

R-Appendix A: The Recreation Opportunity Spectrum Framework Steps

Recreation Opportunity Spectrum (ROS) summary (adapted from Clark and Stankey, 1979) answers the principle question “ What recreational settings exist and what should be provided? ”		
ROS Component	ROS Phase	Description
Component One - Establish current condition; inventory what is	Phase One	Define and describe the recreation setting (biophysical, social and managerial attributes determined to represent continuum of opportunities); continuum classified into “zones” of opportunity
Component Two - Prescriptions; what could be and what should be	Phase Two	Assess alternative management regimes including placing locations into potential zones
	Phase Three	Select the preferred alternative
Component Three - Monitor and manage; what will be back to what is	Phase Four	Implement the preferred alternative
	Phase Five	Monitor and evaluate

Land managers describe the setting by using specific setting attributes as the basis for inventory of the area. In many cases, these attributes (USDA FS, 1990) include:

- access (trail, road, paved, gravel);
- remoteness (distance from trails and roads);
- naturalness (visibility of resource management activities such as timber harvesting);
- presence of facilities and site management;
- amount and type of encounters with other people in the area;
- types and visibility of visitor impact; and
- visitor management activities such as rules, enforcement personnel, etc.

These inventories are then used to map the existing set of ROS classes across the landscape (McCool et al., 2007)

R-Appendix B: OSMP Management Area Designations, Their Primary Characteristics, Goals and Criteria for Inclusion (City of Boulder 2005, p. 48)

Passive Recreation Area Designation

Characteristics

- Generally in close proximity to city or county development.
- Higher level of visitor use and density of existing trails.
- More evidence of human use and impacts.
- May include some interspersed patches of high-quality habitat.

Goals

- Provide a high level of public access to destinations and connection through designated trails.
- Maintain or improve passive recreational and educational opportunities, while protecting and preserving natural lands and resources.
- Accommodate high levels of visitor use with appropriate management, trails and trailheads and services.
- Reduce conflicts among visitor activities.
- Minimize the number of undesignated or “social trails;” eliminate undesignated trails when they are duplicative or damaging to resources.

Criteria for Inclusion of Management Areas in the Passive Recreation Area Designation

- Higher level of visitation.
- Trails and trailheads that accommodate high levels of visitor use.
- High density of trails.
- Offers destinations for a wide range of different passive recreational activities.
- Compatibility with adjacent land use (i.e., opportunities to coordinate with neighboring or nearby landowners/managers in providing recreational services).

Natural Area Designation

Characteristics

- Locations can be both close to and remote from development.
- Varying levels of visitor use, types of activities and availability of facilities.
- Conditions of natural ecosystems are variable- many areas with ecological systems in good condition, some with evidence of human use and impacts.
- May be in proximity to agricultural production and operations.

Goals

- Accommodate low-impact visitor activities where adequate trails exist or can be built and resource impacts can be minimized.
- Provide opportunities for passive recreational and educational activities that require topographic relief or a natural setting (e.g., hang/paragliding, climbing/bouldering, nature study, scenic viewing).

- Protect the quality of natural and agricultural resources (especially where high value resources exist).
- Eliminate undesiguated trails when they are redundant or damaging to resources.

Criteria for Inclusion of Management Areas in the Natural Area Designation

- Interspersed recreational and natural values require that management determine the appropriate mix of open space purposes and manage multiple uses accordingly.
- Relatively high resource and recreation values.
- Compatibility with adjacent land use (i.e., opportunities for coordinating habitat protection and connections and passive recreational activities/trail linkages).

Agricultural Area Designation

Characteristics

- Rural areas in the Boulder Valley.
- May be in proximity to areas of either high or low visitor use.
- Areas of intensive agricultural production or operation.

Goals

- Maintain the efficiency of agricultural production and operation.
- Manage agricultural production and operation to ensure safety for operators and visitors in the vicinity.
- Provide, where appropriate, public access and passive recreational opportunities that have minimal impacts on agricultural production and operation or other resources.
- Manage visitor access in areas of intensive agricultural production or operation to ensure visitor safety.
- Eliminate undesiguated trails when they are redundant or damaging to resources.

Criteria for Inclusion of Management Areas in the Agricultural Area Designation

- Crop production and irrigated hay fields and grazing areas.
- Areas where conflicts with visitors and their pet companions could or do adversely affect the efficiency of agricultural production and operations or endanger visitor safety.
- Compatibility with adjacent land use (i.e., opportunities for coordinating agricultural protection and recreational activities/trail linkages).

Note: Areas of concentrated livestock activity (corrals, horse boarding, etc.), private residences, machinery storage areas, etc. will be addressed in a separate policy.

Habitat Conservation Area Designation

Characteristics

- Tend to be located in more remote areas.
- Typically represent the largest blocks of an ecosystem type with few, if any, trails or roads.
- Lower level of visitor use; no or few trails and trailheads.

- Naturally functioning ecosystems (but may contain areas with evidence of human use and impacts).

Goals

- Maintain, enhance and/or restore naturally functioning ecological systems.
- Maintain, enhance and restore habitat for species of concern identified in the Boulder County and the Boulder Valley Comprehensive Plans.
- Provide public access and passive recreational opportunities that foster appreciation and understanding of ecological systems and have minimal impacts on native plant communities and wildlife habitats or other resources.
- Eliminate all undesigned trails, unless they are made part of the designated trails system or provide specialized access to appropriate low-use destinations.
- Where sustainable infrastructure exists, continue to allow public access to appropriate destinations.

Criteria for Inclusion of Management Areas in the Habitat Conservation Area Designation

- Large habitat blocks with a low density of trails, roads or development.
- High potential for restoration of natural ecosystems (including areas with restoration underway).
- Plant communities that are rare or unique on Open Space and Mountain Parks lands.
- Habitat for species of concern such as threatened, endangered, rare and other species.
- Areas with high biodiversity such as wetlands and riparian areas (especially un-trailed riparian reaches).
- Comparatively lower visitation levels.
- Compatibility with adjacent land use (i.e., opportunities for coordinating habitat protection and connections and recreational activities/trail linkage

R-Appendix C: OSMP Management Area Designations and the VMP Guidance for Management Strategies Within Each Area (City of Boulder 2005, p. 50)

Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	Passive Recreation Area Strategies	Natural Area Strategies	Agricultural Area Strategies	Habitat Conservation Area Strategies
<p>On-Trail Visitor Use</p> <p>Note: Management <i>in all areas</i> may include seasonal or local requirements for visitors to stay on-trail or seasonal/local closures to address environmental sensitivity or trail sustainability.</p> <p>All designated trails will be signed and indicated on trail maps.</p>	<p><u>Encourage on-trail use.</u> Require on-trail use in sensitive areas and/or at specific times, unless an off-trail permit is obtained.</p>	<p><u>Encourage on-trail use.</u> Require on-trail use in sensitive areas and/or at specific times, unless an off-trail permit is obtained.</p>	<p><u>Encourage on-trail use.</u> Require on-trail use in sensitive areas and/or at specific times, unless an off-trail permit is obtained.</p> <p>Consider/provide designated on-trail access to selected destinations.</p>	<p><u>Require on-trail use</u> except: 1) in a limited number of designated off-trail activity areas; or 2) if an off-trail permit is obtained for OSMP-sponsored activities or other limited and approved public use.</p> <p>Consider/provide designated on-trail access to selected destinations.</p>
<p>Trail Functions, New Trails and Interconnected Trail System</p> <p>Note: In all management areas, OSMP will provide different classes of trails. Trail classes are matched to the specific travel needs / opportunities and the environmental context in a given area. Trails will provide different levels of access, offer different types of travel experiences / challenges, and use different physical designs and materials. Trails will accommodate different types and levels of use, but all are intended to accommodate use</p>	<p>Build and maintain a hierarchy of trails that encourage visitors to travel on-trail and minimize impacts. New trails to important destinations will be considered.</p> <p>Improve and construct sustainable trail linkages to create an interconnected trail system.</p>	<p>Build and maintain a hierarchy of trails that encourage visitors to travel on-trail and minimize impacts. New trails to important destinations will be considered.</p> <p>Improve and construct sustainable trail linkages to create an interconnected trail system.</p>	<p>Minimize new trails and trail density; locate new trails to minimize impacts on agricultural operations.</p> <p>Consider designating/building trails that:</p> <ul style="list-style-type: none"> • Do not impinge upon agricultural operations • Provide appropriate access • Include appropriate linkages and connections 	<p>Minimize new trails and trail density; locate new trails to minimize impacts on habitat quality.</p> <p>Consider designating/building trails that:</p> <ul style="list-style-type: none"> • Do not impinge upon ecological systems • Provide appropriate access • Include appropriate linkages and connections

Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	Passive Recreation Area Strategies	Natural Area Strategies	Agricultural Area Strategies	Habitat Conservation Area Strategies
without undue maintenance demands and to minimize impacts on the environment. OSMP will make management decisions based upon the best available information and evaluate the appropriateness and effectiveness of management actions.				
Trail Design for Level of Use	Design and construct trails and other facilities to sustain a <u>higher</u> level of visitor use.	Design and construct trails and other facilities to sustain a <u>variable</u> level of visitor use.	Design and construct trails and other facilities to sustain a <u>variable</u> level of visitor use.	Design and construct trails and other facilities to sustain a <u>low</u> level of visitor use.
Undesignated Trails	Lower priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: <ul style="list-style-type: none"> • Evaluate best management actions • Designate • Re-route • Close and reclaim • Retain undesignated trails • Monitor newly established or developing undesignated trails 	Variable priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: <ul style="list-style-type: none"> • Evaluate best management actions • Designate • Re-route • Close and reclaim • Retain undesignated trails • Monitor newly established or developing undesignated trails 	Variable priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: <ul style="list-style-type: none"> • Evaluate best management actions • Designate • Re-route • Close and reclaim • Retain undesignated trails 	High priority for management of undesignated trails. Minimize new undesignated trails. Management actions for existing undesignated trails include: <ul style="list-style-type: none"> • Evaluate best management actions • Designate • Re-route • Close and reclaim

Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	Passive Recreation Area Strategies	Natural Area Strategies	Agricultural Area Strategies	Habitat Conservation Area Strategies
Access to Areas Normally Closed to Visitors	Provide guided educational hikes in areas normally closed to visitors.	Provide guided educational hikes in areas normally closed to visitors.	Provide guided educational hikes in areas normally closed to visitors.	Provide guided educational hikes in areas normally closed to visitors or require permits for off-trail use.
Dog Management	<p>Visitors are strongly encouraged to keep dogs on-trail.</p> <p>Dog management is predominantly voice-and-sight control. Dogs on-leash, dogs prohibited or seasonal dog requirements may be implemented.</p>	<p>Visitors are strongly encouraged to keep dogs on-trail.</p> <p>Dog management is predominantly voice-and-sight control. Dogs on-leash, dogs prohibited or seasonal dog requirements may be implemented.</p>	<p>Visitors are strongly encouraged to keep dogs on-trail.</p> <p>Dog management is predominantly voice-and-sight control. Dogs on-leash, dogs prohibited, dogs on-corridor voice-and-sight control or seasonal dog requirements may be implemented.</p>	<p>Dogs are required to be on-trail, with some exceptions allowing on-corridor voice-and-sight control.</p> <p>Dog management is predominantly on-leash. Dogs on-leash, dogs prohibited, dogs on-corridor voice-and-sight control or seasonal dog requirements may be implemented.</p>
Nighttime Use	Trailhead parking prohibited 11 p.m. to 5 a.m. (except Panorama	Trailhead parking prohibited 11 p.m. to 5 a.m.	Trailhead parking prohibited 11 p.m. to 5 a.m.	Trailhead parking prohibited 11 p.m. to 5 a.m. and a nighttime curfew encouraged one hour after dusk to one

Management Strategies for Open Space and Mountain Parks Management Areas				
Management Issue	Passive Recreation Area Strategies	Natural Area Strategies	Agricultural Area Strategies	Habitat Conservation Area Strategies
	Point and Halfway House).			hour before dawn.
Emphasis for Education and Enforcement Activities	Target educational and enforcement services to reduce visitor conflict, foster appreciation and protection of the OSMP environment and support resource protection.	Target educational and enforcement services to reduce visitor conflict, foster appreciation and protection of the OSMP environment and support resource protection.	Target educational and enforcement services to support on-trail visitor use and foster appreciation and protection of agricultural resources.	Target educational and enforcement services to support on-trail visitor use and foster appreciation and protection of natural resources.
Visitor Services and Facilities Matched to Level of Use	Provide a level of visitor services and facilities to support <u>higher use levels</u> and a quality visitor experience (interpretive signs, scenic pull-outs, picnic tables, toilets, etc.).	Provide a moderate level of visitor services and facilities.	Provide a variable level of visitor services and facilities matched to the levels of use encountered.	Provide a low level of visitor services and facilities, except those supporting basic protection and maintenance services.

R-Appendix D: 2004/2005 Visitation Study Hourly Visitation Distribution Across OSMP (Vaske et al. 2009); Gray Cells Indicate Hours not Sampled During 2014 North TSA Visitation Study

Hour	Weekday Person Visits	Weekday Percent	Weekend Person Visits	Weekend Percent	Holiday Person Visits	Holiday Percent	System-wide Average Hourly Sums
Midnight	3,544	0.16%	1,341	0.09%	161	0.07%	0.32%
1:00 a.m.	3,272	0.15%	1,190	0.08%	210	0.09%	0.32%
2:00 a.m.	1,475	0.07%	970	0.07%	70	0.03%	0.17%
3:00 a.m.	1,205	0.06%	968	0.07%	46	0.02%	0.15%
4:00 a.m.	1,664	0.08%	1,892	0.13%	72	0.03%	0.24%
5:00 a.m.	14,671	0.68%	2,718	0.19%	527	0.22%	1.09%
6:00 a.m.	80,108	3.70%	15,487	1.09%	2,742	1.13%	5.92%
7:00 a.m.	135,956	6.29%	50,127	3.53%	6,904	2.85%	12.67%
8:00 a.m.	156,254	7.22%	91,328	6.43%	12,181	5.03%	18.68%
9:00 a.m.	168,050	7.77%	119,710	8.43%	17,196	7.10%	23.30%
10:00 a.m.	165,694	7.66%	143,618	10.11%	22,073	9.12%	26.89%
11:00 a.m.	166,446	7.70%	150,683	10.61%	25,848	10.67%	28.98%
Noon	167,731	7.76%	144,396	10.16%	25,950	10.72%	28.64%
1:00 p.m.	152,305	7.04%	140,924	9.92%	26,611	10.99%	27.95%
2:00 p.m.	150,770	6.97%	144,015	10.14%	25,676	10.60%	27.71%
3:00 p.m.	154,492	7.14%	134,559	9.47%	23,748	9.81%	26.42%
4:00 p.m.	174,992	8.09%	107,215	7.55%	19,524	8.06%	23.70%
5:00 p.m.	168,274	7.78%	71,433	5.03%	13,180	5.44%	18.25%
6:00 p.m.	141,284	6.53%	44,144	3.11%	9,602	3.97%	13.61%
7:00 p.m.	91,425	4.23%	29,156	2.05%	5,276	2.18%	8.46%
8:00 p.m.	41,621	1.92%	13,826	0.97%	2,516	1.04%	3.93%
9:00 p.m.	12,195	0.56%	5,143	0.36%	993	0.41%	1.33%

