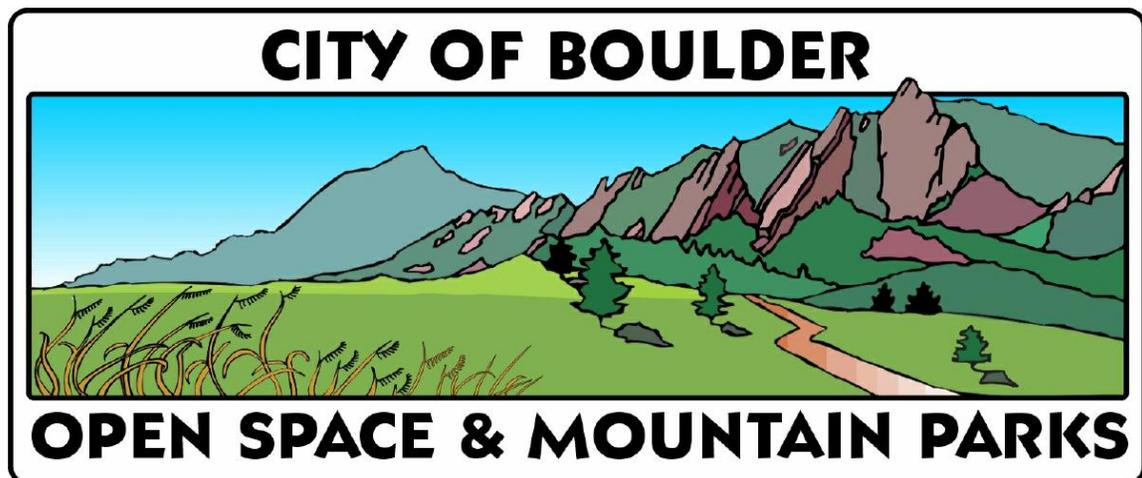


Open Space and Mountain Parks
Department
City of Boulder, Colorado

Trail Assessment and Prioritization Report



April 2004

Trail Assessment and Prioritization Report

Executive Summary

Need for Assessment and Prioritization

The Trail Assessment and Prioritization report is based on information compiled from extensive public participation and recreation and resource specialist issue identification and analysis. The goal of the Visitor Plan is to maintain a high quality visitor experience while protecting natural resources. Using trail facilities - trails, trailheads, and related amenities such as trash cans - is one way to achieve this goal.

A working group of recreation and resource specialists discussed and prioritized trail needs to provide better access, reduce resource impacts, and minimize long term maintenance cost. Issues were grouped in the following categories:

- Trail maintenance
- Trail improvements (addressing deferred maintenance)
- New trails

With limited trail crew and financial resources, it is critical to prioritize work. Heavy visitation requires continual maintenance. Additional maintenance will be required as visitation continues to climb.

Recommended Priorities

Trail Maintenance

Maintain current trails to ensure that facilities don't degrade and safety/resource issues don't arise. Priorities are set annually through work plans. Basic maintenance has the highest priority.

Trail Improvements

Provide access by making trails "sustainable" to deliver visitors to appropriate destinations on routes that have moderate grades and are safe, durable, aesthetic, placed away from sensitive areas, and less expensive to maintain. Close and restore undesignated trails. Conditions needing improvement were largely created through deferred maintenance. Trail improvement projects will generally have priority over new trails because they address immediate safety and resource issues and prevent further degradation and cost.

The highest priority trail improvement projects are:

- Royal Arch/Woods quarry/3rd Flatiron reroute/upper Enchanted Mesa - reroute and rebuild to provide additional designated access

- 4th of July Trailhead - transfer land or create plan
- Saddle Rock/Amphitheater - reroute and rebuild to provide additional designated access
- E.M. Greenman Trail - reroute trail away from sensitive area
- Eldorado Mountain/Doudy Draw/Lindsay - close and restore undesignated trails and assess designated access
- North Foothills - close and restore undesignated trails
- Kolb east of 75th along Boulder Creek - close and restore undesignated trails

High priority trail improvement projects include:

- Sanitas and Centennial Trailheads improvement
- Bear Canyon Trail reroute and rebuild
- Chautauqua including Bluebell Baird rebuild and Bluebell Mesa rebuild
- Marshall Mesa Trail realignment
- Boulder Falls transfer or improvement
- Settlers Anemone Trailhead improvement and trail plan
- Bear Peak summit access from Fern Canyon and Bear Peak West Ridge Trail
- Crown Rock Trailhead rebuild and trail realignment
- Buckingham Picnic Areas improvement and restoration
- Flagstaff Summit plan and improvements
- Flagstaff Trail realignment
- Upper Flagstaff Mountain Trail connector

New Trail Projects

New trails provide for increased recreational opportunities and provide critical connections and routes to destinations. Criteria for prioritizing include safety, anticipated use levels and minimal environmental impacts. High priority new trail or critical connection projects, that will be addressed based on opportunity, include:

- Community Ditch Trail and Highway 93 - provide underpass

- Highway 93 stoplight near Greenbelt Trailhead to Flatirons Vista Trailhead
- Boulder Feeder Canal
- Cottonwood Trail to Fourmile Canyon Creek Trail Road Crossing (Greenways)
- Bobolink Trailhead to Dry Creek Trailhead to Teller Trailhead
- Marshall Mesa Trailhead to S. 66th to Coal Creek Drive to Superior
- Valmont-Gunbarrel connector (Greenways)
- Gunbarrel to Boulder Reservoir via IBM (under Diagonal) (Greenways)
- Cottontail Trail to Niwot Trail

Funding and Organizational Capacity to Meet Demands

OSMP has limited funds to accomplish all the work tasks described in this report. Basic annual trail maintenance on existing trail infrastructure requires about 29,000 hours or \$350,000. Trail work staffing in 2002 was about 29,000 hours, leaving no staff time for trail improvements or new trails described below. Total annual cost for maintenance for trails, trailheads and other visitor infrastructure is about \$557,000 including personnel and materials.

For capitol (non-annual) costs, there are about 5.5 million dollars of needed trail improvements and new trails. Of the 5.5 million dollars, trail improvements account for \$4 million and the nine prioritized new trails are \$1.5 million. Additional new trails would require more money. All estimates are preliminary and rough. Preparation and permitting work will be required before many of trail projects can begin. To meet trail demands, a significant increase in funding is required.

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Introduction and Project Description

The Trail Assessment and Prioritization report is based on information compiled from extensive public participation opportunities and recreation and resource specialist issue identification and analysis. The goal of the Visitor Plan is to maintain a high quality visitor experience while protecting natural resources. Using trail facilities - trails, trailheads, and related amenities such as trash cans - is one way to achieve this goal.

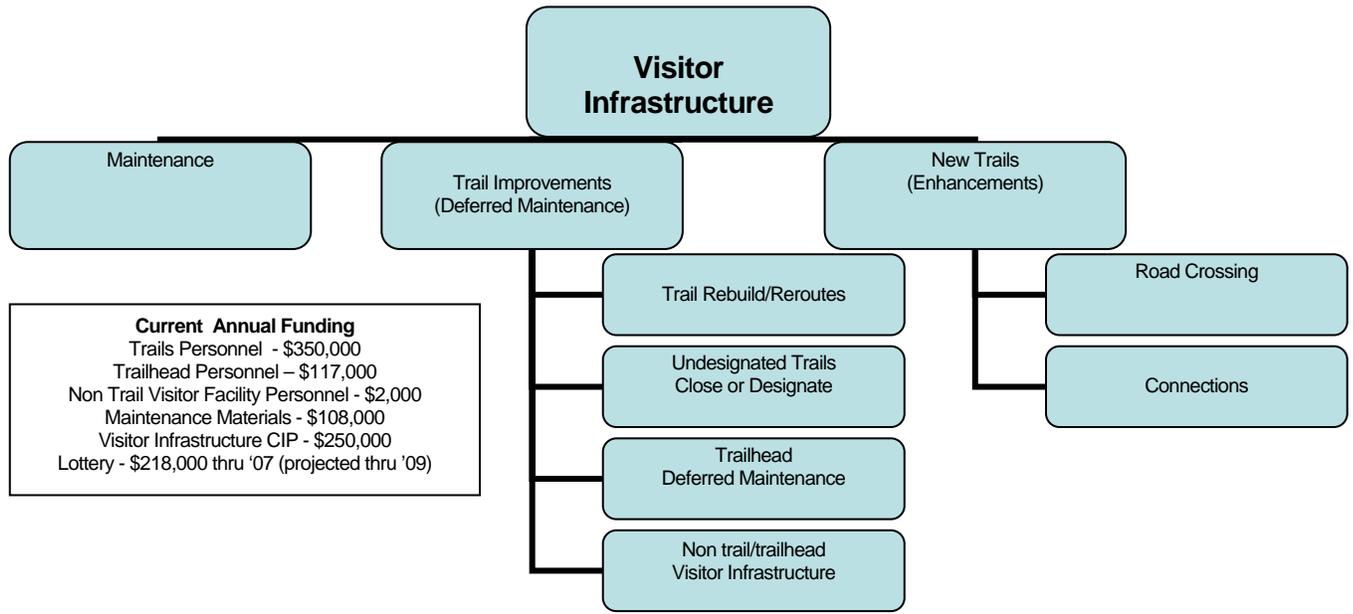
A working group of recreation and resource specialists discussed and prioritized trail needs to provide better access, reduce resource impacts, and minimize long term maintenance cost. Issues included:

- **Trail and trailhead maintenance** to manage erosion and keep trails and trailheads safe, passable and functional.
- **Trail improvements** to address access and resource impacts and improve the visitor experience. These conditions were largely created through deferred maintenance. Trail improvements were analyzed using the five subcategories listed below. Trail improvement projects were then identified that combined interrelated subcategory projects based on physical proximity, visitor use patterns, and management solutions.
 - **“Management challenge” areas**, areas with large numbers of undesignated trails demonstrating destinations not served by designated trails and a higher level of resource impact, were identified and prioritized
 - **Trail rebuilds or reroutes** to improve unstable or poorly placed trails
 - **Major Maintenance** to bring portions of trails back into their service life.
 - **Trailheads** to improve safety, resource protection, and reduce crowding problems
- **New trails** improve safety and provide important connections and additional passive recreational opportunities
 - **Road Crossings** to improve safety and make critical road crossings
 - **Connectors** to link up the trail system

These issues correspond to the sections of this report.¹ Figure 1 illustrates the analytical framework used for the trail assessment and prioritization.

¹ A number of non-trail or trailhead visitor facilities exist on Flagstaff Mountain that requires maintenance. These include Flagstaff Amphitheater, Stone Shelter, Wood (Jaycee) Shelter, Nature Center, Halfway House and Bluebell Shelter. Assessing and prioritizing these facilities was not assigned or completed in this report

Figure 1: Trail Assessment and Prioritization Analytical Framework



Project identification and prioritization process - Priorities for each category and subcategory were set by an interdisciplinary team of recreation and resource specialists using a three step process. First, projects were identified and placed in a table. In some cases further description of the project and possible solutions were documented. Second, rating criteria were established and are described in each section. Third, team members rated each project on a five point scale, the more important the matter, the higher the vote. These votes were compiled and divided by the number of participants voting. Dividing by the members present standardizes scoring when team members were absent. Because this rating process is qualitative, ratings aren't exact but provide a general idea of how important projects are relative to one another.

There are three exceptions to this rating system. Maintenance priorities are determined annually based on existing conditions. Because the scope of this report is multi-year, the maintenance inventory and prioritization process is described but not prioritized. The next two exceptions are the scoring systems used for rebuild and reroute trails and new trails.

Cost estimates provided in this report are preliminary. Accurate estimates can not be made until site specific route and construction techniques are decided. Preliminary estimates are provided for a sense of both relative and total costs.

Maintenance

Description

Trail maintenance is the basic work required to keep the trail system functional and safe. Keeping a trail functional requires building and cleaning drain dips and “canting” or sloping the trail to minimize erosion and muddy areas, defining the trail to minimize trail widening and braiding, clearing the trail of branches, rocks and exposed roots, and closing, and restoring undesignated trails. Adequate maintenance is fundamental to sustaining a quality trail system.

Trailhead maintenance is the weekly attention need to keep trailheads safe, clean and functional. Trailhead maintenance consists of picking up trash, cleaning outhouses and minor repair. Not Trail and Trailhead visitor infrastructure maintenance consists of minor repair and upkeep to structures such as the Halfway House and BVR arena.

Methodology

Trails - The trail maintenance priorities are dynamic. No attempt was made by the work group to list priority projects. This report documents the process used for assessing trail maintenance needs and highlights any needed modifications in the results section.

Trails are inventoried in the spring to establish maintenance priorities, and trails that were worked on are again assessed in the fall to assess the work conducted through the summer work season. Trails are divided into numbered segments that can be easily recognized in the field. These segments are used in the trails database to track segment specific work. Items assessed include: corridor clearing needed, and type; erosion present, severity, and length; compaction present and length; braiding and length; widening and length; canting and length; undesignated trails and their width; erosion structure type and comments; gate comments; and general comments. The information was entered into the database beginning in 1995 and ended in 2000, although assessments continued past 2000. Staff prioritizes trail work using professional judgment.

When trail work is completed a trail work log database is used to track the project. Items tracked include trail name, segment number, crew, leader, date, hours, persons, and the work conducted and any descriptive comments. Work items include: corridor cleaning, canting, water bar cleaning, check dams built, water bars built, rock steps, log steps, rock wall, log wall, closure, new trail, tread rebuilt, and surfacing. The amount of work for each work item is quantified in length of trail or structures built.

In the past best management standards were used to guide the construction and maintenance of trails. To better to define trail construction and maintenance needs and costing, modified U.S. Forest Service trail standards will be used.

Trailheads – Trailheads are maintained weekly to pick-up trash, clean toilets and do minor maintenance.

Non Trail and Trailhead Visitor Infrastructure – Structures are inspected periodically for repair and integrity and larger projects such as painting are scheduled.

Results

Through 2000 trails were assessed and condition documented in the trails database. In 2001 and 2002 trails were assessed but not documented in the database. Trails will continue to be assessed and the results documented in the database that is now linked to the Geographic Information System (GIS). A criterion based prioritization should be used that is based on the database assessment results.

Costs

Trails - Annual maintenance costs were estimated based on annual work records. Based on these records, about 29,000 hours and \$350,000 dollars in personnel expense (PE) are required annually to maintain OSMP trails. Another way to estimate maintenance costs is to look at what is needed to maintain the trail system based on staff's best professional judgment. Using this estimating approach \$410,000 would be needed annually. In addition, \$56,000 in non personnel expense (NPE) for materials are required.

This annual maintenance personnel cost estimate cost was derived from records kept for Open Space trails from 1996 to 2000. Trails were categorized in three groups: service road, moderate trails (in the plains), and mountain trails. Every trail is not maintained every year. However, for estimating purposes, an annual trail maintenance cost can be calculated by averaging per mile maintenance costs over the five years. This was done for each category of trail. Mountain Parks' trails were then categorized, added to the Open Space mile totals, and multiplied by the estimated annual maintenance cost for each category. Trail mileage does not add up to the 130 miles on OSMP; some trail mileage is maintained by other governmental entities (e.g., Greenways). The results are presented in Table 1 below.

Trail category	Miles	Hours/mile/year	Total hours/year	Cost/hour @ \$12
Service Road	45	3	135	\$1,620
Moderate trails	40	133	5,320	\$63,840
Mountain Trails	36	657	23,652	\$283,824
Total			29,107	\$349,284

OSMP has limited funds to accomplish all the work tasks described in this report. Trail maintenance on existing trail infrastructure requires about 29,000 hours (Table 1). In 2002 there were only enough staff and volunteer work hours to maintain current designated trails, deferring other critical safety and resource

impacts, and likely making them more difficult and expensive to fix. In 2000 about 50,000 hours and \$595,440 were put into maintenance allowing for the improvement of some trails.

