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DESIGN GUIDELINES

FOR THE JORDAN RIVER PARKWAY

*A resources to help communities implement
consistent design along the Jordan River Parkway.*



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INTRODUCTION

The Jordan River Parkway serves multiple purposes—as a recreational amenity for cycling, running, walking, boating, and fishing, to increase regional access and active transportation, for environmental education, and as nature preserve for open space, conservation, and restoration. The Jordan River runs through 16 cities and three counties. Because of this, the Jordan River Parkway (which spans from Saratoga Springs to North Salt Lake) was developed in a piecemeal approach, beginning after the idea for the Parkway was conceived in 1971. In 2008, the publication of the Blueprint Jordan River helped propel further development of the trail, and the 45 miles stretch was finally completed on November 18, 2017.

Because the Jordan River Parkway was developed over time, there are variances in amenities and design aspects throughout. These include (but are not limited to) differences in trail and bridge width, sign styles, garbage cans, benches, and access to things like educational and informational signage, restrooms, and drinking fountains. Currently, the main consistent design aspect of the parkway is wayfinding signage developed by Alta Planning and design. This wayfinding signage includes milemarkers, trailhead kiosks, directional signage, and equestrian trail markers. For a more detailed report of existing conditions and amenities along the trail, see the *2020 Jordan River Parkway Inventory* document compiled by the Jordan River Commission.

This is a *Preliminary Design Guidelines* document that will be further developed by the Jordan River Commission. The purpose of the design guidelines herein is to help communities along the Jordan River implement consistent design along the Parkway. The document is intended to be a resource for communities along the Jordan River Parkway as they develop, redevelop, and maintain the Jordan River Trail and accompanying amenities. Guidelines are provided for paved and unpaved trails, signage and pavement markings, a variety of trail amenities, and design elements influencing water quality.

This *Preliminary Design Guidelines* document was completed by Meadow Wilkinson, a Masters student at the University of Utah, as a capstone project to complete her program of study.

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The Jordan River

1 TRAIL GUIDELINES

The Jordan River Parkway is a shared use path. According to the 2012 American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*, "shared use paths" are: "Bikeways that are physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way." (1)

Potential users may include:

- Upright and Recumbent Bicyclists
- Inline and Roller Skaters
- Skateboarders and Long boarders
- Scooter Riders
- Pedestrians including Walkers and Runners
- Dog Walkers
- Non-motorized and Motorized Wheelchair Users
- People with Baby Strollers
- Equestrian Users
- Others

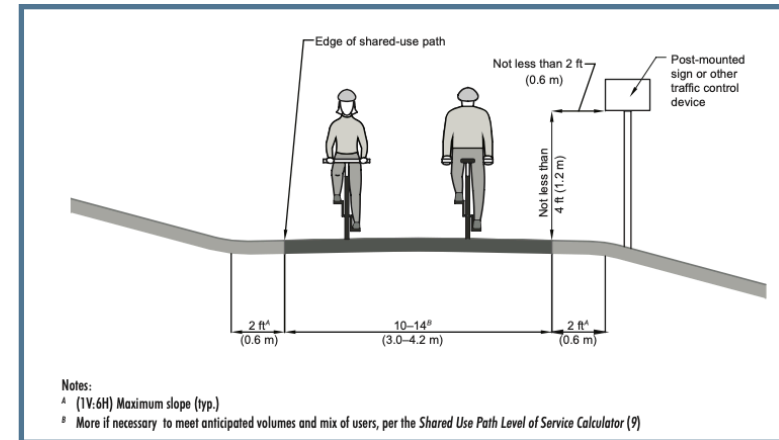
1.1 PAVED TRAILS

1.1.1 WIDTH

The minimum paved trail width for a two-directional shared use path is 10 feet. A wider path is often needed to provide an acceptable level of service because the Jordan River Parkway Trail is frequently used by both pedestrians and wheeled users simultaneously. Widths may range from 10 to 14 feet, with the wider values in areas with high use and/or a wider variety of user groups.

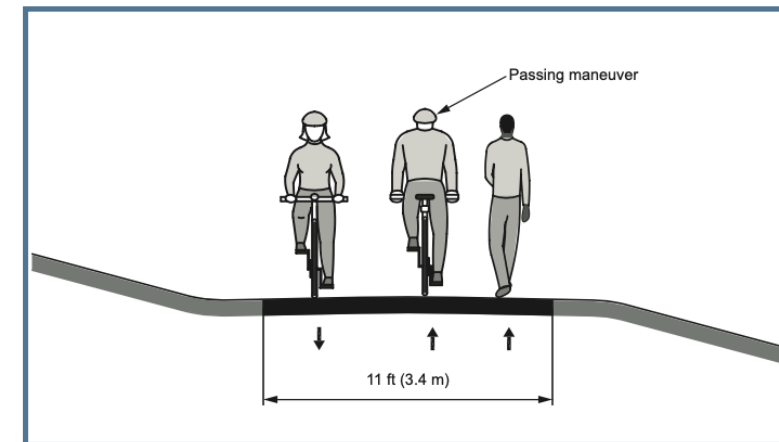
Ideally, a graded shoulder area should be at least 3 to 5 feet wide with a maximum cross-slope of 1V:6H, which should be maintained on each side of the pathway. At a minimum, a 2-foot graded area with the same maximum slope should be provided for clearance from lateral obstructions such as bushes, large rocks, bridge piers, abutments, and poles. The MUTCD requires a minimum 2-foot clearance to post-

mounted signs or other traffic control devices (3). If adequate clearance cannot be provided between the path and lateral obstructions, then warning signs, object markers, or enhanced conspicuity and reflectorizing of the obstruction should be used. (1)