10:00 p.m.	5,992	0.28%	3,604	0.25%	624	0.26%	0.79%
11:00 p.m.	3,458	0.16%	2,090	0.15%	432	0.18%	0.49%

R-Appendix E: 2010/2011 Visitor Survey Methodology Synopsis

Staff conducted a self-administered exit survey (**R-Appendix F**) of visitors leaving OSMP property from June 1, 2010 through May 31, 2011. The survey period consisted of four seasons: summer (June 1 through Aug. 31, 2010), fall (Sept. 1 through Nov. 30, 2010), winter (Dec. 1, 2010 through Feb. 28, 2011), and spring (March 1 through May 31, 2011).

Staff used a two-stage cluster sampling design to randomly sample exiting OSMP visitors. OSMP access points were the primary sampling units in this design and exiting visitors were the secondary sampling units.

For more detail, see VanderWoude, D. 2015.

R-Appendix F: 2010-2011 OSMP Visitor Survey Instrument



Open Space and Mountain Parks Survey

Your feedback on this survey enables city staff to better understand visitor's views and improve service delivery. Your participation is voluntary and your answers are anonymous. **Thank you — your input is appreciated!**

1. What time did you start on a trail today? _____ Start time _____ Current time
2. How did you get to the trailhead? Car Walk/Run Bike Bus Other
3. How many people are in your group? _____
4. Which one of the following was the most important reason for visiting Open Space & Mountain Parks?
I came here to enjoy the place itself.
I came here because it is a good place to do the activities that I enjoy.
I came here because I wanted to spend more time with family or friends.
5. What activities did you do during this visit? (PLEASE CHECK ALL THAT APPLY)
Climbing/Bouldering Walking dog(s) Viewing scenery
Photography Picnicking Viewing wildlife
Social gathering Contemplation/Meditation Horseback riding
Hiking Biking Nature study
Running Pleasure driving Other _____
6. Please **CIRCLE ONE** activity from **ABOVE** that you consider your **PRIMARY ACTIVITY** today.
7. How many dogs are with you today? 0 1 2 3 4 5+
8. What made your trip enjoyable today? (PLEASE CHECK ALL THAT APPLY)
Scenery Close to home Get away from daily pressures
Wildlife Family or friends Exercise/Health
Plants/Wildflowers Being with my dog(s) Other _____
9. Where do you live?
Boulder (within city limits) Longmont Other area in Colorado
Louisville Unincorporated Boulder County Out of state
Lafayette Other city in Boulder County Out of country
Superior Metro Denver
10. Please estimate how many times per month, on average, you have visited Open Space & Mountain Parks during the last 12 months? _____ Times per month

11. How many years have you been coming to Open Space & Mountain Parks?
 _____ Number of years

12. Please grade Open Space & Mountain Parks on the following, based on your recent experience.

PLEASE CHECK ONE FOR EACH CATEGORY.	A= Excellent				F= Failing	
	A	B	C	D	F	N/A
Restroom cleanliness	<input type="checkbox"/>					
Usefulness of signs and brochures	<input type="checkbox"/>					
Fixing eroded or trampled areas	<input type="checkbox"/>					
Trail conditions and maintenance	<input type="checkbox"/>					
Enforcement of rules	<input type="checkbox"/>					
Ability to access your destination	<input type="checkbox"/>					
Trailhead and nature education	<input type="checkbox"/>					
Trash cans and bag dispensers	<input type="checkbox"/>					
Overall satisfaction with Open Space & Mountain Parks	<input type="checkbox"/>					

13. Please rate your recent experience with the following visitor activities.

PLEASE CHECK ONE FOR EACH CATEGORY.	A= Excellent				F= Failing	
	A	B	C	D	F	N/A
Experience with runners	<input type="checkbox"/>					
Experience with bikers	<input type="checkbox"/>					
Experience with hikers	<input type="checkbox"/>					
Experience with horseback riders	<input type="checkbox"/>					
Experience with dogs and dog walkers	<input type="checkbox"/>					

14. Sometimes the behavior of others can interfere with your visit to OSMP. Examples include failure to share the trail, not picking up after dog, approaching without warning or shouting loudly. These types of situations are often referred to as *recreation conflict*.

DID YOU EXPERIENCE:	Today?		Last 12 months?	
	No	Yes	No	Yes
Recreation conflict?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes <i>today</i> , describe:				
Recreation conflict with dog walkers or dogs specifically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes <i>today</i> , describe:				
Recreation conflict with mountain bikes specifically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes <i>today</i> , describe:				

15. Are you using a particular Open Space and Mountain Parks area less often or have you even stopped using it entirely? No Yes **If yes, where?**

If yes, describe the reason _____

16. How old were you on your last birthday? _____ Years old

PLEASE REFER TO THE MAP*

17. Did you enter from this access/trailhead?

Yes

If **No**, where did you enter from? Please write access number _____ (see map)

*Map available upon request.

R-Appendix G: North TSA Visitor Characteristics Compared with Other TSAs and OSMP System-wide

Table R4. OSMP visitor residency by TSA (2011)

Trail Study Area	Type of Measure	Visitor Residency						Total
		Boulder (in city limits)	Boulder County (outside city limits)	Metro Denver	Other area in CO	Out of State	Out of Country	
North	Count	312	73	13	9	19	2	428
	Percent	72.9%	17.1%	3.0%	2.1%	4.4%	.5%	100.0%
East	Count	292	133	10	7	11	1	454
	Percent	64.3%	29.3%	2.2%	1.5%	2.4%	.2%	100.0%
South	Count	111	78	47	23	17	1	277
	Percent	40.1%	28.2%	17.0%	8.3%	6.1%	.4%	100.0%
West	Count	778	187	150	53	162	33	1363
	Percent	57.1%	13.7%	11.0%	3.9%	11.9%	2.4%	100.0%
All TSAs Combined	Count	1493	471	220	92	209	37	2522
	Percent	59.2%	18.7%	8.7%	3.6%	8.3%	1.5%	100.0%

Table R5. Proportion of visitors in each age group by TSA (2011)