Maintenance costs will increase as more people visit the system and as new trail miles are added. Staff will work to minimize these increasing costs by making current and future trails sustainable to reduce maintenance needs (see rebuild/reroute section of report).

Trailheads – Annual maintenance costs were estimated using what staff is needed to conduct the work with the current number of trailheads and access points. Trailhead maintenance requires \$120,000 in personnel and \$40,000 for materials such as gates, toilet paper and cleaner.

Non Trail and Trailhead Visitor Infrastructure – It costs about \$5,000 in personnel a year to inspect and do minor repair on structures. About \$2,000 is spent on materials.

Total annual cost for maintenance is about \$557,000 including personnel and materials.

Trail Improvements

Trail improvements address deferred maintenance needs.

Management Challenge Areas

Description

Management Challenge Areas are areas on Open Space and Mountain Parks that have a large number of undesignated trails that indicate places where people are choosing to travel off designated trail to reach destinations. These areas provide opportunities for passive recreation, but have correspondingly high levels of resource impact from off-trail travel. Off-designated trail travel causes vegetation trampling, soil compaction, erosion, sedimentation, spread weeds, and creates “edges” that adversely affect some wildlife. Management and trail maintenance costs are higher in management challenge areas due to resource impacts and the creation of unsustainable undesignated trails.

Methodology

Staff identified areas with a large number of undesignated trails indicating that some desired destinations, but are not served by designated trails. Likely causes for the situation were listed as an issue statement. Second the work team reviewed and edited the list. They then discussed each area and listed a recommended action plan. Finally, the work team prioritized the “management challenge areas” using the following criteria:

- Resource sensitivity - the more sensitive the resource the higher the score
- Durability - the relative ability of the area to hold up under use; the more easily degraded the higher the score

- Rate of change - a measure of how quickly the situation is degraded from an infrastructure and resource perspective; the quicker the higher the score.
- Level of use - a measure of how much use an area currently receives; the less the use the higher the score (to enable the situation to be more proactively addressed)
- Entrance to low level use areas - would management now limit impacts in an area currently with low use and impact; the lower the level of use the higher the score

Team members rated each area on a one to five scale; a higher rating meant a higher importance for the area (see Appendix 1 for team members). This process resulted in a general ranking of areas to address.

Results

Results are listed in Table 2 and mapped in Figure 2. Projects are listed in priority score order. The designator number associated with the area name is used to locate projects on Figure 2, starting with the northwest corner of the system and proceeding counterclockwise. Common reasons for undesignated trail creation include:

- Activity from adjacent private lands, particularly neighborhoods
- Climbers and equestrians traveling off-trail to destinations and creating trails for others to follow
- Trails that dead-end

Common recommended management actions include:

- Building or designating “feeder” collection trails from neighborhoods and closing redundant undesignated trails
- Realign or build designated trails to better deliver people to destinations, particularly for climbing access, and close redundant undesignated trails
- Make critical trail connections
- Encourage “stay on-designated trail” use through informational signs and fencing
- Temporarily close steep, very erodable, irreparable areas if and until sustainable access can be provided by working with climbers
- Require on-designated trail use in larger habitat blocks with relatively low levels of use

Costs

Estimating total cost for addressing undesignated trails is difficult. To address this uncertainty this estimate breaks down the work tasks and costs for each stage of the management process. All undesignated trails on OSMP are not included in this estimate. It only includes the areas with the highest concentration of undesignated trails--"management challenge areas."

Each area will take significant time to evaluate, including public involvement, action plan design and the work of either reconstructing or closing undesignated trails in the 39 management challenge areas. It is estimated that on average it will take 200 hours to evaluate an area and achieve an approved management plan. Evaluation includes site work, discussion with interested members of the public, staff coordination, planning and permitting. This totals 1,300 hours per year and for the 39 projects it is 7,800 hours, totaling about \$230,000.

Bringing up undesignated trails to standard can be inexpensive to expensive. The estimate for rebuilding trails is \$20 a linier foot, which may be high or low. Some undesignated trails may also need to be rerouted which adds distance and cost. Undesignated trails that are have sustainable alignments will require less work. Because of these uncertainties, a conservative, low end cost, \$5 a linier foot, is used to make this estimate. It is anticipated that on average 1/2 mile of trail will be designated in each management challenge area for a total of about 20 miles of trail. This works out to \$13,200 per area and \$514,800 total.

Closing trails will be about 160 hours of labor per area to initially close the trails. The closures then need to be maintained through time. While amount of labor required maintaining the closures increase each with additional closures, to keep it simple this estimate spreads the cost over six years for 5,240 hours at \$96,000. Materials, design and other contractor costs would total around \$300,000. Thus to plan, designate and close undesignated trails in the 39 management challenge areas it costs around \$1,139,000. Maintenance costs increase each year for new trails and closures.

Table 2: Management Challenge Areas

Map ID Number and Name	Priority Score	Issues/Problem Statement	Action Plan
37 - Kolb east of 75th along Boulder Creek	5.00	Large relatively unfragmented habitat block with relatively low levels of use - Undesignated trail along creek in riparian area from neighborhood	Keep people on designated trails. Close undesignated trails.
01 - North Foothills railroad grade	4.86	Large relatively unfragmented habitat block with relatively low levels of use - Existing undesignated trail on old rail road grade, desired connection by some, dead end trail, off-trail use from private horse operation	Keep people on designated trails. Close undesignated trails.
18 - Bear Canyon climbing access/south side of Dinosaur	4.86	Climbing access not served by designated trails, very steep erodable terrain	Regulatory closure until sustainable trail can be built by OSMP, consider on-trail only use with sustainable trail (see partnerships and priorities section)
11 – Chautauqua complex	4.71	Many undesignated trails entering and crossing through area including off of Baseline Road, sledding and "runner" trails	Develop and execute plan to accommodate use, increase safety and reduce resource impact
15 - 3rd Flatiron south side access	4.43	Climbers and hikers leaving designated climber access to north side of 3rd Flatiron and traveling to access south side	Construct access trail and recommend on-trail use only (part of Royal Arch trail reroute), monitor
16 - Upper Enchanted Mesa, Tomato Rock, Wood's Quarry	4.43	Old quarry road and undesignated loop hikes	Realign Royal Arch trail and link to Wood's Quarry, close undesignated trails
17 - 4th and 5th Flatirons access points, Royal Arch dead end, Wood's Quarry connection	4.43	Wood's Quarry designated trail ends and climbers and hikers coming from or returning to NCAR continue on to or return from Royal Arch or climbs	Realign Royal Arch trail and link to Wood's Quarry, close undesignated trails
26 - Mickey Mouse climbing access	4.43	Climbing access not served by trails, private property used to access area	Access cannot be provided until private property is purchased. If purchased, a climbing access feasibility study will be conducted, which includes natural resource issues, work with climbing community

Table 2: Management Challenge Areas

Map ID Number and Name	Priority Score	Issues/Problem Statement	Action Plan
28 - Doudy Draw complex	4.43	Access along Denver Water Board ditch and undesignated trails to riparian area/pond and shrublands, Community Ditch access to west of Doudy Draw Trail, off-trail equestrian use creating trail that others follow	Restrict access to cultural resources and shrublands, close area around pond, fix gaps in fence, investigate trail link from Doudy Draw to service road including discussion with the private property owner (Denver Water Board) and making area on-trail only
07 - Undesignated trail off Boy Scout Trail to Boulder Canyon	4.29	Undesignated trail has been constructed in unfragmented area, nearby Viewpoint designated trail to Flagstaff already exists	Close undesignated trail
27 - Lindsay complex	4.29	Access into area with established service roads and Doudy Draw trail, undesignated trails developing, Denver Water Board private property	Use only on designated trails, close undesignated trails, study further
14 - 1st and 2nd Flatiron dead end	4.14	Designated climbing access trail up 1st and 2nd Flatiron stops at "saddle," old undesignated trail connects to Saddlerock Trail	Re-route to provide sustainable access to Saddle Rock Trail, close undesignated trails
23 - Eldorado Trail to South Boulder Peak/ Bear Peak West Ridge complex	4.14	Undesignated trails across unfragmented "backside" properties	Visitation restricted to designated trails, close undesignated trails
35 - Pit D connection South Boulder Creek Confluence	4.14	Old roadway and undesignated trail connecting bike paths, extensive riparian and wetland area	Work with City departments to make connection using sustainable alignment
09 - 4th-of-July campground	4.00	Trails around stream/campsites	Provide ownership opportunity to U.S. Forest Service if possible, if not possible develop management plan - evaluate camping use
22 - Terrain Boulders complex	4.00	Climbing access not served by trails	Stabilize areas around boulders, monitor area for increased visitor use and resource damage, build designated trail or close if necessary
29 - Flatirons Vista spur trails	4.00	Undesignated trails leading off of Flatirons Vista trail	See Doudy Draw complex above, evaluate public access to pond and along power line

Table 2: Management Challenge Areas

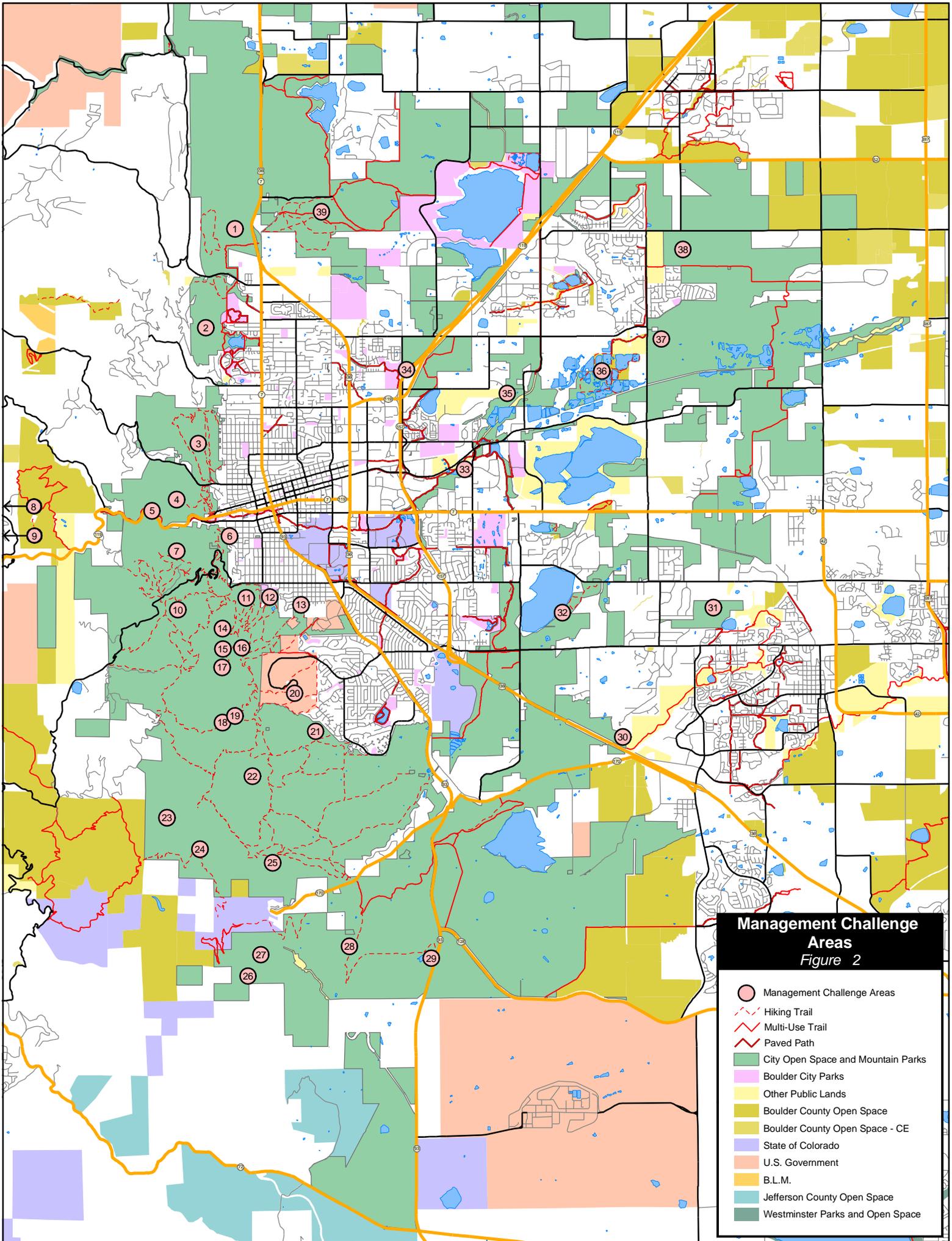
Map ID Number and Name	Priority Score	Issues/Problem Statement	Action Plan
19 - Dinosaur climbing access from east	3.57	Many climbing accesses not served by designated trails, some designated trail improvements improving climbing access have already been made, visitors continuing on west over last ridge on very steep erodable slopes and important wildlife habitat	Define climbing access, close south side until and if a sustainable trail can be built, discourage access west of the last ridge
10 - Old road from Gregory to Greenman	3.29	Old roadway serving as trail	Sign as "not a designated trail"
04 - Anemone	3.14	Designated trail dead ends, pipeline route has become undesignated trail with unsustainable grades and severe erosion that connects with and extends beyond designated trail to the west, neighborhood undesignated trail access, undesignated trail along Sunshine Road from Centennial Trailhead, off-trail use on Red Rocks and irrigation ditch	Create a sustainable trail system, close undesignated trails, consult Utilities Department about future plans of pipe corridor
39 - BVR complex	3.14	Undesignated trails connecting from Valhalla neighborhood, uphill between Sage and Eagle Trails, in the Mesa Reservoir area, Lefthand Trail near Lefthand Reservoir, new undesignated trails developing	Encourage on-trail use with fencing and signs
05 - Access to Dome/Elephant Butress	3.00	Climbing access to rocks and along Silver Lake Ditch/pipe at base of climbs (see partnerships and priorities section)	Create a sustainable access, work w/ Silver Lake Ditch organization
32 - Dry Creek extended loop	2.86	Extended loop trail past "hint" fences	Fence and close off entire back field under Lafayette agreement because of water quality and trespass issues
24 - Eldorado Trail climbing access points	2.57	Climbing access not served by designated trails	Close to off-trail use within large relatively unfragmented habitat block with relatively low levels of use
36 - Sawhill complex	2.43	Undesignated trails connecting between ponds and access to ponds/creek for anglers and hikers	Acquisition of land from Colorado Division of Wildlife and develop of management plan

