

Outdoor Recreation Trails and Access Routes



Building Connections:
Enhancing the Links Between
Communities and Trails

TENAYA LODGE AT YOSEMITE
APRIL 22 - 24, 2015

CALIFORNIA
trails & greenways
CONFERENCE

Pedestrian Routes

Trails

Outdoor Recreation Access
Routes (ORAR)

Beach Access Routes



Trail



Pedestrian route developed primarily for outdoor recreational purposes

Newly constructed/altered trail directly connected to a trailhead or another trail that substantially complies with guidelines

Trail Guidelines

Grade

1:20 (5%) to 1:12 (8.33%) 200 feet max

1:12 (8.33%) to 1:10 (10%) 30 feet max

1:10 (10%) to 1:8 (12%) 10 feet max

Cross Slope

1:20 (5%) maximum unless concrete,
asphalt or boards, then 1:48 (2%)

Trail Guidelines

Width

36 inches minimum width
Passing spaces – every
1,000 feet where less than
60 inches in width

Tread obstacles

2 inches maximum, except concrete,
asphalt, or board = $\frac{1}{2}$ inch

Openings

$\frac{1}{2}$ inch maximum



Surface

... shall be firm and stable



Conditional exceptions

Apply on a provision-by-provision basis

Where full compliance with a technical provision is not possible because of the limitations and constraints included in the conditional exceptions... the portion of the trail shall comply with the provision to the “extent practicable.”

Conditional exceptions

...not practical due to terrain



Conditional exceptions

...cannot be accomplished with the prevailing construction practices



Conditional exceptions

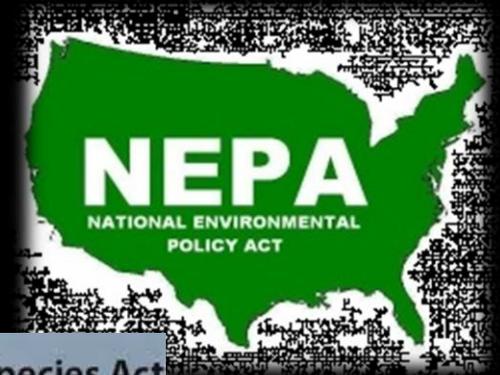
Compliance would fundamentally alter the function or purpose of the facility or the setting



Conditional exceptions

Compliance is precluded by the:

- Endangered Species Act;
- National Environmental Policy Act;
- National Historic Preservation Act;
- Wilderness Act; or
- Other Federal, State, or local laws



Trailheads



Outdoor space developed to serve as an access point to a trail

Not a junction of two or more trails where no other access point is provided

Min Requirements for Trail Signs



New trail information signs provided at trailheads... shall include the following information:

1. Length of the *trail or trail segment*
2. Surface type
3. Typical and minimum tread width
4. Typical and maximum *running slope*
5. Typical and maximum *cross slope*

ABA-2013, Section 1017.11 & FSTAG-2013 Section 7.4.11.2





Dune Trek
National Recreation Area

Length: 0.8 mi (1.3 km)
Elev. Gain: 600 ft (183 m)
Elev. Loss: 600 ft (183 m)
Elev. Range: 4,000 ft (1,219 m)

Icons:
• Water
• Shelter
• Single Use Location
• Restricted Area
• No Motorized Vehicles
• Grade

Grade:
Normal Grade: 4.0%
Steepest Grade: 10%
Steepest Grade Length: 100 ft (30 m)
Steepest Grade Slope: 4.0%

Cross Slope:
Normal Cross Slope: 4.0%
Steepest Cross Slope: 10%
Steepest Cross Slope Length: 100 ft (30 m)
Steepest Cross Slope Slope: 4.0%

Tread Width:
Normal: 50 ft (15 m)
Steepest: 50 ft (15 m)

Surface:
Surface Type: Sand
Surface Condition: Very Soft
Surface at End of Trail: Sand
Normal Tread Width: 5.0 ft (1.5 m)
Steepest Tread Width: 5.0 ft (1.5 m)
Normal Tread Width: 5.0 ft (1.5 m)
Steepest Tread Width: 5.0 ft (1.5 m)

Map:
Map of the area showing the trail route.

Outdoor Recreation Access Routes - ORAR

Connecting common use and public use areas in picnic, camping, and viewing areas



Outdoor Recreation Access Routes - ORAR

Connecting
recreation
facilities



Outdoor Recreation Access Routes

Grade

Between 1:20 (5%) and 1:12 (8.33%), 50 feet maximum

Between 1:12 (8.33%) and 1:10 (10%), 30 feet maximum

Cross Slope

1:33 (3%) maximum unless concrete, asphalt or boards, then 1:48 (2%)

Outdoor Recreation Access Route

Surface

firm and stable

Width

36 inches min

Passing space

required where width is less than 60 inches
every 200 ft. max

Openings

< 0.5 inch sphere



Beach Access Route



Beach Access Route

Permanent or removable

Minimum number

at least one for each $\frac{1}{2}$ mile of shoreline managed by the entity

Not required to exceed the number of pedestrian access points to a beach provided by the entity



Beach Access Route

Grade

Between 1:20 (5%) and 1:12 (8.33%),
50 feet maximum

Between 1:12 (8.33%) and 1:10 (10%),
30 feet maximum

Obstacles

1 inch max, except concrete, asphalt,
or boards = ½ inch

Trail Assessment Options

Universal Trail
Assessment
Process (UTAP)



High Efficiency
Trail Assessment
Process (HETAP)



Key UTAP & HETAP Information

Length



Grade



Width



Surface



Cross
slope



Features &
Facilities



UTAP Tools



UTAP at Work

Requires min 2 Person Teams (4 min is ideal)

Low cost of Equipment

Adaptable to
various trail
types & agency
requirements



HETAP at Work

One person to operate
Equipment significantly
more expensive



Consistent with UTAP Principles
Data easily Integrates into GIS
Increased Data Accuracy

**Last Station Recorded**

48 in

Hard

Aggregate/ Gravel

6628.0 Ft

-7.1 %

0.7 %

Copy Surf. Data ->**Tread Width:****Surface Category:****Surface Type:****Distance:****Grade:****Cross Slope:****Current Station To Record**

