



# MOAPA VALLEY TRAILS STUDY

FINAL REPORT  
DECEMBER, 2009





# ACKNOWLEDGEMENTS

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**Special thanks to all the community volunteers who did the initial work that led up to this plan:**

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And all those who filled out surveys and attended public meetings.



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## **EXISTING CONDITIONS, OPPORTUNITIES AND CONSTRAINTS**

In stark contrast to the surrounding desert, the valley floor holds a patchwork of vibrant green fields, which are remnants of Moapa Valley's agricultural heritage. The pastoral landscape is made possible by the water of the Muddy River.



## USER NEEDS ASSESSMENT

Survey results indicate that the Moapa Valley has a thriving recreational community which values health. 85% of survey respondents indicated that they walk and/or run/jog for exercise.

Walk	75%
ATV/OHV/Motorcycle	62%
Bicycle Riding	42%
Equestrian activities	30%
Running/Jogging	28%

Percentages of current activities among respondents.



## **TRAIL DESIGN STANDARDS**

The Moapa Valley Trail System will accommodate a wide range of users including: pedestrians, bicyclists, equestrians, persons with mobility impairments, and OHV riders. These design guidelines will allow the various users to safely enjoy the trails, find their way through the valley, and enjoy amenities along the way.



## TRAIL ALIGNMENTS

A significant defining feature of the Moapa Valley is the Muddy River. It is the backbone of the community and the backbone of the trails plan. The river edge serves as the primary trail through the valley. Alignments connecting to the river complete the trail network.



## PHASING AND COSTS

Phase I Trails \$3,200,000  
(funded under a previous plan)

Phase II Trails \$3,128,242

Phase III Trails \$2,117,333

Phase IV Trails \$1,052,555



# EXISTING CONDITIONS, OPPORTUNITIES AND CONSTRAINTS

## Introduction

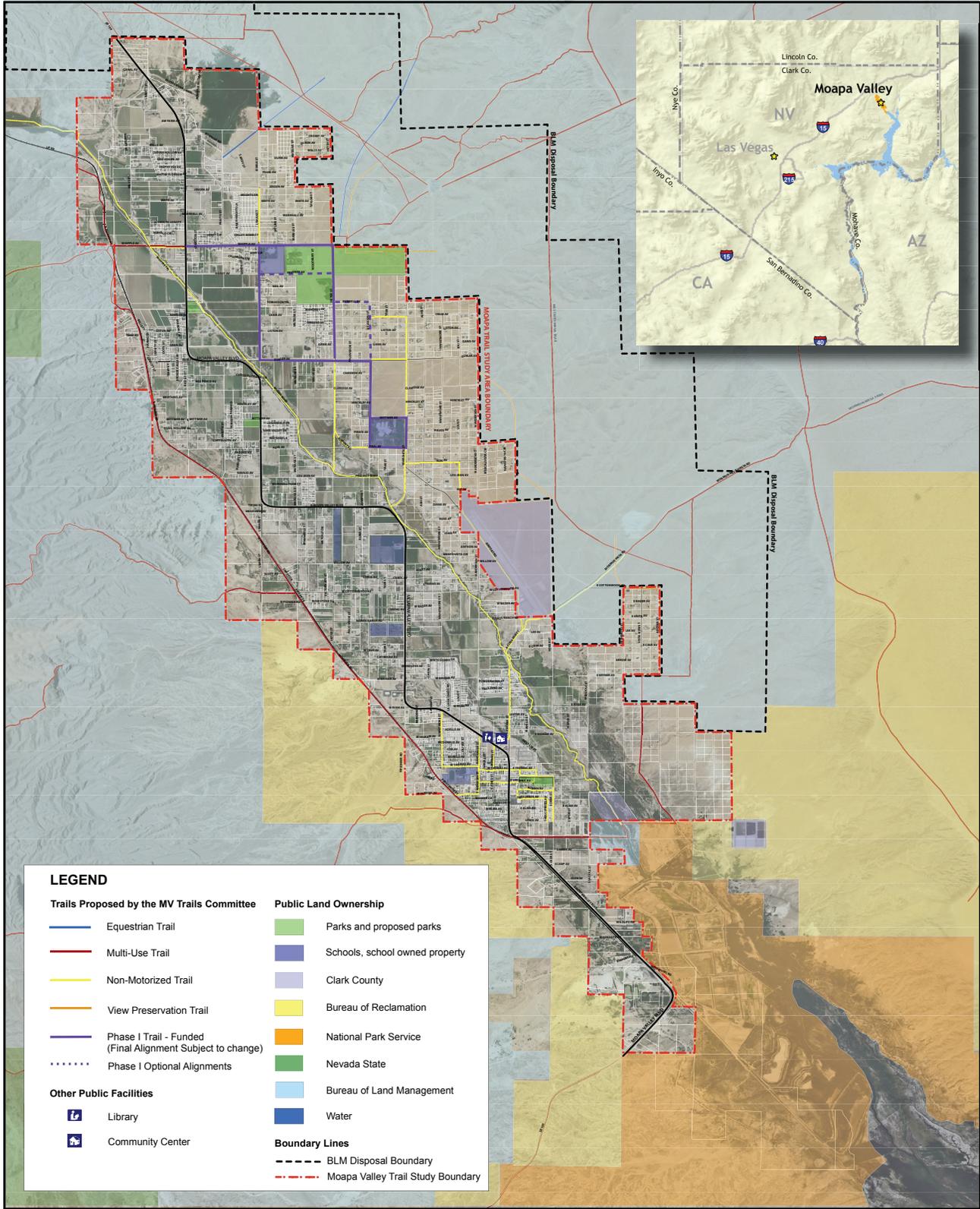
There is a long history of citizen interest and involvement in developing a comprehensive trail system in the Moapa Valley. In 2001 the Moapa Valley Strategic Planning Committee (Trails Subcommittee) began actively working to develop a trails network. This local grass-roots committee held public meetings and later (2005) collaborated with the University of Nevada Cooperative Extension to develop and carry out a valley wide survey to gather input on trail alignments and trail types. As a result of the Trail Committee's work, a three-phase Moapa Valley trail system was developed. In 2007 Clark County received funding through the Southern Nevada Public Lands Management Act (SNPLMA) for the design and construction of an initial phase of the trail system. As of fall 2009 this Phase I Trail Project is under design with construction to begin in 2010.

Between 2006 and 2007 the County applied for and received Pre-Proposal Planning funding through SNPLMA to complete this Moapa Valley Trails Plan. The development of a formal Trails Plan was necessary to identify future trail corridors and to help preserve trail building opportunities as development continues. This study is a natural outgrowth of the Phase I Trail Project and several planning studies that were carried out in the Moapa Valley (see below). By preparing a comprehensive Trail Plan including present and future cost estimates the County will be prepared to seek future SNPLMA funding and leverage cost sharing opportunities for the development of a comprehensive trail network.

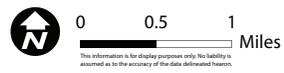
The initial objectives of the Moapa Valley Trail Study included:

- Review and evaluate the three-phase trail plan developed by the Moapa Valley Trail Committee
- Ensure that the funded Phase I trails become part of a cohesive trail network
- Identify opportunities to leverage trail construction costs with planned public works projects and private development projects in Moapa Valley
- Propose a trail network that meets the goals and objectives in recent planning documents such as: the Moapa Valley Community Profile and Vision Plan (2004-5), the Moapa Valley Master Plan of Parks and Recreation 20 year plan (2007), and the North East Land Use Plan (2006)
- Develop a master trail plan that accommodates pedestrians, bicyclists and equestrians
- Provide two east/west crossings for Off-Highway Vehicles (OHVs), such as ATV's and motorcycles, to connect through Moapa Valley to public land.

# MOAPA VALLEY TRAILS STUDY



Source: GISMO



This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated herein.



View of Overton from a ridge above the power line road near Ramos Ranch Road



Skateboarder on Moapa Valley Blvd. near Anderson St. in Overton



This section of the Muddy River at Ramos Ranch Rd. is included in the Muddy River Improvement plan



Muddy River diversion structure at Wells Siding



Bowman Reservoir with a cloud wrapped Bunkerville Mountain in the background



Equestrian in Logandale



Bikes parked in front of W. Mack Lyon Middle School



ATVs in Overton wash



Power Line Rd. heading toward the Mesa in Logandale

MOAPA VALLEY TRAIL STUDY



Horseback riders along the Muddy River in Logandale.



Overton Wash goes under the railroad tracks and crosses Moapa Valley Boulevard, then continues on to the Muddy River.



Overton Wash



Old Skaggs farm off W. Cottonwood



Irrigation ditch along Cooper Street



Flood irrigation of a field in Logandale



Walkers in Logandale



Storm drain culverts under Gann Ave.



Red Rooster Bar in Downtown Overton

Two other studies were conducted concurrently with the Moapa Valley Trails Study, The Moapa Valley Open Space Plan and the Valley of Fire General Management Plan revision. The Moapa Valley Open Space Plan study area covers the 11,000 acres of Bureau of Land Management (BLM) disposal land to the north and east of the Moapa Valley town boundary. The Valley of Fire plan includes a portion of the popular Logandale Trail system. OHV access between the Bureau of Land Management (BLM) land to the east, and the Logandale Trail system to the west, was a driving factor for the Moapa Valley Trails Committee to request two east/west OHV trails within the town boundaries; one in Logandale and one in Overton.

### Overview of the Study Area

Moapa Valley is situated in the northeast portion of Clark County, Nevada, about 60 miles northeast of Las Vegas. The Valley lies within the Mojave Desert, the most arid desert in North America. Moapa Valley is cradled by natural features, forming a strong desert edge around the developable area. Notably, Mormon Mesa is to the east, Valley of Fire State Park to the west, Interstate Highway 15 on the north and the Overton Arm of Lake Mead to the south. Clark County Comprehensive Planning Department Documents reports Moapa Valley is “no more than twenty five miles long, with an average width of 2 miles” (1986).

In stark contrast to the surrounding desert, the valley floor holds a patchwork of vibrant green fields, which are remnants of Moapa Valley’s agricultural heritage. The pastoral landscape is made possible by the water of the Muddy River. The valley is bisected by the Muddy River, which comes into the valley above Wells Siding (in the northwest) through the “Narrows”. The Wells Siding structure diverts the Muddy’s water across the valley to Bowman Reservoir, north of Logandale. Bowman Reservoir is held privately and is a prominent water feature that provides irrigation water to share holders. Below Wells Siding, the Muddy River acts as a flood channel, carrying overflow into Lake Mead, just south of Overton.

A Union Pacific Railroad track spur enters into the Moapa Valley parallel to the Muddy River. These tracks snake along the western side of Moapa Valley to the Simplot silica production facility at the south end of Overton. The railroad tracks and river mark one of the very early access points between the upper and lower Muddy River valleys.

Moapa Valley Boulevard (State Route 169) zigzags through the valley, with only one river crossing in Logandale. Moapa Valley Boulevard is the only paved access in and out of the valley for vehicular traffic. Like the Muddy River, Moapa Valley Boulevard also bisects the valley floor. In the developed area, speed limits range from 25 mph to 55 mph.

### Character of the Study Area

Moapa Valley exudes a small town feel, even while evidence of the explosive growth pressures of Southern Nevada can be seen. Large lots, open fields and livestock punctuate the landscape. A network of irrigation ditches, both covered and uncovered, crisscross the valley. Much of the valley is without sidewalks, curbs and gutters. The primary business sector is in Overton. In both the Overton and Logandale town centers, one can find the small lot sizes typical of early settlements, making the centers very walkable. Originally, these town centers were surrounded by farmland. Now, as farmland has transitioned to housing developments, lot sizes have increased, with ½ acre to 1-acre lots typical. Homes in the area vary in size, age and style. The majority of residents now commute over an hour to the Las Vegas Valley and one-half hour to Mesquite, making Moapa Valley a bedroom community.

### Political Boundary

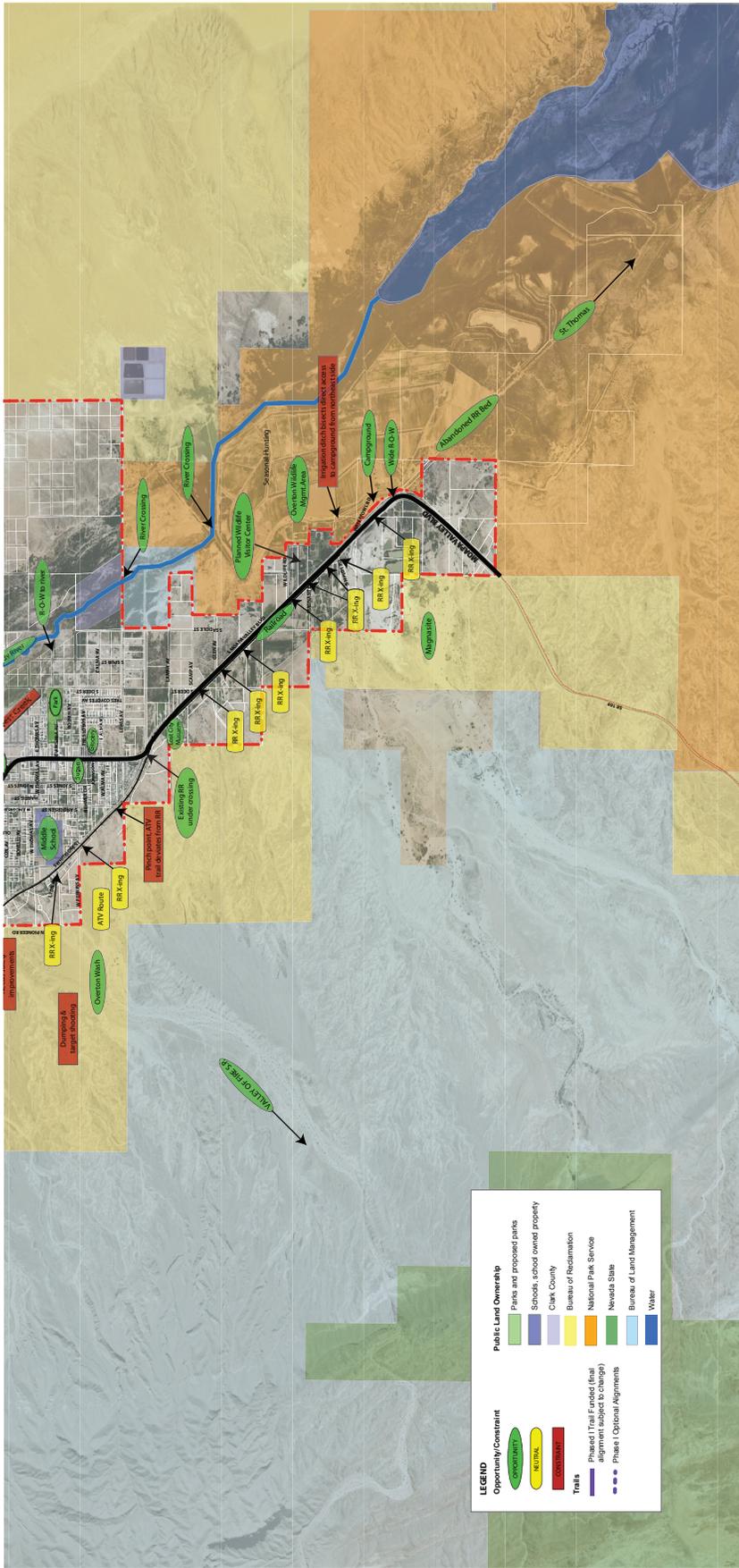
In 1981, the Clark County Board of County Commissioners combined the small communities of Logandale and Overton into the Unincorporated Town of Moapa Valley as a political entity for taxation and representation purposes.

### Population and Future Growth

According to Clark County Department of Comprehensive Planning, the population of Moapa Valley in 1990 was estimated at 4,051. In 2001, a population of 5,997 is listed. In 2008, the population increased to 7,200. These numbers do not include “snowbirds” or transients. Over the course of 18 years, the population has increased by almost 78%.

BLM land: Approximately 9,500 acres are earmarked for disposal within the Moapa Valley Town boundaries. As of spring 2007, Clark County Comprehensive Planning staff does not believe this land will be disposed of within the next 20 years (Moapa Valley Master Plan of Parks and Recreation 20 year plan, May 2007, p. 39).

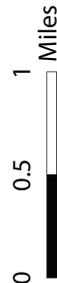




# Opportunities and Constraints Map

Moapa Valley, Nevada  
 Moapa Valley Trails Study

Source: GISMO  
 Author: SKM  
 Date: April 16, 2009



This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated herein.



## Soils

The soils in the area are primarily erosion remnants (sand, silt, etc.) from the surrounding mountains. These soils have been deposited by flowing water to form alluvial fans and river valleys. Desert soils are very fragile, easily compacted and highly sensitive to disturbance.

## Air Quality

Moapa Valley is an attainment area. While air quality is generally good in Moapa Valley, the dry conditions combined with sandy and disturbed soil can result in very dusty conditions where motorized travel occurs on unpaved roads and trails.

## Drainage and Flood Control

While annual rainfall is low in the area, high-intensity storms of short duration can cause flooding. Desert soils, and in particular “desert pavement” cannot quickly absorb rainfall from high-intensity storms, which results in surface run off. In the Upper Muddy (Glendale/Moapa) valley, the California Wash and the Meadow Valley Wash converge with the Muddy River. Flooding in Moapa Valley can occur when these two washes drain into the Muddy, causing the river to overflow its banks. In addition, three large washes, Logan (Benson), Wieber and Overton, along with two smaller washes, drain directly into Moapa Valley from the westerly side. The alignment of the Union Pacific Railroad along the western side of the valley, impedes the natural drainage paths between these five washes and the Muddy River channel, which results in flooding. To further exacerbate the problem, historic development patterns have been within the 100-year floodplain. In the Clark County Regional Flood Control, Muddy River and Tributaries Master Plan 2005 Update, Volume 2, Appendix 6, lists in chronological order documented flood events since 1906.

Further background information can be found in Appendix A.

## USER NEEDS ASSESSMENT

A survey to assess the attitudes, opinions and behavior of residents in Moapa Valley with regard to a trail system was conducted between January 22, 2009 and April 16, 2009. The survey was available online at the project website, and in hard copy at the Moapa Valley library and at the Moapa Valley Community Center. The survey focused on four user groups: pedestrians, bicyclists, equestrians and OHV/ATV/motorcycle riders. The survey instrument can be found in Appendix D.

### Background of Respondents

The project team received 131 responses to the survey, with 85.5% of the respondents being Moapa Valley residents. Most respondents were twenty six years of age or older and 55% of the respondents were women. The distribution of the respondents was fairly even between the following age groups: 26-3 (21.4%), 36-45 (20%), 46-55 (28%), and 56+ (27.5%). Responses between the genders came in fairly even with 55% from women and 45% surveys completed by men.

Although this survey focuses on trail related activities, it does not focus on only one user group. Many of the people targeted by this survey often have two or three activities in common. This survey is divided into four areas, soliciting responses regarding the following activities: walk/run/jog, bicycle, equestrian, and OHV/ATV/motorcycle.

### Respondent Activities

Survey results indicate that the Moapa Valley has a thriving recreational community that values health. 85% of respondents indicated that they walk and/or run/jog for exercise/fitness. Survey takers overwhelmingly responded that they are interested in walking or running in the Moapa Valley. It was surprising to note that many of the respondents reported that they participated in two or more activities. (See Figure 1) For example, equestrians also rode ATV's and bicycles. Percentages of current activities among respondents were as follows:

- Walking (including pet walking) - 75%
- ATV/OHV/motorcycle use - 62%
- Bicycle Riding - 42%
- Equestrian activities - 30%
- Running/jogging - 28%

### Respondent Activities

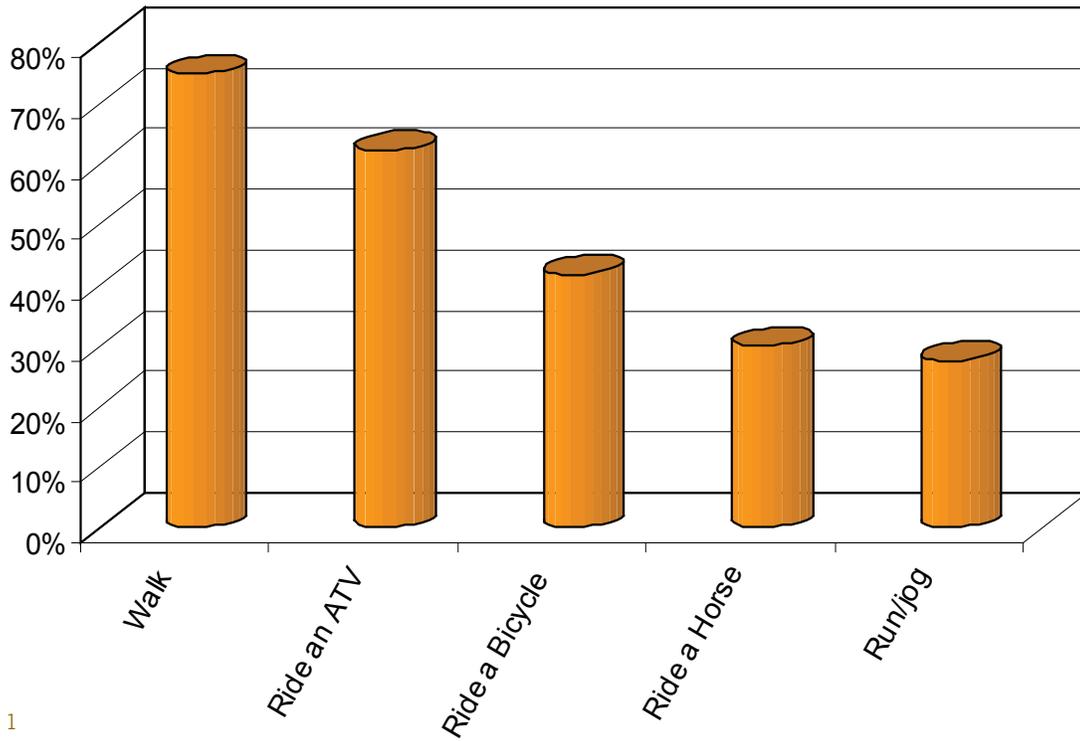


Figure 1

### Frequency of Walkers

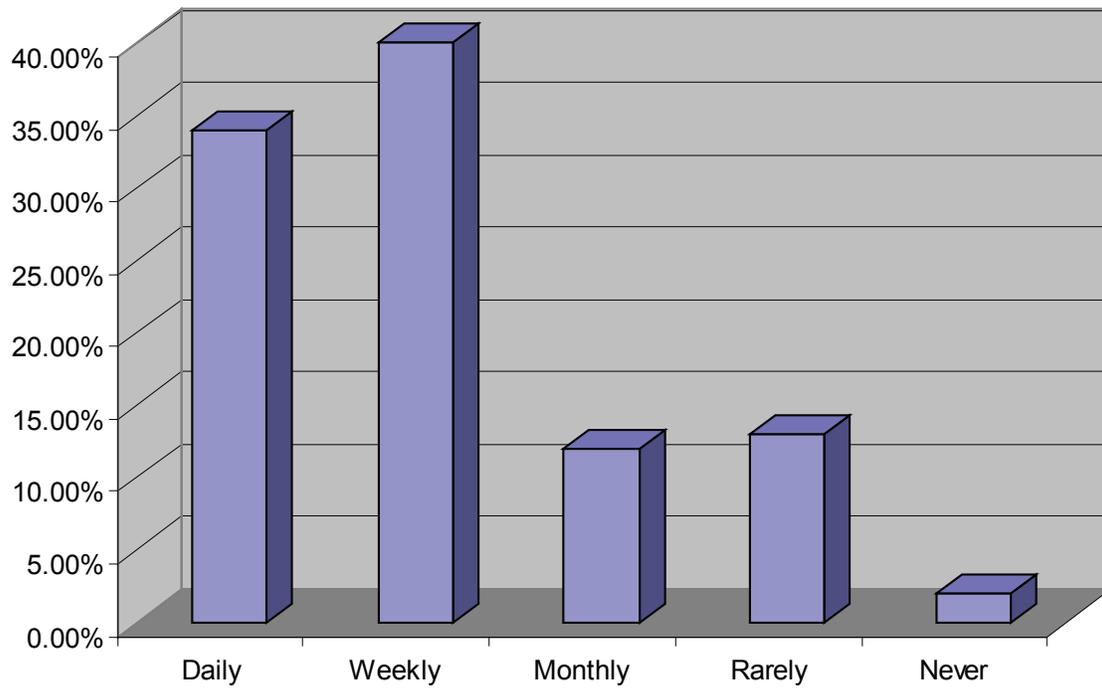


Figure 2

## Walk/Run Activities

### Frequency

The majority of survey takers indicated that they walk or run in Moapa Valley on a weekly, if not daily basis. (See Figure 2) In this category:

- 40% walk/run weekly
- 34% walk/run daily
- 12% walk/run monthly
- 13% rarely walk/run
- 2% never walk/run

### Time of Day and Distance

The most popular times to walk/run are weekday mornings (50%) and evenings (46%), followed by weekend mornings (44%). Interestingly the least popular times to walk/run are weekend evenings, with 17% of respondents active during this time period.

The average walk/jog distance is less than 5 miles. 60% of respondents walk/run between 2 and 5 miles, and 40% walk/run under 2 miles.

### Route Preferences

The majority of walkers and runners utilize paved or unpaved roads over open spaces or along irrigation ditches. Results show users travel on:

- Paved roads – 71%
- Unpaved roads – 57%
- Open areas with trails – 38%
- Open areas without trails – 28%
- Moapa Valley Boulevard – 27%
- Irrigation ditch alignments – 19%

While many survey takers walk and/or run regularly, over 50% indicated that the main factor that deters them from walking or running is the lack of sidewalks and paths. By a large margin, the survey reveals that Moapa Valley residents that walk and/or run regularly, prefer well defined, marked trails and stable surfaces.