Table 2: Management Challenge Areas

Map ID Number and Name	Priority Score	Issues/Problem Statement	Action Plan
08 - Boulder Falls	2.29	People continuing beyond the trail that dead ends at the falls	Provide ownership opportunity to government agency if possible, if not possible develop management plan
12 - Lower McClintock complex	2.29	Many undesignated trails entering and crossing through area including trails off 12th Street and connections to Enchanted Mesa	Develop trails plan, build sustainable trail and encourage on-trail use
31 - Steinbach, O'Connor-Hagman	2.29	Undesignated dispersed access from Louisville area neighborhoods, Habitat Conservation Area with unrestricted dog use creating potential conflicts with wildlife, bikes not staying on designated trails	Increase signing for bikes and dogs, review HCA status as it relates to dog regulations
02 - ERNI Hogback	2.14	Paragliders walking to take-offs created undesignated trails on steep grades that others followed and then expanded for an undesignated loop trail	Build sustainable trail to launch sites, monitor other social trails and encourage on-trail use, E & O to work w/ paragliders and neighbors
20 - NCAR complex	2.14	Many undesignated trails entering and crossing through area including those from NCAR to Bear Canyon and Lower Skunk Canyon	Develop trails plan w/ NCAR to designate some trails and close redundant undesignated trails
34 - Cottonwood trail connection to Fourmile Canyon Creek Path	2.14	Greenways bike path dead ends near OSMP trail	Encourage Greenways to make connection
03 - Sanitas complex	2.00	Dispersed undesignated trails, multiple access points feeding the area, undesignated trail from Linden Street, untrailed interior forest area to west of Dakota Ridge	Maintain current designated trails, close undesignated trails, put up reclamation signs, investigate creating sustainable trail from Linden to Dakota Ridge, discourage use west of Sanitas trail, including Sunshine Canyon Drive hairpin
21 - Shanahan backyard complex	1.86	Many undesignated trails from neighborhoods crossing through area including "feeder" trails in back of houses	Accommodate and allow some feeder/collection trails to exist, create sustainable trail to pond
25 - Eldorado connection to Shadow Canyon (old Mesa trail)	1.86	Old undesignated trail connection crossing private property in Eldorado Springs	Legal access cannot be provided until private property is purchased

Table 2: Management Challenge Areas

Map ID Number and Name	Priority Score	Issues/Problem Statement	Action Plan
33 - Cottonwood Lake	1.86	Undesignated trails around lake, fishing access	Provide sustainable access
06 - Viewpoint complex	1.29	Many undesignated trails entering from neighborhood and crossing through area	Designate and improve some feeder/collection trails connecting to Viewpoint Trail
13 - Four Pines complex	1.29	Many undesignated trails entering from neighborhoods and crossing through area	Develop sustainable trail from neighborhood system with loop trail back to Kohler Mesa through NIST
38 - Gunbarrel Hill north of Heatherwood to Lookout Road	1.29	Undesignated trails connecting between neighborhoods and nearby horse operation and to overlook	Provide sustainable access, determine whether trail designation is appropriate
30 - Davidson Mesa/Louisville open space trail	1.14	External trail dead ends near OSMP Habitat Conservation Area lands	Continue current management



Management Challenge Areas
 Figure 2

- Management Challenge Areas
- - - Hiking Trail
- - - Multi-Use Trail
- - - Paved Path
- City Open Space and Mountain Parks
- Boulder City Parks
- Other Public Lands
- Boulder County Open Space
- Boulder County Open Space - CE
- State of Colorado
- U.S. Government
- B.L.M.
- Jefferson County Open Space
- Westminster Parks and Open Space

Rebuild/Reroute Trails

Description

Addressing major deficiencies in the trail system involves rerouting and rebuilding designated trails to better deliver visitors to their destination on a durable, less steep grade that is less expensive to maintain and routes them away from more sensitive areas. This is generally known as making trails “sustainable.”

Many trails, particularly in the mountain backdrop, are not sustainable due to poor placement, construction, and/or inadequate maintenance. This results in trails crumbling down hills, trail widening and “braiding,” vegetation trampling, soil compaction, erosion, weed spread, additional trail “edge effects” on wildlife, “unfixable” situations, exorbitantly high maintenance costs, visual scars, and generally a reduced visitor experience. Not addressing these issues allows the impacts to worsen and costs to increase. Rerouting trails also has the benefit of providing more direct access to significant attractions and providing more designated trail miles.

Methodology

First, work team members listed OSMP trails needing to be rebuilt and/or rerouted to make the trails sustainable. Included is a short description of the work needed. Second, prioritization criteria were discussed and established. These criteria were used:

- Trail condition - current condition of trail including visitor safety; the poorer the condition the greater the importance
- Volume of use - how much traffic the trail receives; the more the traffic the greater the importance
- Environmental impacts - how ecologically sensitive the area is; the more sensitive the area the greater the importance
- Rate of change - how much will the problem get worse if not addressed soon; the greater the rate of change the higher the importance

Third, trails were ranked using the criteria. Trails that overlapped priority management challenge areas (see above) were placed in a top tier. Bullet voting was used to prioritize this top tier which yielded a clear break between work rank “ones” and “twos” listed in Table 3. Bullet voting was then used to prioritize the remaining trails. Results were assessed by the team and divided into priority work ranks based on where breaks naturally occurred. Information supplied by natural resource staff was considered before voting (Appendix 2). Results are listed in Table 3 and mapped in Figure 3.

The rating system for trails needing rebuilding/rerouting is different than the ranking system used for other categories. For trail rebuild/reroutes the lower the number, the higher the priority.

Results

Rebuild/reroute trails are almost all in mountainous terrain on trails that were poorly placed many years ago. The rebuild/reroute trails overlapping priority challenge areas should be addressed first in order to provide adequate access and reduce the number of undesignated trails and associated resource damage. These include Royal Arch, Bluebell Mesa, Bluebell Baird, Third Flatiron, and Bear Canyon Trails. E.M. Greenman Trail was listed next because of a sensitive spring area and Saddle Rock Trail because of its very bad condition.

Costs

A very rough cost estimate is also listed in Table 3. The \$20 per linear foot numbers are used for estimating costs because of uncertainties in trail work in mountainous terrain. This estimating number may be high or low and based on work results, this rough estimate will be refined for future estimates. Shorter segment of trails were not mapped, but will require rebuilding. Three miles of trail were added to account for these short sections of trail. Rebuilding/rerouting trails will likely cost approximately \$1,646,000 dollars.

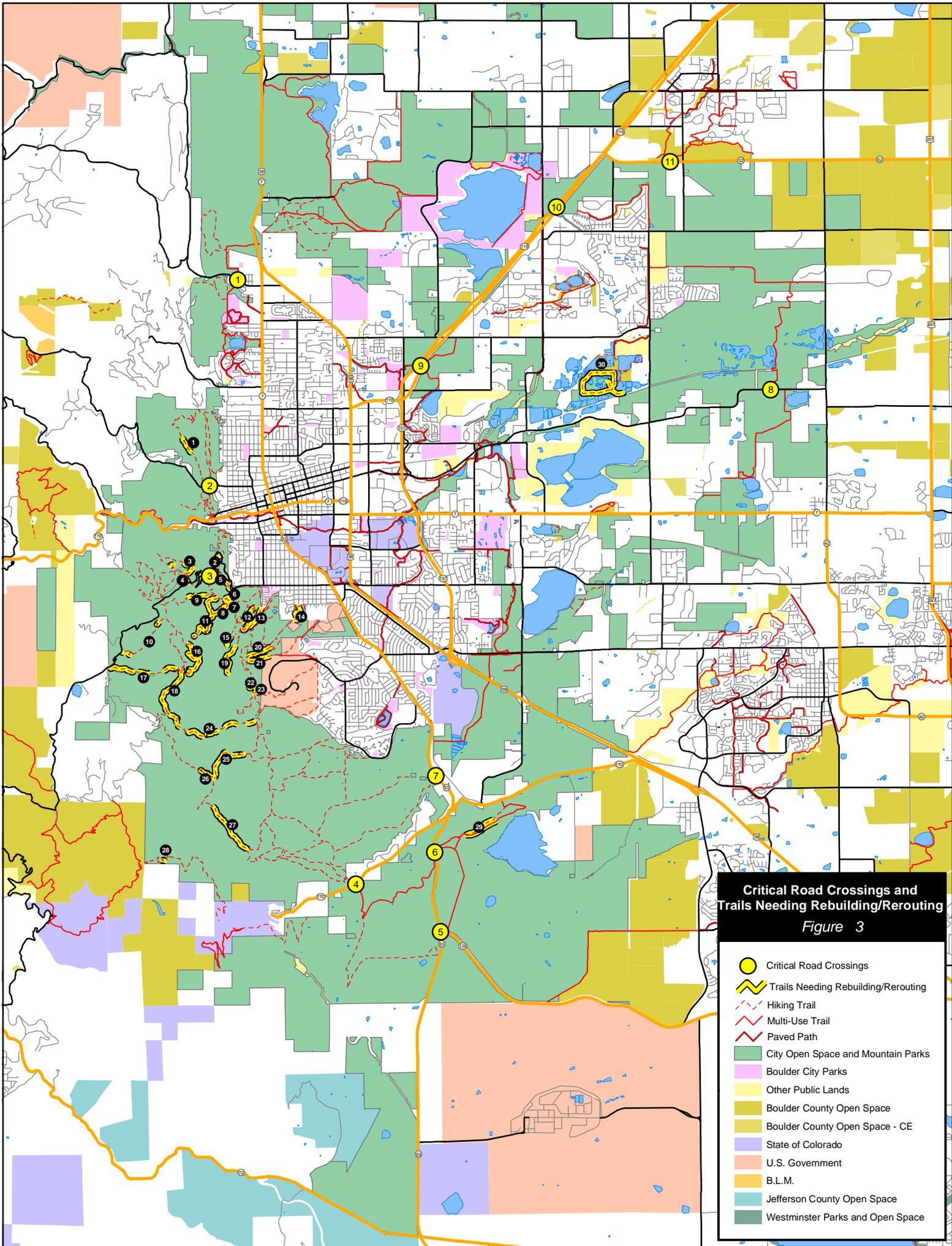
Table 3 - Trails Needing Rebuilding/Rerouting

Trail	Work Rank	Length (feet) Rebuild	Length (feet) Reroute	Cost - \$20 foot	Description
Royal Arch*	1	857	2086	\$58,860	Bluebell drainage to Royal Arch--reroute for arch visitors, rebuild above Royal Arch for climbers
Bluebell Mesa*	1	0	2085	\$41,700	Reroute, consolidation of two trails
Bluebell-Baird*	1	0	958	\$19,160	Reroute dropping north off of Ski Jump Mesa down to Gregory Canyon and Baseline Trail
3rd Flatiron*	2	0	954	\$19,080	Rebuild from 2nd/3rd Flatiron loop to the east bench; reroute / new construction of trail from descent to the east bench; construct trail to south side climbing areas
Bear Canyon*	2	1046	3723	\$95,380	Selective reroute to pull the trail out of the riparian corridor
E.M. Greenman	3	3786	1344	\$102,600	Reroute from the 1st drainage crossing to Greenman Springs; rebuild the rest of the trail
Fern Canyon	4	1019	2631	\$73,000	Rebuild sections of lower Fern Canyon to the Nebelhorn saddle; reroute above there to the summit of Bear Peak
Marshall Mesa	4	4350		\$87,000	Consolidate parallel trails at west end of Marshall Mesa and Community Ditch trails
Saddle Rock	4	0	5549	\$110,980	Reroute to the Gregory Canyon Amphitheater; reroute to the Spy Trail and Spy to Saddle Rock; investigate link to the backside of the 1st Flatiron
Sawhill	5	621		\$12,420	Define and retrofit the trail system
Flagstaff	5	830	1865	\$53,900	Reroute and rebuild sections of the trail
Green Mountain West Ridge	5	0	3843	\$76,860	Reroute trail sections between the road and Ranger Trail; reroute/rebuild from Ranger-Green Bear junction to Green Mountain summit
Skunk Canyon	6	0	1621	\$32,420	Reroute from Kohler Mesa junction to 200' down from the 1st drainage crossing

Gregory Canyon	6	700	740	\$28,800	Reroute from the 1st crossing of the north bank of the canyon to where the old road corridor intersects below the first primary switchback
Mount Sanitas	6	1431		\$28,620	Reroute upper-middle portion of the trail
Amphitheater	7	1207	820	\$40,540	Study a reroute of the bottom from the Amphitheater Express down; rebuild the rest of the trail
Bear Peak West Ridge	7	0	1817	\$36,340	Reroute from where the trail goes steeply up the hill to the summit
Long Canyon	8	0	590	\$11,800	Reroute additional sections of the trail
Shadow Canyon North	8	4895	0	\$97,900	Rebuild connector with Mesa Trail to the mouth of Shadow Canyon near Stockton Cabin
Kohler Mesa	8	1880	0	\$37,600	Rebuild; possible hardened surface
Four Pines	8	1950		\$39,000	Develop sustainable trail from the neighborhood system with loop back to Kohler Mesa through NIST
Green Bear	8	0	4251	\$85,020	Study options for a reroute at the bottom, and at the top to deal with bouldering activity
Bluebell Road	8	2405	0	\$48,100	
Baseline		0	917	\$18,340	
Boy Scout		0	1026	\$20,520	
Eldorado Canyon		0	226	\$4,520	
Halfway House		0	280	\$5,600	
Mesa		1054	51	\$22,100	
NCAR		0	440	\$8,800	
Plains Overlook		0	636	\$12,720	
**Additional rebuilds		15840		\$316,800	
				\$1,646,480	

* Associated with priority Management Challenge Area

** Three miles of unmapped, scattered trails needing rebuilding



Critical Road Crossings and Trails Needing Rebuilding/Rerouting
Figure 3

-  Critical Road Crossings
-  Trails Needing Rebuilding/Rerouting
-  Hiking Trail
-  Multi-Use Trail
-  Paved Path
-  City Open Space and Mountain Parks
-  Boulder City Parks
-  Other Public Lands
-  Boulder County Open Space
-  Boulder County Open Space - CE
-  State of Colorado
-  U.S. Government
-  B.L.M.
- Jefferson County Open Space
- Westminster Parks and Open Space

Trailheads

Description

Facilities including trailheads (OSMP parking provided), access points (no OSMP parking provided), and picnic areas (area primarily used of picnicking) have safety, resource protection, and crowding issues and do not function as well as they could. In many instances if deficiencies are not addressed soon, safety and resource impacts will worsen and maintenance costs will increase.

Methodology

First, work team members listed OSMP trailheads, access points, and picnic tables (see Table 5); some trailhead/access points were grouped into interrelated units. Also included was a short description of any deficiencies and a recommend course of action to remedy the deficiency. Second, prioritization criteria were discussed and established. These criteria were used:

- Facility condition - current condition of trailhead, access point or picnic area, and visitor safety; the poorer the condition the greater the importance
- Volume of use - how much traffic the trailhead receives; the more the traffic received the greater the importance
- Environmental impacts - how ecologically sensitive the area is; the more sensitive the area the greater the importance
- Rate of change - how much problem will get worse if not addressed soon; the greater the rate of change the higher the importance

Third, trailheads projects were scored on a scale of 1 to 5 based on the criteria; the higher the score the more important the project. Results are listed in Table 5.

Results

Trailhead rankings are listed in Table 4, and mapped in Figure 4. The top ten priority trailhead units are included below. There is a significant backlog of work to bring trailheads to a standard that is safe, in good condition and effectively delivers people to trails. Most trailheads needing work are in the mountainous terrain and many of them were poorly placed and/or not designed for today's demands. Facilities also receive a lot of "wear and tear" because of the number of visitors.

- Fourth of July Trailhead and Campground
- Sanitas and Centennial Trailheads
- Buckingham and Lefthand Picnic Areas
- Chautauqua Trailhead Baseline/6th Street access
- Crown Rock Trailhead and Picnic Area

- Flagstaff Summit Trailhead and Picnic Area
- Boulder Falls
- Green Mountain Access
- Lost Gulch Overlook and Cathedral Trailheads and Picnic Areas
- Mesa, Doudy Draw, South Boulder Creek, Flatirons Vista, Greenbelt Plateau Trailheads

Costs

A preliminary cost estimate to bring trailheads up to standard is \$1,120,000. Because it will take significant time to evaluate, including public involvement, plan, design and oversee contractors 30% was added to the estimate to account for these costs. These costs will be refined based on actual work for future estimates. Cost estimates by project are listed in Table 5.

