



Wyandotte County Lake Bridle Trail

RESTORATION PLAN



CREDITS

Wyandotte County Parks Foundation



Unified Government of Wyandotte
County / Kansas City, Kansas Parks
and Recreation Department



Hollywood Casino



Equestrian Design Guidebook for
Trails, Trailheads, and Campgrounds



vireo

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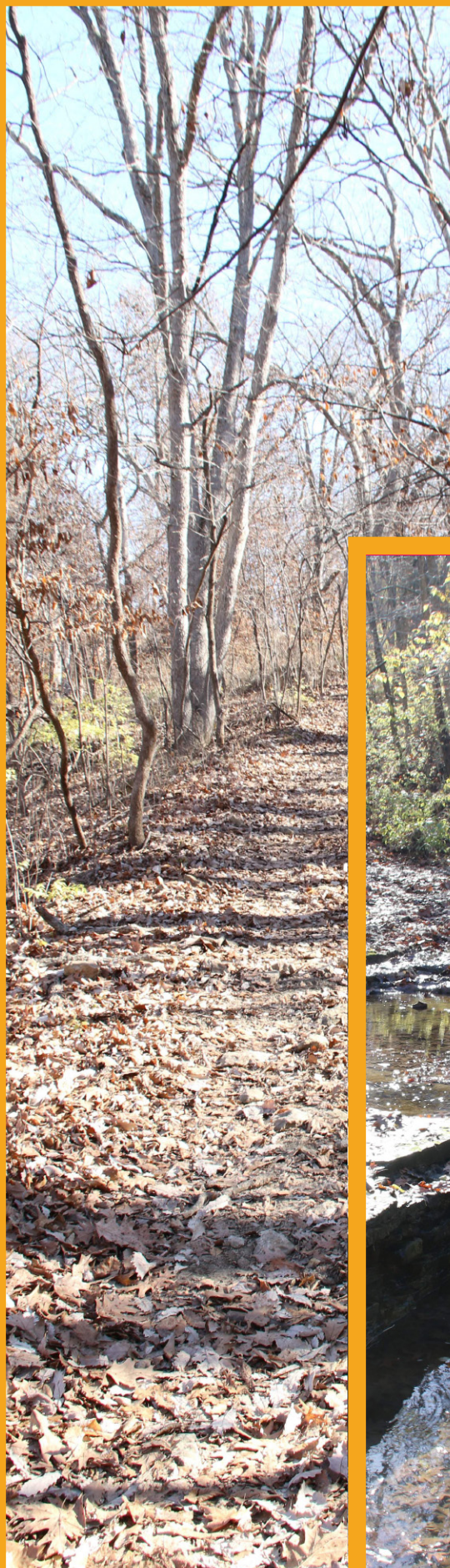
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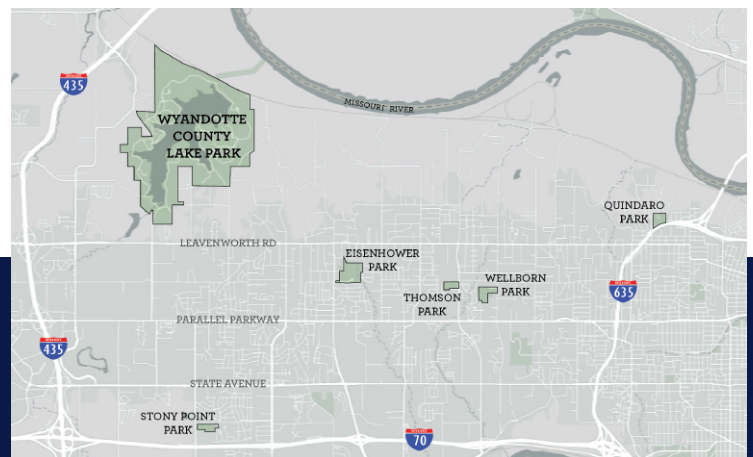
Community Engagement

01



INTRODUCTION

The Wyandotte County Parks Foundation, with assistance from the Unified Government of Wyandotte County/Kansas City, Kansas (UG) Hollywood Grant Fund, initiated a planning process for the revitalization of the Wyandotte County Lake Park Bridle Trail. The Bridle Trail is the only walking/riding trail through a natural area in Wyandotte County. It traverses 10.5 miles of some of the most beautiful terrain in the County as it crosses creeks, winds through forests and glades, and provides views of the Lake and Missouri River floodplain. It also offers good opportunities to view wildlife and observe nature. Although parts of the trail are in good condition, the trail has not been routinely maintained over the years, and sections of the trail bed have eroded due to inadequate drainage of water runoff or poor layout. As a result, these sections of the trail remain excessively muddy for long periods, making trail use difficult and hazardous. Bridges, or other water crossing practices, are needed for stream crossings and low-lying areas that tend to collect water for long periods. Additionally, signage is almost nonexistent, discouraging novice trail users from exploring the trail.



Wyandotte County Lake Park in relation to surrounding parks in the area.

History of the Park and Bridle Trail

Wyandotte County Lake Park is located in western Wyandotte County, south of the Missouri River/Kansas state line and east of I-435. The 1,400-acre park and 400-acre lake were built to address two significant issues facing the County and the Nation in the 1930s: the Great Depression and a lack of water due to drought. The County was looking for ways to create jobs and establish water conservation through impoundments (lakes).

In 1935, the County began looking for tracts of land of sufficient size to form a lakebed and the necessary access from all sides. That fall, the County passed a resolution declaring its intent to purchase 1,400 acres of land for a country lake and park. Wyandotte County Lake was formed by damming Marshall Creek, which was known for abundant fish and wildlife, suitable topography, forested hillsides, and being in a watershed of sufficient size for the proposed lake.



Snow Geese and Canada Geese taking advantage of the lake.

Federal funding through the Works Progress Administration (WPA) was used to fund the lake and park construction. Construction of the dam started in 1936 and wasn't completed until 1945, which was when water flowed over the completed spillway for the first time. Many of the buildings and shelters within the park were built in the earlier years.

It was rumored that there may have been a horse racetrack in the area where the lake is today that may have been used by Fort Leavenworth. Research at the Fort Leavenworth Military Museum and Leavenworth Command General College archives indicates that such use may have been in operation from the 1890s until just before the 1920s.

The original Bridle Trail (also known as the Wyandotte County Lake Loop Trail) was built in the late 1930s. In the 1950s, the UG Parks Department operated a stable with horse rentals that was especially popular on weekends. The trail began at the stables on the southeastern end of the lake and ended at shelter 11 on the lake's northeastern corner. In 1982, the expansion of the trail was completed to fully encircle the lake. A mounted horse patrol was operated at the park from the late 1980s into the early 1990s. In the present day, the trail is used by walkers, hikers, trail runners, and horseback rider



Early photos of Wyandotte County Lake.

Photo credit: Missouri Valley Special Collections, Kansas City Public Library, Kansas City, Missouri.

Below is the trail description as provided by Wyandotte County Parks and Recreation.

Enjoy 8+ miles of scenic bridle trails surrounding beautiful Wyandotte County Lake. Each season at the lake offers its own unique riding experience. Springtime kicks off with trailside flowers and budding trees. Summer offers views of sailboats, pontoons, and fishermen. The most breath-taking autumn foliage captures Kansas City's beauty (don't forget the camera). With winter comes a new view of the lake through leafless trees and offers glimpses of the ever-present wildlife. Be sure to look skyward for our resident eagles.

After your ride, relax and enjoy a picnic lunch at the tables provided next to the trailer parking area. Top off your day with a quick stop at the nearby Schlagle Nature Library (also located at the lake) for fun and informative exhibits highlighting mammals, reptiles, and birds native to the lake area.

Horse trailer parking is located at the 83rd St entrance

Trail ride-time approximately 3-4 hours

Park hours: 6:00AM - 10:00PM

Cost: Free

No alcoholic beverages

Restoration Plan Development

The goal of the planning process for the Wyandotte County Lake Park Bridle Trail Restoration Plan is to develop a plan and design recommendations that will guide Wyandotte County Lake Park into the future. The planning process included a current conditions assessment of the trail; creative and active engagement of trail users for input throughout; development of a set of volunteer-based design plans for trail improvements; design of trailheads and wayfinding signage; and cost estimates for trail restoration and improvements.



2012 Run Toto Trail
A Trail Nerd Event

*Current trail runner use on the Wyandotte County Lake Park Bridle Trail
Photo credit: Dan Jarrell*

02



COMMUNITY ENGAGEMENT

The planning team engaged a broad range of targeted and interested parties to hear their concerns and potential strategies for addressing them into this Plan. The following pages describe the methods used and input received from the community.

User Groups

Preliminary discussions and initial assessment identified three primary user groups and two auxiliary groups.

PRIMARY

HIKER



EQUESTRIAN



TRAIL RUNNER



AUXILIARY

EDUCATOR



CYCLIST



Each of these groups has a vested interest in the trail and, in some cases, requires different amenities to create an enjoyable trek on the trail.

Focus Groups

A stakeholder group of more than 40 people representing a cross-section of the user groups gathered at the start of the project to share thoughts, ideas, needs, and desires for the Wyandotte County Lake Park Bridle Trail. Two daytime and two evening sessions were held, each containing a variety of different user groups.

Focus group attendees were given a short presentation outlining the current user groups, an introduction to the inventory, and the goals of the Restoration Plan. Individuals were encouraged to add their own sticky notes to each of the 13 prompts, as shown on the following page. Discussions centered around five main questions, starting with the strengths and weaknesses before diving into amenity offerings and ending on what priorities each individual desired to meet the needs of Wyandotte County Bridle Trail users.

STRENGTHS

Although individuals varied in their wording, several common elements rose to the top. For those who are in training, the length, all-weather availability, and terrain are what entices them to the Bridle Trail. More passive users enjoy the ability to 'feel lost' in the natural scenery. They also appreciate that the trail loops back, with several entrances and exit points.

WEAKNESSES

User groups agreed that mud, erosion, and drainage were a major issue; other weaknesses included signage, invasive vegetation, and trash. Previous trail improvements done one user groups to solve their issues often cause issues for the other varied users.

AMENITIES

The amenities category was broken up between on the trail and at the trailheads. Overall, the need for signage and mapping at the trailheads, along the trail, and digitally accessible is apparent. Many of the very active users feel that current amenities are adequate. More passive users are looking for places to stop and take a break; this could be as simple as a bench along the trail or a stop-off location with picnic tables and hitching rails. Users are looking for restrooms, trash cans, water access, and hitching rails at the main Bridle Trailhead. Parking is at a premium and would need expansion if use increases.

The results summarized above informed the questionnaire distributed to the public on an online survey platform.

Wyandotte County Lake Bridle Trail

RESTORATION PLAN



01 What are the BEST ASPECTS or STRENGTHS of the Bridle Trail?	02 What are the WEAKNESSES of the Bridle Trail?	03 Are there any issues you have with other user groups along the trail?	04 Describe your typical use of the WYCO Bridle Trail?
05 Are there areas of the trail that are unusable? If so, what causes these conditions and where are they located?	06 Do you actively participate in trail maintenance currently?	07 What should we be thinking about as we design restoration projects for volunteer groups?	08 What concerns do you have about long-term trail maintenance?
09 What other features of Wyandotte County Lake Park are you using?	10 In the next 5 years, should the Parks Foundation focus on repairing existing facilities of building new amenities, or both?	11 What types of amenities would you like to see offered along the trail?	12 What types of amenities would you like to see offered at the trailhead? <small>Help us locate another trailhead.</small>
13 If you could select ONE PRIORITY for the Restoration Plan, what would it be?	14 How do you find out about the trail and scheduled events? <small>Do you have ideas on how the foundation can do a better job in creating awareness?</small>	15	16

RATINGS

Trail maintenance, cleanliness, and general upkeep

Trail safety and security

Quality of trail amenities

Trail amenities meet the needs of the community

Coordination between trail user groups

Please share any thoughts you have regarding the future of the Wyandotte County Lake Bridle Trail Restoration Plan:

PRIORITIES

Parking
Upgrades

Signage
[Wayfinding,
Trailheads, &
Mile Markers]

Erosion &
Drainage
Issues

Trail
Rerouting
to Avoid
Problem
Areas

Organization
between user
groups and
volunteers

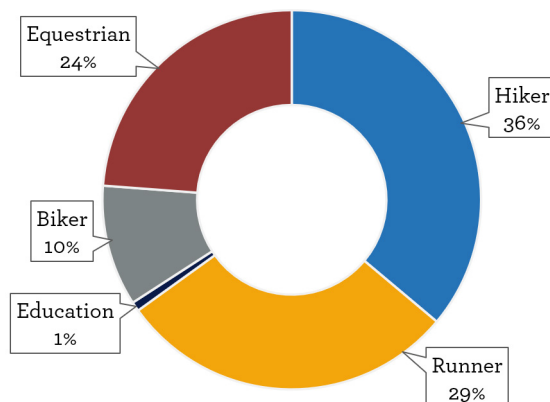
Coordinated
& Timely
Maintenance
between the
groups

On-line Public Survey

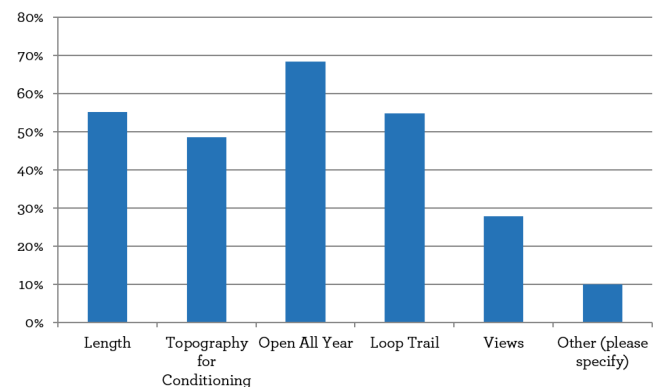
Trail users were eager to participate in the planning process, with over 275 responses from various user groups. The survey was shared widely through several social media groups and physical signs were placed throughout the park and along the trail. Responses are shown below, using graphs and word clusters to illustrate the thoughts and opinions of participants.

The survey captured the user groups, with the 'hiker' category becoming a catch-all for the more spontaneous and random users. Within the park, there are several trails available to users. However, the Bridle Trail is the only option for equine trail users. There are eight defined mountain bike trails with a combined total of just under 18 miles, primarily used and maintained by bikers, but available for hikers and other users.

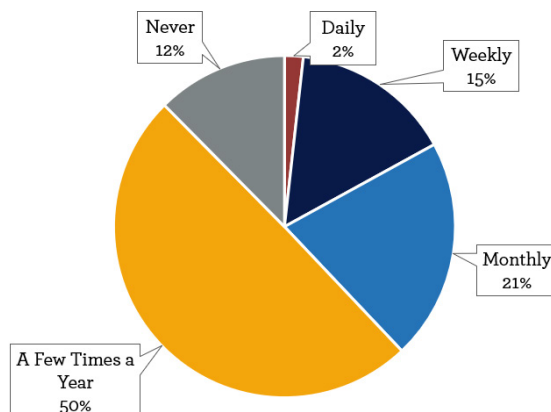
Describe your typical use of the Wyandotte County Bridle Trail?



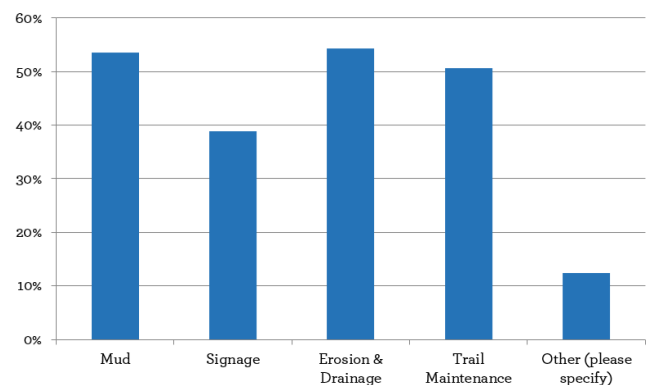
What are the BEST ASPECTS or STRENGTHS of the Bridle Trail?



How often do you use the Bridle Trail at Wyandotte County Lake Park?



What are the WEAKNESSES of the Bridle Trail?



Respondents were then asked,

Are there any issues you have with other user groups along the trail?

Answers to this question varied by user experience, but the most frequent response was ‘no.’ Of the issues reported, the most common conflict lies between horses and bikers and horses and canines. When the Off-Leash Dog Run was added, it was cut directly in half by the Bridle Trail. This is an area of concern for both horse and rider safety, but also for the canines. Current usage makes riders uncomfortable, and they often choose to reroute to avoid the dog park.



The trail is full of tight corners, blind spots, and narrow trail beds that can occur for several hundred feet. Given current issues with trail use and looking at current equestrian trail guidelines, the recommendation would be to pull cyclist use from the Wyandotte County Lake Park Bridle Trail. The Bridle Trail is one of the least utilized trail options for cyclists, and as other use increases, this separation can minimize trail conflicts.



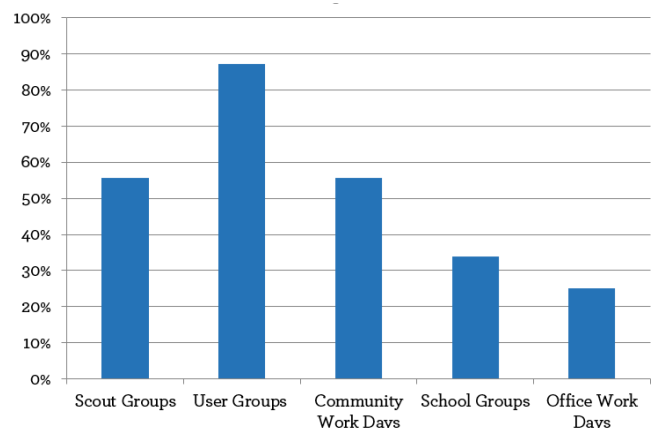
Users were also asked if they currently participate in trail maintenance and, if so, in what capacity. 77% of participants responded “No.” Of those who answered yes, 35% were runners, 27% equestrian, 22% cyclists, and 16% hikers. The most common responses came from trail runners engaged in Trail Nerds, a local running group that uses the trail for their weekly runs.

Participants were also asked to share their concerns about long-term trail maintenance; a word cloud of the most common responses can be seen below. The more often a word was used, the larger it appears below.

CLEAR VOLUNTEERS
MAINTENANCE TIME MAINTAINED
NONE EROSION MUD

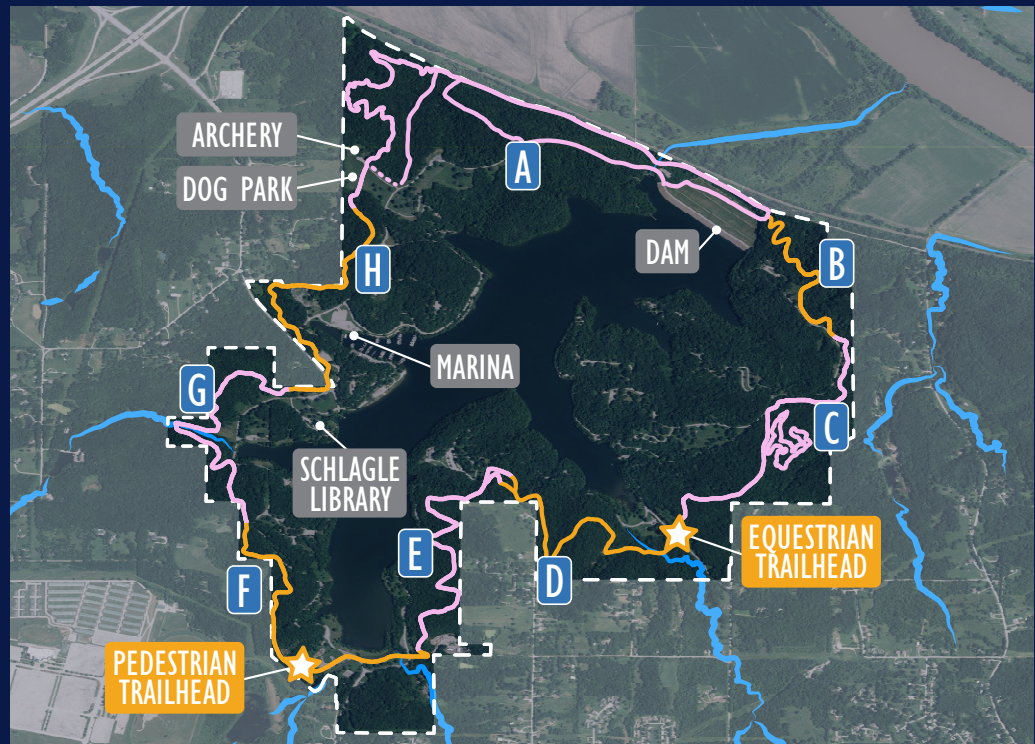
When engaging with the focus groups, a majority prioritized trail maintenance and the lack of coordination between the main trail user groups. This led to the question:

Who should we be engaging to volunteer to help maintain the Bridle Trail?



Survey participants were asked to select all that apply. A majority chose to involve user groups, and 55% of respondents believe in engaging scout groups and organizing community workdays.

