

OPEN SPACE BOARD OF TRUSTEES
Monday, May 9, 2016

Council Chambers, 1777 Broadway

MEETING AGENDA

(Please note that times are approximate.)

- 6:00 I.** Approval of Minutes
- 6:05 II.** *Public Participation for Items Not Identified for Public Hearing
- 6:15 III.** Matters from Staff
- A. Chautauqua Update
 - 1. Final designs for Chautauqua Pedestrian Safety, Access and Lighting Improvements Project Update
 - 2. Chautauqua Access Management Plan Update
 - 3. Chautauqua Meadow Trail Flood Repair
 - B. City of Boulder Resilience Strategy
 - C. Rocky Mountain Greenway Update
 - D. Draft 2017-2022 Capital Improvement Program (CIP)
 - E. Status report on bridge replacement on the Amphitheater Trail over Gregory Canyon Creek.
- 7:45 IV.** Matters from the Board
- A. Greenways Advisory Committee Items:
 - 1. 2017-2022 Greenways Capital Improvement Program
 - 2. Draft CEAP for Fourmile Canyon Creek Greenways Improvements from Upland Avenue to West of Broadway
 - B. [Message from the Boards and Commissions Committee](#)
- 8:15 V.** Adjournment

* Public hearing

OPEN SPACE BOARD OF TRUSTEES

Minutes

Meeting Date April 13, 2016

BOARD MEMBERS PRESENT

Frances Hartogh Molly Davis Kevin Bracy Knight Tom Isaacson Curt Brown

STAFF MEMBERS PRESENT

Tracy Winfree Jim Reeder John Potter Mark Davison Abbie Poniatowski
Jennelle Freeston Joe Reale Phil Yates Annie McFarland Alycia Alexander
Lisa Dierauf Leah Case Gabe Wilson Kelly Wasserbach Brian Anacker
Heather Swanson Mark Gershman Dan Burke Deryn Wagner Kristin Weinberger

GUESTS

Dave Zader, City of Boulder Fire, Wildland Division

AGENDA ITEM 1 – Call to Order

The meeting was called to order at 6:02 p.m.

The newest Open Space Board of Trustees (OSBT) member, Curt Brown, read and signed the Oath of Office.

Tom Isaacson move to appoint Frances Hartogh as the chairperson for the Open Space Board of Trustees. Curt Brown moved to appoint Molly Davis as the Vice Chair. Frances Hartogh moved to elect Leah Case as the Board Secretary. All motions passed unanimously by acclamation.

AGENDA ITEM 2 – Approval of the Minutes

Molly Davis said on page 1, under Matters from the Board, it should read, “. . . take place during public Board meetings.” She said on the same page, it should read, “Molly asked that a Board retreat be held as soon as possible.” Frances Hartogh said on page 3, Edie Stevens’ public comment should read, “We foster appreciation and use that sustain the natural values of the land for current and future generations . . . passive recreation use is allowed when it sustains the natural values of the land for future generations.” She said on page 4, Pat Billig’s public comment should read, “The inventory report for the North TSA makes the strongest case for the preservation of the resources in the West Beech HCA . . . violates management specified for an HCA.”

Tom Isaacson moved that the Open Space Board of Trustees approve the minutes from Mar. 9, 2016 as amended. Molly Davis seconded. This motion passed four to zero; Curt Brown abstained.

AGENDA ITEM 3 – Public Participation for Items not on the Agenda

None.

AGENDA ITEM 4 – Matters from Staff

Jim Reeder, Trails and Facilities Division Manager, and John Potter, Resource and Stewardship Division Manager, highlighted several staff projects.

Frances asked about the reclamation of the Lower Big Bluestem area. Jim said staff will supervise the reclamation; the goal is to narrow the trail so it no longer serves as a road. Tom asked how the current raptor monitoring numbers compare to previous years. John said he did not have that information, but it appears to be relatively normal. Molly asked if staff are still considering other locations for the horse arena, such as the Schooley property. John said he will look into that with staff. Frances asked if there will be information on site and online about the rules and risks of the arena. John said yes.

Tracy Winfree, Director, gave an update on the North Trail Study Area (TSA) timeline.

Joe Reale, Ranger Services Supervisor, and Dave Zader, Wildland Fire Administrator, gave an update on a wildfire response simulation event in May.

Kevin Bracy Knight asked if the Hogback Trail will be closed during this simulation. Joe said yes. Curt Brown asked if staff could provide the Board with the full plan for this simulation. Joe said no, large parts of the simulation are purposefully kept secret as part of the drill. Frances asked if the water will come from Wonderland Lake. Joe said yes; he noted that no actual fire will be used.

Gabe Wilson, Maintenance Person III, Trails, and Heather Swanson, Senior Wildlife Ecologist, gave an update on the Flood repair on Mesa Trail/Skunk Creek Crossing.

Molly asked if staff have looked at alternate areas for the proposed bridge. Gabe said due to different grades in the area, this suggested location would be significantly less work and use less resources. Curt asked if the proposed bridge is horse friendly. Kelly said yes. Kevin said the high priority should be allowing access while still preserving the riparian area. Tom asked if the bridge would be affected by a flood. Kelly said that the life expectancy is about 40-60 years with maintenance upkeep; it would be built to uphold in the case of a flood. Curt asked if this bridge is worth the amount of work required. Gabe said the area for the bridge is steep, but it would minimize the work in the sensitive habitat. Frances said she is concerned that this proposed bridge will create a precedence that OSMP will build more man-made structures on Open Space; she added that a bridge has potential to be misused and will become an attractive nuisance. Heather said bridges are a mechanism to allow less trail and travel in a drainage and this proposed bridge will substantially lessen the environmental impact. Curt said he understands this area is a wildlife corridor. Heather said it certainly is and the bridge will be high enough to allow wildlife movement. Tom stated that staff should not feel pressure to make this crossing super easy for everyone.

Abbie Poniatowski, Central Services Division Manager, gave an update on Draft 2017 Work Plan and Budget.

Frances asked if the department priorities list is in order. Tracy said the first item will be handled first; the rest are flexible. Frances asked for the overarching issues to be dealt with sooner than outlined in the Visitor Master Plan (VMP). Tracy said the updating of the VMP is the appropriate place to work on the overarching issues; however, staff can make sure this is the second item on the priority list. Frances requested that certain sections be revised to include more clearly the Charter's preservation of resources. She asked if the budget amount for the North TSA plan and implementation is the total budget including trail construction. Tracy said yes and the amount is a place holder. Molly requested that when this plan and budget document comes back to the Board if it could include a detailed breakdown on the cost allocations.

Mark Davison, Community Connection and Partnership Division Manager, gave a staff update on exploratory talks for a Conservancy to provide private funding to support Open Space and Mountain Parks (OSMP) priority programs and projects.

Tom asked if this organization would be city specific. Mark said yes, the current concept is targeted towards the city. Tom said OSMP is perceived as already being very well funded and wondered if the trouble put into this would be worth it. Kevin said this conservancy could be a great bridge and way to communicate between all nearby land management agencies. Molly said obtaining funding is not an issue for OSMP, but she is concerned how the funding would be used; would the conservancy support the current Charter. Curt asked how much has been raised by other foundations, would the return be worth the investment. Mark said if there is concurrence by the Board, staff would look into the details of other conservancies that support city departments. Frances added that she would want total transparency from this conservancy; in regards to the legacy, the focus for this conservancy should be preservation of resources, stewardship, environmental planning and sustainability.

AGENDA ITEM 5 – Matters from the Board

The Board discussed dates for upcoming Board meetings as well as a Board Retreat. Tracy suggested she and Frances work on a draft agenda and then send that around to the Board.

Tom explained that for those public and staff in attendance tonight, that are interested, he has some copies of a document he wrote clarifying why he voted the way he did on the last meeting's North TSA motions.

The Board discussed the upcoming city climate meeting in relation to OSMP.

AGENDA ITEM 6 – Summary of 2015 Open Space and Mountain Parks (OSMP) Volunteer Services and Declaration to Honor OSMP Volunteers during National Volunteer Week, April 10-16, 2016.

Jennelle Freeston, Volunteer Program Supervisor, and Kristin Weinberger, Coordinator of Group Volunteer Projects, presented this item.

Kevin said he applauds all the amazing growth that this program has had over the years. He asked what the limiting factors are. Kristin said that their capacity is based off of staffing size; she said they are working on training volunteers to help lead project days. Jennelle said there are many volunteers who stay with OSMP for a long time; staff looks at the retention levels and when they hit that retention point they then recruit more. Frances said the OSMP volunteer program is incredible and would imagine that it is unparalleled in the county or perhaps the country, and that this amazing volunteer experience helps people respect the trails.

Public Comment

None.

Return to the Board

Frances Hartogh read the following proclamation: The Open Space Board of Trustees joins the staff of the City of Boulder Open Space and Mountain Parks Department in recognizing all of our volunteers during National Volunteer Week 2016. We salute the more than 1,760 Open Space and Mountain Parks volunteers who contributed their talents and efforts in helping the department carry out its mission. These individuals are an inspiration as they help to protect the resources that make Boulder's Open Space and Mountain Parks so special.

ADJOURNMENT: The meeting adjourned at 8:53 p.m.

These draft minutes were prepared by Alycia Alexander.

MEMORANDUM

TO: Open Space Board of Trustees

FROM: Tracy Winfree, Director, Open Space and Mountain Parks
Melanie Sloan, Transportation Planner, Public Works Transportation division
Brian Wiltshire, Project Manager, Public Works Transportation division

DATE: May 9, 2016

SUBJECT: Chautauqua Pedestrian Safety, Access and Lighting Improvements Project Update

Executive Summary

The Chautauqua Pedestrian Improvement Project (the Chautauqua project) proposed final plans are presented tonight for review by the Open Space Board of Trustees (OSBT).

The Chautauqua project will construct a sidewalk on the south side of Baseline Road from 6th Street east to Chautauqua Park's eastern boundary west of 10th Street; improve pedestrian crossings to meet Americans with Disabilities Act standards at intersections within the project area; installation of stone stairs at West Trail Study Area Plan-designated access trails on Baseline Road into the Chautauqua Meadow; construct a crusher fines pedestrian connection from Baseline Road to Open Space and Mountain Parks (OSMP)-designated access trails along Kinnikinic Road; construct a five-foot wide detached, patina sandcrete concrete sidewalk from Baseline Road into Chautauqua Park along Kinnikinic Road; install fieldstone swales along Kinnikinic Road to the ranger cottage parking lot entrance on the west and Sumac Drive on the east; construct a soft surface trail from the re-constructed Queen's Gate near 9th Street into Chautauqua Park; make the existing transit stop (also known as King's Gate) compliant with the Americans with Disability Act (ADA); and install pedestrian lighting from the project area into Chautauqua Park.