36 in

Set MCW

Soft

Sand

6640.7 Ft

4.9 %

2.6 %

Record Station**Add Features****Return Home****Distance Hold****Manual Entry****View Data****Alarm Settings****Calibration****New Segment****Current Segment:****3 Nature Fort 2009-01-06****Outslope**

Check Outslope Direction

<- Left

Right ->

Vehicle Orientation **Forwards** **Backwards**

Settings

Hide

Save Image

Compass Heading: ° True**GPS Location and Status****Lat:** 39° 0' 3.25" N**Lon:** 119° 46' 1.17" W**Apprx. Err:** ± 47 Feet**Elev:** 4647 ± 85 Feet

Fix is 3D

Distance: **6640.7**

Type: **Rock**

Description:

Embedded Rock

Zone

Trail Bed Visual

Remaining Tread: **25** in

Dimensions

Units of Measure: **in**

L **12** W **8** H **4**

Quantity: Ending Distance:

1

End Distance Reminder

Optional Data

Recommended Action: **Remove**

Materials Needed:

For a Built Feature: Is this feature Accessible?

Yes No **This is not a Built Feature**

	Distance	Feature Type	E	D
34	6374.1	Sign	<input type="checkbox"/>	<input type="checkbox"/>
35	6413.9	Picnic Area	<input type="checkbox"/>	<input type="checkbox"/>
36	6606.2	Sign	<input type="checkbox"/>	<input type="checkbox"/>
37	6606.2	Bridge	<input type="checkbox"/>	<input type="checkbox"/>
38	6618.4	Restroom	<input type="checkbox"/>	<input type="checkbox"/>
39	6627.9	Parking	<input type="checkbox"/>	<input type="checkbox"/>

Record Feature

Stations

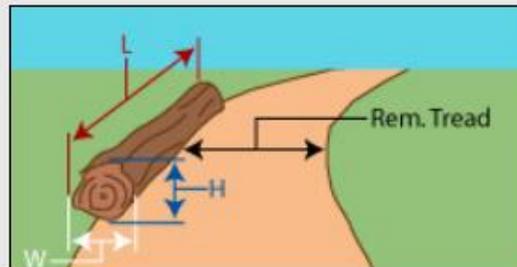
Manual Entry

Edit Feature

Copy Feature

Delete Feature

Rotational Penetrometer Data



Settings

Hide

Save Image

UTAP & HETAP are suitable for any trail or path of travel in an outdoor environment.

What are different types of trails?

Shared Use Path



Urban Shared Use Paths



Neighborhood Connector Trails



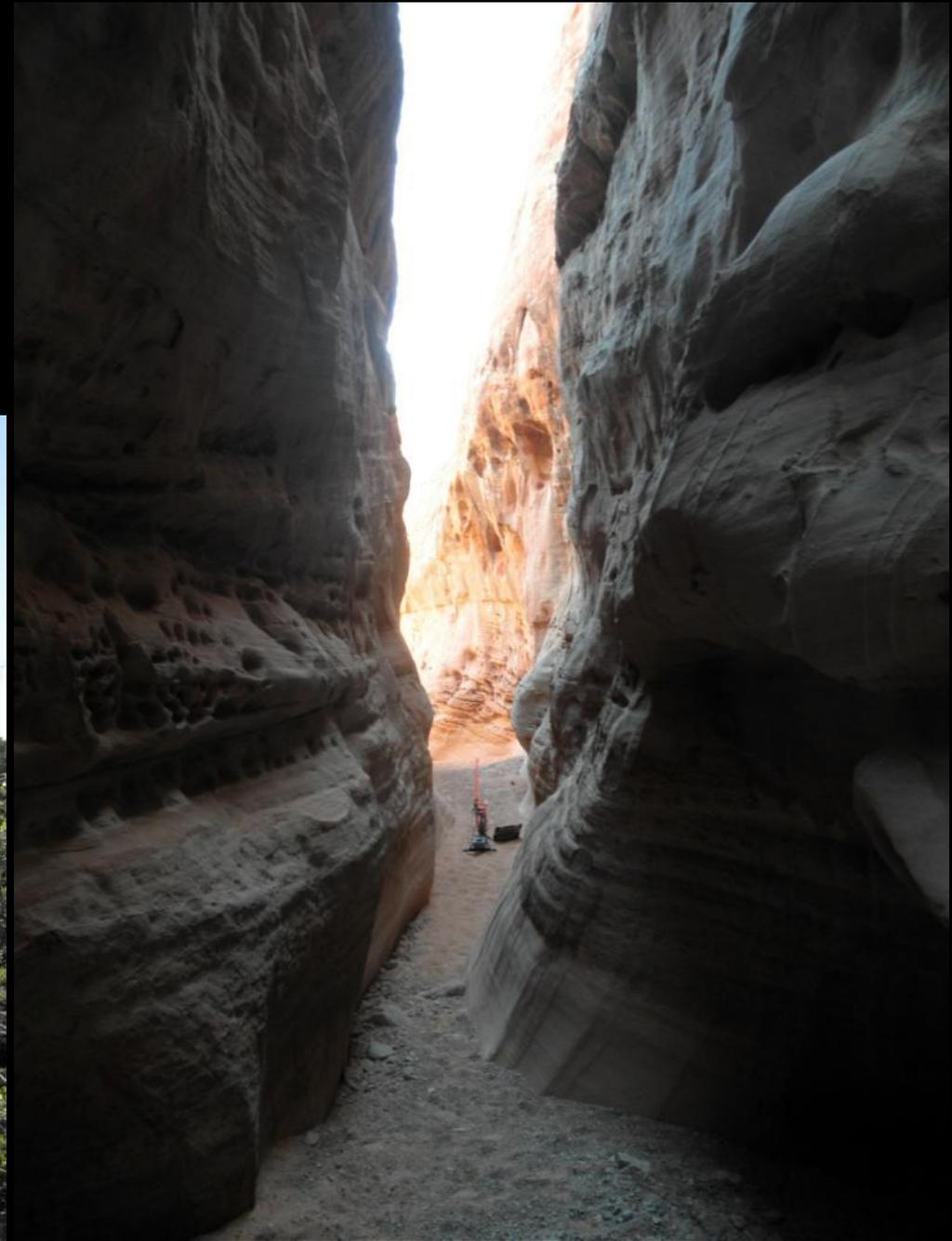
Front Country Trails



Recreation Trail (Back Country)