Several questions asked participants to use the map to the right to locate features and issues along the trail.



If a new trailhead was added, where would you locate it?

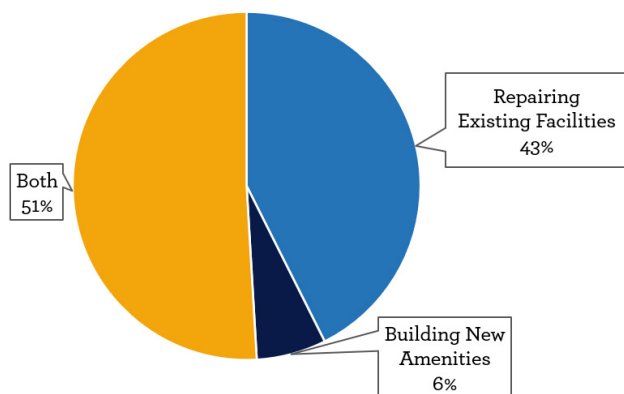
38 percent of participants don't see the need for another trailhead. Of those who saw a need, the most common locations for a new trailhead were in segments A, H, and G. Equestrian users tended to see the greatest need for a new trailhead, likely due to the lack of parking for trailers at the current trailhead. The Plan will include further recommendations on trailhead locations in subsequent sections.

Are there unusable sections of the trail? If so, describe what causes these conditions and where are they located?

The most common answer (55%) was that no issues made the trail impassable, which speaks to the types of current users. However, many of them understand that drainage and erosion issues are complicated. Continued use of a compromised trail often compounds the issue, negatively affecting the integrity of the trail.

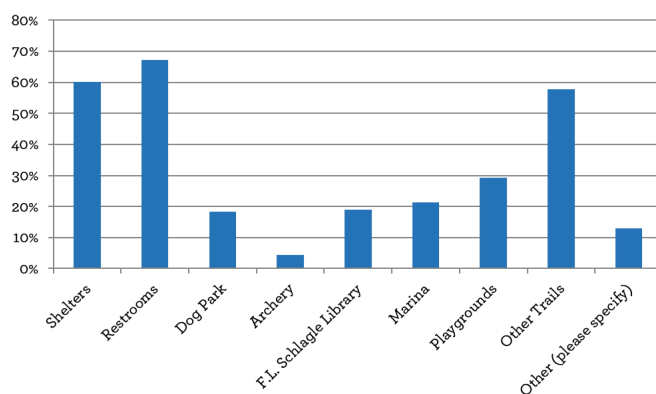
The most commonly used words of those who specified an issue were mud and erosion, vegetation clearance issues, and lack of signage. Sections B, D, & A had the most recorded problems. These directly correlate to the projects and issue types described in Section 03.

In the next 5 years, what should the Parks Foundation focus on?



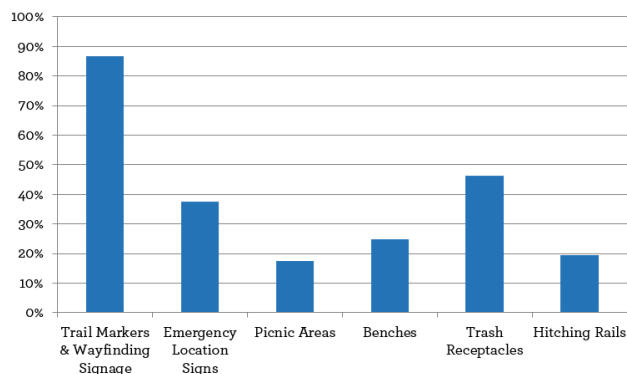
The graph above illustrates the desire of 94% of respondents to repair the existing facilities, and 57% of respondents are interested in building new amenities. When comparing this to the rest of the survey, it is evident that most respondents are interested in repairing the trail base while updating or adding amenities within the trailheads and stop-off locations.

What other features of Wyandotte County Lake Park are you using?

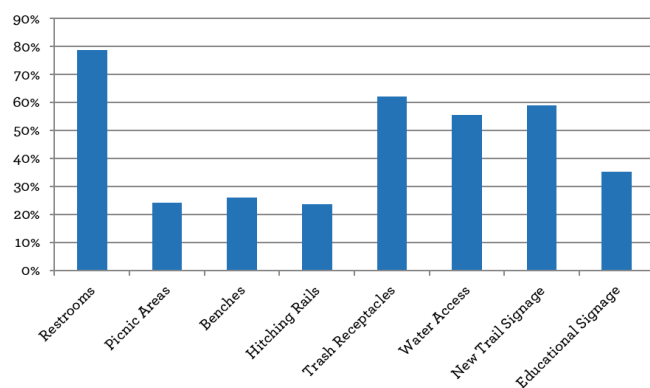


Trail users often take advantage of the other amenities within Wyandotte County Lake Park. The most common responses were restrooms (67%), shelters (60%), and other trails (58%). Answers provided in the other category included fishing at the lake and trips to the Snackle Box, the restaurant located in the marina.

What types of amenities would you like to see offered along the trail?



What types of amenities would you like to see offered at the trailhead?



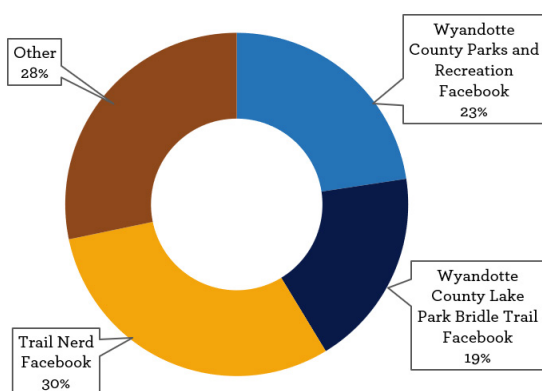
After evaluating several aspects of the trail and its systems, participants were asked for their number one priority. The word cloud below illustrates the most common answers.



These directly correlate with what was seen previously in the focus groups.

Another priority that was mentioned several times is the lack of coordination between user groups, specifically regarding maintenance and trail workdays. This led to the question;

How do you find out about the trail and scheduled events?



Within the 'other' category, the most common answer was word of mouth through friends, family, and neighbors who actively use the trail. Other reoccurring answers included the Urban Trail Co. and Trail Mason groups. Current user groups use Facebook as their primary source of connection, but many respondents were looking for info outside of social media.

The final question in the survey gave respondents a chance to share any final thoughts regarding the future of the Wyandotte County Lake Bridle Trail Restoration Plan. The quotes shown below reflect what individuals are feeling about the future of the Bridle Trail.

ADD SIGNAGE

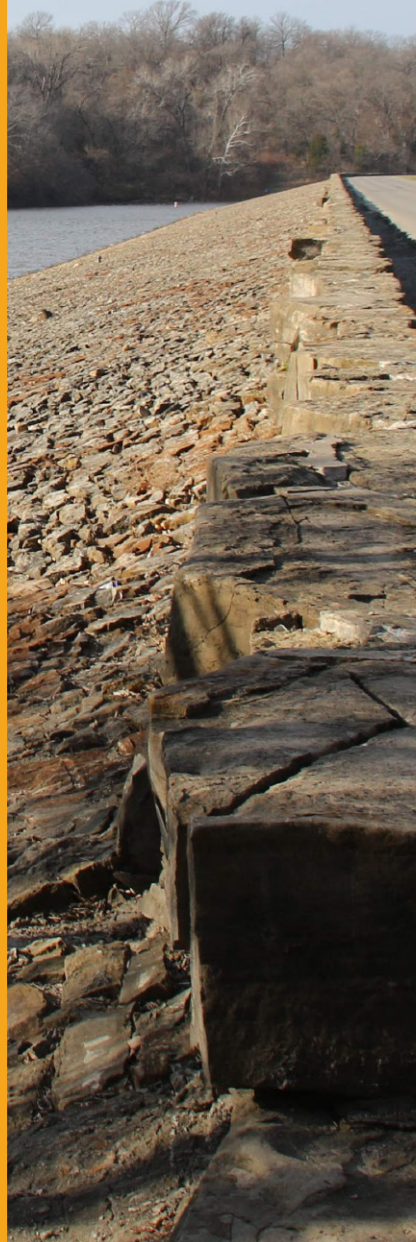
**IT'S A HIDDEN TREASURE.
LET'S MAKE IT EVEN BETTER!**

**MUCH NEEDED AND
LONG OVERDUE.**

**KEEP THE TRAIL
CHALLENGING &
HIGHLY TECHNICAL**

KEEP IT NATURAL

03



TRAIL INVENTORY AND ANALYSIS

A team set out to hike the trail over two days in December and take GPS data. The group included researchers, trail novices, a runner, and a hiker with extensive knowledge of the Wyandotte County Lake Park Bridle Trail. This team took several hundred photos, and the GPS points relevant to the data to follow.

Establishing a Goal

Before restoration can begin, the site needs a set of overarching goals and a group of individuals committed to helping achieve those goals.

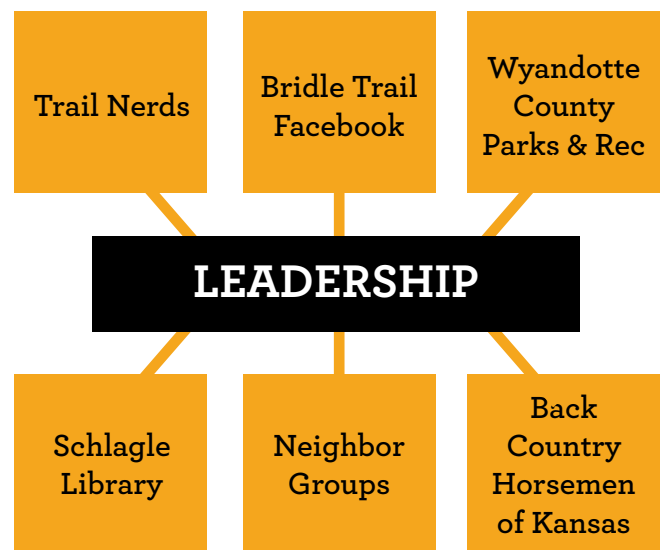
The survey asked users for their number one priority, which can be used as a start for defining needs for the project. They boil down to four main goals.

1. Signage
2. Coordinated Maintenance
3. Mitigate Erosion & Drainage
4. Enhance Natural Surroundings

Each goal can be broken down into objectives that can then be turned into projects for volunteers to take on.

Based on input given in the focus groups and survey, several individuals are interested in participating but lack leadership. For this Plan to be brought to fruition, it will need a strong set of leaders to break out different projects, obtain funding, and manage volunteers.

The current system lacks a single location to turn to for information, and users are left floundering.



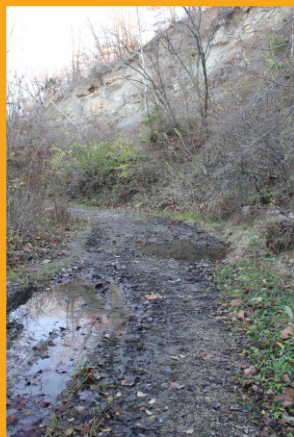
Understanding the Issues

Conditions vary significantly along the 10 miles of trail, and some sections have complications that impact their use. The initial inventory catalogs and organizes these issues into three main categories outlined on the following page.

TRAIL ISSUE TYPES

Vegetation

Vegetation issues can be varied, but the most common are overgrowth and downed trees. The first can be addressed by regular workdays trimming back vegetation and removing invasive species, i.e., shrub honeysuckle and Japanese honeysuckle. Downed trees can be managed on a case-by-case basis, but require a method of reporting.



Erosion & Drainage

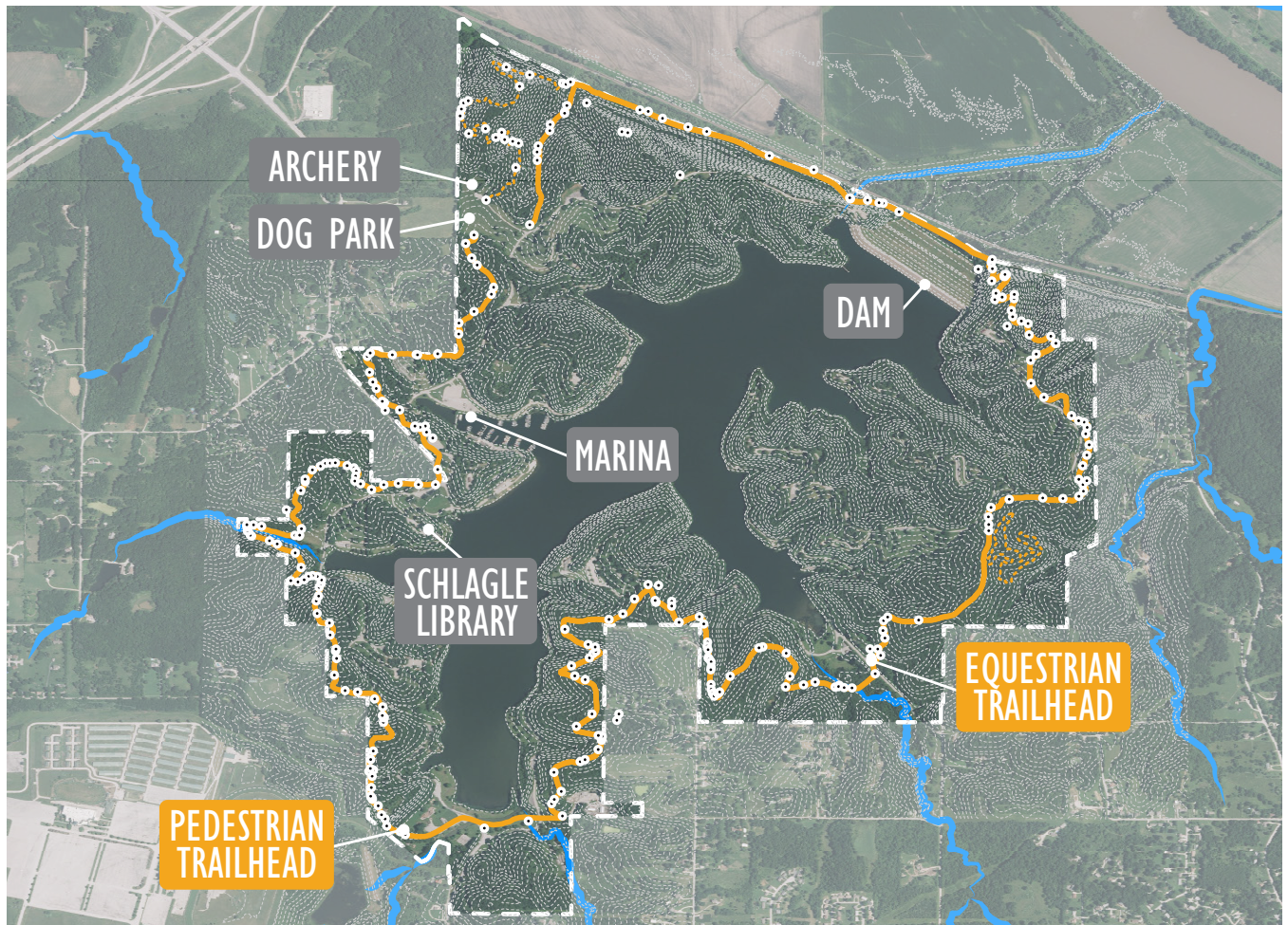
Erosion of the trail has three primary causes. The first is channelized water on the trail; this causes users to reroute to avoid muddy feet, only expanding the issue. Another cause is use during unfavorable conditions. The path is primarily soil, which is easily displaced if there is heavy use during wet conditions. The final cause is intermittent seeps from nearby springs, which cause large mud pits to span the trail.

Crossings

Roads and vehicles are a significant concern for both pedestrian and equine users. The road crossings are extremely wide, unmarked, and around blind corners in many cases.

Several ravines within the trail alignment could be bridged for safer access for all users groups.





Each dot on the map above represents an issue seen along the trail. Some are as simple as a downed tree, while others represent long-term erosion issues. GPS data was taken for each location, and these points were then broken down into project types described in section 05.

The team also looked for locations to restore the natural beauty of spaces that had been previously disturbed. Invasive species have taken over many sections of the park and will take years of dedicated and coordinated maintenance to get under control. The removal of these species will allow native flora to flourish and enhance the views of the lake and the trail surroundings.

04



RESTORATION PROJECTS

By creating a Restoration Plan for the Wyandotte County Bridle Trail, each previously described issue helps define a project that a team of volunteers can take on. More straightforward projects can be done by scouting groups and other volunteers, while other long-term issues can be tackled by pursuing grants to help provide funding and expertise.

This section of the Plan breaks the projects down into five categories, each with their own priorities.

1. General Trail Concerns
 - Erosion
 - Drainage
 - Crossings
 - Trail Bed Issues
2. Trail Reroutes
3. Trailheads
4. Signage
5. Amenity Updates

Within these project types, there are a variety of projects with varying levels of difficulty and cost, beginning to outline the short-term or long-term needs. Each project time frame is defined on the right and color-coded for the following maps.

SHORT TERM | 1-5 years \$

Trail maintenance that can be done through coordinated efforts with parks staff and volunteers.

Examples could include cleaning up vegetative debris and remedying clearance issues.

MID TERM | 5-10 years \$\$

Trail restoration projects often in areas of limited access, requiring large equipment or skilled labor.

Examples could include filling and stabilizing eroding trails or smaller rerouting opportunities.

LONG TERM | 10+ years \$\$\$

These are typically much larger projects that require design time and performed outside the Parks Dept.'s yearly budget.

Examples could include building short stacked ledge rock walls to stabilize sections of the trail or replacing the bridge near shelter 2.

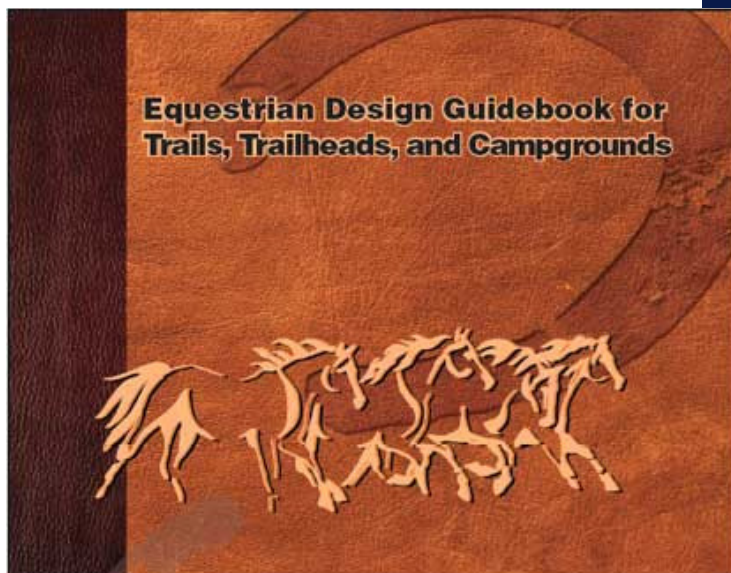
Overall Trail Design

Great trail design and overall sustainability come down to several factors. The WyCo Bridle Trail has three significant factors that impact the trail; surface substrate, trail slopes, and trail clearance.

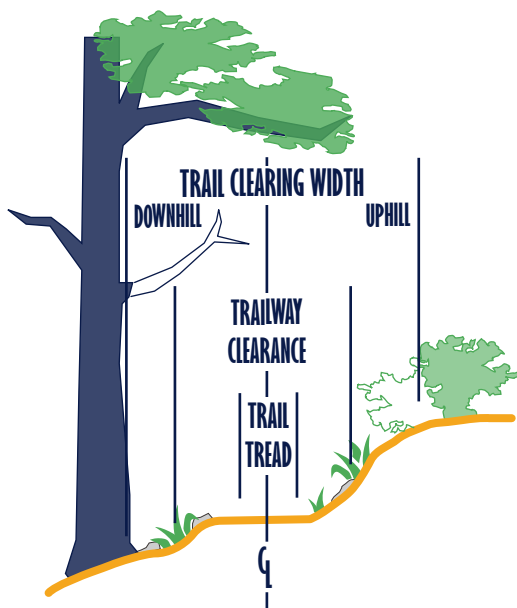
Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

Additional information may be required throughout the course of the trail design process. If so, the Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds provided by the USDA. The following descriptions are adaptations of the information supplied in the design guidebook. Additional renderings and photos may be available at the hyperlink provided below.

https://www.fhwa.dot.gov/environment/recreational_trails/publications/fs_publications/07232816/toc.cfm



Sloped Trail Clearance



Vegetation removal height dependent on adjacent trail height, measurement should be taken from highest point on the trailbed.

Trail Clearance

Three measurements are used to describe trail clearance; tread width, clearing width, and overhead clearance. For low development trails such as the WyCo Bridle Trail, desirable tread could range from 1.5-6 feet in width for typical use zones. The Bridle Trail will take on a flexible tread width approach. In areas of typical use, a 2' tread zone is desirable. In areas of significant slope or where users cannot maneuver off the trail, passing spaces should be incorporated. This can be done several ways; however, the most common types are trail bump-outs that allow users to pause and let others pass. Another option would be to widen the trail tread to allow two horses to pass in a single stretch of trail. Consider wider trailbeds and armoring the downslope side for trail sections on steep side slopes.