## Biking in Moapa Valley

Responses regarding biking in Moapa Valley indicate that many people like the idea of biking, but currently, not many are biking. 65% of respondents indicated that they are interested in bicycling in Moapa Valley.

### Frequency

Bicyclists reported they rode (See Figure 3):

- Daily – 9%
- Weekly – 21%
- Monthly – 25%
- Rarely – 37%
- Never – 7.5%

### Time of Day and Distance

Respondents indicated that they enjoy biking at all times of the day, with the most popular time being weekday mornings (40%). 36% of respondents enjoy both weekend and weekday afternoons, 34% of respondents ride on weekend mornings, and 29% ride during weekday evenings. The least popular time to bike was weekend evenings (21%), which was the least favored time period for the walkers and runners. The majority of trips are less than 5 miles.

### Route Preferences and Facilities

The majority of bicyclists are riding mainly on public land (84%) and do not ride for long distances. Respondents were asked to rate several bicycle facilities that would encourage them to bike more often. The top three responses were:

- More designated bike routes overall
- More paved off-street bike paths
- More bike lanes

Survey results strongly indicate that many Moapa Valley residents would like to bike, but find the lack of safe routes prohibitive. Many respondents indicated that more paved (off-street) bike routes combined with traffic calming measures would influence them to bike more often.

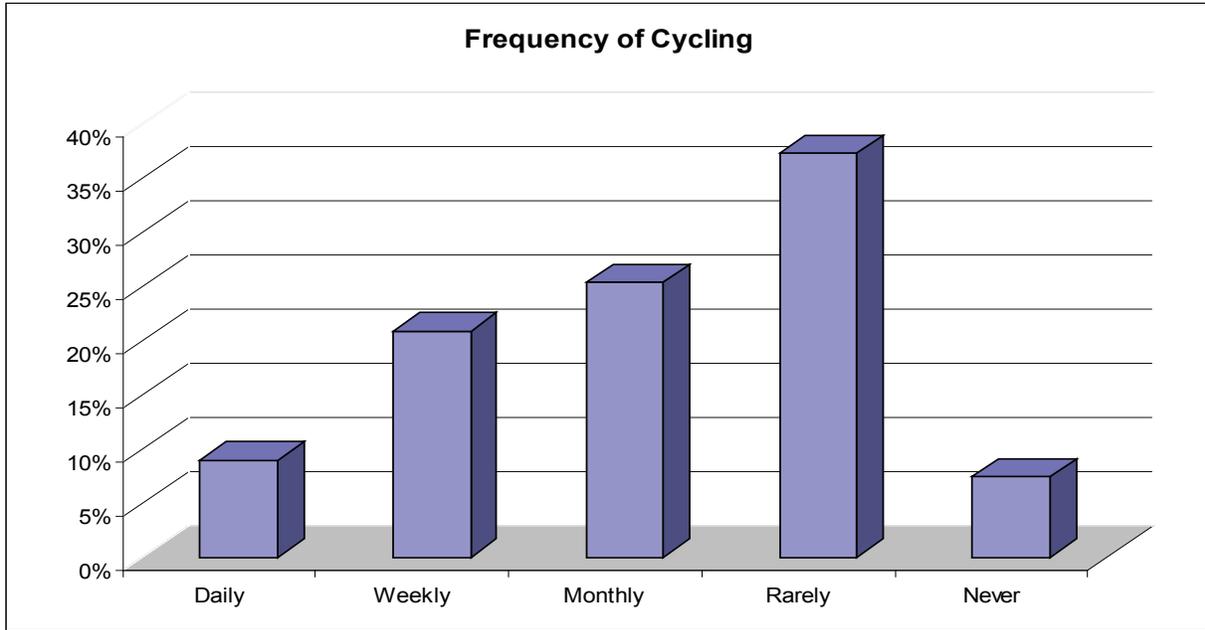


Figure 3

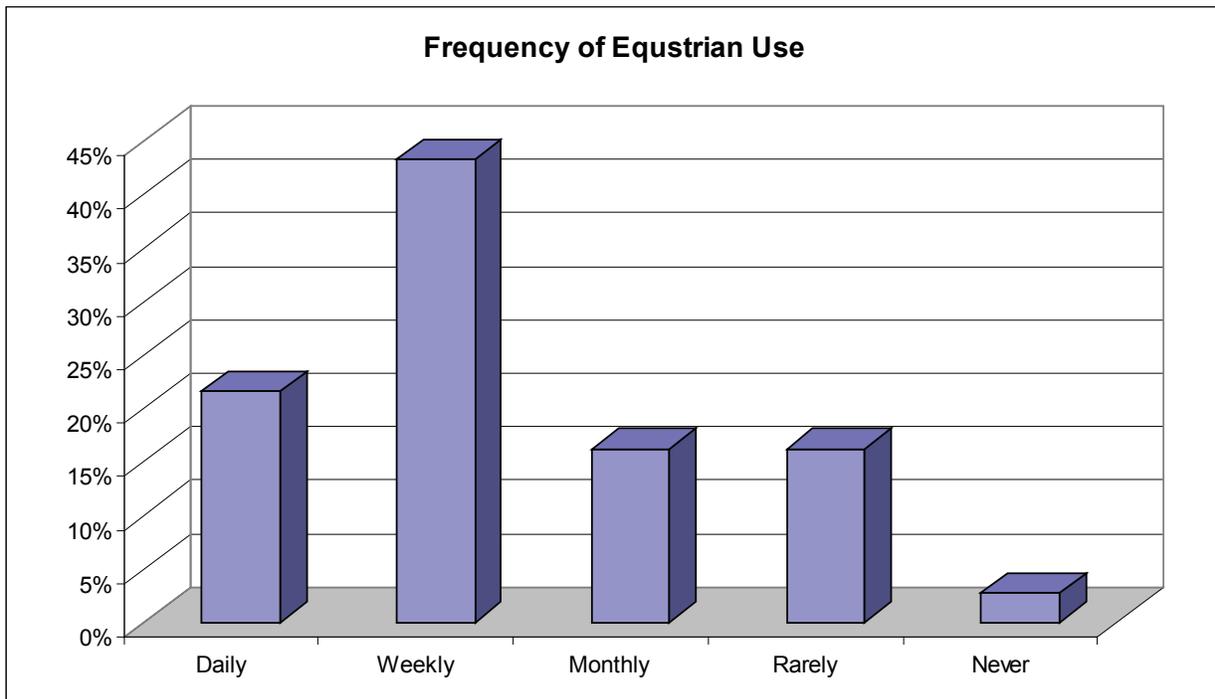


Figure 4

## Equestrian Uses in Moapa Valley

Approximately 41% of the survey respondents indicated that they have an interest in equestrian activities in Moapa Valley. 97% of equestrians participate in pleasure and trail riding activities, with 11% of riders participating in endurance rides. Activities restricted to arenas, such as roping and dressage, account for 34.5% of the responses.

### Frequency

Respondents own two or more horses and ride fairly often. Equestrians noted that they ride (See Figure 4):

- Daily – 22%
- Weekly – 43%
- Monthly – 16%
- Rarely – 16%
- Never – 3%

### Ride Duration & Distance

The majority of equestrians (63%) surveyed prefer one and two hour rides. 46% preferred a ride distance that ranged between 3 and 6 miles. Only 17% of equestrians restrict riding activities to an arena.

### Route Preference & Departure points

Most equestrians (67%) depart directly from their home to ride. Only 33% of equestrians trailer their horses to a destination to ride. Equestrians were asked about the ownership of the land where they typically ride. The answers were fairly evenly split:

- Public lands – 47%
- Unsure of the land ownership – 41%

A large number of equestrians surveyed (77%) indicated they would be likely to use equestrian trails if they were provided which reflects that the bulk of equestrian activities in Moapa Valley takes place outside of an arena. The survey results suggest that equestrians would benefit and use designated trail corridors and trails within the study area to access public lands.

## ATV/OHV and Motorcycle Use in the Moapa Valley

The Moapa Valley is a community very engaged in motorized off-road activities. 73% of survey respondents indicated that they have an interest in OHV/ATV/Motorcycle use. Generally, ATV owners have more than one vehicle. The number of vehicles per owner breaks down as follows:

- One vehicle – 29%
- Two vehicles – 35%
- Three vehicles – 18%
- Four or more vehicles – 18%

The majority (89%) of Off-Highway Vehicle (OHV) users own ATVs, 31% own dune buggies or similar, and 28% own motorcycles.

### Ride Duration & Distance

73% of OHV users surveyed have indicated that they cross Moapa Valley Blvd. (the busiest road in Moapa Valley) each time they ride. The majority of respondents indicated that the duration of their ideal off-road ride would be 3 to 4 hours. 61% of the riders indicated that on a usual ride, they cover more than 10 miles. Almost all respondents indicated that they would either be likely (70%) or somewhat likely (21%) to use designated off-road trails. OHV users indicated that they rode on public land 68% of the time, but were unsure of the ownership of the land they ride on 27% of the time. This uncertainty of land ownership, like with equestrian users, supports the need for clearly designated OHV corridors.

### Route Preference & Departure points

Like the equestrian respondents, the majority (85%) of OHV users depart directly from their homes when they ride. This fact has been brought up often at public meetings as both a perk of living in a rural area as well as a behavior found disturbing by some residents.

## Important Amenities to Accompany any New Trails in the Moapa Valley

Connections to other trails	58%
Wide trail shoulders for walking or jogging	43%
Restrooms	42%
Regular maintenance	41%
Shade (trees or structures)	40%
Waste receptacles	37%
Crossings of major roads	35%
Wildlife viewing spots	31%
Connections to existing parks	31%
Directional/destination signs	28%
Trail heads with parking	28%
Picnic areas/benches	27%
Historical and environmental interpretation signs	25%
Water fountains	22%
Connections to businesses	19%
Mile markers	19%
Fitness course	18%
Lighting	13%
Dog waste bag stations	10%
Bike racks	4%

## Primary Benefits of Open Space Trails

Recreational opportunities	78%
Improved physical fitness and health	54%
Reduced exposure to auto traffic	54%
Nature watching	29%
Active transportation (bicycling, walking)	28%
Neighborhood revitalization	19%
Environmental interpretation	16%
Children's access to school	12%
Improved air quality by eliminating auto trips	8%
Comments	7%
No benefits	5%

## Geographic Distribution of the Respondents

The respondents were asked to provide the nearest cross streets to their residence. About 80 respondents living in the study supplied the information. Figures 5 through 11 show the geographic distribution of the respondents. The goal of mapping these data points was to identify clusters of similar trail user groups which could inform route planning. The maps do not show any distinct clusters, with trail user groups spread evenly throughout the study area. This even distribution suggests that an integrated trail network area would be most effective.

Figure 10 combines the geographic distribution of all trail users onto one map. It shows that many trail users are multi-modal. In some cases there were a number of respondents from the same household. Figure 11 depicts the aggregate number of respondents near a particular intersection.

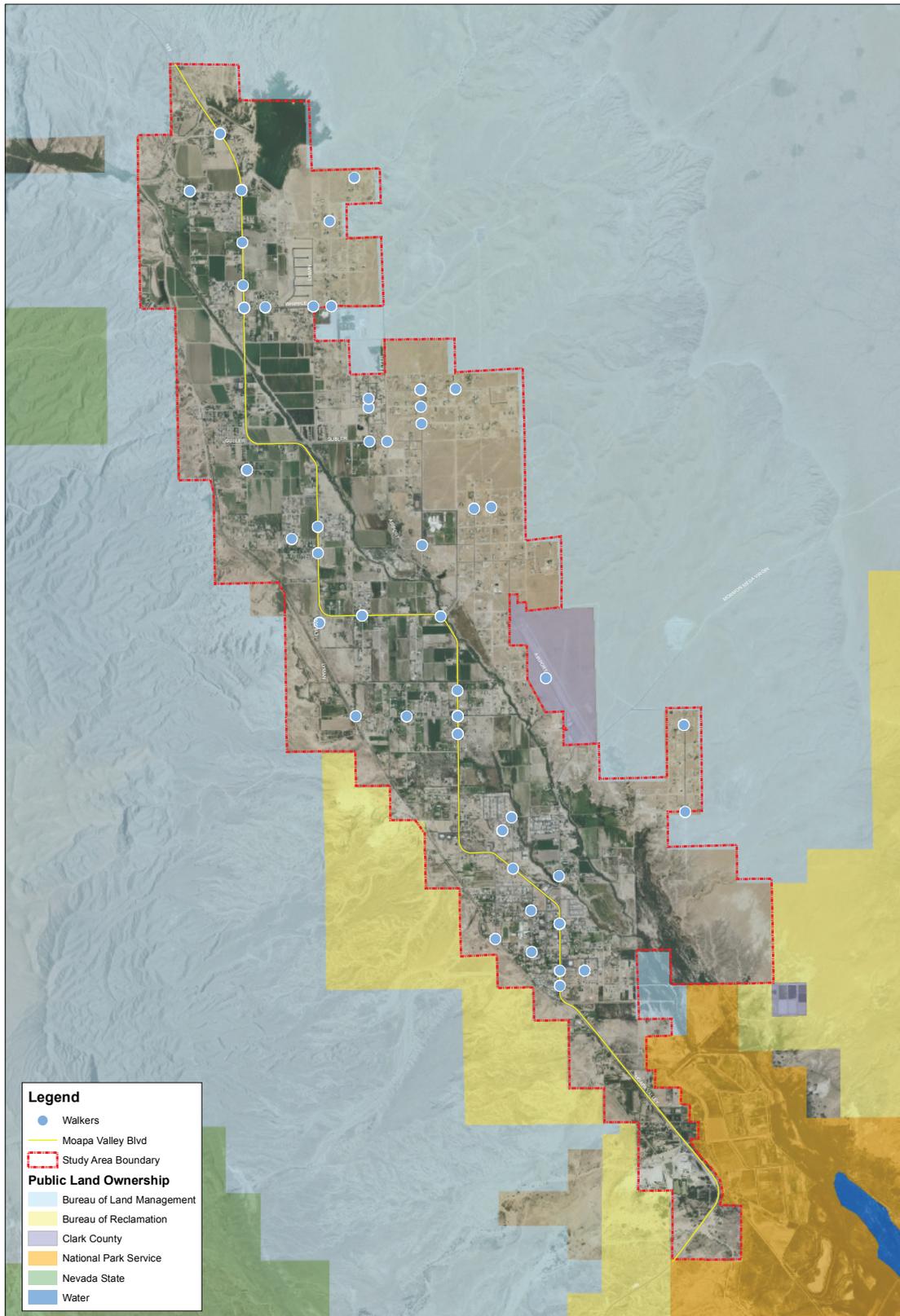
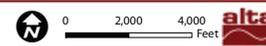
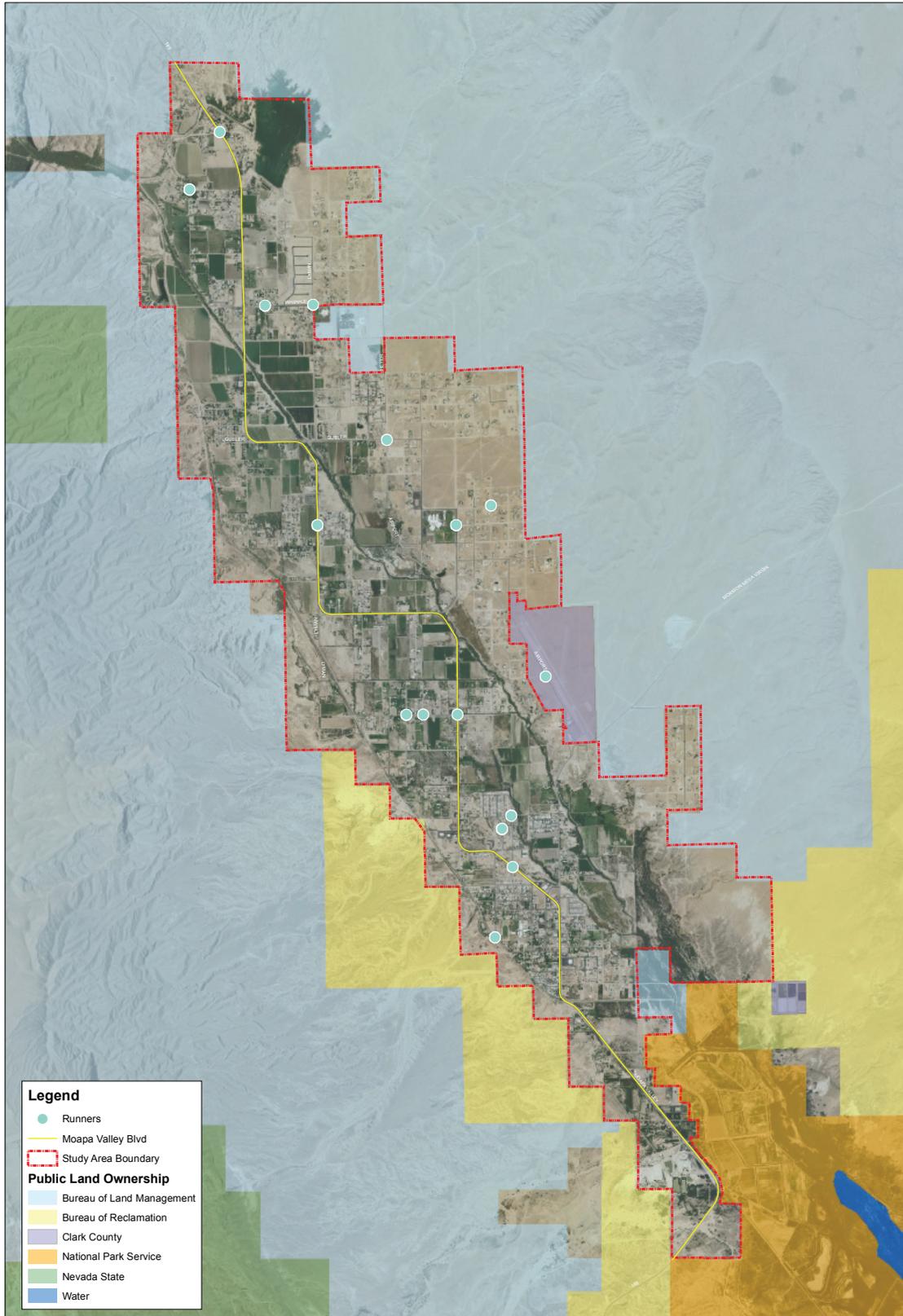