Narrow Trails



Backcountry single track trails



Cross Country Trails



Snowshoe Trails



Snowmachine Trails



State Parks/Day Use Areas



Motorized Trails



Outdoor Recreation Access Route (ORAR)



Paths of Travel at Recreation Facilities



UTAP & HETAP Record

Typical and Extreme Values

Grade

Cross Slope

Tread Width

<u>Trail</u>	Grade (%)		Cross Slope (%)	
	<u>Typ</u>	<u>Max</u>	<u>Typ</u>	<u>Max</u>
Kersey Lake	5	70	11	32
Indiana Falls	8	10	16	19

Surface Characteristics are Recorded with UTAP & HETAP

Surface Type (soil type)

Firmness Category

Paved

Hard

Firm

Soft

Very Soft



Surface Firmness & Stability



Series 100 Rotational Penetrometer (RP)

A reliable, objective, portable, precision instrument for measuring the firmness and stability of ground and floor surfaces.

Available from
Beneficial Designs

Rotational Penetrometer



The RP is used by surface manufacturers, land & trail managers, school & park facilities, and ADA accessibility consultants and is the only device of its kind.

Rotational Penetrometer Readings

<u>Surface</u>	<u>Firmness</u>	<u>Stability</u>
Decomposed Granite	0.18	0.82
Gravelpave2	0.17	0.38
Geoblock2	0.17	0.41
Envirogrid Geoweb	0.18	0.44
EGA20 Geoweb	0.20	0.62

Dissemination of Access Information to the Public

Facility Brochures

Online

Panel Maps & Kiosks

Trailhead Signs

Trail Access Information (TAI) to Convey to Users

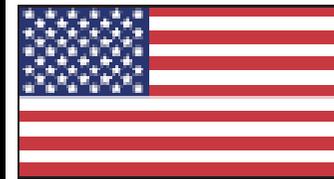
Grade

Cross Slope

Tread Width

Surface

Obstructions



Ruins Loop

Fort Churchill
State Historic Park

Length 0.6 mi (1.0 km)

Hikers

Bikes

Dogs OK

Equestrians

No Motorized Vehicles

Grade

Typical Grade 2.6%

8% of the trail is 5% to 12%

23 ft (7 m) is 12% to 17%
8% grade is a standard ramp

Cross Slope

Typical Cross Slope 5.9%

13% of the trail is 10% to 15%

455 ft (139 m) is 15% to 28%
8% grade is a standard ramp

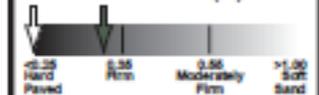
Tread Width

Typical 19 in (48 cm)
Minimum 12 in (31 cm)

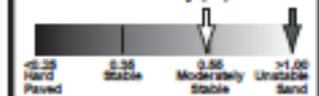
Surface

Soil
3% of the trail is Soft

Typical Firmness (In) 0.21
Minimum Firmness (In) 0.32



Typical Stability (In) 0.54
Minimum Stability (In) 1.03



Obstructions

Multiple 6 in (15.2 cm) Rocks

WARNING: Trail conditions may have changed since January 2004 when this trail was assessed. Temporary obstacles were not mapped.

Signage created by Beneficial Design, Inc. using data collected by a certified trail assessment coordinator.

Trail Access Information

Sparks Blvd. Bike Path
City of Sparks
Truckee River to Pyramid Hwy.
Length 6.8 mi (10.9 km)

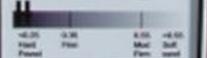
-  Hikers
-  Dogs on Leash
per posted restrictions
-  Bikes
-  No Equestrians
-  No Motorized Vehicles

 **Grade**
Typical Grade 1.7%
4% of the trail is 5% to 8%
131 ft (40 m) is 8% to 15%
8% grade is a standard ramp.

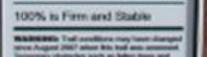
 **X-Slope**
Typical Cross Slope 2.3%
5% of the trail is 5% to 8%
185 ft (56 m) is 8% to 14%