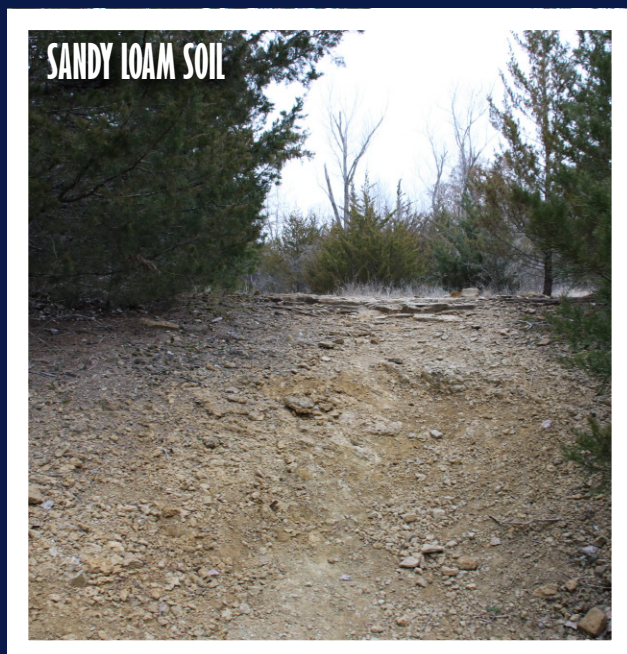
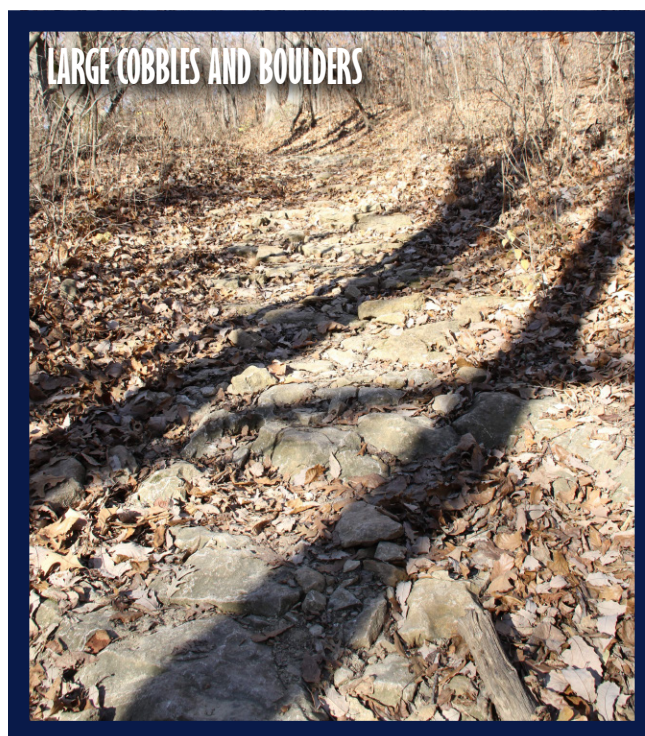
Clearing width and overhead clearance generally apply to vegetation clearance. A 6-8 feet width is optimal for the level of use seen, with areas that widen for passing. An overhead clearance of 10' minimum is required, with 12' preferred for equestrian use. Desirable vegetation less than 2.5' can be left in place outside of the 2' tread zone to minimize erosion. This will be an ongoing issue, spring and fall workdays with educated volunteers will set the trail up for success.

Shrub honeysuckle is an invasive species that dominates much of the under-story. Volunteer education on proper removal of and replacement of natives will be critical.

Surface Substrate

Surface substrate refers to the ground condition of the trail, which changes throughout the trail. The trail is clay with exposed roots in many areas. Some sections are comprised of a sandy, loamy (very loose) soil. There are also several locations with large cobbles or boulders present. These complications to the trail design process need to be factored into alignment opportunities. The photo below provides an example of rocky conditions along the trail.

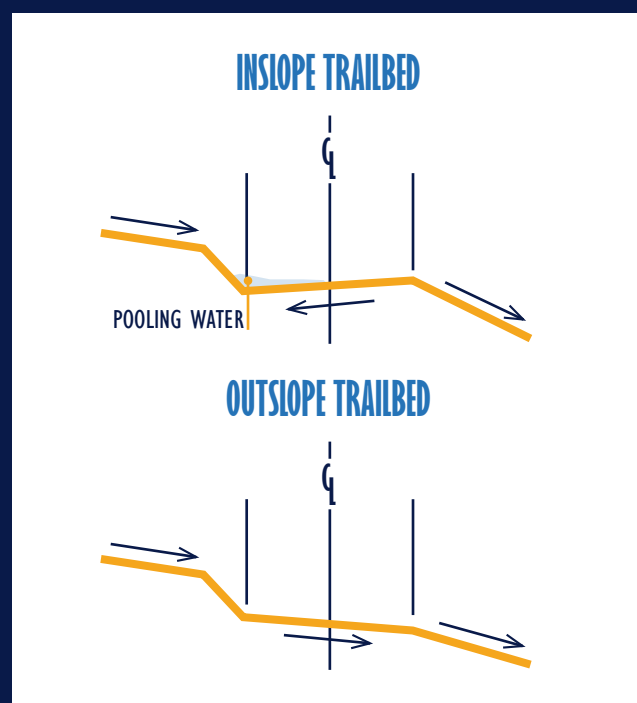
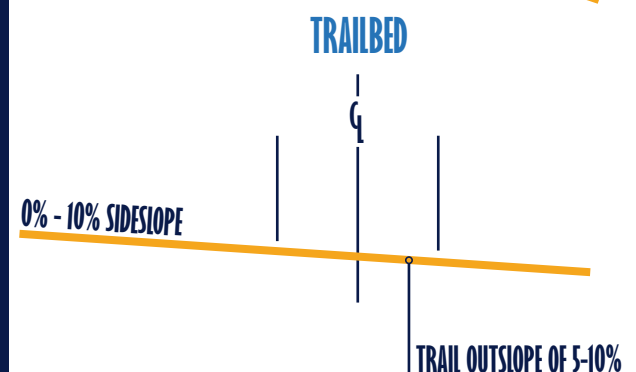
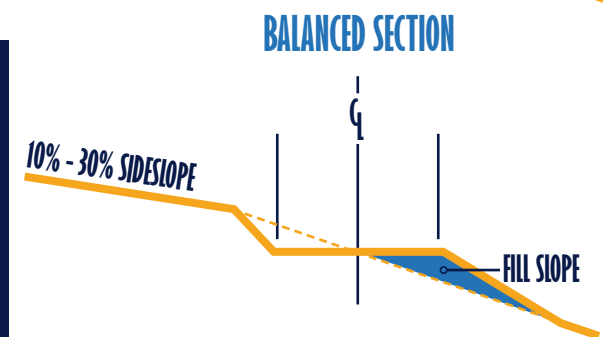
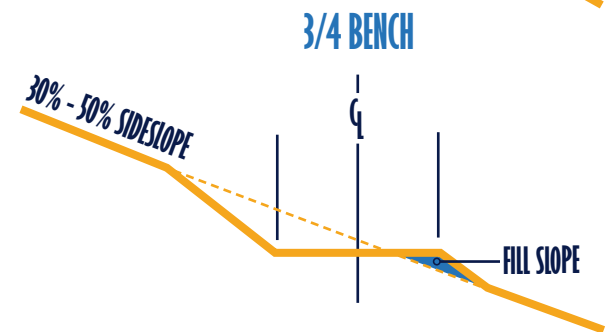
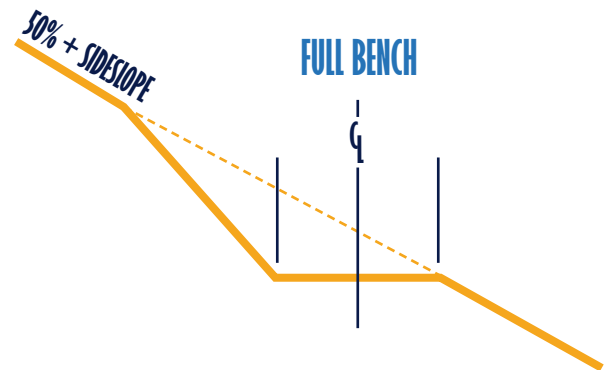
In locations where the surface substrate needs to be amended, crushed rock with fines is the optimal choice, as it provides excellent traction for equestrians and low long-term maintenance. The addition of fines is key to lowering the susceptibility of displacement.



Trail Slopes

An outslope (downhill side of the trail) of 5-10% is preferred to ensure proper drainage and limit water ponding on the trail. Outslope refers to the percentage decline on the trail's surface from the toe of the sideslope. For new or rebuilt trails, a common practice is to use the sideslope to determine your bench. For example, if a trail section has a 45% sideslope, designers would use a $\frac{3}{4}$ bench, indicating that $\frac{3}{4}$ of the trail section would be cut in from the uphill side and $\frac{1}{4}$ would be filled on the downhill side. The larger the bench, the better the compaction, reducing the potential for impact and erosion by equestrian use. For all new equestrian trail construction in areas of a significant slope, no less than $\frac{3}{4}$ bench should be designed.

Typical Trail Cross Sections



Trail Mitigation

For the Bridle Trail, rerouting some trouble spots may be a long-term solution for proper trail design. In the short term, users can look for ways to improve current trail conditions.

Entry Erosion:

This is a significant issue for trails across the nation. Erosion and wear can be caused by enthusiastic users meeting up with their hiking groups or antsy equestrians just beginning their trek, but can also have natural causes at a poorly graded entrance and exit point. The trailheads slope either up or down upon entry in many sections. Less erosion is seen in areas that immediately slope up or remain flat. In sections that slope down upon entry, water from the surrounding open space is funneled into the trail. This leaves the trail entry as the most obvious route for the water to escape. Creating berms and ensuring good vegetative cover around these entrances can mitigate the effects of water scouring out these entry points.

In many cases, these entrances and exits can be protected by adding crushed rock with fines to the surface to withstand the additional use better.



Soft Spots:

Soft Spots are the result of water ponding on the trail's surface. This can happen for several reasons; inslope, sedimentation, or even natural springs. If this issue is with inslope, a simple regrade to outslope the entire tread section should remedy the problem. In cases of trail sedimentation, or if the trail is unable to maintain an outslope, a wide drain or knick should be added. A knick is a 5-10' wide subtle depression in the relatively flat trail surface that protrudes from the low side—typically having a 15% slope decline to the outer edge to pull water off the trail. A reinforced outlet can be added to keep it from getting clogged or washed out. Either can be done in tandem with a rock layer to keep the surface of the trail dry and allow water to flow off the trail.



Well meaning trail users have implemented short term solutions. Stumps, logs, even pallets have been placed for users to cross without losing their shoes in the mud.

These types of solutions work temporarily for runners and hikers, but overtime they can sink in or become unstable causing tripping hazards on the trail. Equestrians also have issues with these types of amendments, often routing around them to avoid tripping. As the pallets break up splintering wood and rusty nails have been found in the mud on the trail.

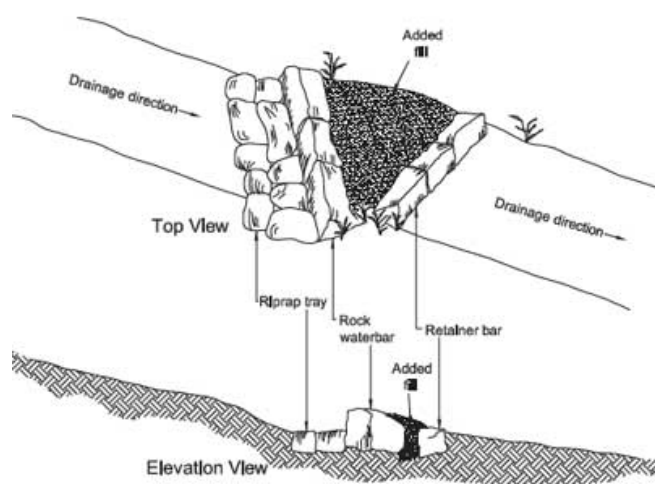
Channelized Water:

There are several solutions for areas where water is becoming trapped or channelized on the trail. This issue is often self-perpetuating, as the water continues to erode the soil, which deepens the trench. Water bars and rolling dips are the two most common. Water bars are considered an older method, have higher maintenance, and have a higher failure rate, but they are already seen on the trail. They can be implemented with volunteers and used as a temporary measure to resolve issues.

Waterbars

When installed correctly, they are at a 30 to 45-degree angle to the trail; as the water sheet flows down the trail, it hits the waterbar and is pushed off the downslope side of the trail. The issue is that water bars were historically made of wood, which rot and need to be replaced frequently. In other cases, they were undercut, leading to a dangerous sinkhole in the trail or significant tripping hazards. The photo below shows an example from the trail entrance near shelter 6.

Regular clean outs of sediment and debris are required. Armored waterbars with rock trays, like the one seen below, tend to have better success rates in less than 5% grade areas. For trails 15-20% slope, 45 degrees is the minimum to reduce clogging and over-topping issues. For grades over 20%, waterbars should not be considered.

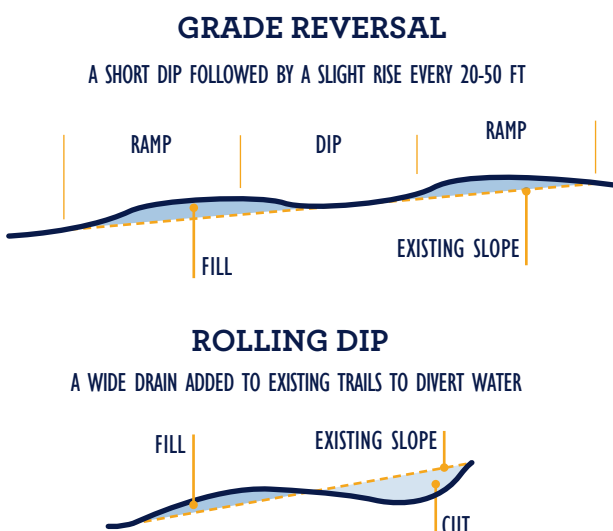


A diagram from the USDA Equestrian Design Guidebook illustrating a section view of an armored waterbar.

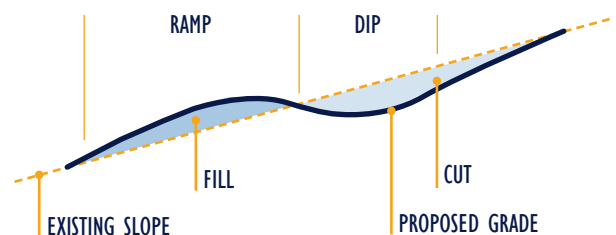
Rolling Dips / Grade Reversals.

This is another option for dealing with channelized water, which involves regrading sections to interrupt water flow. Mimicking the knick described earlier, with the addition of a ramp built up on the downhill side of the trail. For example, a route descending at a 10% slope would have a dip (knick) built at a desirable drainage location with an outsloped tread, followed by a 10-20' ramp at a 3-4% incline and then returning to the original descending slope.

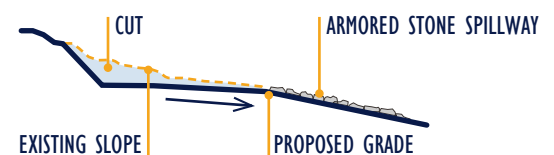
These should be installed based on trail slope and optimal drainage locations. This should minimize the maintenance needed, but no trail amendment is without maintenance. Stability should be checked yearly or after extreme washout conditions.



Section Cut Parallel to the Trail



Section Cut Perpendicular to the Trail [At Dip]

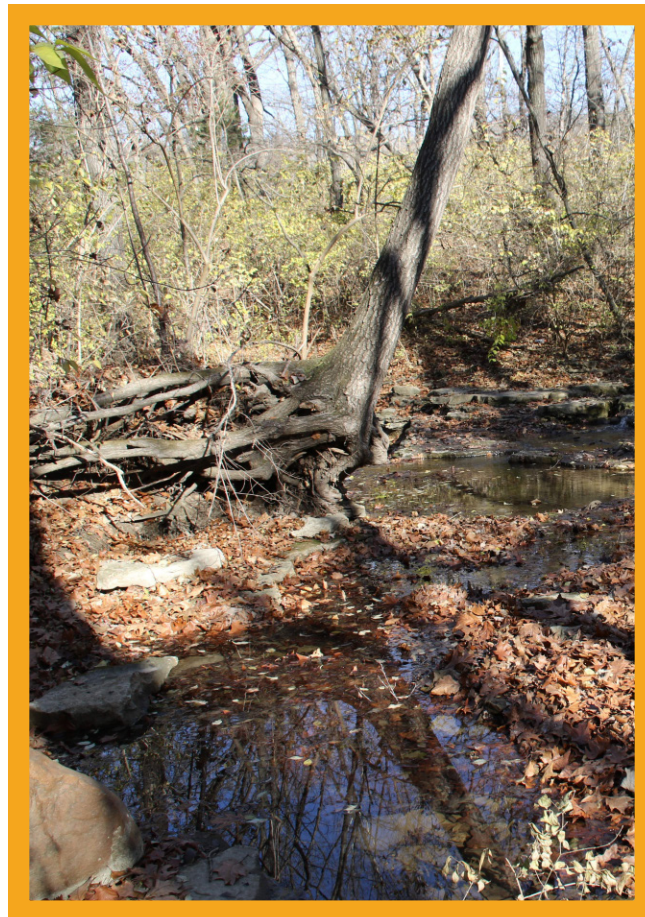


Volunteer maintenance is key to the WyCo Lake Bridle Trail. This often requires electing the simpler solution, even if replacement or maintenance is needed more often. Waterbars may be used as a solution in areas of minimal channelization and grades less than 5%. The material can be sourced from the site, and a group of volunteers can do the installation in a single work session. Rolling dips should be used in areas of more severe erosion or significant water movement, and all new trail additions to mitigate water channelization.

Drainage Crossings:

In locations where a drainage channel runs perpendicular to the trail, it can often create a soft spot. The longer it continues to run across the trail's surface, the higher the likelihood of erosion. Mitigation needs to be done on a case-by-case basis. Leaving the trail untouched but monitored is the best course of action for many small drainage channels. In areas low in the watershed, two options are available, depending on the location. A culvert may be the best choice in areas with ample room on either side of the trail. Culverts need space for water to gather before the trail and funnel into a pipe or a small rock culvert and then outlet the other side. If water backs up on either side of the channel, significant erosion will ensue. The surface above the culvert can be thin and may need regular maintenance.

The other option is low water crossings made of gravel and cobbles. A trench carved out and filled with large cobbles, then topped with gravel, without fines, will allow the water to move freely through the trail. This will need armoring and regular maintenance in seasons of high rainfall.



Stream Crossings:

There are several locations where the trail crosses small perennial streams, which are mucky and unstable. Current guidelines recommend using geotextiles to stabilize banks and provide a stable tread through the stream. Gravel and larger rocks can also be used, but the wider surface area lowers the traction, making them very slippery to both runners and horses. Any amendments made to stream crossings should be done in coordination with an engineer to maintain the integrity of the stream.

Users must cross in the correct location if adjustments are made to the crossing site. Logs, larger boulders, and rocks can be used to direct horses and runners to the ideal crossing location.



Bridges:

In some locations, bridges may be necessary. An engineer should oversee bridge design, selection, and installation. Several guidelines will help in the design phase, such as preferred trail width of 8' in high traffic areas and a minimum of 6' in lower-traffic areas. For the WyCo Bridle trail, the new bridge near shelter two would be considered an area of high traffic, while bridging the gully on the western section of the trail would be a low traffic example.

The material, slope, and style of the bridge will be dependent on location. However, careful consideration of how horses and their riders experience the bridge must be given—starting with creating a stable, slip-resistant connection to the trail that guides the horse onto and off of the bridge comfortably. Other considerations include if the bridge sways or sounds hollow when traversed, which can spook even the hardiest trail horse. Rub rails can also be considered for rider safety and minimizing equipment snags.

EXISTING BRIDGE



Steep Slopes:

Traversing steep terrain requires carefully constructed trails that weave down the slope. Switchbacks and climbing turns are the two most common construction methods.

The switchbacks' construction includes the approach, landing, and interior curve barriers. Switchbacks landings for equestrian trails should be a minimum of 8' wide, but a radius curve of 10' is preferred.

In cases of 50% or greater slope, a drainage swale and retaining wall may be required. This is needed to maintain a full bench trail that will be less likely to erode due to heavy equestrian use. Depending on the location, retaining walls may be required on both sides of the trail.

Climbing turns are similar to switchbacks, but they are grander in scale. They tend to follow the slope more gradually, and instead of pivoting at a landing, the curve continues to rise at a similar slope to the rest of the trail. A 20' minimum turn radius is necessary for this construction method. These are typically best suited for slopes less than 15%.