Trail Study Area	Type of measure	Age Category							Total
		<20	20-29	30-39	40-49	50-59	60-69	70+	
North	Count	2	34	94	94	110	65	20	419
	Percent	.5%	8.1%	22.4%	22.4%	26.3%	15.5%	4.8%	100%
East	Count	0	54	88	106	111	62	24	445
	Percent	0.0%	12.1%	19.8%	23.8%	24.9%	13.9%	5.4%	100%
South	Count	3	53	55	77	55	20	10	273
	Percent	1.1%	19.4%	20.1%	28.2%	20.1%	7.3%	3.7%	100%
West	Count	46	282	268	249	258	172	35	1,310
	Percent	3.5%	21.5%	20.5%	19.0%	19.7%	13.1%	2.7%	100%
All TSAs Combined	Count	51	423	505	526	534	319	89	2,447
	Percent	2.1%	17.3%	20.6%	21.5%	21.8%	13.0%	3.6%	100%

Table R6. Number of visits to OSMP per month by TSA (2011)

Trail Study Area	Type of Measure	Number of Visits per Month					Total
		0-1	>1-4	>4-12	>12-20	>20	
North	Count	36	49	110	106	126	427
	Percent	8.4%	11.5%	25.8%	24.8%	29.5%	100%
East	Count	24	61	138	125	112	460
	Percent	5.2%	13.3%	30.0%	27.2%	24.3%	100%
South	Count	56	63	102	38	17	276
	Percent	20.3%	22.8%	37.0%	13.8%	6.2%	100%
West	Count	316	262	326	249	202	1,355
	Percent	23.3%	19.3%	24.1%	18.4%	14.9%	100%
All TSAs Combined	Count	432	435	676	518	457	2,518
	Percent	17.2%	17.3%	26.8%	20.6%	18.1%	100%

Table R7. Number of years visiting OSMP by TSA (2011)

Trail Study Area	Type of Measure	Number of Years Visiting OSMP						Total
		1 or less	>1-2	>2-5	>5-10	>10-20	>20	
North	Count	54	19	60	71	107	118	429
	Percent	12.6%	4.4%	14.0%	16.6%	24.9%	27.5%	100%
East	Count	30	17	72	83	146	109	457
	Percent	6.6%	3.7%	15.8%	18.2%	31.9%	23.9%	100%
South	Count	34	25	41	51	67	54	272
	Percent	12.5%	9.2%	15.1%	18.8%	24.6%	19.9%	100%
West	Count	271	99	169	198	299	320	1,356
	Percent	20.0%	7.3%	12.5%	14.6%	22.1%	23.6%	100%
All TSAs Combined	Count	389	160	342	403	619	601	2,514
	Percent	15.5%	6.4%	13.6%	16.0%	24.6%	23.9%	100%

Table R8. Visitor self-reported primary activity by TSA (2011)

Trail Study Area	Type of Measure	Primary Activity							TSA Total
		Biking	Climbing/ Bouldering	Hiking	Horseback Riding	Running	Walking Dogs	Other *	
North	Count	57	1	141	1	103	77	26	406
	Percent	14.0%	.2%	34.7%	.2%	25.4%	19.0%	6.4%	100%
East	Count	68	0	56	0	126	135	22	407
	Percent	16.7%	0.0%	13.8%	0.0%	31.0%	33.2%	5.4%	100%
South	Count	102	0	59	0	33	33	25	252
	Percent	40.5%	0.0%	23.4%	0.0%	13.1%	13.1%	9.9%	100%
West	Count	14	45	684	0	150	182	135	1,210
	Percent	1.2%	3.7%	56.5%	0.0%	12.4%	15.0%	11.2%	100%
All TSAs Combined	Count	241	46	940	1	412	427	208	2,275
	Percent	10.6%	2.0%	41.3%	.0%	18.1%	18.8%	9.1%	100%

*Includes activities such as wildlife viewing, socializing or picnicking

Table R9. Number of people in group by TSA (2011)

Trail Study Area	Type of Measure	Number of People in Group				Total
		1	2	3 or 4	5+	
North	Count	264	143	23	2	432
	Percent	61.1%	33.1%	5.3%	.5%	100%
East	Count	283	130	29	16	458
	Percent	61.8%	28.4%	6.3%	3.5%	100%
South	Count	119	122	23	12	276
	Percent	43.1%	44.2%	8.3%	4.3%	100%
West	Count	521	539	207	93	1,360
	Percent	38.3%	39.6%	15.2%	6.8%	100%
All TSAs Combined	Count	1,187	934	282	123	2,526
	Percent	47.0%	37.0%	11.2%	4.9%	100%

Table R10. Number of dogs with visitor by TSA (2011)

Trail Study Area	Type of Measure	Number of Dogs				Total
		0	1	2	3+	
North	Count	303	110	19	3	434
	Percent	69.8%	25.3%	4.4%	.7%	100%
East	Count	288	129	35	7	457
	Percent	63.0%	28.2%	7.7%	1.5%	100%
South	Count	203	57	11	2	273
	Percent	74.4%	20.9%	4.0%	.7%	100%
West	Count	932	311	89	23	1,352
	Percent	68.93%	23.00%	6.58%	1.70%	100%
All TSAs Combined	Count	1,726	607	154	35	2,516
	Percent	68.6%	24.1%	6.1%	1.4%	100%

Table R11. Mode of transportation to OSMP (2011)

Trail Study Area	Type of Measure	Mode of Transportation					Total
		Car	Walk/Run	Bike	Bus	Other	
North	Count	167	217	46	0	1	431
	Percent	38.7%	50.3%	10.7%	0.0%	.2%	100%
East	Count	165	202	89	0	0	456
	Percent	36.2%	44.3%	19.5%	0.0%	0.0%	100%
South	Count	199	13	65	0	0	277
	Percent	71.8%	4.7%	23.5%	0.0%	0.0%	100%
West	Count	893	422	32	1	6	1,354
	Percent	66.0%	31.2%	2.4%	.1%	.4%	100%
All TSAs Combined	Count	1,424	854	232	1	7	2,518
	Percent	56.6%	33.9%	9.2%	.0%	.3%	100%

R-Appendix H: Designated Trails in the North TSA with Associated Mileage

Name	Mileage
Buckingham Park	0.23
Cobalt	0.89
Degge	0.90
Eagle	3.26
Foothills - Wonderland Lake spur	0.02
Foothills North	0.91
Foothills South	0.72
Foothills Spur	0.03
Hidden Valley	1.24
Hogback Ridge	1.79
Left Hand	2.91
Mesa Reservoir	1.01
North Rim	0.24
Old Kiln	0.80
Old Kiln Spur	0.37
Old Mill	0.21
Sage	1.83
Wonderland Hill	0.96
Wonderland Lake	0.87
Total Trail Miles in North TSA	19.19

R-Appendix I: Designated Entry Point with Associated Classification

Entry Point Name	Entry Point Type	Classification
Buckingham Park	Trailhead	T3
Lefthand	Trailhead	T1
Boulder Valley Ranch	Trailhead	T1
Eagle	Trailhead	T1
Four Mile Creek	Trailhead	T1
Foothills	Trailhead	T1
Wonderland Lake	Trailhead	T2
Cottonwood Picnic Area	Access to Recreational Facility	R2
Wonderland Lake and Poplar	Access Point	A2
Leftland Trail and Pebble Beach Ln.	Access Point	A1
Eagle Parking Coffee	Access Point	A3
Foothills access to Eagle	Access Point	A1
Wonderland Lake at Utica	Access Point	A3
Foothills at Second and Dakota Blvd	Access Point	A1
Foothills at Second and Denver	Access Point	A1