 **Tread Width**
Typical Tread Width
109 in (276 cm)

 **Surface Type**
Concrete / Asphalt
Typical Firmness 0.19
Minimum Firmness 0.22

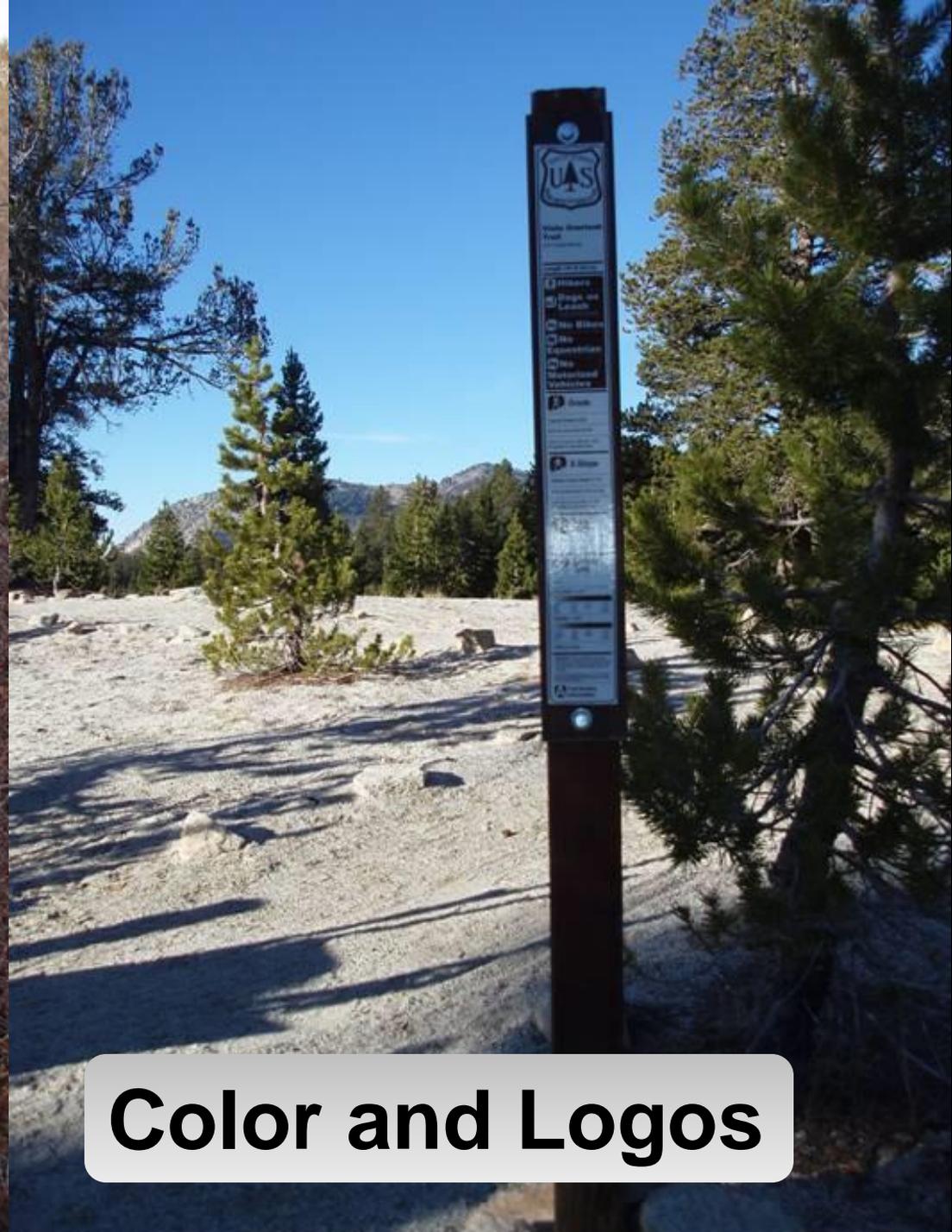
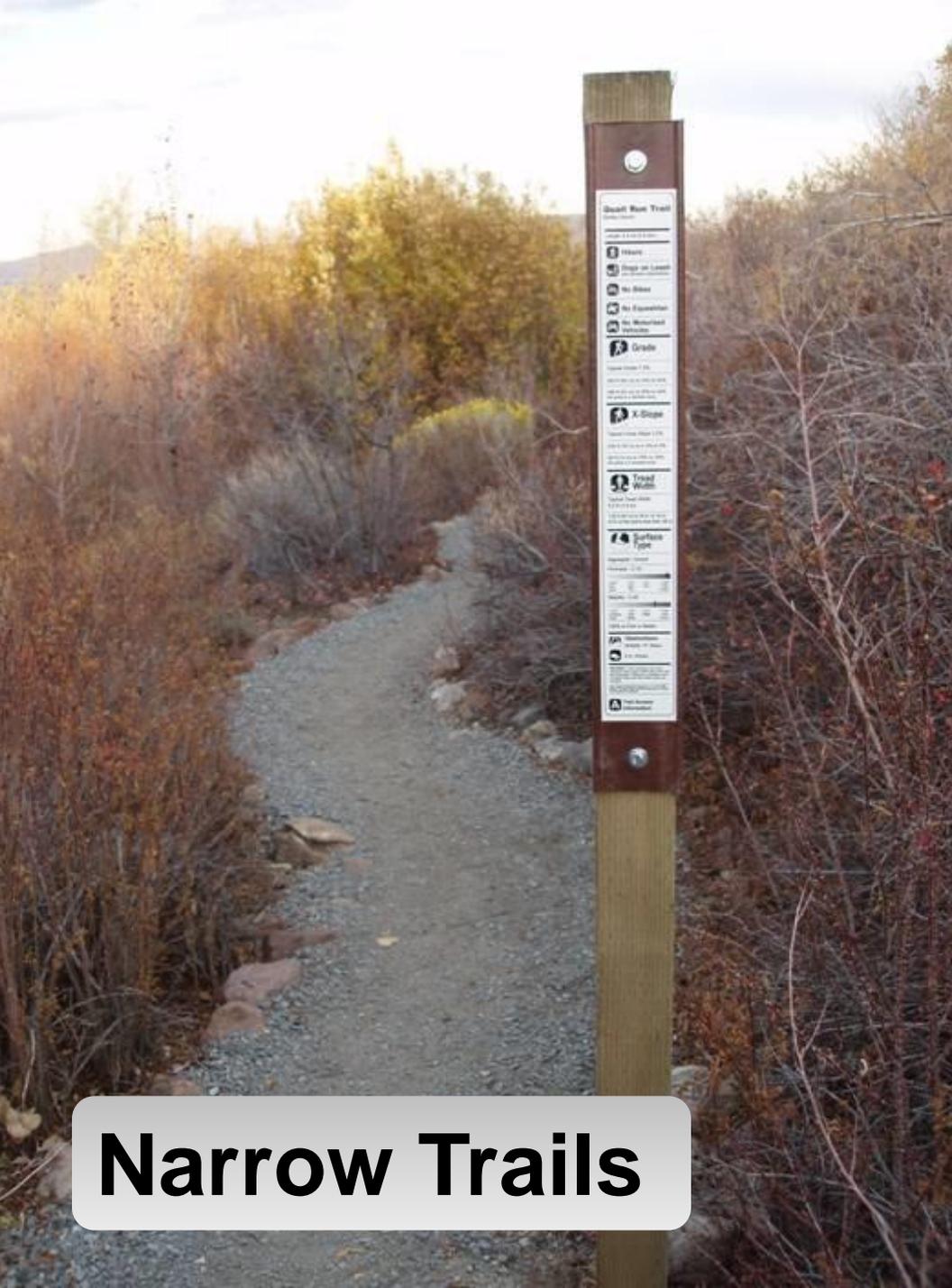