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
06 - Fourth of July Trailhead and Campgrounds	Erosion, old signs, revegetation needs due to undesignated trails, poor placement of campsites, picnic area near wetlands, concrete picnic tables that are falling apart due to harsh conditions.	Continue discussions with U.S.F.S. on transfer of land and management responsibilities. If transfer is not possible, draft detailed site plan that covers facilities, camping areas, access, information, road, parking, and trail needs.	4.88	\$10,000
03 - Sanitas and Centennial Trailheads	Sanitas Trailhead parking is unsafe due to parking in the road right-of-way and poor sight lines with vehicles traveling at high speeds down Sunshine Canyon. The Centennial Trailhead, south of and across the road from the Sanitas Trailhead, has limited, but underutilized, parking and better sightlines along the road. While visitation is heavy, there are no nearby restrooms.	Centennial - expand parking area, add restroom facilities, redevelop picnic sites, develop information/education kiosk, expand fence alignment, replace gate, close and restore undesignated trails. Increase enforcement of parking regulations including location and times, sanction visitors who engage in noncompliant behavior	4.75	\$80,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
01 - Buckingham/ Lefthand			4.63	\$50,000
01a - Buckingham Natural Area, Location: East of Lefthand Canyon Drive, west of Joder Ranch, north of Old Stage Rd.	Off trail activity creating trampling, erosion, weed spread impacts, golden eagle nest in a relatively undisturbed area.	Close area including restoring undesignated trails, placement of high tensile fence and signs.		\$10,000
01b - Buckingham Picnic Area, Location: West and north of Lefthand Canyon Drive.	In 2001 the parking lot was resurfaced, trails reconstructed, undesignated trails closed, new fence and two new ADA picnic tables installed. Area still has several old grill and picnic tables. Vandalism is a problem.			\$5,000
01c - Lefthand Picnic Area Location: .8 miles west of Old Stage/Lefthand Canyon Drive	Eroding trails, deteriorating fences, old tables and old signs.	Develop and maintain picnic area. Construct access trail, redesign and replace fence, replace tables and grills, add two picnic sites, upgrade signs, and restore area. Note: This site should not be considered for ADA standards.		\$5,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
01d - Lefthand Picnic Area; Juniper. Location: 1.2 miles west of Old Stage/Lefthand Canyon Drive	Vandalism, trash dumping, and illegal use of ATV and of fire arms.	Consider this area for closure and restoration. U.S.F.S. should be consulted for impacts to their bordering property.		\$5,000
01e – Lefthand Picnic Area; Ponderosa. Location: 1.5 miles west of Old Stage/Lefthand Canyon Drive	Vandalism, trash dumping, and illegal use fire arms.	Consider this area for closure and restoration.		\$5,000
01f – Lefthand Picnic Area; Willow Location: 1.9 miles west of Old Stage/Lefthand Canyon Drive	Poor trail construction to picnic areas, deteriorating fence, poor placement of picnic areas, and little signs.	Designate and develop picnic area. Construct access trail, redesign and replace fence, replace grills and tables, add two picnic sites, and upgrade signs. Future renovations and development should comply with ADA specifications.		\$20,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
17 - Chautauqua/ Baseline/6 th Street			4.50	\$270,000
17a - Chautauqua Trailhead	Safety issues and volume of use exceed trailhead capacity. Threats to visitor safety include facility design not providing safe access in and out of pedestrian areas. Crowding from high to extreme volumes of use has resulted in lack of available parking spaces and high number of encounters with other visitors. Parking areas are eroding, lack of parking spot delineation and hardening has resulted in visitors parking on adjacent vegetation. Fence repairs/replacement needed. Illegal activities include parking violations, vandalism, and improper disposal of garbage.	Build retaining wall and trail along Baseline Road west of the Kinnikinnick Drive for increased safe parking and access to Chautauqua (see Baseline/6th Street access) and maintain parking lot. Develop information/ education kiosk, replace gate. Close and restore undesignated trails.		\$270,000
17b – Baseline//6th Street access	Drainage issues, need for a sidewalk and a fence.	Design and install fence. Build retaining wall or fence and sidewalk along Baseline Road. Address drainage issues.		in above

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
15 - Crown Rock Trailhead and Picnic Area	Visitor safety issues around parking area, old picnic areas, poor trail alignment, absence of restrooms, old signs, undesignated trails, revegetation problems, and limited parking for a high use area.	Install of walkway around pavement surface and reinforce parking area retaining wall for visitor convenience and safety. Evaluate and upgrade picnic site. Realign trail serving area. Evaluate installation of restroom facilities given the areas severe site constraints. Evaluate and replace needed signs. Evaluate and complete revegetation. Designate and publicize overflow parking areas.	4.25	\$33,000
10 - Summit Trailhead, Flagstaff Trailhead, Summit Picnic Area	Redevelopment and/or renovations are needed at the summit. Facilities, roads, access, and trails need repair.	Draft detailed site plan for area covering all facilities, access, information, road, and trail needs. All future development and/or renovations should comply with ADA specifications.	4.00	\$10,000
05 - Boulder Falls	Fence along the road and along the river need repair or replacement. Most signs are old and worn. Several undesignated trails in a closed area. Parking area, which belongs to the State of Colorado Transportation Department, in need of repair.	Work to transfer to other government land management agency. If transfer is not possible, evaluate and replace needed signs and fence. Close and restore undesignated trails. Contact State about the parking lot condition.	3.88	\$8,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
07 - Green Mountain Access	Safety issues with limited parking along road right-of-way and limited space for improvements.	Draft site plan for upper Flagstaff Road area; the site plan should cover all access, information, parking, and trail needs within the area. Consider area for closure if and after Lost Gulch Overlook/Picnic Area and Cathedral Picnic Area are addressed.	3.88	\$3,000
08 – Lost Gulch/ Cathedral/Long Canyon			3.88	\$105,000
08a - Lost Gulch Overlook, Trailhead, and Picnic Area	Parking area recently improved with recycled asphalt, although drainage is still a problem. No restrooms are located near this popular viewing area. The two picnic areas are old and have very bad erosion problems. Trail signs in the area are old and in need of replacement.	Draft detailed site plan for upper Flagstaff Road area. Site plan should include restroom facility, redeveloped picnic sites, information/education kiosk, trail and access plan. Possible trail connections to Long Canyon and Green Mountain area to alleviate parking problems.		\$50,000
08b - Cathedral Trailhead and Picnic Area	The parking is very limited and located in front of a private drive way. Limited use, private property conflict and a restroom with a possible cracked vault make this area obsolete.	Draft site plan for upper Flagstaff Road area. At this site redevelop or remove picnic sites, information/education kiosk, access, and remove of restroom facility.		\$35,000
08c - Long Canyon Access	Limited parking and limited space for improvements.	Draft site plan for upper Flagstaff Road area. Close area if and after Lost Gulch Overlook/Picnic Area and Cathedral Picnic Area are addressed.		\$20,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
24 - Mesa, Doudy Draw, South Boulder Creek, Flatirons Vista, Greenbelt Plateau	The southern end of the Open Space Mountain Parks system is not well served by existing trailheads. The size and configuration of the six trailheads south of Shanahan Ridge, the lack of adequate and safe trail connections across Highway 93, and lack of horse trailer parking create congestion and illegal overflow parking at some trailheads while others remain below capacity (see Appendix 3 for more detail).	Provide more parking opportunities and improve safety by expanding Greenbelt Plateau and South Boulder Creek Trailheads. Configure them for horse trailer use, eliminate horse trailer parking at Doudy Draw and South Mesa. Add restroom at Greenbelt Plateau. This work should be conducted after stoplight is placed on Highway 93 and trail built between Greenbelt Plateau and Flatirons Vista (see road crossings).	3.88	\$50,000
16 - Flagstaff/Gregory			3.75	\$15,000
16a - Flagstaff Trailhead	Roadside parking located southeast of bridge. Thick tree stands. Eroding pavement at entrance and old signs and gates.	Close roadside parking located southeast of bridge. Evaluate and mitigate road side seep. Replace pavement entrance. Replace gate and evaluate and replace needed signs.		\$5,000
16b - Gregory Trailhead	Old picnic area is placed next to drainage, little room in parking area, non-accessible bathrooms and deteriorating pedestrian wood bridge.	Elevate or remove picnic site. Install walkway around pavement surface and reinforce pavement edges for visitor convenience and safety. Improve bathroom access. Upgrade and replace bridge.		\$10,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
25 - Marshall Mesa Trailhead	Parking at Marshall Mesa frequently overflows onto Highway 173 on weekends. The parking lot is actually in the highway right-of-way. However, the lot cannot be expanded as it abuts the Coudry Drainage on the south.	When the trail is constructed linking Coal Creek Drive with Marshall Mesa, a trailhead should be considered. Consider building the new trailhead with parking for 10 to 12 cars on South 66th St, near Marshall Lake. If done, work with Boulder County and Colorado Department of Transportation to make Marshall Road near the present trailhead a no parking area.	3.50	\$20,000
04 - Settlers Trailhead and Picnic Area	High volume of use approaching trailhead capacity, high levels of undesignated trails in the area, illegal camping, litter, and weeds. Wood foot bridge is worn out.	Reduce undesignated trails through improved fence design, installation, closure, and restoration. Upgrade picnic site, develop information/education kiosk, replace bridge, evaluate and mitigate hazard trees. Increase enforcement of parking regulations and camping violations. Thin stand of Ponderosa at quarry site to "open" the area, making it less attractive for camping.	3.25	\$20,000
09 - Realization Point Trailhead and Picnic Area	Parking area is in need of a walkway to provide a safe path of travel. Trails and signs need to be reassessed.	Install walkway around pavement surface and reinforce pavement edge visitor convenience and safety. Realign trail serving area. Evaluate and place needed signs.	3.25	\$10,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
13 - Contact Corner Access	Visitor safety issues around parking area, undesignated trails, poor trail alignments, and old signs. Area is used as overflow parking for Crown Rock	Install walkway around pavement surface and reinforce pavement edge for visitor convenience and safety. Realign trail serving area. Evaluate and replace needed signs.	3.25	\$8,000
29 - Boulder Valley Ranch (BVR)/Foothills/Lefthand Trailheads	The northern part of the system is generally well served by existing facilities. Visitors park at the end of Mesa Reservoir Road where it is difficult to turn a vehicle around. Eagle Trailhead is difficult for horse trailers to use, the Lefthand Trailhead is underutilized, and there is room at the BVR ranch complex. The ranch complex is open to public horse trailer parking, but the present situation makes this neither obvious nor inviting.	Formalize parking at the east end of the Mesa Reservoir road by moving the southern fence 20 ft. and provide off-street parking for 8 to 12 cars. Discourage horse trailer parking at Eagle Trailhead and direct it to Lefthand Trailhead and to BVR ranch complex. Clarify parking opportunities and BVR Trailhead.	2.75	\$2,000
26 - South Boulder Creek/Dry Creek	This area is served adequately by trailheads and parking available at the East Boulder Community Center. Also, restrooms are available at East Boulder Community Center. A trail connector between Teller, Dry Creek, and Bobolink Trailheads is planned.	When the trail connector between Teller, Dry Creek, and Bobolink Trailheads is built, consider expanding the Dry Creek trailhead to accommodate increased use, take the parking pressure off Bobolink Trailhead, and place restroom facility.	2.63	\$100,000

Table 4: Trailheads Needing Work

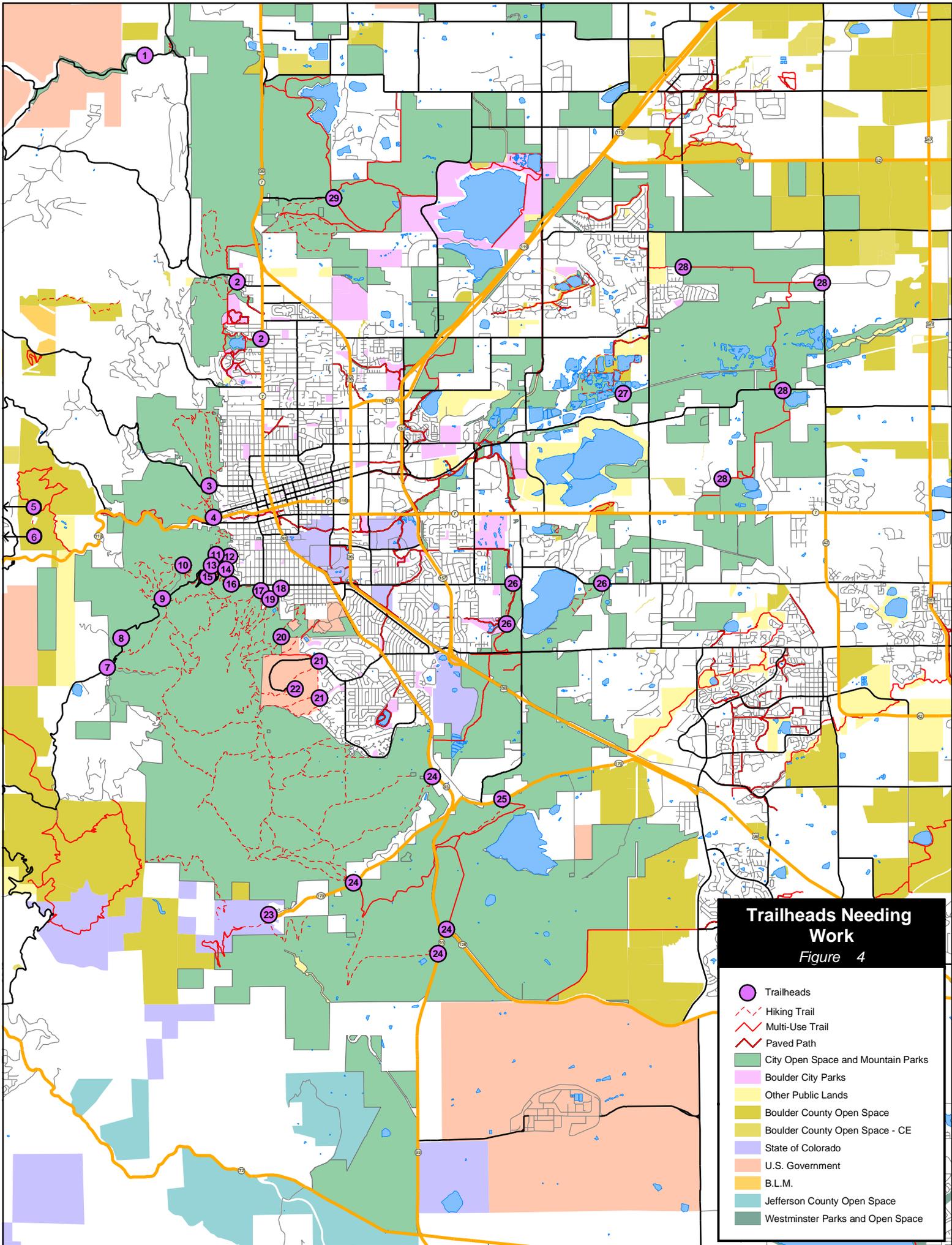
Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
11 - Halfway House Trailhead and Picnic Area	Visitor safety issues around parking area near road, old picnic sites, undesignated trails, and condition of historical structures.	Install walkway around pavement surface and reinforce pavement edge for visitor convenience and safety. Upgrade picnic site. Evaluate Halfway House and restroom structures for future use.	2.25	\$7,000
14 - Baseline Overlook and Picnic Area	Poor parking opportunities make travel to and from view points and picnic site challenging. Picnic table is old and has erosion problems around it. Flagstaff Trail is in need of realignment.	This area should not be considered or designated as a trailhead due to the limited parking space available and future trail realignments. Remove road crossing signs and stripes after Flagstaff Trail reroute.	2.25	\$4,000
21 – Skunk Canyon/ Bear Canyon			2.00	\$10,000
21a - Skunk Canyon Access Point	Parking and sign issues.	Address parking and sign issues.	2.00	\$5,000
21b - Bear Canyon Access Point	Parking and sign issues.	Address parking and sign issues.		\$5,000
22 - NCAR Access Point	Parking and sign issues.	Address parking and sign issues.	2.00	\$5,000
28 - Gunbarrel Hill/Teller Farms	The eastern part of the system has adequate trailhead facilities and services. Sawhill Ponds, because of its proximity to North Teller trailhead and the Gunbarrel Hill access, provides an outhouse for the area (along with the one at South Teller) for users of the East Boulder Trail.	Continue current management.	1.88	\$2,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
12 - Panorama Point Overlook and Picnic Area	Erosion problems, old signs, and revegetation needs due to undesignated trails.	Evaluate and replace needed signs. Address erosion.	1.75	\$3,000
27 - Sawhill Ponds Trailhead	Problems in this area are older picnic areas and benches, deteriorating lake deck, and several visitor bridges that are in need of repair. Installation of two new picnic tables with a covered patio were added in 2001.	Replace or remove picnic site. Upgrade bridge and restore deck. Delineate designated trails and close undesignated trails.	1.50	\$15,000
23 - Eldorado Canyon Access Points	Parking and sign issues.	Evaluate and address parking and sign needs.	1.38	\$5,000
02 - Wonderland Lake/Fourmile Canyon Creek Trailheads	This area is well served by existing trailheads on Broadway and Lee Hill road and by on-street parking. There is excellent coverage with trash cans, dog bag dispensers, and signs. Use will increase when the Dakota Ridge subdivision is completed.	Continue management.	1.13	\$2,000
18 - Mariposa (neighborhood) access	Area is in need of new signs.	Evaluate and place needed signs.	1.00	\$5,000