SUITABLE BRIDGE



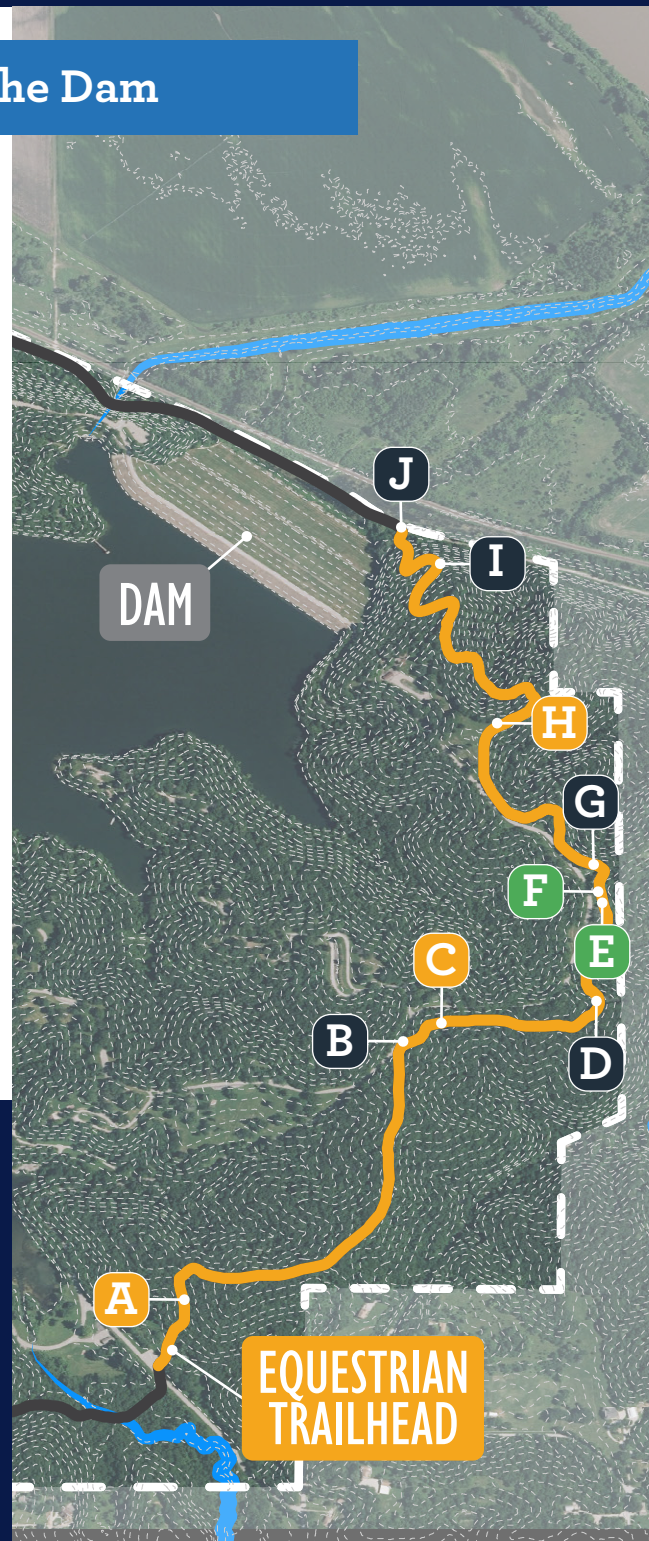
TRAIL CONCERNS

EAST | Equestrian Trailhead to the Dam

This is the start of the journey at Wyandotte County Lake Park for current equestrian users. The trailhead is where they park their trailers, load and unload their horses, and prep any needed supplies. Amenity concerns regarding the trailhead and any other stop-off locations are addressed on pages 34-38.

Dots seen on the map to the right identify an issue caused by drainage or erosion. Some areas are minor and are only noted for continued monitoring; others relate to long-term management and restoration projects to create more sustainable trails.

Several of the current issues seen on the trail are addressed by rerouting fall line trails into sweeping switchbacks. Rerouting these sections will address multiple problem areas and limit the long-term maintenance needed to keep them in usable condition.



A

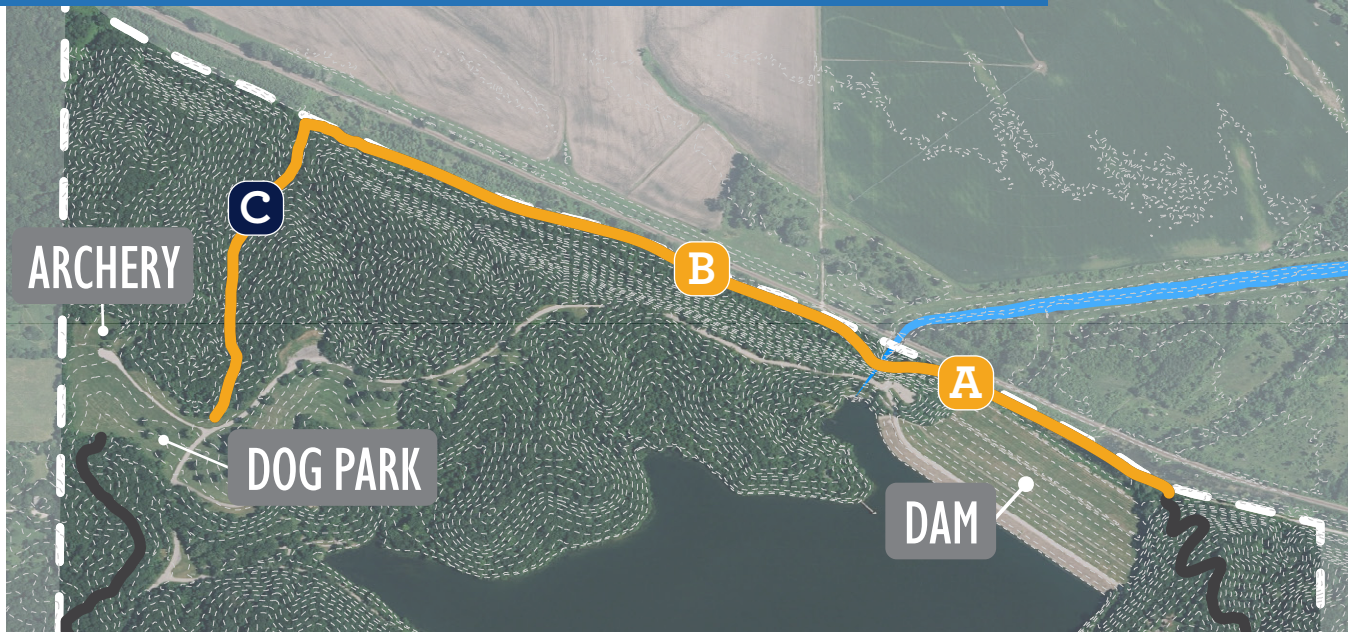


- A** Soft Spot: Consider crushed fines as an amendment to the beginning of the trail. High traffic and heavy use will continue to displace soil.
- B** Entry Erosion: Significant cut at trail entry, mitigate at the entry point, and supplement with rolling dip if needed.
- C** Regrade: Trail narrows due to erosion. Consider fill and crushed fines to stabilize the area and divert water off the trail.
- D** Channelizing: Regrade with rolling dip.
- E** Regrade: Erosion likely due to use in wet conditions. Regrading is needed for proper sheet flow to minimize future soil displacement. Add a knick to reduce ponding.
- F** Drainage Crossing: No action is needed at this time; needs monitoring for drainage impacts over time.
- G** Channelizing: Significant erosion, considered armoring the high-side with native stone walls. Likely a long-term project to protect the integrity of the trail and the hillside above.
- H** Entry Erosion: Consider crushed fines as an amendment to the beginning of the trail. High traffic and heavy use will continue to displace soil.
- I** Switchbacks: Created by the trail runners in recent years in reaction to the heavily eroding fall line trails used to navigate the northeastern section of the park. For equestrian users, they are proving to be a technical challenge, with narrow trailbeds and tight corners. Stabilization will be vital in maintaining this location through native vegetation and rock armoring.
- J** Stream Crossing: Consider the addition of geotextiles to stabilize banks.

**B****I****J**

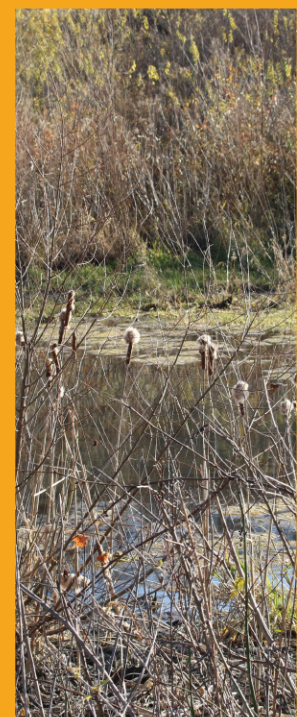
TRAIL CONCERNS

NORTH | Dam to the Leash Free Dog Run



The northern quadrant of the trail following the back of the dam suffers from significant standing water with areas that remain soft all year round. Restoration in this section of the trail breaks down into three major projects.

Amenity updates and vegetation maintenance in this area are addressed on page 38.



Projects A & B contain similar conditions; the trail remains soft year-round, with water visibly pooling around the trail.

A Consider resurfacing with gravel to maintain emergency and maintenance vehicle access, directing water drainage from the backside of the dam into the improved wetlands described in the amenity updates.

B Regrade & Culvert: Incorporate a parallel drainage channel at the toe of the slope. Water is then piped beneath the trail before it migrates to the auxiliary spillway.

C A long-term restoration project is reclaiming the original Bridle Trail alignment. This beautiful corridor provides a unique experience to trek parallel a gently trickling stream. Varying trail widths at the toe of the slope provide opportunities to pause and enjoy the scenery.

The trail can be used currently, but the stream channel is beginning to meander within the valley, and bank restoration may be needed for long-term sustainability. A geotextile or similar armoring method partnered with deep-rooted native vegetation may be installed to keep the trail usable in high water conditions.

A



B



C



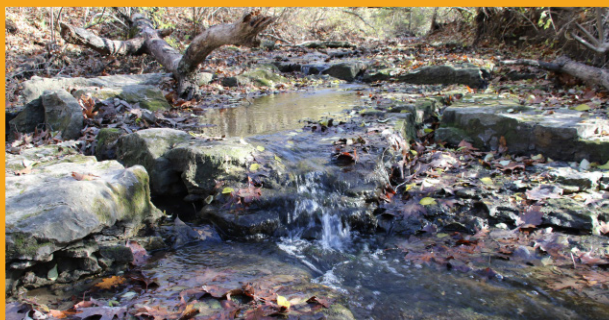
TRAIL CONCERNS

WEST | Leash Free Dog Run to Pedestrian Trailhead

This section is commonly used by runners and hikers, who enjoy the challenge presented by the significant change in topography. In areas hugging the park property line, the trail may require additional signage or fencing in some areas.

Several locations require significant restoration due to erosion and drainage concerns, as noted by the many projects listed below.

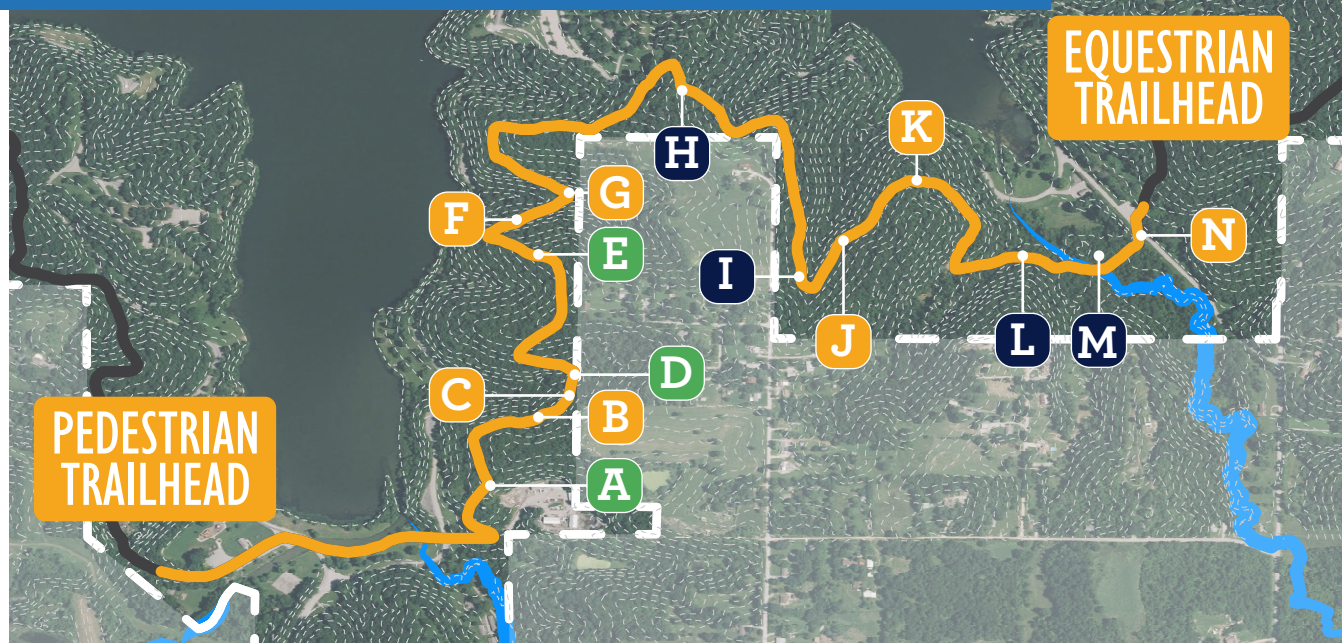
- A** Soft Spot: Consider crushed fines as an amendment to the beginning of the trail. High traffic and heavy use will continue to displace soil.
- B** Soft Spot: Consider crushed fines as an amendment, highlighting the spur down to shelter 14.
- C** Channelization: Trail narrows due to erosion. Consider fill and regrade with rolling dips to stabilize the trail and reroute surface water flow.



- D** Drainage Crossing: Water from an upstream detention pond is causing significant erosion and soil displacement. Consider a partnership with neighbors to create another wetland detention structure with a piped overflow beneath the trail.
- E** Fencing and vegetative overgrowth behind the marina storage cause significant narrowing of the trail. Short-term, remove shrubby vegetation. Long-term, fencing for the maintenance area could be shifted south to allow better access.
- F** Drainage Crossing: Causing significant head-cut. Address piping challenges, and armor the outlet to prevent future issues.
- G** Channelization: Fill and regrade with modifications to outlet water.
- H** Drainage Crossing: Pipe beneath the trail to prevent trail washout.
- I** Drainage Crossing: Pipe beneath the trail to prevent trail washout.
- J** Regrade: Trail bench too narrow.
- K** Soft Spot: Consider regrading to create a small wetland adjacent to the trail.
- L** Drainage Crossing: Significant erosion where sheet flow crosses the trail; consider adding a large knick to concentrate flow.
- M** Entry Erosion: Significant cut at trail entry, mitigate at the entry point, and supplement with rolling dip if needed.
- N** Stream Crossing: Long-term trail project to address the fall line trail and steep bank access to cross the creek.
- O** Drainage Crossing: Pipe beneath the trail to prevent trail washout.
- P** Replant: Remove road access point.
- Q** Drainage Crossing: No action is needed at this time. Continue monitoring.
- R** Channelization: Parallel to the trail. Fill and regrade with modifications to outlet water.
- S** Bridge: Long-term engineering opportunity to keep trail users out of the gully and off the street.
- T** Bridge: Current trail conditions limit equestrian use. Opportunity to create a low water bridge crossing to keep trail users out of the gully.
- U** Channelization: Parallel to the trail. Fill and regrade with modifications to outlet water.
- V** Entry Erosion: Significant cut at trail entry, mitigate at the entry point, and supplement with rolling dip if needed. High traffic and heavy use will continue to displace soil.

TRAIL CONCERNS

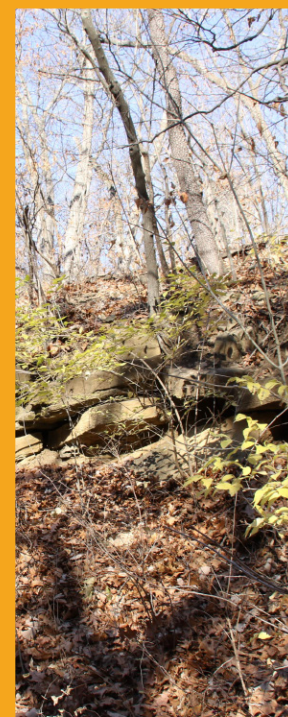
SOUTH | Pedestrian to Equestrian Trailhead



Between the two existing trailheads, the southern section of the trail is the least traveled. Many users are making out-and-back trips north from either trailhead and turning around when they encounter unfavorable conditions on the trail.

There are several locations with mud liable to remove your shoes within this section. The projects seen to the right aim to remedy this and other erosion issues.

Amenity concerns regarding the trailhead and any other stop-off locations are addressed on page 38.



- A** Replant: Remnant trail, replant with natives to mitigate the current confusion in locating the trail.
- B** Soft Spot: Current crossing solutions provided by trail users are inadequate. Stumps, logs, and pallets need to be removed. Regrade trail with knick.
- C** Channelization: Fill and regrade with modifications to outlet water.
- D** Replant: Remnant trail, replant with natives to mitigate the current confusion in locating the trail.
- E** Replant: Wide trail bed with exposed soil—plant with natives to mitigate potential erosion.
- F** Channelization: Fill and regrade with modifications to outlet water.
- G** Drainage Crossing: Pipe beneath the trail to prevent trail washout.
- H** Channelization: Fill and regrade with modifications to outlet water.
- I** Drainage Channel: Standing water at the bend; several small springs cross at this location. Consider a long-term project to alter their flow across the trail.
- J** Regrade: To sheet flow water over the trail bench.
- K** Regrade: Fill, create a knick, and stabilize the outside edge of the curve.
- L** Channelization: Fill and regrade with modifications to outlet water.
- M** Stream Crossing: Consider adding geotextiles to stabilize banks. It needs a defined crossing location to prevent future erosion.
- N** Entry Erosion: Significant cut at trail entry, mitigate at the entry point, and supplement with rolling dip if needed. High traffic and heavy use will continue to displace soil.

**B****E****N**

TRAIL RE-ROUTES

Much of the historical Wyandotte County Lake Bridle Trail was carved by users, each navigating around obstacles as needed. This method has left some trails wide and rutted, and others split off in multiple directions before linking back up. These trail remnants confuse novice trail users, and wider trails allow for further erosion.

The trail has been rerouted from the old fall line trails to create more sustainable switchbacks in some locations. The existing switchbacks were created by runners and are filled with tight corners and narrow trail beds. This is a deal for pedestrians, but can be dangerous for equestrians, especially if multiple users come from either direction. Future trail amendments will use similar practices and principles, but widen the trail bed and turn radius for better flow and less erosion at the pivot points.



Equestrians have limited choices for local trails; while they enjoy the length of the current trail, they are always looking to add length and new scenery where possible.

Project I would be a long-term trail project that looks into extending the trail out around James P. Davis Hall to provide a unique opportunity for equestrian users to access the lake, mimicking the fishing access from shelter 3.

Project D and E are looking to create a more straightforward transition along the park's northern edge. Current conditions along the abandoned roadway are muddy and overgrown. Restoration is needed to maintain the emergency vehicle access point. The equestrian and pedestrian use split in the northeast corner, allowing runners to use the tight switchbacks and steep runs without equestrians causing further damage. Equestrian users will take a smoother route along the creek before emerging just east of the dog park.

Project H is another long-term project, but one that is of higher priority for the safety of trail users. The bridge is dangerous and unusable for equestrians (and has limited, safe pedestrian use) in its current state. Users must cross several parking lots before joining traffic to trek across a soft spot adjacent to the lake and cross another road before jumping back on the trail. Not only is this confusing to trail users, but it is likely to cause them to make unpredictable movements in traffic.

This project should be completed in conjunction with the additional trail mileage resulting from the addition of the property to the east of the Amazon facility.



- A** Perpendicular crossing at County Lake Park Rd., rerouting also allows users to stay out of vehicular traffic.
- B** Reroute to address erosion issues.
- C** Reroute to address erosion, creating switchbacks to navigate the slope.
- D** Defining the primary route for the Bridle Trail repair to keep this accessible for vehicles for future maintenance.
- E** To avoid conflict within the dog park and direct users south to the trail.
- F** To avoid conflict with users of Shelter 10 and the adjoining playground.
- G** Reroute to avoid fall-lines among the bluffs, sweeping switchbacks to prevent future erosion.
- H** Keeping users off the road and parking lot areas requires a new bridge and pedestrian crossing for N 91st street.
- I** Expansion opportunity: Adds approximately 0.75 miles of trail and two road crossings.
- J** Reroute to address erosion issues.

TRAILHEAD

The current Wyandotte County Lake Park Bridle Trail has little to no interaction with the rest of the park. The equestrian trailhead is relatively isolated, and much of the trail is disconnected from many other park amenities. This section will detail potential locations for small rest stops, a potential new trailhead, and adjustments to the dog park for better park user interaction.