Typical Stability 0.25
Minimum Stability 0.27



100% is Firm and Stable

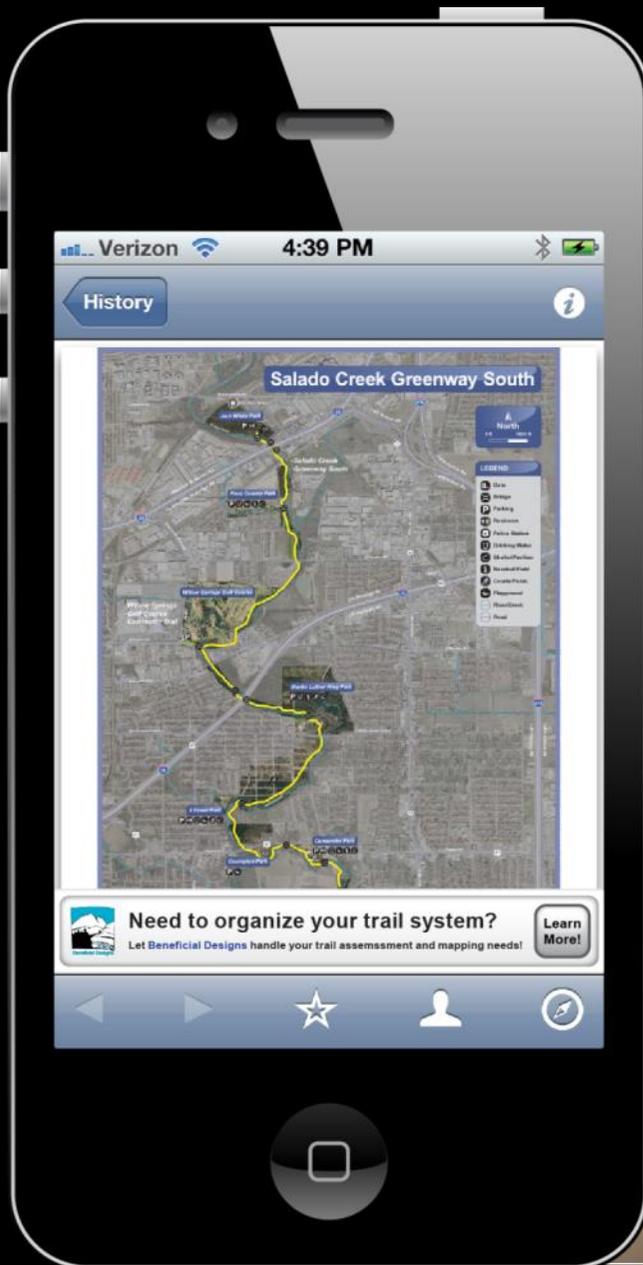
 **Trail Access Information**



Narrow Trails

Color and Logos

QR Codes take TAI to the next level



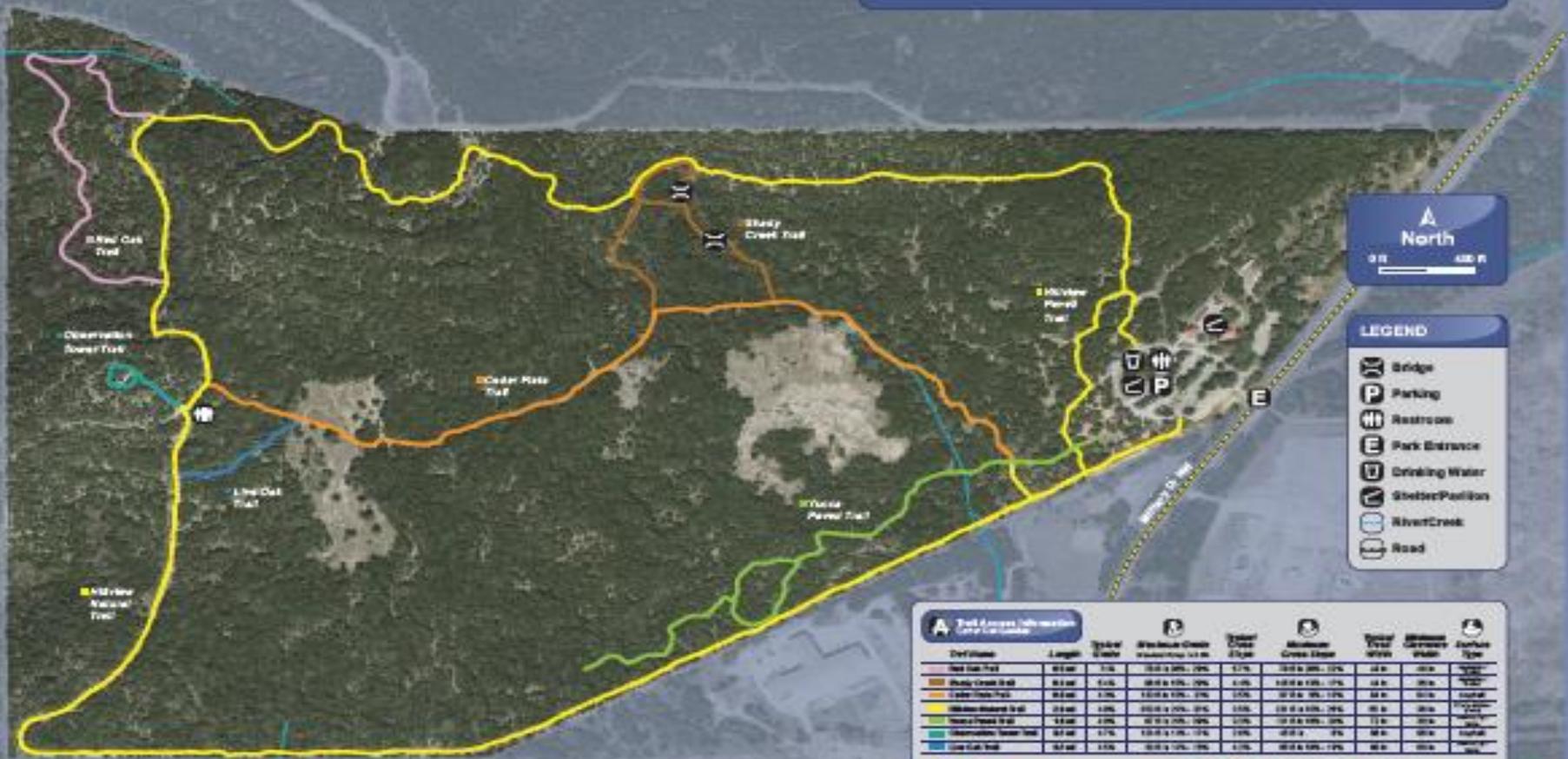
LEGEND

-  Dam
-  Bridge
-  Parking
-  Restroom
-  Park Entrance
-  Shelter / Pavilion
-  Courts/Fields
-  Playground
-  River/Creek
-  Road