Table 4: Trailheads Needing Work

Map ID number and Trailhead	Issues/Problem Statement	Recommendation	Priority score	Cost
19 - Enchanted Mesa Trailhead and Picnic Area	Parking design is poor and in need of improvements. Picnic area is old and in need of repair. The area is in need of better signs.	Draft site plan for area that includes evaluating parking, redeveloping picnic site, and development of information/ education kiosk.	1.00	\$5,000
20 - Kohler Mesa Access Point	Parking and sign issues.	This area should be considered for upgrades to serve as a Park Access Point. Staff should consider the following objectives for the site plan - signs and location.	1.00	\$5,000
TOTAL				\$862,000



Trailheads Needing Work

Figure 4

- Trailheads
- - - Hiking Trail
- Multi-Use Trail
- Paved Path
- City Open Space and Mountain Parks
- Boulder City Parks
- Other Public Lands
- Boulder County Open Space
- Boulder County Open Space - CE
- State of Colorado
- U.S. Government
- B.L.M.
- Jefferson County Open Space
- Westminster Parks and Open Space

Trail Improvement Summary

Description

Trail improvements are projects that combine management challenge areas, rebuild/reroute trails, road crossings, and trailheads into interrelated work projects in the same physical area. There is a significant backlog of work to provide good facilities and minimize resource impacts. It is critical to prioritize. Listed trail improvement projects are those that provide the highest leverage to improve the visitor experience and reduce or prevent resource impacts. There is substantial work beyond these listed projects.

Methodology

First, work team members listed and prioritized the subcategories of management challenge area, rebuild/reroute trails, road crossings, and trailheads (see sections above). The team reviewed the top ten priorities in each of these subcategories, identified interrelated components in the same physical area, and combined components to create trail improvement projects. Second, identified projects were scored on a scale of 1 to 5, the greater the number the higher the importance, on each of the following criteria, and divided by the number of team members participating:

- Facility condition - current condition of trails, trailheads, access points or picnic areas or road crossings, this includes visitor safety; the poorer the condition the greater the importance
- Volume of use - how much traffic the area/trail receives; the more the traffic the greater the importance
- Environmental impacts - how ecologically sensitive the area is; the more sensitive the area the greater the importance
- Rate of change - how much will a problem get worse if not addressed soon; the greater the rate of change the higher the importance

Third, project scores were added together to yield a prioritization score; the higher the score the more important the project. Fourth, trail projects were broken into highest, other highest and high categories. Highest and high designations are based on total score breaks. "Other highest" is based on the project having a very high need in one rating criteria, even though it would have fallen into only the "high" category based in its total score.

Results

Priority trail improvements are listed below and in Table 5 and are mapped in Figure 5. Three projects are included in the "highest" category, five in "other highest," and 13 in "high." "Other highest" priority trail improvement projects had lower total scores, but had high scores on one of the criteria: one because of immediate safety concerns (Community Ditch), one because of high environmental concern (E.M. Greenman), and three because of being preventive and avoiding restoration cost (Eldorado, North Foothills, Kolb). The latter projects may or may not be considered trail improvements, but are in areas that are

relatively large and unfragmented and were identified as priority management challenge areas.

Highest Priority Trail Improvement Projects

- Royal Arch/Woods Quarry/3rd Flatiron reroute/upper Enchanted Mesa
- 4th of July Trailhead land transfer or plan
- Saddle Rock/Amphitheater reroute and rebuild

Other Highest Trail Improvement Projects

- E.M. Greenman Trail reroute
- Eldorado Mountain/Doudy Draw/Lindsay plan
- North Foothills plan
- Kolb east of 75th along Boulder Creek restoration

High Priority Trail Improvement Projects

- Sanitas and Centennial Trailheads improvement
- Bear Canyon Trail reroute and rebuild
- Chautauqua including Bluebell Baird rebuild and Bluebell Mesa rebuild
- Marshall Mesa Trail realignment
- Boulder Falls transfer or improvement
- Settlers/Anemone Trailhead improvement and trail plan
- Bear Peak summit access from Fern Canyon and Bear Peak West Ridge Trail
- Crown Rock Trailhead rebuild and trail realignment
- Buckingham Picnic Areas improvement and restoration
- Flagstaff Summit plan and improvements
- Flagstaff Trail realignment
- Upper Flagstaff Mountain trail connector

It is recognized that priority order may change among these or another projects based on opportunities that arise. For example a stoplight may be installed that satisfies the need for a safe road crossing without the expense of a half-million dollar underpass.

Table 5: Trail Improvements

Map ID and Project	Cost estimate	Condition/safety	Volume	Environmental	Change	Total Score	Management Direction
14 - Royal Arch/ Woods Quarry/3rd Flatiron reroute/ upper Enchanted Mesa	\$30,000	4.00	5.00	5.00	4.71	18.71	Improve visitor experience by making a trail connection, improving access, and reduce resource impact. Reroute Royal Arch Trail to a location that has a more sustainable grade and gets more sun in winter. Link Wood's Quarry Trail, that now dead ends, to Royal Arch Trail reroute making a sustainable loop trail accessible from both Chautauqua and NCAR. Rebuild Royal Arch Trail for climber access. Close and restore undesignated trails.
06 - 4th of July Trailhead land transfer or plan	\$10,000	4.71	4.86	4.86	4.14	18.57	Work to transfer to other government land management agency. If transfer is not possible, improve visitor experience and reduce resource damage by drafting a detailed site plan that covers facilities, camping areas, access, information, road, parking, and trail needs.
11 - Saddle Rock/ Amphitheater rebuild and reroute	\$56,000	4.86	4.00	3.57	4.29	16.72	Improve visitor experience and minimize resource impacts by rerouting Saddle Rock to the Spy Trail or connecting Spy to Saddle Rock; investigate link to the backside of the 1st Flatiron. Address undesignated trails at the Amphitheater. Close and restore undesignated trails.
03 - Sanitas and Centennial Trailheads improvement	\$80,000	4.71	5.00	2.71	3.43	15.85	Improve immediate safety and access issues by expanding Centennial parking area and eliminate on street parking, adding restroom, redevelop picnic sites, close and restore undesignated trails

Table 5: Trail Improvements

Map ID and Project	Cost estimate	Condition/safety	Volume	Environmental	Change	Total Score	Management Direction
10 - Chautauqua including Bluebell Baird rebuild and Bluebell Mesa rebuild	\$302,000	3.86	5.00	3.29	3.57	15.72	Improve visitor experience by increasing safety, defining functional access, and making the trail tread more usable and attractive. Reduce resource impact. Build retaining wall and sidewalk along Baseline Road west of the Kinnikinnick Drive for increased safe parking and access to Chautauqua. Reroute Bluebell/Baird Trail by dropping north off of Ski Jump Mesa down to Gregory Canyon and Baseline Trail. Close and restore undesignated trails.
20 - Marshall Mesa Trail reroute	\$44,000	3.71	4.43	3.29	4.29	15.72	Improve visitor experience and minimize resource impacts by realigning Community Ditch and Marshall Mesa trails west of the trailhead and closing and restoring undesignated trails. Assess location of interpretive signs that promote undesignated trails.
15 - Bear Canyon Trail reroute and rebuild	\$48,000	3.86	3.14	5.00	3.71	15.71	Improve visitor experience and minimize resource impacts by rerouting trail to reduce number of stream crossings and rerouting upper portion of trail.
05 - Boulder Falls land transfer or improvement	\$8,000	4.86	4.86	2.86	3.00	15.58	Work to transfer to other government land management agency. If transfer is not possible, improve the visitor experience by evaluating and replacing needed signs and fence. Close and restore undesignated trails. Contact CDOT about the parking lot condition.

Table 5: Trail Improvements

Map ID and Project	Cost estimate	Condition/safety	Volume	Environmental	Change	Total Score	Management Direction
04 - Settlers Anemone trailhead improvement and trail plan	\$20,000	4.29	3.86	3.29	4.00	15.44	Improve the visitor experience and reduce resource damage by improving Settlers Park including replacing bridge. Increase enforcement of parking regulations and camping violations. Thin stand of Ponderosa at quarry site to "open" the area, making it less attractive for camping. Create a sustainable trail system, close undesignated trails, consult Utilities Department about future plans of pipe corridor
09 - Crown Rock Trailhead rebuild and trail realignment	\$33,000	4.00	4.71	3.00	3.57	15.28	Improve visitor experience and reduce resource damage by installing walkway around pavement surface, realign trail, evaluate installation of restroom facilities, designate and publicize overflow parking areas.
16 - Bear Peak summit access from Fern Canyon and Bear Peak West Ridge Trail	\$58,000	3.57	3.71	4.00	4.00	15.28	Improve visitor experience and minimize resource impacts by rebuilding sections of lower Fern Canyon to Nebel Horn saddle; reroute above saddle to the summit of Bear Peak. Reroute Bear Peak West Ridge Trail from where the trail goes steeply up the hill to the summit.

Table 5: Trail Improvements

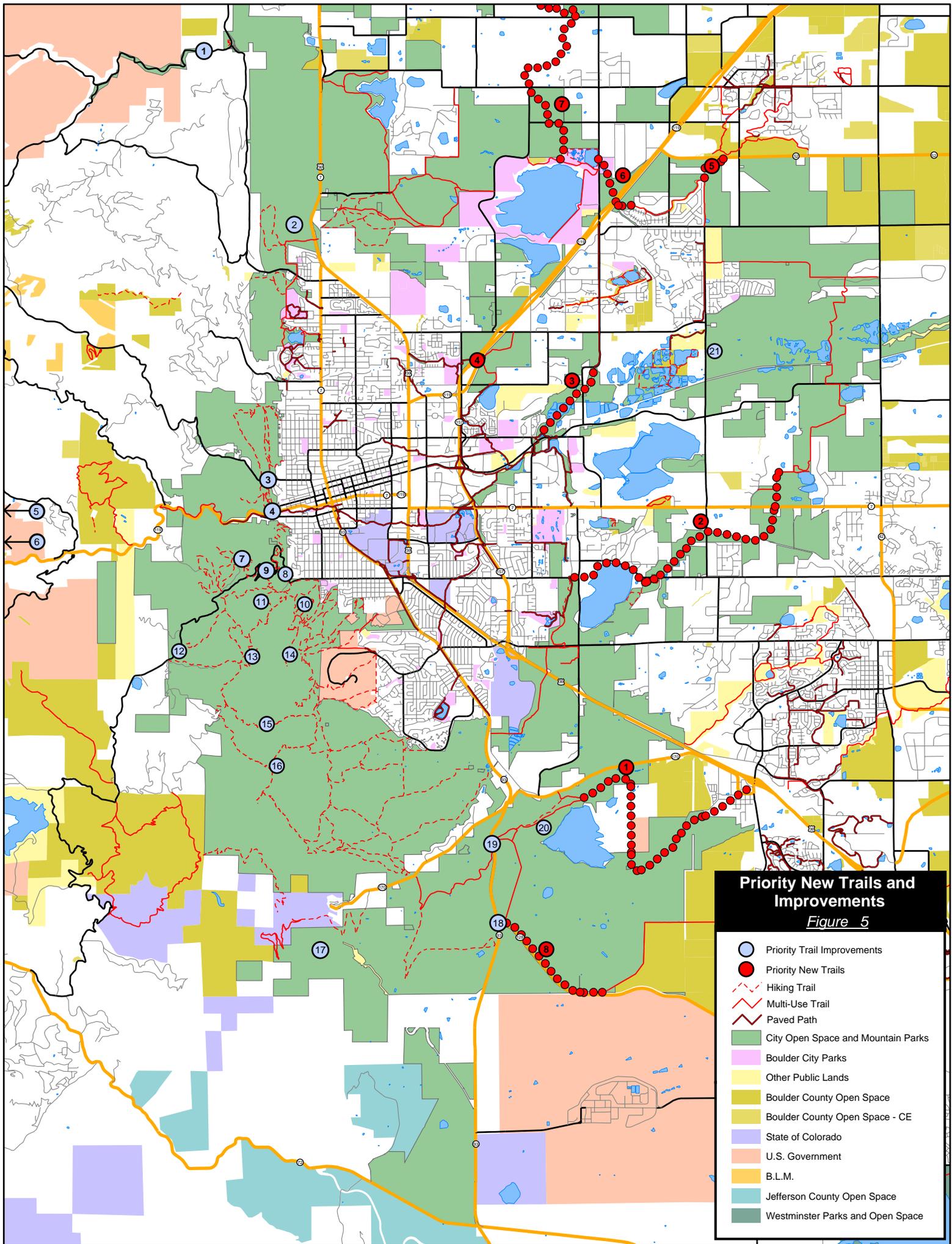
Map ID and Project	Cost estimate	Condition/safety	Volume	Environmental	Change	Total Score	Management Direction
01 - Buckingham Picnic Areas improvement and restoration	\$50,000	4.43	4.00	3.14	3.57	15.14	Improve the visitor experience and reduce resource damage, vandalism, and illegal firearms use by continuing to improve Buckingham, Lefthand (.8 miles from Old Stage Road) and Willow (1.9 miles) Picnic Areas, close and restore Juniper (1.2 miles), and Ponderosa (1.5 miles) Picnic Areas. Close area and restore undesignated trails in Buckingham natural area to east Old Stage Road.
17 - Eldorado Mountain/Doudy Draw/Lindsay plan	\$10,000	2.86	3.29	4.14	4.43	14.72	Minimize resource impacts in a large relatively unfragmented habitat block with relatively low levels of use. Work to keep people on designated trails, close undesignated trails. Develop a conceptual plan for area
18 - Highway 93 stoplight near Greenbelt Trailhead to Flatirons Vista Trailhead	\$125,000	4.00	3.86	3.57	3.29	14.72	Improve the visitor experience and minimize resource impacts by making key connections, improving safety, expanding trailhead parking. Place stoplight between Greenbelt Plateau and Flatirons Vista Trailheads. Expand Greenbelt Plateau and South Boulder Creek Trailhead and design for horse trailer parking. These trailheads have good sight lines for entering the highway. Remove horse trailer parking from Flatirons Vista, South Mesa, and Doudy Draw Trailheads improving access for other visitors. Replace non ADA accessible restroom at South Boulder Creek Trailhead with a restroom at Greenbelt Plateau. Close and restore undesignated trails.

