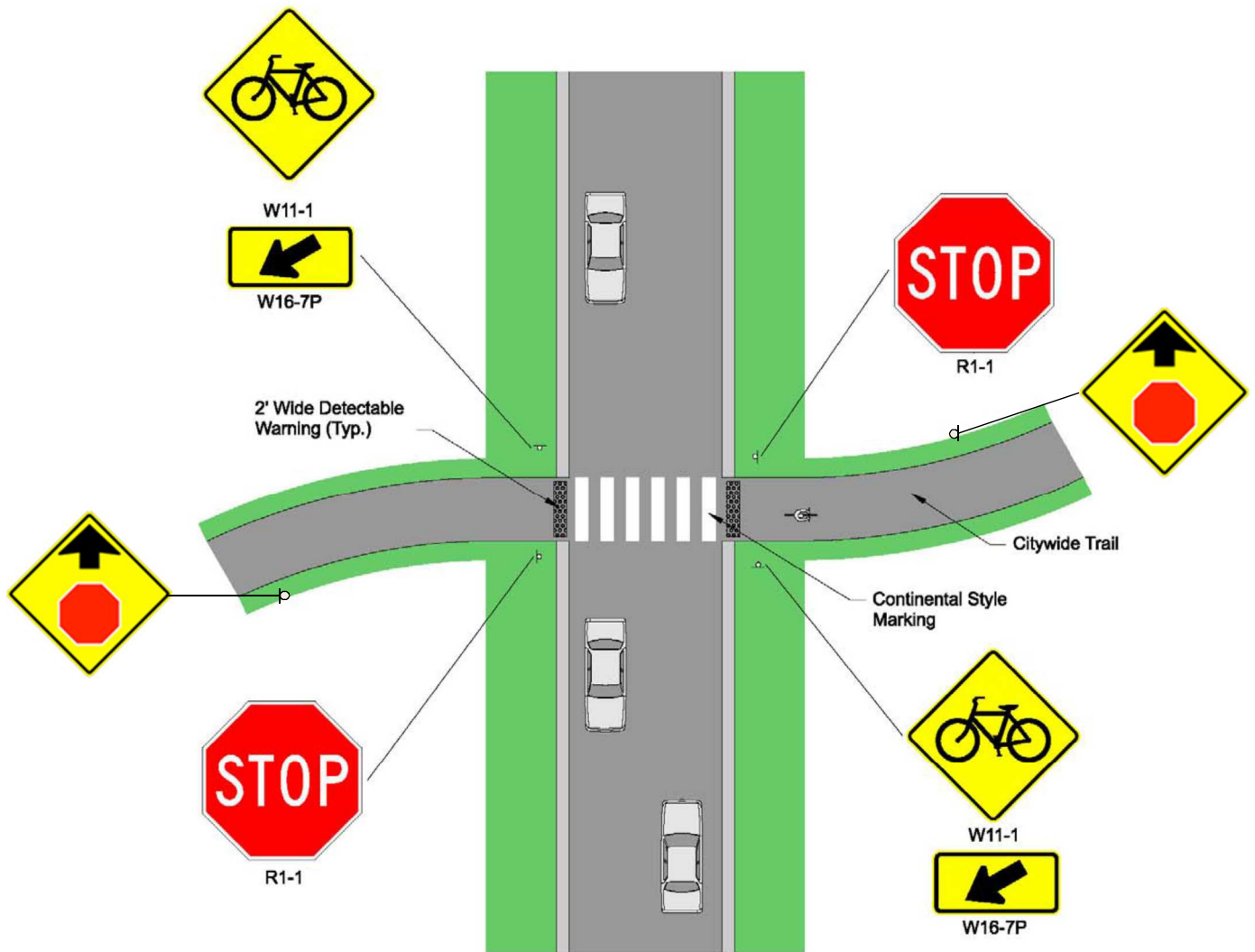
Roadway Functional Class		Local Roads, Collectors.....Arterials											
Roadway ADT		< 9,000 ADT			9,000 - 12,000 ADT			12,001 - 15,000 ADT			> 15,000 ADT (1)		
Posted Speed		< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH	< = 30 MPH	35 MPH	40 MPH (1)
Roadway Type (Number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

(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.
- **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.