-  Road
-  River/Creek

Eisenhower Park Trails



North
0 ft 400 ft

LEGEND

- Bridge
- Parking
- Restroom
- Park Entrance
- Drinking Water
- Shelter/Pavilion
- River/Creek
- Road

A Trail Access Information

Definition	Length	Trail Width	Minimum Grade	Trail Class	Minimum Cross Slope	Trail Class	Minimum Cross Slope	Surface Type
Red Oak Trail	0.5 mi	3.0'	0.0% to 20%	1.0'	0.0% to 20%	1.0'	Gravel	
Steady Creek Trail	0.5 mi	3.0'	0.0% to 10%	1.0'	0.0% to 10%	1.0'	Gravel	
Cedar Hill Trail	0.5 mi	3.0'	0.0% to 10%	1.0'	0.0% to 10%	1.0'	Gravel	
Mid View Natural Trail	0.5 mi	3.0'	0.0% to 20%	1.0'	0.0% to 20%	1.0'	Gravel	
Office Parcel Trail	0.5 mi	3.0'	0.0% to 20%	1.0'	0.0% to 20%	1.0'	Gravel	
Line Out Trail	0.5 mi	3.0'	0.0% to 10%	1.0'	0.0% to 10%	1.0'	Gravel	
Red Oak Trail	0.5 mi	3.0'	0.0% to 20%	1.0'	0.0% to 20%	1.0'	Gravel	

Eisenhower Park Trails

A Trail Access Information

Typical Trail Qualities

Trail Name	Length	Typical Grade	Maximum Grade Standard Ramp is 8.3%	Typical Cross Slope	Maximum Cross Slope	Typical Tread Width	Minimum Clearance Width	Surface Type
Red Oak Trail	0.5 mi	7.1%	78 ft is 20% - 29%	5.7%	78 ft is 20% - 22%	48 in	48 in	Aggregate / Gravel
Shady Creek Trail	0.4 mi	5.4%	66 ft is 15% - 29%	4.4%	145 ft is 13% - 17%	44 in	36 in	Aggregate / Gravel
Cedar Flats Trail	0.8 mi	4.3%	133 ft is 15% - 21%	3.5%	87 ft is 9% - 10%	84 in	84 in	Asphalt
Hillview Natural Trail	2.6 mi	4.8%	353 ft is 21% - 37%	3.5%	231 ft is 15% - 26%	55 in	36 in	Crushed Stone (Fines)
Yucca Paved Trail	1.6 mi	4.0%	67 ft is 21% - 39%	3.3%	111 ft is 16% - 24%	72 in	30 in	Wood Chip / Mulch
Observation Tower Trail	0.1 mi	4.7%	124 ft is 11% - 17%	2.9%	45 ft is 6%	96 in	96 in	Asphalt
Live Oak Trail	0.1 mi	4.5%	33 ft is 11% - 15%	4.2%	65 ft is 10% - 19%	60 in	60 in	Wood Chip / Mulch



WARNING:
Trail conditions may have changed since March 2011 when these trails were assessed. Signage created by Beneficial Designs Inc. using trail data collected by a certified trail assessment coordinator.

Trail Name	Length	Typical Grade	Maximum Grade	Typical Cross Slope	Maximum Cross Slope	Typical Tread Width	Minimum Clearance Width	Surface Type
Red Oak Trail	0.5 mi	7.1%	78 ft is 20% - 29%	5.7%	78 ft is 20% - 22%	48 in	48 in	Aggregate / Gravel
Shady Creek Trail	0.4 mi	5.4%	66 ft is 15% - 29%	4.4%	145 ft is 13% - 17%	44 in	36 in	Aggregate / Gravel
Cedar Flats Trail	0.8 mi	4.3%	133 ft is 15% - 21%	3.5%	87 ft is 9% - 10%	84 in	84 in	Asphalt
Hillview Natural Trail	2.6 mi	4.8%	353 ft is 21% - 37%	3.5%	231 ft is 15% - 26%	55 in	36 in	Crushed Stone (Fines)
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Live Oak Trail	0.1 mi	4.5%	33 ft is 11% - 15%	4.2%	65 ft is 10% - 19%	60 in	60 in	Wood Chip / Mulch



Washoe Lake State Park

TRAIL USE

- Hiking
- Bicycles
- Equestrian
- Dogs on Leash
- No Motor Vehicles

- No public access beyond viewing tower on Wetlands Loop February 1-July 15 to protect nesting habitat
- No bicycles allowed on Wetlands Loop
- No equestrians allowed on Wetlands Loop and Deadman's Creek Trail

LEGEND

- Bridge
- Parking
- Restroom
- Picnic Area
- Boat Launch
- Drinking Water
- Maximum Grade
- Stair Viewing Tower
- Entrance Fee Station
- Horse Trailer Parking

A Trail Access Information

Trail Name	Length	Typical Grade	Maximum Grade	Typical Cross Slope	Maximum Cross Slope	Typical Tread Width	Minimum Clearance Width	Surface Type	Surface Firmness	Surface Stability
									Typical	Typical
Beach Stroll	2.7 mi	1.8%	220 ft is 8 - 9%	2.8%	473 ft is 8 - 11%	42 ft	20 ft	Sand	0.98	1.00
Day Use Pathway	0.4 mi	2.2%	9 ft is 9 - 15%	2.9%	333 ft is 5 - 7%	6 ft	48 in	Asphalt	0.16	0.16
Deadman's Creek Trail	0.6 mi	7.5%	309 ft is 16 - 28%	7.8%	298 ft is 16 - 26%	26 in	16 in	Soil	0.17	0.18
Dune Trek	2.4 mi	9.2%	175 ft is 35 - 49%	4.2%	217 ft is 15 - 23%	32 in	18 in	Sand	0.77	0.80
East Loop	3.8 mi	2.0%	106 ft is 8 - 15%	1.8%	35 ft is 8 - 13%	43 in	18 in	Sand	0.41	0.53
North Loop	3.4 mi	1.8%	173 ft is 10 - 27%	2.4%	200 ft is 7 - 9%	60 in	24 in	Sand	0.47	0.68
South Loop	2.5 mi	1.6%	316 ft is 5 - 6%	2.1%	738 ft is 5 - 7%	60 in	24 in	Sand	0.35	0.43
Wetlands Loop	1.1 mi	1.3%	335 ft is 5 - 11%	1.6%	28 ft is 5 - 11%	7 ft	48 in	Aggregat Gravel	0.23	0.27