Table 5: Trail Improvements

Map ID and Project	Cost estimate	Condition/safety	Volume	Environmental	Change	Total Score	Management Direction
07 - Flagstaff Summit plan and improvements	\$10,000	3.29	4.43	3.29	3.57	14.58	Improve visitor experience and minimize resource impacts by drafting detailed site plan for area covering all facilities, access, information, road, and trail needs.
13 - E.M. Greenman Trail reroute	\$52,000	3.14	3.14	5.00	3.29	14.57	Improve the visitor experience by making the trail tread more usable and attractive. Reroute and rebuild sections of trail. Close and restore undesignated trails.
08 - Flagstaff Trail realignment	\$27,000	4.29	4.00	3.00	3.00	14.29	Improve visitor experience including safety by rerouting to reduce number of road crossings
12 – Upper Flagstaff Mountain Trail connector	\$55,000	3.57	4.00	3.00	3.57	14.14	Link Lost Gulch, Realization, Cathedral Trailheads and Long Canyon Access into one trail system. Place restroom in most beneficial location and remove old restroom at Cathedral Trailhead.
02 - North Foothills	\$5,000	1.14	2.57	3.86	4.14	11.71	Minimize resource impacts in a large relatively unfragmented habitat block with relatively low levels of use. Work to keep people on designated trails and close and restore undesignated trails.
19 - Community Ditch Trail underpass on Highway 93	\$80,000	5.00	3.86	1.57	1.00	11.43	Improve the visitor experience by eliminating a critical safety hazard and improving access. Work with FRICO and Colorado Department of Transportation to retrofit underpass for recreational use.

Table 5: Trail Improvements

Map ID and Project	Cost estimate	Condition/safety	Volume	Environmental	Change	Total Score	Management Direction
21 - Kolb east of 75th along Boulder Creek restoration	\$5,000	1.43	1.43	4.00	3.43	10.29	Minimize resource impacts in a large relatively unfragmented habitat block with relatively low levels of use. Work to keep people on designated trails and close undesigantated trails. Develop a conceptual plan for area.
Total Estimated Cost	\$1,108,000						



Priority New Trails and Improvements

Figure 5

-  Priority Trail Improvements
-  Priority New Trails
-  Hiking Trail
-  Multi-Use Trail
-  Paved Path
-  City Open Space and Mountain Parks
-  Boulder City Parks
-  Other Public Lands
-  Boulder County Open Space
-  Boulder County Open Space - CE
-  State of Colorado
-  U.S. Government
-  B.L.M.
- Jefferson County Open Space
- Westminster Parks and Open Space

New Trails

Critical Road Crossings

Description

Critical road crossings are where trails cross roads creating safety issues and providing critical trail links. Providing these key internal linkages greatly expands the ability of visitors to access the OSMP system.

Road crossings probably are the greatest hazard for Open Space and Mountain Parks visitors. There are many places where designated trails cross roadways at grade. There are additional locations where no crossing is recommended, but visitors often choose to cross a roadway to use another section of the Open Space and Mountain Parks trail system. All these crossings require navigating across busy roads or highways resulting in unsafe conditions. Since the city of Boulder does not own these roads, the city cannot guarantee safety or safe crossings. State and county transportation departments have to approve any improvements to crossings of state highways or county roads in their respective jurisdictions. In some cases road crossings require either underpasses or stoplights to make the crossing safe.

Methodology

First, trail road crossings were identified for existing trails. Need for underpasses or stoplight was identified. Second, prioritization criteria were discussed and established. Third, road crossings were prioritized based on the following criteria using a scale of 1 to 5, the greater the number the higher the importance, and divided by the number of team members participating.

- Immediate safety issues based on speed of vehicles, traffic volume, sight lines, and current use volume; the greater the safety risk the higher the score.

Results

Table 6 lists, and Figure 3 depicts the critical road crossings for Open Space Mountain Parks trails and identifies whether pedestrian underpasses or stoplights are anticipated at these locations. Community Ditch Trail is the priority based on immediate safety concerns and where an existing ditch underpass can be retrofitted to provide access. The multiple crossings of Flagstaff Road need to be addressed; realignment of the trail potentially could reduce the number of crossings. Even with improvements several years ago, Sanitas/Centennial Trailhead crossing needs more attention because of fast vehicle speeds down Sunshine Canyon, congestion from people accessing cars along the right of way and poor sight lines. Linking Greenbelt Plateau and Flatirons Vista Trailheads across Highway 93 will improve safety by removing parking along the highway right of way and moving it to the more easily accessed Greenbelt Plateau. In all cases, safety issues need to be addressed within site constraints. Priority Road crossings include:

- Community Ditch Trail underpass at Highway 93

- Highway 93 stoplight near Greenbelt Trailhead to Flatirons Vista Trailhead

Costs

Costs for critical road crossings are listed above are very preliminary and need to be refined as developed. Total cost is \$1,655,000. Cost to OSMP is \$155,000.

Table 6: Critical Road Crossings for Open Space and Mountain Parks Trails				
Map ID Number and Trail	Road Crossing	Safety Score	Underpass	Estimated Cost
06 - Community Ditch Trail	Highway 93	5.00	Yes	\$80,000
03 - Flagstaff Trail	Flagstaff Rd	3.88	No	NA
02 - Sanitas/Centennial Trailhead	Sunshine Canyon Drive/ Mapleton	3.50	No	NA
05 - Greenbelt Plateau Trail/Flatirons Vista (cost includes trail work)	Highway 93	3.25	Stoplight	\$15,000
04 - South Mesa Trail/Doudy Draw Trail	Eldorado Springs Drive	2.25	No	NA
07 - South Boulder Creek Trail	Highway 93	2.25	Stoplight	\$60,000
08 - East Boulder Trail	Valmont Road	1.88	No	NA
01 - Foothills Trail (COB Public Works)	Lee Hill Road	1.50	Yes	\$500,000 *
09 - Fourmile Canyon Creek Trail (Greenways) to Cottonwood Trail	Diagonal Highway	1.00	Yes	\$500,000 *
10 - Cottontail Trail (Greenways)	Diagonal Highway near IBM	1.00	Yes	\$500,000 *
11 - Cottontail Trail	Mineral Road (Highway 52)	1.00	Stoplight	\$0
TOTAL				\$1,655,000
TOTAL OSMP Cost				\$155,000

* Cost not to be paid by OSMP

Trail Connections

Description

New trails connections provide additional recreational opportunities and make important trail links. New trails also often provide access to desired destinations and provide more experiences and variety for visitors.

Methodology

First, every request for a trail on Open Space and Mountain Parks over the last four years was compiled and included in this analysis. Requested trails are listed in Table 7 and mapped in Figure 6.

Second, information was compiled about the trail requests including if the trail was included on the Boulder Valley and/or County Comprehensive Plan map (all trails on the Boulder Valley Comprehensive Plan map are included), ownership interests, resource issues, and the agency with lead responsibility for the project is, if not OSMP. Third, the work team discussed the projects and recommended a course of action. Fourth, the team prioritized the projects using each of the following criteria:

- Use levels – the anticipated level of attraction (use); the more the traffic the greater the importance
- Environmental impacts – how ecologically sensitive the area is; the more sensitive the area the lower the importance

Projects were rated for each criterion by team members on a scale of 1 to 3. Team member's scores were added for a category total. The scores for both criteria were then added for a total project score - the higher the score, the more important the project. Trails where OSMP has limited management control or acquisition potential were not rated. Fifth, the team double checked the prioritization to ensure the priorities reflected the views of the team.

Results

The top seven priority new trails listed below have higher anticipated use volumes and lower environmental impacts than other listed trails and are the trails recommended for site evaluation and construction. These priority trails improve safety and make critical connections providing more variety and longer options using the already existing trail system. Priority new trails link major destinations. Three projects are the responsibility of the City of Boulder Greenways program.

Trails were placed on the list because they were recommended by at least one citizen at one time over the last five years. Because of this, trails rated below the top seven may or may not be appropriate to build and require further information and analysis before recommendations are made. Coalton Trail to Greenbelt Plateau Trailhead has been added because it was preliminarily approved by the Open Space Board. Because of site constraints, the need to cross a number of private properties, cost, limited benefit or natural resource impact, many of the suggested trails on the list are not feasible and will not be constructed.

The top eight new trails are listed below and are mapped in Figure 5. Table 7 has the results for all the trails.

- 07 - Boulder Feeder Canal
- 04 - Cottonwood Trail to Fourmile Canyon Creek Trail Road Crossing (Greenways)

- 02 - Bobolink Trailhead to Dry Creek Trailhead to Teller Trailhead
- 01 - Marshall Mesa Trailhead to S. 66th to Coal Creek Drive to Superior
- 03 - Valmont-Gunbarrel connector (Greenways)
- 06 - Gunbarrel to Boulder Reservoir via IBM (under Diagonal) (Greenways)
- 05 - Cottontail Trail to Niwot Trail
- 08 - Marshall Mesa/Greenbelt Plateau to Coalton Trail

Costs

The top eight projects are anticipated to cost OSMP approximately \$1,365,000. New trail project costs for the top seven new trails are provided in Table 7. The other listed trail requests were not costed because they may or may not be appropriate to build and require further information and analysis before recommendations are made.

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
43 - Boulder Feeder Canal	21	19	40	BVCP BCCP	Managed by Northern Colorado Water Conservancy District, owned by Bureau of Reclamation and some private owners	Raptors	Boulder County north of Niwot Road	Water quality issues	Build trail on alignment	\$100,000
29 - Cottonwood Trail to Fourmile Canyon Creek Trail Road Crossing	19	17	36	BVCP BCCP	Colorado State Highway Department, Burlington Northern Railroad Company		City Transportation	Connection	Encourage City Transportation to complete trail	City Transportation
20 - Marshall Mesa Trailhead to S. 66th to Coal Creek Drive to Superior	13	16	29	BVCP BCCP	2 private owners off Coal Creek Drive, 1owner between Marshall Trail and S. 66th	Drainage and wetlands near Marshall Road/ 66th, high quality grassland and shrublands near Coal Creek Drive	Boulder County Transportation to vacate Coal Creek Drive		Close Coal Creek Drive as a public road and convert to a trail, investigate alternative across County's Bush/Cohig and City's Damyanovich properties	\$80,000

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
27 - South Boulder Creek Trail to Dry Creek Trailhead to Teller Trailhead	15	14	29	Conceptual BVCP BCCP		Wetlands and riparian areas		Critical connection	Make trail connection	\$800,000
30 - Valmont-Gunbarrel connector (Pit D)	10	19	29	Conceptual BVCP BCCP	Private property in area along trail corridor	Wetlands and riparian areas	City Transportation		Work with City Transportation on alignment that is acceptable to OSMP	City Transportation
41 - Cottontail Trail to Niwot Trail	14	14	28	Conceptual BVCP BCCP	CO Dept of Transportation	Prairie dogs, raptors, and wetlands	Boulder County	Outside funding requests (GOCO, ISTE) for underpass on Highway 52, unsuccessful; agriculture water delivery issues	Use stoplight at 79th and Highway 52, continue acquisition opportunities for trail connection	\$145,000
42 - Gunbarrel to Boulder Reservoir via IBM (under Diagonal)	16	12	28	BVCP BCCP	CO Dept of Transportation, Parks & Recreation	Wetlands	City Transportation		Work with City Transportation to complete trail	City Transportation