The Chautauqua project was one of the projects listed in the 2014 voter-approved [Community, Culture and Safety tax](#). The total project budget is \$1.5 million.

Vegetation pruning and removal will begin in the fall of 2016. Project construction is anticipated to begin in the winter of 2016 and will take six months to complete.

Current Context

This section of Baseline Road serves an important role for the use of Chautauqua Park, Open Space and Mountain Parks trails and Chautauqua Association lodging, programming and venues. These three facets of Chautauqua, combined, attract more than half a million visitors per year.

Currently, the lack of sidewalk on the south side of Baseline Road from west of 6th Street east to King's Gate creates a safety hazard. Pedestrians parking on the south side of Baseline Road must walk in the street increasing pedestrian-vehicle and pedestrian-bicycle conflict. The lack

of sidewalks also impedes the mobility and access of area residents. Consequently, the project area has been identified in the City's Missing Sidewalk Links program.

Pedestrians also travel in Kinnikinic Road due to a lack of adequate pedestrian connections to OSMP-designated access trails and existing Chautauqua Park paths. During the public process, the project team received comments and emails from the public that shared their concerns for the lack of safe pedestrian connections from Baseline Road to Chautauqua Park along Kinnikinic Road, requested pedestrian connections to be maintainable in the winter and called for pedestrian connections to be ADA accessible and stroller friendly.

Special events, programming and other attractions bring visitors, performers and employees to Chautauqua during low light conditions, such as evening musical performances or talks. Performers and Chautauqua staff are assigned parking in the lot on 12th Street. The HOP 2 Chautauqua, a free City of Boulder transit service to the Colorado Music Festival and Chautauqua Summer Series events, provides service to the King's Gate transit stop on Baseline Road. Existing unlit pedestrian paths link both the 12th Street parking lot and King's Gate to the Dining Hall and performance areas and venues. Visitors, the Colorado Chautauqua Association and the voters identified the unlit paths as a safety concern. During the public process, the project team received comments from the public stating their support for pedestrian scale, historically appropriate styled, programmable, dark sky compliant lighting along the existing pedestrian paths from King's Gate to the parking area on 12th Street.

Project Purpose

The project team is directed by the 2014 voter-approved Community, Culture and Safety sales tax ballot initiative to provide the community with safer, accessible pedestrian routes. The project team developed project plans that achieve this by providing ADA accessible sidewalks, intersection crossings and pedestrian connections and through installation of pedestrian lighting along key paths.

The project team seeks to honor the natural character of Chautauqua through material selection, design and re-vegetation plant selection. The project team also seeks to honor Chautauqua's National Historic District designation through design and material selection for all project improvements, including those within the historic district boundary.

The interdepartmental project team is also guided by the members' respective master plans and guiding plans. The Transportation Master Plan guides the Public Works' Transportation department to provide travel options by constructing multimodal facilities. The West Trail Study Area Plan guides the Open Space and Mountain Parks department to reduce damaging social trails on the north side of Chautauqua Meadow.

Additionally, the Colorado Chautauqua Association has created the Cultural Landscape Assessment and Plan which provides "a series of recommended strategies and tasks that provide a direction for holistically managing change at Chautauqua to ensure that it continues to evolve in a manner that is in keeping with its historic character" and the Master Exterior Lighting Plan, which identified proposed lighting designs and locations.

The project team has used the Colorado Chautauqua Association's master plans as guiding documents in the development of previous project plans. It has become clear through previous presentations to the Landmarks Board that these plans have not been developed through the collaborative framework or approved by the Landmarks Board. Recognizing this, the project team has removed the lighting component from the current round of Landmarks Alteration Certificate application so that the Colorado Chautauqua Association and the Landmarks Board can develop an approved lighting plan over the next year (2016-2017). The Chautauqua project will seek a landmark alteration certificate to install the first phase of that lighting plan when it is completed (2017-2018).

Improvements (Appendix A)

The Chautauqua Project will provide the following improvements (those adjacent to or within Open Space and Mountain Parks lands are in bold):

- **Construction of 5-foot wide sidewalks on the south side of Baseline Road from the park boundary near 10th Street to the end of on-street parking west of 6th Street**
- **Improved ADA-compliant pedestrian crossings along Baseline Road**
- **Installation of stone stairs at West Trail Study Area Plan designated access trails on Baseline Road into the Chautauqua Meadow**
- **Native shrubs and plantings to replace non-native species and improve landscape conditions on the north edge of the Chautauqua Meadow**
- **Crusher fines trail from Baseline Road to Open Space and Mountain Parks-designated access trails**
- **Construction of swales along Kinnikinic Road from Baseline Road to Bluebell Road on the west and Sumac Drive on the East**
- Transit stop improvements, including an ADA-compliant ramp at King's Gate
- Construction of a soft surface social trail from the re-constructed Queen's Gate into Chautauqua Park
- Construction of a five-foot wide, patina sandcrete concrete detached sidewalk on the east side of Kinnikinic Road within the historic district boundary
- Pedestrian lighting
 - The Colorado Chautauqua Association will work with the Landmarks Board through a collaborative framework to develop an approved lighting plan over the next year (2016-2017). The Chautauqua project will implement the first phase of that approved lighting plan subsequent to the master lighting plan development.

Public Process

The project team developed preliminary project plans and presented these to the relevant boards for review and feedback: Open Space Board of Trustees (September 9, 2015), the Transportation Advisory Board (September 14, 2015), the Parks and Recreation Advisory Board (September 28, 2015), and the Landmarks Board (October 7, 2015).

The project team then presented the preliminary project plans to the public at an open house held at the Colorado Chautauqua Association Community House (October 15, 2015). The project team also received input from the public through emails and online surveys.

The project team incorporated feedback received from the boards, committees and the public into the proposed project plans, where feasible.

Some of the improvements identified in the CCS ballot initiative and from feedback received through the public process were outside of the city's right-of-way and inside the Chautauqua Historic District boundary. These improvements required a Landmarks Alteration Certificate to: construct pedestrian lighting from the King's Gate (transit stop) entrance to the parking lot east of the tennis courts; install pedestrian lighting at the Shelter House (Trolley station) and the Arbor; install way-finding elements; construct fieldstone drainage swales along Kinnikinic Street; convert parallel parking to angular parking along the northern edge of Sumac Drive; construct concrete sidewalk on the east side of Kinnikinic Road from Baseline Road to Sumac Drive; and construct a soft surface path to connect Queen's Gate with Sumac Drive.

The project team presented revised project plans to the Landmarks Board on February 3, 2016. The project team withdrew the application when it became apparent that the board was going to deny the application.

The project team revised the proposed project plans to respond to the board's concerns and re-submitted a Landmarks Alteration Certificate application for the following improvements: construct fieldstone swales along both sides of Kinnikinic Road, from Baseline Road to Bluebell Road on the west and Baseline Road to Sumac Drive on the east; construct crusher fines social path from the re-constructed Queen's Gate (Baseline Road near 9th Street) into Chautauqua Park to guide park users away from historic oak tree roots; and construct a five-foot wide, patina-sandcrete concrete detached sidewalk on the east side of Kinnikinic Road within the Historic District boundary. The landmarks alteration certificate application for these improvements received approval from the Landmarks Board on April 6, 2016.

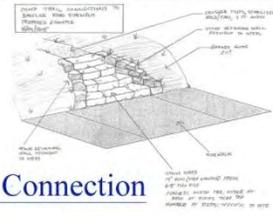
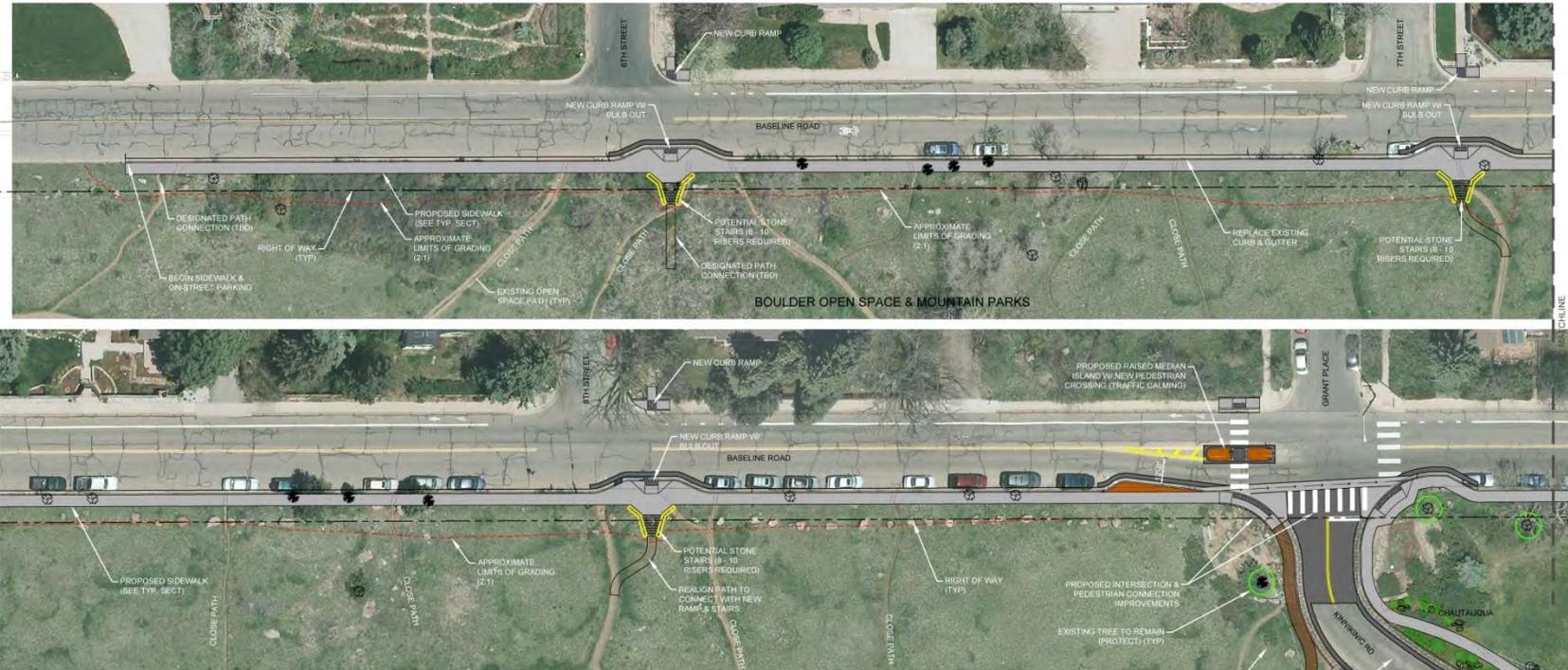
Next Steps

The project team will present the proposed final project plans to the relevant boards in May: OSBT: May 9, 2016; TAB: May 9, 2016; and PRAB: May 23, 2016) and to the public in a second open house in June 2016 (date to be determined).