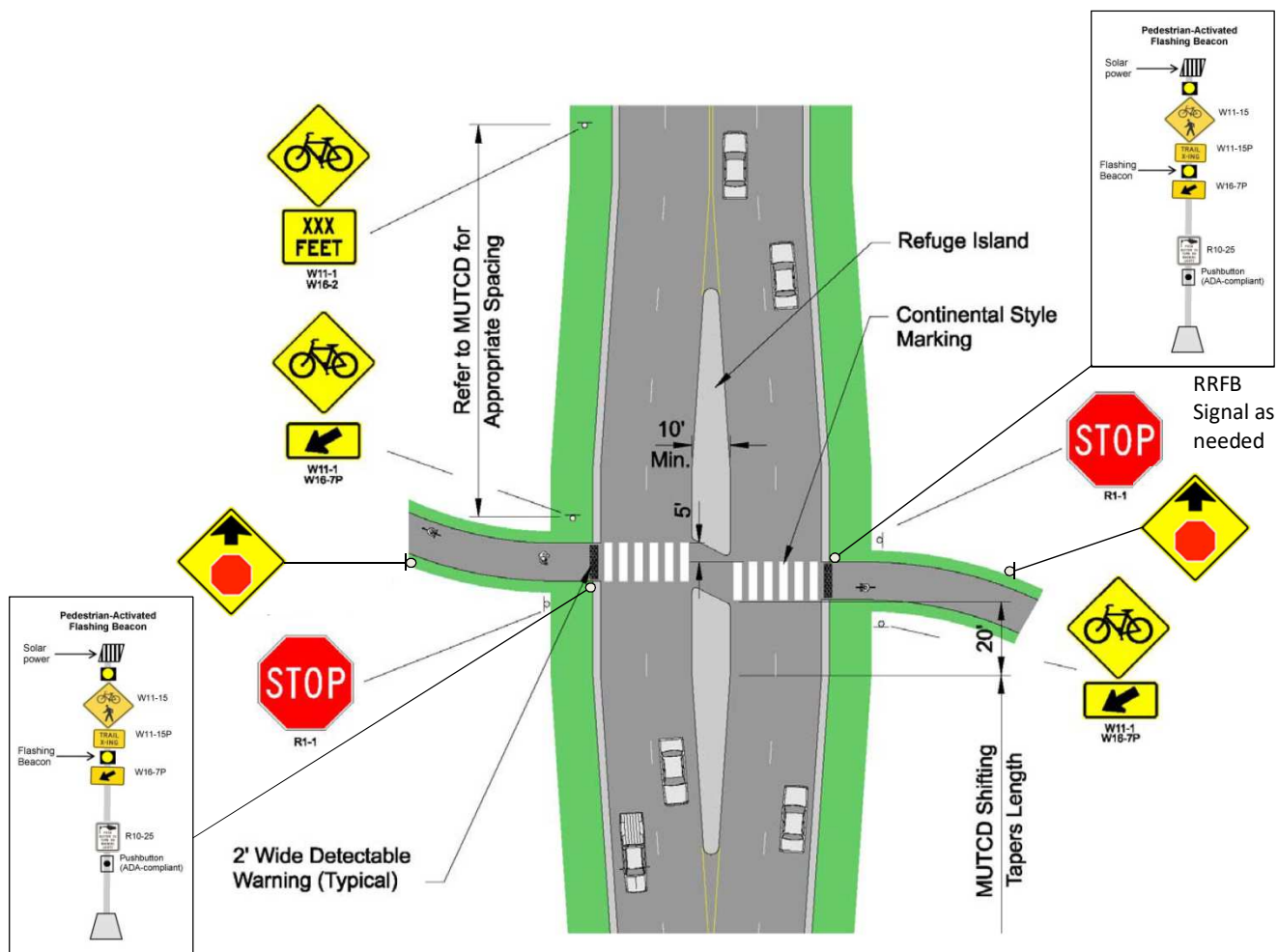


TYPICAL LOCAL ROAD TRAIL CROSSING

Source: Modified from Kansas City Trail Master Plan 2008

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.

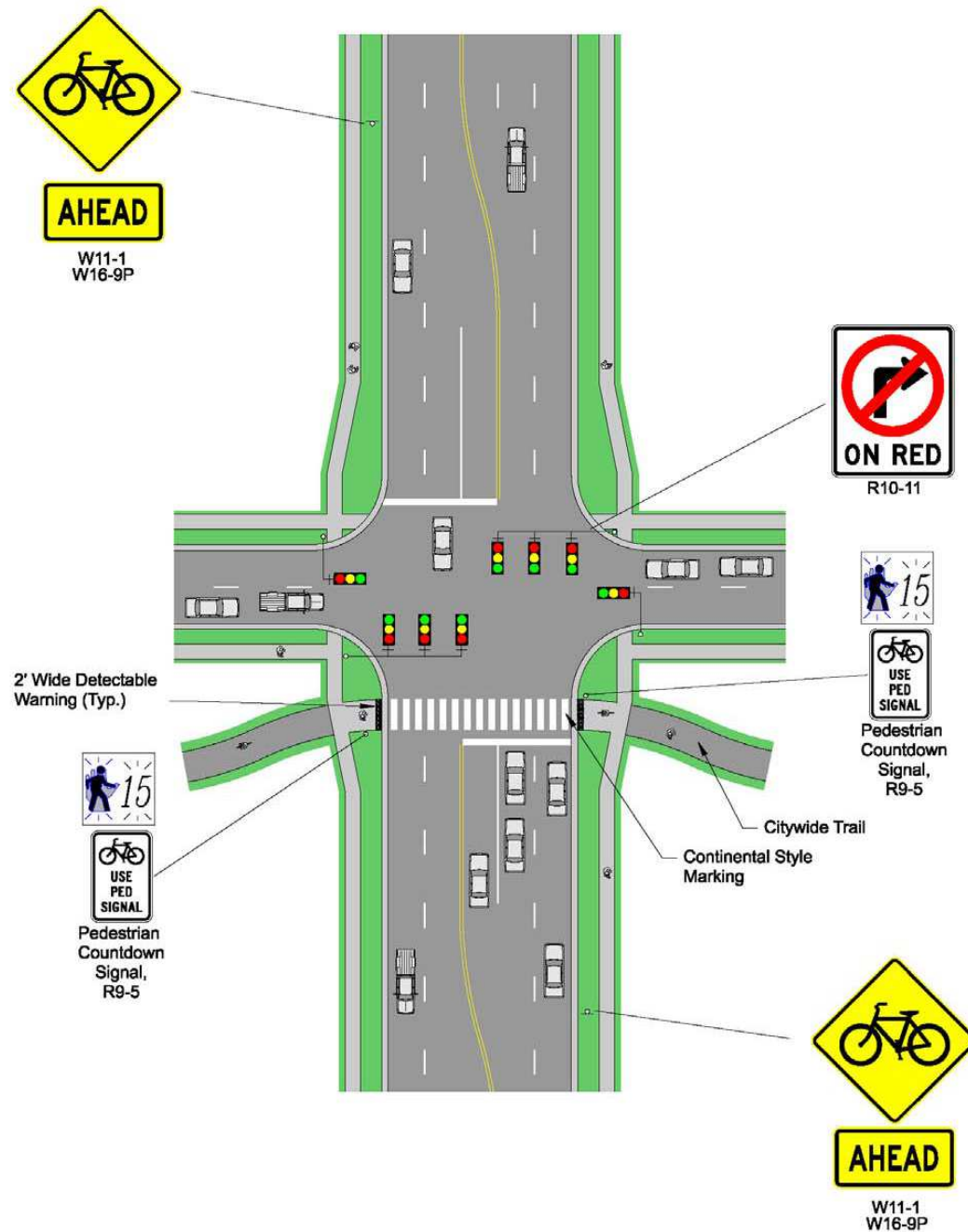


TYPICAL COLLECTOR/MINOR ARTERIAL ROAD TRAIL CROSSING

Source: Modified from Kansas City Trail Master Plan 2008

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.



TYPICAL TRAIL CROSSING AT SIGNALIZED INTERSECTION

Source: Modified from Kansas City Trail Master Plan 2008

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.