AASHTO: Typical Cross Section of Two-Way, Shared Use Path on Independent Right-of-Way (1)

11-foot-wide pathways are needed to enable a bicyclist to pass another path user going the same direction, at the same time a path user is approaching from the opposite direction. (1)



AASHTO: Minimum Width Needed to Facilitate Passing on a Shared Use Path (1)

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1.1.2 DESIGN SPEED

The path should be designed for a selected speed that is at least as high as the preferred speed of the faster bicyclists. In general, a minimum design speed of 20 mph should be used. Although bicyclists can travel faster than this, to do so would be inappropriate in this mixed-use setting. Design and traffic controls can be used to deter excessive speed and faster cyclists can be encouraged to use the roadway system. Lower design speeds should not be selected to artificially lower user speeds. (1)

1.1.3 GRADE

Grades on the path should be kept to a minimum, especially on long inclines. Grades greater than 5 percent should be avoided because the ascents are difficult for many bicyclists to climb and the descents cause some bicyclists to exceed speeds at which they are competent or comfortable. Steeper grades can also be dangerous for a variety of trail users. Where terrain dictates, designers may need to exceed the 5 percent grade recommendation for bicycles for some short sections. As a general guide, the following grade restrictions and grade lengths are suggested.

- 5-6% for up to 800 ft
- 7% for up to 400 ft
- 8% for up to 300 ft
- 9% for up to 200 ft
- 10% for up to 100ft
- 11+% for up to 50 ft (1)

Additional Grade Guidelines

- Provide signage that alerts bicyclists to the maximum percent grade.
- Provide recommended descent speed signage.
- Exceed minimum stopping sight distances.
- Exceed minimum horizontal clearances, recovery area/or protective bike rails.
- When possible, instead of higher grade, use a wider path (4-6 feet addition recommended) and a series of short switchbacks to contain the speed of descending bicyclists.

1.1.4 PAVING MATERIALS

Hard, all-weather pavement surfaces are desirable on multi-use trails over crushed aggregate, sand, clay, or stabilized earth since paved surfaces provide a higher level of service and require less maintenance than unpaved surfaces. Portland cement concrete and asphalt are both viable pavement options with a variety of advantages and disadvantages. Concrete is recommended for durability and better long-term value; however, asphalt may be preferable in some situations if it can be properly installed and maintained.

Permeable pavement option may also be considered in environmentally sensitive areas and in areas where the recommended 25-foot setback from the river bank cannot be maintained.

General Paving Recommendations

- Pavements should be machine laid.
- Soil sterilizers should be used where needed to prevent vegetation from erupting through the pavement.
- Total pavement depth should typically be a minimum of 6 inches, inclusive of the surface course of concrete and the base course (typically an aggregate rock base). Pavement should be placed over a compacted subgrade. (1)
- Paths should be designed to sustain wheel loads of occasional emergency, patrol, maintenance, and other motor vehicles that are expected to use or cross the path. When motor vehicles are driven on shared use paths, their wheels often will be at the edges of the path. This can cause edge damage. The path should, therefore, be constructed of sufficient width to accommodate the vehicles, and adequate edge support should be provided. Edge support can be provided by means of stabilized shoulders, flush or raised concrete curbing, installation of geotextile fabric beneath a layer of aggregate base course, or additional pavement width or thickness. (1)

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Portland Cement Concrete

ADVANTAGES	DISADVANTAGES
Longer service life of roughly 40 years	Pavement markings like center lines may have lower contrast against cement surface, especially at night
Lower maintenance	Higher construction costs
Reduced susceptibility to cracking and deformation from roots and weeds	Concrete may be more difficult to repair after movement and cracking has occurred
More consistent riding surface	Concrete will necessarily contain joints making for a less smooth ride
	Longer construction time

Recommendations

- Asphalt pavement thickness should be a minimum of three inches deep for pavements which will be placed on good soil. Pavements placed on poorer sub-grade should be thicker. (2)
- Transverse joints needed in concrete to control cracking should be saw cut, rather than tooled, to provide a smoother ride.
- Broom finish or burlap drag concrete surfaces are preferred for skid resistant qualities.

Concrete Maintenance

- Joint sealing of portland cement concrete pavements is recommended. Any measure to prevent moisture penetration into the pavement structure will increase the serviceable life.
- Cracks should be filled as they appear and progress. Especially critical are cracks with a width that could accept a bicycle tire.
- Patching is recommended in areas where cracks in the pavement exceed 0.5 inches, or where there is significant concrete pavement degradation.

Asphalt

ADVANTAGES	DISADVANTAGES
Cheaper construction costs	Shorter service life of 10-20 years
May provide higher contrast with pavement markings, especially at night	Increased susceptibility to cracking and deformation from roots and weeds
Smooth rolled surface when new	Requires more interim maintenance
Softer surface may be preferable for some runners and walkers over concrete	
Asphalt may be easier to repair after movement and cracking has occurred	
Continuous, smooth, joint-free travel lanes if asphalt is properly maintained is preferable for cyclists and rollerbladers	
Shorter construction time	

Recommendations

- Increased asphalt thickness will increase durability and service life of the path.

Asphalt Maintenance

- Normal periodic maintenance, depending on path location, drainage and climate, should include sweeping the trail of debris.
- The path or trail should be inspected on an annual basis to determine the overall condition of the drainage, asphalt pavement, pavement markings and vegetation growth.
- Drainage areas should be improved or repaired where problems are noted and vegetation should be removed from the pavement and surrounding areas where it will affect use of the path.
- Cracks which are 0.25 inches to 0.5 inches should be thoroughly cleaned, dried and filled with a sealant. The best method is to rout the cracks, clean the crack with compressed air, and pour hot crack filling material into the crack.
- Preventive maintenance should include sealing the surface of the asphalt. (2)

1 TRAIL GUIDELINES

Refer to additional design standards in the 2012 AASHTO *Guide for Development of Bicycle Facilities* (1) for additional design speed, horizontal alignment, cross slope, grade, stopping sight distance, drainage, roadway intersection, and other related design requirements.