Existing Trailheads

Currently, one official trailhead for equestrian use is located on the eastern side at the County Lake Park Rd entrance, and an unofficial trailhead for pedestrian use near shelter 2.

The **equestrian trailhead** is limited in size, and the potential for expansion is limited by topography. Users report being unable to use the trail at times due to poorly configured trailers or standard vehicles filling the small lot and horses slipping on the asphalt parking lot. Current amenities include an aging trailhead sign and a water spigot. Across the street are the 83rd street shelter, a seasonal restroom, and a couple of portable toilets which are tucked into the trees, which is why many users report not seeing them.

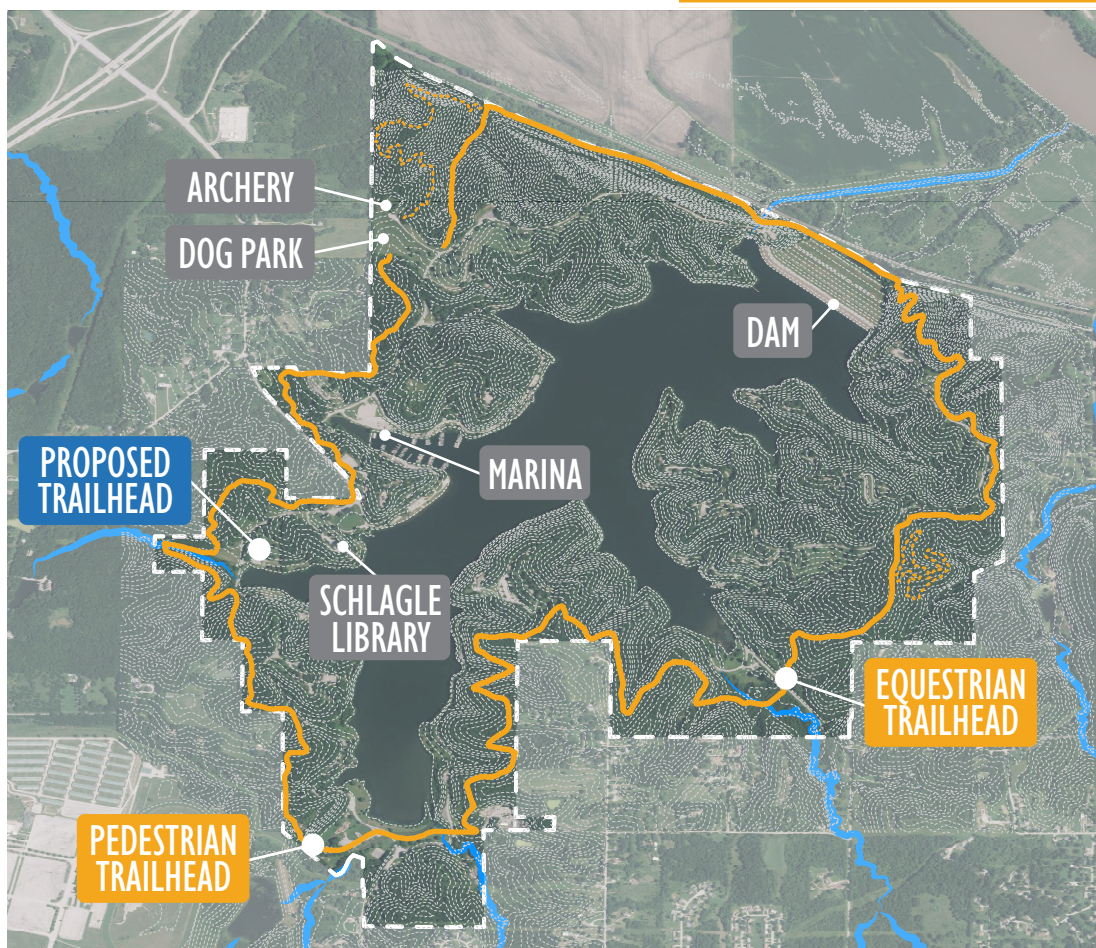
The **pedestrian trailhead** located on the park's southern end near shelter 2 is not well marked. It does have nearby amenities, including a restroom, playground, and ample parking.

Proposed Trailhead Updates

Updates to the **Equestrian Trailhead** would begin with creating a larger pedestrian space away from the parking lot. The space will be defined by hitching rails, a multi-use drinking fountain with a frost free spigot, picnic tables, and a trailhead kiosk. Long-term plans could include replacing the asphalt lot with a gravel one, redesigned to better accommodate back-in trailer parking. Security lighting and cameras are to be provided to mitigate break-ins involving the horse trailers. Manure removal method, to be determined by the leadership team, will also be provided for owners to clean up after their animals.

Updates to the **Pedestrian Trailhead** include creating a gathering place, as this is an ideal location for families prepping their children or runners meeting up for their weekly runs. Site furniture should consist of benches, trash receptacles, and multipurpose water fountains. Kiosk signage will be imperative to help users navigate the trail heading east.

This trailhead update should be coordinated with the park's expansion to the south to minimize any future reconfigurations..



Proposed Equestrian Trailhead located at shelter 6, with a pull-through gravel parking lot. This western location has convenient access to water, an existing restroom, and an easy trail connection. It also gives equestrian users a new way to experience the park by bringing them closer to the lake. This would be used in tandem with the existing equestrian trailhead.

This trailhead location strengthens the connection to the Schlagle Library, allowing library groups to access trail amenities and unique highlighted natural spaces.

Library staff often report pedestrian users wanting to jump on the Bridle Trail. This location would give librarians a way to direct hikers directly to the trail using the Stoptler Cove Nature Trail.

SIGNAGE

Wayfinding systems typically include several levels of signage, from larger trailhead kiosks to simple mile markers. Each plays a vital role in how the user experiences the trail.

Current Conditions

Signage is lacking throughout the park and is almost nonexistent along the Bridle Trail. There is limited information provided at either existing trailhead, and users are left to infer where to begin their journey.

Some of the trail entrances are marked with signs that vary greatly in legibility. Some are decaying, and others are completely overtaken by vegetation.



Wayfinding Updates

The proposed wayfinding system includes several layers of signage, starting with a multi-use **trailhead kiosk**. This will provide the user with up-to-date trail information, a map, and the rules of the trail.

Secondary signage comes in the form of **four-sided fiberglass posts**; these serve as a visual indicator of what trail they are on, who is using the trail, and where the trail begins as it moves from an open field into a stand of trees. The Plan will also include Emergency Medical Services (EMS) locator signage on two sides of the four-sided post in critical locations.

FOUR-SIDED FIBERGLASS



CARSONITE

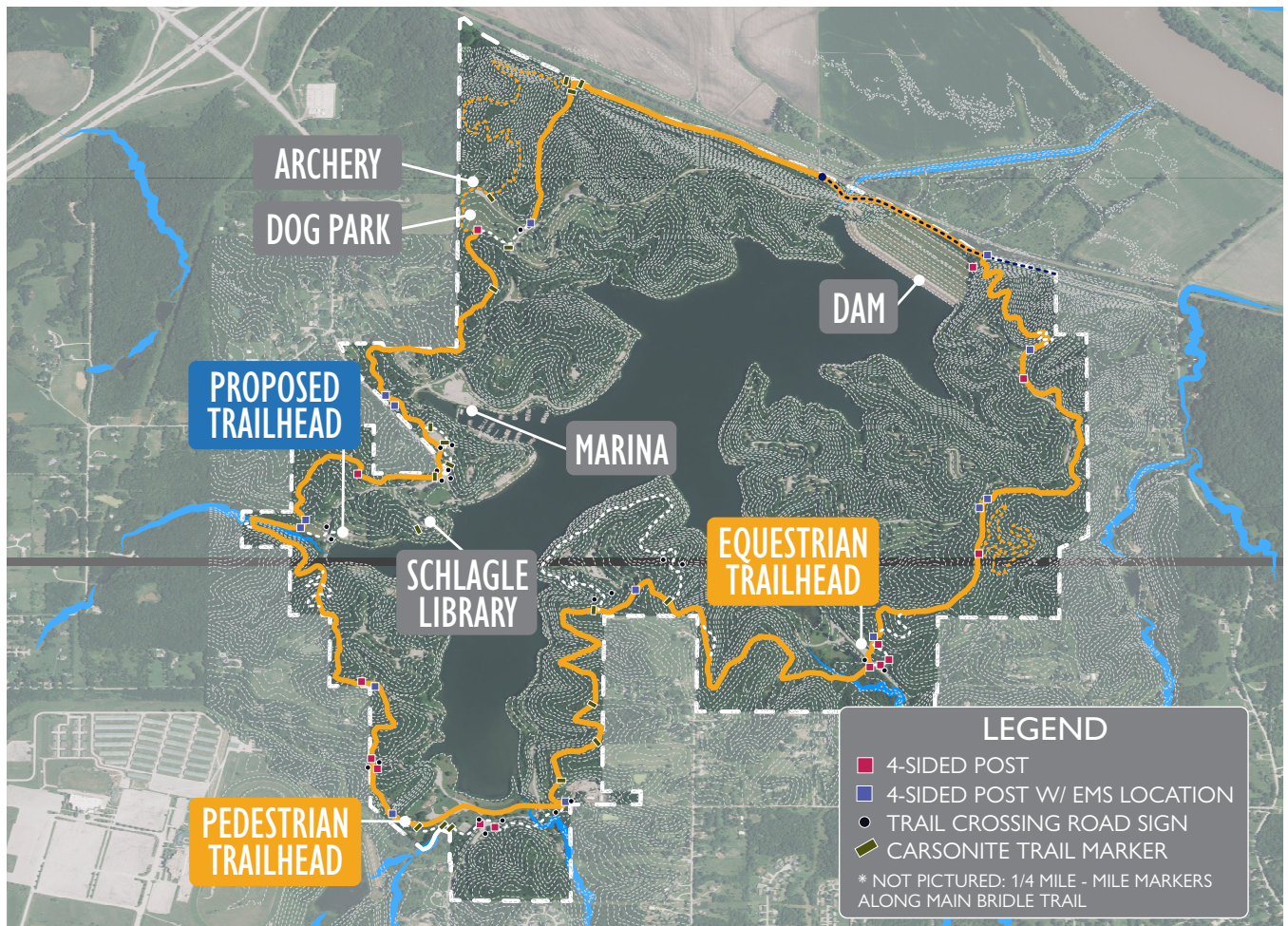


MILE MARKERS



REFLECTIVE SIGNS





Carsonite markers will be used in areas within the trail. Information should include: the trail name, expected user information, and directional arrows for trail intersections.

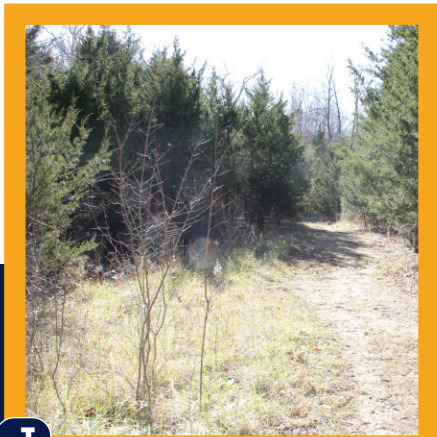
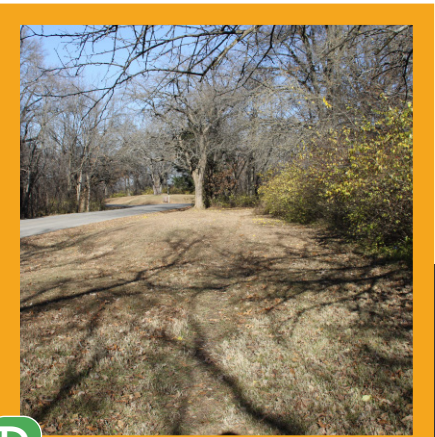
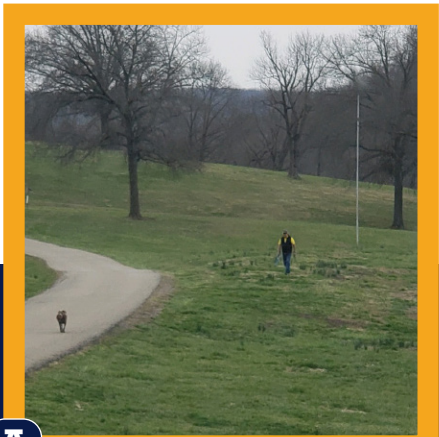
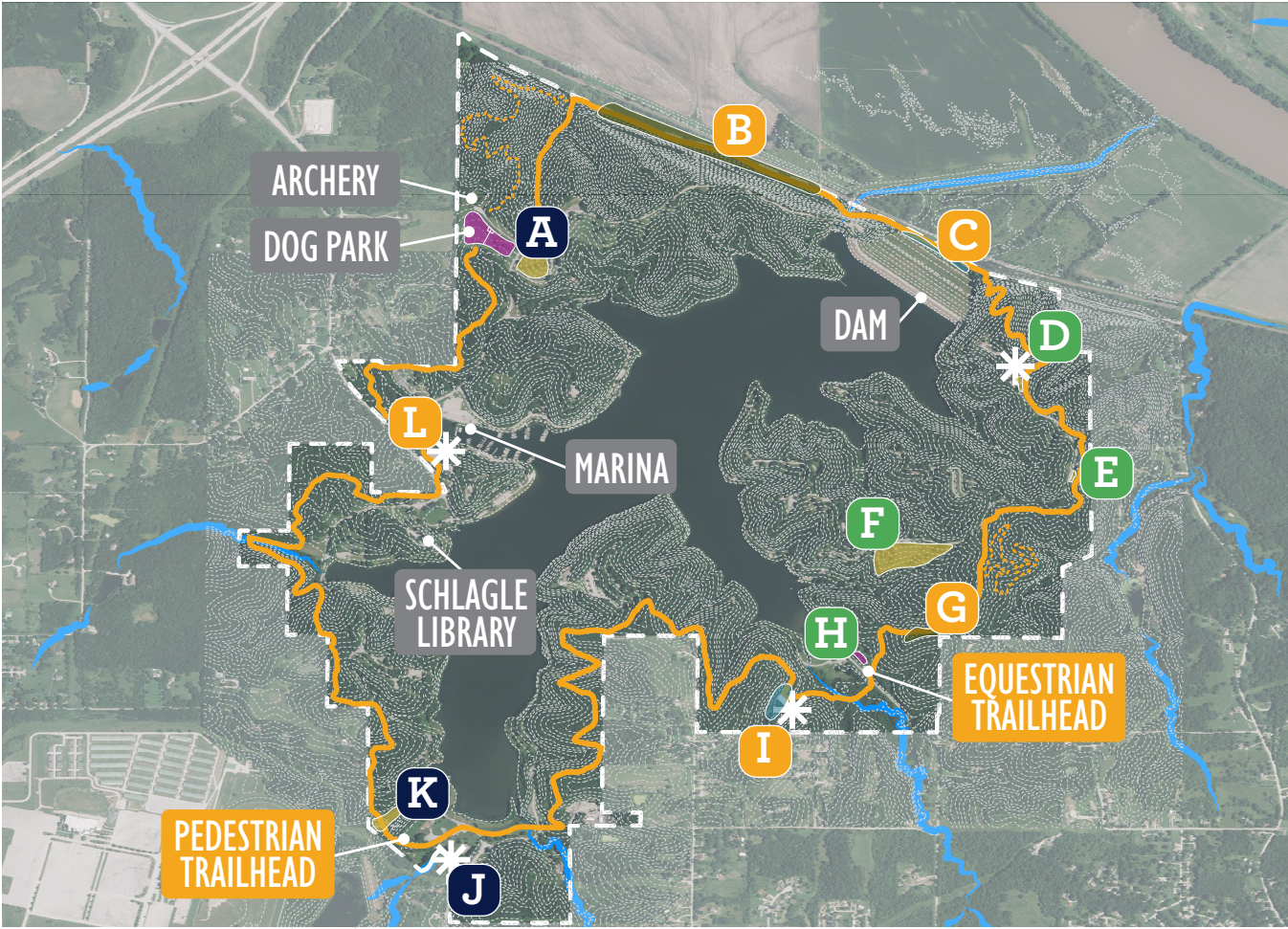
Other signs within the system include **1/4 - mile markers** to help users track their distance. These should be nondescript so as not to detract from the natural surroundings.

Signage is key for empowering users along the trail and instilling confidence no matter where they start their journey. However, trail users aren't the only ones who can benefit. **Reflective signs** and **painted crosswalks** are valuable assets in informing vehicles of where they should expect to see trail users and keep lower speeds.

AMENITY UPDATES

This section will detail potential locations for small rest stops, a potential new trailhead, and adjustments to the dog park for better park user interaction. All stop-off locations should include seating, trash receptacles, and hitching rails. These act as rest stops for trail users and provide enough space for users to migrate off the trail and pause to enjoy the unique nature of that location.

- A** The **Leash Free Dog Run** is a large open field bisected by the Bridle Trail. It is also open to the archery range and surrounding roads, relying on canine recall to keep dogs out of harm's way. Equestrian users report difficulty navigating through this space with potentially reactive animals.
A majority of other local dog parks boast other amenities such as fenced-in small and large dog areas, shade structures, and water access. Updates like these would provide better amenities for dog park users and safer trail access for equestrians. Southeast of the dog park is a large swath of mowed turf grass; this should be reseeded and returned to native prairie to cap the dog park space visually.
- B** Honeysuckle Removal Test Area: Overgrown with this invasive shrub, this is an ideal location for a preliminary test with convenient vehicular access.
- C** Wetland: Clean-up and improvements to the railway barrow pits. Introduce native wetland species and educational signage.
- D** Stop-Off Location: Surrounding mowed area could be returned to native prairie.
- E** Prairie: Mowed area could be returned to native prairie. This will provide a natural buffer for the trail.
- F** Prairie: Mowed area could be returned to native prairie. This will provide a natural edge condition to the forest and lessen the park's yearly budget strain.
- G** Honeysuckle Removal Test Area: Overgrown with this invasive shrub, this is an ideal location for a preliminary test with convenient access from the trailhead.
- H** Hammock Grove: Unique opportunity for a hammock grove within the trees to the north of the trailhead.
- I** Stop-Off-Location: Opportunity to slow some of the runoff water in a wetland, creating an Eco-lab just west of the Equestrian Trailhead.
- J** Stop-Off-Location: East of the new bridge from the parking lot at shelter two along Marshall Creek.
- K** Glade: An old construction site could be restored into an upland prairie glade. Opportunity for a distinct change in vegetation type.
- L** Stop-Off Location: Southeast of the playground, allowing trail users to stop near shelter 10.



05



IMPLEMENTATION

This process aims to provide a community-supported comprehensive Restoration Plan to guide future development and restoration of the Bridle Trail. This chapter seeks to identify a set of goals based on recognized community priorities and who should be approached as partners for the trail. Also included in this chapter is a reference list of general costs for various typical trail improvements that can then be used for planning and budgeting purposes.

Input from trail users and the wider community was solicited in various ways throughout this planning process. In total, 324 interactions from the community guided the development of this Plan.

Focus Group Participants 41

Online Opinion Survey 283

The system-wide priorities that are most important to the community were generally consistent. Four overarching goals became apparent, which will be defined over the following pages.

GOAL # 1 | Signage

GOAL # 2 | Coordinated Maintenance

GOAL # 3 | Mitigate Erosion & Drainage

GOAL # 4 | Enhance Natural Surroundings



GOAL #1.

Signage

The #1 priority identified by the community is to add trail signage. A common issue heard from users of the Bridle Trail is getting lost or ending up on an entirely different trail while attempting to make the loop. This can be dangerous for unprepared users due to limited access to water and the potential for encountering unfavorable trail conditions and unexpected users like mountain bikers. New and improved signage will also increase accessibility to novice users, helping build their confidence.

The existing signage at the equestrian trailhead is aging and difficult to read, and the current pedestrian trailhead lacks signage in general. Adding larger kiosks allows users to map their experience and receive any needed trail guidance or information. This also serves as a magnet for new users and introduces them to the trails within the park.

Below is a list of crucial signage components that should be a priority for restoration, replacement, or addition.



TRAILHEAD KIOSK

1. Eastern Equestrian Trailhead
2. Southern Pedestrian Trailhead
3. Proposed Western Equestrian Trailhead

WAYFINDING

- 19 Trail markers on carsonite
- 24 Trail markers on fiberglass posts

MILE MARKERS

- 44 1/4 - mile marking posts

EMERGENCY TRAIL LOCATORS

- 10 EMS locator points

ROAD CROSSING

- 23 Reflective signs for vehicular crossing
- 11 Crosswalks

GOAL #2.

Coordinated Maintenance

The need for coordination was an extensive discussion topic throughout many focus group sessions. Users asked for a unified method of working through vegetation maintenance, a central location for trail information, and a coordinated leadership team.



TRAIL CONDITION REPORTING

PRESENT

Each of the main user groups has a few individuals who disseminate information to users through their individual platforms. For the most part, this requires trail users to belong to one of these groups and then use their social media to inform leaders of any issues they see along the trail before it ultimately falls on those leaders to do something about it.