R-Appendix J: Regional Trail Concepts from Public Agency Plans and Efforts

Map Key	Regional Trail Concept	Lead Agency	Guiding Document(s) or Agreement(s)	General Concept
1	Rocky Mountain Greenway Project	Department of Interior – National Park Service	America's Great Outdoors and a partnership agreement between Secretary of the Interior and the Governor of Colorado	Create uninterrupted trail connections between Rocky Flats, Rocky Mountain National Park, other destinations and existing community trail networks.
2	Joder to Heil Ranch	Boulder County Parks and Open Space (BCPOS)	Boulder County Comprehensive Plan (BCCP) and 2013 OSMP Acquisitions Plan	Create long-distance mountain biking opportunities to connect with existing mountain bike trail networks.
3	Joder to Olde Stage Road	City of Boulder – Open Space and Mountain Parks (OSMP)	BCCP and temporary access agreements with Boulder County and others	Construct an interim trail to allow visitor access until final guidance is provided in North TSA Plan.
4	Joder to Lagerman Reservoir	BCPOS	BCCP	Create an east-west axis across grasslands connecting the Joder property, Lefthand Trailhead, Lagerman Reservoir and beyond to the City of Longmont.
5	North Rim to Left Hand connector	To be determined	Boulder Valley Comp Plan (BVCP)	Connect Lefthand Trail with North Rim Trail south of Loukonen Reservoir.
6	Axelson to North Rim	OSMP	<ul style="list-style-type: none"> BVCP and North Boulder Valley Area Management Plan 	Connect North Rim Trail with Boulder Reservoir and Boulder Valley Ranch trail network.
7	Lyons to Boulder (Boulder Feeder Canal Trail)	BCPOS	<ul style="list-style-type: none"> BCCP BVCP VMP 	Create multi-use path between Lyons and Boulder along Feeder Canal to provide gentle grades attractive to all ages/abilities. Planning is on hold indefinitely.
8	Lagerman Complex	BCPOS	BCCP and Lagerman/Imel/AHI Open Space Complex Management Plan	Provide internal trail network within open space complex and future connections into City of Longmont trail system.

Map Key	Regional Trail Concept	Lead Agency	Guiding Document(s) or Agreement(s)	General Concept
9	Colorado Front Range Trail	Colorado Parks and Wildlife	Colorado Front Range Trail Implementation Plan	The vision of this trail is to create an 876-mile multi-purpose trail from Wyoming to New Mexico, along the Front Range of Colorado.
10	Lyons to Boulder (North of reservoir on OSMP land)	OSMP	BVCP and VMP	The section of the stalled Lyons-to-Boulder Trail is on OSMP land.
11	Multi-Use Reservoir Trail	City of Boulder Parks and Recreation	Boulder Reservoir Master Plan	Create trail along 51st and 55th streets, and along the south shore, to provide access around entire reservoir.
12	IBM Connector	Boulder County (through construction, then managed by OSMP)	<ul style="list-style-type: none"> • BVCP • VMP • Reservoir Master Plan • 2003 Transportation Master Plan • Other reports 	A planned multi-use regional trail and underpass connecting Gunbarrel to the City of Boulder parks and trails system. Design and construction is underway in 2015.
13	Reservoir Road to Diagonal	Boulder County	BVCP and Greenways Master Plan	Create trail and underpass connecting Reservoir Road along the south shore of the reservoir with Gunbarrel.
14	Four Mile Canyon Creek Underpass	Boulder County	BVCP and Greenways Master Plan	Construct underpass under railroad to connect existing trail segments.

R-Appendix K: Key Destinations Served or Not Served

Passive Recreation Area			Total: 7
Map Number	Key Destination Name	Served/Not Served	
1	Wonderland Lake	Designated and Undesignated Trail	
2	Paragliding Launch Site 1	Designated and Undesignated Trail	
3	Paragliding Launch Site 2	Designated and Undesignated Trail	
4	Paragliding Launch Site 3	Designated and Undesignated Trail	
5	Old Kiln	Not Served	
7	Mesa Reservoir	Undesignated Trail	
8	BVR Pond	Designated and Undesignated Trail	
Natural Area			Total: 1
Map Number	Key Destination Name	Served/Not Served	
9	Beech Pavilion	Designated Trail**	
Habitat Conservation Area			Total: 4
Map Number	Key Destination Name	Served/Not Served	
6	Rock View Point	Undesignated Trail	
10	Six Mile Fold	Not Served	
11	Joder Peak	Not Served	
12	Palisades Climbing Area	Undesignated Trail	

** Served by City of Boulder Bike and Pedestrian System

R-Appendix L: Undesignated Trail Mapping Methodology Synopsis

All undesignated trails and road-like pathways meeting the mapping criteria on OSMP-managed properties through the Weiser acquisition of 2011 were surveyed between July 2011 and November 2012. Using a Global Positioning System (GPS), OSMP staff mapped and documented attributes of start, end and interior points spaced at approximately 200-foot intervals along undesignated trails and road-like pathways. A Geographic Information System (GIS) map of undesignated trails and road-like pathways was created by digitizing segments between the start, interior and end GPS points. The GIS map and associated database of attributes provided tools for visualization and analyses. GIS spatial analysis techniques were developed to determine the size of trail and road-free OSMP blocks, to quantify the density of undesignated trails and roads across the OSMP system and to evaluate spatial patterns of undesignated trails and roads in proximity to designated and undesignated access points.

For more detail, see Lezberg, A. 2015.

R-Appendix M: Dog Regulation Compliance Methodology Synopsis

The **Voice and Sight Regulations component** of the effectiveness monitoring was an observation study designed to evaluate dog guardian compliance with observable aspects of specific dog regulations from the voice and sight ordinances. During field monitoring, data was collected to describe visitor party attributes, dog behaviors and guardian responses. Observations were categorized as “pass” events where no dog behaviors were recorded, “interaction” events where the dog under observation exhibited a behavior toward another person, dog, wildlife or livestock and as “other” events describing situations where the dog was out of sight and/or the guardian issued a command *and* where these observations were not associated with a pass or interaction event. The resulting descriptive data were evaluated and interpreted using the collected information for each party. The use of these data provided context for each party’s recorded behaviors and interactions. Evaluation and interpretation was conducted by the monitoring staff. For some indicators, project management and ranger staff also participated in determining a final compliance outcome for each visitor party.

The **Leash Interview component** of the effectiveness monitoring was a visitor interview administered to visitor parties with at least one dog off-leash and without a leash visible to the observer for each off-leash dog. During the interview, each guardian was asked to demonstrate that the guardian possessed a leash for each dog they were managing under voice and sight control.

Additional measures of dog regulation compliance

Two additional measures of dog regulation compliance *not specific to the Tag Program* were monitored during the study period (described below). These two additional components included dog excrement removal and leash compliance on both year-round and seasonal leash-required trails. These measures were added to this project based upon direction received from the Open Space Board of Trustees (OSBT) and project team staff.

- The **Dog Excrement component** was an observational study designed to evaluate dog guardian compliance with dog excrement pickup and removal regulations. This component was executed simultaneously with the Voice and Sight component.
- The **Leash Required component** was an observational study designed to evaluate dog guardian compliance with seasonal and year-round leash laws on OSMP leash-required trails.