APPENDIX D - STANDARDS AND GUIDELINES FOR BICYCLE FACILITY SIGNAGE AND PAVEMENT MARKING

EXAMPLE OF SIGNING FOR THE BEGINNING AND END OF A DESIGNATED BICYCLE ROUTE ON A SHARED-USE PATH

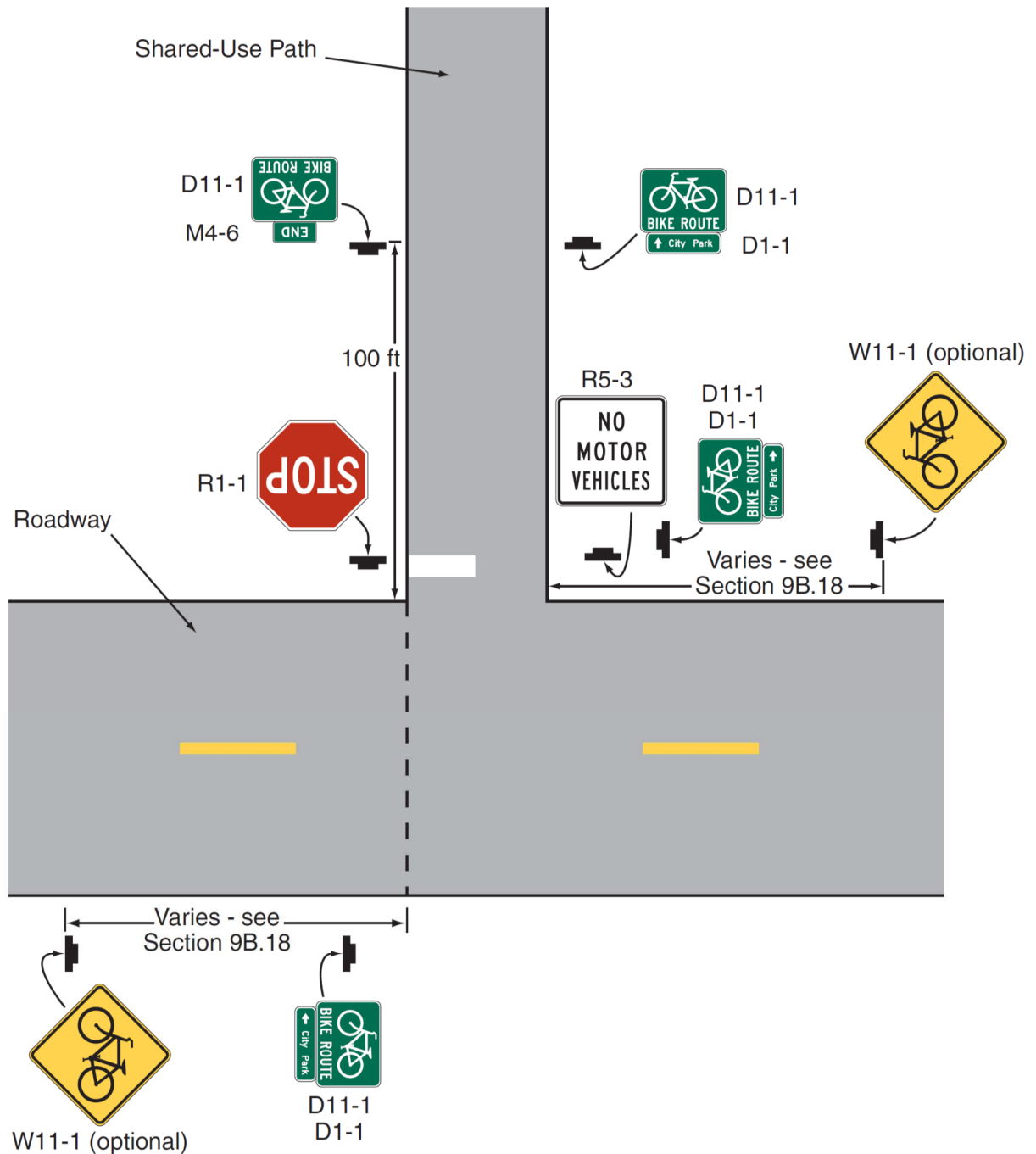


Figure 9B-5

Figure 9B-5 shows an example of the signing for the beginning and end of a designated bicycle route on a shared-use path. Figure 9B-6 shows an example of signing for an on-roadway bicycle route.