User groups are left to fend for themselves and often take a random maintenance approach. This is problematic for several reasons, with trail safety and sustainability at the top of the list.

FUTURE

Many trail maintenance teams nationwide use digital forms that users can fill out while out on the trail to give immediate feedback to the maintenance team. The forms often require a description of the trail issue, map coordinates, and contact information. This helps the team prioritize by issue type, identify what tools are needed, where they are headed, and request additional information if required. Many of these forms even allow photos to be uploaded.

By creating a centralized location for maintenance needs, projects can be accomplished efficiently, safely, and in a manner that benefits the longevity of the trail.

LEADERSHIP & COMMUNICATION

Given the variety of trail users, a leadership team should strive to have participants from each user group. They would be held responsible for advocating for trail amendments that meet the needs of their intended users without alienating other user groups.

This leadership team would also have a unified method of correspondence with the public, using various resources to reach as many users as possible. The current techniques revolve around Facebook and trail mapping applications. However, many who responded to the survey were unaware of these resources, receiving most of their information through word of mouth or posted trail info.

By posting a QR code within the trailhead kiosk, users will be able to quickly scan and reach a web address that can be kept updated with current trail conditions, scheduled workdays, and other events that may pique their interest. The QR code can also link to the trail condition reporting so that users are quick to relay issues they experience on the trail.

GOAL #3.

Mitigate Erosion & Drainage

Erosion caused by drainage channels, heavy use, and natural springs is the most extensive maintenance challenge seen within the Bridle Trail. More than 45 restoration projects can currently be seen on the trail, each involving erosion damage. Many trail entrances are washed out, making these a top priority for getting users back out on the trail. If the entrance looks difficult, novice users can be easily frightened away.



PRIORITIZATION

The leadership team should devise a method for prioritization, likely dividing the trail into use zones. Suppose there is significant damage in an area in the western corridor under constant abuse. In that case, this is given priority over another similar issue seen in the southern corridor because of its lower use ratio. Similar priority is given to things higher in the watershed. If erosion and water damage can be mitigated early in the system, havoc can be limited as the water moves toward the lake.

The nature of this site is ever-changing; with spring storms and dry summers, erosion conditions are ebbing and flowing. Users should be encouraged to report what they see, such as if drainage amendments are needed or if a lesser-used channel has a washout. To ensure consistent maintenance, the challenges and priorities should be assessed yearly.

DAMAGE TYPES

Concerns listed as restoration projects can be broken into several different damage types. Frequently, listed projects can take on several of these damage types.

Drainage Channel Crossings



Soft Spots



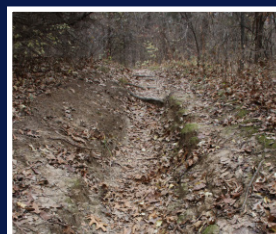
Stream Channel Crossings



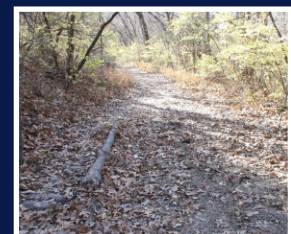
Significant Erosion



Channelized Water



Trail Bed Width



GOAL #4.

Enhance Natural Surroundings

Wyandotte County Lake Park provides a unique respite for the urban area, unmatched by any neighboring public spaces, boasting terrain changes, abundant flora and fauna, and several different habitat types. Trail users quickly tell others that this is a stunning natural space, and they are just visitors.

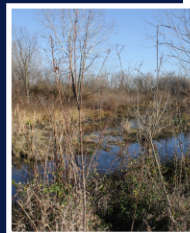


CREATING HABITAT

Three primary habitat restoration project types are highlighted as a part of this Plan, looking specifically at areas that have been historically disturbed and how they can be shaped into a more sustainable ecosystem.

WETLAND

By enhancing the railroad barrow pits through vegetation and simple grading, stormwater can be held, filtered, and allowed to infiltrate. This is a unique opportunity for adaptive reuse and educational components.



GLADE

Cedar thickets along the trail often open up to barren spaces created by previous construction. They offer a unique opportunity to develop rocky, upland meadows or glades, providing an entirely different ecosystem to the northern wetlands.



PRAIRIE

Several areas adjacent to the trail are mowed regularly and are not being used. They would serve a much greater purpose if reseeded and allowed to return to tallgrass prairie. Prairie plantings can provide multiple benefits by clearly defining the trail corridor within larger grassed openings, creating additional wildlife habitat, and reducing the need for maintenance in areas underutilized by the public.



MINIMIZING OUR IMPACT

Trail users worldwide use the phrase ‘pack it in, pack it out.’ This rings true for the Bridle Trail and needs to be emphasized at each of the trailheads. Users have noticed a lack of trash receptacles along the trail and are vocal about needing them to minimize litter.

Over the years, the trail has become ‘disturbed’; this can be from trail construction, dumping, even looking back to when the dam was constructed. All this disturbance and debris opens the gates for invasive species.

Shrub honeysuckle is rampant throughout the park but is most concentrated in areas of disturbance or edge conditions. The same can be said for the stands of cedars, which are typically in areas of older disturbance. Both species crowd out any native undergrowth that leads to further erosion and, in some cases, shade areas of the trail, causing constantly muddy conditions that are easily disturbed.

Historically the Bridle Trail has been open in all conditions, but this doesn’t mean that all conditions are ideal. Signage and wording crafted by the leadership team can strongly discourage use during wet conditions. By staying off wet trails, erosion issues and soil displacement caused by heavy loads can be avoided. This is especially critical in sensitive locations.

PARTNERSHIP OPPORTUNITIES

Budget constraints for the park limit maintenance of the Bridle Trail. Therefore, most care falls to the individuals who are using the trail. This has led to each group leading their own projects without communication or coordination with other users. Goal #2 of the Restoration Plan outlined a need for a leadership team that will need a plan to build off and plenty of workforces to support them.

User Groups

The most straightforward partners for the trail are the three primary user groups who are already boots on the ground.

1. Runners - Trail Nerds
2. Equestrians
 - Wyandotte County Lake Bridle Trails
 - Back County Horsemen of Kansas
3. Schlagle Library

The Trail Nerds put in hundreds of hours each year cleaning up trails after storms and cutting back invasive overgrowth. Teams of equestrian users also report bringing in their own equipment and trimming as needed while on the trail.

Non-Profits

Other like-minded non-profits should be brought in as partners. Burroughs Audubon Society of Greater Kansas City and different nature-focused groups are fantastic examples. Bringing in knowledgeable individuals can help protect the native species while providing another location to conduct research.

Other partners can be land-focused such as the Forest and Woodland Association of Missouri or Grassland Heritage Foundation, each with its focused interests.

Community Outreach

The restoration plan focuses on larger projects that require labor and funding, but there are also year-round needs. Litter cleanup, honeysuckle management, and the removal of fallen limbs could be managed monthly, overall vegetation maintenance bi-yearly, and a yearly evaluation on dumping. Over 50% of the community suggested engaging scout troops and organizing community workdays. These could be marketed through the leadership team in coordination with UG Parks and Recreation.



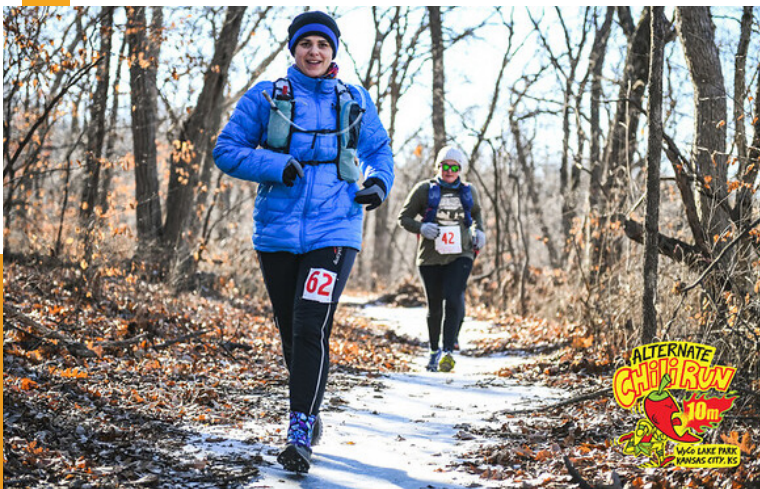
Many trail systems throughout the nation have simple online certifications that users or groups can receive to authorize them to do trail maintenance. This helps standardize trail care and holds each team to the Bridle Trail's standards. Other more specialized courses could be provided for these larger erosion projects to allow volunteers to dig into more complicated projects.

Opportunities to partner also come from local businesses and school districts that are interested in using the trail. With new ecosystem restoration projects, the wetlands would be an ideal space to bring a high school biology class, earn a scout badge about bugs, or simply get out in nature after sitting at a desk all day. Every user that ventures onto the trail should be considered a partner in maintaining the beauty of the Bridle Trail.

Unified Government

The Unified Government of Wyandotte County has an opportunity to play a prominent role in how partnerships are achieved. A government presence will be needed on the leadership team to ensure that changes to the Bridle Trail continue to meet the needs of the overall park. Coordination with Parks and Recreation also keeps the UG informed of the current goals for the trail.

By working in tandem, the city should be able to minimize maintenance needs and maximize volunteer benefits. Within the last 5-10 years, Kansas City has blossomed with trails, and this trail and park are a gem for Wyandotte County. Many users have expressed interest in a 'Friends of' style group. By capitalizing on this interest, there is an opportunity to gain funding and leadership from neighbors, turning them from just casual users to partners in protecting the Bridle Trail.



CAPITAL NEEDS

The following opinion of costs was determined based on recommendations for restoration and improvement of the Bridle Trail and are provided for reference in deciding future capital improvement campaigns. For each mitigation type listed below, budget ranges are given for planning purposes only.

Erosion & Drainage

	Short-Term	Mid-Term	Long-Term
Trail Plantings	\$1,000-\$5,000		
Simple Regrade	\$1,000-\$10,000		
Soft Spot	\$1,000-\$8,000	\$5,000-\$15,000	\$20,000-\$50,000
Drainage Crossing	\$0,000-\$5,000	\$5,000-\$15,000	\$15,000-\$40,000
Entry Erosion		\$5,000-\$15,000	\$15,000-\$30,000
Channelization		\$3,000-\$15,000	\$15,000-\$30,000
Stream Crossing			\$10,000-\$40,000
Bridge			\$80,000-\$200,000



Other Projects

EAST

I	Armoring Switchbacks	\$60,000
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NORTH

B	Drainage Channel	\$50,000
C	Stream Channel Restoration	Needs Further Engineering Evaluation

WEST

D	Neighborhood Stormwater Improvement	\$50,000
E	Marina Fencing Adjustment	\$25,000



CAPITAL NEEDS

Amenity Updates

■	A	Leash Free Dog Run - 3.5 Acres	\$115,000
		<i>Fencing for small and large dog areas, double gated entry, small shelter, benches, and trash receptacles</i>	
■	B & G	Honeysuckle Removal Test Areas	\$23,500
		<i>Initial training and chemicals</i>	
■	C	Wetland	\$25,000
		<i>Clearing of invasive species and sediment, replanting of wetland species</i>	
■	D	Stop-Off Location - Prairie - 1.25 Acres	\$17,500
		<i>Clearing and grubbing of existing vegetation, planting of native prairie species, and the addition of picnic tables</i>	
■	E	Native Prairie Restoration - 0.6 Acres	\$4,500
		<i>Clearing and grubbing of existing vegetation, regrading to reroute water flow from surrounding areas and planting of native prairie species</i>	
■	F	Native Prairie Restoration - 3.3 Acres	\$25,000
		<i>Clearing and grubbing of existing vegetation, and planting of native prairie species to reduce mowing maintenance within the park</i>	
■	H	Hammock Grove	\$3,500
		<i>Installation of posts</i>	
■	I	Stop-Off Location - Eco-Lab - 0.5 Acres	\$40,000
		<i>Clearing and grubbing of existing vegetation, planting of native wetland species and the addition of picnic tables</i>	
■	J	Stop-Off Location - Shelter 2	\$8,000
		<i>Addition of picnic tables and trash receptacles as a future trail connection</i>	
■	K	Upland Prairie Glade - 0.5 Acres	\$12,000
		<i>Clearing and grubbing of existing vegetation, planting of native species, and the addition of picnic tables</i>	
■	L	Stop-Off Location - Shelter 10	\$8,000
		<i>Addition of picnic tables, hitching rails, and trash receptacles</i>	
			<hr/> \$282,000

Example Amenity Updates

Leash Free Dog Run



Wetland



Honey Suckle Removal



Prairie Restoration



Hammock Grove



Eco-Lab



Upland Prairie Glade



CAPITAL NEEDS

Trailhead

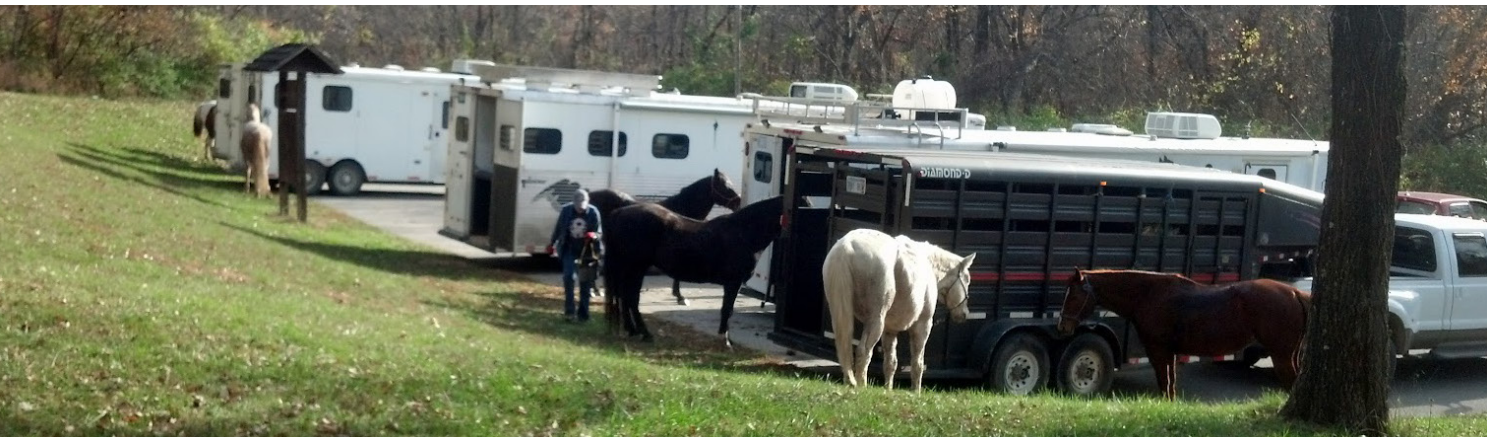
Equestrian Trailhead Updates	\$50,000
Pedestrian Trailhead Updates	\$25,000
Additional Equestrian Trailhead	\$60,000

Current Trailheads

Pedestrian Trailhead













Equestrian Trailhead



Trail Re-Routes

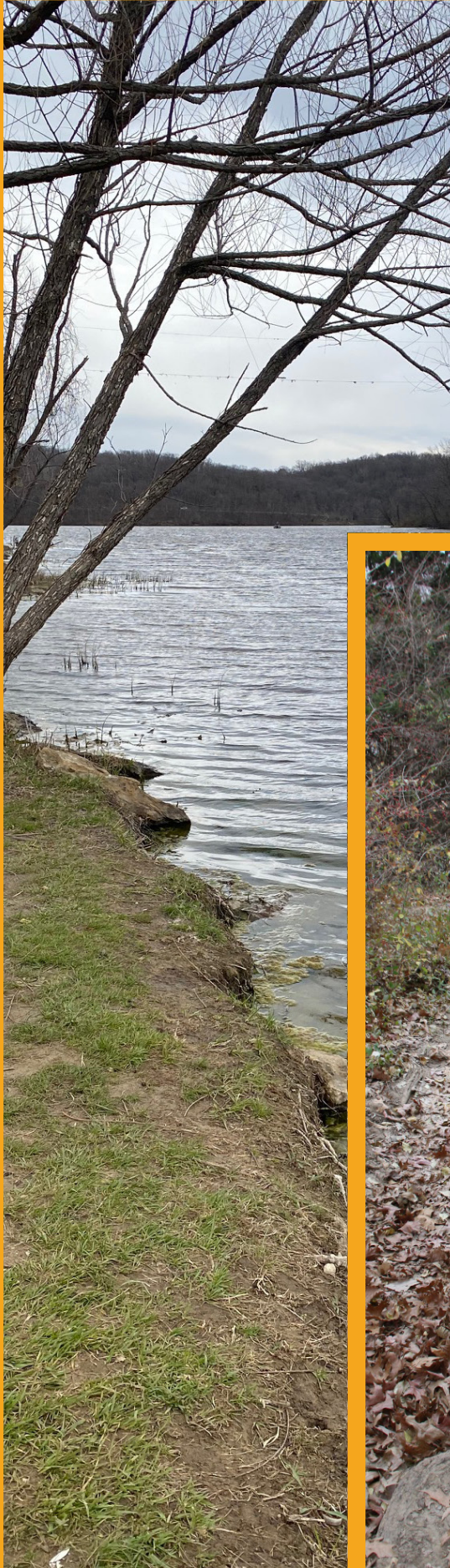
Planning costs for new trails are highly dependent on current terrain, surface substrate, and stormwater flow paths. A consultation with a trail specialist or engineer is needed. Before installation, each route would need design and mapping to ensure the trail takes the optimal route through the location. Depending on the site’s constraints, per mile planning cost can range from 15 to 50 thousand per mile. Areas of low slope and limited stormwater management will be on the low end, while areas of steep slopes with rocky substrate will cost more. Much of this cost consists of labor; accessibility to the trail by larger construction vehicles can also significantly impact the price.

-  A Perpendicular Crossing - 0.1 Miles
-  B Erosion Issue - 0.2 Miles
-  C Erosion Issue - Switchbacks - 0.2 Miles
-  D Vehicular Access - 0.5 Miles
-  E Dog Park - 0.2 Miles
-  F Shelter 10 - 0.2 Miles
-  G Erosion Issue - Switchbacks - 0.25 Miles
-  H Off Road - 0.4 Miles
-  I Expansion - 0.75 Miles
-  J Erosion Issue - 0.1 Miles

Signage

Vehicular Crossings	\$20,000
Trail Signage	\$10,000
Interpretive Signage	Per Sign \$5,000

APPENDIX

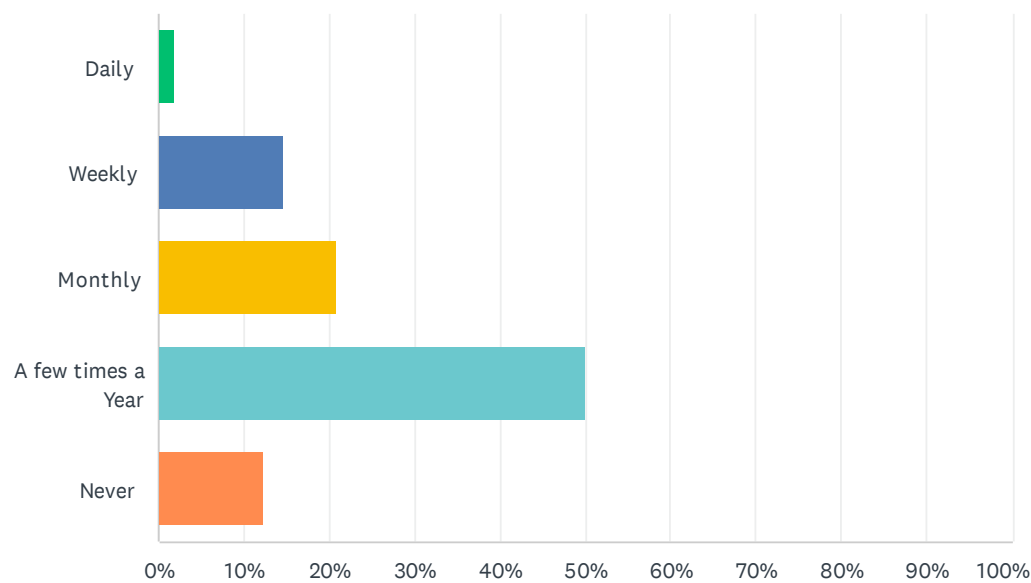


PUBLIC ENGAGEMENT



Q1 How often do you use the Bridle Trail at Wyandotte County Lake Park?