Refer to the U.S. Access Board website (www.access-board.gov) for up-to-date information regarding the accessibility provisions for shared use paths and other pedestrian facilities covered by the *Americans with Disabilities Act* and the *Architectural Barriers Act*.

Refer to local, state, and federal stream buffer set-back requirements.

1.2 UNPAVED TRAILS

Unpaved surfaces are appropriate on paths where the intended use of the path is primarily equestrian. Unpaved pathways should be constructed of materials that are firm and stable. (1) A firm surface resists deformation by indentations. A stable surface is not permanently affected by expected weather conditions and can sustain normal wear and tear from the expected use(s) of the area between planned maintenance cycles. Firm and stable surfaces prevent assistive devices from sinking into the surface. Surfaces that are not firm and stable make travel difficult for a person using crutches, a cane, a wheelchair, or other assistive device. (7)

The following materials are more likely to provide firm and stable surfaces:

- Crushed rock (rather than uncrushed gravel)
- Rock with broken faces (rather than rounded rocks)
- A rock mixture containing a full spectrum of sieve sizes, including fine material (rather than a single size)
- Hard rock (rather than soft rock that breaks down easily)
- Rock that passes through a 0.5-inch screen (rather than larger rocks)
- Rock material that has been compacted into 3- to 4-inch-thick layers (rather than thicker layers)

- Material that is moist (not soggy) before it is compacted (rather than material that is compacted when it is dry)
- Material that is compacted with a vibrating plate compactor, roller, or by hand tamping (rather than material that is laid loose and compacted by use)

To determine whether a surface is both firm and stable, one may ask the following questions:

Could a person ride a narrow-tired bicycle across the surface easily without making imprints? (Bicycle tires are similar to the large rear wheels of a wheelchair).

Could a folding stroller with small, narrow plastic wheels containing a 3-year-old be pushed easily across the surface without making imprints? (A stroller's wheels are similar to the front wheels of a wheelchair). (2)

1 TRAIL GUIDELINES

1.3 SHARED USE PATH CASE STUDY: MURDOCK CANAL TRAIL

The Murdock Canal Trail is a 17-mile-long multi-use trail that runs through Orem, Lindon, Pleasant Grove, Cedar Hills, American Fork, Highland and Lehi. It starts at 800 North in Orem and ends at state Route 72 near Lehi. From there, trail users can easily access the nearby Jordan River Parkway. The Murdock Canal Trail is paved with asphalt and also has an adjacent dirt path for equestrian use. This trail is in well maintained condition and could be used as a resource and template for future development and maintenance of the Jordan River Parkway Trail. The Mountainland Association of Governments worked closely with Utah County to fund and build this trail and could be contacted with additional questions.

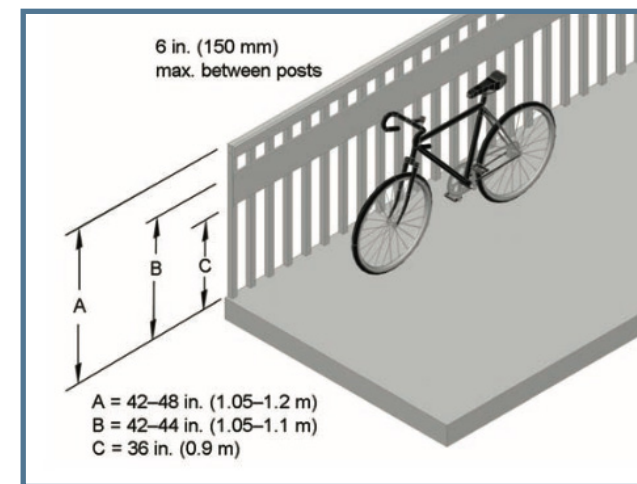


Murdock Canal Trail (photo by: cdjonesus alltrails.com)

1.4 BRIDGES

A bridge may be needed to provide continuity to the shared use path. Placement of bridges should consider the hydrology of the river, and should not further restrict the movement of the river within its available floodplain. Bridge placement should also be considerate of how many bridges are present. Too many bridges results in more hydrologic alteration and dysfunction of the river. If an additional bridge is to be placed in close proximity to one or more existing bridges, alternatives such as re-routing of trails to consolidate bridge use should be considered.

Railings on bridges where bicyclists are present should be a minimum of 42 inches in height. In some locations where high-speed, steep-angle (25 degrees or greater) impacts between a bicyclist and the railing may occur, such as at a curve at the foot of a long, descending grade where the curve radius is less than that appropriate for the design speed or anticipated speed, a 48-inch-high railing should be considered in order to prevent bicyclists from falling over the railing during a crash. (1)



AASHTO Bridge Railing Guidelines (1)