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

EXAMPLES OF SIGNING AND MARKINGS FOR A SHARED-USE PATH CROSSING

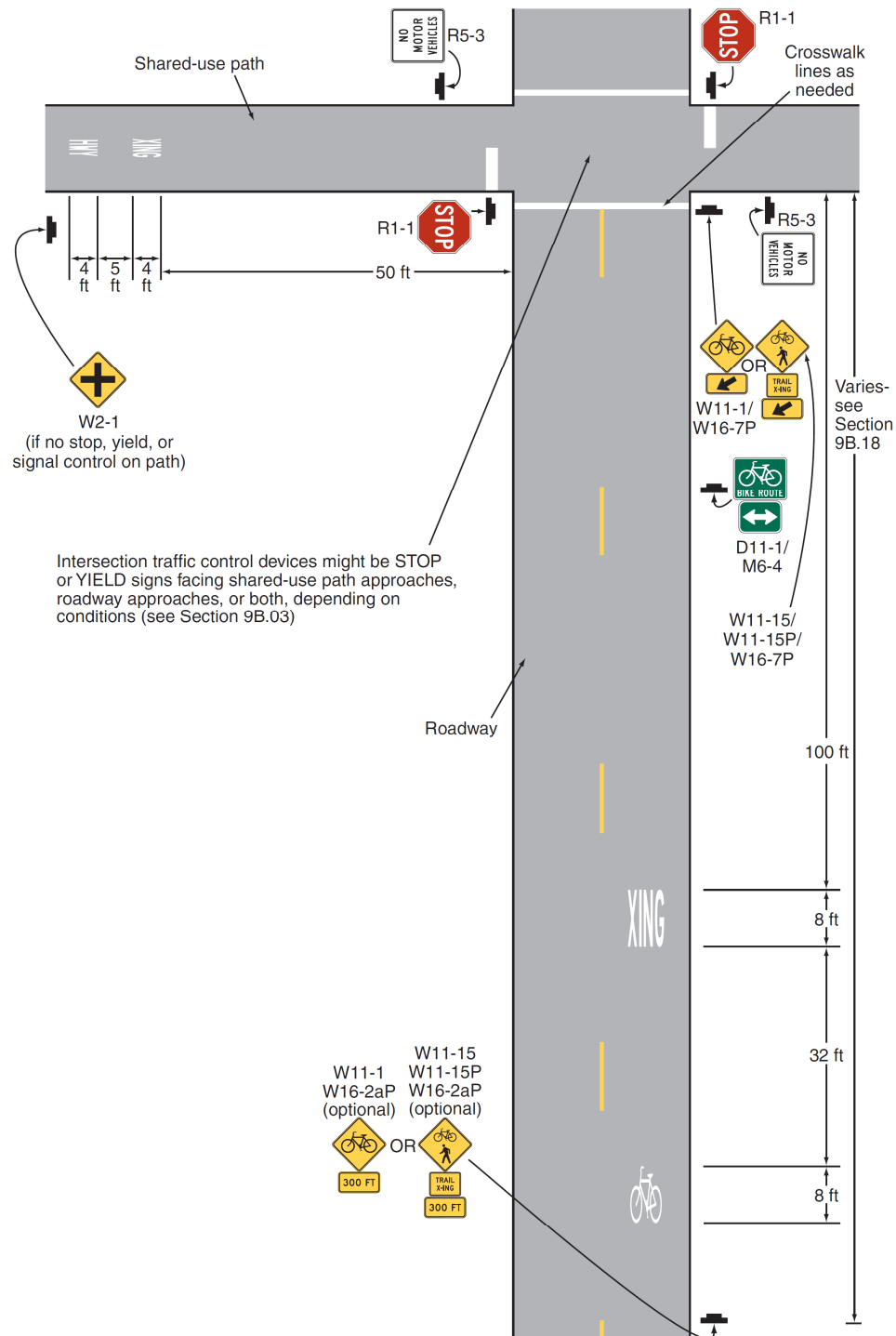


Figure 9B-7

Figure 9B-7 shows examples of signing and markings for a shared-use path crossing.
(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

EXAMPLES OF CENTER LINE MARKINGS FOR SHARED-USE PATHS

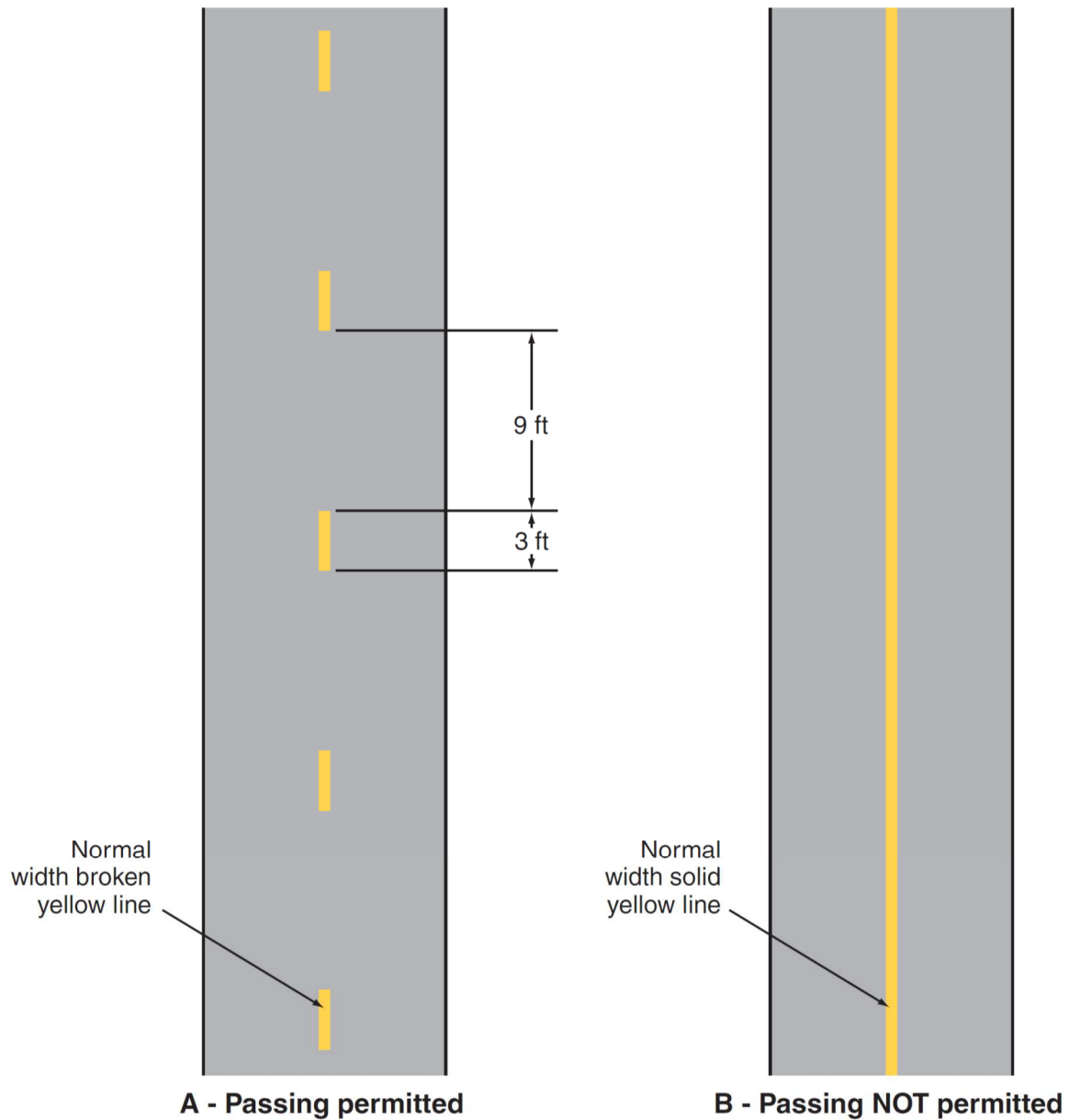


Figure 9C-2

Where shared-use paths are of sufficient width to designate two minimum width lanes, a solid yellow line may be used to separate the two directions of travel where passing is not permitted, and a broken yellow line may be used where passing is permitted (Figure 9C-2).