A project contractor will be selected in fall, 2016. Vegetation removal is anticipated to begin in fall, 2016 followed by project construction in winter, 2016-2017. The project is estimated to be completed, including re-vegetation and tree planting, by spring, 2017.

Appendix A

West of 6th Street to Kinnikinic Road

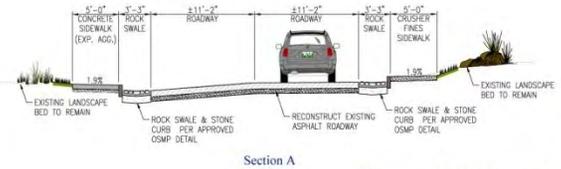


Conceptual Stair Connection

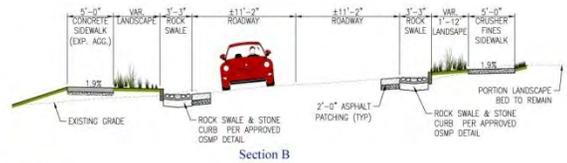


Proposed Sidewalk Section
6th Street to Kinnikinic Road

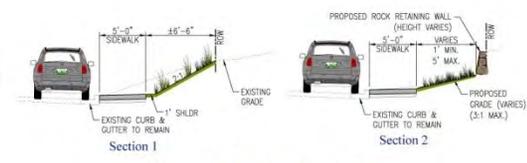
Kinnikinic Road to 9th Street



Section A



Section B



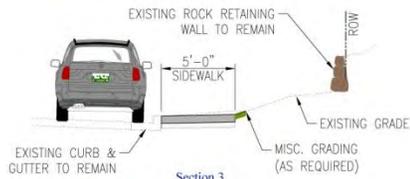
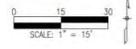
Section 1

Section 2

Proposed Roadway Sections
Kinnikinic Road

Proposed Sidewalk Sections
Kinnikinic Road to 10th Street

9th Street to Chautauqua's Eastern Boundary



Section 3
Proposed Sidewalk
 Kinnikinic Road to 10th Street & Sumac Drive

Renderings of Selected Improvements



Chautauqua King's Gate
Existing Conditions



Chautauqua Kings Gate
Proposed Conditions



Chautauqua Entry at Kinnikinic Rd
Existing Conditions



Chautauqua Detached Sidewalk
Proposed Conditions



Chautauqua Entry at Kinnikinic Rd
Proposed Conditions

Chautauqua Pedestrian Safety , Access,
and Lighting Improvements

Design Concept
Existing Conditions & Renderings
March, 2016



SHEET 4 OF 5

MEMORANDUM

TO: Open Space Board of Trustees

FROM: Tracy Winfree, Director, Open Space and Mountain Parks (OSMP)
Deryn Wagner, Planner, Open Space and Mountain Parks

on behalf of:

Molly Winter, Executive Director, Department of Community Vitality
Bill Cowern, Transportation Operations Engineer, Department of Public Works,
Transportation Division

DATE: May 9, 2016

SUBJECT: **Chautauqua Access Management Plan (CAMP) Update**

Executive Summary

Led by the Public Works Transportation Division and Community Vitality Department, the Chautauqua Access Management Plan (CAMP) will explore ways to manage existing demand for transportation access (including parking) to and from the Chautauqua area in ways that minimize vehicular and parking impacts to surrounding neighbors, visitors and the area's natural and cultural resources. The CAMP will not explore resource management or visitor use of OSMP land in the Chautauqua area, in large part because existing OSMP plans already provide that guidance. At this early stage in the CAMP project, city staff is interested in gathering feedback from the public, city boards, and City Council on the proposed planning process, including the scope of work, schedule, and community engagement.

Background

The City of Boulder enjoys a now 118-year-old, public/private partnership with the nonprofit Colorado Chautauqua Association ("CCA") for shared stewardship of the Colorado Chautauqua. The city owns the 40-underlying acres, three historic buildings and a new building, and leases approximately 26 acres and those four buildings to CCA. The city's Parks and Recreation Department operates a city park on the north lawn known as the Chautauqua Green. In addition to leasing the land and four buildings from the city, CCA also owns 67 historic buildings, including 60 cottages. Year-round, CCA offers lodging, programming, rental of historic venues and a full-service restaurant. Private individuals own 39 historic cottages, most of which are used seasonally (typically summer) but some of which are year-round, owner-occupied residences. Chautauqua was designated a Boulder Landmark District in 1979 and a National Historic Landmark in 2006. Physically, Chautauqua is surrounded on two sides by city open space that is not part of the historic district. The Chautauqua Trailhead is one of the most popular trailheads in the region. The Chautauqua Ranger Cottage, located within the historic district adjacent to that trailhead, is staffed by the Open Space and Mountain Parks Department and provides information services to local and visiting hikers. The historic district abuts single-family residential neighborhoods to its north across Baseline and to the east. This brief

description illustrates the number and variety of interests and uses/users associated with “greater Chautauqua.”

The previous lease between the city and CCA (dated 1998, amended 2002) recognized the negative impacts of parking demand exceeding supply and the unique conditions within historic Chautauqua. The 1998 lease authorized CCA to take a variety of actions to limit access and parking under certain circumstances and anticipated that the city would designate a residential permit parking or similar program within the historic district to address the negative impacts on the Chautauqua operations and environment. Many of these approaches were deemed infeasible to implement.

Actions that were taken over the years included:

- CCA and the city, in collaboration with the Colorado Music Festival, in 2003 initiated free off-site parking and free shuttle service on event nights at the Chautauqua Auditorium to mitigate traffic impacts within the historic district and in the surrounding residential neighborhoods to the north and east. This free service has continued yearly since inception and will continue in summer 2016. The city issues a special event permit annually to permit temporary street closures and limited access on these event evenings.
- RTD discontinued a bus route that stopped just east of 9th Street on Baseline, leaving the closest transit stops at 9th and College and Broadway south of Baseline.
- The city funded a pilot Hop 2 Chautauqua daytime bus during the summer 2008 but ridership was low and the results did not warrant further continuing the service at that time.
- In 2011, the city and the CCA partnered to evaluate parking and access issues in the leasehold area. As a part of this project, the partnership collected parking utilization and parking duration data on all available parking within the leasehold area and in the neighborhood to the north of Chautauqua on three separate days. The results of that data collection showed some areas of high parking utilization within the leasehold area, but very few areas of high parking utilization in the neighborhood north of Chautauqua. Using the data and analyses from this study, a series of pilot programs for the CCA leasehold area was advanced by staff for City Council’s consideration but none of these pilots were adopted for implementation. Council members’ concerns at that time included the concept of restricting parking on streets near open space and park property. Following the council meeting in spring 2012, it was jointly determined that access and parking management at Chautauqua should be addressed through the upcoming lease renegotiation rather than through a pilot program.

In late 2012, the city and CCA adopted *Collaborative Stewardship of the Colorado Chautauqua: Guiding Principles for Place Management and Fiscal Sustainability* (hereinafter “the Guiding Principles”) as a shared statement about the nature of the Colorado Chautauqua and the manner in which its primary stewards, the city and CCA, intend to collaborate in the planning and management of Chautauqua’s future. The ***Collaborative Stewardship Guiding Principles*** are summarized as follows:

1. A Public Place
2. A Historic Landmark

3. A Historic Mission
4. A Balanced Approach
5. Collaborative Place Management
6. A Cautious Approach to Change
7. Shared Financial Responsibility

The city and CCA entered into a new lease effective Jan. 1, 2016 (“the Lease”). The “Access and Parking Management” section of the Lease acknowledges the need for a tailored access management strategy to balance the access of the variety of users and modes while also maintaining the natural, built and historic environments. The Lease reiterates the recognition that during peak periods, parking demand for all uses within and around Chautauqua far exceeds supply, and acknowledges that the movement of vehicles looking for parking presents safety issues and degrades the visitor experience. The lease contains the commitment of the city and CCA to develop a Chautauqua Access Management Plan (“CAMP”) within the first year of the new lease according to the following governing principles (*“the CAMP Governing Principles”*):

- Chautauqua is a unique, shared resource requiring unique solutions.
- Chautauqua is a National Historic Landmark.
- The needs of all stakeholders, including the Association, cottage owners, park users, open space users and neighbors should be considered.
- A mix of uses must be accommodated.
- Pedestrians must be given priority on the narrow streets without sidewalks.
- Traffic circulation should be minimized in the interests of pedestrian safety and user experience.
- Parking demand is seasonal and solutions need not address time periods during which access is readily available.
- During peak periods, the parking needs of users in the historic core should be prioritized, but not exclusive.
- A seasonal transportation demand management (TDM) plan for employees should be implemented.
- The right of public access should not be restricted except for good cause, with such restrictions minimized as appropriate.
- The interests of the surrounding neighbors should be addressed.
- Any plan should be flexible to address changing circumstances.
- Access management should be consistent with the Guiding Principles for Place Management and Fiscal Sustainability.
- Consistent with the city’s climate commitment and sustainability and resilience goals, any plan should support public transit, alternative modes of transportation, a reduction in vehicle miles traveled and a reduction in visits in single-occupant vehicles.

In 2015, resident-owners in the neighborhood north of Baseline adjacent to the Chautauqua historic district and Chautauqua Meadow open space (“Sustainable Chautauqua”) approached the city with parking-related and nuisance issues including: parking too close to or in front of driveways, stop signs, and hydrants; litter and dog waste; speeding and u-turns; general disrespect and noise; overuse of resource/environmental impacts; and lack of parking enforcement. Some improvements have been implemented already, including placement of trash

receptacles and enhanced parking enforcement in the area. Temporary pavement markings will be installed this spring to help delineate where parking is legal. It is anticipated that the Chautauqua-area, activity-related issues will be addressed during the CAMP process.

At a study session on Feb. 9, 2016, staff sought council feedback on the process for development of the CAMP. One option identified was to move forward with developing a CAMP for implementation in the summer of 2016 utilizing parking utilization and duration data from 2011 that may be different today because of increased visitation to Chautauqua. This approach would have the advantage of providing mitigation this summer but would have the disadvantage of being based on data that may be out of date¹ and may be questionable to use as baseline data for future comparison. Another option would be to collect new data in summer 2016 to use to develop the CAMP for implementation and monitoring in summer 2017, thus delaying mitigation until 2017. Council supported staff's recommendation to pursue the second option – to collect new data this summer, followed by the development of a CAMP for implementation in 2017.

After consideration of information and recommendations from staff, City Council approved staff's operating assumptions regarding development of the CAMP (see details below) and directed staff to:

- Develop a data collection/evaluation plan and a public process plan for council's review prior to this summer
- Gather data including parking utilization and duration and an updated user intercept survey this summer
- Work with OSMP to coordinate data collection and outreach and to understand data and system-wide options
- Explore transit options and other ideas for Baseline as part of CAMP development.