1 TRAIL GUIDELINES

- Openings between horizontal or vertical members on railings should be small enough that a 6 in. sphere cannot pass through them in the lower 27 inches. For the portion of railing that is higher than 27 inches, openings may be spaced such that an 8-inch sphere cannot pass through them. This is done to prevent children from falling through the openings. (1)
- The minimum clear width should be the same as the approach paved surface, plus a minimum of 2 feet wide on each side. Under constrained conditions the clear width may taper to the pathway width. The clear areas provide the opportunity to avoid conflicts between bicyclists, railings, handrails, and other bicyclists who may have stopped on the bridge. (1)
- At transitions from paths to bridge decks, the height of the path's surface should match the height of the bridge deck surface so as to provide a smooth transition between pathway and bridge deck. Bridge deck lips, formed by differences between pathway and bridge deck heights, should be avoided because they can cause tire blowouts, bent wheels, crashes, and injuries. These lips can be eliminated by placing a transitional layer of asphalt between the path surface and the bridge deck. (1)
- Where a bicyclist's handlebar may come into contact with a railing or barrier, a smooth, wide rub-rail may be installed at a height of about 36 to 44 inches, to reduce the likelihood that a bicyclist's handlebar will be caught by the railing. (1)
- Bridges must conform to ADA, AASHTO, state, and local regulatory standards.
- Refer to AASHTO guidelines for information about load bearing capacity of bridges. Where maintenance and emergency vehicles may be expected to cross a bridge, the design should accommodate them.
- Railings are required when boardwalks exceed 30 inches in height above the ground surface. Railings on boardwalks where bicyclists are present should be a minimum of 42 inches in height.
- Boardwalks should meet bridge structural design standards and be designed for pedestrian loading. Where maintenance and emergency vehicles may be expected to cross a boardwalk, the design should accommodate them.
- Identify floodway and floodplain elevations to determine the height at which the decking can be constructed. Verify with local government authorities prior to construction.
- Environmental and wetland impacts should be minimized when boardwalks are used.
- Boardwalks should be built from products that are environmentally sensitive and nontoxic to the environment.
- Openings or gaps that are big enough to allow wheels, cane or crutch tips, or shoe heels to drop through or get stuck are hazards that shouldn't occur in boardwalks. Openings up to 0.5 inches wide are permitted. Place elongated openings that are more than a quarter of an inch wide with the long dimension perpendicular or diagonal to the primary direction of travel. (7)
- Boardwalks must conform to ADA, AASHTO, state, and local regulatory standards.

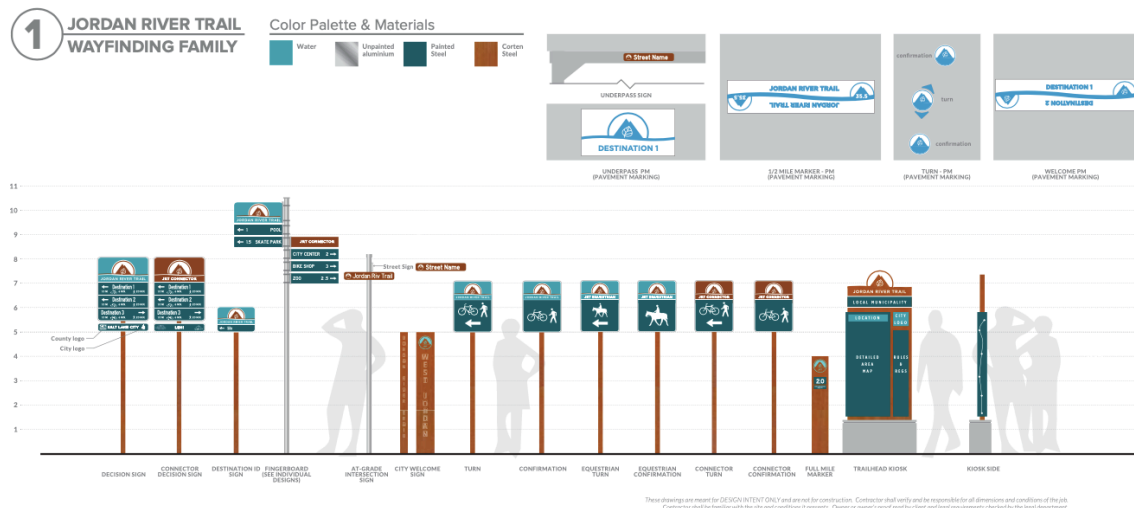
1.5 BOARDWALKS

Boardwalks are used to connect trails over environmentally sensitive areas. Boardwalks are typically made of wood timbers, recycled composite plastic, or narrow liner concrete slab. If properly constructed, boardwalks minimize impacts to sensitive areas and can be a good alternative where extensive grading is required.

2 SIGNAGE AND PAVEMENT MARKING GUIDELINES

2.1 WAYFINDING SIGNAGE

Wayfinding signage along the Jordan River Trail should follow the designs outlined in the *Jordan River Trail Wayfinding Family Signage Document* (6). Current wayfinding signage along the trail is often confusing for users who are unfamiliar with the trail and the surrounding area. For this reason, addition of pavement markings at frequent intervals along the trail and especially at trail intersections is recommended. For additional information on pavement markings, reference the "Pavement Marking" Section of this document.



Jordan River Trail Wayfinding Family Signage

2.2 TRAILHEAD INFORMATIONAL SIGNAGE

Each trailhead along the trail is marked by a trailhead kiosk that is consistent with the design outlined in the *Jordan River Trail Wayfinding Family Signage Document* (6). In addition to each kiosk and at trail entrance points, a permanent Trail Etiquette sign should be erected. Each trail etiquette sign should contain the following information:

TRAIL ETIQUETTE

Be Courteous - All trail users, including bicyclists, joggers, walkers, wheelchairs, skateboarders, bladders and skaters, should be respectful of other users regardless of their mode, speed or level of skill.

Be Predictable - Travel at a reasonable speed in a consistent and predictable manner.

Keep Right - Travel on the right side of the path, except to pass.

Pass on the Left - Pass others traveling your direction on the left. Yield to oncoming traffic when passing. Always look ahead and behind before passing.

Yield - Yield to other users when entering and crossing the trail.

Speak Up - Give audible warning before passing using voice, bell, or horn.

Crowding - Travel no more than two abreast.

Don't be a Litterbug - Do not leave glass, paper, cans, plastic, or any other debris on or near a trail. If you drop something, please remove it immediately.