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

WORD, SYMBOL, AND ARROW PAVEMENT MARKINGS FOR BICYCLE LANES

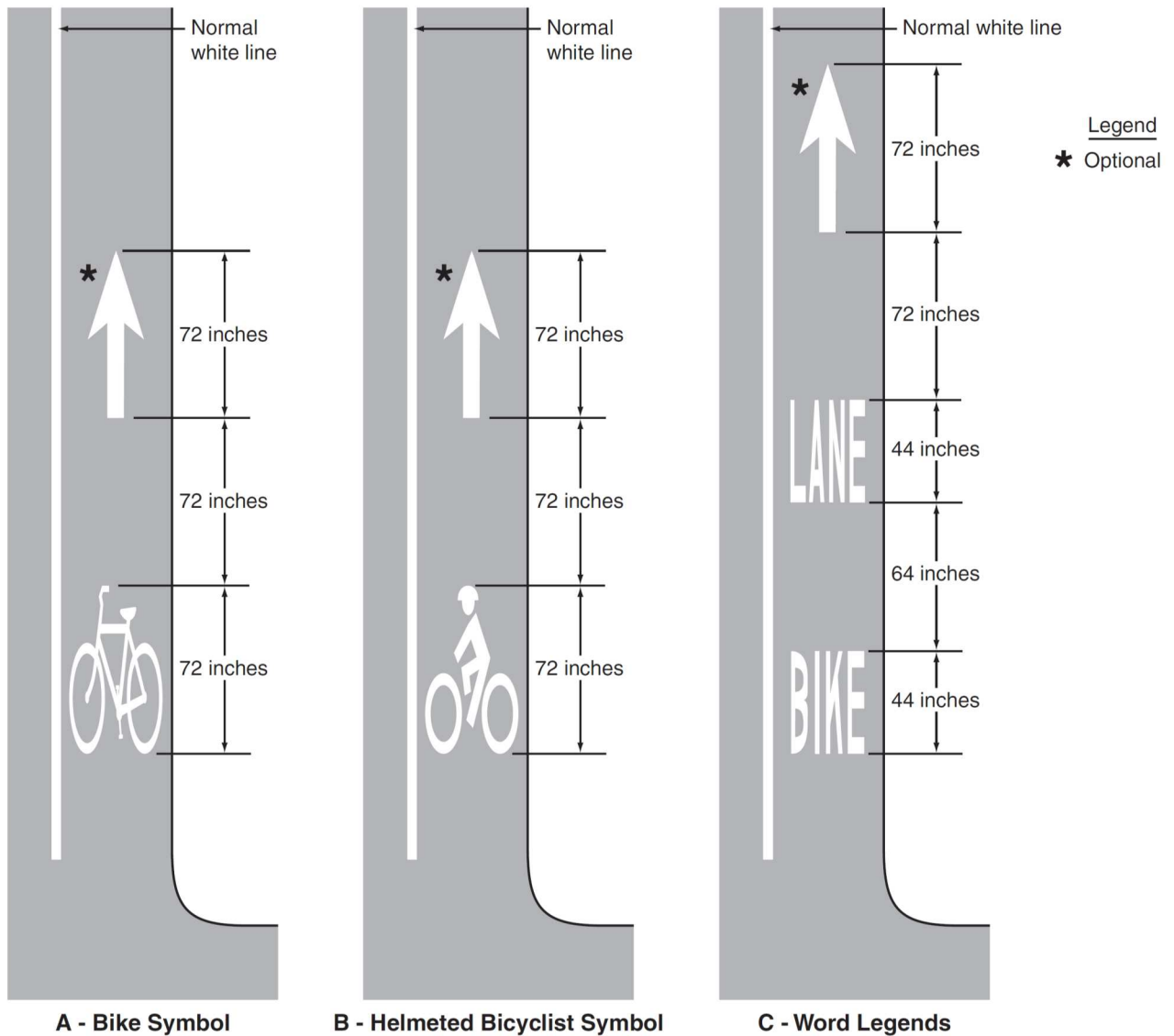


Figure 9C-3

Pavement word message, symbol, and arrow markings for bicycle lanes are shown in Figure 9C-3.

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

BICYCLE DETECTOR PAVEMENT MARKING



Figure 9C-7

A symbol (Figure 9C-7) may be placed on the pavement indicating the optimum position for a bicyclist to actuate the signal.

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

SHARED LANE MARKING

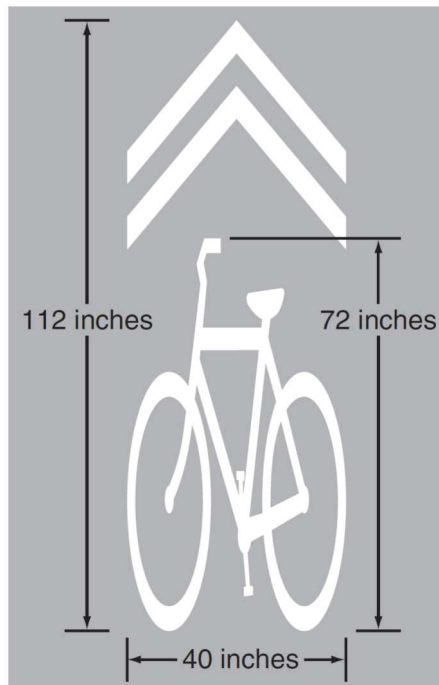
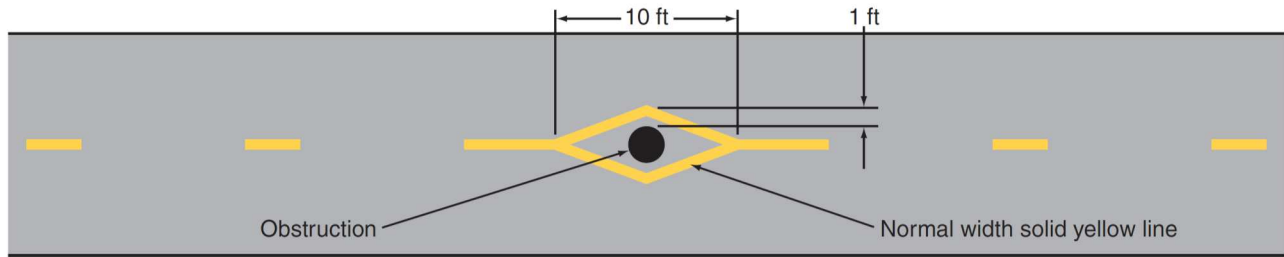