Operating Assumptions for the Development of the CAMP

As approved by City Council Feb. 9, 2016, options for the development of the CAMP may include consideration of:

- Some degree of managed parking within the Chautauqua leasehold area and possibly in the surrounding neighborhood as well. This could include parking restrictions similar to those provided by the Neighborhood Parking Permit Program.
- Some degree of paid parking, possibly in the Ranger Cottage lot, on the loop surrounding the park and/or on Baseline Road.
- Enhancements to other modes of transportation including but not limited to restoration of transit service to the Chautauqua area.

¹ The 2011 parking utilization and duration data and corresponding analyses could form the foundation of the development of the 2016 CAMP, but recent data from an Open Space and Mountain Parks Chautauqua Study Area Visitation Monitoring Report (2015) suggest that visitation to Chautauqua has increased substantially since 2005. Whether this increase occurred since the 2011 data collection is unclear. The substantial increase in visitation over time suggests that parking utilization within the leasehold and in the surrounding neighborhood potentially could be higher than previously studied, thus suggesting the necessity of data collection and evaluation of current conditions.

Relevant guidance for this plan includes the city's [Access Management and Parking Strategy \(AMPS\) guiding principles](#):

- Provide for all transportation modes
- Support a diversity of people
- Customize tools by area
- Seek solutions with co-benefits
- Plan for the present and the future

OSMP and the CAMP

OSMP is assisting other City of Boulder departments (Transportation and Community Vitality) to complete this community-driven planning effort. To that end, OSMP was asked to conduct a short-term study in 2015 to understand recent OSMP visitation levels in the Chautauqua area. From Aug. 1 to Nov. 30, 2015, staff used trail counters to estimate daily and monthly visitation to the Chautauqua Meadow and Enchanted Mesa subareas. Findings from this study are included in **Attachment A**.

Guidance for OSMP management of the area can be found in two major plans. In 2005, the Boulder City Council and the Open Space Board of Trustees approved the department's Visitor Master Plan (VMP), which included a "Passive Recreation Area" (PRA) designation for the Chautauqua Meadow. PRAs are generally in close proximity to city or county development, and are managed to accommodate a higher level of visitor use. One of the goals for passive recreation areas is to provide a high level of public access to destinations while also protecting natural and cultural resources.

In 2011, the Boulder City Council approved the West Trail Study Area (TSA) Plan for city-managed open space south of Linden Avenue and north of Highway 170. This plan identified on-the-ground actions designed to improve visitor use in the Chautauqua Meadow. It also called for specific actions to help restore and conserve the area's resources. Like the VMP, the West TSA included many opportunities for public review and comment, and was approved by the Open Space Board of Trustees and the Boulder City Council. OSMP has identified the implementation of West TSA projects as a departmental priority.

The CAMP will not explore limiting public access to the area, for example by decreasing access to open space. The City Council has asked OSMP to address visitor use throughout the OSMP system, which will be included as part of an update to the Visitor Master Plan. That update will take the form of a new systemwide Master Plan for OSMP, scheduled to begin in summer 2017.

Proposed CAMP Process

Subject to modification based on feedback received from the community, CCA and the city boards and commissions, and City Council, the project team anticipates the following project steps:

1. Initial Community Engagement including check-ins with boards and commissions, CCA and council – late April to early June 2016 (see detailed schedule below)
2. Data Collection – Summer 2016

3. Evaluation of Data, Initial Formulation of Menu of Possible Approaches/Pilots for summer 2017 and Consultation with Potential Community Working Group – Fall 2016
4. Formulation of Recommended Approaches/Pilots – Winter 2016-17
5. Consultation with Boards and Commissions, presentation to City Council – Q2 2017
6. Preparation for implementation of pilot project – Q2 2017
7. Implementation of pilot project – Summer 2017
8. Finalization of plan – Fall/Winter 2017

Data collection efforts in summer 2016 may include:

- User intercept survey to understand more about the people arriving at Chautauqua, why they are there and where they are coming from (funds being requested)
- New parking utilization and duration data to be collected within the CCA leasehold and in the neighborhood to the north and east of the leasehold
- Speed and volume data to be collected on key roadways within the leasehold and in the surrounding neighborhood
- Coordination with OSMP on a systemwide visitor survey to understand current visitor use and demographics at Chautauqua

The CAMP Community Engagement Process

To gain feedback on the many perspectives of Chautauqua from the variety of users and stakeholders, the project team will pursue some combination of the following communication tools to foster ongoing outreach and engagement throughout the project:

- Email newsletters through the city and the Colorado Chautauqua Association
- Press releases
- Direct mail postcards
- Social media including Facebook, Twitter and Nextdoor
- Flyers around town
- Signs around Chautauqua (e.g., at trailheads)
- Online and/or intercept surveys
- A community working group to offer periodic feedback
- Presentations to city boards and City Council

The project team will seek input from those attending the Community Open House on April 28th on the preferred and most effective means of communication and outreach.

Upcoming Meetings

The project team will seek feedback on the project schedule and work plan during the following meetings:

- | | |
|----------------------|--|
| April 28 | Community Open House at Chautauqua Community House |
| May 2 | Colorado Chautauqua Association (CCA) Board of Directors |
| May 9 | Transportation Advisory Board (TAB) |
| May 9 | Open Space Board of Trustees (OSBT) |
| May 23 | Parks and Recreation Advisory Board (PRAB) |
| June 1 st | Landmarks Board |
| June 7 | Information Packet [memo] to City Council |

Questions for the Board:

1. Do you have any questions about or feedback on the project schedule or scope of work?
2. What feedback do you have on the possible community outreach and engagement approaches?
3. Is there anything else you would like to share at this point in the process?

ATTACHMENTS

- A. OSMP Chautauqua Study Area Visitation Monitoring Report

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**Open Space and Mountain Parks
Chautauqua Study Area
Visitation Monitoring Report**



Prepared by:

Deonne VanderWoude, Human Dimensions Program Coordinator and

Brian Anacker, Science Officer

January 2016

City of Boulder
**OPEN SPACE &
MOUNTAIN PARKS**



City of Boulder
Open Space and Mountain Parks
Chautauqua Study Area Visitation Monitoring
January 2016



I. Data Collection Dates: August 1, 2015 – November 30, 2015.

II. Project Goal: To understand visitation levels and the distribution of visitation over four months within the Chautauqua study area. Amongst other future applications, this data will be used to support the forthcoming process to develop a Chautauqua Access Management Plan.

Generally, land managers can use visitation data to:

1. Understand visitation patterns (e.g., annual, seasonal, weekly or daily) and apply this understanding to management.
2. Develop indicators of visitor experience and resource quality using one of several carrying capacity/visitor management frameworks (e.g., Recreation Opportunity Spectrum (ROS), Limits of Acceptable Change (LAC), and Visitor Experience and Resource Protection (VERP).
3. Develop an understanding of the relationship between spatial-temporal visitation patterns and integrity of natural, recreational and cultural resources.
4. Inform the budget, such as staffing levels or infrastructure development.
5. Substantiate the need for visitor management actions such as increased outreach, visitor kiosks or enforcement.
6. Determine facility needs (e.g. parking, bathrooms, trash cans or dog stations).
7. Create visitation thresholds for infrastructure and facility (level of) development classes.

III. Monitoring Objective: To estimate the number of summer season (but, August only) and fall season (September-November) person-visits to the Chautauqua study area.

IV. Key Findings: Open Space and Mountain Parks (OSMP) staff has drawn the following conclusions about visitation to the Chautauqua study area. The study area includes the Chautauqua meadow as well as the Enchanted Mesa sub-areas (**Figures 1-2**).

- The current study estimates more than 300,000 visits between August 1 and November 30, 2015. This number is more than double the visitation to the area during the same timeframe in 2004 (~132,000 visits). Moreover, visitation over an entire year, measured in 2004/2005, was estimated at 330,000-350,000 visits, around the same number of visits as recorded in just 4 months in the current study.
- August was the busiest month and November the slowest of the four monitored months. Between 2004/2005 and 2015, monthly visitation in August increased 147% and visitation in November increased 185%.
- In 2015, the number of daily visits to the entire study area ranged from 188 to 5,126, with a daily average of 2,570. Weekend days had consistently higher visitation than weekdays. In the Chautauqua meadow sub-area, Saturdays were the busiest during both summer and

fall seasons. For the Enchanted Mesa sub-area, Sundays received the most visits during both seasons.

- The Chautauqua Trail monitor station captured the greatest number of visits across the entire study area. This location received approximately double the number of visits captured at the Bluebell Road location, which was the next busiest location. Staff estimates that low numbers of visits to the Chautauqua Meadow sub-area originate or end at the 6th Street access point and the unmonitored locations along Baseline Road. Staff also estimates that these levels have generally remained the same between 2004/2005 and 2015 for the months of August-November.
- Information on visitor demographics or experiences was not collected during this 2015 study. However, this type of data is available from past OSMP studies conducted over a year from 2004 to 2005 and from 2010 to 2011. A sample of relevant findings from those studies is included in **Appendix A**.

Note: OSMP conducted only a visitor survey in 2010/2011; visitation counts were not collected during this study period. Therefore, an estimate cannot be made using the studies represented in this report about when or in what period of time within the last eleven years visitation has increased at the Chautauqua study area.