Signage - For your safety, pay strict heed to rules and regulations along the trail, particularly seasonal signage as conditions vary throughout the year.

Be Visible - All trail users should use a light and reflectors after dusk and before dawn.

Pets - Please keep pets on a short leash and clean up after them.

Prohibitions - Generally, motorized vehicles are prohibited, but consult local guidelines for additional guidance on assistive and recreational motorized vehicles. Alcoholic beverages, illegal drugs, firearms, fireworks, and fires are not permitted on the trail.

Phones - Be aware and courteous to others while using a cellular phone. Step off the trail while using your device if necessary.

Stopping - Step off the trail and out of the way of passing trail users if you need to pause for any reason.

2 SIGNAGE AND PAVEMENT MARKING GUIDELINES

Each Trail Etiquette sign should include the scannable QR code to allow trail users to visit myjordanriver.org directly from their mobile device while on the trail.

(Scannable QR Code image file below can be obtained from the Jordan River Commission.)



Visit myjordanriver.org for additional information about the Jordan River Parkway.

2.3 INTERPRETIVE AND EDUCATIONAL SIGNAGE

Signage providing cultural, ecological, and historical information along the trail is encouraged. Additional signs providing the QR code inviting trail users to visit myjordanriver.org for additional and frequently updated trail information are also encouraged.

2.4 PAVEMENT MARKINGS

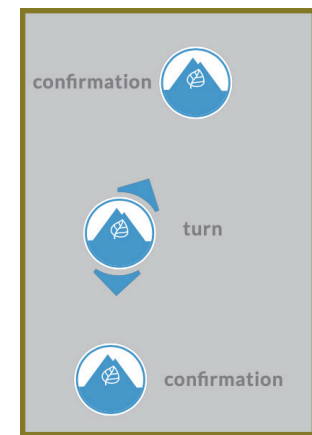
Pavement markings can provide important guidance and information for path and roadway users. Pavement markings should be retroreflective. They should not be slippery or rise more than 0.16 inches above the pavement. (1)

A 4-to-6-inch wide, yellow centerline stripe may be used to separate opposite directions of travel. This stripe should be dotted where there is adequate passing sight distance, and solid in locations where passing by path users should be discouraged. A solid yellow centerline stripe may be used on the approach to intersections to discourage passing on the approach and departure of an intersection. If used, the centerline should be striped solid up to the stopping sight distance from the edge of the sidewalk or roadway. A consistent approach to intersection striping can help to increase awareness of intersections.

Pavement markings indicating and identifying the main trail as well as any intersecting trails should be placed on the ground at all trail intersections. These markings will help trail users navigate the trail with ease. The design of these pavement markings should be consistent with the design presented in the *Jordan River Trail Wayfinding Family Signage Document* (6) and existing pavement markings on the trail.



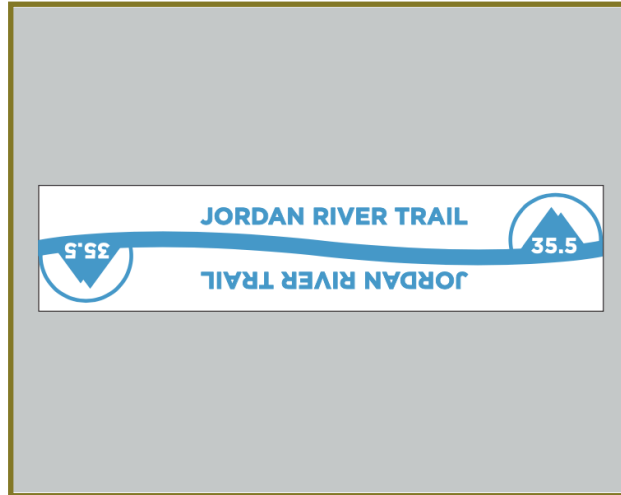
Existing Trail Pavement Markings near Parry Farms Baseball Fields, Riverton



Intersection Pavement Marking Design

2 SIGNAGE AND PAVEMENT MARKING GUIDELINES

Pavement markings should also be placed every 1/10 mile along the main trail to assist users in identifying their exact location on trail in case of emergency. These pavement markings should span the width of the trail and be consistent with the design presented in the *Jordan River Trail Wayfinding Family Signage Document* (6).



1/10 Mile Pavement Marking Design

Reference MUTCD (3) for additional guidance on pavement markings.

3 TRAIL AMENITY GUIDELINES

3.1 BENCHES

Since the trail passes through multiple municipalities and governing agencies, each with its own character and setting, the bench style for the Jordan River Parkway Trail should be consistently coordinated, rather than trying to conform to the bench standards of each local jurisdiction. Benches are divided into two categories, trailhead benches and trailside benches.

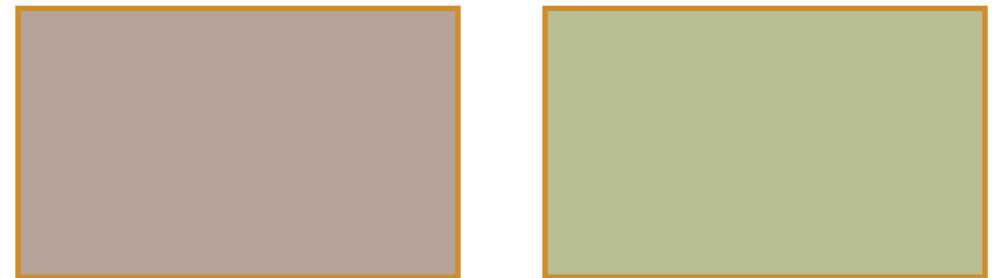
3.1.1 TRAILSIDE BENCHES

Trailside benches are benches located along the trail, especially in areas that are less frequently maintained.