Figure 5 - Geographic Distribution of Walkers

Moapa Valley, Nevada  
 Moapa Valley Trails Study

Source: GISMO/Alta  
 Author: KAW/ES  
 Date: May 2009





**Figure 6 - Geographic Distribution of Runners/Joggers**

Moapa Valley, Nevada  
Moapa Valley Trails Study

Source: GISMO/Alta  
Author: KAV/ES  
Date: May 2009



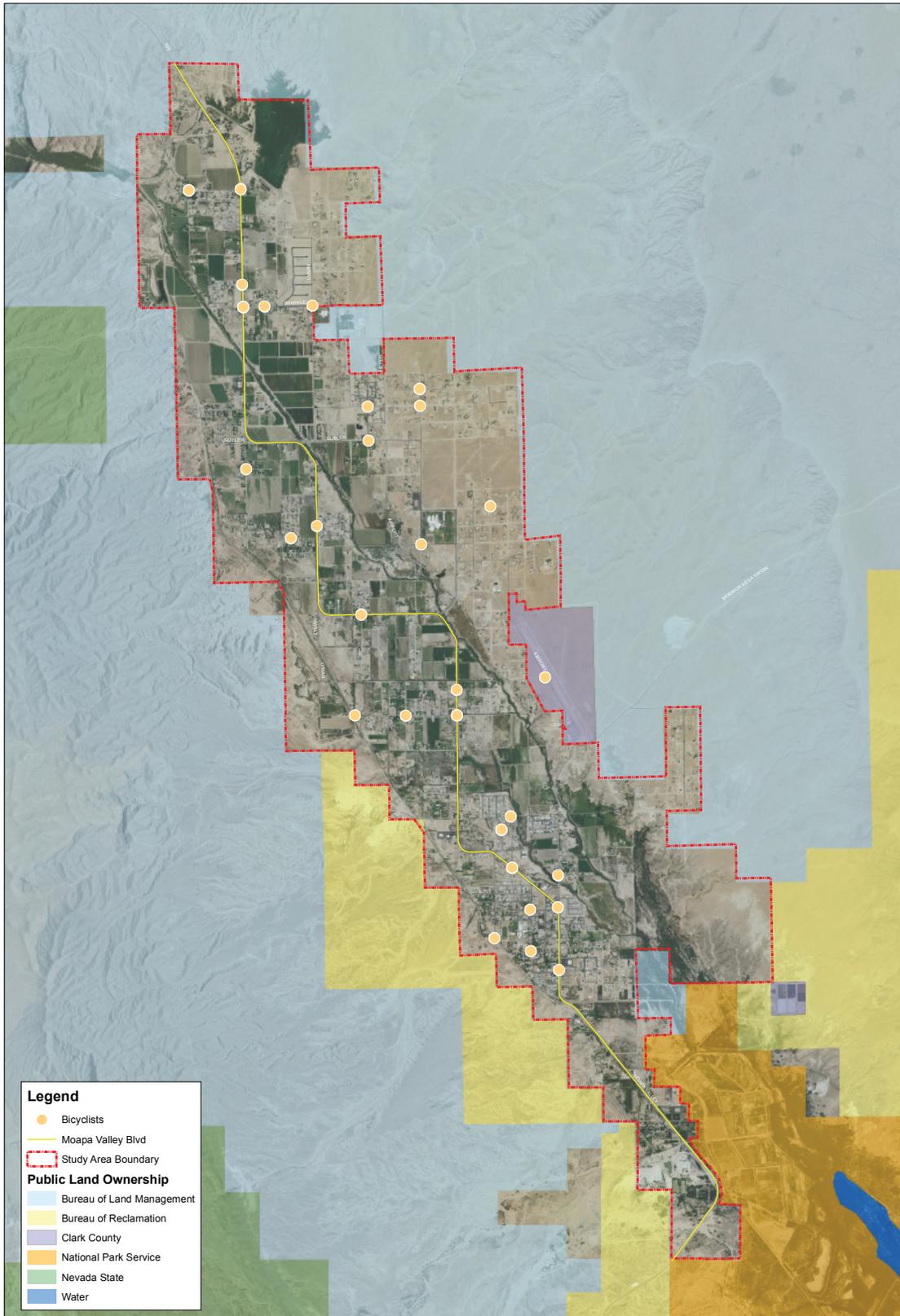


Figure 7 - Geographic Distribution of Bicyclists

Moapa Valley, Nevada  
Moapa Valley Trails Study

Source: GISMO/Alta  
Author: KAW/ES  
Date: May 2009



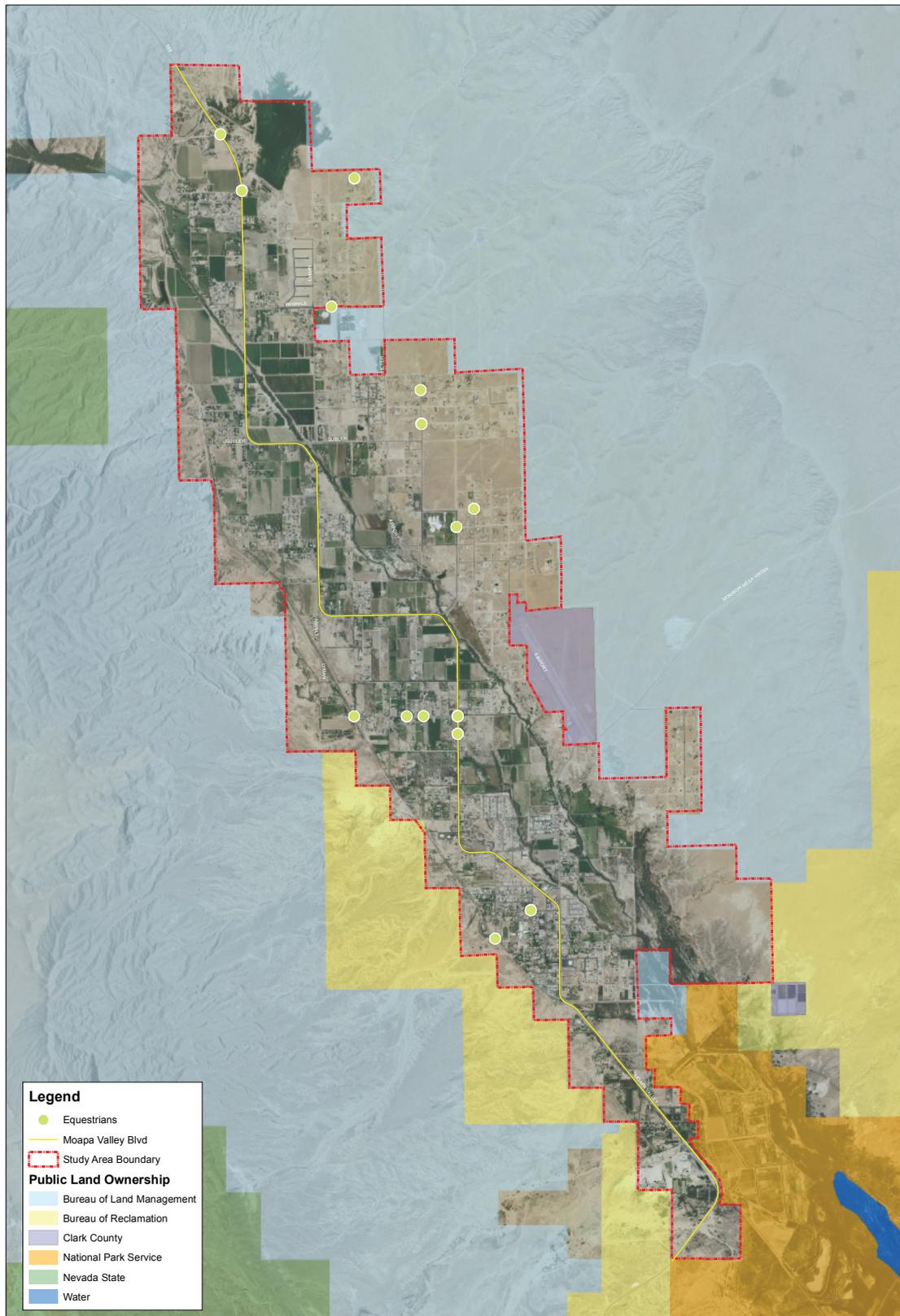


Figure 8 - Geographic Distribution of Equestrians

Moapa Valley, Nevada  
Moapa Valley Trails Study

Source: GISMO/Alta  
Author: KAV/ES  
Date: May 2009



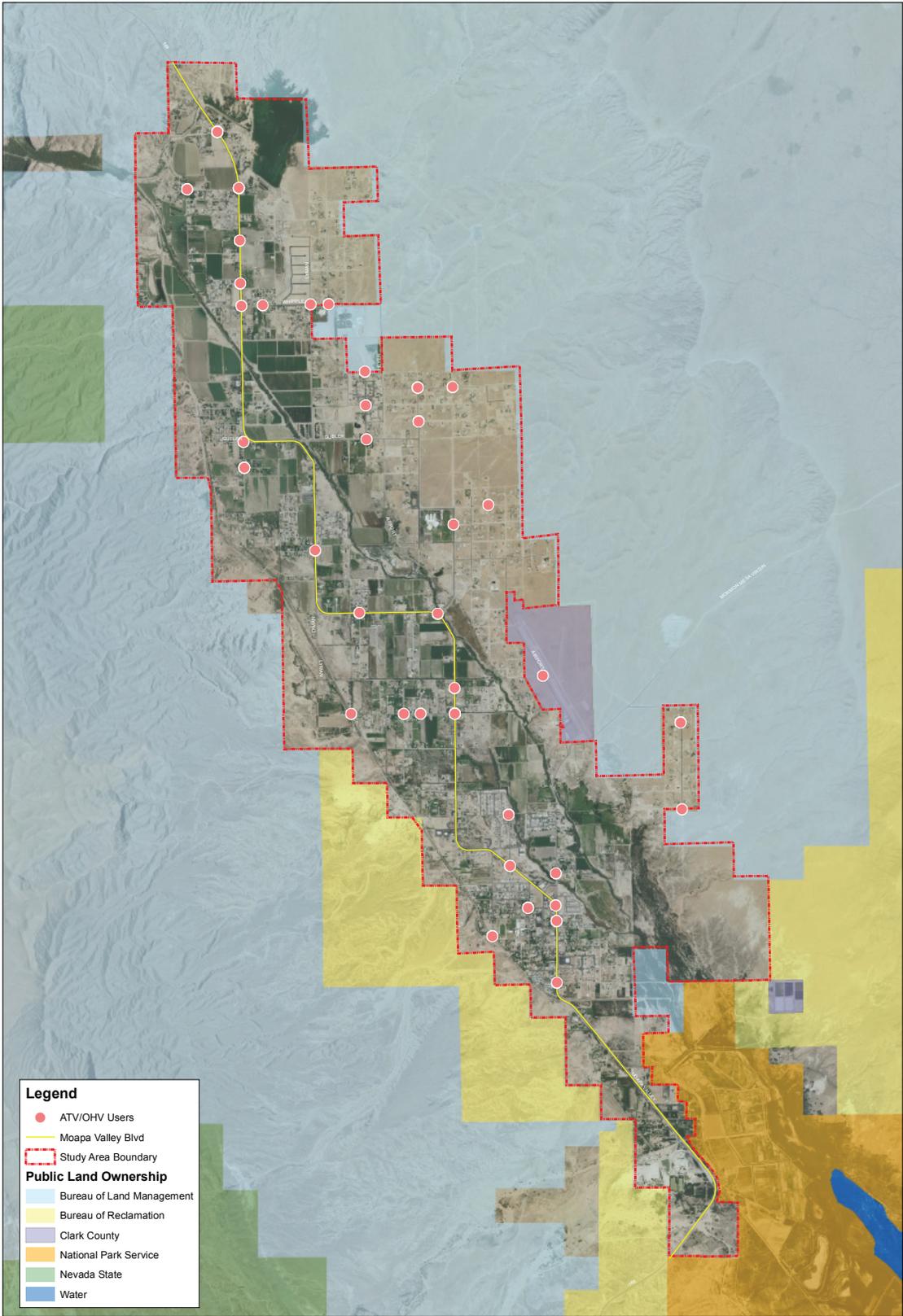
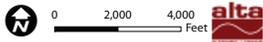


Figure 9 - Geographic Distribution of ATV/OHV Users

Moapa Valley, Nevada  
Moapa Valley Trails Study

Source: GISMO/Alta  
Author: KAW/ES  
Date: May 2009



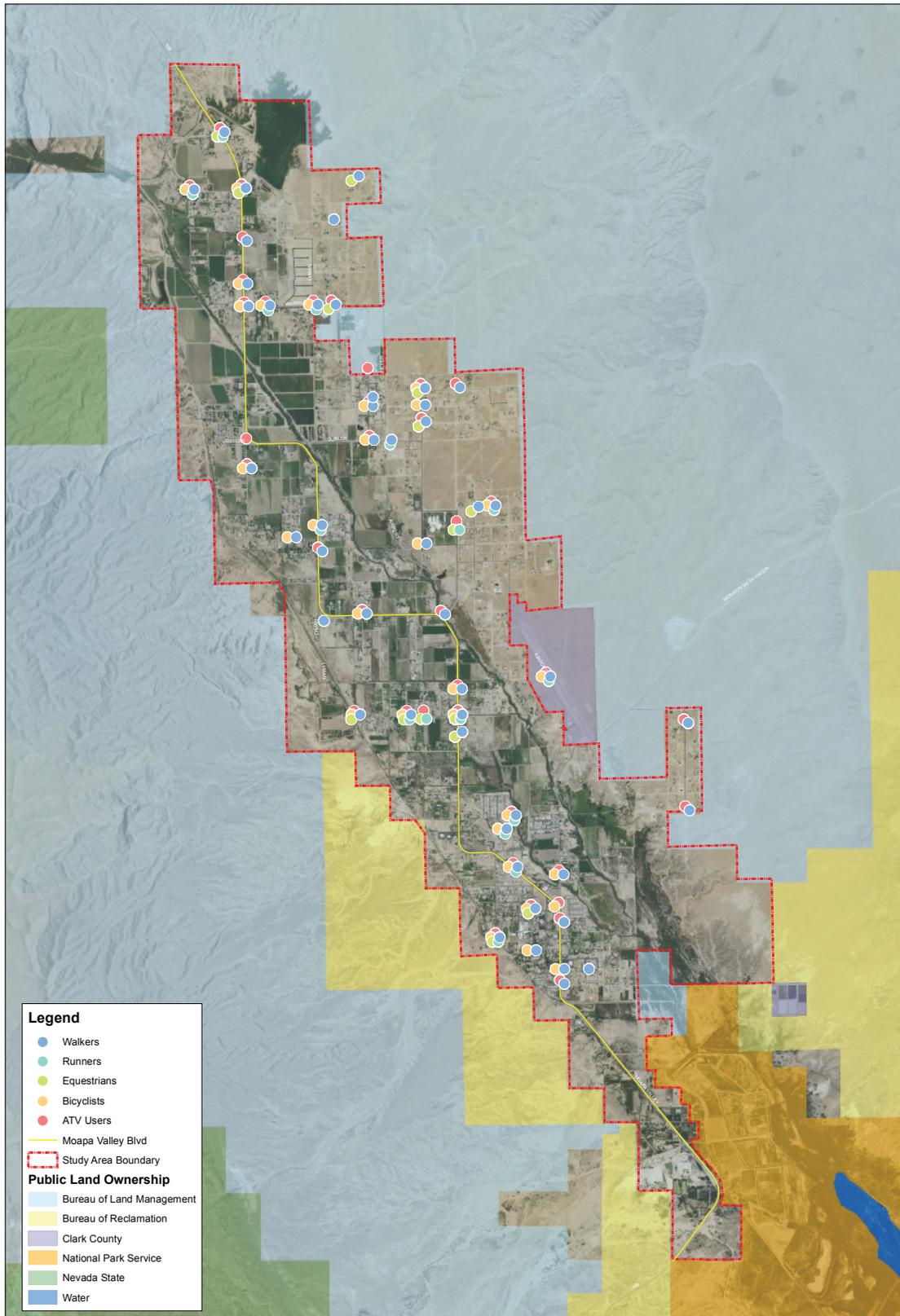
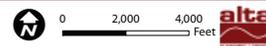


Figure 10 - Geographic Distribution of Trail Users by Type of User

Moapa Valley, Nevada  
Moapa Valley Trails Study

Source: GISMO/Alta  
Author: KAW/ES  
Date: May 2009



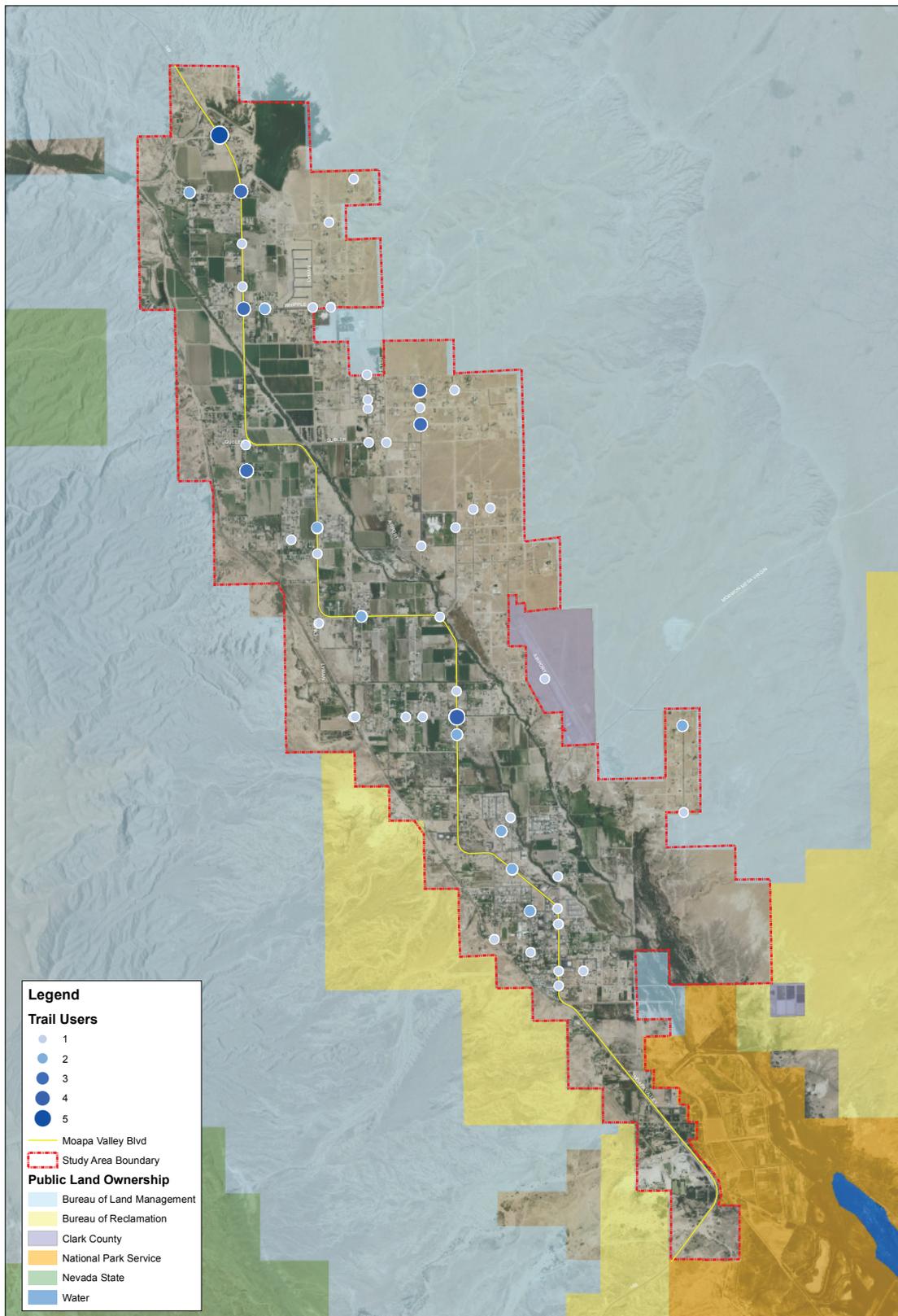
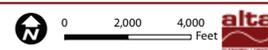


Figure 11 - Geographic Distribution of Trail Users by Number of Users

Moapa Valley, Nevada  
Moapa Valley Trails Study

Source: GISMO/Alta  
Author: KAW/ES  
Date: May 2009



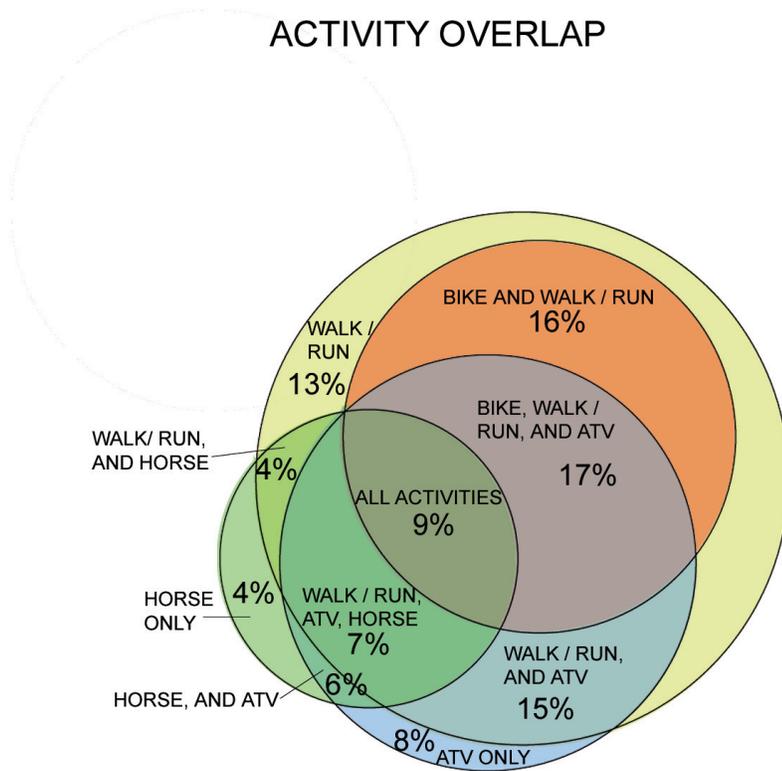


Figure 12

### Multiple Mode Users

There is significant overlap between user groups, demonstrating that many of the same people will likely be using the trails for multiple purposes. This common ground suggests that trail users previously thought to have conflicts may in fact understand each other quite well. This understanding may lead to respectful user relations. Figure 12 shows the breakdown of the groups of multiple users. 9% of respondents identify themselves as trail users of all four modes included in the survey.

### Conclusions

The results of this Moapa Valley Trail survey indicated that respondents participate in and value an active lifestyle. Safety is an over-arching concern of all types of trail users. Some respondents were concerned with the following conflicts: pedestrian/vehicle, pedestrian/aggressive dogs, and ATV/equestrian. Many respondents also expressed concern about funding sources for construction and maintenance of trails. Although some respondents expressed concern and negativity about a potential trail plan, the majority of the community sees a trail plan as an amenity for Moapa Valley.

# TRAIL DESIGN STANDARDS

## Trail Design Guidelines

The Moapa Valley Trail System will accommodate a wide range of users including: pedestrians, bicyclists, equestrians, persons with mobility impairments, and OHV riders. Trail development standards for both multi-use and equestrian trails are found below.

Trail Types	
Multi-Use Non Equestrian	Trail is designated for pedestrians and bicyclists
Multi-Use/Equestrian	Trail corridor is designated for pedestrians, bicyclists and equestrians
Multi-Use/OHV	Trail corridor is designated for pedestrians, bicyclists, and OHV users
Shared Segment (Multi-Use, Equestrian & OHV)	Trail corridor is designated for pedestrians, bicyclists, equestrians and OHV users
Equestrian Trail	Trail is designated for equestrians
OHV	Trail is intended only for OHV users.
*Multi-Use – shared pedestrian and bicycle trail	

The trail types recommended in this study include both off-street trails and on-street facilities. Off-street trail standards are set forth in Clark County’s Development Standards for Off-Street Trails. These standards categorize trails as:

- Multi-Use Non-Equestrian
- Equestrian
- OHV

Due to the unique nature of the Moapa Valley and the underlying objectives of the trail study, the off-street and on-street trails network is designed to accommodate various groups, including OHV users on two segments. The trail types in the Moapa Valley Trail Study network are defined as:

### Multi-Use Non-Equestrian Trails

Unless otherwise designated, multi-use non-equestrian trails are shared-use trails that are typically used by pedestrians and bicyclists. These trails may be designed with a single tread for all users or multiple treads to separate conflicting uses. As the number of trail users increases additional trail treads may be required to reduce conflicts.

### Equestrian Trails

Trails reserved exclusively for equestrians are also called bridle trails, bridle paths, or bridleways. The needs of equestrian trail users are unique, due to the natural flight instinct of equine when startled. As with any trail design, the design of an equestrian trail facility should respond to the setting, needs of the trail users, level of use, and safety issues.



Less developed or rural equestrian trail settings include: rivers, open spaces, and drainages among others. Safety concerns for riders in rural settings involve: visibility, interactions with other trail users and natural hazards. Urban settings include developed or congested areas.



Equestrians often use wide road shoulders as trails

Equestrians include youth, elders, leisure riders, professional riders, organized groups, novices, and people with disabilities. Riders may recreate individually or in groups for pleasure, exercise or challenge. While some equestrians prefer wide, gentle trails, others seek a technically challenging route.

Trail facilities should provide enough space so that a horse feels at ease. Horses prefer to travel away from walls or barriers that they cannot see through or over and are most comfortable traveling in the tread that other stock have traveled.

Horizontal trail clearance will vary based on the trail setting. USDA/FHWA suggested widths, with clearance tolerances for a standard single- and double-track horse trails are shown in **Table 1**.

A horse on a single-track will often travel 18 inches from a trail edge or tread surface. Single track treads vary from 1.5 feet in open areas to 8 feet in urban areas. Double-tracked equestrian trails are designed to be 5 feet to 6 feet wide in open areas and are often 8 feet to 12 feet wide in developed areas. A double-track tread allows for equestrians to ride side by side while also providing a comfortable passing distance. This is a common configuration for moderately developed trails in rural settings where right-of-way is available.

According to American Association of State Highway and Transportation Officials (AASHTO) design standards, two-way multi-use paths should be designed to be a minimum of 8 feet in width. Eight foot wide sections should be reserved for pinch points that have physical or environmental constraints. Ten feet of width is the preferred recommendation for rural multi-use trails.

## Multi-Use & Equestrian Shared Corridors

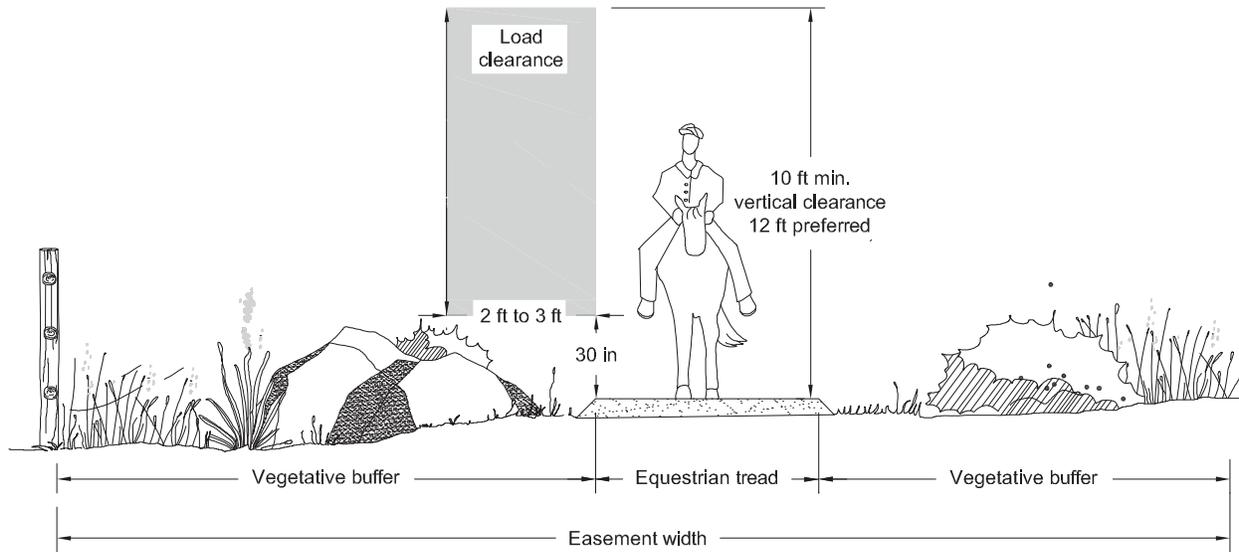
Design that considers the interactions of all trail users is essential for a successful design. Walkers, hikers, and cyclists often share trail corridors with equestrians. Pedestrians and riders are often compatible on the same tread as they both accept unpaved surfaces and move at relatively slow speeds. However, fast moving and quiet cyclists, approaching a horse from behind, are a valid concern for riders. In areas where conflicts seem likely, efforts are made to physically separate the different user groups. Within the Moapa Valley trails network there are three trail segments where equestrians, pedestrians and bicyclists will share a trail corridor and a fourth trail segment includes a short segment where equestrians, pedestrians, bicyclists and OHV s will share the corridor.

The first trail segment is along the Muddy River between Wittwer Avenue and Gubler Avenue where the river is “pinched” by Moapa Valley Boulevard. This pinch point prohibits locating a trail on both sides of the river, therefore a shared-use trail is required on the east side of the river (see cross section 5.1 in the Trail Alignment Options section).

The second segment is along the west side of Moapa Valley Boulevard between Bowman Road and A & W Farm Road. Locating the equestrian and multi-use trail on the west side minimizes the number of Moapa Valley Boulevard crossings required and reduces the amount of dedicated space for the trail.

The third segment begins at Lewis Avenue and extends through the Overton Wildlife Management Area (OWMA) to the southern town boundary. The alignment between Lewis and the OWMA is a shared corridor, with equestrian trails on one side of the road and a multi-use trail on the other. Through the OWMA, the existing access roads will be shared by equestrians, pedestrians and bicyclists.

The fourth segment is about 1200 feet long on Lewis Avenue. Lewis Avenue is a primary east/west access route south of Overton, which includes a critical route for OHVs to access the Overton Wash and the Logandale Trail system. On Lewis Avenue, from Saddle Street to the Muddy River, equestrians, pedestrians and bicyclists will have a shared corridor on the north side of Lewis Avenue, while an OHV trail will be located on the south side of the street.



Recommended guidelines for an equestrian-only trail. Source: USDA/FHWA, Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

**Table 1.**

**Suggested widths and clearance for a standard, single-track horse trail.**

Source: USDA/FHWA Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

Trail element	Low (rural) development (feet)	Moderate development (feet)	High development (feet)
Tread width	1.5' to 2'	3' to 6'	8' to 12'
Clearing width (horizontal)	5.5' to 8' (Tread plus 2' to 3' each side)	9' to 12' (Tread plus 3' each side)	14' to 18' (Tread plus 3' each side)
Vertical clearance	10'	10' to 12'	10' to 12'

**Suggested widths and clearance for a standard, double-track horse trail.**

Source: USDA/FHWA Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds

Trail element	Low (rural) development (feet)	Moderate to High development (feet)
Tread width	5' to 6'	8' to 12'
Clearing width (horizontal)	10' to 12' (Tread plus 3' each side)	14' to 18' (Tread plus 3' each side)
Vertical clearance	10'	10' to 12'

### OHV and ATV Defined

The term off-highway vehicles (OHV) includes, but is not limited to, motorcycles, all-terrain vehicles (ATVs), dune buggies, mules and 5-wheelers. Four-wheel drive vehicles registered as motor vehicles are not considered OHVs.

ATVs are defined as a vehicle that travels on low pressure tires, with a seat that is straddled by the operator, along with handlebars for steering control. ATVs are commonly called a quad or quad bike, but can have three to six wheels.

### OHV Trails

The rolling to rugged terrain and vast open spaces of the areas surrounding Logandale and Overton lend themselves to frequent use of Off-Highway Vehicles (OHVs) in the Moapa Valley. Due to their motorized nature, OHV's are oftentimes not compatible with non-motorized trail users including pedestrians, cyclists and equestrians. Dust and noise generated by OHV's are also contentious issues for residents along routes used by these vehicles.

The OHV trails within this study's boundaries are primarily transportation trails that provide users transitional access through the town boundaries to connect to recreational trails outside of the town boundaries. These routes are not intended for vehicle types such as dune buggies and sand rails, as the OHV trail widths proposed are 10 feet maximum to accommodate bi-directional travel.

### ADA Compliance

General guidelines have been created in response to the American with Disabilities Act (ADA) for accessible trails. A summary of those guidelines include:

Travel ways shall be a minimum clear tread width of 3 feet.

- Tread obstacles should be no more than 2 inches high (maximum and up to 3 inches high where running and cross slopes are 5% or less).
- Cross slope should not exceed 5%.
- Passing space should be provided at least every 100 feet when the trail width is less than 5 feet.
- Signs shall be provided indicating the length of the accessible trail segment.