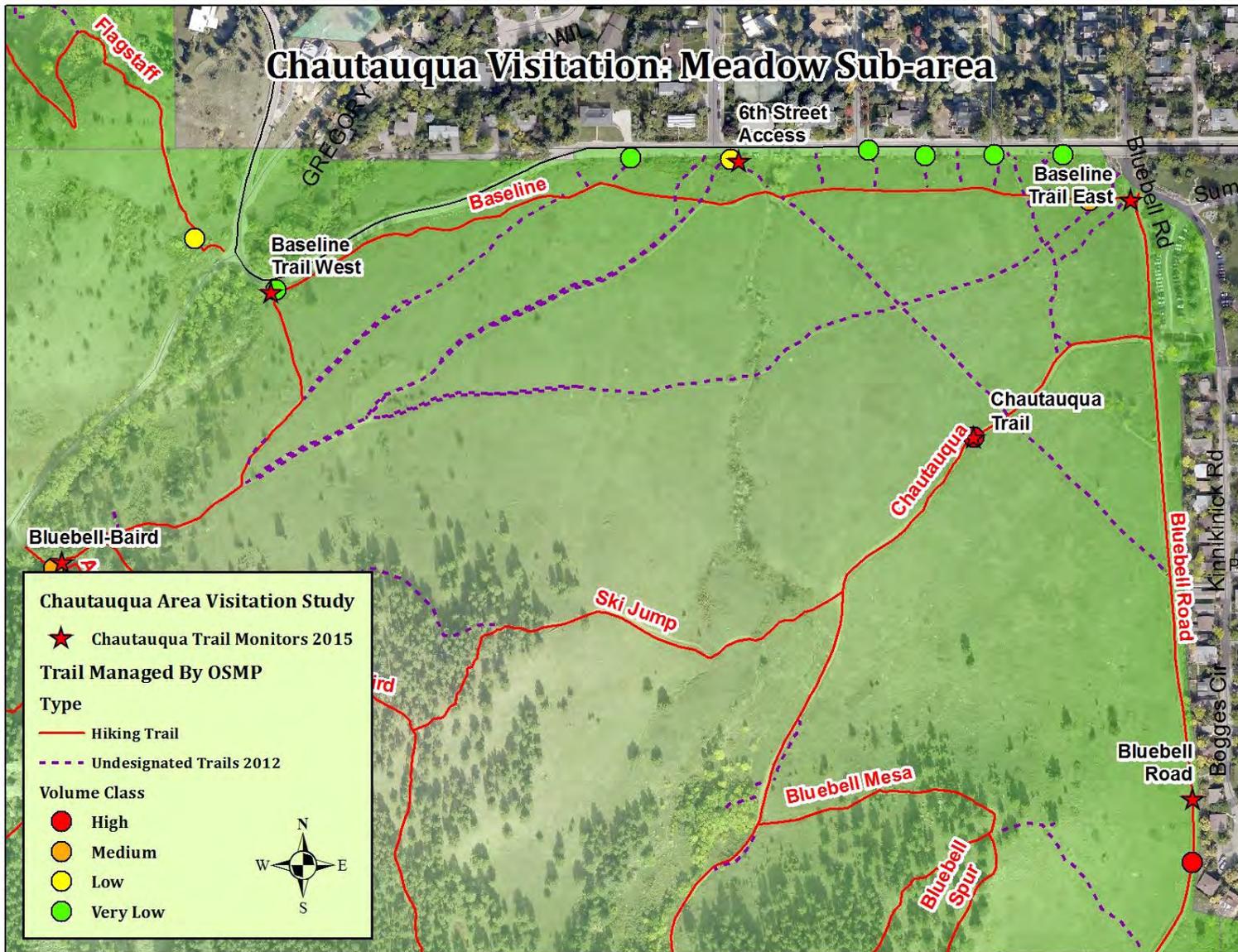


Figure 1. Chautauqua meadow sub-area visitation monitor station locations



Figure 2. Enchanted Mesa sub-area visitation monitor station locations

V. Definitions

Access point: Where a visitor enters or exits OSMP. Often this is the trailhead or beginning of a designated or undesignated trail.

Calibration: A field test conducted on the monitor to determine the average level of operational accuracy and concomitant data error. To calibrate a monitor, actual visitor counts (as observed by field staff) are compared with the counts recorded by the monitor for a minimum of one hour (per calibration period) to determine the percentage of counts not recorded or over recorded.

Count: A count refers to the record collected by the monitor when the infrared beam is broken whether it is broken by a human or another object (e.g., wildlife, blowing vegetation or falling snow).

Daily monitor count (or daily count, or daily count total): The daily monitor count refers to the sum of all the counts on a given day for a given monitor.

EMC: Estimated Monitor Count. The EMC is the total number of counts at a given monitor for a set period of time after outliers have been removed and replaced, missing values have been replaced, and the ratio inflation factor (RIF) has been applied.

Missing (or missed) value: Missing value refers to an hourly or daily monitoring count of zero believed by staff to represent a monitor malfunction (e.g., low battery, the monitor was vandalized, the monitor reached capacity, etc.) or staff error (e.g., staff accidentally erased the data during download). Missed values do not represent a daily record of zero counts which normally indicates days when no visitors travelled past the monitor.

Open Space and Mountain Parks visitation volume classes: Ranges of visitation used to classify OSMP access points. Current classes and associated annual visitation ranges are:

- High: $\geq 75,000$
- Medium: 25,000 – 74,999
- Low: 10,000 – 24,999
- Very Low: 1,000 – 9,999
- Very Very Low: $< 1,000$

Order of magnitude: A factor of ten (i.e., 1, 10, 100, 1000).

Outlier: An outlier is an observation that lies outside the overall pattern of a distribution (Vaske, Shelby & Donnelly, 2009). For this visitation estimate project, outliers were defined as: 1) any daily monitor count that is two or more orders of magnitude larger than the typical value for a day at that monitor; 2) any single value for a given hour (i.e., the sum of all the counts for a given hour) that was identified through the “tsclean” function of the “forecast” library in R (see methods).

Passive infrared monitor (also referred to as “visitation monitor” or simply “monitor” throughout this report): The TRAFx Generation III monitor (**Figure 3**) is a one-piece unit consisting of a passive infrared receiver. A passive infrared receiver operates by detecting rapid changes in

temperature within its field of view. On a trail, a rapid change will occur when a warm object, such as a person, dog, or horse, passes in front of the receiver. Because the object is warmer than the surrounding environment and the change is very fast, the receiver records the change as one “count”. The TRAFx monitor is one brand and model of infrared trail monitor currently used during site specific visitation estimate projects. The TRAFx monitor has a memory capacity to record 14,000 counts.

Distance from IR scope to trail	2m (6.5 ft.)	4m (13 ft.)	6m (20 ft.)
Diameter of detection zone	0.3m (1 ft.)	0.7m (2.3 ft.)	1.0m (3.3 ft.)

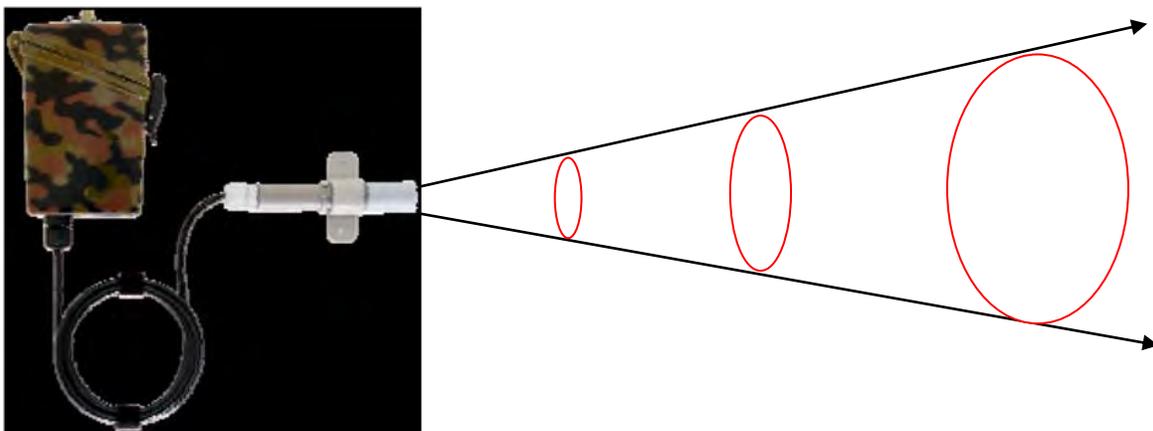


Figure 3. TRAFx Generation III monitor showing the beam’s detection zone variability at different distances from scope to trail

Person-visit: A person-visit is the unit of measure reported for visitation estimates. A person-visit represents a trip to the study area, regardless of how much time a visitor spent on OSMP during their trip.

RIF: Ratio Inflation Factor. The RIF is an inflation factor applied to the data set after outliers and missing values have been replaced that accounts for error due to undercounting/overcounting visitors that pass the monitors. The RIF is calculated from the results of calibration sessions and can be shown as: m/a

Where “ m ” equals the counts captured by the monitor and “ a ” equals the actual counts observed by staff during the calibration sessions.

TRAFx Communicator: Computer software designed for use when configuring TRAFx monitors with the G3 dock and when uploading data files (i.e. shuttle files) from the G3 dock for transfer to the Datanet software.

TRAFx Datanet: Online computer software designed specifically for use with the TRAFx monitor and G3 dock to initially clean, analyze and report count data. Accessed at <https://www.trafx.net/Datanet/login>.

Visitation estimate: The estimated number of person-visits for a given area for a specified period of time.

Visitor: A visitor is the person actually visiting OSMP. Visitors may make multiple *person-visits* to OSMP, each resulting in one or more *counts* (Vaske et al., 2009).

VI. Methods

The “Chautauqua study area” was divided into two sub-areas for monitoring purposes; the meadow area and the Enchanted Mesa area (**Figures 1, 2**). Staff installed a monitor at eight locations across the two sub-areas. Six monitors were installed in the Chautauqua meadow sub-area and two were installed in the Enchanted Mesa sub-area. The monitors were placed to capture the most possible visits to each study area. Six monitors were placed on designated trails and two monitors were placed on current undesignated trails; one intended for future designation (6th Street) and one to be closed (Baseline Trail West) per the West Trail Study Area Plan. Visitation estimates were calculated using monitor count data collected at these locations along with system-wide averages (Vaske et al. 2009) for unmonitored locations (five very low volume undesignated access points along Baseline Road).

Days with documented problems (such as low batteries or vandalism) resulting in an abnormally low number or a zero were replaced using the average count value measured for the matching combination of day of the week, season, and hour. Substitution of daily count sums with estimated values was infrequent. Across the entire study area for the duration of the study period, 20 days (2% of the 976 total days; 8 locations multiplied by 122 days each) of the daily count sums were replaced.

Monitor data comprised of counts and associated time stamps were downloaded twice weekly. Counts were summed by hour (and day) resulting in 2,928 hourly count totals for each of the locations (122 days multiplied by 24 hours). Outliers (43 total individual hours out of 2,928; 1%) were removed and replaced for each location using the “tsclean” function of the “forecast” library in R. Briefly, a smoothed line relating the number of visits per hour (y variable) and time (x variable) is fit using a local regression technique called “loess”, and outliers are identified as those outside $\pm 2 (q_{0.9}-q_{0.1})$, where q_p is the p-quantile of the residuals; these outliers were replaced with the fitted value for that time point (Chen, C, and Liu, L. 1993. Forecasting time series with outliers. Journal of Forecasting 12: 13-35).

The daily count totals from each location were then summed. This sum was then inflated by multiplying by a ratio inflation factor (RIF) calculated from the Chautauqua study area calibration periods (**Appendix B**).

After the RIF is applied, the daily sum for each location is then divided by 2, and the resulting 8 total monitor counts are summed to estimate the number of person-visits to the study area. This calculation assumes that every visitor that goes into the monitored area must exit the area.