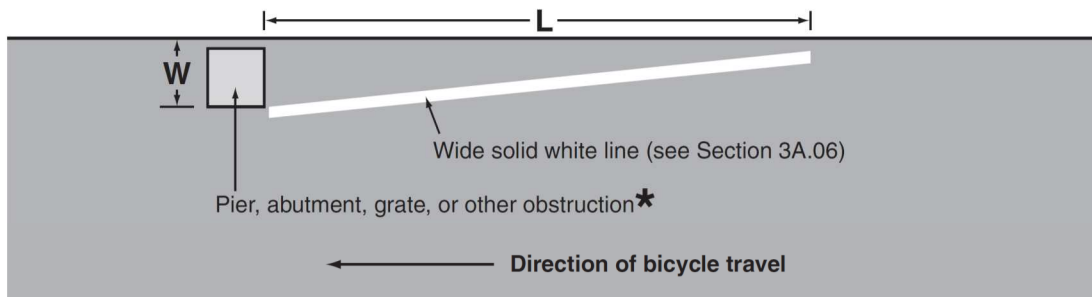
Figure 9C-9.

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

EXAMPLES OF OBSTRUCTION PAVEMENT MARKINGS



A - Obstruction within the path



B - Obstruction at edge of path or roadway

$L = WS$, where W is the offset in feet and S is bicycle approach speed in mph

* Provide an additional foot of offset for a raised obstruction and use the formula
 $L = (W+1) S$ for the taper length

Figure 9C-8

In roadway situations where it is not practical to eliminate a drain grate or other roadway obstruction that is inappropriate for bicycle travel, white markings applied as shown in Figure 9C-8 should be used to guide bicyclists around the condition.

(Source: MUTCD "2009 Edition" with Revision Numbers 1 and 2 incorporated, dated May 2012)

APPENDIX E – COST ESTIMATES

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
PHASE 1 - Trail Section from Train Depot to Main Street

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 1 - WORK		
2450	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$47,897.50
7965	S.F.	10 ft. wide Concrete Trail Pavement	\$5.15	\$41,019.75
345	S.F.	Concrete Sidewalks/Pads	\$5.00	\$1,725.00
8	EA.	Traffic signals, pedestrian signals and callers	\$5,000.00	\$40,000.00
32	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$6,400.00
2	LS	Trail Head Kiosk Sign	\$7,500.00	\$15,000.00
1	LS	Trail Monument Sign	\$10,000.00	\$10,000.00
1	LS	Historical Depot Marker Monument Sign	\$10,000.00	\$10,000.00
12	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$9,600.00
1	EA.	ADA Pedestal Drinking Fountain w/Pet Bowl	\$4,200.00	\$4,200.00
1	LS	Water line connection to Drinking Fountain - assumes nearby water source	\$600.00	\$600.00
675	L.F.	Ornamental Fencing - 5 ft. High, Metal w/Pickets	\$47.00	\$31,725.00
4	EA.	Architectural Bench - 6 ft.	\$2,100.00	\$8,400.00
2	EA.	Metal Arch. Trash Receptacle - 50 gal.	\$1,000.00	\$2,000.00
1	EA.	Bike Rack - 10 ft.	\$600.00	\$600.00
1	LS	Pavement Marking	\$7,200.00	\$7,200.00
		Site Work - Sub Total		\$236,367.25
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$1,250.00	\$1,250.00
1	LS	Shrubs/Perennials - ALLOWANCE	\$4,000.00	\$4,000.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$20,000.00	\$20,000.00
		Landscape - Sub Total		\$25,250.00
1		5% Project Management, Insurance, Permits	\$13,000.00	\$13,000.00
1		20% Contingency - Concept Phase	\$54,463.75	\$54,463.75
1		15% Design/Engineering/Surveying	\$49,000.00	\$49,000.00
		Sub Total		\$116,463.75
		GRAND TOTAL		\$378,081.00

NOTE:

- * Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016
- * Costs reflected in this estimate are for informational purposes and should be considered for budgeting only.
- * Actual construction values will vary according to bid conditions, time of year and type of project.
- (1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

Phase 1 - CostEstimateSummary-11-11-16.xlsx

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
PHASE 2a-Option 1: Existing ROW & Connection to Veteran's Park

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 2 - WORK		
2800	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$54,740.00
3050	S.F.	Concrete Sidewalks/Pads	\$5.00	\$15,250.00
2	EA.	Traffic signals, pedestrian signals and callers	\$5,000.00	\$10,000.00
1	LS	Misc. Curb/Pavement Improvements at Main Street	\$10,000.00	\$10,000.00
14	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$2,800.00
1	LS	Trail Head Kiosk Sign	\$7,500.00	\$7,500.00
1	LS	Trail Monument Sign	\$10,000.00	\$10,000.00
4	EA.	RRFB Crossing w/Signs	\$15,000.00	\$60,000.00
5	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$4,000.00
1	EA.	ADA Pedestal Drinking Fountain w/Pet Bowl	\$4,200.00	\$4,200.00
1	LS	Water line connection to Drinking Fountain - assumes nearby water source	\$600.00	\$600.00
1400	LF	White vinyl privacy fence - 8 ft.	\$42.25	\$59,150.00
4	EA.	Architectural Bench - 6 ft.	\$2,100.00	\$8,400.00
2	EA.	Metal Arch. Trash Receptacle - 50 gal.	\$1,000.00	\$2,000.00
1	EA.	Bike Rack - 10 ft.	\$600.00	\$600.00
1	LS	Pavement Marking	\$800.00	\$800.00
0.6	MILE	Bike Lane/Sharrows	\$25,000.00	\$15,000.00
		Site Work - Sub Total		\$265,040.00
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$1,500.00	\$1,500.00
1	LS	Shrubs/Perennials - ALLOWANCE	\$2,000.00	\$2,000.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$18,000.00	\$18,000.00
		Landscape - Sub Total		\$21,500.00
1		5% Project Management, Insurance, Permits	\$14,000.00	\$14,000.00
1		20% Contingency - Concept Phase	\$60,000.00	\$60,000.00
1		15% Design/Engineering/Surveying	\$54,000.00	\$54,000.00
		Sub Total		\$128,000.00
		GRAND TOTAL		\$414,540.00

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

* Costs reflected in this estimate are for informational purposes and should be considered for budgeting only.