- Slopes typically should not exceed 5%. However certain conditions may require the use of steeper slopes, with no more than 30% of the total trail length exceeding a running slope of 8.33%. For those conditions exceeding a 5% slope, the recommendations are as follows:
  - Up to an 8.33% slope for a 200 feet (maximum) run may be used, however, landings or resting intervals must be provided at minimum of 200 feet.
  - Up to a 10% slope for a 30 feet maximum run, with resting intervals spaced at 30 feet minimum.
  - Up to 12.5 % slope for 10 feet maximum run, with resting intervals spaced at 10 feet minimum.



Non-paved surfaces can meet the needs of users with disabilities when properly constructed

The trail surface shall be firm and stable. The Forest Service Accessibility Guidelines defines a firm surface as a trail surface that is not noticeably distorted or compressed by the passage of a device that simulates a person who uses a wheelchair.

Where rights-of-way are available, paths can be made more accessible by creating side paths that meander away from a roadway that exceeds a 5% slope.

At roadway crossings and curbs, curb ramps shall be provided. It is also a best management practice to provide tactile warning strips at roadway crossing of high visual contrast to the surrounding surface. Auditory crossing signals help those with site impairments safely negotiate roadway crossings.



Decomposed granite, separated path



Separated asphalt path



Colored concrete trail

### Surface Materials

A hard surface should be used for multi-use trails. Concrete, while more expensive than asphalt, is the hardest of all trail surfaces and lasts the longest.

However, joggers and runners prefer surfaces such as asphalt or decomposed granite due to its relative “softness”. While most asphalt is black, dyes (such as reddish pigments) can be added to increase the aesthetic value of the trail itself.

For equestrian routes, trail tread or surface should be relatively stable. The trail surface should be solid, obstacle free and should stay in place. Appropriate trail surfaces include: compacted native soil, and decomposed granite. Hard surfaces, such as asphalt and concrete are not amenable to equestrians.



Earthen ATV Trail

OHV users prefer natural surface trails, however bare earth treated with a stabilizer or compacted crusher fine surface will aid in dust reduction. The OHV trail along Whipple Avenue will be a paved surface, separated from the road, to minimize maintenance. The remainder of trails will be constructed of crushed rock pieces less than 3/4 inches in size.

### Horizontal and Vertical Clearances

At a minimum, 2 foot clear shoulders should edge the trail. Typical setback from edge of tread to obstructions (including signs) and buildings is 3 feet. A 10 foot vertical clearance should be maintained on multi-use trails used by pedestrians and cyclists. Equestrian trails should maintain a 12 foot vertical clearance. This area should be free from tree limbs and any other obstructions that may interfere with pathway use.

OHVs include dirt bikes, all-terrain vehicles (ATVs), and other off-road capable vehicles. Typical vehicle widths range from about 28 inches (motorcycle) to 60 inches (side x side). An additional 2 feet of tread and 2 feet of clear shoulder width is recommended for OHV trail design. Passing areas should occur in response to anticipated frequency of use where two-way travel is expected. A minimum horizontal clearance of 6 feet of trail plus 2 feet of shoulder on each side is recommended for passing areas.

## Grading, Drainage, Erosion Control and Water Retention

Steep grades should be avoided on any multi-use trail, with 5% the recommended maximum gradient. Steeper grades of up to 8.33% can be tolerated for short distances (up to about 500 feet), however these require periodic landings

For equestrians, grade or steepness determines how challenging a trail is. Trails that are comfortable for equestrians are ones that accommodate most trail users. While horses can easily negotiate grades up to 20% for short distances (up to 200 feet), steeper running grades result in faster water run-off and erosion problems. Following contours helps reduce erosion problems, minimize maintenance needs and increase comfort levels. A 2% cross slope or crowned tread and periodic grade reversals along running slopes will minimize standing surface water and will resolve most drainage issues on a multi-use path. An exception is cut sections where uphill water must be collected in a ditch and directed to a catch basin, where the water can be directed under the trail in a drainage pipe of suitable dimensions. Additionally, on running grades steeper than 5%, add 6 to 12 inches of extra tread width as a safety margin where possible.

Natural surface trails may be compacted, coated with a soil stabilizer, or covered with chat, fines or decomposed granite to help reduce erosion/dust.

Passive water harvesting at planting areas will locally retain natural rainfall as well as irrigation water thereby reducing demand on an irrigation system. With native plant materials, water harvesting may eliminate the need for a permanent irrigation system altogether

## Trail Amenities

### Trail Theme

A trail theme creates a cohesive and memorable trail, while establishing a distinct identity or “sense of place.” The theme brands a trail segment or system with unifying materials, elements, images and colors. These features define the system as a unique place and provide a reason for people to experience it. A unifying theme serves to inform subsequent design elements from site furnishings to interpretive information.

Features which make Moapa Valley unique include: the Muddy River, the surrounding mesas, agriculture and flood irrigation system, Anasazi cultural areas, pioneer heritage and the former identity as the “Muddy Valley.”

A specific trail system name and logo would help to make the network legible. Several possibilities exist for the Moapa Valley Trail System including:

- Moapa Valley Trails
- Muddy River Trail Network
- Mesa Trail System
- Moapa Valley Heritage Trails
- Muddy to Mesa Trail System
- Muddy Valley Trails



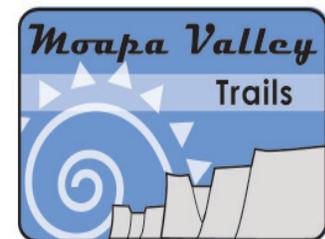
### Signs

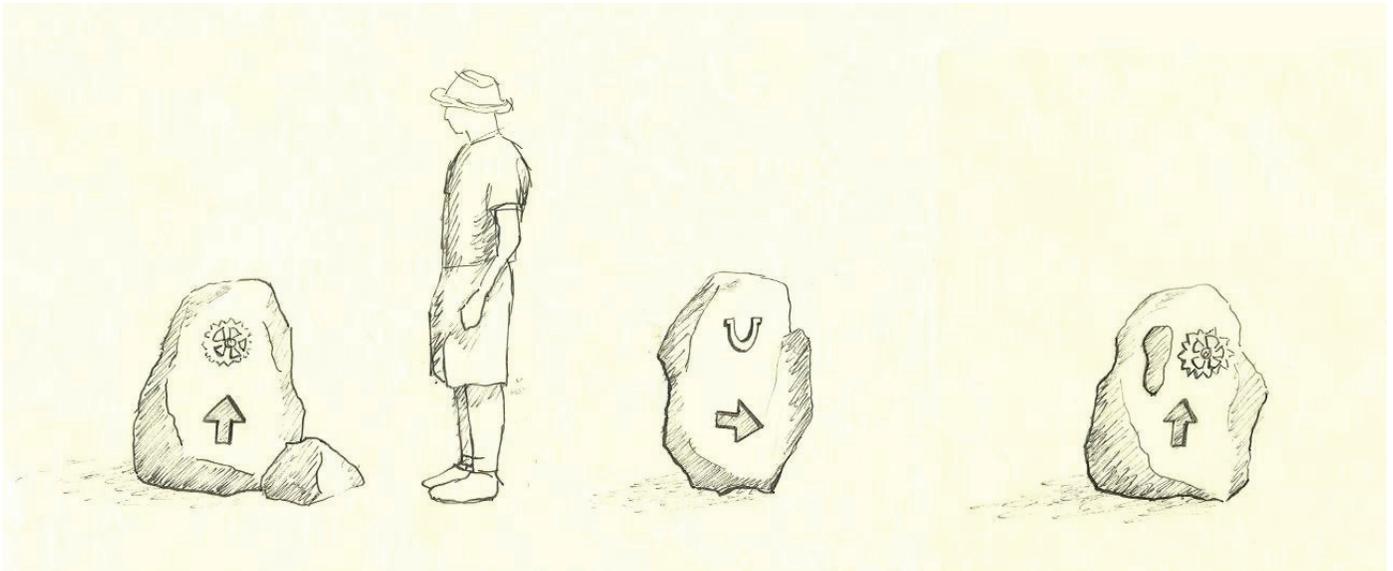
A comprehensive sign system makes a trail system memorable as well as navigable. Trail sign systems typically include signs in the following categories: identity signs, way-finding, regulatory and interpretive. Signs should be consolidated to avoid clutter and sign fatigue.



### Identity

Gateways at major access points with trail identity information should be considered. Trail branding or identity may also be conveyed through the use of a logo throughout the site. Monument or identity signs should be placed at each major and secondary entry way to the trail system. A monument sign is the first step in the trail visitor’s way-finding experience. Trail themes, colors and forms should be consistent with other elements found along the trail. Images and text on a monument sign should be clear and legible from a roadway when oriented towards those arriving via motorized vehicle. Smaller scaled signs, legible from the pedestrian perspective, are recommended for neighborhood gateway points.





Wayfinding signs created from natural local materials

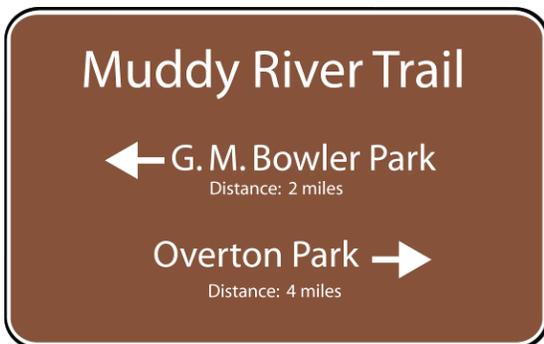


**Way-finding**

Way-finding information directing users of the trail should be incorporated into the master plan. This may take the form of an overall area map, specific independent directional signs or both. Informational kiosks with maps at trailheads and other pedestrian generators can provide enough information for someone to use the trail system with little introduction. Clear, pedestrian-scaled, signs and markers will aid in way-finding as well as separation of user groups. Way-finding materials typically include a trail map

which indicates current location, nearby destinations and prominent natural and built features. Way-finding maps are recommended at trailhead facilities for orientation.

Directional signs should impart a unique theme so trail users know which trail they are following and where it goes. The theme may be conveyed in a variety of ways: engraved stone, medallions, bollards, and mile markers. Directional guidance should be auspiciously placed at key decision points. Distances are traditionally labeled in terms of feet or miles to the next destination or overall trail length; however time via walking, bicycling or horse riding may also be given. Trail users who wish to pace themselves may use distance markers to track accomplishments. Distance markers are also used to orient emergency response staff to situations on a trail. Geographic coordinates would also be helpful for this use. Global coordinates are increasingly popular with those interested in the hobby of geo-caching.



Distance markers placed every two-tenths of a mile are recommended. Distance and directional information may come in the form of posts with signs, medallions, bollards, or engraved stones. The image above depicts local boulder material with impressions of different symbols aimed at the various anticipated user groups.



## Goals & Policies

Establishing goals and policies sets a common framework for understanding trail rules and regulations. Rights and responsibilities of trail usage should be stated at main trail access points. Once rules and regulations are established, the trail managing agency has a means of enforcement. Local ordinances may be adopted to help enforce trail policies. Penalties such as fines or community service may be imposed in response to non-compliance.

### Regulatory

Regulatory signs should state the rules and regulations associated with trail usage, as well as the managing agency, organization or group. Typical trailhead regulations include: hours of operation, trail etiquette, emergency and maintenance call numbers. Given the variety of users expected to utilize this trail, issues of proper trail etiquette specifically need to be outlined.



Regulatory signs also include those recommended to control circulation such as warning signs (i.e. stop, yield, railroad crossing). Crossing features for all roadways include warning signs for both vehicles and trail users. The type, location, and other criteria are identified in the Manual for Uniform Traffic Control Devices (MUTCD). Adequate warning distance is based on vehicle speeds and line of sight. Signs should be highly visible. Catching the attention of motorists accustomed to roadway signs may require additional alerting devices such as a flashing light, roadway striping, or changes in pavement texture. Signs oriented towards trail users must include a standard stop sign and pavement marking, sometimes combined with other features such as bollards or a kink in the trail to slow bicyclists. Care must be taken not to place too many signs at crossings lest they overwhelm the user and lose their impact.

## Trail Etiquette

Informing trail users of acceptable trail etiquette is a common issue when multiple user types are anticipated. Yielding the right-of-way is a courtesy and yet a necessary part of a safe trail experience involving multiple trail users. Trail right-of-way information should be posted at trail access points and along the trail. The message must be clear and easy to understand. The most common trail etiquette systems involve yielding of cyclists to pedestrians and equestrians and the yielding of pedestrians to equestrians.



A bicycle and pedestrian crossing caution sign

The education of trail users is a critical part of creating a safe trail environment for all trail users. Not everyone understands the innate flight sense of a horse or the responsibilities of OHV use. Guidelines should be clearly posted at trail access points. Education programs, following a curriculum much like "Safer Routes to Schools" Programs, could be integrated into the public school system to ensure that a base level understanding of safe practices around equestrian and OHV use is held by the community



A commonly used multi-use trail etiquette sign

### Policy Recommendations

While each trail managing agency needs to determine for itself activities to be allowed and prohibited, specific issues which need to be addressed related to the Moapa Valley Trail system rules and regulations include:

- Managing agency and emergency contact information.
- Hours of operation.

- Trail etiquette – other trail users should yield the right of way to equestrians. OHV users required to yield the right of way to all other trail users.
- Prohibited items & activities – alcohol, fire arms, camping, dogs, vandalism, dumping.
- Trash – pack it in, pack it out, including equestrian and dog waste.
- Trail responsibility – equestrian users/cyclists/OHV users should have complete control over their animal/bicycle/vehicle at all times.

### User Conflict Reduction Strategies

There are many means of separating trail users including: time, distance, screening, and barriers. Time separation applies when different user groups are expected to use a corridor at different times of the day or week (such as cyclists during weekday commute hours and equestrians during evenings or weekends only).

In corridors where adequate right-of-way is available, trail users may be separated by physical space. Vegetated buffers or barriers have successfully been used in many trail scenarios. Elevation changes are another means of effectively physically and visually separating different use corridors. Differing surfaces suitable to each user group, also help foster visual separation and clarity of where each user group should be. When trail corridors are constrained, the approach is often to locate the two different trail surfaces side by side with no separation. Oftentimes, an expanded trail shoulder serves the role of the equestrian facility.

When barriers are considered necessary to separate user types, options include: vegetation, walls, fences, railings and bollards. The accepted height for most equestrian barriers is 54 inches. Solid barriers significantly limit an animal's peripheral vision and sense of security and thus are not recommended. When solid walls are necessary, vegetation should be used to soften the structure's appearance.

Railings or safety barriers are recommended when a trail occurs within six feet of a steep slope (more than 3:1) with a vertical grade change or drop off of more than 30 inches.

Barriers may also be needed to deter motorized vehicle access. When bollards are used to deter

vehicular access, 5 foot horizontal spacing is recommended for equestrian passage. In areas where motorcycles or ATVs are anticipated, bollard spacing would need to be closer. In the image below, separate horse specific gateways are utilized at access points.

Directing OHV travel patterns is a significant challenge. While large boulders may be used to limit OHV access, associated costs prohibit their application over long distances. Providing OHV specific trails and facilities, is the most effective means of limiting pressure on other areas



A motorized vehicle barrier that allows for equestrian passage

## Crossings

### Trail / Roadway Crossings

It is highly desirable to minimize the number of potential vehicle-trail user conflicts. As a general rule, when roadway crossings are required, they should occur at established pedestrian crossings, or at locations completely away from the influence of intersections.

Trail approaches at roadways should always have Stop or Yield signs to minimize conflicts with autos. Bike crossing stencils may be placed in advance of trail crossings to alert motorists. Curb ramps should be designed to accommodate the range and number of users.

When considering a proposed off-street multi-use path and required at-grade crossings of roadways, it is important to remember two items: 1) trail users will be enjoying an auto-free experience and may enter into an intersection unexpectedly; and 2) motorists

may not anticipate bicyclists riding out from a perpendicular trail into the roadway. However, in most cases, an at-grade trail can be properly designed to a reasonable degree of safety and meet existing traffic engineering standards.

Evaluation of multi-use trail crossings should involve an analysis of vehicular traffic patterns, as well as the behavior of trail users. This includes traffic speeds, street width, traffic volumes (average daily traffic and peak hour traffic), line of sight, and trail user profile (age distribution, range of mobility, destinations). A traffic safety study should be conducted as part of the actual civil engineering design of the proposed crossings to determine the most appropriate design features. This study would identify the most appropriate crossing options given available information, which must be verified and/or refined through the actual engineering and construction document stage.

### Basic Crossing Prototypes

Intersection approaches are based on established standards, published technical reports, and the experiences from existing facilities. Virtually all crossings fit into one of four basic categories:

#### Type 1: Unprotected/Marked Crossings

An unprotected crossing (Type 1) consists of a crosswalk, signing, and often no other devices to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, vehicle speed, road type and width, and other safety issues such as the proximity of schools. Unprotected crossings may be acceptable when the following thresholds are met:

- Install crosswalks at all trail-roadway crossings
- Maximum traffic volumes:
  - Up to 15,000 ADT on two-lane roads, preferably with a median.
  - Up to 12,000 ADT on four-lane road with median.
- Maximum travel speed
  - 35 mi/h
- Minimum line of sight:
  - 25 mi/h zone: 250 feet
  - 35 mi/h zone: 350 feet
  - 45 mi/h zone: 450 feet

On two lane residential and collector roads below 15,000 ADT with average vehicle speeds of 35 mph or less, crosswalks and warning signs (“Bike Xing”) should be provided to warn motorists, and stop signs and slowing techniques (bollards/geometry) should be

Virtually all roadway crossings fit into one of four basic categories:

#### Type 1: Unprotected/Marked

Unprotected/protected crossings include trail crossings of residential, collector, and sometimes major arterial streets or railroad tracks.

#### Type 2: Route Users to Existing Intersection

Trails that emerge near existing intersections may be routed to these locations, provided that sufficient protection is provided at the existing intersection.

#### Type 3: Signalized/Controlled

Trail crossings that require signals or other control measures due to traffic volumes, speeds, and trail usage.

#### Type 4: Grade-Separated

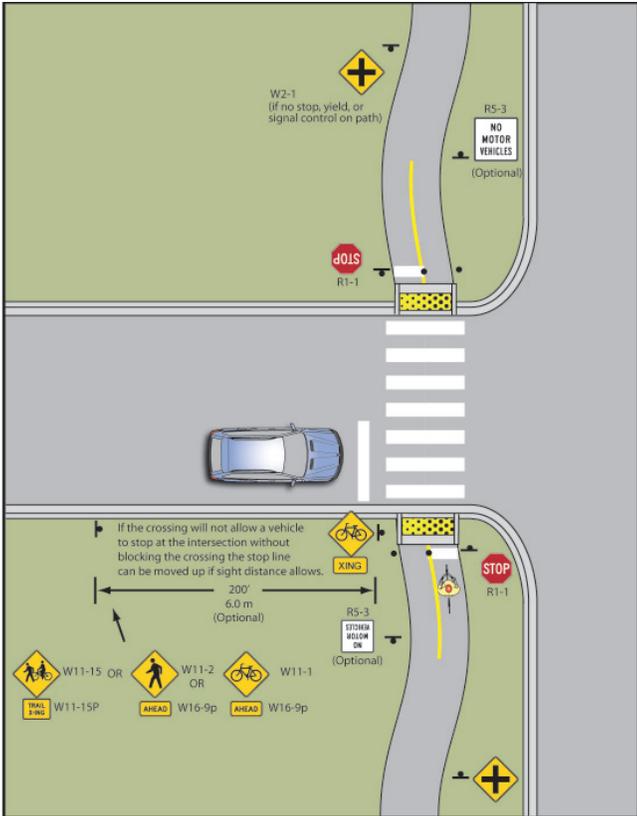
Bridges or under-crossings provide the maximum level of safety but also generally are the most expensive and have right-of-way, maintenance, and other public safety considerations.

used on the trail approach. Care should be taken to keep vegetation and other obstacles out of the sight line for motorists and trail users. Engineering studies should be done to determine the appropriate level of traffic control and design.

A flashing yellow beacon or embedded pavement lights, may be used with a marked crosswalk, preferably one that is activated by the trail user rather than operating continuously. Some jurisdictions have successfully used flashing lights activated by motion detectors on the trail, triggering the lights as trail users approach the intersection. This equipment, while slightly more expensive, informs motorists about the presence of trail users. This type of added warning would be especially important at locations with restricted sight distance.

#### Type 2: Route Users to Existing Intersection

Crossings within 250 feet of an existing signalized intersection with pedestrian crosswalks are often diverted to the signalized intersection for safety purposes. For this option to be effective, barriers and signs may be needed to direct trail users to the signalized crossings. In most cases, signal



Type 1 crossing improvements are recommended at trail intersections with Moapa Valley Boulevard.



Type 1 Crossing

modifications would be made to add pedestrian detection and to comply with ADA recommendations. In many cases, such as on most community trails parallel to roadways, crossings are simply part of the existing intersection and are not a significant obstacle for trail users.

### Type 3: Signalized/Controlled Crossings

New signalized crossings are recommended for crossings more than 250 feet from an existing signalized intersection and where the 85th percentile of travel speeds are 40 mph and above and/or average daily traffic counts (ADT) exceeds 15,000 vehicles. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.



Type 3 Crossing

Trail signals are normally activated by push buttons, but also may be triggered by motion detectors or weight sensors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. The signals may rest on flashing yellow or green for motorists when not activated, and should be supplemented by standard advanced warning signs. Typical costs for a signalized crossing range from \$150,000 to \$250,000.

### Type 4: Grade-Separated Crossings

Grade-separated crossings are needed where ADT exceeds 25,000 vehicles, and 85th percentile speeds exceed 45 mph. Safety is a major concern with both overcrossings and under-crossings. When designed properly, grade-separated crossings practically eliminate any safety concerns related to crossing a roadway.

Grade-separated crossing approaches should minimize the out-of-direction travel required by the trail user, so that users don't alternatively attempt to dart across the roadway. Under-crossings, like parking garages, have the reputation of being places where crimes occur, but these safety concerns can be ad-



Type 4 Grade-Separated Overcrossing



Type 4 Grade-Separated Undercrossing

dressed through design. An undercrossing can be designed to be spacious, well-lit, equipped with emergency cell phones at each end, and completely visible for its entire length prior to entering. For cyclists and pedestrians, vertical clearance should be kept to a minimum of 8 feet (12 feet for equestrians).

Over-crossings, or bridges, avoid darkness and safety concerns that occur with an at- or below-grade option. Any bicycle and pedestrian bridge needs to be approached via ADA compliant ramps (running slopes less than 5%). Bridges present unique opportunities for creating landmark architectural and artistic statements.

### Additional Crossing Enhancements

Additional measures may be taken to improve comfort and safety conditions for trail users at roadway intersections. These include: curb extensions, midway refuge islands and vehicle travel lane width reductions.

Curb extensions effectively narrow the width of roadway that a trail user needs to cross. Also referred to as “bulb-outs,” curb extensions are a literal extension of the curb and sidewalk, or pedestrian realm into the travel way from each direction. Oftentimes, extensions occupy space formally taken by on-street parking. Shifting parking farther from the intersection with an extension provides for better visibility between trail users and motorists. Also, the real estate gained may be used for additional plantings or site furnishings.

Midway refuge islands provide a protected stopping point midway across roadways. Refuge islands are particularly appropriate in areas with high numbers of



A curb extension is an ideal plant to add plantings and street furnishings



Midway refuge islands reduce the time trail users are within the unprotected roadway

young people, the elderly and those with mobility impairments as they shorten the distance and thus time for which the trail user spends within the unprotected travel way.

Moapa Valley Boulevard is a state highway. The wide roadway has high traffic volumes and varying speeds from 25 mph to 55 mph. Where trails intersect the highway, crossing enhancements such as midway refuge islands would create a safer environment for cyclists, pedestrians and equestrians. Curb extensions, where curb and gutters exist, can also improve trail user safety. Additionally, an overall “road diet” or reduction in vehicle travel lane width, would help reduce travel speeds thereby enhancing the non-motorized travel experience. A maximum width of 11 feet is recommended for all vehicle travel lanes for roadways with trail components in Moapa Valley.

### Interpretive Program and Signs

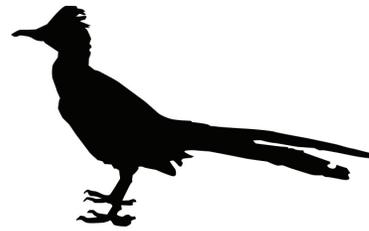
Interpretive installations and signs enhance the trail experience by providing information about the history and culture of the area. Installations may range from the standard sign panel to interactive elements. Subjects may discuss local ecology, environmental concerns, and other educational information. Educational information may be placed at scenic view areas or in relation to specific elements being interpreted. Potential interpretive topics specific to Moapa Valley include:

- Community history
- Local petroglyphs
- Agricultural history including the story of the Educational Farm Foundation of Moapa Valley
- Irrigation system and network
- The Muddy River and flooding
- Clark County Fairgrounds
- Geology
- Anasazi areas
- Civilian Conservation Corps (CCC) projects

An inventory of historic sites and structures has been conducted by an area resident. Historic homes and significant places could be assembled into a walking tour complete with route map and site descriptions or stories.

The Clark County School District Laboratory Farm, otherwise known as the MVHS Ag Farm, offers students the opportunity to gain hands-on farm operation experience.

Native desert flora and fauna are another local feature which could be interpreted and alluded to throughout



**Roadrunner**  
(*Geococcyx Californianus*)

**Did You Know...?**

Roadrunners are quick enough to catch and eat rattlesnakes, hummingbirds, and dragonflies.

Roadrunners prefer walking or running, and attain speeds up to 17 miles per hour.

The roadrunner is a member of the Cuckoo Family (Cuculidae), characterized by feet with 2 forward toes and 2 behind.

Images and facts about local plants and animals could be integrated into trail features and amenities as well as detailed in interpretive signs.