For more detail, see VanderWoude, D. & Bitume, E. 2015

R-Appendix N: Classes and Standards for Trailheads, Access Points and Recreation Sites

Classes*	Visitor Use Patterns	Examples	Standard Facilities**	Optional	Replace - Nonconforming Structures	Maintenance Standards
Class A1 Access to trails	Very Low to Low	Four Pines at 17th Street Shanahan Ridge - Hardscrabble Sawhill Access East	1. Wayfinding/regulatory sign post ***	1. Trailhead signs *** 2. Bike rack	1. Dog station	1. Checked monthly 2. Pickup loose trash 3. Fix and repair any damage
Class A2 Access to trails	Medium to High	Wonderland Lake Trail at Poplar South Boulder Creek Trail south of South Boulder Road Eagle Trail at coffee shop Dakota Ridge - 4th and Maxwell	1. Wayfinding/regulatory sign post ***	1. Trailhead signs *** 2. Fence 3. Bike Rack	1. Dog station 2. Outhouse 3. Trash can(s)	1. Checked monthly 2. Pickup loose trash 3. Fix and repair any damage
Class A3 Access to trails	Very High	Wonderland Lake Trail at Utica Sanitas Valley Trail, south end	1. Trailhead signs *** 2. Dog station 3. New bear proof trash can	1. Fence 2. Bike rack	1. Outhouse	1. Checked monthly 2. Pickup loose trash 3. Fix and repair any damage
Class T1 Simple/ Minor developed Trailhead	Very Low to Low	White Rocks Greenbelt Plateau Halfway House White Rocks	1. Fence 2. Parking area (road base surface) 3. Trailhead signs *** 4. New bear proof trash can 5. Dog stations 6. Bike racks	1. Access to facilities 2. Bike rack 3. Horse trailer parking 4. Asphalt parking if required by law 5. Parking bollards	1. Bench 2. Grills 3. Horse trailer parking 4. Picnic tables 5. Outhouse	1. Checked twice weekly 2. ID erosion problems and fix as needed 3. Pickup loose trash 4. Fix and repair any damage 5. Trim and mow when vegetation height is greater than 8 inches
Class T2 Developed/ Improved Trailhead	Medium	South Teller Wonderland Lake Realization Point Crown Rock Boulder Valley Ranch	1. Fence 2. Parking area (road base surface) 3. Trailhead signs *** 4. Trash can(s) 5. Dog stations 6. ADA Picnic tables/area 7. Bike racks	1. Outhouse if not near developed area 2. Bike Rack 3. Bench 4. Parking bollards 5. Asphalt parking if required by law 6. Horse trailer parking	1. Grills	1. Checked twice weekly 2. ID erosion problems and fix as needed 3. Pickup loose trash 4. Fix and repair any damage 5. Trim and mow when vegetation height is greater than 8 inches 6. Service restrooms 7. Power wash restrooms monthly or as needed
Class T3 Fully Developed Trailhead	High to Very High	Chautauqua Marshall Mesa Dry Creek Four Mile Creek	1. Fence 2. Parking area (road base surface) 3. Trailhead signs *** 4. New bear proof trash can 5. Dog stations 6. Picnic tables/area 7. Bike racks 8. Outhouse	1. Access to facilities 2. Bench 3. Parking bollards 4. Asphalt parking if required by law 5. Horse trailer parking 6. Bike Rack	1. Grills 2. Campground	1. Checked twice weekly 2. ID erosion problems and fix as needed 3. Pickup loose trash 4. Fix and repair any damage 5. Trim and mow when vegetation height is greater than 8 inches 6. Service restrooms 7. Power wash restrooms monthly or as needed
Class R1 Access to recreational facilities (No access to OSMP designated trail system)	N/A	Bench at Eisenhower Bench at Forest and 4th Juniper pulloff in Lefthand	1. Wayfinding/regulatory sign post ***	1. Trailhead signs *** 2. Access to facilities 3. Fence 4. Bench 5. Bike Rack	1. Dog station	1. Checked monthly 2. ID erosion problems and fix as needed 3. Pickup loose trash 4. Fix and repair any damage 5. Trim and mow when vegetation height is greater than 8 inches
Class R2 Access to recreational facilities (No access to OSMP designated trail system)	N/A	Cottonwood pull off (Lefthand Canyon) Baseline Picnic Area Pulloffs on Flagstaff Rd	1. Wayfinding/regulatory sign post *** 2. Picnic tables	1. Trailhead signs *** 2. Access to facilities 3. Fence 4. Bench 5. Picnic tables 6. Trash can 7. Bike Rack	1. Dog station 2. Grills	1. Checked monthly 2. ID erosion problems and fix as needed 3. Pickup loose trash 4. Fix and repair any damage 5. Trim and mow when vegetation height is greater than 8 inches

*Recreational facilities include picnic areas, viewpoints, bench sites. Trailheads provide access to a trail and have at least one parking spot managed by OSMP.

**Please see 'Definition of Facilities' attached.

*** Please see "Trailhead signs and structures" document to view various signs used at each class of trailhead

OSMP Definitions of Trailhead Facilities

11-13-2008

Parking Areas Surfaces

Road base

Parking area surfaces using road base will be built to standards found in Colorado Department of Transportation (CDOT): Standard Specifications for Road and Bridge Construction (1999) CDOT standards.

CDOT standards for road base surfaced parking areas call for a road base thickness of six inches of Class 6 road base. OSMP parking areas shall be road base unless required by law or if there is significant erosion potential.

Asphalt

Parking area surfaces using asphalt will be built to CDOT standards found in Colorado Department of Transportation (CDOT): Standard Specifications for Road and Bridge Construction (1999).

CDOT standards for driveway pavement include: Type S from roadway pavement to right of way line, thickness = minimum 6 inches. Additional 6 inches of Class 6 road base shall be installed below the asphalt pavement.

Parking slots

Each slot will be 9 feet wide by 19 feet long.

Parking slots for the disabled will be 13 feet wide by 19 feet long and will meet disabled specifications found in USDA FSORAG.

Horse trailer parking

Horse trailer parking will be 'drive through' style. Horse trailer parking slot dimensions will be 12 feet wide by 50 feet long. A driveway entrance to parking slots will be maintained with an internal radius of 30 feet and an external radius of 50 feet.

Driveway pavement specifications

Will meet CDOT standards.

Drainage

Parking lots will be graded to drain to engineered detention pond with drain pipe to nearest drainage way.

Parking bollards

Parking bollards will be constructed and installed as follows. Parking bollards will be constructed of one 6"x6"x5' and two 6"x6"x2' treated lumber. These will be bolted together at each end of the 6"x6"x5' using two 10" timber locks fasteners on each end. This will form a U shaped structure. Two 8"x8"x 2' holes will be excavated so that each end of the U shaped form can be placed in the ground, leaving the 6"x6"x5' at ground level. Two ½ inch holes will be drilled through the 6"x6"x5' cross member, at a distance approximately 20" out from centerline, in each direction. A two foot section of number 4, (1/2") rebar will be used to secure the structure in the soil substrate.

Trailhead signs

Please see attached 'Trailhead Sign Structures', 'Parking Area Signs' and 'Visitor Information Kiosks'. All signs will be placed to ADA specifications found in USDA FSORAG.

Trash cans

All trash cans will be Bear Saver trash cans model # HB2G-P (phone #909-605-1697). All cans will be placed to ADA specifications found in USDA FSORAG. Mounting for these trash cans will use 4" x 6" x 34" timbers that are below ground level and installed with ½ rebar. The trash can will then be mounted to the timbers with four inch lag bolts.