- Trailside benches should be placed at a minimum every 1/4 to 1/2 mile to provide convenient and attractive resting places along each segment.
- Key views, trailside amenities, and natural opportunities for shade should be considered when deciding on locations for trailside benches.
- Trailside benches should be made of metal with thermoplastic or powder coating for spray paint resistance and durability.
- Trailside benches should be tan or sage green in color. These lighter colors help to reduce bench temperatures on hot days.
- Trailside benches should be perforated to promote quick dry capability.
- Trailside benches should be secured to the spot by in-ground or similar mounting techniques.
- Distinguishing logos may be added to benches so long as all other design guidelines are met.
- Landscapeforms is a preferred provider for trailside benches and other amenities. Visit [landscapeforms.com](https://www.landscapeforms.com) to view available inventory.



Trailside Bench Example (Legacy Trail, Davis County)



Bench Color Swatches ([landscapeforms.com](https://www.landscapeforms.com))

3 TRAIL AMENITY GUIDELINES

3.1.2 TRAILHEAD BENCHES

Trailhead benches are benches located in higher maintenance areas such as at trailheads or in parks. Trailhead benches may also be made of wood as it is more easily replaceable and maintainable.



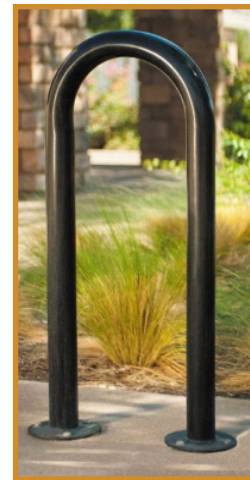
Trailhead Bench Example (Existing Bench, Jordan River Trail)

3.2 TRASH CANS AND RECYCLING BINS

- Trash receptacles should be concentrated within a approximately 1/2 mile from a trailhead and at serviceable locations like trail intersections.
- Priority should be given to serviceable locations such as trail entrances, trailheads, trail-road intersections, trail-trail intersections, rest stops and viewing areas.
- Each trash receptacle unit should include 1 trash container and 1 recycling container.
- Bins should be located at a distance from seating or gathering areas to reduce smell and insect nuisances.
- The containers shall include animal-proof lids, and the design, color, and style shall be consistent with accompanying benches.

3.3 BICYCLE RACKS

Bicycle racks should be placed along the trail at all trailheads, observation areas, picnic areas, restrooms, and other locations where trail users may be likely to pause. At trailheads, bicycle racks should be placed near power outlets for e-bike charging needs. (E-bikes may not be permitted in all areas along the trail.) Spaced single loop bike racks are preferred but multiple loop bike racks are also acceptable.



Bike Rack Examples (worthingtondirect.com)

3 TRAIL AMENITY GUIDELINES

3.4 BICYCLE REPAIR STATIONS

A public outdoor bicycle repair station should be placed along the trail at all trailheads. Bicycle repair stations should be frequently maintained to ensure they remain in good working condition.



Public Bike Repair Station Example (huntco.com)

3.5 LIGHTING

Lighting should be focused in parking lots and at trailheads along the trail. Dark sky-compliant lighting should be used. Bollard style lighting may be used for trailhead lighting outside of parking lots.

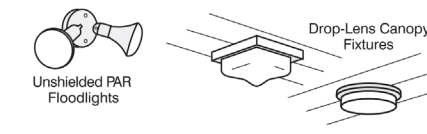
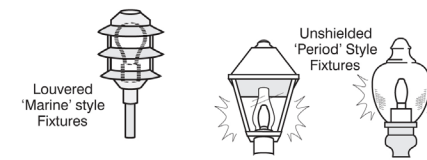
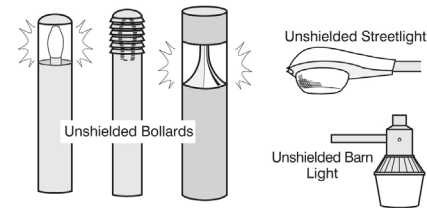
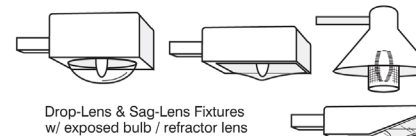
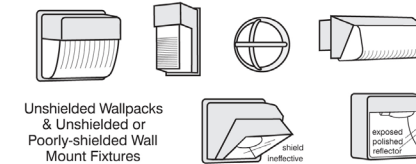
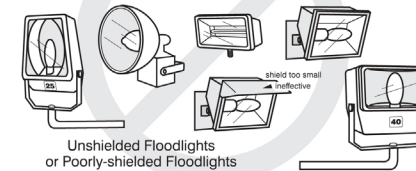
Dark sky lighting should:

- Only be on when needed
- Only light the area that needs it
- Be no brighter than necessary
- Minimize blue light emissions
- Be fully shielded (pointing downward)

Examples of Acceptable / Unacceptable Lighting Fixtures

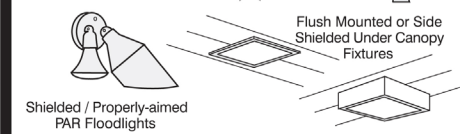
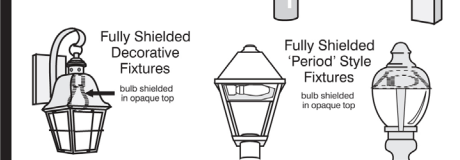
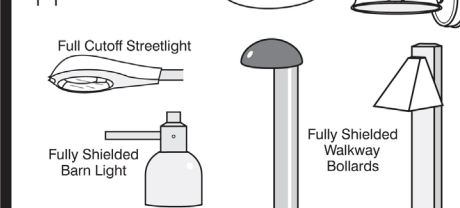
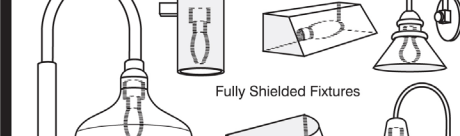
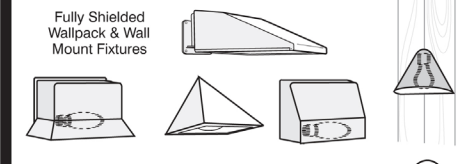
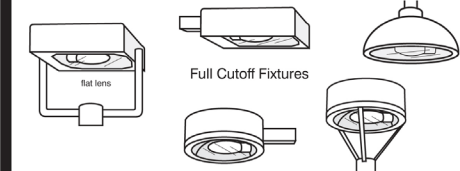
Unacceptable / Discouraged