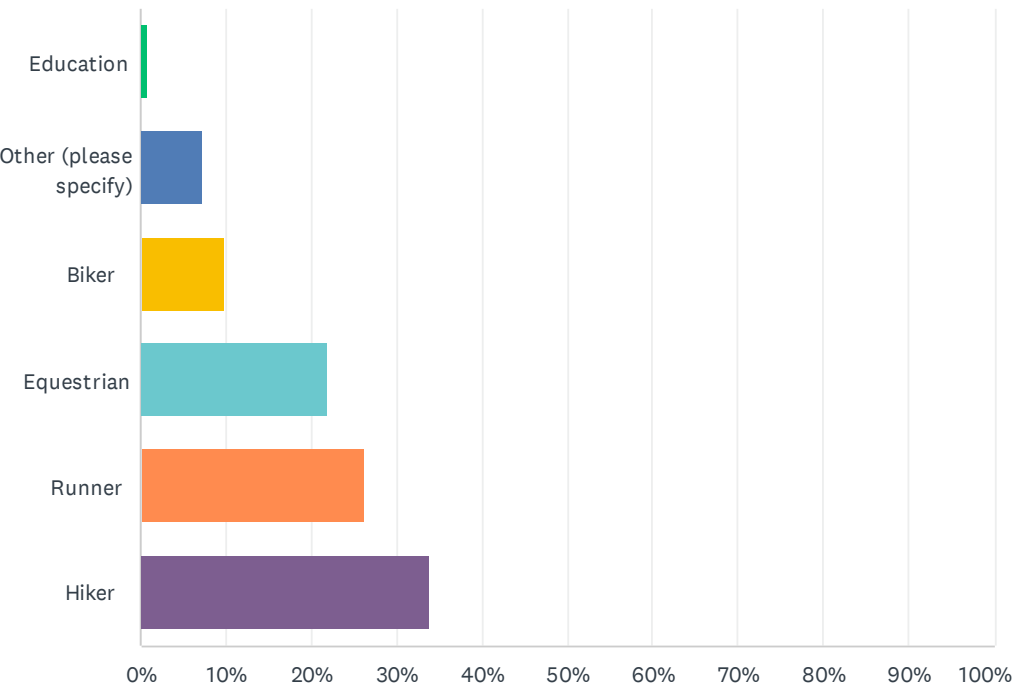
Answered: 273 Skipped: 1



ANSWER CHOICES		RESPONSES	
Daily		1.83%	5
Weekly		14.65%	40
Monthly		20.88%	57
A few times a Year		50.18%	137
Never		12.45%	34
TOTAL			273

Q2 Describe your typical use of the WYCO Bridle Trail?

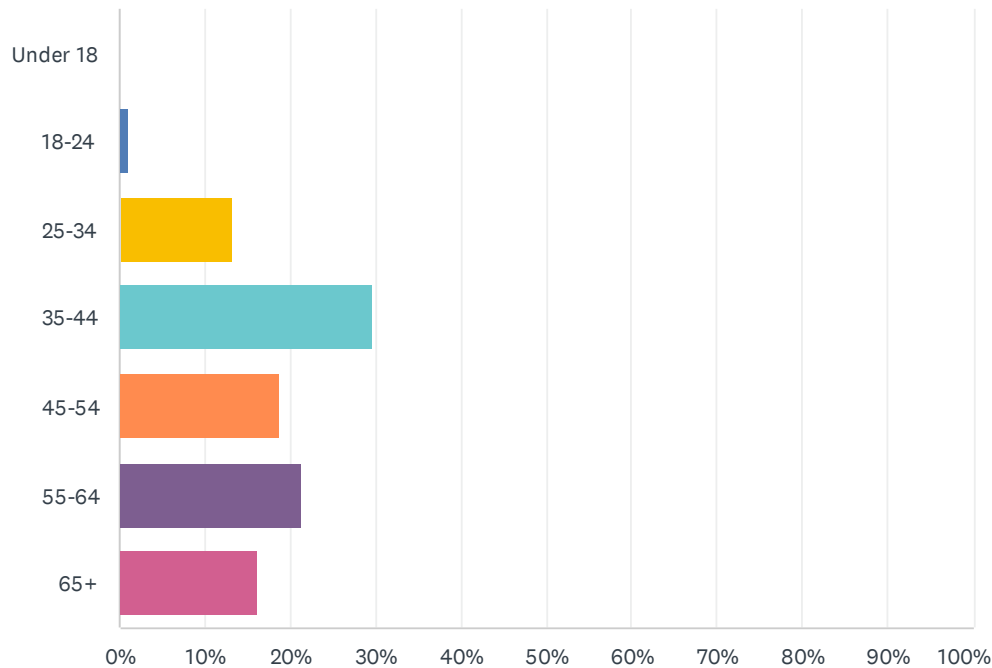
Answered: 263 Skipped: 11



ANSWER CHOICES	RESPONSES	
Education	0.76%	2
Other (please specify)	7.22%	19
Biker	9.89%	26
Equestrian	22.05%	58
Runner	26.24%	69
Hiker	33.84%	89
TOTAL		263

Q3 Choose the age category that best describes you.

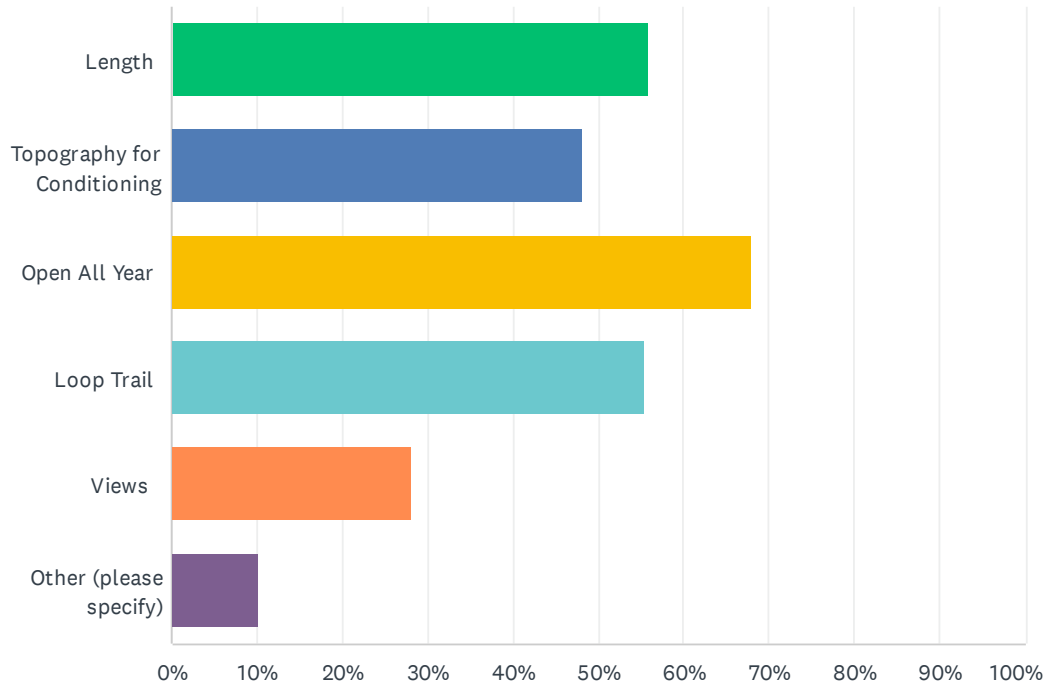
Answered: 273 Skipped: 1



ANSWER CHOICES		RESPONSES	
Under 18		0.00%	0
18-24		1.10%	3
25-34		13.19%	36
35-44		29.67%	81
45-54		18.68%	51
55-64		21.25%	58
65+		16.12%	44
TOTAL			273

Q4 What are the BEST ASPECTS or STRENGTHS of the Bridle Trail? (select up to 3)

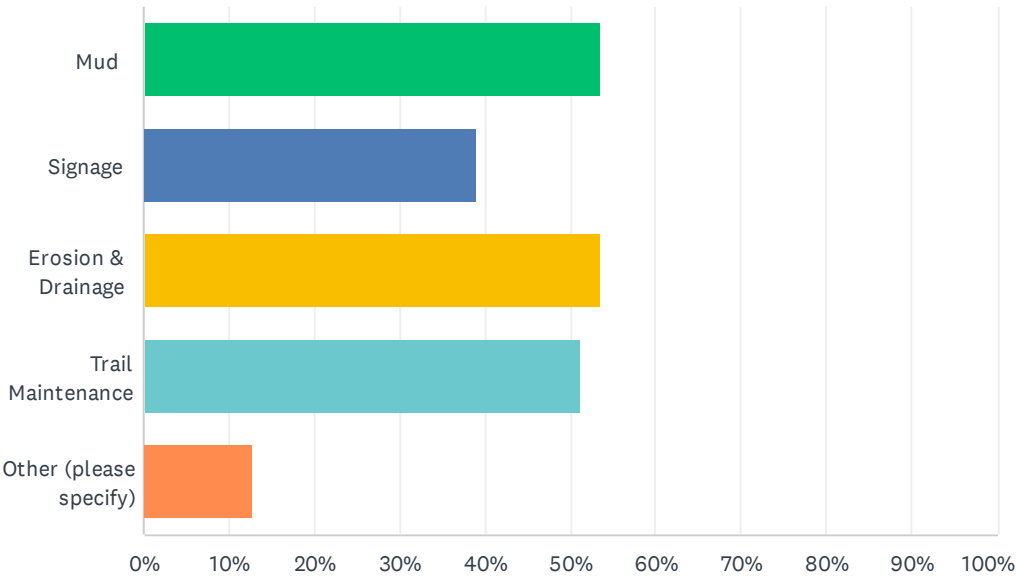
Answered: 263 Skipped: 11



ANSWER CHOICES	RESPONSES	
Length	55.89%	147
Topography for Conditioning	48.29%	127
Open All Year	68.06%	179
Loop Trail	55.51%	146
Views	28.14%	74
Other (please specify)	10.27%	27
Total Respondents: 263		

Q5 What are the WEAKNESSES of the Bridle Trail? (select up to 3)

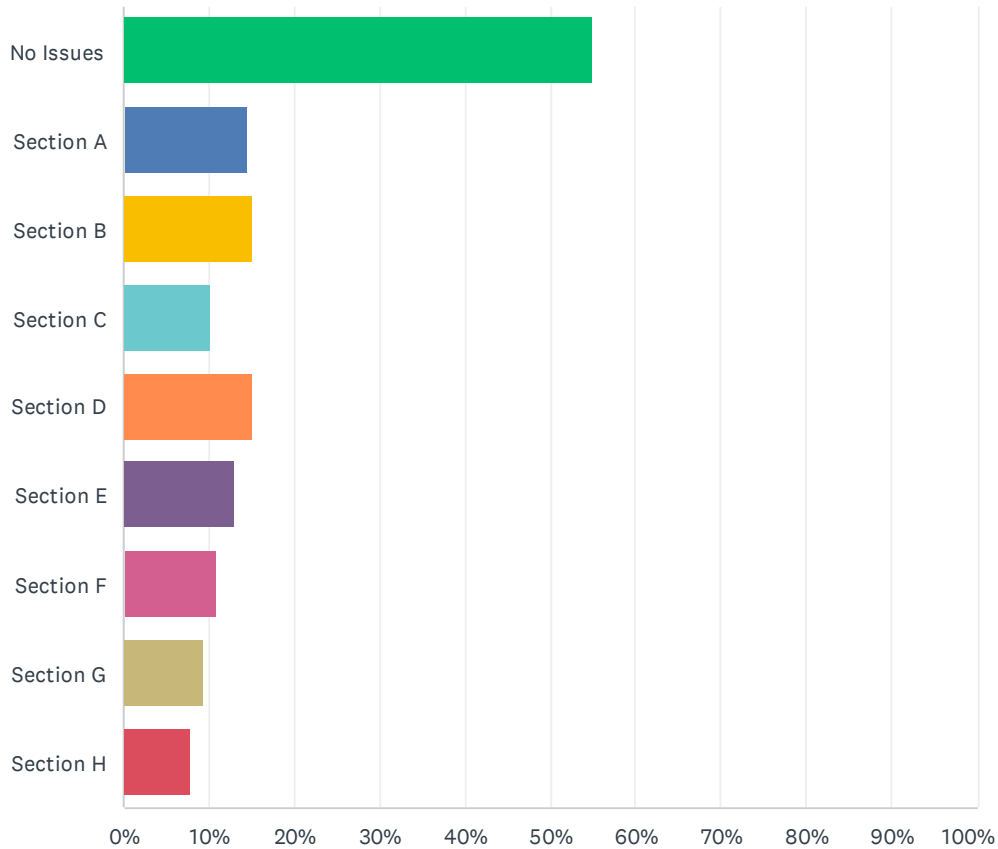
Answered: 256 Skipped: 18



ANSWER CHOICES	RESPONSES	
Mud	53.52%	137
Signage	39.06%	100
Erosion & Drainage	53.52%	137
Trail Maintenance	51.17%	131
Other (please specify)	12.89%	33
Total Respondents: 256		

Q7 Using the map above, are there sections of the trail that are unusable?
If so, describe what causes these conditions and where are they located?

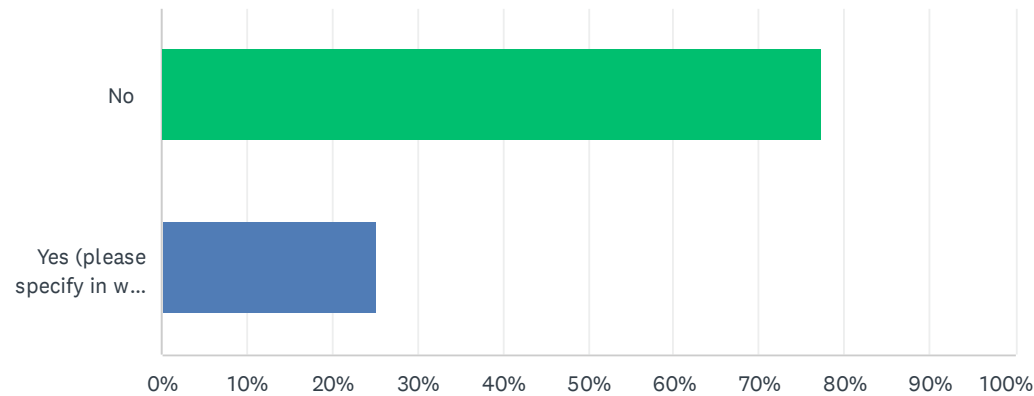
Answered: 138 Skipped: 136



ANSWER CHOICES	RESPONSES	
No Issues	55.07%	76
Section A	14.49%	20
Section B	15.22%	21
Section C	10.14%	14
Section D	15.22%	21
Section E	13.04%	18
Section F	10.87%	15
Section G	9.42%	13
Section H	7.97%	11
Total Respondents: 138		

Q8 Do you actively participate in trail maintenance currently?

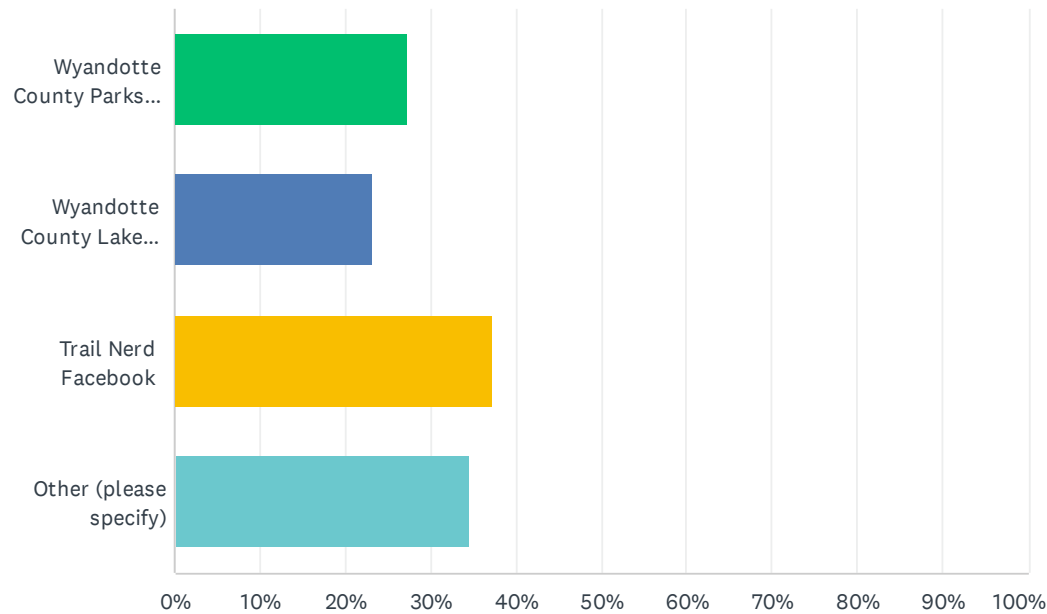
Answered: 207 Skipped: 67



ANSWER CHOICES	RESPONSES	
No	77.29%	160
Yes (please specify in what capacity)	25.12%	52
Total Respondents: 207		

Q18 How do you find out about the trail and scheduled events?

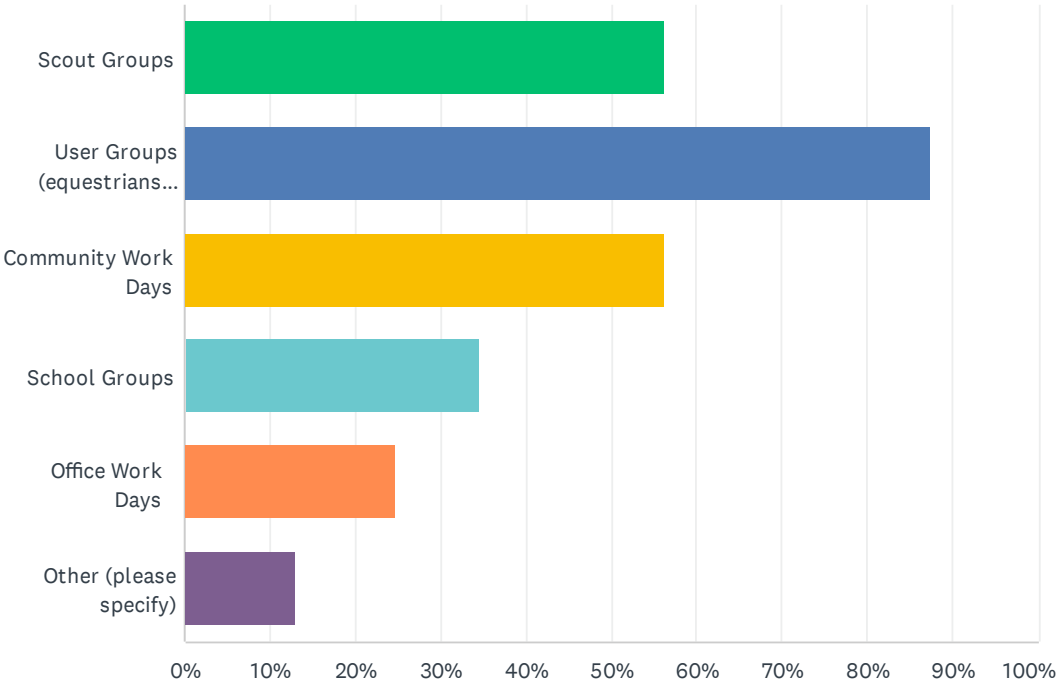
Answered: 180 Skipped: 94



ANSWER CHOICES	RESPONSES	
Wyandotte County Parks and Recreation Facebook	27.22%	49
Wyandotte County Lake Park Bridle Trail Facebook	23.33%	42
Trail Nerd Facebook	37.22%	67
Other (please specify)	34.44%	62
Total Respondents: 180		

Q10 Who should we be engaging to volunteer to help maintain the Bridle Trail?

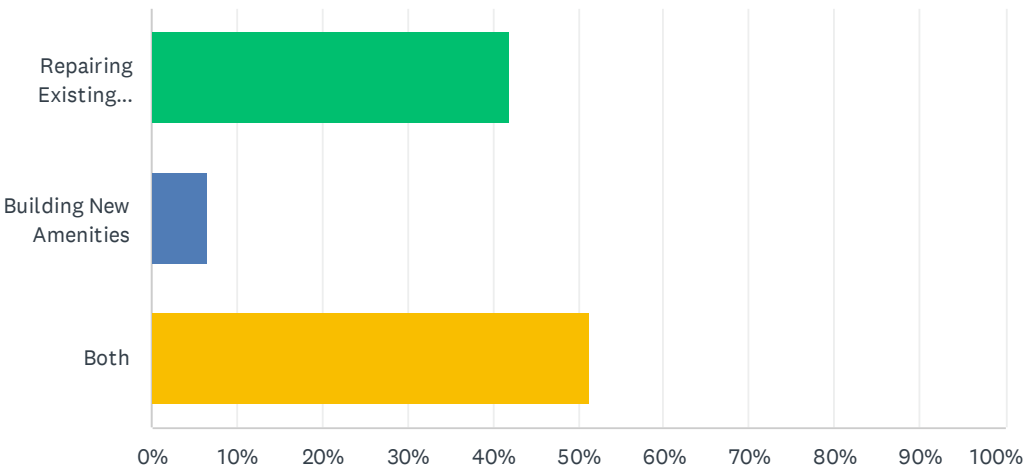
Answered: 206 Skipped: 68



ANSWER CHOICES	RESPONSES	
Scout Groups	56.31%	116
User Groups (equestrians, trail runners, and hikers)	87.38%	180
Community Work Days	56.31%	116
School Groups	34.47%	71
Office Work Days	24.76%	51
Other (please specify)	13.11%	27
Total Respondents: 206		

Q11 In the next 5 years, what should the Parks Foundation focus on?