Table 1. Steps for estimating visitation using active infrared visitation monitors

1. VISUAL SCAN OF DAILY COUNTS
a. Flag obvious outliers (daily values two or more orders of magnitude higher than typical for each station)
b. Flag missing values (untrue zeros)
c. Remove flagged days from the data set
2. DATA REPLACEMENT FOR MISSING VALUE DAYS
a. Calculate the average value for each location by season, day of week and hour
b. Replace removed hours with the respective value
3. QUANTITATIVE OUTLIER TEST
a. Identify and replace hourly outliers identified using the “tsclean” function of the “forecast” library in R
4. MONITOR COUNTS TO PERSON-VISIT CONVERSION
a. Sum daily counts at each location
b. Multiply by Ratio Inflation Factor to compute Estimated Monitor Count (EMC)
c. Divide summed EMCs by 2 to estimate annual person-visits for specified geographic area
d. Calculate the bounds of the estimate

Recognizing Measurement Error (Vaske et al. 2009)

Although infrared monitors offer advantages (e.g., low maintenance, continuous operation), measurement errors can occur. The accuracy and reliability of the data are influenced by errors associated with: (a) the counts obtained from the monitors and (b) the procedures used in estimating visitation from the count data. The following are *some* common measurement errors that can occur.

Counting Errors (i.e., monitor functionality)

1. Placement of equipment; miscounts occur when the receiving “eye” is struck by direct sunlight.
2. Soil, dust or snow accumulating on the transmitter or receiver.
3. Blowing vegetation or heavy falling snow.

Estimation Errors (i.e., converting counts to visits)

1. OSMP installs monitors to accommodate an average adult human waist height of three feet, and to avoid counting most dogs. Consequently people shorter than 36 inches (e.g., small children) are not included in the estimate.
2. People walking side-by-side, in large groups or visitor parties passing the monitor at the same time can be missed.
3. Monitors cannot differentiate humans from non-human presence (e.g., livestock, wildlife or vehicles).

The methodology used for this study minimizes and/or accounts for many of these measurement errors. However, the estimate does *not* address people who travel within the study area but do not pass a monitor (e.g. walk around the monitor or enter via a non-trailed area).

VII. Results

All results reflect visits during August 1, 2015 – November 30, 2015 only and *should not be used to estimate annual visitation* to the study area. These results also *should not be used to make individual trail estimates*. Lastly, an unknown portion of visits (likely minimal) can be attributed to staff, contractors or volunteers that passed a monitor during the study period. Overall results (**Table 2**) are explained and analyzed by season, day of week and hour in the following section.

Table 2. Estimated number of visits for the Chautauqua visitation study, during August 1, 2015 - November 30, 2015 by location

Location	Number of Visits	Lower and Upper Bounds
Entire study area	317,561	(291,573 to 335,515)
Meadow sub-area	281,317	(261,605 to 301, 029)
Enchanted Mesa sub-area	32,227	(29,968 to 34,485)
Unmonitored access points*	4,017	N/A

*Not included in bounds estimate, or season, day of week or hourly calculations

Daily totals

Across the study period, the number of daily visits to the entire study area ranged from 188 to 5,126 (**Figure 4**). The low point (October 21st) occurred during a prolonged heavy rainstorm and the high point occurred on Sunday, September 6th (Labor Day weekend) The average number of visits per day within the entire study area, for the months of August through November, is 2,570. Weekend days had consistently higher visitation than weekday days.

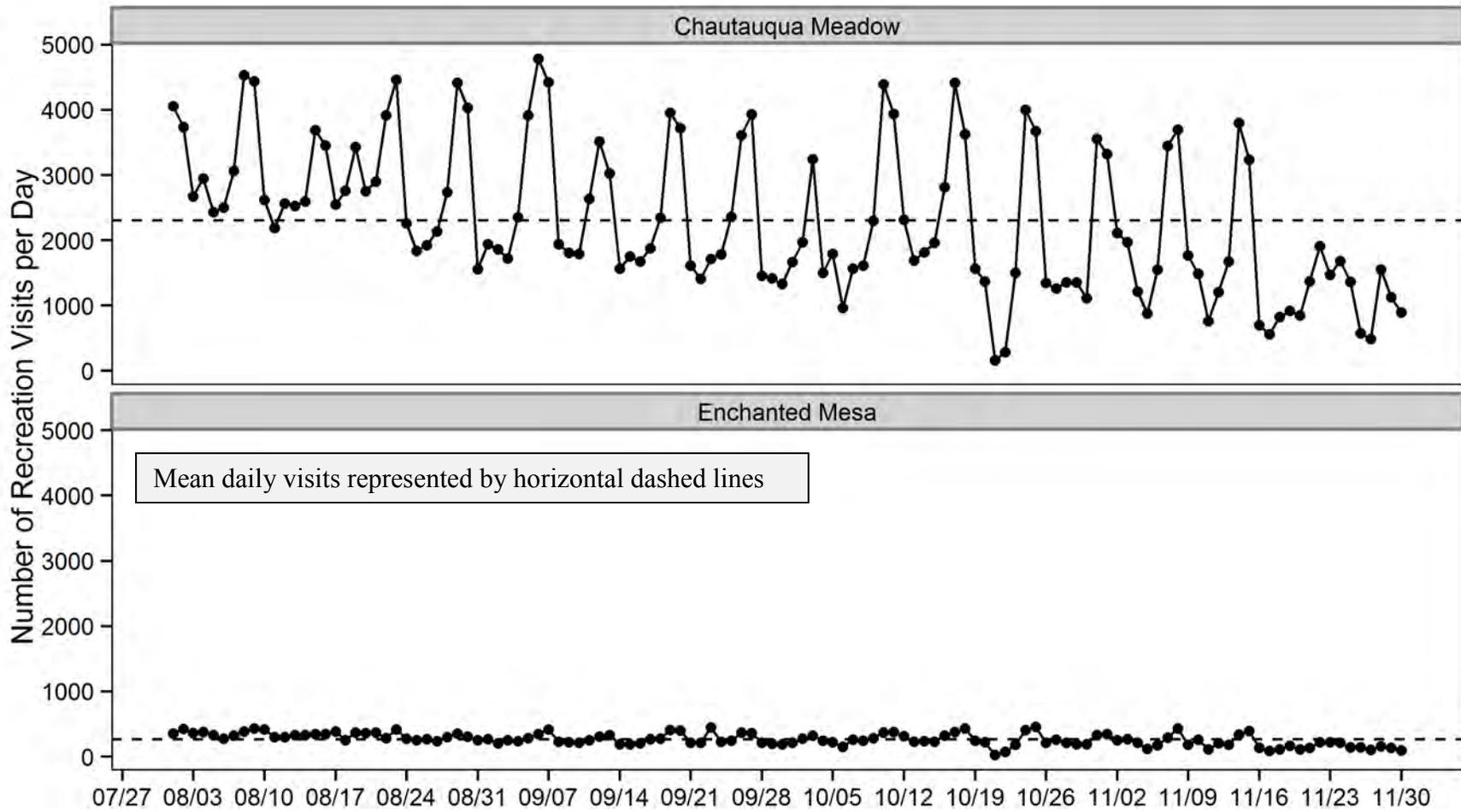


Figure 4. Total number of recreation visits per day from August 1, 2015 – November 30, 2015 for the two sub-areas

Day of the week distribution

In the Chautauqua meadow sub-area, Saturdays were the busiest during both summer and fall seasons (**Figure 5**). Mondays and Friday were busier than Tuesdays-Thursdays and Fall Wednesdays were the lowest overall.

For the Enchanted Mesa sub-area, Sundays received the most visits during both seasons and Mondays were relatively high during the summer season compared to other weekdays due to the Meadow Music events conducted.

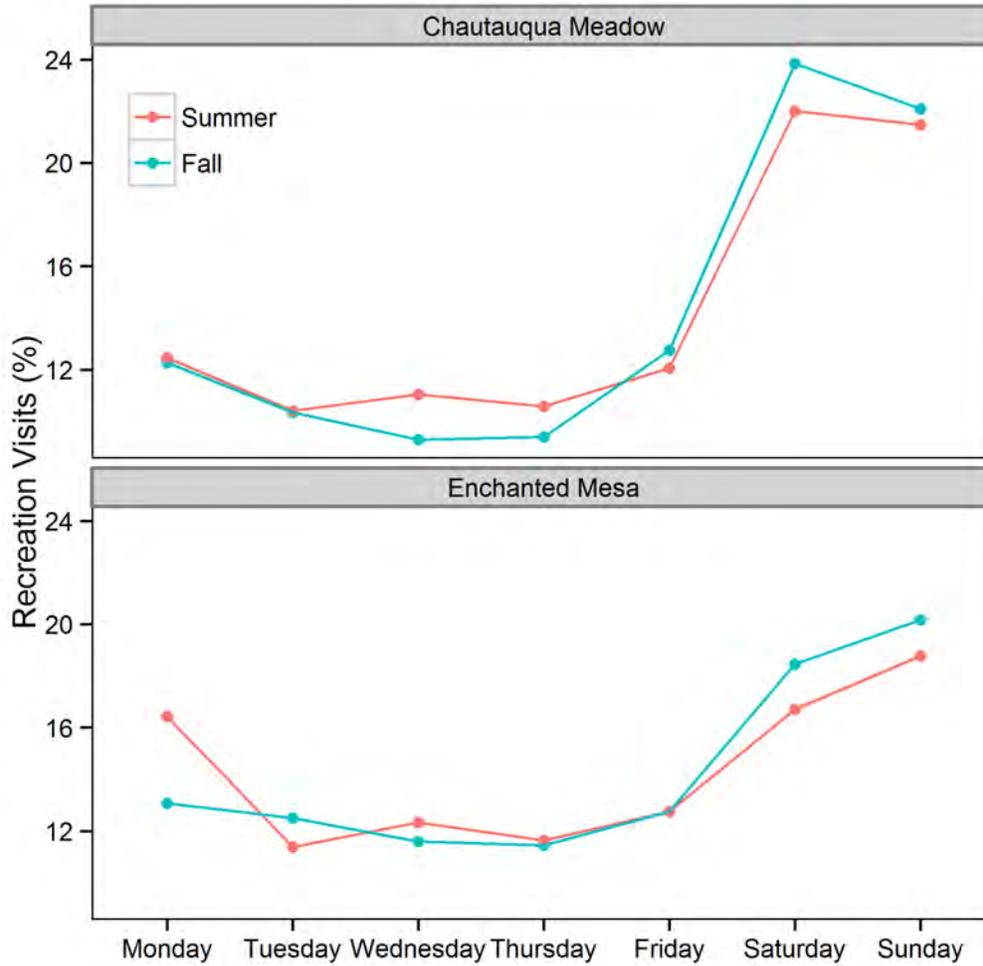


Figure 5. Proportion of total visits by season, day of week and sub-area

Monthly distribution

August was by far the busiest, and November the slowest, of the four monitored months (**Figure 6**). August contributed over one third of the total visits and November less than one tenth within the Chautauqua sub-area. November was proportionately busier within the Enchanted Mesa sub-area – something that *could be* attributed to factors such as a more steady local population regularly visiting the area, better trail conditions, or group events.