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
13 - Highway 93 from JeffCo	12	15	27	Conceptual BVCP BCCP	CO Dept. of Trans., Private, U.S. Dept. of Energy (Rocky Flats), Jefferson County Open Space	Tall grass		May be near road, critical connector	Investigate alternatives to connect to JeffCo	
45 - North Rim	18	9	27	BVCP BCCP	Boulder County Parks and Open Space		Boulder County Parks and Open Space	Neighborhood concerns	No action recommended, under County jurisdiction	
06 - Green Mountain West Ridge Trail to Lost Gulch Overlook	15	11	26			Prime habitat for large mammals including bears, mountain lions, high quality forest and shrub communities		Road crossing	Investigate trail alignment	
11 - Denver Water Aqueduct	12	14	26		Denver Water Board	large unfragmented natural area, bear habitat, birds, high quality grass, shrub, and forest communities		Alternatives include corridor along Highway 93 south from Flatirons Vista Trail or from south end of Coalton Trail via western edge of Rocky Flats	Investigate alternatives to connect to JeffCo	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
14 - Marshall Mesa/Greenbelt Plateau to Coalton Trail	11	15	26	Conceptual BVCP BCCP	CO Dept. of Transportation, Boulder County Parks and Open Space	Large unfragmented natural area, high quality grassland community, prairie dogs, badger, possible sharp tailed grouse reintroduction area		Old service road on the East Varra property along Coal Creek or crossing Coal Creek at any point is not recommended because of potential impacts to the riparian area. Agricultural and irrigation issues on OSMP property	Place Trail near Highway 128, but buffer from road where possible, recommend to Boulder County Transportation that on-road bike lane be provided. Cost includes stream crossing,	\$322,000
25 - U.S. 36 Cherryvale Road to Davidson Mesa	15	11	26	BVCP	CO Dept. of Transportation, Louisville			Along road	Work with CO Department of Transportation to provide trail connection in right-of-way	
37 - 51st to Boulder Reservoir	17	9	26		Boulder County Transportation, Private property	Wetlands			Work with Boulder County Transportation to provide on-road bike lanes	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
10 - Doudy Draw to Eldorado Springs	10	15	25			High quality grassland communities, erosion prone slopes near town, riparian areas, wetlands		Critical connector	Work with Boulder County Transportation to provide on-road bike lane	
16 - S.H. 93 underpass at Matterhorn site linking Flatirons Vista and Greenbelt Plateau Trailheads	13	12	25	Conceptual BVCP	CO Dept. of Transportation	High quality grassland communities, lead plant		Near road	If funding is not available for stoplight at road crossing at Flatirons Vista and Greenbelt Plateau trailheads north of highway 128, this is alternative	
40 - Niwot Trail East of 79th to East Boulder Trail (at Gunbarrel)	12	13	25		CO Dept. of Transportation				Recommend not to build trail because of road crossing, trail connection already planned at Cottontail Trail to the west	
03 - Chapman Drive	12	12	24		Private	Large unfragmented natural area, high quality forest, multiple rare plant communities			Investigate legal right-of-way at Boulder Canyon	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
17 - Off street along Eldorado Drive from S.H. 93 west	14	10	24		Private	High quality grasslands		Already provided by South Boulder Creek Trail	Work with Boulder County Transportation to provide on-road bike lanes	
34 - 75th north of Valmont	13	11	24						Work with Boulder County Transportation to provide on-road bike lanes	
01 - North Foothills to Heil Ranch	9	14	23	BCCP north of Neva Road	Private property (5 to 7 owners over 2 to 3 miles some with nearby homes)	Habitat Conservation Area, large block of unfragmented natural land, high quality grass and shrub communities, sensitive archaeological areas, rattlesnake denning area, raptor use of the Palisade		Alternatives of Left Hand Trail or the Boulder Feeder Canal	Do not place trail on west Beech property; if a trail connection is made work to make connection on Left Hand Trail and work with Boulder County to explore obtaining easements from necessary private property owners	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
33 - Erie rail trail	10	13	23	Conceptual BVCP BCCP		Extensive wetlands and plant and animal habitat at Sawhill Ponds, White Rocks Nature Preserve, and the Heron Rookery east of 95th Street		Adjacent private landowners	Investigate whether the benefits of the trail connection on this railroad bed corridor are outweighed by impacts to wildlife and natural resources	
07 - Bear Canyon access to Walker Ranch	9	13	22		Private property	Riparian area, prime habitat for large mammals including bears and mountain lions, steep erosion slopes		Allow bikes to Walker	Recommend against due to numerous private property conflicts, increased impacts to sensitive resources, and the potential for significant user conflicts; alternate connections to Walker Ranch are being investigated	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
08 - South Foothills	9	13	22		Potentially	Potential erosion prone slopes, prime habitat for large mammals including bears, mountain lions, and elk, high quality forest and shrub communities		Redundant of Mesa Trail	The city of Boulder generally prohibits the use of bicycles west of Broadway and already provides significant off-road bicycle transportation corridors; significant off-road recreation opportunities exist in the Boulder area; will continue to explore opportunities to connect bicycles to Walker Ranch	
09 - Eldorado Springs to Walker Ranch	10	12	22	Conceptual BVCP BCCP	Private owners, Eldorado Canyon State Parks Boulder County Parks and Open Space	Potential erosion prone slopes, prime habitat for large mammals including bears and mountain lions			Work with Boulder County and Eldorado Canyon State Park to explore feasibility of trail connection along existing roadways	
44 - Axelson from North 55th Street to North Rim	13	9	22		Property owners to north (for potential alignment away from resources)	Prairie dogs and raptors (bald eagles and an osprey nest site)			Continue to try to purchase properties north of Axelson for a trail alignment	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
04 - Gregory Canyon	8	12	20			Potential erosion prone slopes, prime habitat for large mammals, including bears, mountain lions, and elk, high quality forest and shrub communities			Not recommended due to lack of trail characteristics suitable to bikes and unacceptable levels of resource impacts and user conflicts	
18 - Big Bluestem-Doudy	10	10	20						Work with Boulder County Transportation for on-road bike lane	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
15 - S.H. 128 existing underpass	9	9	18		CO Dept. of Transportation	Riparian area along Coal Creek, well-developed shrub and woodland communities, Preble's jumping mouse habitat, sensitive archaeological sites, habitat for bears and bobcats		Extensive modifications required to make a safe underpass, equestrians would need to dismount, new trail required along the west side of Highway 93 to connect to Flatirons Vista Trail, Alternatives include stoplight on Highway 93 near trailheads or current underpass at Matterhorn site	Not recommended due to resource issues	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
24 - Boulder Turnpike underpass near Davidson Mesa to Marshall Mesa	8	10	18			Habitat Conservation Area and a new trail on the west side of Boulder Turnpike could impact other sensitive resources in the area including wetlands, largest parcels of tallgrass, rare plant species, raptor habitat, ground-nesting bird habitat, prairie dogs, burrowing owls, and State Natural Area		Alternatives include a corridor along U.S. 36 from Louisville to South Boulder Creek Trail or connecting trails to the south of Boulder Turnpike, existing underpass at Boulder Turnpike is very low - now 3 to 5 feet tall	Not recommended, other alternatives being considered	
31 - East Boulder Creek	8	10	18		Private parcels	Significant riparian area extensive wetlands, raptor and waterfowl habitat, White Rocks State Natural Area, Heron Rookery east of 95th St.			Not recommended due to resource issues	

Table 7: Requested New Trails

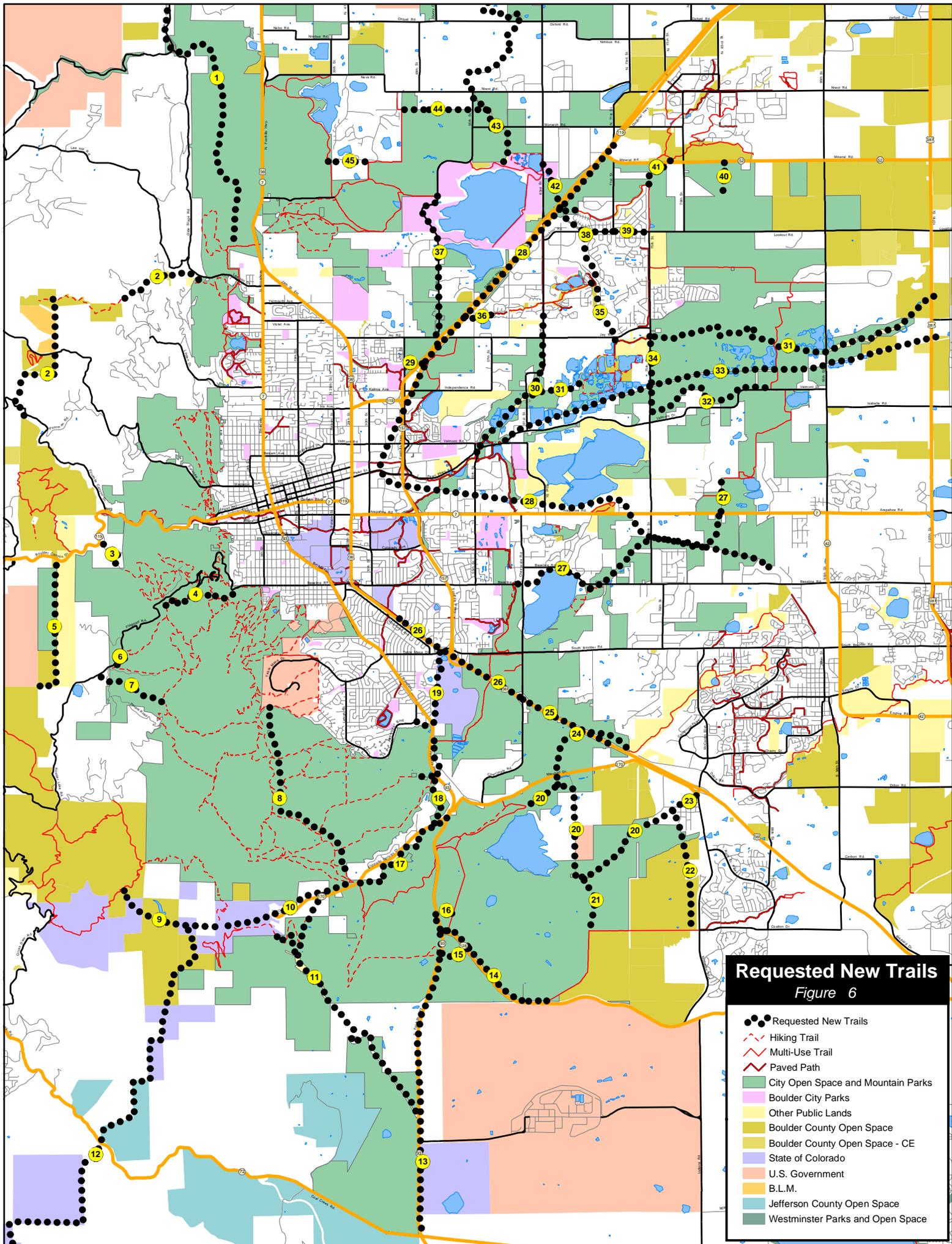
Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
05 - Tram Hill	7	10	17		City of Boulder Utilities	Large unfragmented natural area, prime habitat for large mammals including bears, mountain lions, and elk, high quality forest and shrub communities			Not recommended due to terrain constraints, resource impacts, and lack of trail connections	
22 - Coal Creek to Coalton Trail	8	9	17		Boulder County Parks and Open Space	Riparian and wetlands, grassland communities	Boulder County		County project	
32 - Fell-ERTL II circle trail	8	6	14		Several private parcels (with conservation easements)	Grassland communities, riparian areas, wetlands?			Not recommended, see rail connection	
02 - Old Kiln to Ann White, Bald Mountain Betasso			Limited OSMP control Not scored		Unknown number of private parcels, Boulder County Parks and Open Space, Bureau of Land Management	Potential erosion prone slopes, unknown resource impacts		Limited control	Work with Boulder County to explore easement acquisitions from private property owners to make trail connection	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
12 - JeffCo Mountains			Limited OSMP control Not scored		All other jurisdictions			Limited control	Have other entities explore connections	
19 - CU South to Shanahan Ridge			Limited OSMP control Not scored		University of Colorado Private parcel (one with conservation easement) Boulder Trans. at Broadway crossing			Limited control	Adequate pedestrian and bike transportation opportunities already available	
21 - Coal Creek Drive across Coal Creek to west end of Coalton Trail			Not scored		Boulder County Parks and Open Space	Prairie dogs, raptors, Preble's jumping mouse, and the riparian area along Coal Creek, cross Coal Creek restoration area		Alternative connection from Coal Creek Drive to McCaslin connection to Coalton Trail	Not recommended due to serious resource impacts, restoration area; alternative along Coal Creek Drive to McCaslin to Coalton	
23 - McCaslin			Limited OSMP control Not scored		All County			Limited control	Not OSMP property	

Table 7: Requested New Trails

Map ID number and Trail	Level of Resource Impact	Level of Attraction	Priority Score	Comp Plan	Other entity ownership	Resources	Agency lead	Miscellaneous	Recommendation	Cost
26 - U.S. 36 West			Redundant not scored					Limited control	See Davidson Mesa	
28 - Burlington North Railroad			Limited OSMP control Not scored	BVCP BCCP	Burlington Northern Louisville Broomfield			Limited control	Will investigate with other entities	
35 - Twin Lakes to Jay Road			Limited OSMP control Not scored		All private property with houses, ditch company	Riparian		Limited control	Not OSMP property	
36 - Diagonal to Willows subdivision.			Limited OSMP control Not scored	BVCP BCCP	Potential private parcels ditch company	Riparian		Limited control	Not OSMP property	
38 - Homestead Subdivision to Twin Lakes			Limited OSMP control Not scored		All private property with houses ditch company	Riparian		Limited control	Not OSMP property	
39 - Lookout Road			Limited OSMP control Not scored		All on road ROW			Limited control	Recommend on-road bike lane	



Trail Work Prioritization

With limited trail crew and financial resources make it critical to establish work priorities. Heavy visitation requires continual maintenance. Additional maintenance will be required as visitation continues to climb. The work list is extensive and will take many years to accomplish. It is critical to take a preventive approach to minimize costs long term and not fall further behind.

Priorities

The working group strongly recommends that priority be placed first on taking care of immediate or imminent safety and resource impacts. To accomplish this goal the recommended prioritization is detailed below and mapped in Figure 5.

1. Maintenance - Maintaining current trails to at least provide for visitor safety and minimize resource damage. Priorities are set annually through work plans. Basic maintenance has the highest priority.

2. Trail improvements - The next trail priority is to make current trails “sustainable” and minimize resource impacts. Sustainable trails deliver visitors to appropriate destinations on routes away from sensitive areas on a safe, durable, less steep, enjoyable, and less expensive to maintain trail. Trail improvement projects are intended to meet these goals. Trail improvement projects combine interrelated components of management challenge areas, current trail rebuilds/reroutes, critical road crossings, and trailheads. These projects were prioritized using the following criteria: facility condition and safety, volume of use, environmental impacts, and rate of change. Priority trail projects are listed below:

Highest Priority Trail Improvement Projects

- Royal Arch/Woods Quarry/3rd Flatiron reroute/upper Enchanted Mesa
- 4th of July Trailhead land transfer or plan
- Saddle Rock/Amphitheater reroute and rebuild

Other Highest Priority Trail Improvement Projects

- E.M. Greenman Trail reroute
- Eldorado Mountain/Doudy Draw/Lindsay plan
- North Foothills
- Kolb east of 75th along Boulder Creek restoration

High Priority Trail Improvement Projects

- Sanitas and Centennial Trailheads improvement

- Bear Canyon Trail reroute and rebuild
- Chautauqua including Bluebell Baird rebuild and Bluebell Mesa rebuild
- Marshall Mesa Trail realignment
- Boulder Falls transfer or improvement
- Settlers/Anemone Trailhead improvement and trail plan
- Bear Peak summit access from Fern Canyon and Bear Peak West Ridge Trail
- Crown Rock Trailhead rebuild and trail realignment
- Buckingham Picnic Areas improvement and restoration
- Flagstaff Summit plan and improvements
- Flagstaff Trail realignment
- Upper Flagstaff Mountain trail connector

Trail improvement projects will generally have priority over new trails to address immediate safety and resource issues.

3. New trail projects - New trails provide for increased recreational opportunities and provide critical connections and routes to destinations. Criteria for prioritizing include anticipated use levels and minimal environmental impacts.

The top nine new trails are listed below. Table 6 has the results for all the trails.

- Community Ditch Trail underpass at Highway 93
- Highway 93 stoplight near Greenbelt Trailhead to Flatirons Vista Trailhead
- Boulder Feeder Canal
- Cottonwood Trail to Fourmile Canyon Creek Trail road crossing (Greenways)
- Bobolink Trailhead to Dry Creek Trailhead to Teller Trailhead
- Marshall Mesa Trailhead to S. 66th to Coal Creek Drive to Superior
- Valmont-Gunbarrel connector (Greenways)
- Gunbarrel to Boulder Reservoir via IBM (under Diagonal Highway) (Greenways)
- Cottontail Trail to Niwot Trail

Costs

Trail Improvements

The cost for all the categories considered in the trail improvement analysis is \$2,242,000 (Table 8).

Table 8: Total Costs for Management Challenge Areas, Rebuild/Reroute Trails, and Trailheads	
Trail improvement categories	Cost
Management challenge areas	\$1,139,000
Rebuild/reroute trails	\$1,646,000
Trailheads	\$1,180,000
Non Trail and trailhead facilities (e.g. Halfway House)	7,000
Total	\$3,972,000

The cost estimate for priority trail improvement projects is \$3,972,000.

New Trails

The cost for the top nine new trails is \$1,520,000.