Dog stations

Please see attached "Trailhead Sign Structures" sheet. All dog stations will be placed to ADA specifications found in USDA FSORAG.

Dog poop-bag tubes

All dog waste-bag tubes will be constructed using schedule 40, white 6"x 2' PVC tubing with a 4" tube reducer on bottom of tube. A 6" cap will be attached to the top using a 1/8" nylon lanyard. The tube will then be placed on dog stations using several washers to allow for cap removal and replacement using two 3" X 5/8" lag bolts at a height compliant with ADA standards. Tubes will be checked and stocked during trash runs.

Picnic tables and picnic areas

All picnic tables will be Pilot Rock model # PT/B-6PW (phone #800-762-5002). Any older cement tables will be maintained until they need to be replaced. All tables will be placed to ADA specifications found in USDA FSORAG. Tables will be installed with a 4 foot “clear space” ADA path on all sides. This makes the total foot print 13 feet wide x 14 feet long. Tables will be installed with a minimum of four bags of 80 pound Quickcreeet and 1/2” rebar will be placed in the holes provided to ensure stability and prevent theft.

Bike racks

All new bike racks will be Pilot Rock model #SRP/G-7 (powder coated black) (phone #800-762-5002). Bike racks will be installed with a minimum of four bags of 80 pound (two bags on each end) Quickcreeet and 1/2” rebar will be placed in the holes provided to ensure stability and prevent theft.

Outhouses

Where outhouses are installed at OSMP access points, the outhouse will be a vault evaporative restroom fabricated facility, model # R2-167 VE W/DC Power National Value Engineered Structure similar or equivalent to structures engineered by Biological Mediation Systems, Inc. (BMS) Fort Collins, CO 80526, 1-800-524-1097. (Please see “Standard OSMP Outhouses Specifications for Vault Evaporative Restroom Facility” document for exact specifications)

Fences

Exterior fences will be pin and rail with three horizontal wires for reinforcement. Materials are six inch diameter vertical treated wooden posts, five feet maximum above ground, with two-eight foot horizontal wooden posts between each vertical post. There shall be three high tensile, horizontal reinforcing wires between the horizontal wooden posts. Each vertical post shall be pounded into the ground a minimum of 20 inches and up to 30 inches, depending on soil conditions.

Interior fences will be pin and rail with one horizontal wire (HTF) reinforcement wire. Materials are six inch diameter vertical treated wooden posts, three feet maximum above ground, with one-eight foot horizontal wooden posts between each vertical post. There shall be one high tensile wire; horizontal reinforcing wires between the horizontal wooden posts. Each vertical post shall be pounded into the ground a minimum of 20 inches and up to 30 inches depending on soil conditions.

Buck and pole fence: Please refer to USDA Forest Service technology and development program Manual “FENCES” page 200 to see specifications and diagrams on how to build. Buck and pole fences will be used in the mountain backdrop and in areas where drilling or digging is not an option.

Gates

OSMP trailhead entrance gates (road access) will be a minimum of 24 feet in width and built to Colorado Department of Transportation (CDOT): Standard Specifications for Road and Bridge Construction (1999) CDOT standards. These gates may be pre-manufactured or built by OSMP staff if greater security is needed.

Agriculture gates and emergency access gates will be a minimum of 12 feet in width to allow for easy access of large farming equipment or large emergency vehicles to access roads and OSMP properties.

Pedestrian and equestrian gates to trails will be a minimum of five feet in width to allow for easy access for pedestrians, bikers and equestrian riders.

Benches

All new benches will be Pilot Rock model #SWRB/CB-4FR (powder coated black) (phone #800-762-5002). Any older benches will be maintained until a replacement is needed. (Please see photos below). All new benches will be placed to ADA specifications found in USDA FSORAG. The foot print for the bench is 6 feet long x 2 feet wide. Benches will be installed with a minimum of four bags of 80 pound (two bags on each end) Quickcreeet and 1/2" rebar will be placed in the holes provided to ensure stability and prevent theft. When possible, a four foot square area will be left on one side of the bench to provide access for a wheel chair user. If a bench is badly damaged (from vandalism or sun damage) all boards will be replaced to make sure all boards are consistent in color.

Grills

Grill will be replaced as need in the OSMP system (phone #800-762-5002).

Campgrounds

No new campgrounds will be installed on OSMP property. Fourth of July Campground improvements will comply with trailhead facility standards.

ADA access to facilities

OSMP will provide ADA access to all amenities for Class 3, 4 and 5 trailheads. All amenities will be placed to ADA specifications found in USDA FSORAG.

Parking Area Signs

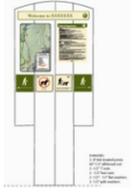
Sign type	Size	Materials	Hardware	Photograph	Notes	TH Class
No Parking	12"x18"	Reflective vinyl on aluminum. All signs mounted on 6x6 pressure treated posts.	¼"x3" Hex head lag screws, flat washers		Posts should be either 6' or 8' tall depending on whether 1 or 2 signs are displayed. Hours will vary at some areas.	A1-A3 T1-T3 R1, R2
ADA Parking	12"x18"	Reflective vinyl on aluminum. All signs mounted on 6x6 pressure treated posts.	¼"x3" Hex head lag screws, flat washers		1 ADA space should be provided for each 25 parking spaces at areas where ADA amenities are provided.	T1-T3
Dogs Must Be Leashed in Parking Area	12"x18" and 18"x24"	Digitally printed vinyl on aluminum. All signs mounted on 6x6 pressure treated posts.	¼"x3" Hex head lag screws, flat washers		Posts should be either 6' or 8' tall depending on whether 1 or 2 signs are displayed. 18"x24" signs at parking area entrances. 12"x18" at parking area perimeters.	T1-T3
Various Other Traffic Signs as Determined by Area						

All posts treated with Behr Premium semi-transparent stain. Color: "Coffee"

Visitor Information Kiosks

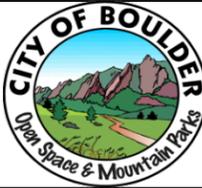
Structure type	Size	Materials	Signs displayed	Photograph	Notes	TH Class
Visitor Information Kiosk #1	72"x51" total board. 42"x45" display grid. 19"x45" bulletin cabinet. Arched roof is 140"x 62". Minimum height to bottom of arch is 80" from grade.	Powder coated steel structure. Skatelite roof. Signs mounted to 1" powdered coated steel grid. Bulletin cabinet, cork display with locking polycarbonate door. 6x6" Douglas Fir posts as visual accents.	5"x39" Welcome Banner. 22"x24" landscape oriented map. 9"x12" rules & regulations 4x4" regulation icons.		Posts treated with Olympic sealant #57504 Redwood natural tone. All signs mounted to 3/4" MDO blocks, with 1/4" T nut inserts painted flat black. Blocks mounted to screen with tamper resistant 1/4x20 stainless screws and 2"flat washers.	T3
Visitor Information Kiosk #2	48"x36" total board. 44"x32" display grid. 63" post to post width. 90" Arched roof width. Minimum height to bottom of arch is 80" from grade.	Powder coated steel structure. Signs mounted to 1" powdered coated steel grid. Square steel collars slide onto 6"x6" Douglas Fir posts.	5"x39" Welcome Banner. 11"x17" landscape oriented map. 9"x12" rules & regulations 4x4" regulation icons.		Posts treated with Olympic sealant #57504 Redwood natural tone. All signs mounted to 3/4" MDO blocks, with 1/4" T nut inserts painted flat black. Blocks mounted to screen with tamper resistant 1/4x20 stainless screws and 2"flat washers.	T2
Visitor Information Kiosk #3	48"x36" total board. 44"x32" display grid. 63" post to post width.	Powder coated steel structure. Signs mounted to 1" powdered coated steel grid. Square steel collars slide onto 6"x6" Douglas Fir posts.	5"x39" Welcome Banner. 11"x17" landscape oriented map. 9"x12" rules & regulations 4x4" regulation icons.		Posts treated with Olympic sealant #57504 Redwood natural tone. All signs mounted to 3/4" MDO blocks, with 1/4" T nut inserts painted flat black. Blocks mounted to screen with tamper resistant 1/4x20 stainless screws and 2"flat washers.	T1
Interpretive Kiosk Module	48"x36" total board. 44"x32" display grid. 63" post to post width.	Powder coated steel structure. Signs mounted to 1" powdered coated steel grid. Square steel collars slide onto 6"x6" Douglas Fir posts.	Interpretive display panels, size and number may vary. May be joined with multiple units to create an interpretive center.		Posts treated with Olympic sealant #57504 Redwood natural tone. All signs mounted to 3/4" MDO blocks, with 1/4" T nut inserts painted flat black. Blocks mounted to screen with tamper resistant 1/4x20 stainless screws and 2"flat washers.	T1 - T3