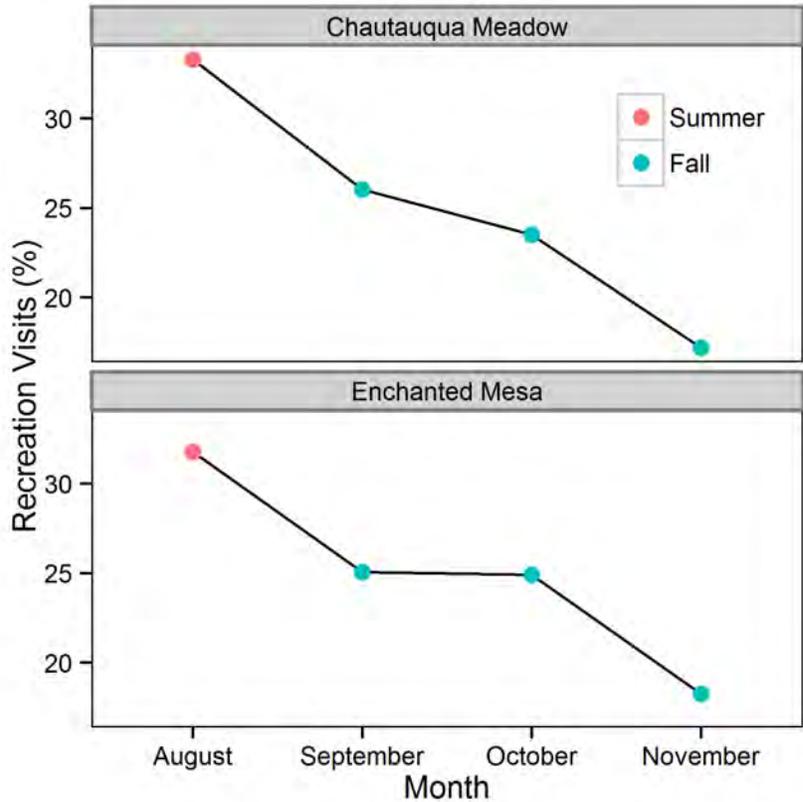


Figure 6. Proportion of total visits by season, month and sub-area

By month for the study area (not including 4,017 visits from unmonitored access points)
 Monthly distributions are fairly similar to 2004/2005, with some increase proportionately for November 2015. Fall season (September-November) visits in 2004 were ~90,000 and in 2015 they were ~210,000 (**Table 3**).

Table 3. Total number of visits for entire Chautauqua study area by month, for 2004 and 2015

Month	2004 Visits	2015 Visits	Increase
August	42,000	103,905	147%
September	36,000	81,270	126%
October	35,000	74,125	112%
November	19,000	54,244	185%

Hourly distribution

Within the Chautauqua meadow sub-area, hourly distributions were fairly similar across weekdays and the greatest number of hourly visits occurred from mid-day to early evening (**Figure 7**). Weekends days included a much steeper mid-day spike.

While less busy overall, the Enchanted Mesa sub-area also had fairly similar weekday hourly distributions and weekends included a mid-day increase. Generally speaking, the daily peaks occurred earlier in the day within this sub-area.

Hourly distributions for the entire study area, by individual day, are included in **Appendix C**.

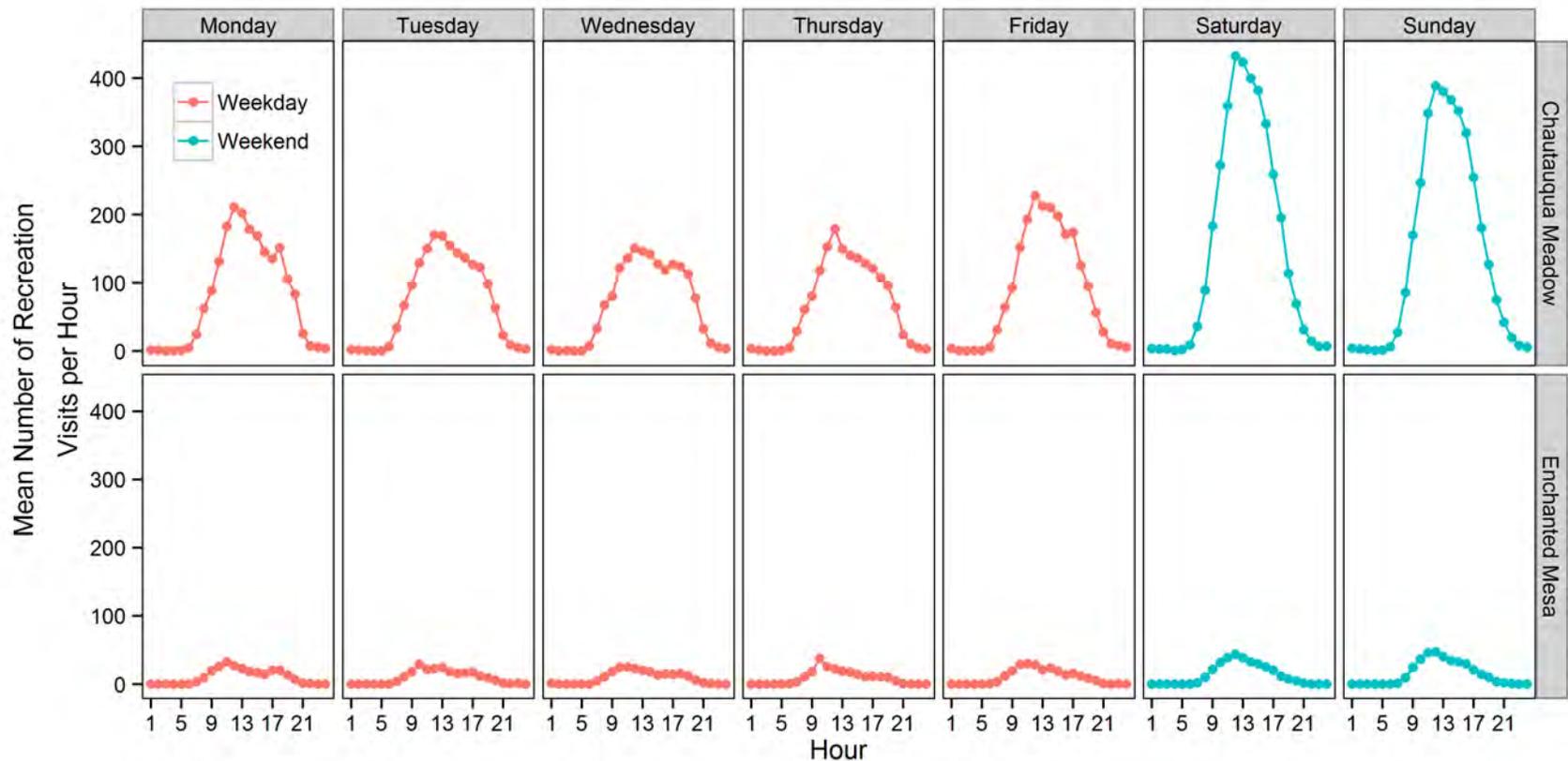


Figure 7. Average number of visits per hour across each sub-area for each day of the week

The Chautauqua Trail monitor captured by far the greatest number of visits across the entire study area (**Figure 8**). This location received approximately double the number of visits captured at the Bluebell Road location, which was the second busiest location. Baseline West, a currently undesignated very low access point located near the first hairpin turn on Flagstaff Road, received the lowest number of visits, followed by the 6th Street and McClintock Lower access points. The Baseline East and Bluebell-Baird locations received a fairly similar proportion of total visits (~10%) across the entire study area.

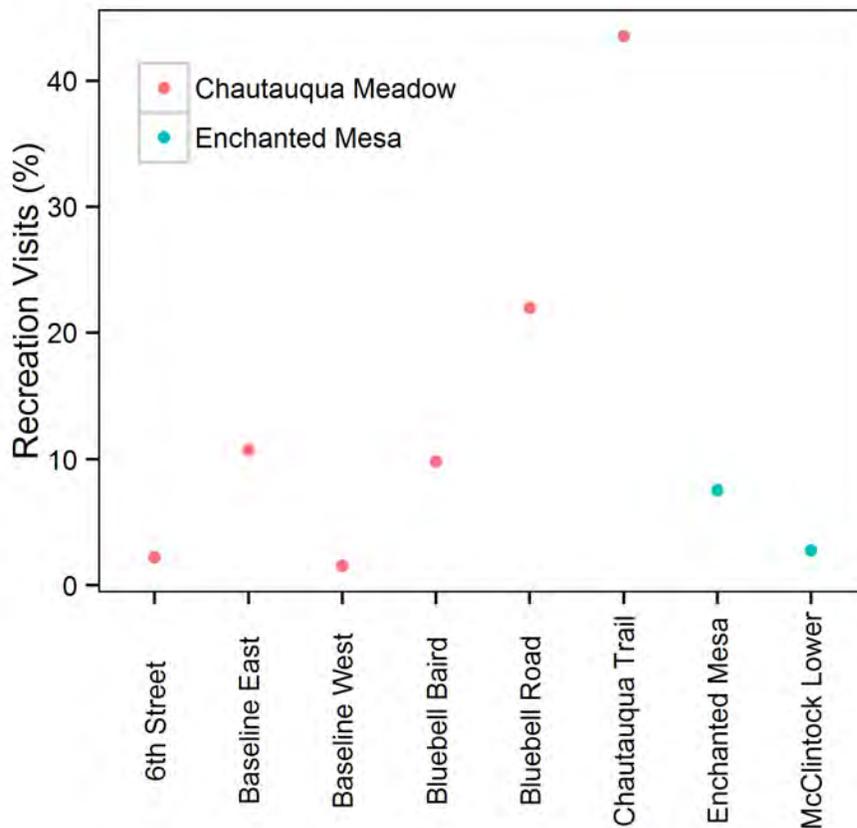


Figure 8. Proportion of total visits attributed to each monitored location during the study period

Estimates at unmonitored very low locations

Monitors were not installed at five previously identified (Vaske et al. 2009) undesignated trail access points along Baseline Road (**Figure 9**). To estimate visitation at these locations, staff used the average number of visits at very low locations, as estimated during the 2004/2005 system-wide visitation study. At this time, very low access points averaged an annual 2,132 visits. Staff then used the average monthly distributions from the same study to determine the average number of visits per August-November (803 visits). This number was then multiplied by five, to estimate the total number of visits during the study period at these unmonitored locations (4,017). This estimate is considered conservative as there are many short undesignated trail segments connecting the street parking along Baseline Road and Baseline Trail within OSMP that were not included in this estimate. Staff believes that all undesignated trails along

Baseline Road are intermittently used, and concluded that including five locations within the estimate was reasonable.