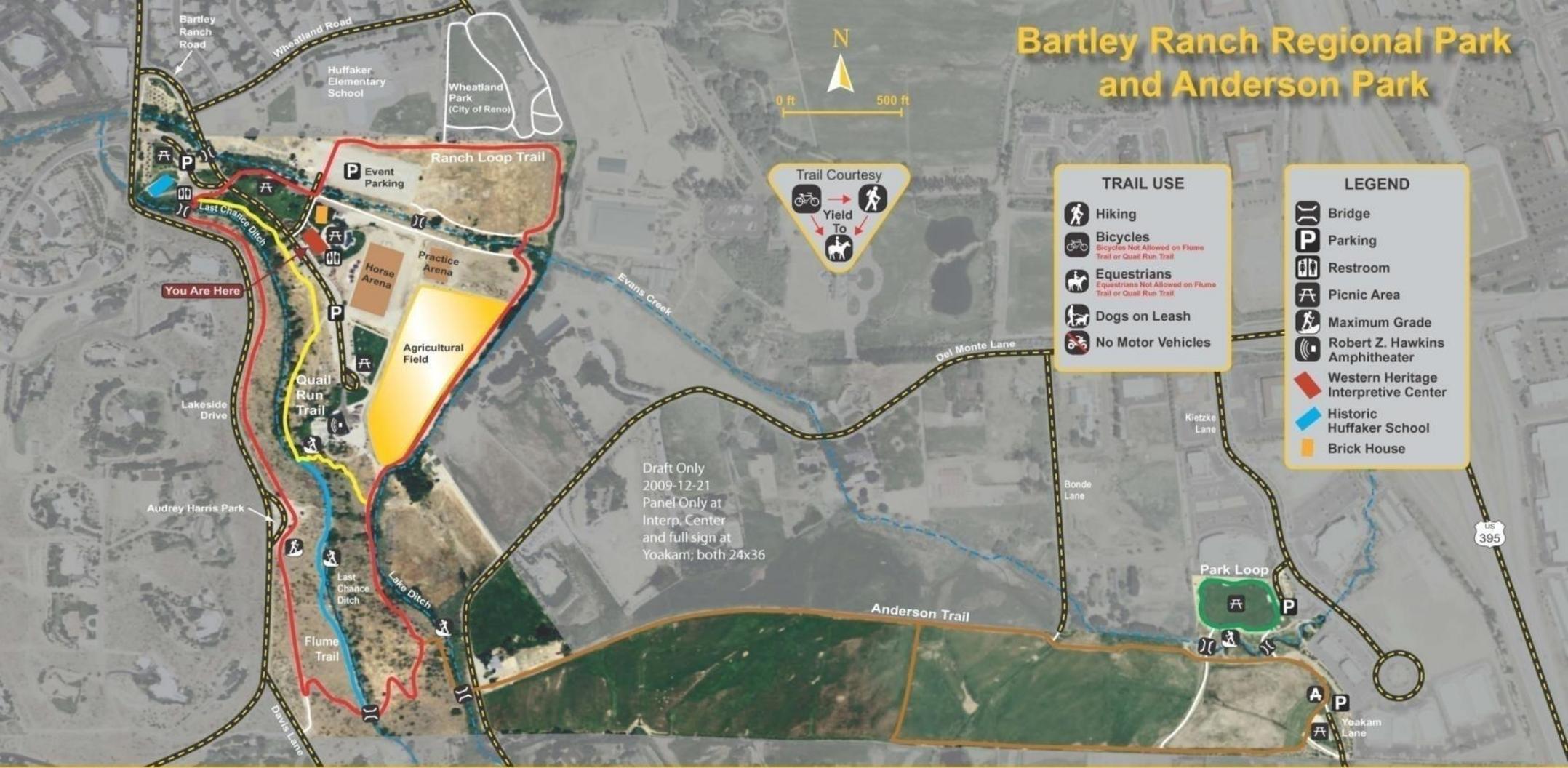
WARNING: Trail conditions may have changed since January 2009 when these trails were assessed. Secondary trails are shown in black. Not all trails are mapped. Signage created by Beneficial Designs Inc. using trail data collected by a certified trail assessment coordinator.



Rough Draft Only
2009-12-24
5 at 20x24 at south equestrian, north equestrian, entrance area, middle, Deadman's



Bartley Ranch Regional Park and Anderson Park



- TRAIL USE**
- Hiking
 - Bicycles
Bicycles Not Allowed on Flume Trail or Quail Run Trail
 - Equestrians
Equestrians Not Allowed on Flume Trail or Quail Run Trail
 - Dogs on Leash
 - No Motor Vehicles

- LEGEND**
- Bridge
 - Parking
 - Restroom
 - Picnic Area
 - Maximum Grade
 - Robert Z. Hawkins Amphitheater
 - Western Heritage Interpretive Center
 - Historic Huffaker School
 - Brick House

Trail Name	Length	Typical Grade	Maximum Grade	Typical Cross Slope	Maximum Cross Slope	Typical Trail Width	Minimum Clearance Width	Surface Type	Surface Firmness		Surface Stability	
									Typical	Worst	Typical	Worst
Ranch Loop Trail	1.5 mi	4.5%	371 ft is 16% – 25%	2.8%	18 ft is 16% – 20%	90 in	40 in	Aggregate/Gravel	0.19	0.22	0.36	0.60
Quail Run Trail	0.4 mi	7.3%	186 ft is 20% – 40%	3.5%	46 ft is 18% – 30%	60 in	25 in	Aggregate/Gravel	0.19	0.22	0.39	0.50
Flume Trail	0.2 mi	4.6%	37 ft is 14% – 19%	3.9%	47 ft is 12% – 14%	48 in	20 in	Soil	0.23	0.25	0.38	0.49
Anderson Trail (Round Trip)	1.7 mi	2.5%	196 ft is 14% – 21%	2.4%	311 ft is 7% – 11%	76 in	48 in	Aggregate/Gravel	0.19	0.22	0.39	0.52
Park Loop	0.2 mi	1.6%	64 ft is 4% – 5%	1.8%	230 ft is 3% – 4%	84 in	84 in	Aggregate/Gravel	0.18	0.19	0.37	0.43



WARNING: Trail conditions may have changed since September 2009 when these trails were assessed. Secondary trails are shown in white. Signage created by Beneficial Designs Inc. using data collected by a certified trail assessment coordinator.