Trailhead Sign Structures

Structure type	Size	Materials	Hardware	Signs displayed	Photograph	Notes	TH Class
Trailhead Identification	36"x 64"	High density foam backed with 1/2" MDO sign grade, plywood. Mounted to 6x6 x 12' - 16' pressure treated posts	2"x 1/4" steel angle 1/2" x 5" hex head lag screws, 1/2"x 1" hex head lag screws	Highway trailhead name sign.		Post length will vary depending on location and should be set 3' deep in concrete. Two perpendicular 1" holes should be drilled through posts within 1' of ground for break-away safety.	T1 - T3
Quad-wide Post	24"x 96" (66-68" above ground)	4x6x8' pressure treated	1/2" all-thread rod, 1/2" T nuts, 1/2" hex nuts, 1/2' flat washers	Trailhead/trail name sign. May also display regulatory information and map. May have an acrylic covered holder for temporary information.		Top is cut on a 40" rad. arch	A1-A3 T1-T3 R1, R2
Double-wide Post	11"x 96" (66-68" above ground)	4x6x8' pressure treated	1/2" all-thread rod, 1/2" T nuts, 1/2" hex nuts, 1/2' flat washers	Trailhead/trail name sign. May also display regulatory information. May have an acrylic covered holder for temporary information.		Post tops cut at 15 degree angle to make "pitched roof".	A1-A3 T1-T3 R1, R2
Dog Station	14-15"x 96" (66-68" above ground)	4x4x8' pressure treated	1/2" all-thread rod, 1/2" T nuts, 1/2" hex nuts, 1/2' flat washers	Dog Station banner, dog regulation signs appropriate to area, brochure box mounted to post for dog regulation brochures and bag tube. May have an acrylic covered holder for temporary information and/or map.		Requires three 8' posts. Post tops cut at 15 degree angle to make "pitched roof".	A1-A3 T1-T3 R1, R2
Wayfinding/Regulatory Sign Post	5.5"x 96" (54" above ground)	6x6x8' pressure treated	N/A	May contain a combination of 5.5"x 5.5" wayfinding and/or regulatory signs.		Top cut at 15 degree angle, 4 sides to make "hip roof",	A1-A3 T1-T3 R1, R2

All posts treated with Behr Premium semi-transparent stain. Color: "Coffee"

R-Appendix O: Trail Design and Management Guidelines Matrix

Trail Design and Management Guidelines Matrix														
	X-Slope Range	Tread Width	Max. Sustained Grade	Max. Sustained Outslope	Clearing		Turn Radius	Surface Materials						
					Width	Height		Natural	Gravel	Crusher	Roadbase	Concrete	Asphalt	
Accessible	0-50%	>=3'	8.33%	<2%	8'	8'	4'	ok	No	ok	ok	ok	ok	ok
Class 5 Fully Developed	Hiking	0-30%	3-5'	8%	<=5%	6'	8'	2'	ok	ok	ok	ok	ok	ok
	Biking	0-30%	3-8'	8%	<=5%	10'	10'	6'	No	ok	ok	ok	ok	ok
	Equestrian	0-30%	3-8'	8%	<=5%	10'	10'	8'	No	ok	ok	ok	No	No
	Official Vehicle	N/A	8-10'	8%	<= 8%	28-40'	12'	10-12'	No	ok	ok	ok	ok	ok
Class 4 Highly Developed	Hiking	0-50%	2.5-5'	10%	<=5%	6'	8'	2'	ok	ok	ok	ok	No	No
	Biking	0-50%	3-8'	8%	<=5%	6-10'	10'	6'	ok	ok	ok	ok	No	No
	Equestrian	0-50%	3-8'	8%	<=5%	6-10'	10'	8'	ok	ok	ok	ok	No	No
	Official Vehicle	N/A	8-10'	6%	<= 6%	28'	12'	10-12'	No	ok	ok	ok	ok	ok
Class 3 Developed/ Improved	Hiking	0-75%	1.5-3'	15%	<= 8%	4-6'	8'	2'	ok	ok	ok	ok	No	No
	Biking	0-75%	1.5-5'	12%	<=5%	4-6'	10'	6'	ok	ok	ok	ok	No	No
	Equestrian	0-75%	1.5-6'	12%	<=5%	6'	10'	8'	ok	ok	ok	ok	No	No
	Official Vehicle	N/A	8-10'	6%	<=5%	12'	10'	10-12'	ok	ok	ok	ok	No	No
Class 2 Minor Development	Hiking	0-75%	1.5-2.5'	15%	<=10%	4'	8'	2'	ok	No	No	No	No	No
	Biking	0-75%	1.5-3'	12%	<= 8%	4-6'	10'	6'	ok	No	No	No	No	No
	Equestrian	0-75%	1.5-2.5'	12%	<= 8%	6'	10'	8'	ok	No	No	No	No	No
	Official Vehicle	N/A	8-10'	5%	<=5%	10'	10'	10-12'	ok	N/A	No	No	No	No
Class 1 Primitive/ Undeveloped	Hiking	0-90%	1.5-2'	15%	<=10%	N/A	N/A	2'	ok	No	No	No	No	No
	Biking	0-90%	1.5-2'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	N/A	N/A
	Equestrian	0-90%	1.5-2'	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	N/A	N/A
	Official Vehicle	N/A	8-10'	4%	<= 3%	N/A	N/A	10-12'	ok	N/A	No	No	No	No
Class 0	Example:													
	Climbing Access	N/A	0-2'	N/A	<=15%	N/A	N/A	N/A	ok	No	No	No	No	No

Trail Design Parameters provide guidance for the assessment, survey and design, construction, repair and maintenance of trails, based on the Trail Class and Designed Use of the trail.

Exceptions and variances to these parameters can occur when site-specific circumstances demand such exceptions. These exceptions should be noted in the Trail Management Objectives (TMOs) for the trail.

* Accessible is currently a separate Trail Class. If assessing/designing trails for accessibility, refer to current Agency trail accessibility guidance.

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