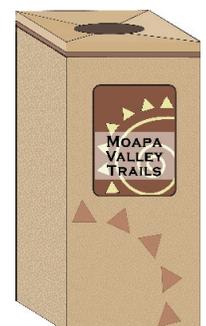


Historic homes including some structures over 100 years in age could be part of a walking route.

the trail system. Features and habits of desert plants and animals could be described including unique adaptations that allow each to thrive in the desert environment.

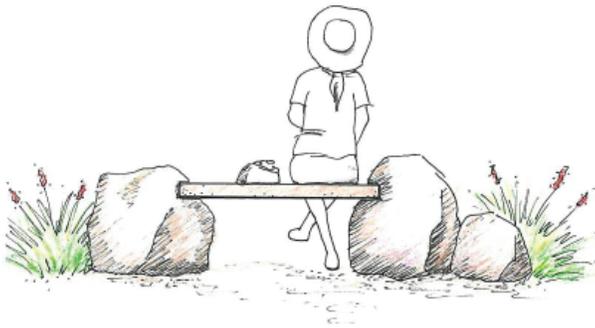
### Site Furnishings

Amenities enhance the trail experience, encourage trail usage and make trails more comfortable and safe for the user. In the Mojave Desert, shade and water are important amenities for trails and trailheads. Basic amenities include seating, trash cans and signs. Enhanced amenities include trail specific logos, art installations, interpretative elements, and other creative applications to reinforce a trail brand or a “sense of place”. Trail elements should be constructed of durable, low maintenance materials such as concrete, stone and metals. Amenities and trail support features should be placed a minimum of 3 feet from edge of trail.



### Benches and Seating

Seating is recommended at trailheads and at quarter mile intervals along the Muddy River trail and the Bowman Reservoir loop. To compliment the rural nature of Moapa Valley, seating incorporated into natural



Boulder seating blends into the surrounding environment

materials is recommended. Adding trees or shade structures to provide shade at each seating node will increase functionality and user enjoyment. Trees or shade structures should be located to provide a cast shadow over the seating area during the spring, summer and fall months.

Trash and dog waste receptacles help encourage trail users to keep the trail and trailheads free from debris. It is recommended that both types of receptacles be placed at trailheads and key access points along the trail. However, the National Park Service’s ethic of “pack it in, pack it out” should be encouraged, especially for the Bowman Reservoir loop trail.

Bollards or posts at roadway/trail intersections and trail entrances will be necessary to keep vehicles and

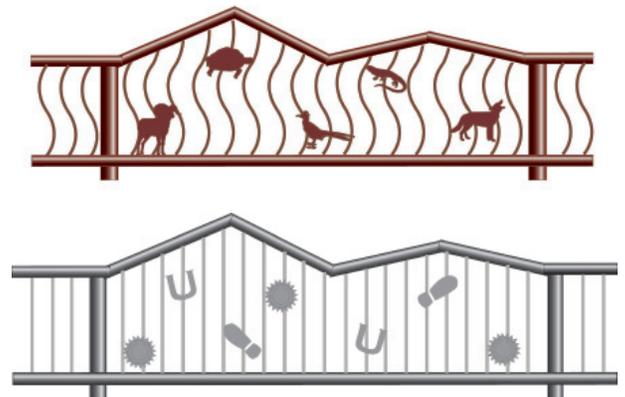
OHV’s from entering the Muddy River Trail system. Posts should be designed to be visible to bicyclists and equestrians, especially at nighttime, with reflective materials and appropriate striping. Posts should be designed to be removable by emergency vehicles.

Fencing will be required along the Muddy River trail. Fencing is another opportunity for creative treatments which enhance trail identity through design. Limiting decorative fencing to trailheads and at major crossings points of the Muddy River is recommended.

Bicycle racks allow trail users to park their bikes in a secure and organized manner if they wish to stop along the trail. Racks, also present an opportunity to incorporate artistic elements into utilitarian features. Bike racks should be located at key destinations



Bollards can support trail identity with integrated design applications



Two different ideas for fencing treatments are shown above. One incorporates images of commonly found local fauna, the other emphasizes the variety of users of the trail system. Durable material such as corten steel or powder coated metal should be used.



Bike Parking

including commercial areas, parks, public service buildings and trailheads.

Water fountains that provide drinking water for people and pets are highly desirable trail amenities in desert environments. Drinking fountains should be located at key destinations including commercial areas, parks, public service buildings and trailheads.

Pedestrian-scaled, low level lighting improves safety, enables the trail to be used year round and can improve the aesthetic of the trail. Good pedestrian-scaled lighting provides high-quality lighting without the glare that is produced by typical cobra-type street fixtures. Lighting at trailheads and along the Muddy River trail is recommended. Fixtures which project light downward should be selected so as to maintain the rural quality of the area and reduce light pollution.

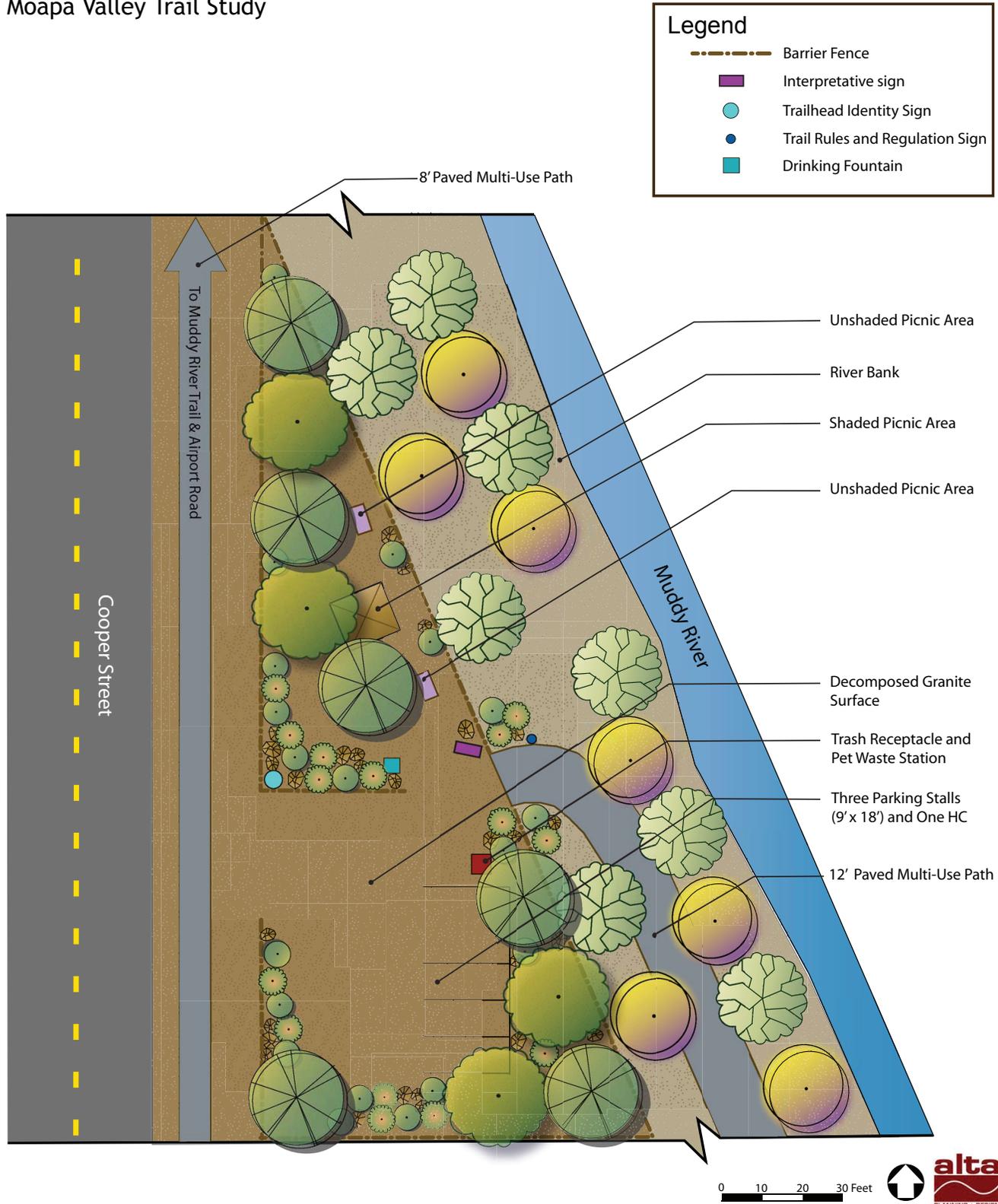


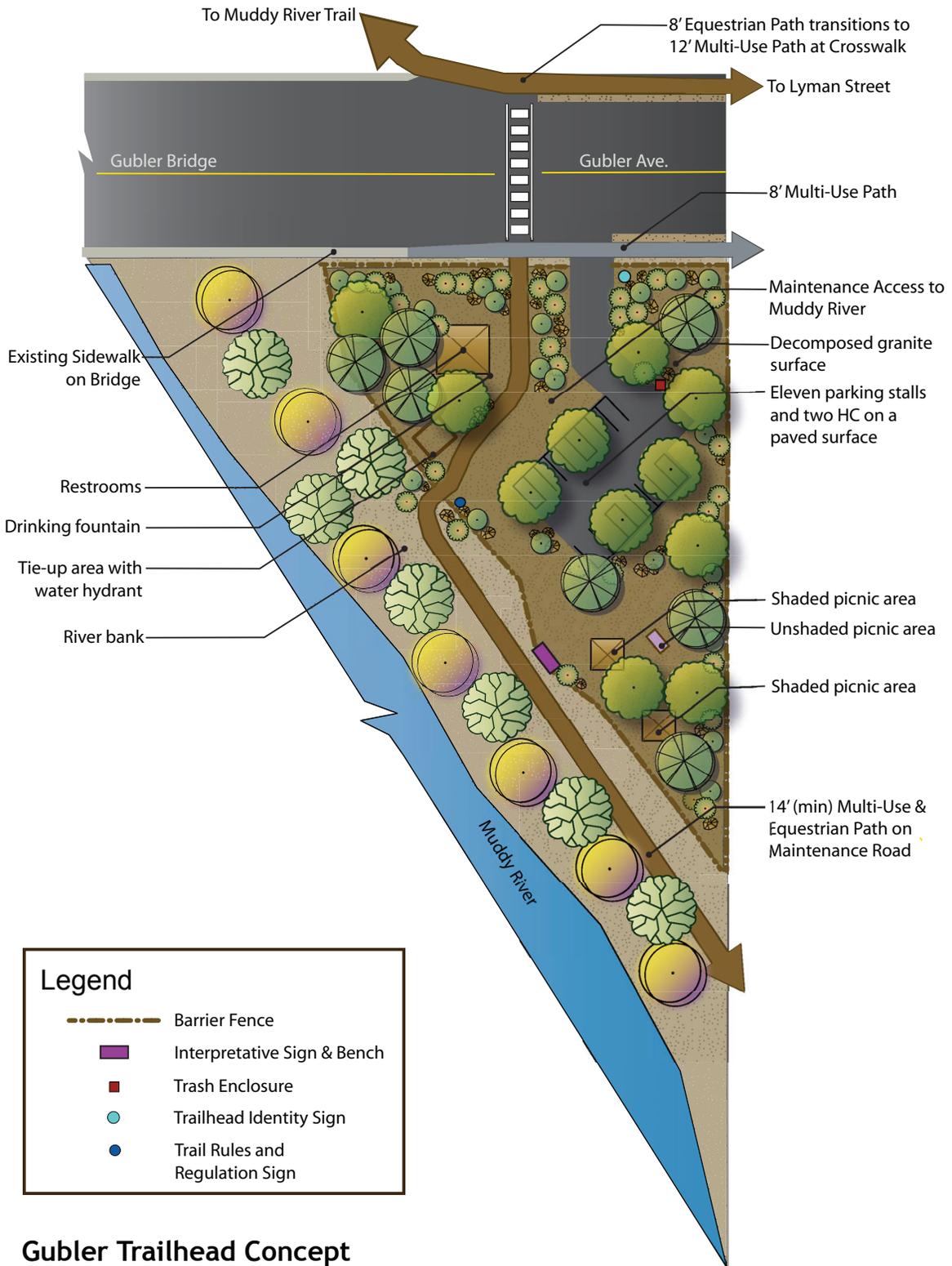
Low-level, pedestrian-scaled lighting

There are two opportunities for trailheads to be built in conjunction with the Flood Control Projects in the valley. The following drawings show preliminary designs with recommended amenities for these two locations.

### Cooper Trailhead Concept

#### Moapa Valley Trail Study





Legend	
	Barrier Fence
	Interpretative Sign & Bench
	Trash Enclosure
	Trailhead Identity Sign
	Trail Rules and Regulation Sign

### Gubler Trailhead Concept

### Moapa Valley Trail Study



# TRAIL ALIGNMENT OPTIONS

## Alignment Options

Field visits, coupled with the alignments suggested by the Moapa Valley Strategic Planning Trails Sub-Committee, resulted in a number of potential alignments to complete a comprehensive trail network. In order to develop a preferred alignment network, an evaluation matrix was constructed to inform the strengths and weaknesses of each potential alignment, as well as highlight the alignments most likely to result in a successful trail route.

## The Goals of the Trail Network

The goals of the trail set the stage for the evaluation criteria. The goals of the trail are:

- Provide a well connected trail network that links key destinations within the community.
- Accommodate a wide variety of non-motorized uses, including bicycling, walking and equestrian activities.
- Provide two east/west access routes for OHV's
- Ensure the trail design, construction and long-term use respect adjacent residential and commercial property owners
- Create well-used and safe trail network
- Determine the feasibility to construct the trail

## Alignment Evaluation Criteria

### 1. Safety and Liability

Trails that support natural surveillance opportunities (e.g. eyes-on-the-trail) increase user safety and encourage trail use. Safe and accessible roadway crossings are also taken into consideration and factor into a user's decisions to use an alignment.

### 2. Community Connections

Alignments that connect key destinations to each other and to the overall network are instrumental in creating a trail network that is widely used.

### 3. Environmental Impacts

Awareness of environmental impacts is an important aspect of alignment decisions. In developed urban areas, environmental impacts are minimal. In undeveloped and/or open space areas, environmental impacts can strongly effect where and if a trail can be constructed. Significant grading is included in this category, due to habitat disturbance, dust issues and possible drainage mitigation.

### 4. Costs

Major investments needed for trail construction and improvements or additional studies (e.g. NEPA requirements) are some of the cost factors that can determine the feasibility of an alignment. In addition, major investments in land, right-of-way or easement acquisition can increase the costs of the trail.

### 5. Private Property Impacts

Most of the alignments are within Clark County right-of-way along existing roads. A few alignments will impact private property and require acquisition of right-of-way, an easement or some other agreements with the property owner(s).

## 6. Anticipated Use

Latent demand for trails can correlate to trail connectivity, safety and perceived safety, along with connections to desired destinations. Trails that accommodate a variety of users generally see more trail usage. Users included in the evaluation of this trail are walkers/runners, cyclists, equestrians, physically impaired and where applicable, OHV riders.

## 7. Quality of User Experience

Alignments that offer scenic qualities and/or have cultural significance are attractive to trail users, are alignments that are more likely to be used.

## 8. Alignment Value

A good trail framework has major and supporting segments. If certain alignments are not included the connectivity of the overall trail system would be negatively impacted.

## 9. Implementation Opportunities

Where development or other public projects are planned, can the costs of construction, right-of-way acquisition and design services for trails be leveraged into the project?

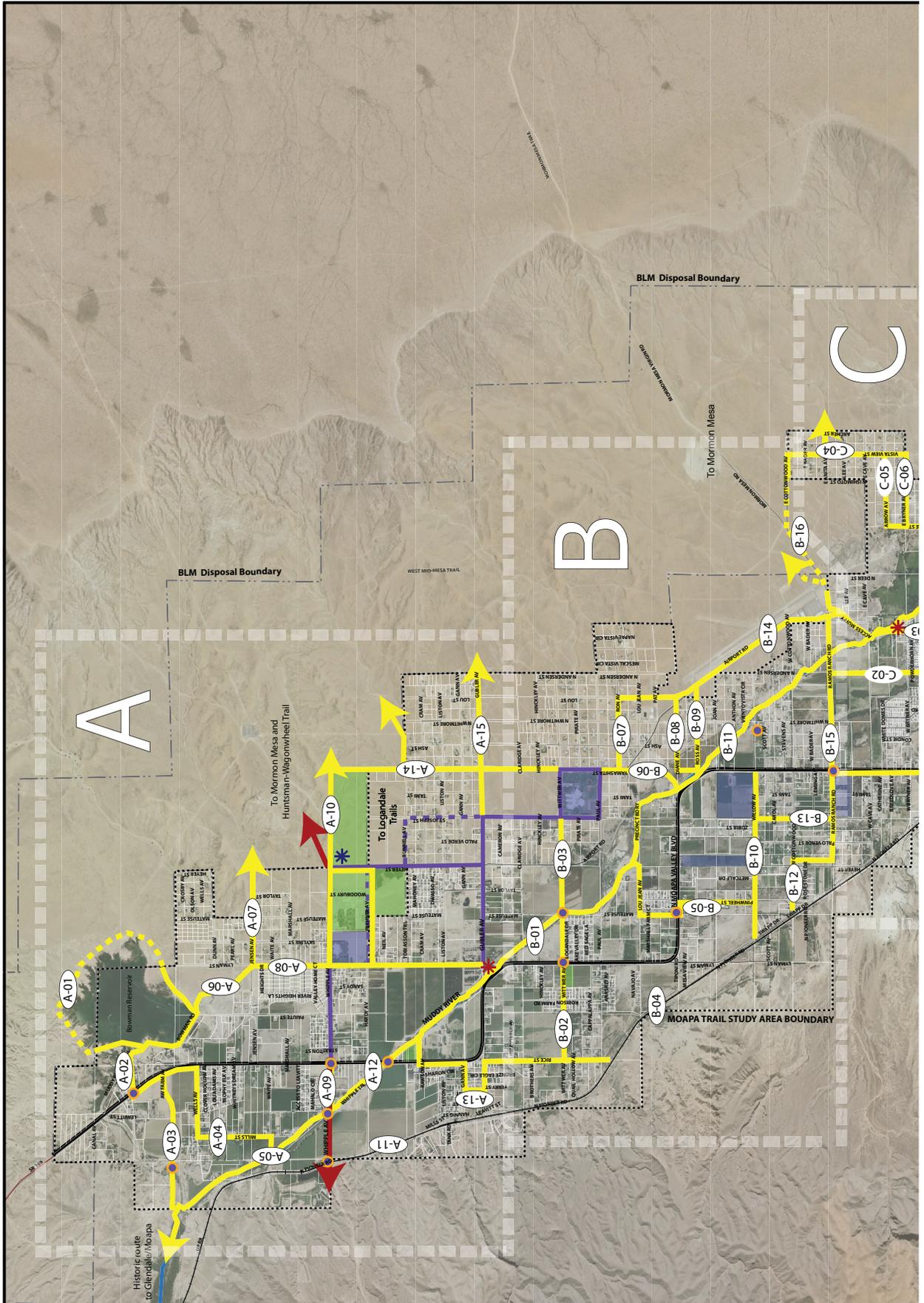
## Scoring

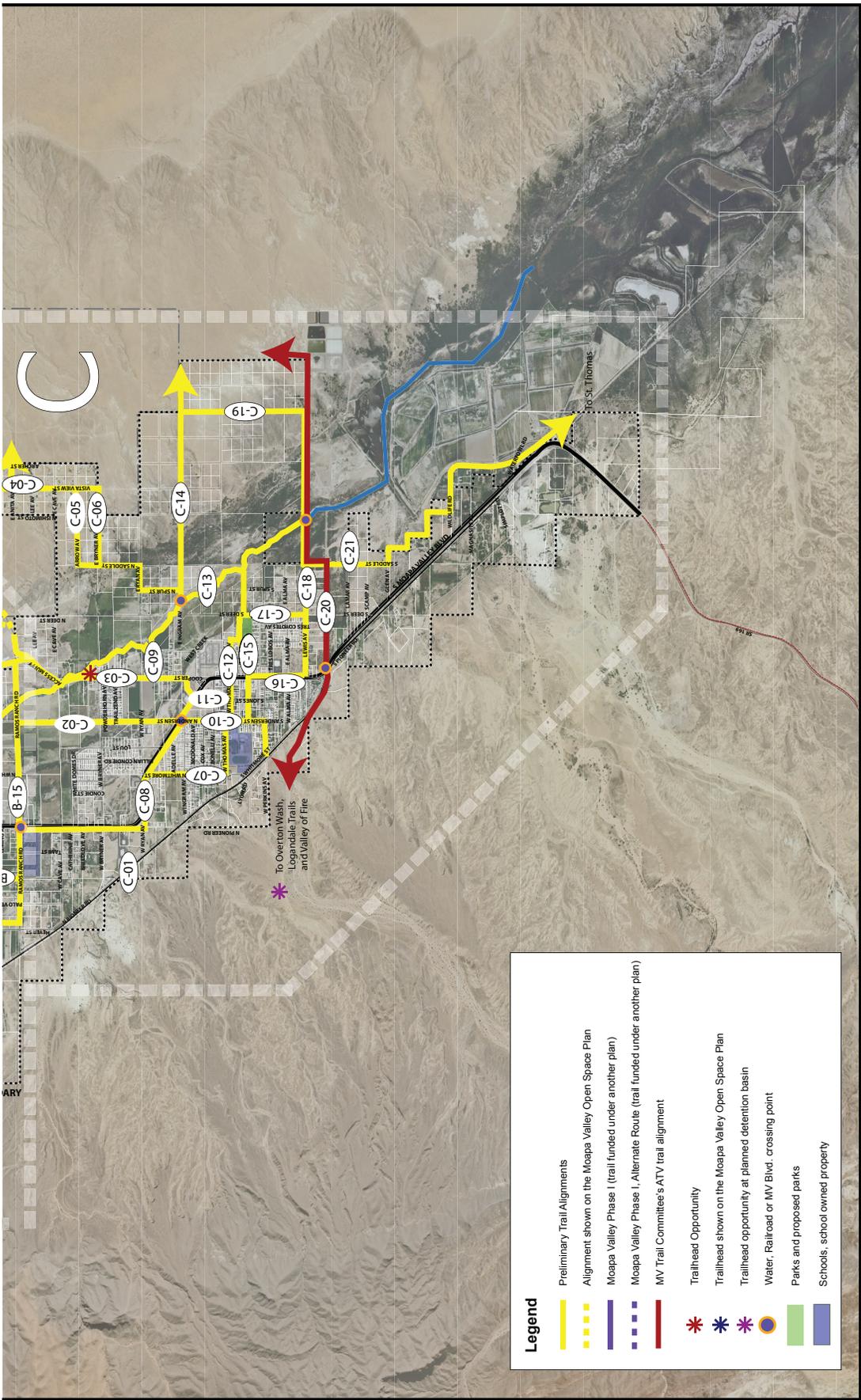
Each of the alignment alternatives were assessed using an evaluation matrix. Scores range between 1 and 3:

- 1 = option does not meet criterion
- 2 = option has neutral or moderate positive impact to criterion
- 3 = the best solution to satisfy the criterion

In each evaluation matrix, a score was assigned to each segment option to reflect how well it met each criterion. The higher the score, the better suited the alignment to meet the multiple goals of the trail. The Cost category had additional weight applied, as cost is a major factor in the feasibility of planning, constructing and maintaining trails. The map on the following page shows the alignments that were evaluated. Detailed descriptions of each alignment are included in Appendix C.

# Preliminary Trail Alignment Evaluation Map





Moapa Valley, Nevada - Moapa Valley Trails Study

Source: GISMO  
Date: May 28, 2009



Moapa Valley Trails Study - Table 1  
 Alternative Planning + Design - May 2009

Alignment Option	Safety and Liability		Community Connections		Environmental Impacts		Cost		Private Property Impacts		Anticipated Use		Quality of User Experience		Alignment Value		Implementation Opportunities		Total Score		Weighted Score		Recommended		Priority ***			
	1	1	1	1	1	1	1.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<b>Section A</b>	Street or Alignment																											
A-01	1	3	3	3	1	2	3	3	2	3	3	2	21	21.5	Yes	High												
A-02	2	2	3	2	2	3	2	2	2	2	2	2	19	20	Yes	Low												
A-03	2	2	3	2	2	2	1	2	2	2	3	2	18	18.5	Yes	Low												
A-04	3	3	3	3	1	1	1	2	2	2	2	2	18	18.5	Yes	Low												
A-05*	3	3	2	1	1	1	1	3	2	3	2	3	20	20.5	Yes	High												
A-06	3	3	2	3	2	3	3	3	2	3	2	3	23	24.5	Yes	High												
A-07	2	3	3	2	1	2	2	2	2	2	2	2	20	21	Yes	Low												
A-08	3	3	3	3	1	3	3	3	3	3	3	3	23	23.5	Yes	High												
A-09	3	3	3	3	1	3	3	3	3	3	3	3	25	25.5	Yes	High												
A-10	3	3	2	2	2	3	2	3	3	3	3	1	22	23	Yes	High												
A-11**	2	3	3	3	1	1	1	3	1	3	1	3	18	18.5	No	NA												
A-12	2	3	3	2	1	3	2	1	3	3	3	2	22	23	Yes	High												
A-13	2	3	3	3	3	1	2	2	2	3	1	2	20	21.5	Yes	Med												
A-14	3	1	2	3	3	3	3	3	3	3	1	3	21	22.5	Yes	Med												
A-15	3	3	3	2	2	3	2	3	3	3	3	3	25	26	Yes	Med												

\* River Alignments are high priority community connections

\*\* Railroad alignment (if allowed by railroad) is a priority for ATV users

Scoring: scale of 1 to 3

1: option does not meet criteria

2: option has neutral or moderate positive impact to criteria

3: best solution to satisfy criteria

Criteria:

Safety - layout supports natural surveillance (eyes-on-the-trail), and safe roadway crossings.