* Actual construction values will vary according to bid conditions, time of year and type of project.

(1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

Phase 2-Option 1 - CostEstimateSummary-11-10-16.xlsx

PREPARED BY:

Date:
Client:

Project:

MATERIALS & LABOR

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

* Costs reflected in this estimate are for informational purposes and should be considered for budgeting only.

* Actual construction values will vary according to bid conditions, time of year and type of project.

(1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

Phase 2-Option 2 - CostEstimateSummary-11-10-16.xlsx

PREPARED BY:

Date:
Client:

Project:

PHASE 2a-Option 3: One Way Lynn Street and Connection to Veteran's Park

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 2 - WORK		
2770	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$54,153.50
2550	S.F.	Concrete Sidewalks/Pads	\$5.00	\$12,750.00
1065	L.F.	3 ft. wide Curbed Concrete Median	\$60.00	\$63,900.00
14	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$2,800.00
1	LS	Trail Head Kiosk Sign	\$7,500.00	\$7,500.00
1	LS	Trail Monument Sign	\$10,000.00	\$10,000.00
5	EA.	RRFB Crossing w/Signs	\$15,000.00	\$75,000.00
7	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$5,600.00
1	EA.	ADA Pedestal Drinking Fountain w/Pet Bowl	\$4,200.00	\$4,200.00
1	LS	Water line connection to Drinking Fountain - assumes nearby water source	\$600.00	\$600.00
1065	LF	White vinyl privacy fence - 8 ft.	\$42.25	\$44,996.25
4	EA.	Architectural Bench - 6 ft.	\$2,100.00	\$8,400.00
2	EA.	Metal Arch. Trash Receptacle - 50 gal.	\$1,000.00	\$2,000.00
1	EA.	Bike Rack - 10 ft.	\$600.00	\$600.00
1	LS	Pavement Marking	\$1,000.00	\$1,000.00
0.6	MILE	Bike Lane/Sharrows	\$25,000.00	\$15,000.00
		Site Work - Sub Total		\$308,499.75
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$1,000.00	\$1,000.00
1	LS	Shrubs/Perennials - ALLOWANCE	\$2,000.00	\$2,000.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$18,000.00	\$18,000.00
		Landscape - Sub Total		\$21,000.00
1		5% Project Management, Insurance, Permits	\$17,000.00	\$17,000.00
1		20% Contingency - Concept Phase	\$70,000.00	\$70,000.00
1		15% Design/Engineering/Surveying	\$62,500.00	\$62,500.00
		Sub Total		\$149,500.00
		GRAND TOTAL		\$478,999.75

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

* Costs reflected in this estimate are for informational purposes and should be considered for budgeting only.

* Actual construction values will vary according to bid conditions, time of year and type of project.

(1) Cost of the pedestrian signals assumes existing signals and control box can easily accomodate the upgrade to the pedestrian signals

Phase 2-Option 3 - CostEstimateSummary-11-10-16.xlsx

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
PHASE2a-Option 4: Sharrows and Connection to Veteran's Park

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
PHASE 2 - WORK				
2770	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$54,153.50
8575	S.F.	Concrete Sidewalks/Pads	\$5.00	\$42,875.00
2	EA.	Traffic signals, pedestrian signals and callers	\$5,000.00	\$10,000.00
1	LS	Misc. Curb/Pavement Improvements at Main Street	\$10,000.00	\$10,000.00
14	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$2,800.00
1	LS	Trail Head Kiosk Sign	\$7,500.00	\$7,500.00
1	LS	Trail Monument Sign	\$10,000.00	\$10,000.00
5	EA.	RRFB Crossing w/Signs	\$15,000.00	\$75,000.00
7	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$5,600.00
1	EA.	ADA Pedestal Drinking Fountain w/Pet Bowl	\$4,200.00	\$4,200.00
1	LS	Water line connection to Drinking Fountain - assumes nearby water source	\$600.00	\$600.00
1065	LF	White vinyl privacy fence - 8 ft.	\$42.25	\$44,996.25
4	EA.	Architectural Bench - 6 ft.	\$2,100.00	\$8,400.00
2	EA.	Metal Arch. Trash Receptacle - 50 gal.	\$1,000.00	\$2,000.00
1	EA.	Bike Rack - 10 ft.	\$600.00	\$600.00
1	LS	Pavement Marking	\$1,000.00	\$1,000.00
1	MILE	Bike Lane/Sharrows	\$25,000.00	\$25,000.00
Site Work - Sub Total				\$304,724.75
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$1,000.00	\$1,000.00
1	LS	Shrubs/Perennials - ALLOWANCE	\$2,000.00	\$2,000.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$18,000.00	\$18,000.00
Landscape - Sub Total				\$21,000.00
1		5% Project Management, Insurance, Permits	\$16,250.00	\$16,250.00
1		20% Contingency - Concept Phase	\$68,000.00	\$68,000.00
1		15% Design/Engineering/Surveying	\$61,500.00	\$61,500.00
Sub Total				\$145,750.00
GRAND TOTAL				\$471,474.75

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

* Costs reflected in this estimate are for informational purposes and should be considered for budgeting only.

* Actual construction values will vary according to bid conditions, time of year and type of project.