Fixtures that produce glare and light trespass



Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



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Shielded Lighting Example (4)

3 TRAIL AMENITY GUIDELINES

3.6 ELECTRIC VEHICLE CHARGING STATIONS

Electric vehicle charging stations should be provided in all trailhead parking lots.

- Each parking lot along the trail should contain a minimum of 1 Level 2 EV charging station.
 - » In parking lots with more than 20 parking spaces, the EV charging station should be upgraded to a DC rapid charging station.
 - » Parking lots with more than 50 parking spaces should have a minimum of 2 DC rapid charging stations.
 - » In parking lots with 60 or more spaces, 5 percent of parking spaces should have a level 2 or higher EV charging station.
- All parking lots should be designed with an expandable electrical system that allows for potential additional EV charging stations to be installed with ease.
- Eligible entities may be able to receive reimbursement for purchase and installation costs associated with electrical vehicle service equipment through the Department of Environmental Quality's *Electric Vehicle Charging Funding Assistance Program*. Visit the Utah Department of Environmental Quality's website for additional information.

4 WATER QUALITY GUIDELINES

4.1 PARKING LOTS

Stormwater runoff and pollution washed into the Jordan River from impervious parking lots contributes to the River's existing water quality issues. A variety of natural stormwater management options are available and offer short-term savings in minimizing piping and long-term savings in maintenance. For this reason, the following surface stormwater management options for parking lots along the Parkway should be considered:

- Reduce parking requirements and implement shared parking to reduce the amount of impervious surface.
- Install pervious pavers or pavement in parking lots (especially in parking stalls) to provide enhanced on-site stormwater filtration and reduce sedimentation to the River.
- Implement curb cuts to direct stormwater runoff into landscaped areas, catch basins, and vegetated bioswales to slow down the rate of runoff, reduce runoff volumes, attenuate peak flows, and encourage filtering and infiltration of stormwater. Curb cuts can be especially useful when used to manage stormwater runoff from areas paved with impervious surfaces. (5)
- Parking lot run-off should not be directed into natural wetlands or drainage channels that lead into the Jordan River. However, run-off that is pre-treated in a bioswale can be routed into a natural wetland.

Pervious Paving Considerations

- Evaluate soils for appropriate drainage
- Limit permeable paving to slopes less than 5%
- Install appropriate paving profile that includes: appropriate site conditions and soil permeability, filter fabric, drainage rock and wearing surface that can be pavers or porous concrete.

- Keep the pervious pavement surface free of sediment in order to preserve its porousness and effectiveness by blowing (with leaf blower or similar equipment), truck-sweeping and/or dry vacuuming. (5)

4.2 PARKING LOT CASE STUDY 1: CONSERVATION GARDEN PARK

The Conservation Garden Park parking lot in West Jordan is paved with a combination of impervious concrete (in driving lanes that need to be plowed) and pervious pavers (in parking stalls). The parking lot design also incorporates curb cuts to facilitate the flow of stormwater from impervious surfaces into landscaped areas. The Conservation Garden Park could be contacted with additional questions about implementation of this design.



Pervious Pavers in Parking Stalls

4 WATER QUALITY GUIDELINES



Parking Lot Curb Cut to Manage Stormwater Runoff from the Impervious Surface



Pervious Paver Parking Lot

4.3 PARKING LOT CASE STUDY 2: NATURAL HISTORY MUSEUM OF UTAH

The Natural History Museum parking lot in Salt Lake City is paved entirely with pervious pavers that allow stormwater to be filtered back into the ground. The Natural History Museum could be contacted with additional questions about implementation of this design.

ADDITIONAL RESOURCES

1. AASHTO. *Guide for Development of Bicycle Facilities Fourth Edition*. American Association of State Highway and Transportation Officials, Washington, DC, 2012.
2. Eric West, P.E. *Technical Aspects of Asphalt Trail Design*. Colorado Asphalt Pavement Association, Colorado, 2001.
3. FHWA. *Manual on Uniform Traffic Control Devices for Streets and Highways*. Federal Highway Administration, Washington, DC, May 2012.
4. International Dark-Sky Association. *Outdoor Lighting Basics*. IDA International Headquarters, Tucson, Arizona, 2021.
5. Jordan River Commission. *Best Practices for Riverfront Communities*. Jordan River Commission, Salt Lake City, Utah, June 2013.
6. *Jordan River Trail Wayfinding Family Signage Document*
7. USDA. *Accessibility Guidebook for Outdoor Recreation and Trails*. United States Department of Agriculture Forest Service, Missoula, Montana. 2012
8. *United States Access Board. Shared Use Path Accessibility Guidelines*. United States Access Board, Washington, DC, 2011.
9. USDA. *Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds*. Forest Service, U.S. Department of Agriculture, Washington, DC, 2007.