Community Connections - directness of route (minimizes "out of way" travel) & ease of access.

Environmental Impacts - Environmental impacts, including significant grading.

Cost - does the concept require major investment in terms of land acquisition or needed improvements

Private Property Impacts - Does the alignment encroach on private property

Quality of User Experience - alignments that offer scenic qualities

Alignment Value - is alignment key to the overall success of the network- 3 very important, 2 important, 1 neutral

Implementation Opportunities - Opportunities to leverage costs, materials and design services with another project

Moapa Valley Trails Study - Table 2

Alta Planning + Design - May 2009

Alignment Option	Safety and Liability			Community Connections		Environmental Impacts		Cost		Private Property Impacts		Anticipated Use		Quality of User Experience		Alignment Value		Implementation Opportunities		Total Score		Weighted Score		Recommended		Priority		
	1	1	1	1	1	1	1	1.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Section B</b>	<b>Street or Alignment</b>																											
B-01*	1	3	3	3	2	3	2	3	3	2	3	3	3	2	3	3	3	3	3	3	2	3	23	24	Yes	High	High	High
B-02	3	3	3	3	2	1	2	2	1	2	1	2	3	3	3	2	3	3	3	2	3	22	23	Yes	High	High	High	High
B-03	3	3	3	3	1	1	2	3	1	2	1	2	3	3	3	3	3	3	3	2	3	21	21.5	Yes	High	High	High	High
B-04**	2	3	3	3	1	1	3	1	1	3	1	3	1	3	1	3	1	3	1	3	1	18	18.5	Yes	High	High	High	High
B-05	2	3	2	2	2	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	1	19	20	Yes	Low	Low	Low	Low
B-06	2	2	2	2	2	3	2	2	3	1	1	1	1	1	1	1	1	1	1	1	1	15	16	No	Med	Med	Med	Med
B-07	2	3	3	3	2	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	1	20	21	Yes	Med	Med	Med	Med
B-08	3	2	2	2	2	3	1	2	3	1	2	1	2	1	1	1	1	1	1	1	1	17	18	Yes	Low	Low	Low	Low
B-09	3	2	2	2	1	3	1	2	3	1	2	1	2	1	1	1	1	1	1	1	1	16	16.5	No	NA	NA	NA	NA
B-10	3	3	3	3	2	2	3	2	2	2	2	3	3	3	3	3	3	3	3	2	3	24	25	Yes	Med	Med	Med	Med
B-11	3	3	3	3	2	1	2	2	2	1	2	2	3	3	3	3	3	3	3	3	3	23	24	Yes	High	High	High	High
B-12	3	2	3	3	2	1	2	2	3	2	1	2	3	2	3	2	2	2	2	2	1	19	20	Yes	High	High	High	High
B-13	2	2	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1	21	22.5	Yes	Low	Low	Low	Low
B-14	2	3	3	3	2	3	2	2	3	2	3	2	2	1	3	1	3	1	3	1	3	20	21	Yes	Med	Med	Med	Med
B-15	3	3	3	3	2	2	3	2	2	2	2	3	3	3	3	3	3	3	3	2	3	24	25	Yes	High	High	High	High
B-16	2	3	2	2	1	3	2	1	1	3	2	2	3	2	3	2	2	2	2	2	1	19	19.5	Yes	Med to High	Med to High	Med to High	Med to High

\* River Alignments are high priority community connections  
 \*\* Railroad alignment (if allowed by railroad) is a priority for ATV users

Scoring: scale of 1 to 3

- 1: option does not meet criteria
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Criteria:

- Safety - layout supports natural surveillance (eyes-on-the-trail), and safe roadway crossings.
- Community Connections - directness of route (minimizes "out of way" travel) & ease of access.
- Environmental Impacts - Environmental impacts, including significant grading.
- Cost - does the concept require major investment in terms of land acquisition or needed improvements
- Private Property Impacts - Does the alignment encroach on private property
- Quality of User Experience- alignments that offer scenic qualities
- Alignment Value- is alignment key to the overall success of the network- 3 very important, 2 important, 1 neutral
- Implementation Opportunities - Opportunities to leverage costs, materials and design services with another project



### **Alignment Evaluation Summary**

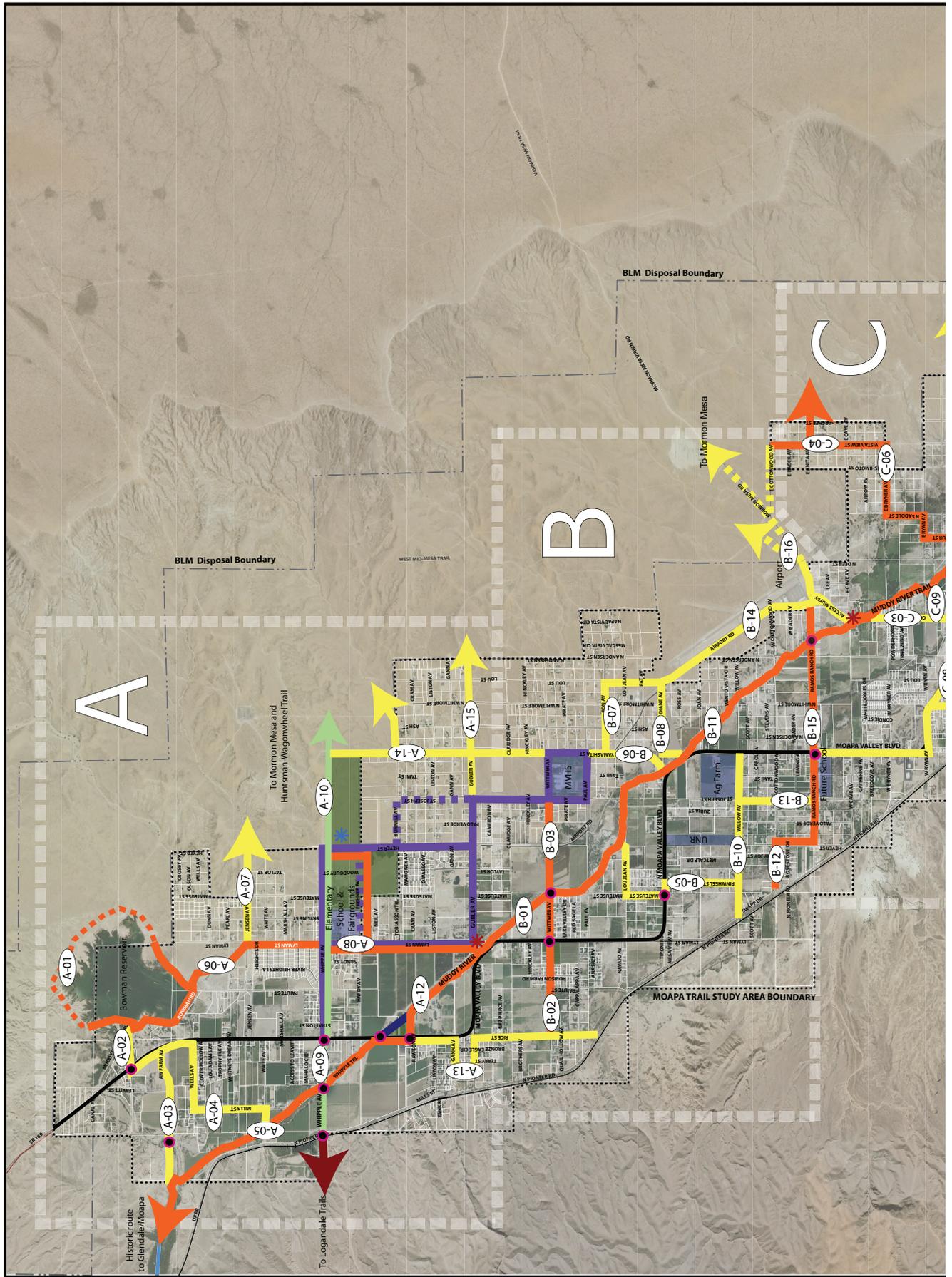
Generally, most alignments evaluated are recommended for implementation. Several alignments did not meet the criterion, which resulted in their removal from the Trail Types Map. The most notable alignment was an OVH route in the UPRR railroad right-of-way desired by the Moapa Valley Trails Committee. An agreement to locate the trail in that right-of-way could not be reached with UPRR representatives. Other alignments eliminated were:

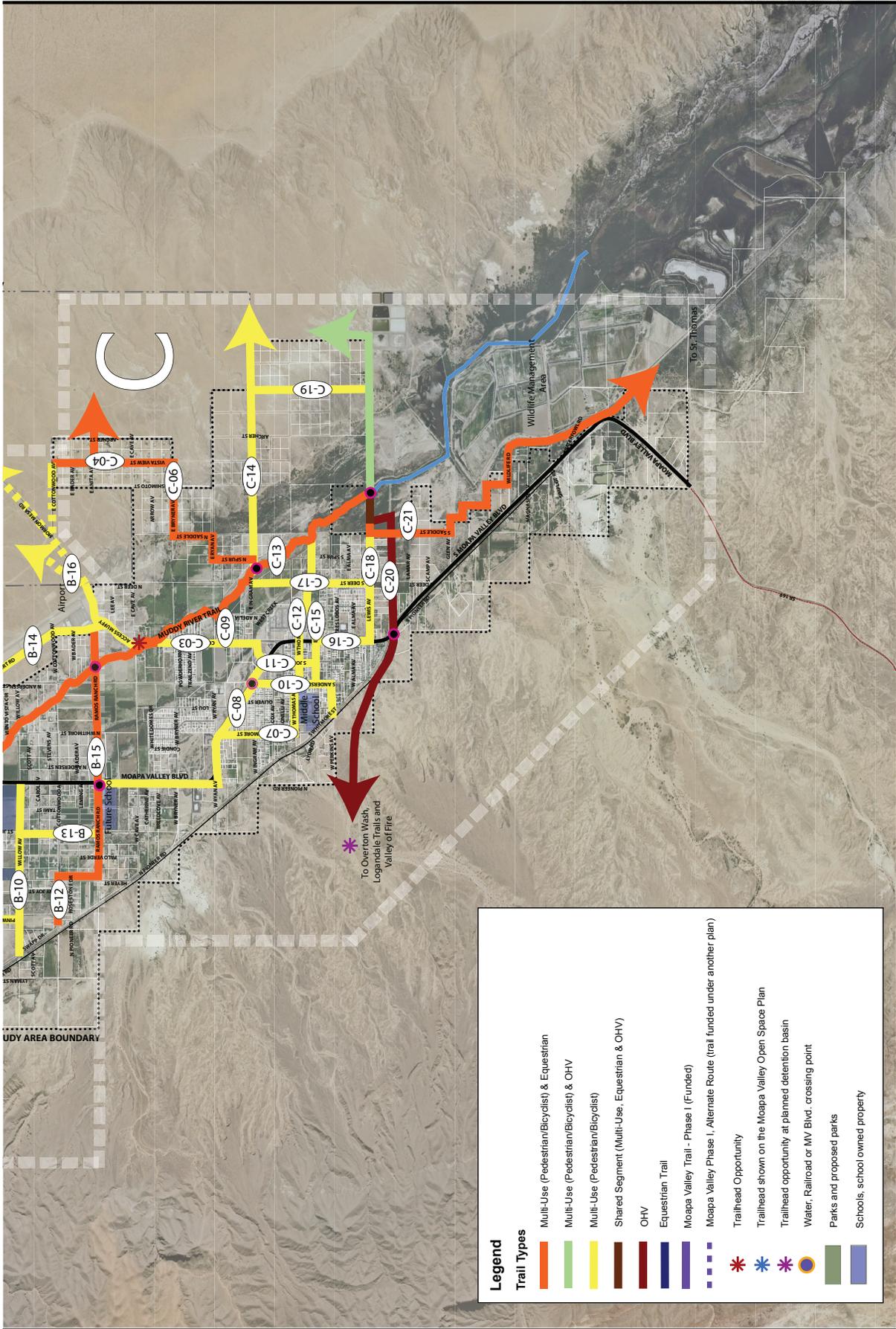
- Alignment B-08 (Diane Avenue from Airport Road to the Muddy River) was removed as it was determined that B-09 (Ross Avenue from Airport Road to the Muddy River) better met the criterion.
- Alignment C-02 (Andersen Street from Ramos Ranch Road to Moapa Valley Boulevard) was removed largely due to the cost and environmental impacts of developing that route through West Creek.
- Alignment C-04, an alternate route through the Vista View neighborhood to the Muddy River, was eliminated as route C-06 fared better in the evaluation process.

### **A General Note about OHV Trails**

It should be noted that the Moapa Valley Trails Committee and Clark County did not intend to create an on-street OHV trail network within the Moapa Valley Town boundaries as part of this study. The intent of the study was to provide an east/west crossing in Logandale, an east/west crossing in Overton, and explore the possibility of a north/south access route along the UPRR rail line between Logandale and Overton. However, because OHV use in the Moapa Valley is a popular activity and there is an abundance of public lands and recreational trails surrounding Moapa Valley, many residents would like to access those outlying areas via OHV, departing directly from their homes. To adequately address a comprehensive OHV access plan, the community should explore the option offered under NRS 490 where a city or county can designate a portion of highway for OHV use. Under this statute, designations of state highways require the approval of the Nevada Department of Transportation.

# Trail Types





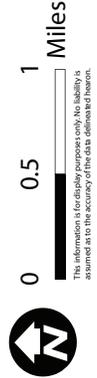
**Legend**

**Trail Types**

- Multi-Use (Pedestrian/Bicyclist) & Equestrian
- Multi-Use (Pedestrian/Bicyclist) & OHV
- Multi-Use (Pedestrian/Bicyclist)
- Shared Segment (Multi-Use, Equestrian & OHV)
- OHV
- Equestrian Trail
- Moapa Valley Trail - Phase I (Funded)
- - - Moapa Valley Phase I, Alternate Route (trail funded under another plan)

**Trailhead Opportunity**

- \* Trailhead shown on the Moapa Valley Open Space Plan
- \* Trailhead opportunity at planned detention basin
- \* Water, Railroad or MV Blvd. crossing point
- \* Parks and proposed parks
- \* Schools, school owned property



Moapa Valley, Nevada - Moapa Valley Trails Study  
 Source: GISMO  
 Date: May 2009

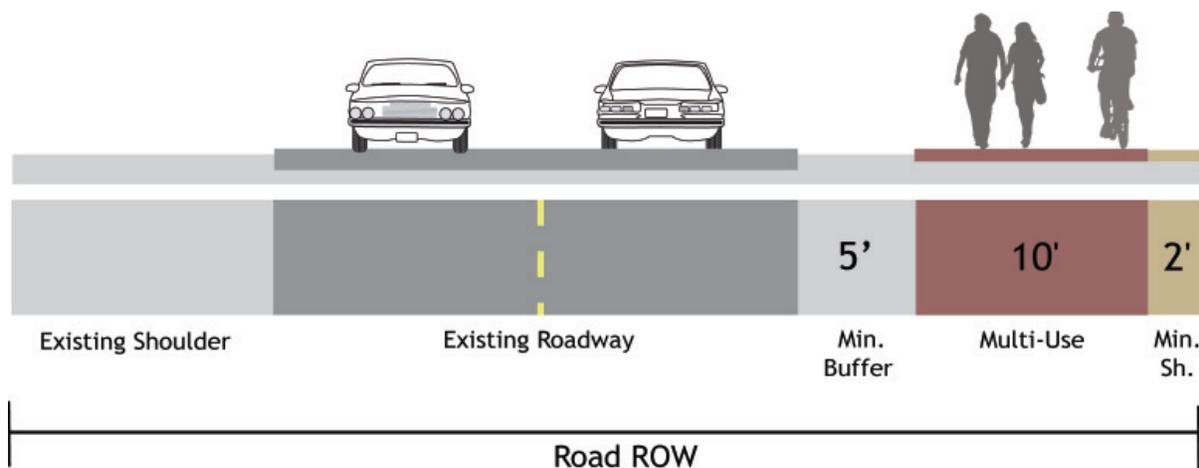
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### Trail Cross Sections

The following cross sections show recommended configurations for each of the trail alignments. The numbering system assigns a primary number for each trail type, with cross sections variations marked with an identifier. For example, multi-use only trails start with the number 1, with specific cross sections listed as 1.0 or 1.1. Since the cross sections were developed with the specific alignments in mind, variations within each trail type group may include trail width, an irrigation or drainage ditch, facilities on one side of the road, facilities on both sides of the road, etc.

Trail Type	Description	Cross Section
Multi-Use Non Equestrian	Trail or trail corridor is designated for pedestrians and bicyclists	1.0, 1.1, 1.2, 1.3, 1.4, 1.5
Multi-Use/Equestrian	Trail is designated for pedestrians, bicyclists and equestrians	3.0, 3.1, 4.0, 4.1, 5.0, 5.1, 5.2
Multi-Use/OHV	Trail corridor is designated for pedestrians, bicyclists, and OHV users	2.0
Shared Segment (Multi-Use, Equestrian & OHV)	Trail corridor is designated for pedestrians, bicyclists, equestrians and OHV users	6.0

\*Multi-Use is a pedestrian and bicyclist shared trail



### 1.0

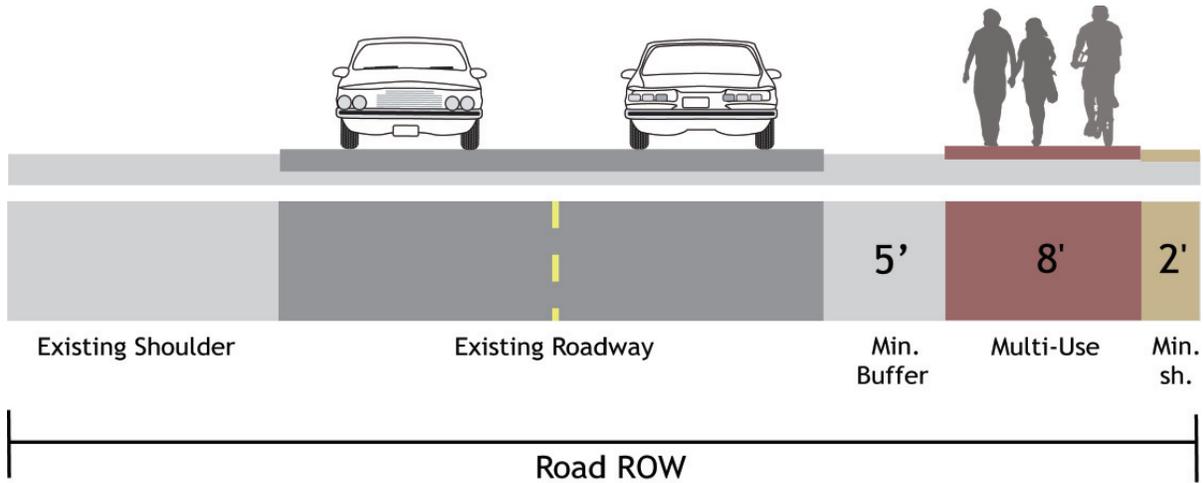
#### CHARACTER

- Two-way vehicle roadway
- 5' minimum buffer
- 10' paved multi-use trail, 2' shoulder

#### ALIGNMENTS

- A-14, B-06, B-16, C-10
- C-08 (Whitmore St. to Ramos Ranch)
- C-18 (Moapa Valley Blvd. to Saddle St.)\*

\* Section is reversed



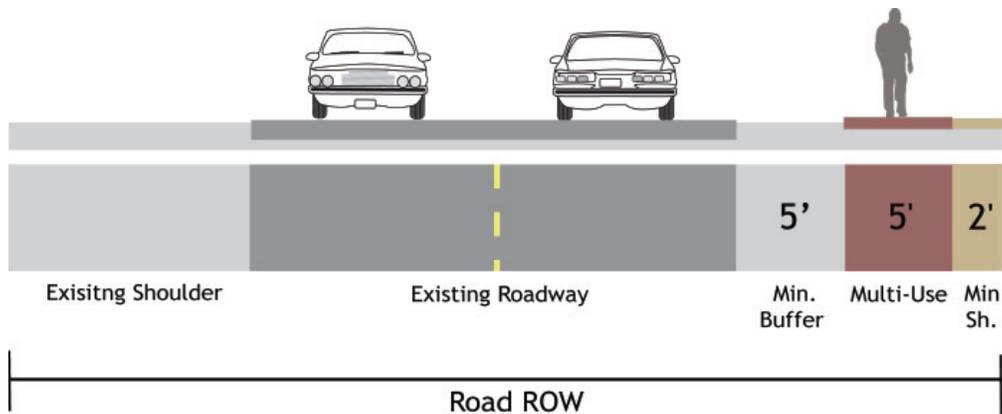
**1.1 CHARACTER**

- Two-way vehicle roadway
- 5' minimum buffer
- 8' paved multi-use trail, 2' shoulder

**ALIGNMENTS**

- A-08 (Heyer St.), A-15, B-07, B-10, B-14, C-07, C-17, C-19
- C-18 (MV Blvd. to Muddy River)\*

\* Section is reversed



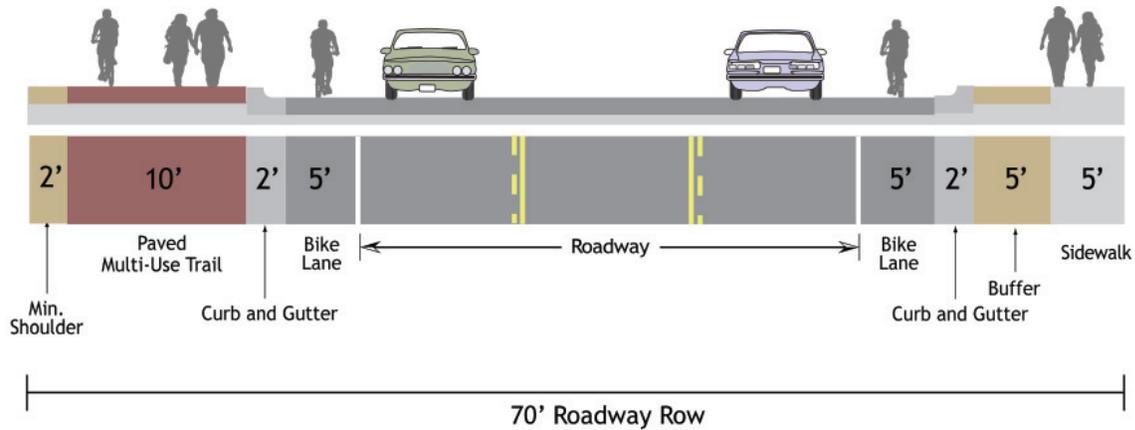
**1.2 CHARACTER**

- Two-way vehicle roadway
- Residential streets
- 5' minimum buffer
- 5' paved trail, 2' shoulder

**ALIGNMENTS**

- A-04, A-07, A-13, B-08, B-13, C-09, C-11, C-12, C-14, C-15
- B-05, \*A-12 (Logandale Park Access Rd. and Moapa Valley Blvd. from crosswalk to Logandale Bridge)

\* Section is reversed.