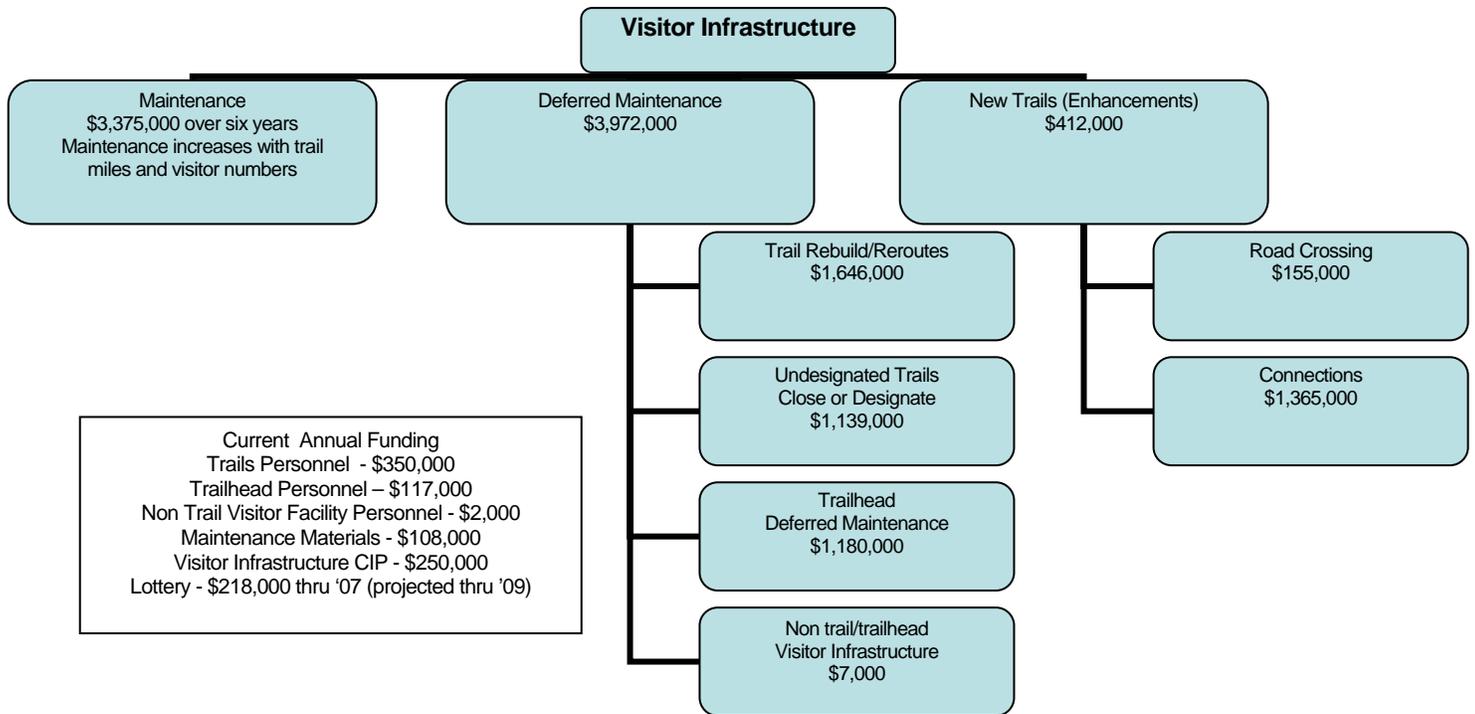
Total Cost

The rough total cost for all projects - trail improvements and the top nine new trails - is \$5,492,000. This cost is the sum of the four trail improvement categories (Management Challenge Areas, rebuild/reroute trails, road crossings, and trailheads).

The rough total cost for the priority trail improvement projects and the top seven new trails is \$2,233,000.

Figure 7 illustrates the analytical framework used for the trail assessment and prioritization with the costs added.

Figure 7: Trail Assessment and Prioritization Analytical Framework with Costs



Organizational Capacity

Funding and Organizational Capacity to Meet Demands

OSMP has limited funds to accomplish all the work tasks described in this report. It is critical for the Department to build the funding and organizational capacity to provide these visitor facilities and minimize resource impacts.

More Department Funding Is Required

More funding needs to be provided to catch-up with long overdue work. This includes continuing Junior Rangers for maintenance, adult trail crew for maintenance and focused rebuilds/reroutes, and contractors for large scale rebuilds/reroutes and new trails. Table 9 lists the organizational trail work capability in the organization for 2002. We estimate it requires about 29,000 hours to perform basic trail maintenance (see Table 1). Adding volunteer projects, at 2002 trail staffing levels there were only enough work hours to maintain current designated trails, deferring other critical safety and resource impacts.

Outside funding - OSMP will seek funding from outside sources to augment Departmental resources. Possible sources include Great Outdoors Colorado, Colorado Department of Transportation and private parties.

Partnerships - OSMP will continue partnerships with groups to meet facility demands. Groups will have the opportunity to accelerate work projects from a lower to a higher priority if they are willing to provide the resources for professional project feasibility analysis, planning, and construction. These projects would be subject to Department approval and oversight and would be projects that the Department would eventually conduct.

Table 9: Organizational Capacity							
<small>2002</small>	Crews	Persons/ crew	Weeks	Overtime @ 1.5	Person weeks	Person hours	\$12/hour
Junior Rangers	7	9	10	0	630	17640	\$211,680
Adult	1	4	26	0	104	4160	\$49,920
Supervisors		3	54	0	162	6480	\$77,760
Total						28280	\$339,360
2000							
Junior Rangers	7	15	10	0	1050	29400	\$352,800
Adult	2	4.5	34	6	312	12480	\$149,760
Supervisors		3.5	54	4.5	193.5	7740	\$92,880
Total						49620	\$595,440

- Junior Rangers work 28 hours/week, others 40 hours/week

- Supervisors include Junior Ranger supervisors

- Trailheads had one supervisor in 2002, two supervisors in 2001 and are not included in this analysis

- Overtime in 2001 is estimated at about 2 weeks for 2 adult crews and 3 weeks for supervisors multiplied by 1.5 overtime pay

Appendix 1

Work Team "Ranking" Staff

Project leader was Matt Jones. The following are staff that made the recommended prioritizations for the listed projects:

Challenge areas: Brad Skowronski, Mike Adams, John Leither, Matt Jones, Joe Mantione, Cary Richardson, and Bryan Pritchett.

Rebuild/reroute trails: Brad Skowronski, Mike Adams, John Leither, Matt Jones, Joe Mantione, Lynn Riedel, and Don D'Amico

Road crossings: Brad Skowronski, Mike Adams, John Leither, Matt Jones, Lynn Riedel, Cary Richardson, Steve Armstead, and Dave Barry.

Trailheads: Brad Skowronski, Mike Adams, John Leither, Matt Jones, Lynn Riedel, Cary Richardson, Steve Armstead, and Dave Barry.

Trail improvement projects: Brad Skowronski, Mike Adams, John Leither, Matt Jones, Lynn Riedel, Cary Richardson, and Steve Armstead.

New trails: Brad Skowronski, Mike Adams, John Leither, Matt Jones, Joe Mantione, Steve Armstead, and Bryan Pritchett.

Staff listed above their job titles and their full time years with Open Space and Mountain Parks are listed below. These numbers do not account for seasonal years with the department or other related work experience.

Name	Title	Full Time Yrs. in Dept.
Mike Adams	Media Specialist (former Trail/Trailhead Supervisor)	10
Steve Armstead	Lead Ranger/Naturalist	11
Ann Armstrong	Plant Ecologist	11
Dave Barry	Maintenance Person II (trailhead lead)	2
Don D'Amico	Wetland Ecologist	6
Matt Jones	Environmental Planner	10
John Leither	Maintenance Person IV (Trails/Trailhead Construction)	11
Joe Mantione	Environmental Planner	16
Bryan Pritchett	Resource Conservation/Education & Outreach Supervisor	7
Cary Richardson	Wildlife Ecologist	3
Lynn Riedel	Plant Ecologist	7
Brad Skowronski	Maintenance Person IV (Trails/Trailhead Construction)	7

Appendix 2

Rebuild/Reroute Natural Resource Improvements

Appendix 2: Top Trail Related Resource Issues						
Trail	Trail Segment	Resource Significance	Issue	Resource Managers Recommendations	Trail Manager's Perspective	Priority
E.M. Greenman	Sensitive plant site next to springs	very high; rare plants, riparian, wildlife, cultural	trail cuts through a sensitive riparian community	reroute away from rare plant sites	rerouting entire trail is major work commitment; historical use suggests we need to continue to leave it as a destination; reroute and rebuild; high priority	1
Bear Canyon	west of Mesa to Green Bear	diverse riparian area, major wildlife corridor, Preble's meadow jumping mouse	trail is within and bisects the riparian corridor many times	reroute out of riparian area	number of trail crossings can be reduced; concern over compromising visitor experience by moving entirely out of riparian area; huge labor effort to move entire trail out of riparian area; can reroute portion to pull out of riparian corridor but has to dip back into drainage to cross creek in a couple of places; where it leaves creek and cranks up hillside needs to be rerouted	2

Appendix 2: Top Trail Related Resource Issues

Trail	Trail Segment	Resource Significance	Issue	Resource Managers Recommendations	Trail Manager's Perspective	Priority
Long Canyon	entire trail	riparian, eastern woodland community, high wildlife, PMJM	trail cuts through a sensitive riparian community; riparian area additionally impacted by Flagstaff Rd. gravel runoff	reroute out of riparian area	opportunities limited for pulling out of riparian area; can consider other options; proposed to be an on-trail only area; some places where it can be done	3
Skunk Canyon	west of Mesa (undesignated trail)	high wildlife value, riparian corridor	high quality plant communities (ferns) being severely impacted by undesignated trail use	close undesignated trail and address desired climbing access issues; consider closing 4th slab west	challenge area; all climbing access; debate over level of use the area gets; needs to be high on list of challenge area priorities	4
Chautauqua Meadow	undesignated trails	diverse mixed grass and xeric tallgrass;	fragmentation; spread of non-natives	designate access points; on-trail only through meadow; add retaining wall and sidewalk for safety; eliminate undesignated trail system	nothing will improve in the meadow until access off Baseline Road is addressed; very high profile whatever we do; has to be handled delicately; sidewalk might make it more of a win-win project	5

Appendix 2: Top Trail Related Resource Issues

Trail	Trail Segment	Resource Significance	Issue	Resource Managers Recommendations	Trail Manager's Perspective	Priority
Towhee	area above and below Homestead trail intersection through shrublands	high wildlife value, riparian corridor, bear habitat;	trail cuts through important shrub habitat and reduces wildlife values; also puts people and dogs in conflict with bears; trail duplicative with Mesa and Homestead	reroute out of riparian area or consider closing trail	steep slope limits options, but it would be possible to send towhee trail up to Mesa trail; probably doesn't make sense in terms of visitor use patterns; probably need to close trail or leave it where it is; rerouting Towhee and have seasonal closures for Homestead; seasonal closure options	6
Doudy Draw	picnic area above DD trail head to mesa top near Lindsay pond	ecotonal shrublands; fish refuge in pond	proliferation of social trails up Doudy Draw and into Lindsay; trail cuts through significant shrub community on side of mesa	close social trails (select one and designate if necessary); on-trail use only; consider rerouting part of trail that cuts through significant shrub community on side of mesa	challenge area;	7
Greenbelt Plateau	trailhead to Community Ditch	xeric tallgrass	social trail proliferation widens recreational impacts compromising xeric tallgrass community	eliminate ancillary undesignated trails; do not allow bike access to continue on these side trails	look for increase of trails (braiding) or undesignated trails in perpendicular examples; could put fences but probably wouldn't put them close to the fence; sacrifice entire area; lower priority	8

Appendix 2: Top Trail Related Resource Issues

Trail	Trail Segment	Resource Significance	Issue	Resource Managers Recommendations	Trail Manager's Perspective	Priority
South Boulder Creek	Baseline to S. Boulder Rd.	high wildlife and plan communities	trail widening; social trail proliferation	keep social trails to a minimum to protect riparian area; consider edging designated trail to limit widening	consider formalizing another creek access point; assess and consider rebuild in parts; area south of E. Boulder Community Center highest need; what use patterns are priority	8

Appendix 3

Southern Trailheads

The southern end of the Open Space Mountain Parks system is not well served by existing trailheads. The size and configuration of the six trailheads south of Shanahan Ridge², the lack of adequate and safe trail connections across State Highway 93, and lack of horse trailer parking all conspire to create congestion and illegal overflow parking at some trailheads while others remain below capacity.

Mesa, Doudy Draw, South Boulder Creek, Flatirons Vista, Greenbelt Plateau

None of the trailheads were designed for horse trailer parking. Consequently, a single horse trailer may use 6 to 8 parking spaces. The situation is particularly acute at South Mesa/Doudy Draw and Flatirons Vista on weekends. It is common to find all three lots packed full, with considerable overflow onto State Highways 93 and 170. This illegal roadside parking is a serious safety issue on Highway 93, a heavily used high-speed road. The situation is exacerbated at Flatirons Vista by use of this trailhead as a park and ride for people heading into the mountains, particularly during ski season.

At the same time that these lots are overflowing, both South Boulder Creek and Greenbelt Plateau trailheads often are below capacity.

If there were a safe below-grade crossing between Greenbelt Plateau and Flatirons Vista all of these trailheads could be considered to serve the same trails system. Since the South Boulder Creek trailhead is already west of Highway 93, it already accesses many of the same trails as the Mesa trailhead. South Boulder Creek trailhead might not be an option to parking at the Mesa trailhead for hikers, runners and climbers because of the extra two miles of walking across the prairie to reach the Mesa Trail. However, it is reasonable to consider it for equestrians.

Greenbelt Plateau could also be considered as a safer lot for horse trailer parking than Flatirons Vista, and as an alternative to Mesa and Doudy Draw trailheads, if an underpass were built west of Greenbelt Plateau at Highway 93.

Both Greenbelt Plateau and South Boulder Creek trailheads could be expanded to two to three times their current sizes with little difficulty. There would be impacts to xeric tallgrass prairie that would need to be mitigated. South Boulder Creek could be expanded onto the grounds of the old Open Space Maintenance offices and shops and Greenbelt Plateau could be expanded both north and west, towards Highway 93.

² South Boulder Creek, Mesa, Doudy Draw, Greenbelt Plateau, Flatirons Vista and Marshall Mesa

If South Boulder Creek is expanded and redesigned for horse trailers, horse trailer parking could be eliminated at Mesa and Doudy Draw trailheads, significantly increasing available parking for cars. Whether or not the trailhead is expanded, the outhouse should be replaced with an outhouse that is compliant with ADA.

Expansion and redesign of Greenbelt Plateau only makes sense if combined with construction of an underpass linking Greenbelt Plateau with the Doudy Draw Trail. The existing underpass at the Matterhorn is probably too far north to serve the needs and desires of users, and development of a trail to connect that underpass with the Doudy Draw Trail may have unacceptable environmental consequences.

Construction of an underpass at Greenbelt Plateau, near the junction of Highways 93 and 128, along with expansion of the Greenbelt Plateau trailhead, might allow for the closing of the Flatirons Vista trailhead. This would eliminate a serious safety hazard. As Highway 128 is a divided road near its junction with Highway 93, access to the lot for traffic coming off of Highway 93 would need to be improved. However, I don't think this would be too difficult or expensive.

Cost

Further design work needs to be done before cost estimates can be provided. The cost of an underpass would clearly be far greater than the cost of expanding the Greenbelt Plateau trailhead. However, South Boulder Creek trailhead could be expanded and reconfigured for probably \$20,000 to \$40,000. A new, ADA compliant outhouse will cost \$15,000 to \$30,000.

Marshall Mesa

Marshall Mesa, while near the above trailheads, should not be considered part of the same system. There is little equestrian use. What use there is comes either from Greenbelt Plateau or within the Marshall neighborhood. One rarely, if ever, sees a horse trailer parked at Marshall Mesa. It seems very unlikely that any users of Marshall Mesa, except bicyclists, are drawn to cross Highway 93. Construction of a trail through the Community ditch underpass would accommodate this desire, and eliminate a serious safety concern. Parking at Marshall Mesa frequently overflows onto Highway 173 on weekends. The parking lot is actually in the highway right-of-way. However, the lot cannot be expanded as it abuts the Coudry Drainage on the south.

When the trail is constructed linking Coal Creek Drive with Marshall Mesa, a trailhead should be considered farther east as part of that trail system. A major trailhead could be built at the east end of Coal Creek Drive, on Boulder County's Arsenault property, with additional parking for 10 to 12 cars on South 66th St. near Marshall Lake. If this is done we should work with Boulder County and CDOT to make Marshall Road near the present trailhead a no parking area.