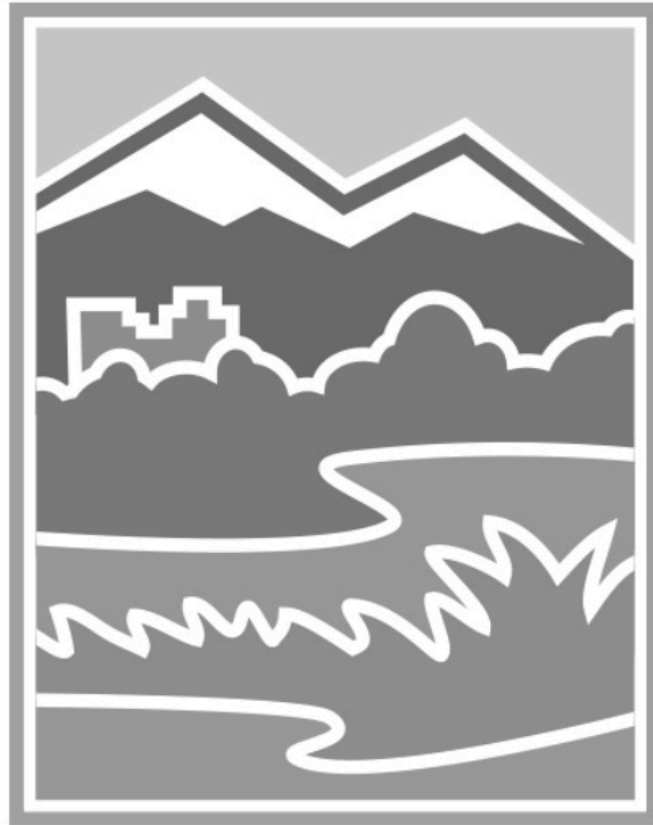
APPENDIX A - AREAS FOR IMPROVEMENT

PATH WIDTHS AND CONDITIONS	
LOCATION	CONCERN
Inlet Park Trailhead	Pavement Condition – Needs Improvement
Willow Park Trailhead	Path Width - 7.5 feet
Riverbend Trailhead	Path Width - 9.5 feet
River Oaks to 7800 S (Trail Section)	Pavement Condition – Needs Improvement
Walden Park to 5390 S Murray Parkway Ave (Trail Section)	Path Width – 7 feet
Arrowhead Trailhead to 4800 S (Trail Section)	Path Width – 9.5 feet Some Significant Pavement Issues
Alzheimers Park to Gatsby Trailhead (Trail Section)	Path Width – 7.5 feet Pavement Condition – Needs Improvement
Cottonwood Park Trailhead	Pavement Width – 5.5 – 8.5 feet

BRIDGE AND BOARDWALK WIDTHS AND CONDITIONS	
LOCATION	CONCERN
Inlet Park Trailhead	Bridge Width – 8 feet Bridge has raised ledge that may cause accessibility issues
Wildlife Park Trailhead	Bridge Condition – Needs Improvement
Thanksgiving Point to Jordan Narrows (Trail Section)	Bridge Width – 6 feet
Jordan Narrows to Springview Farms (Trail Section)	2nd Bridge Width – 9.5 feet 3rd Bridge Width – 9.5 feet
Arrow Trailhead to Jordan River Rotary Park (Trail Section)	1st Bridge Width – 8 feet 2nd Bridge Width – 9 feet
East Riverfront Fishing Ponds Trailhead	Bridge Width – 5.75 feet
Shields Lane to River Oaks (Trail Section)	1st Bridge Condition – Needs Improvement 1st Bridge Width – 9 feet
River Oaks to 7800 S (Trail Section)	Bridge Condition – Needs Improvement
7800 S to Gardner Village (Trail Section)	Bridge Condition – Needs Improvement
Gardner Village to Triumph (Trail Section)	Bridge Connecting Main Stem Condition – Needs Improvement All 4 Bridge Widths – 7, 6, 6, 7 feet
Winchester to Cottonwood Grove (Trail Section)	Main Bridge Connector Width – 7 feet Neighborhood Connector Bridge – 9 feet
5390 S Murray Park Ave Trailhead	Bridge Width – 8 feet
Germania Park to Kennecott Nature Center (Trail Section)	Bridge Width – 8 feet
Kennecott Nature Center to Arrowhead Trailhead (Trail Section)	Boardwalk Width – 6 feet
Arrowhead Park Trailhead	Bridge Width – 7 feet

APPENDIX A - AREAS FOR IMPROVEMENT

4800 S Trailhead	Bridge Condition – Needs Improvement Bridge Width – 7.5 feet
4800 S to General Holm (Trail Section)	2 Bridge Widths – 8, 9 feet
James Madison to Redwood Trailhead (Trail Section)	1st Bridge Width – 7.5 feet
Redwood Trailhead to 1700 S Riverpark (Trail Section)	2nd Bridge Width – 8 feet
1700 S Riverpark Trailhead	Bridge Width – 3.5 feet
1700 S Riverpark to 1300 S (Trail Section)	Bridge Width – 8.5 feet
1300 S to Bend in the River (Trail Section)	Bridge Width – 9 feet
Jordan Park Trailhead	Bridge Width – 9.5 feet
Genesee Trailhead (9th South River Park)	Bridge Width – 9 feet
Gatsby Trailhead to Constitution Park (Trail Section)	2 Bridge Widths – 5, 7 feet
Constitutional Park to Cottonwood Park (Trail Section)	Bridge Width – 4.5 feet
Cottonwood Park Trailhead	Bridge Width – 7 feet
Cottonwood Park to Riverside Park (Trail Section)	Bridge Width – 7 feet
Riverside Park to Trailside Trailhead (Trail Section)	1st Bridge (Riverside Dr.) Width – 5 feet
Trailside Trailhead to Porter's Landing (Trail Section)	Bridge Width – 8 feet



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