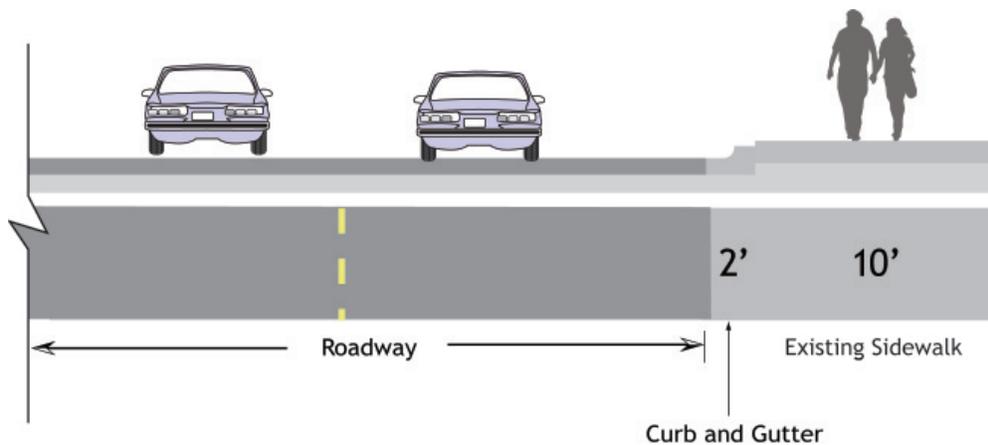


**1.3 CHARACTER**

- Two-way vehicle roadway
- Moapa Valley Blvd.
- Curb and gutter on street side of trail
- 10' paved trail, 2' shoulder

**ALIGNMENTS**

C-08, (Anderson St. to Whitmore St. on south side of Moapa Valley Blvd.; and from existing sidewalk east of Andersen St. to Whitmore St. on north side of Moapa Valley Blvd.), C-11



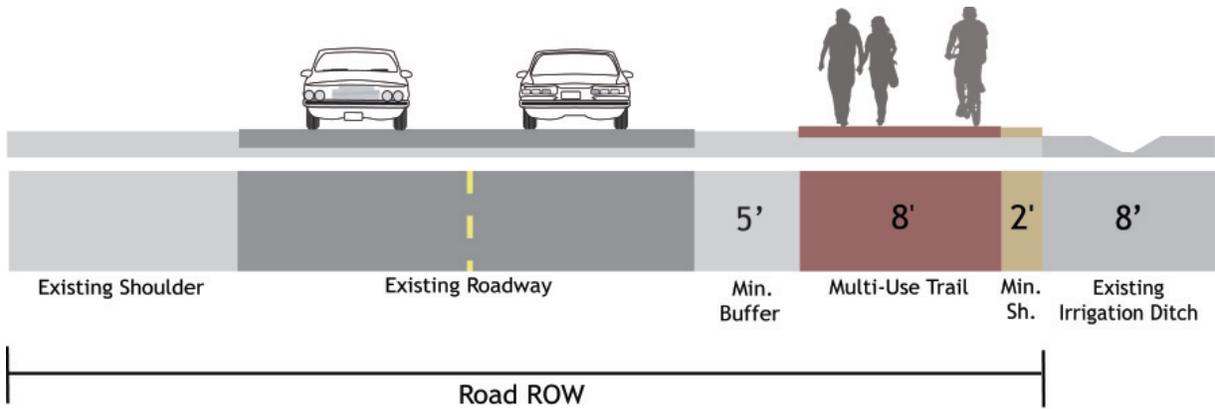
**1.4 CHARACTER**

- Two-way vehicle roadway
- Moapa Valley Blvd.
- Downtown Overton
- Streets with curb and gutter
- 10' paved multi-use trail/sidewalk

**ALIGNMENTS**

C-16\*

\* Portions of alignment are undeveloped

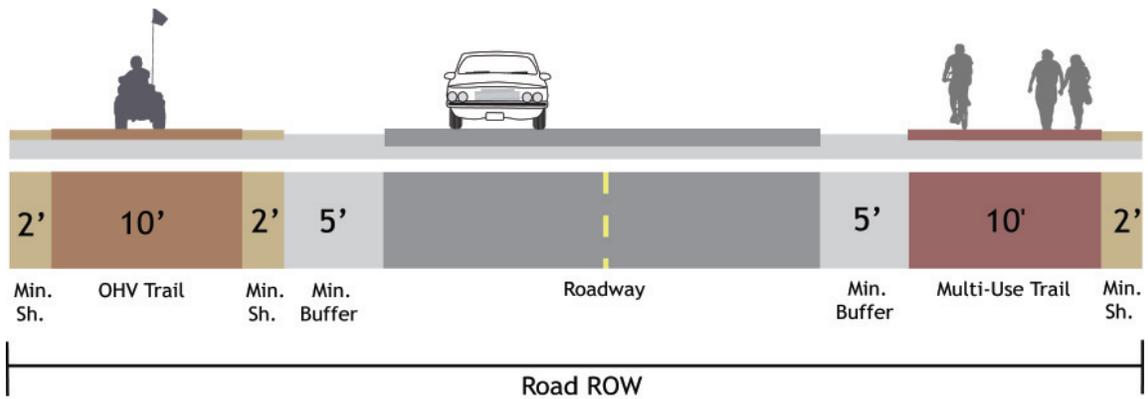


**1.5 CHARACTER**

- Two-way vehicle roadway
- 5' minimum buffer
- 8' paved multi-use trail, 2' shoulder
- Existing irrigation ditch on one side

**ALIGNMENTS**

C-03



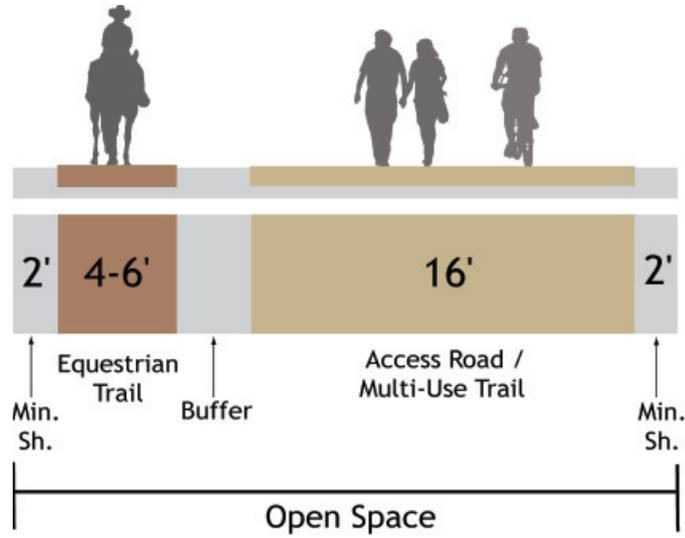
**2.0 CHARACTER**

- Two-way 10' soft OHV trail (rock base or soil stabilization) with 2' shoulders
- Two-way vehicle roadway, with 5' buffers/shoulders min.
- 10' paved multi-use trail

**ALIGNMENTS**

A-09, A-10,\* C-18 (from the Muddy River, eastward to BLM land)\*

\* Section is reversed

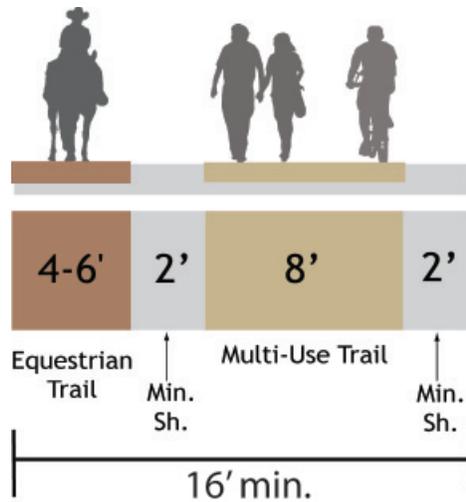


**3.0 CHARACTER**

- 4-6' soft surface equestrian trail
- 16' wide unpaved vehicle access road shared with non-motorized trail users
- Route signed
- 2' clearance/shoulders each side

**ALIGNMENTS**

A-01, A-06

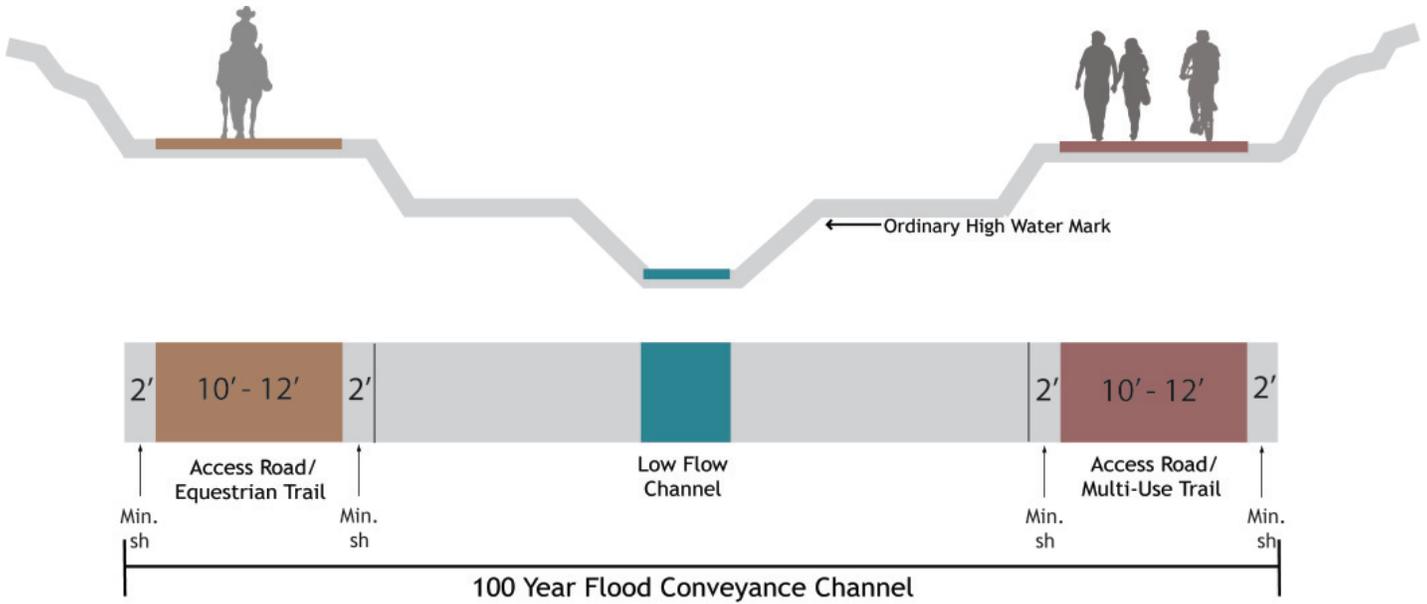


**3.1 CHARACTER**

- 4'-6' soft surface equestrian trail
- 2' shoulders on each side of multi-use trail
- 8' multi-use paved trail

**ALIGNMENTS**

A-03 (Along NDOT ROW), B-17, C-21

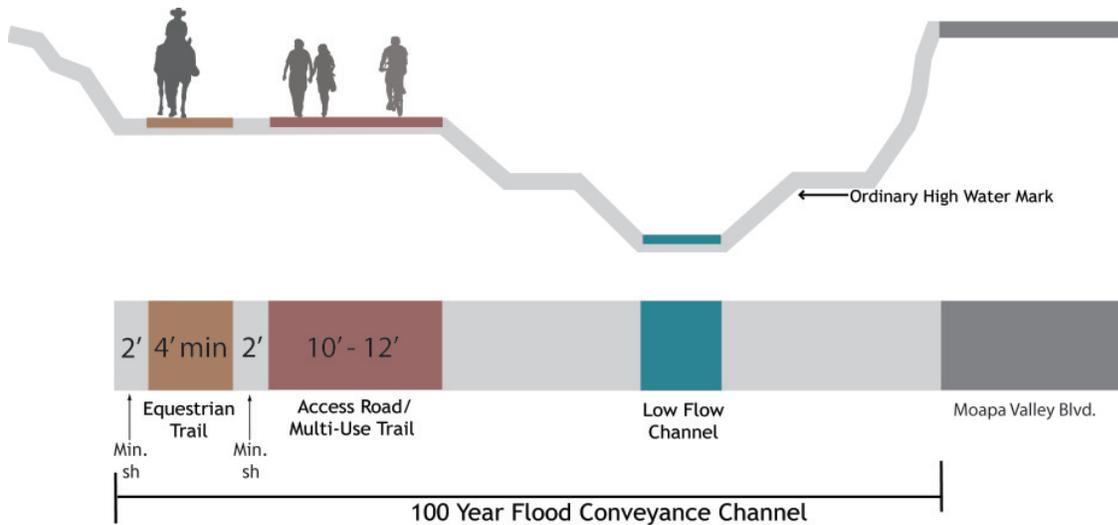


**4.0 CHARACTER**

- Soft surface access road / equestrian trail
- Paved access road / multi-use trail

**ALIGNMENTS**

A-05, A-12, B-11, C-13

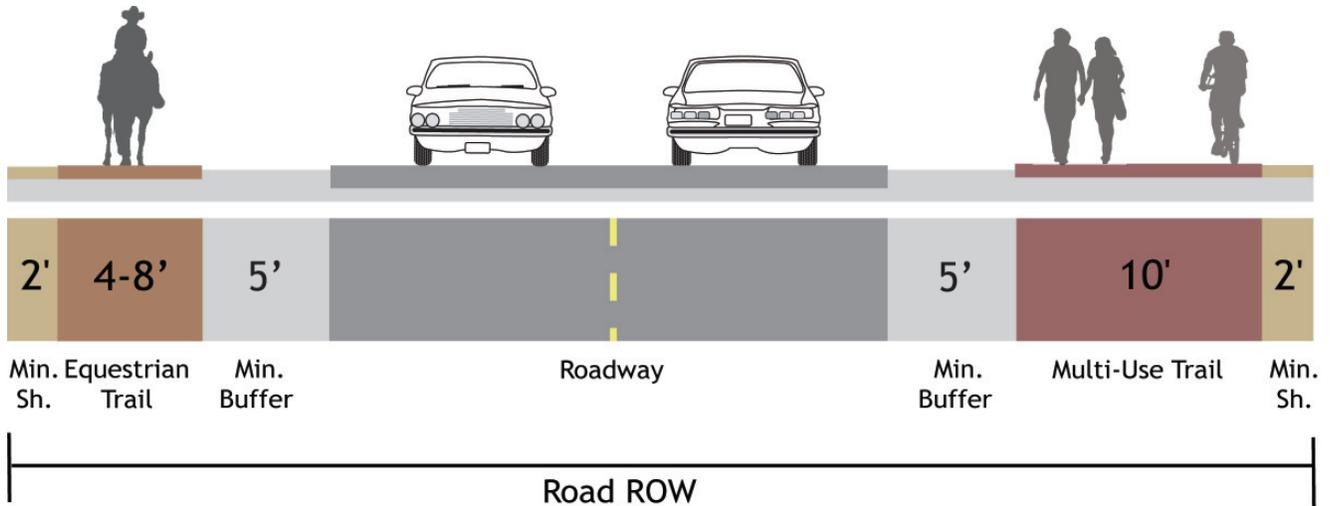


**4.1 CHARACTER**

- Soft surface access road / equestrian trail
- Paved access road / multi-use trail

**ALIGNMENTS**

B-01



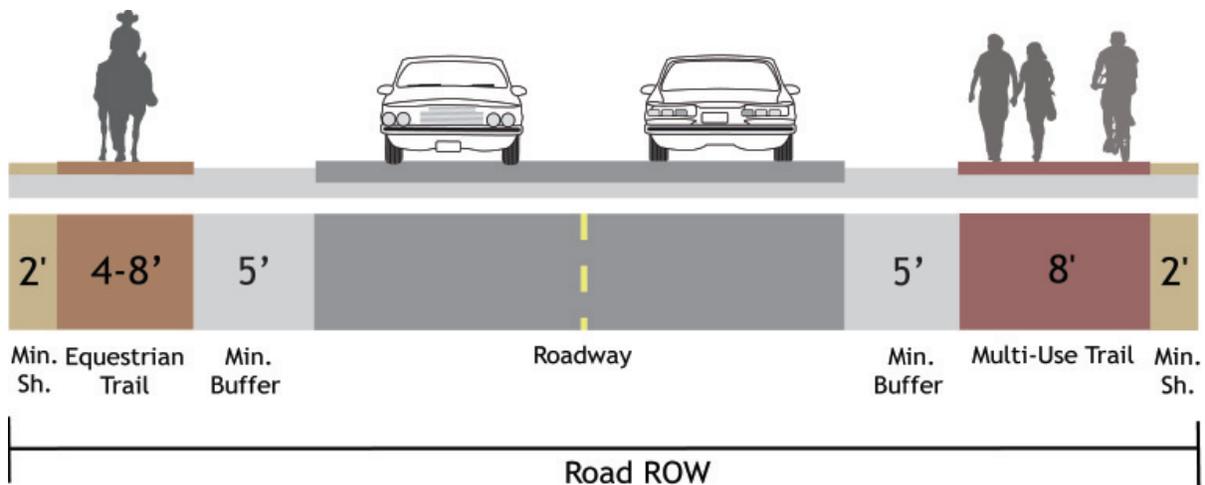
**5.0**

**CHARACTER**

- Soft surface equestrian trail, 4' min., 8' preferred
- Two-way vehicle roadway
- 5' minimum buffer
- 10' paved multi-use trail, 2' shoulder

**ALIGNMENTS**

A-08, B-02, B-03, B-12, B-15



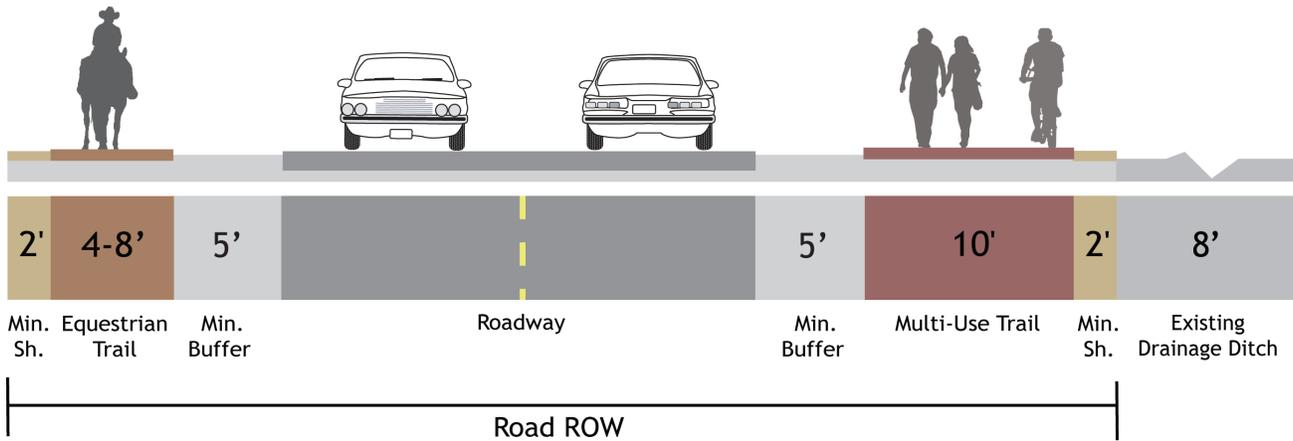
**5.1**

**CHARACTER**

- Soft surface equestrian trail, 4' min., 8' preferred
- Two-way vehicle roadway
- 5' minimum buffer
- 8' paved multi-use trail, 2' shoulder

**ALIGNMENTS**

A-02, C-04, C-06, C-21  
A-03 (A & W Farm Rd.)



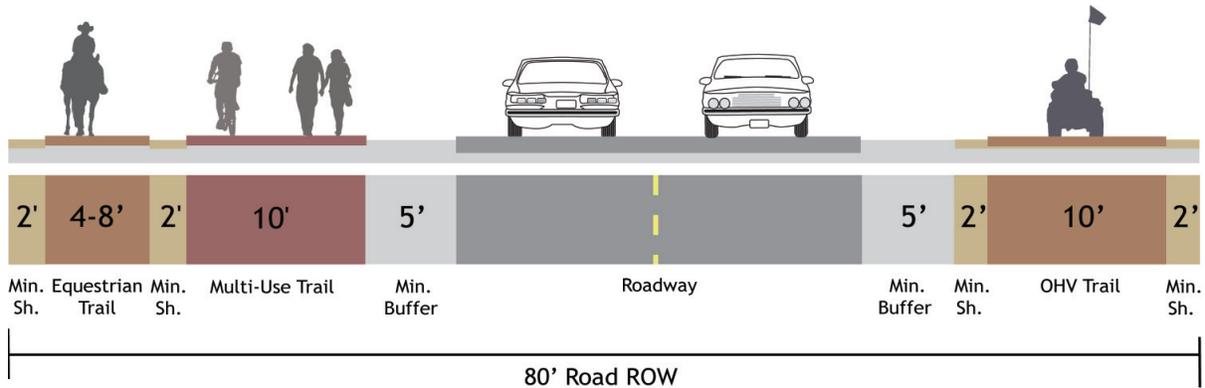
**5.2 CHARACTER**

- Soft surface equestrian trail, 4' min., 8' preferred
- Two-way vehicle roadway
- 5' minimum buffer
- 10' paved multi-use trail, 2' shoulder
- Existing drainage ditch on one side

**ALIGNMENTS**

B-12\*

\* Section is reversed on Heyer St.



**6.0 CHARACTER**

- Two-way vehicle roadway
- 5' minimum buffer on both sides of roadway
- 10' multi-use trail, 2' shoulder
- 4'-8' equestrian trail, 2' shoulder
- 10' OHV trail, 2' shoulder

**ALIGNMENTS**

C-18 (Between Saddle St. and Muddy River)

## PHASING AND COSTS

The trail priorities map on the following page shows the recommended alignments and their associated phases. **Phase I** are the trails that have been funded as part of a previous plan, and provide connections among the grade school, the high school, and the Fairgrounds.

### Phase II

Recommended **Phase II** includes all the trails identified as **primary**, as well as a few additional segments that link key destinations such as the middle school, the high school and downtown Overton. This includes 37.95 miles of trail. Nearly 10 miles of that primary trail is part of the Flood Control projects along the Muddy River. Cost of trail construction will be minimal as the plan recommends using the maintenance roads along the river that will be constructed as part of the flood control work.

### Phase III

**Phase III** includes most of the trails identified as **secondary**. These trails provide important connections to develop a network of trails in the valley that connect with the primary trails. They are mostly along existing streets and within existing R-O-W.

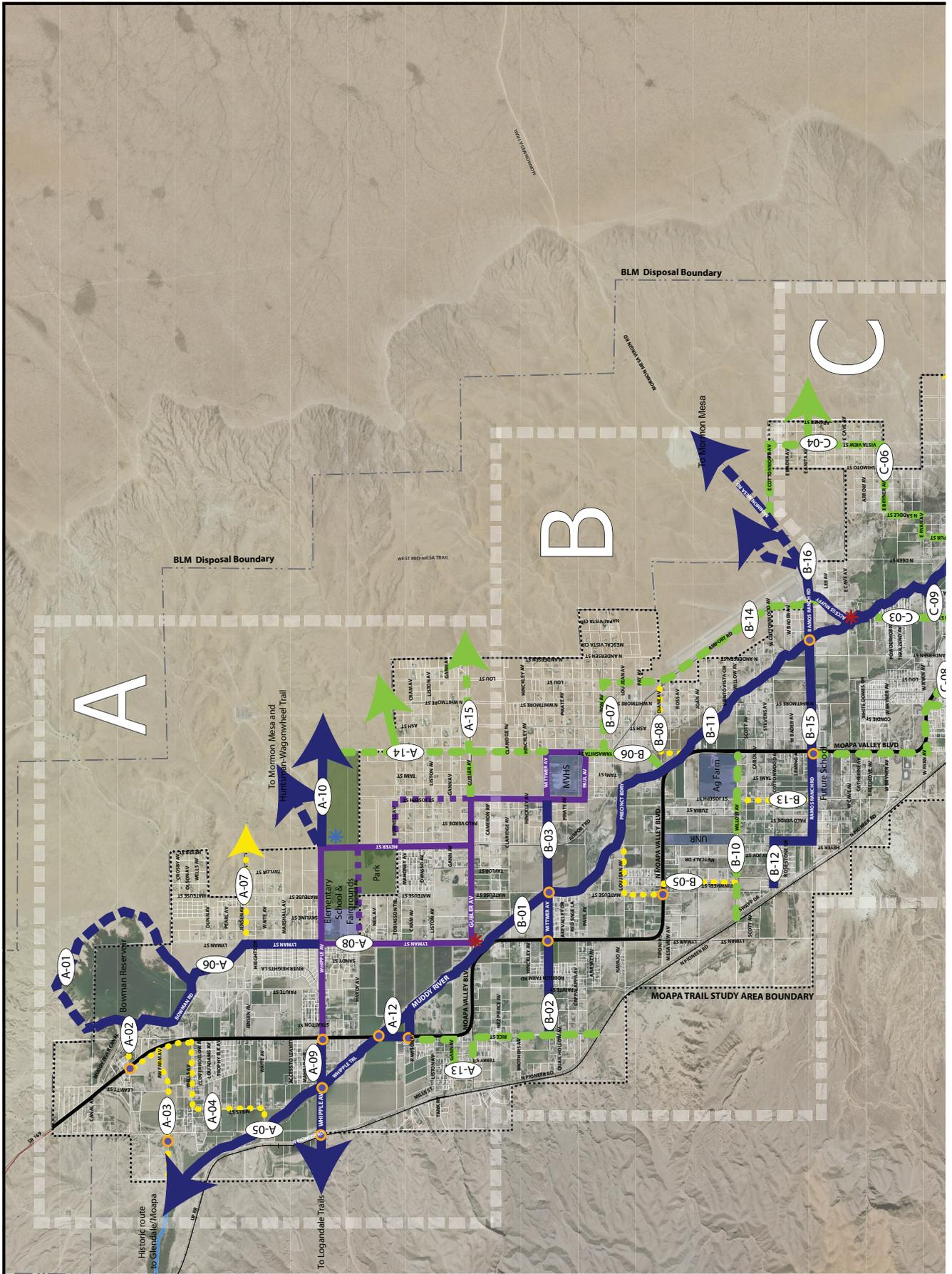
### Phase IV

**Phase IV** are primarily the trails identified as **tertiary**. These trails provide the neighborhood links to the larger trails network. They will also be along existing streets and R-O-W, but will be narrower than the primary and secondary trails as they will have lower levels of use. In many cases they will be similar to sidewalks in the neighborhoods where they do not currently exist. These are also trails that will connect to future development and should be built as development occurs.