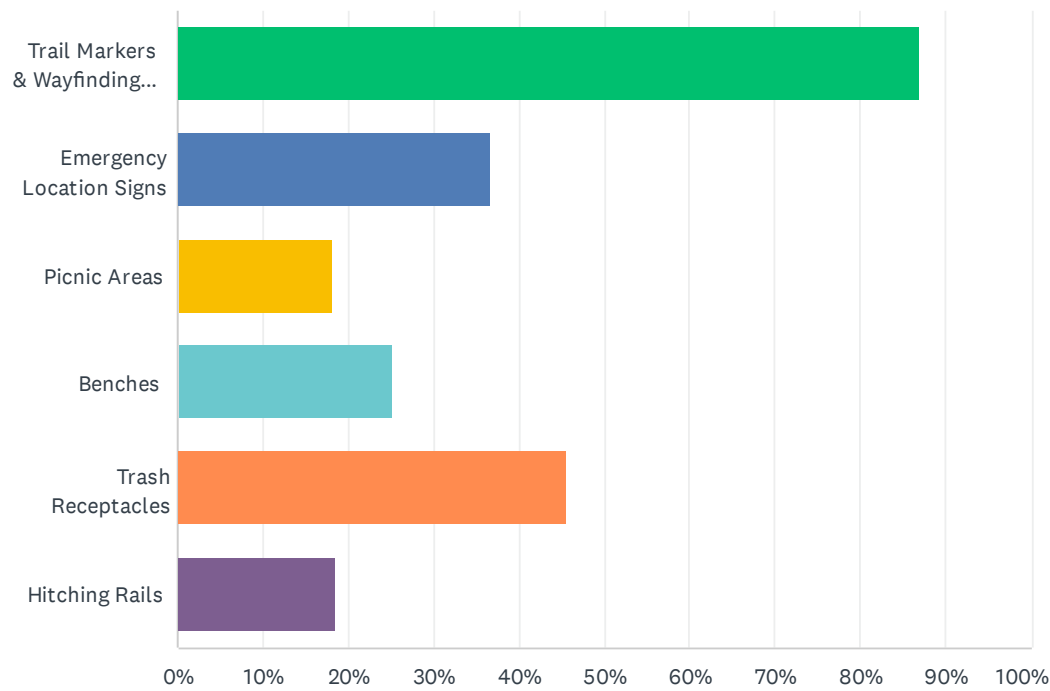
Answered: 210 Skipped: 64



ANSWER CHOICES	RESPONSES	
Repairing Existing Facilities	41.90%	88
Building New Amenities	6.67%	14
Both	51.43%	108
TOTAL		210

Q12 What types of amenities would you like to see offered along the trail?
(select all that apply)

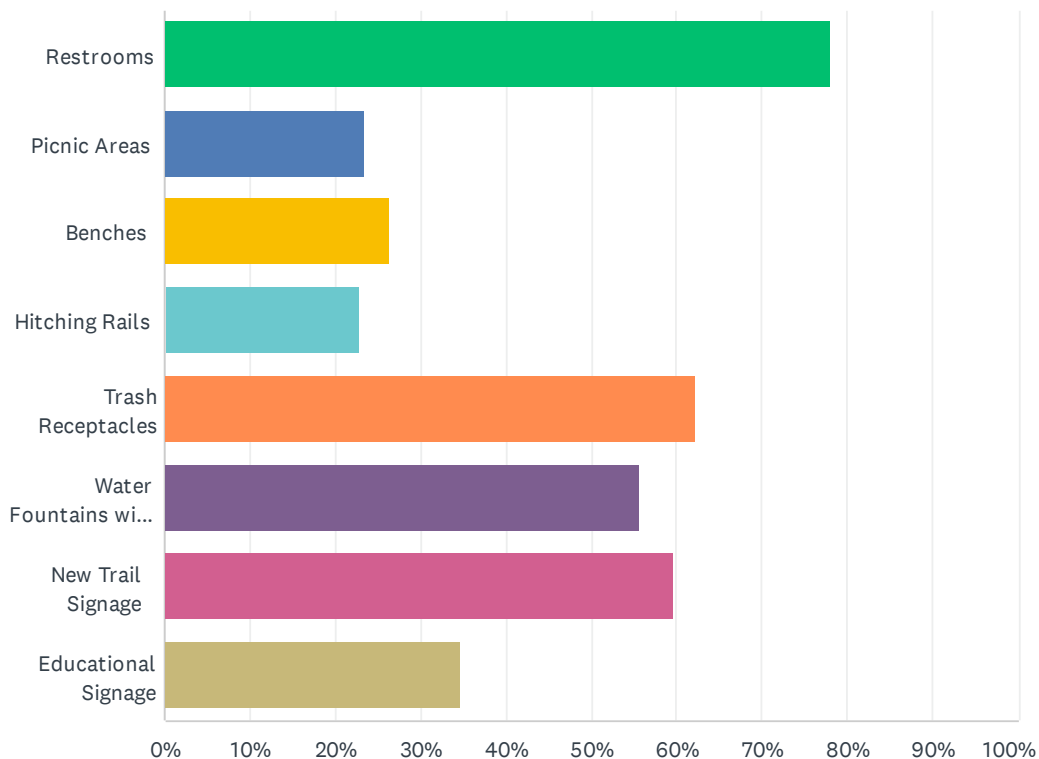
Answered: 199 Skipped: 75



ANSWER CHOICES	RESPONSES	
Trail Markers & Wayfinding Signage	86.93%	173
Emergency Location Signs	36.68%	73
Picnic Areas	18.09%	36
Benches	25.13%	50
Trash Receptacles	45.73%	91
Hitching Rails	18.59%	37
Total Respondents: 199		

Q13 What types of amenities would you like to see offered at the trailhead? (select all that apply)

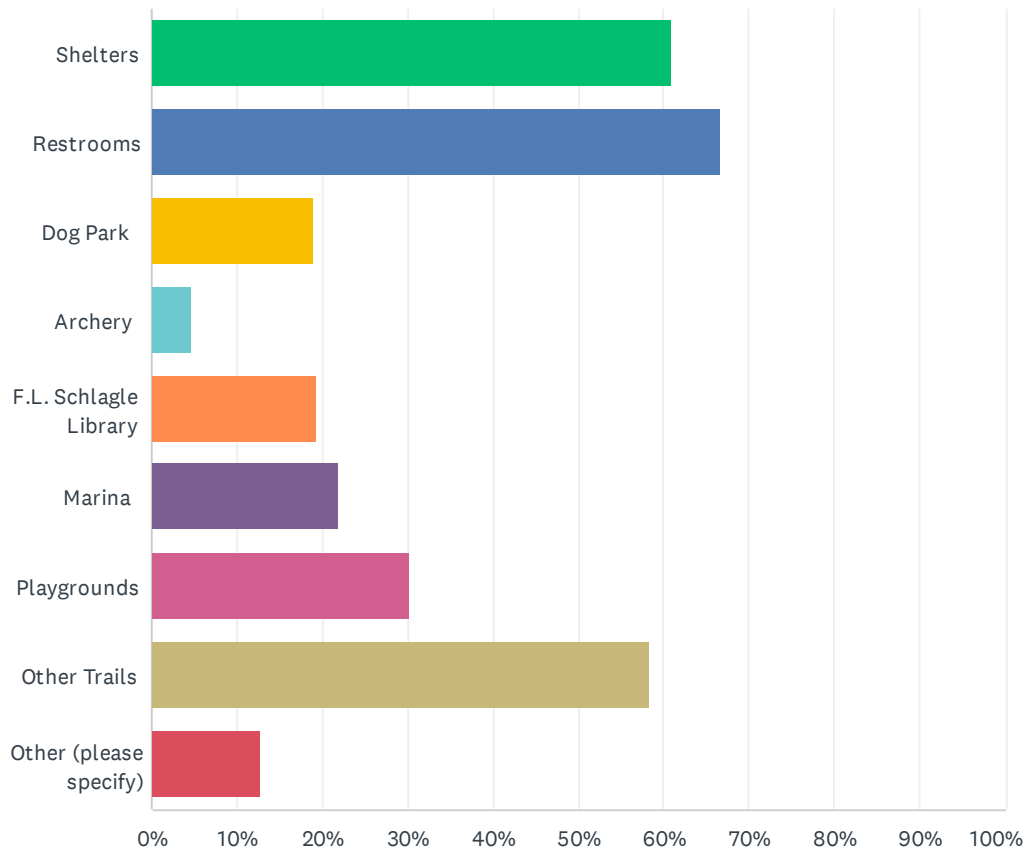
Answered: 201 Skipped: 73



ANSWER CHOICES	RESPONSES	
Restrooms	78.11%	157
Picnic Areas	23.38%	47
Benches	26.37%	53
Hitching Rails	22.89%	46
Trash Receptacles	62.19%	125
Water Fountains with Integrated Spigot	55.72%	112
New Trail Signage	59.70%	120
Educational Signage	34.83%	70
Total Respondents: 201		

Q14 What other features of Wyandotte County Lake Park are you using?

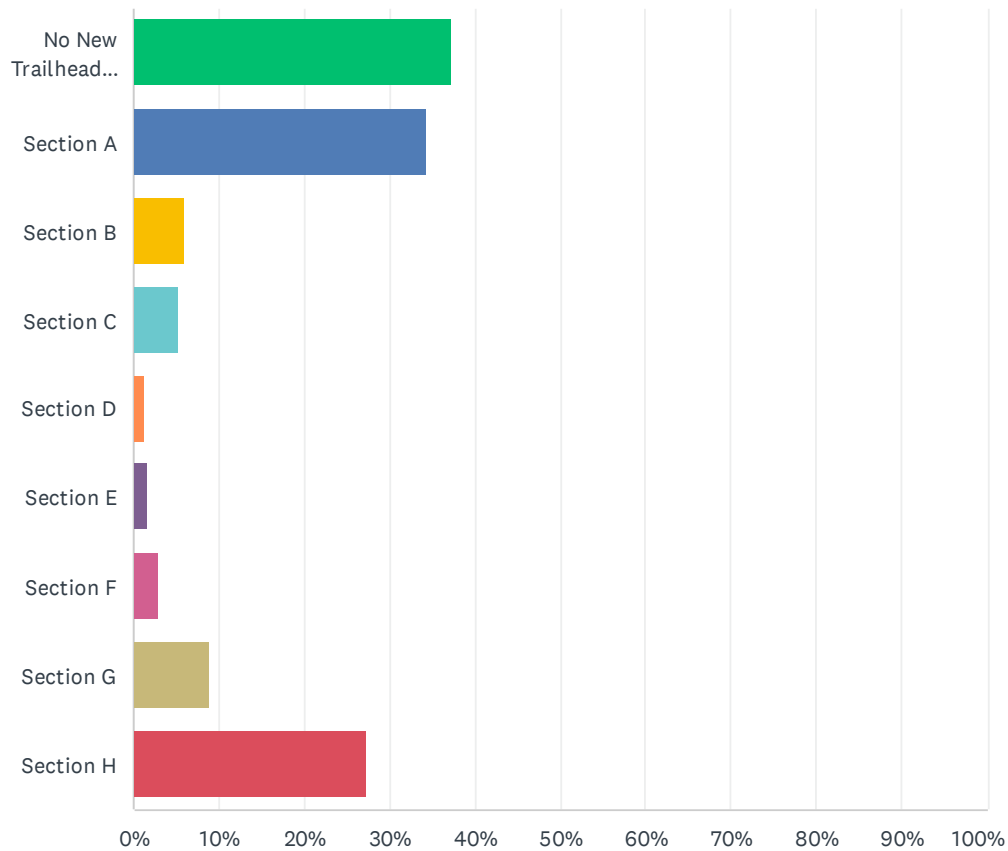
Answered: 195 Skipped: 79



ANSWER CHOICES	RESPONSES	
Shelters	61.03%	119
Restrooms	66.67%	130
Dog Park	18.97%	37
Archery	4.62%	9
F.L. Schlagle Library	19.49%	38
Marina	22.05%	43
Playgrounds	30.26%	59
Other Trails	58.46%	114
Other (please specify)	12.82%	25
Total Respondents: 195		

Q15 If a new trailhead was added, where would you locate it. (using the map above)

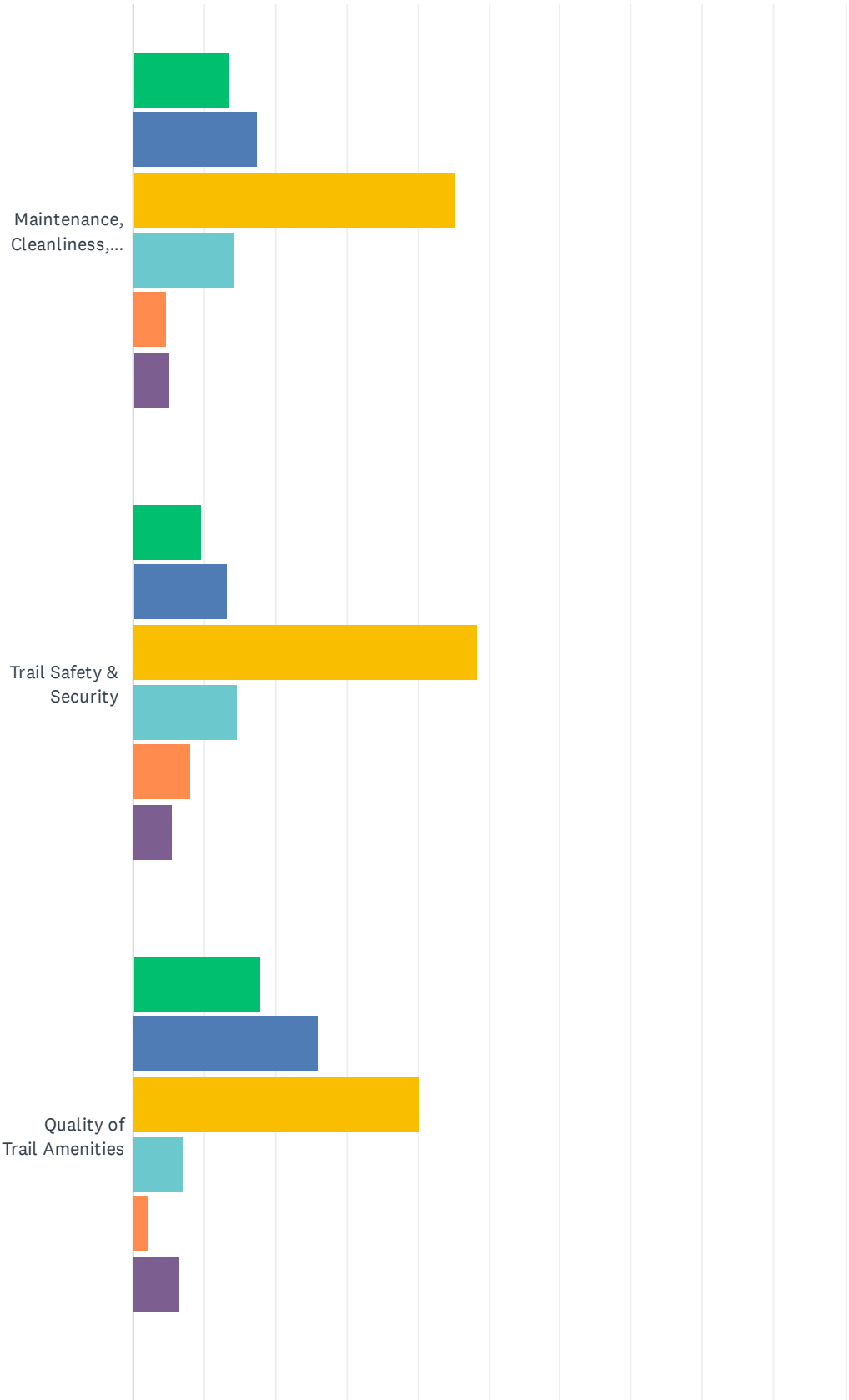
Answered: 169 Skipped: 105

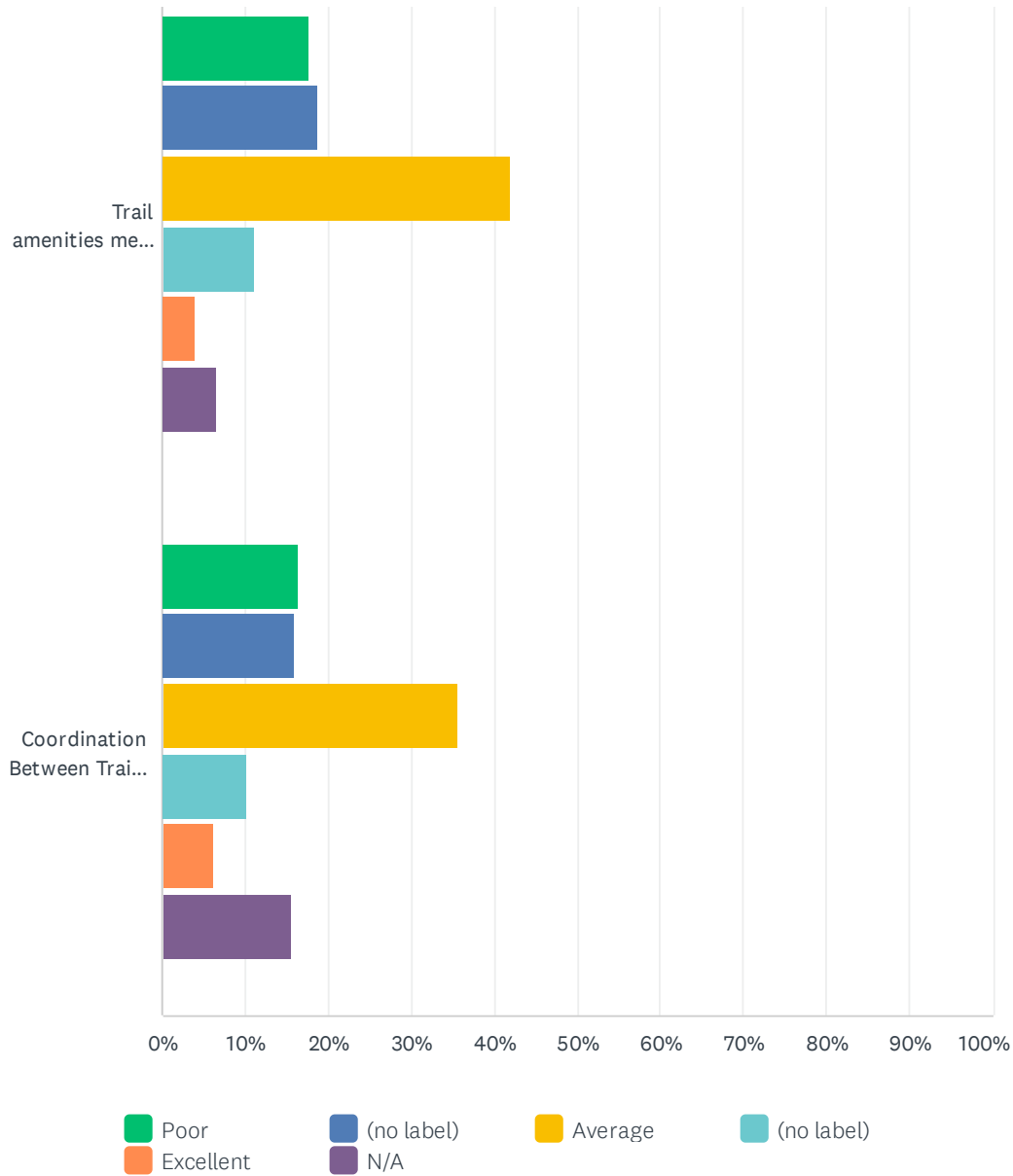


ANSWER CHOICES	RESPONSES	
No New Trailhead Needed	37.28%	63
Section A	34.32%	58
Section B	5.92%	10
Section C	5.33%	9
Section D	1.18%	2
Section E	1.78%	3
Section F	2.96%	5
Section G	8.88%	15
Section H	27.22%	46
Total Respondents: 169		

Q16 Please rate the following based on your experience on the Bridle Trail.

Answered: 198 Skipped: 76





	POOR	(NO LABEL)	AVERAGE	(NO LABEL)	EXCELLENT	N/A	TOTAL	WEIGHTED AVERAGE
Maintenance, Cleanliness, & General Upkeep	13.33% 26	17.44% 34	45.13% 88	14.36% 28	4.62% 9	5.13% 10	195	2.78
Trail Safety & Security	9.69% 19	13.27% 26	48.47% 95	14.80% 29	8.16% 16	5.61% 11	196	2.98
Quality of Trail Amenities	17.86% 35	26.02% 51	40.31% 79	7.14% 14	2.04% 4	6.63% 13	196	2.46
Trail amenities meet the needs of the community	17.68% 35	18.69% 37	41.92% 83	11.11% 22	4.04% 8	6.57% 13	198	2.63
Coordination Between Trail User Groups	16.49% 32	15.98% 31	35.57% 69	10.31% 20	6.19% 12	15.46% 30	194	2.69