Funded by the Nevada Recreational Trails Program

PRISON HILL RECREATION AREA · MOTORIZED USE AREA

PERMITTED USES

- OHVs
- Equestrian
- Hiking
- Mountain Bikes
- Dogs Under Control of Owner

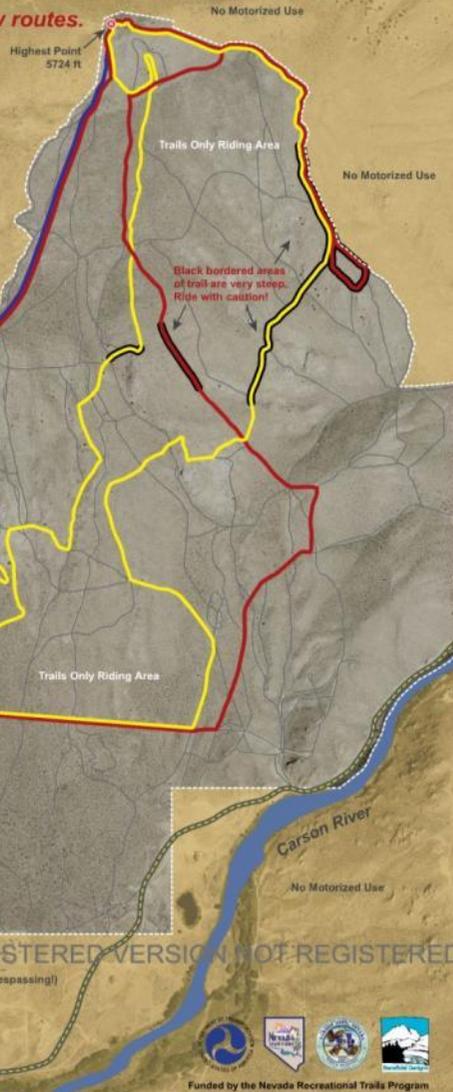
LEGEND

- Main Parking Area
- Secondary Access Area
- Motorized Use Area
- Road
- Secondary Trail

Please do not create new routes.

Watch for rattlesnakes!
 There are no water sources; carrying water is highly recommended!

There is a network of routes in the Prison Hill Recreation Area. For your safety and enjoyment, and for the protection of natural resources, only primary routes are mapped and identified.



PERMITTED USES

- OHVs
- Equestrian
- Hiking
- Mountain Bikes
- Dogs Under Control of Owner

LEGEND

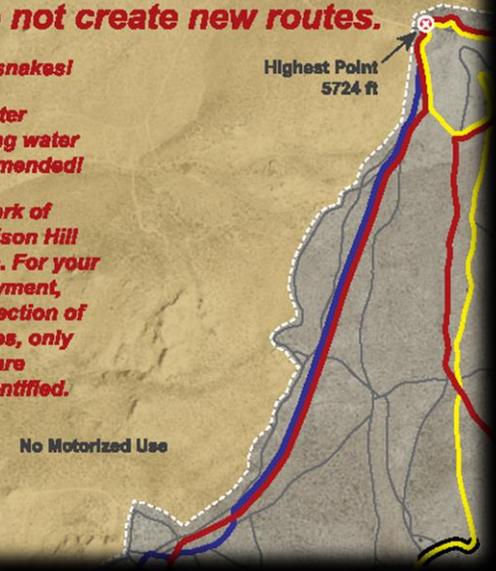
- Main Parking Area
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Watch for rattlesnakes!

There are no water sources; carrying water is highly recommended!

There is a network of routes in the Prison Hill Recreation Area. For your safety and enjoyment, and for the protection of natural resources, only primary routes are mapped and identified.



A TRAIL ACCESS INFORMATION

Vehicle Use	Length	Typical Grade	Maximum Grade Standard Ramp is 8.3%	Typical Cross Slope
Motorcycle Loop	8.0 mi	12.6%	182 ft is 45% - 65%	4.8%
Motorcycle/ATV Loop	1.6 mi	7.9%	38 ft is 40% - 51%	6.3%
Motorcycle Trail	1.6 mi	12.5%	278 ft is 25% - 42%	5.8%
Motorcycle/ATV/Jeep Loop	5.5 mi	10.9%	149 ft is 35% - 37%	4.2%

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A TRAIL ACCESS INFORMATION

Vehicle Use	Length	Typical Grade	Maximum Grade Standard Ramp is 8.3%	Typical Cross Slope	Maximum Cross Slope	Typical Tread Width	Minimum Clearance Width	Surface Type
Motorcycle Loop	8.0 mi	12.6%	182 ft is 45% - 65%	4.8%	49 ft is 20% - 34%	5.3 ft	1.2 ft	Sand / Soil
Motorcycle/ATV Loop	1.6 mi	7.9%	38 ft is 40% - 51%	6.3%	78 ft is 15% - 21%	5.5 ft	4.0 ft	Sand / Soil
Motorcycle Trail	1.6 mi	12.5%	278 ft is 25% - 42%	5.8%	694 ft is 13% - 22%	8.4 ft	6.0 ft	Sand / Soil
Motorcycle/ATV/Jeep Loop	5.5 mi	10.9%	149 ft is 35% - 37%	4.2%	83 ft is 15% - 18%	6.6 ft	7.1 ft	Sand / Soil



0 mi 0.25 mi

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Acknowledgement

Phase I & II funding for the Developed Outdoor Recreation Assessment Process was provided by the U.S. Department of Agriculture through the Small Business Innovation and Research program Grant number 2013-33610-21051

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*Working toward universal access
through research, design & education*