### Amenities

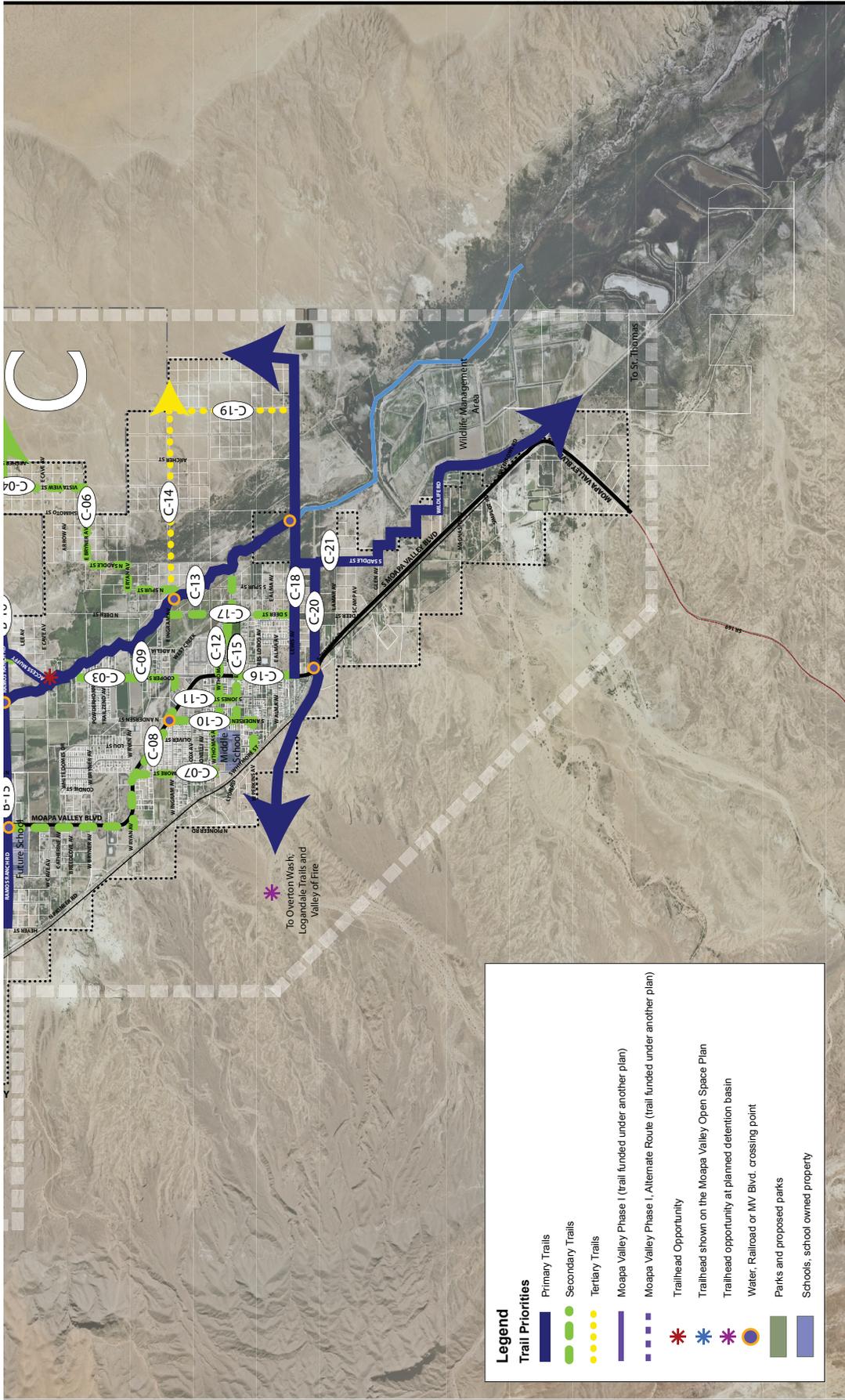
Amenities include trailheads, furnishings and other amenities that are not essential to the trail network, but will enhance and improve the user experience. These amenities are recommended to be implemented when nearby trails are built and therefore are not necessarily recommended as the last part of the project to be implemented.

# Trail Priorities





This information is for display purposes only. No liability is assumed as to the accuracy of the data delineated thereon.



**Legend**

**Trail I Priorities**

- Primary Trails
- Secondary Trails
- Tertiary Trails

Moapa Valley Phase I (trail funded under another plan)

Moapa Valley Phase I, Alternate Route (trail funded under another plan)

Trailhead Opportunity

Trailhead shown on the Moapa Valley Open Space Plan

Trailhead opportunity at planned detention basin

Water, Railroad or MV Blvd. crossing point

Parks and proposed parks

Schools, school owned property

Moapa Valley, Nevada - Moapa Valley Trails Study

Source: GISMO  
Date: May 2009

Cost Estimate by Phase*					
Estimate					
Year	2010	2011	2012	2013	2014
Phase II	\$3,128,242	\$3,197,063	\$3,306,083	\$3,418,820	\$3,535,402
Phase III	\$2,117,333	\$2,163,914	\$2,237,704	\$2,314,009	\$2,392,917
Phase IV	\$1,052,555	\$1,075,711	\$1,112,393	\$1,150,325	\$1,189,551
Amenities	\$1,500,000	\$1,533,000	\$1,585,275	\$1,639,333	\$1,695,234
SubTotal	\$7,798,129	\$7,969,688	\$8,241,454	\$8,522,488	\$8,813,105
10% Contingency	\$779,813	\$796,969	\$824,145	\$852,249	\$881,310
<b>Total</b>	<b>\$8,577,942</b>	<b>\$8,766,657</b>	<b>\$9,065,600</b>	<b>\$9,374,737</b>	<b>\$9,694,415</b>
**Inflation Factor	NA	2.2%	3.4%	3.4%	3.4%

\*excludes cost of any property purchase

\*\*2011 rates set using guidelines from the White House Office of Management and Budget, Circular A-94, October 29, 1992 <http://www.whitehouse.gov/omb/circulars/a094/a094.aspx#7>

\*\*2012 rates and beyond are the average US annual inflation rates calculated from 1913 to 2008

Phase II				
Alignment No.	Length (miles)	Length (feet)	Cost	Section
A-01	3	15,840	204,336	3.0
A-05	1.25	6,600	3,300	5.0
A-06	0.5	2,640	34,056	3.0
A-08	0.5	2,640	40,867	1.0
A-08	0.25	1,320	20,434	6.0
A-09	0.75	3,960	61,301	2.0
A-10	0.75	3,960	247,421	2.0
A-11	2	10,560	290,189	4.0
A-12	1.5	7,920	3,960	5.0
B-01	0.5	2,640	1,320	5.1
B-02	1.25	6,600	102,168	6.0
B-03	0.5	2,640	40,867	6.0
B-04	2.75	14,520	399,010	4.0
B-06	0.5	2,640	12,091	1.0
B-07	0.5	2,640	12,091	1.1
B-14	1.5	7,920	36,274	1.1
B-11	3	15,840	7,920	5.0
B-12	0.25	1,320	66,634	7.0
B-15	1.75	9,240	143,035	6.0
B-16	1.5	7,920	362,736	1.0
C-01	2.25	11,880	326,462	4.0
C-03	0.75	3,960	18,137	7.1
C-10	0.75	3,960	18,137	1.1
C-12	1	5,280	24,182	1.2
C-13	3	15,840	7,920	5.0
C-18	0.55	2,904	147,523	1.0
C-18	0.25	1,320	78,514	7.2
C-18	0.7	3,696	230,926	2.0
C-20	1.5	7,920	0	na
C-21	0.85	4,488	186,432	3.1
C-21	0.85	4488	198010.56	6.1
C-21	1	5280	2640	share the road
<b>Total Length</b>	<b>37.95</b>	<b>TOTAL</b>	<b>\$3,128,242</b>	

Phase III				
Alignment No.	Length (miles)	Length (feet)	Cost	Section
A-13	1.5	7,920	181,368	1.2
A-14	1.5	7,920	362,736	1.0
A-15	1	5,280	193,459	1.1
B-10	1.5	7,920	290,189	1.1
C-04	1.25	6,600	291,192	6.1
C-06	1	5,280	232,954	6.1
C-07	0.75	3,960	145,094	1.1
C-08	0.5	2,640	85,404	1.3
C-09	0.25	1,320	30,228	1.2
C-11	0.25	1,320	85,404	1.3
C-15	0.5	2,640	170,808	1.3
C-16	0.25	1,320	132	1.4
C-17	0.25	1,320	48,365	1.1
<b>Total Length</b>	<b>10.5</b>	<b>TOTAL</b>	<b>\$2,117,333</b>	

Phase IV				
Alignment No.	Length (miles)	Length (feet)	Cost	Section
A-02	0.25	1,320	58,238	6.1
A-03	0.75	3,960	174,715	6.1
A-03	0.25	1,320	54,833	3.1
A-04	0.75	3,960	45,342	1.2
A-07	0.75	3,960	90,684	1.2
B-05	1.25	6,600	151,140	1.2
B-08	0.75	3,960	90,684	1.2
B-13	0.75	3,960	90,684	1.2
C-14	1.25	6,600	151,140	1.2
C-19	0.75	3,960	145,094	1.1
<b>Total Length</b>	<b>7.5</b>	<b>TOTAL</b>	<b>\$1,052,555</b>	

Amenities			
2 Trailheads with parking			\$1,000,000
Other misc. amenities			\$500,000
<b>Total</b>			<b>\$1,500,000</b>

## SECTION A - Trail Locations

### A-01 Loop around Bowman Reservoir

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Location

- Trail is shared use with the current access road or where no road exists a shared-use trail

Section: 3.0

### A-02 Bowman Road between Moapa Valley (MV) Blvd. and Bowman Reservoir

#### Trail Type

- Multi-Use
- Equestrian

#### Trail Location

- Multi-Use Trail on north side of Bowman Rd.
- Equestrian Trail on south side of Bowman Rd.

Section: 5.1\*

#### Crosswalk:

- Bowman Rd. at Moapa Valley Blvd.(connecting Multi-use users to Equestrian trail)
- On Moapa Valley Blvd. Pedestrian/equestrian activated signalized crossing (yellow flashing lights) is recommended. Warrants must be met in order for a signalized crossing to be approved by NDOT.

\* Section 5.1 would be modified to show a 5' multi-use trail

### A-03 MV Blvd. between Bowman Road and A & W Farm Rd.; A & W Farm Rd. from MV Blvd. to Muddy River

#### Trail Type

- Multi-use and Equestrian shared corridor
- Multi-use
- Equestrian

#### Trail Location

- Shared use corridor on west side of Moapa Valley Blvd.
- Equestrian trail on north side of A & W Farm Rd.
- Multi-use trail on south side of A & W Farm Rd.

Section: 3.1 (Moapa Valley Blvd.) & 5.1 (A & W Farm Rd.)

#### Crosswalk:

- On A & W Farm Rd.

## SECTION A - Trail Locations

**A-04 MV Blvd. from A & W Farm Rd. to Wells Ave; Wells Ave. to Mills St.; Mills St. to Waite Ave; Waite Ave. to Muddy River**

**Trail Type**

- Multi-Use

**Trail Location**

- On south side of Wells Ave.
- On east side of Mills St.

**Section: 1.2**

**Crosswalk:**

- On Wells Ave. at Moapa Valley Blvd. and at Mills St.

**A-05 Muddy River from Wells Siding to Whipple Ave.**

**Trail Type**

- Multi-Use
- Equestrian

**Trail Location**

- Multi-Use on west side of Muddy River
- Equestrian on east side of Muddy River

**Section: 4.0**

**A-06 Sandy St. between Jensen Ave. and Bowman Reservoir**

**Trail Type**

- Multi-Use and Equestrian shared corridor

**Trail Location**

- On either side of the Sandy St. alignment. Trail would be on BLM land with no dedicated road.

**Section: 3.0**

**A-07 Jensen Ave. from Lyman St. to Heyer St.**

**Trail Type**

- Multi-Use

**Trail Location**

- South side of Jensen Ave.

**Section: 1.2**

**Crosswalk:**

- At Lyman St., Skyline St., Matuese St. and Taylor St.

## SECTION A - Trail Locations

**A-08 Lyman St. from Gubler Ave. to Jensen Ave.; Frehner Ave. between Lyman St. and Heyer St.; Heyer St. from Frehner Ave. to Whipple Ave.**

### Trail Type

- Multi-Use
- Equestrian

### Trail Location

- Multi-Use on east side of Lyman St., the south side of Frehner Ave, and the east side of Heyer St.
- Equestrian on the west side of Lyman St., the north side of Frehner Ave.

**Section:** 5.0 (Lyman St. & Frehner Ave.), 1.1 (Heyer St.)

### Crosswalk:

- On Lyman St. at Jensen Ave., Waite Ave., Marshall Ave., Whipple Ave. Frehner Ave. and Gubler Ave.
- On Frehner Ave. at Woodbury St. and Heyer St.

**A-09 Whipple Ave. from MV Blvd. to Pioneer Rd.**

### Trail Type

- OHV
- Multi-Use

### Trail Location

- OHV on north side of Whipple Ave.
- Multi-Use on south side of Whipple Ave.

**Section:** 2.0

**Crosswalk:** On Whipple Ave. at Moapa Valley Blvd. Pedestrian/equestrian activated signalized crossing (yellow flashing lights) is recommended. Warrants must be met in order for a signalized crossing to be approved by NDOT.

**A-10 Whipple Ave. from Heyer St., east to BLM land**

### Trail Type

- OHV
- Multi-Use

### Trail Location

- OHV on north side of Whipple Ave.
- Multi-Use on south side of Whipple Ave.

**Section:** 2.0

**Crosswalk:** On Whipple Ave. at Lyman St. and Woodbury St.

<b>SECTION A - Trail Locations</b>
<b>A-12 Muddy River from MV Blvd. to Gubler Ave.; Park Access Rd. from Muddy River to MV Blvd.; MV Blvd. from Park Access Rd. to Muddy River</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> <li>• Equestrian</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• Equestrian on east side of Muddy River</li> <li>• Multi-Use on west side of Muddy River, north side of the Park Access Rd., and west side of Moapa Valley Blvd.</li> </ul> <p><b>Section:</b> 4.0 and 1.2</p> <p><b>Crosswalk:</b> On Moapa Valley Blvd. at the Park Access Rd. and the north side of the Logandale Bridge.</p>
<b>A-13 Rice St., Gubler Ave., Doty St., Gann Ave.; MV Blvd. between Gann Ave. and Rawson Ave., Park Access road</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• On west side of Moapa Valley Blvd., the north side of Gann Ave., the west side of Doty St., the south side of Gubler Ave., and the east side of Rice St.</li> </ul> <p><b>Section:</b> 1.2</p> <p><b>Crosswalk:</b> On Liston Ave. at Moapa Valley Blvd., on Gann Ave. and Gubler Ave. at Doty St.</p>
<b>A-14 Yamashita St. between Paul Ave. and Whipple Ave.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• On the west side of Yamashita</li> </ul> <p><b>Section:</b> 1.0</p> <p><b>Crosswalk:</b> At Wittwer Ave., Gubler Ave, Gann Ave., Liston Ave., and Bunnell Ave.</p>

## SECTION A – Trail Locations

### A-15 Gubler Ave. from St. Joseph St. to Anderson St.

#### Trail Type

- Multi-Use

#### Trail Location

- On the north side of Gubler Ave.

Section: 1.1

Crosswalk: At St. Joseph St., Yamashita St., and Whitmore St.

## SECTION B – Trail Locations

### B-01 Muddy River from Gubler Ave. to Wittwer Ave.

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Location

- Both trails on the east side of the Muddy River

Section: 4.1

### B-02 Wittwer Ave. from Rice to Muddy River

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Location

- Multi-Use on the north side of Wittwer Ave.
- Equestrian on the south side of Wittwer Ave.

Section: 5.0

Crosswalk: At Wittwer Ave., Gubler Ave, Gann Ave., Liston Ave., and Bunnell Ave.

### B-03 Wittwer Ave. from Muddy River to Moapa Valley High School (MVHS)

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Location

- Multi-Use on the north side of Wittwer Ave.
- Equestrian on the south side of Wittwer Ave.

Section: 5.0

Crosswalk: At Heyer St. and St. Joseph St.

## SECTION B – Trail Locations

**B-05 Pinwheel St., Mateuse St. between MV Blvd. and Lou Jean Ave.; Lou Jean Ave. from Mateuse St. to Muddy River**

**Trail Type**

- Multi-Use and Equestrian shared corridor

**Trail Location**

- Multi-Use on west side of Pinwheel St. and Mateuse St., south side of Moapa Valley Blvd., north side of Lou Jean Ave.

**Section: 1.2**

**Crosswalk: On Moapa Valley Blvd.**

**B-06 Yamashita St. from Muddy River to Paul Ave.**

**Trail Type**

- Multi-Use

**Trail Location**

- West side of Yamashita

**Section: 1.0**

**Crosswalk: At Paul Ave.**

**B-07 Ron Ave. between Yamashita St. and Lou St.; Lou St. from Ron Ave. to Airport Road**

**Trail Type**

- Multi-Use

**Trail Location**

- North side of Ron Ave. and on the east side of Lou St.

**Section: 1.1**

**Crosswalk: At Yamashita Ave., and on Ron Ave. at Lou St.**

## SECTION B – Trail Locations

### B-08 Diane Ave. from Airport Rd. to Muddy River

#### Trail Type

- Multi-Use

#### Trail Location

- North side of Diane Ave., and on west side of Yamashita St.

Section: 1.2

Crosswalk: On Lou St. at Diane Ave. and on Diane Ave. at Yamashita St.

### B-10 Willow Ave. from Pioneer Rd. to MV Blvd.

#### Trail Type

- Multi-Use

#### Trail Location

- North side of Willow Ave.

Section: 1.1

### B-11 Muddy River from Wittwer Ave. to Ramos Ranch Rd.

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Location

- Multi-Use on west side of the Muddy River
- Equestrian on the east side of the Muddy River

Section: 4.0

### B-12 Cottonwood Ave. between UPRR and Heyer St.; Heyer St. between Cottonwood Ave. and Ramos Ranch Rd.

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Location

- Multi-Use on south side of Cottonwood Ave., and on the west side of Heyer St.
- Equestrian on the north side of Cottonwood Ave., and on the east side of Heyer St.

Section: 5.2

Crosswalk: On Cottonwood Ave. at Heyer St.

<b>SECTION B – Trail Locations</b>
<b>B-13 St. Joseph St. from Ramos Ranch Rd. to Willow Ave.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on west side of St. Joseph St.</li> </ul> <p><b>Section:</b> 1.2</p> <p><b>Crosswalk:</b> At Cottonwood Ave.</p>
<b>B-14 Airport Rd. between Ramos Ranch Rd. and Diane Ave.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on east side of Airport Rd.</li> </ul> <p><b>Section:</b> 1.1</p> <p><b>Crosswalk:</b> None</p>
<b>B-15 Ramos Ranch Rd. from Heyer St. to Airport Rd.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use and Equestrian shared corridor</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on south side of Ramos Ranch Rd.</li> <li>• Equestrian on the north side of Ramos Ranch Rd.</li> </ul> <p><b>Section:</b> 5.0</p> <p><b>Crosswalk:</b> On Moapa Valley Blvd.</p>
<b>B-16 Ramos Ranch Rd. from Cooper St. to Mormon Mesa Rd.; Mormon Mesa Rd. from Ramos Ranch Rd. to Cottonwood Ave.; Cottonwood Ave. to Vista View St.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use &amp; Equestrian shared corridor</li> </ul> <p><b>Trail Location</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on north side of Ramos Ranch Rd., Mormon Mesa and Cottonwood Ave.</li> </ul> <p><b>Section:</b> 5.1</p> <p><b>Crosswalk:</b> Ramos Ranch Rd. at Airport Rd., on Mormon Mesa Rd. at Cottonwood Ave. and Cottonwood Ave. at Vista View St.</p>

## SECTION C – Trail Locations

### C-03 Cooper St. from MV Blvd to Ramos Ranch Rd.

**Trail Type**

- Multi-Use

**Trail Location**

- On east side of Cooper St.

**Section:** 1.5

### C-04 Vista View St. from Cottonwood Ave. to Bryner St.; Anita Ave. from town boundary on the west to BLM land to the east

**Trail Type**

- Multi-Use and Equestrian shared corridor

**Trail Location**

- Multi-Use on east side of Vista View St., the north side of Anita Ave.
- Equestrian on the west side of Vista View St., the south side of Anita Ave.

**Section:** 5.1

**Crosswalk:** On Vista View St. at Anita Ave.

### C-06 Bryner Ave. from Vista View St. to Saddle St., Saddle St. to Ryan Ave.; Ryan Ave. to Spur St.; Spur St. to Ingram Ave.; Ingram Ave. to Muddy River

**Trail Type**

- Multi-Use and Equestrian shared corridor

**Trail Location**

- Multi-Use on the south side of Bryner Ave., the east side of Saddle St., the south side of Ryan Ave., and the east side of Spur St.
- Equestrian on the north side of Bryner Ave., the west side of Saddle St., the north side of Ryan Ave., and the west side of Spur St.

**Section:** 5.1

<b>SECTION C – Trail Locations</b>
<b>C-07 Thomas Ave. from MV Blvd to Whitmore St.; Whitmore St. from Thomas Ave. to MV Blvd.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on south side of Thomas Ave., and the west side of Whitmore St.</li> </ul> <p><b>Section:</b> 1.1</p> <p><b>Crosswalk:</b> On Thomas Ave. at Whitmore St. and at Jones St.</p>
<b>C-08 MV Blvd. from Ramos Ranch Rd. to Andersen St.; Yamashita St. from MV Blvd. to Ryan Ave.; Ryan Ave. from Yamashita St. to MV Blvd.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on west side of Moapa Valley Blvd. from Ramos Ranch Rd. to Yamashita St., on the west side of Yamashita St., on the south side of Ryan Ave., on the south side of Moapa Valley Blvd. from Yamashita St. to Andersen St.</li> <li>• Multi-Use on the north side of Moapa Valley Blvd. from Whitmore to Andersen St., meeting the existing sidewalk.</li> </ul> <p><b>Section:</b> 1.0 (Whitmore St. to Ramos Ranch Rd.) &amp; 1.3 (Anderson St. to Whitmore St.)</p> <p><b>Crosswalk:</b> On Whitmore St. and Andersen St. at Moapa Valley Blvd., on Moapa Valley Blvd. at Andersen St.</p>
<b>C-09 Lester Ave. from Cooper St. to the Muddy River</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on south side of Lester Street.</li> </ul> <p><b>Section:</b> 1.2</p>

## SECTION C – Trail Locations

### C-10 Andersen from MV Blvd. to Perkins St.

#### Trail Type

- Multi-Use

#### Trail Locations

- Multi-Use on the west side of Andersen

**Section:** 1.0

**Crosswalk:** On Thomas Ave.

### C-11 Jones St. to from Thomas Ave. to Moapa Valley Blvd.

#### Trail Type

- Multi-Use

#### Trail Locations

- Multi-Use on the east side of Jones St.

**Section:** 1.2

**Crosswalk:** On Thomas Ave.

### C-12 Thomas Ave. from Andersen St. to Conley St.; Conley St. to Overton Park; Overton Park Access Road to Deer St.; Deer St. to unnamed street; Unnamed street to the Muddy River

#### Trail Type

- Multi-Use

#### Trail Locations

- On the north side of Thomas Ave. from Andersen and Moapa Valley Blvd., on the south side of Thomas Ave. between Moapa Valley Blvd. and Conley St., on the west side of Conley St. to Overton Park Access Rd., on the south side of the Overton Park Access Road, on the west side of Deer St., on the north side of the unnamed street.

**Section:** 1.2

**Crosswalk:** On Thomas Ave.

### C-13 Muddy River from Ramos Ranch Rd. to northern edge of the Wildlife Management Area

#### Trail Type

- Multi-Use and Equestrian shared corridor

#### Trail Locations

- Multi-Use on the west side of the river
- Equestrian on the east side of the river

**Section:** 4.0

SECTION C – Trail Locations	
<b>C-14 Ingram Ave. from the Muddy River eastward to BLM land</b>	
<b>Trail Type</b>	<ul style="list-style-type: none"><li>• Multi-Use</li></ul>
<b>Trail Locations</b>	<ul style="list-style-type: none"><li>• On the north side of Ingram Ave.</li></ul>
<b>Section: 1.2</b>	
<b>C-15 Virginia Ave. from Anderson Ave. to Overton Park</b>	
<b>Trail Type</b>	<ul style="list-style-type: none"><li>• Multi-Use</li></ul>
<b>Trail Locations</b>	<ul style="list-style-type: none"><li>• Multi-Use on the south side of Virginia Ave.</li></ul>
<b>Section: 1.2</b>	
<b>Crosswalk: On Moapa Valley Blvd.</b>	
<b>C-16 MV Blvd. from Lewis Ave. to Virginia Ave.</b>	
<b>Trail Type</b>	<ul style="list-style-type: none"><li>• Multi-Use</li></ul>
<b>Trail Locations</b>	<ul style="list-style-type: none"><li>• Multi-Use on the east side of Moapa Valley Blvd.</li></ul>
<b>Section: 1.4</b>	
<b>Crosswalk: On Tres Lobos Ave. at Moapa Valley Blvd. and Alma Ave.</b>	
<b>C-17 Deer St. from Lewis Ave. to Overton Park Access Road</b>	
<b>Trail Type</b>	<ul style="list-style-type: none"><li>• Multi-Use</li></ul>
<b>Trail Locations</b>	<ul style="list-style-type: none"><li>• Multi-Use on east side of Deer St.</li></ul>
<b>Section: 1.1</b>	

<b>SECTION C – Trail Locations</b>
<b>C-18 Lewis Ave. from MV Blvd. eastward to BLM land</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use, Equestrian and OHV shared corridor</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• Multi-use on north side of Lewis Ave. from Moapa Valley Blvd. to Saddle St. and from Muddy River eastward.</li> <li>• Equestrian and Multi-Use on north side of Lewis Ave. from Saddle St. to Muddy River</li> <li>• OHV on south side of Lewis from Saddle St. eastward to BLM land</li> </ul> <p><b>Section:</b> 1.0, 2.0 &amp; 6.0</p>
<b>C-19 Eastern unnamed street between Lewis Ave. and Ingram Ave.</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on the west side of eastern unnamed street</li> </ul> <p><b>Section:</b> 1.1</p>
<b>C-20 East town boundary near Saddle St. through the Overton Wash from Muddy River to BLM at west town boundary</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• OHV</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• In wash</li> </ul> <p><b>Section:</b> No trail improvements for this alignment. Use existing surface.</p> <p><b>Crosswalk:</b> On Moapa Valley Blvd.</p>
<b>C-21 Saddle St. between Lewis Ave. and Glen Ave.; Glen Ave. from Saddle St. to Overton Wildlife Mgmt. Area; following the town boundary southward to Ishimoto St.; Ishimoto St. to Wildlife Rd.; route through the Wildlife Management Area to southern town boundary</b>
<p><b>Trail Type</b></p> <ul style="list-style-type: none"> <li>• Multi-Use and Equestrian shared corridor</li> </ul> <p><b>Trail Locations</b></p> <ul style="list-style-type: none"> <li>• Multi-Use on east side of Saddle St., north side of Glen Ave., north side of town boundary to Ishimoto St., the east side of Ishimoto St.</li> <li>• Equestrian on the west side of Saddle St., south side of Glen Ave., south side of town boundary to Ishimoto St., the west side of Ishimoto St.</li> <li>• Shared corridor through the Wildlife Management Area</li> </ul> <p><b>Section:</b> 3.1, 5.1</p>