(1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

Phase 2-Option 4 - CostEstimateSummary-11-10-16.xlsx

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
Phase 3 - Trail Section from Pine Street to Campanella Drive

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 3 - WORK		
2000	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$39,100.00
480	S.F.	Fabricated pedestrian bridge w/foundation walls	\$200.00	\$96,000.00
925	S.F.	Concrete Sidewalks/Pads	\$5.00	\$4,625.00
1	EA.	Traffic signals, pedestrian signals and callers	\$5,000.00	\$5,000.00
4	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$800.00
1	LS	Trail Head Kiosk Sign	\$7,500.00	\$7,500.00
1	EA.	RRFB Crossing w/Signs	\$15,000.00	\$15,000.00
5	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$4,000.00
1	EA.	Architectural Bench - 6 ft.	\$2,100.00	\$2,100.00
1	EA.	Metal Arch. Trash Receptacle - 50 gal.	\$1,000.00	\$1,000.00
1	EA.	Bike Rack - 10 ft.	\$600.00	\$600.00
1	LS	Pavement Marking	\$150.00	\$150.00
		Site Work - Sub Total		\$175,875.00
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$1,000.00	\$1,000.00
1	LS	Shrubs/Perennials - ALLOWANCE	\$2,500.00	\$2,500.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$18,000.00	\$18,000.00
		Landscape - Sub Total		\$21,500.00
1		5% Project Management, Insurance, Permits	\$10,000.00	\$10,000.00
1		20% Contingency - Concept Phase	\$41,000.00	\$41,000.00
1		15% Design/Engineering/Surveying	\$37,000.00	\$37,000.00
		Sub Total		\$88,000.00
		GRAND TOTAL		\$285,375.00

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

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* Actual construction values will vary according to bid conditions, time of year and type of project.

(1) Cost of the pedestrian signals assumes existing signals and control box can easily accomodate the upgrade to the pedestrian signals

Phase 3 - CostEstimateSummary-11-10-16.xlsx

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
Phase 4a - Trail section from Campanella Dr. to Edwards Dr.

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 4 - WORK		
2640	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$51,612.00
2190	S.Y.	10 ft. Crushed Stone Trail Pavement - Mitchell to Edwards Dr.	\$10.00	\$21,900.00
1150	S.F.	Fabricated pedestrian bridge w/foundation walls	\$161.00	\$185,150.00
1	EA.	Traffic signals, pedestrian signals and callers	\$5,000.00	\$5,000.00
4	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$800.00
7	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$5,600.00
1	LS	Pavement Marking	\$200.00	\$200.00
		Site Work - Sub Total		\$270,262.00
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$2,300.00	\$2,300.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$25,000.00	\$25,000.00
		Landscape - Sub Total		\$27,300.00
1		5% Project Management, Insurance, Permits	\$14,880.00	\$14,880.00
1		20% Contingency - Concept Phase	\$62,500.00	\$62,500.00
1		15% Design/Engineering/Surveying		\$56,250.00
		Sub Total		\$133,630.00
		GRAND TOTAL		\$431,192.00

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

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(1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

Phase 4a-CostEstimateSummary-REV 11-21-16.xlsx

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
Phase 4a - Trail section Edwards Dr. to Lamberts Crossing

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 4 - WORK		
1111	S.Y.	10 ft. wide Asphalt Trail Pavement	\$19.55	\$21,720.05
1	LS	HAWK pedestrian crossing signal (Note 2)	\$45,000.00	\$45,000.00
4	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$800.00
2	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$1,600.00
1	LS	Pavement Marking	\$100.00	\$100.00
		Site Work - Sub Total		\$69,220.05
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$550.00	\$550.00
1	LS	Shrubs - ALLOWANCE	\$1,500.00	\$1,500.00
1	LS	Trees - 2-2.5" cal. - ALLOWANCE	\$8,000.00	\$8,000.00
		Landscape - Sub Total		\$10,050.00
1		5% Project Management, Insurance, Permits	\$4,000.00	\$4,000.00
1		20% Contingency - Concept Phase	\$16,500.00	\$16,500.00
1		15% Design/Engineering/Surveying	\$15,000.00	\$15,000.00
		Sub Total		\$35,500.00
		GRAND TOTAL		\$114,770.05

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

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(1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

(2) HAWK signal assumes crossing at E. Malone at Lamberts Café

Phase 4a-LambertsExtension-CostEstimateSummary-11-10-16.xlsx

CONSTRUCTION COST OPINION

PREPARED BY:

Gateway Design Studio
856 Kiefer Trails Dr., St. Louis, MO 63021

Date:
Client:

November 10, 2016
City of Sikeston, MO

Project:

Sikeston - Rail to Trail Master Plan
Phase 4b Option 1 - Trail section from Westend Park to Highway BB
Along Existing Rail Bed

MATERIALS & LABOR

QUANTITY	UNIT	DESCRIPTION	PRICE	TOTAL
		PHASE 4b - WORK		
8330	S.Y.	10 ft. Crushed Stone Trail Pavement	\$10.00	\$83,300.00
400	S.F.	Concrete Sidewalks/Pads - Trailhead at BB	\$5.00	\$2,000.00
650	S.F.	Fabricated pedestrian bridge w/foundation walls	\$181.00	\$117,650.00
1	LS	Trail Head Kiosk Sign	\$7,500.00	\$7,500.00
8	EA.	Signs, stock, aluminum, reflectorized	\$200.00	\$1,600.00
7	EA.	Metal Pipe Bollards, painted, concrete filled	\$800.00	\$5,600.00
1	LS	Pavement Marking	\$500.00	\$500.00
		Site Work - Sub Total		\$218,150.00
1	LS	Seeding utility mix, 7 lb. per M.S.F., tractor spreader	\$2,300.00	\$2,300.00
		Landscape - Sub Total		\$2,300.00
1		5% Project Management, Insurance, Permits	\$11,000.00	\$11,000.00
1		20% Contingency - Concept Phase	\$46,000.00	\$46,000.00
1		15% Design/Engineering/Surveying	\$41,500.00	\$41,500.00
		Sub Total		\$98,500.00
		GRAND TOTAL		\$318,950.00

NOTE:

* Cost information derived from RS Means Site Work & Landscape Online Data - 3rd Quarter 2016

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(1) Cost of the pedestrian signals assumes existing signals and control box can easily accommodate the upgrade to the pedestrian signals

Phase 4b-Option1-CostEstimateSummary-11-10-16.xlsx