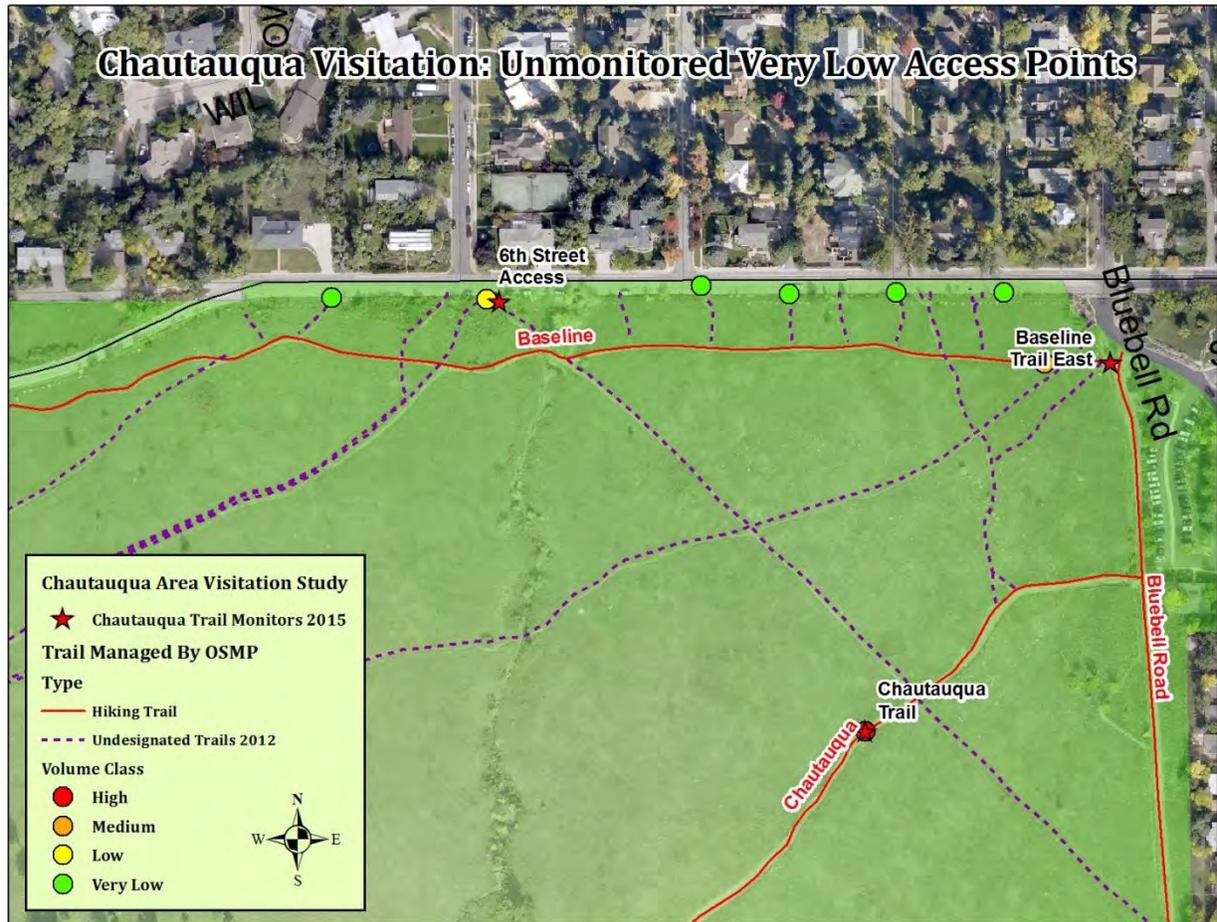


Figure 9. Five unmonitored very low access points along Baseline Road, shown as green dots

Comparison to 2004/2005 visitation estimates

The last monitoring interval conducted within the Chautauqua study area occurred during the system-wide OSMP visitation study of 2004/2005. At this time, *annual visitation* to the Chautauqua study area was an estimated 330,000-350,000 visits. This estimate was the result of automated monitor counts at selected locations (**Appendix D**) along with best professional judgment on unmonitored locations. Results of the current project show a number of visits greater than 300,000 *within just August-November, 2015*. **This indicates that visitation to the area has more than doubled within the past 10 years.**

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Chen, C, and Liu, L. 1993. Forecasting time series with outliers. *Journal of Forecasting*, 12: 13-35.

Giolitto, M. 2012. *City of Boulder Open Space and Mountain Parks Department 2010-2011 Visitor Survey Report ver. 1.0*. City of Boulder, Open Space and Mountain Parks Department, Boulder, Colorado.

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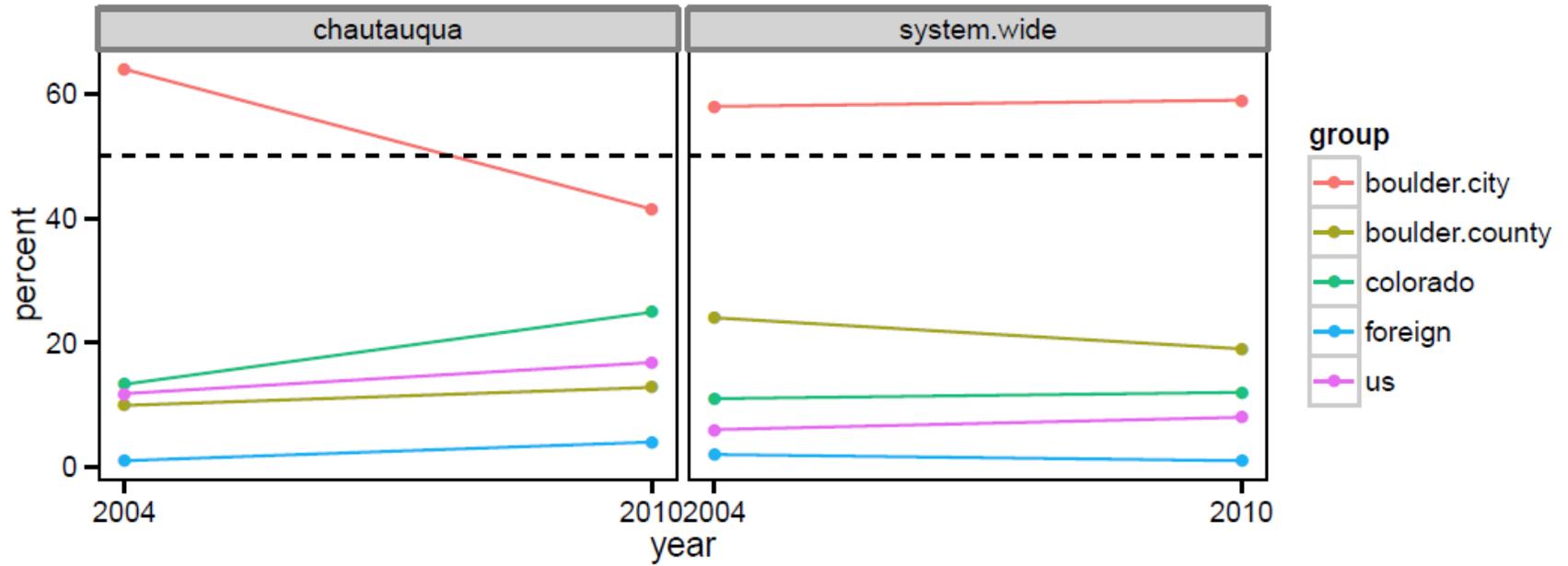
Vaske, J. J., Shelby, L. B., & Donnelly, M. P. 2009. *Estimating visitation to Boulder Open Space and Mountain Parks*. (HDNRU Report No. 80). Report for Boulder Open Space and Mountain Parks. Fort Collins: Colorado State University, Human Dimensions of Natural Resources.

Appendix A. Key Findings from 2004/2005 and 2010/2011 OSMP Visitor Surveys

- The proportion of city of Boulder residents visiting the Chautauqua study area dropped quite a bit between 2004 and 2010.
- The proportion of visitors accessing the Chautauqua study area by vehicle is much higher than the OSMP system-wide average.
- The most important reason people visit the Chautauqua study area is to enjoy the place itself, followed by enjoying activities and enjoying time with family or friends.
- Visitors to the Enchanted Mesa sub-area have been visiting OSMP for more years than visitors to the Chautauqua meadow sub-area, and are generally older.
- The Chautauqua study area receives a greater proportion of large visitor parties (3 or more visitors) than across OSMP.
- The proportion of visitors to the Chautauqua study area with dogs is less than across OSMP.

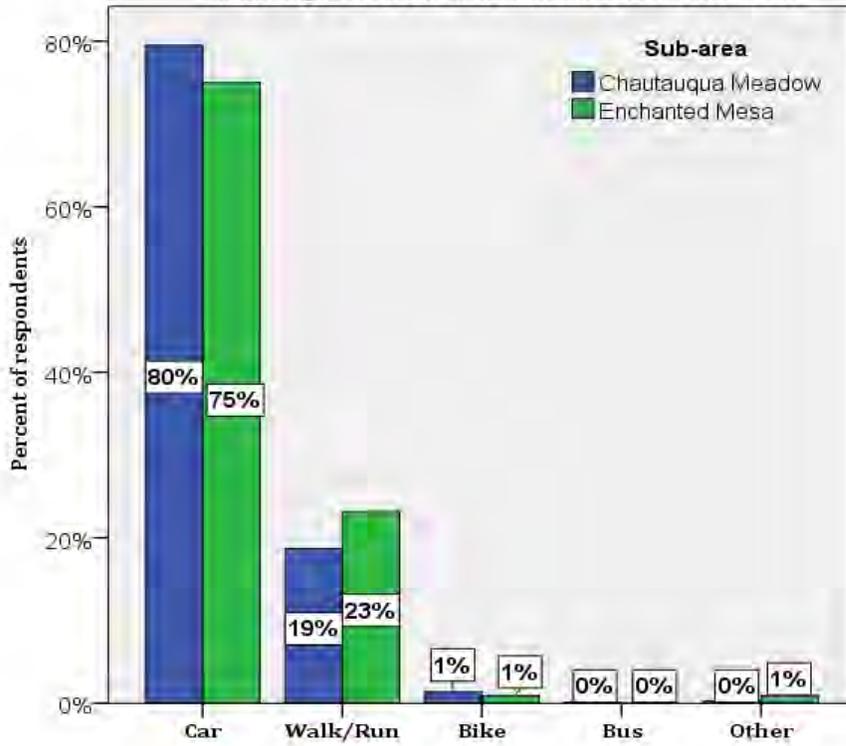
Appendix A. Additional information from the 2004/2005 and 2010/2011 OSMP Visitor Surveys

Residency of visitors to Chautauqua study area over time



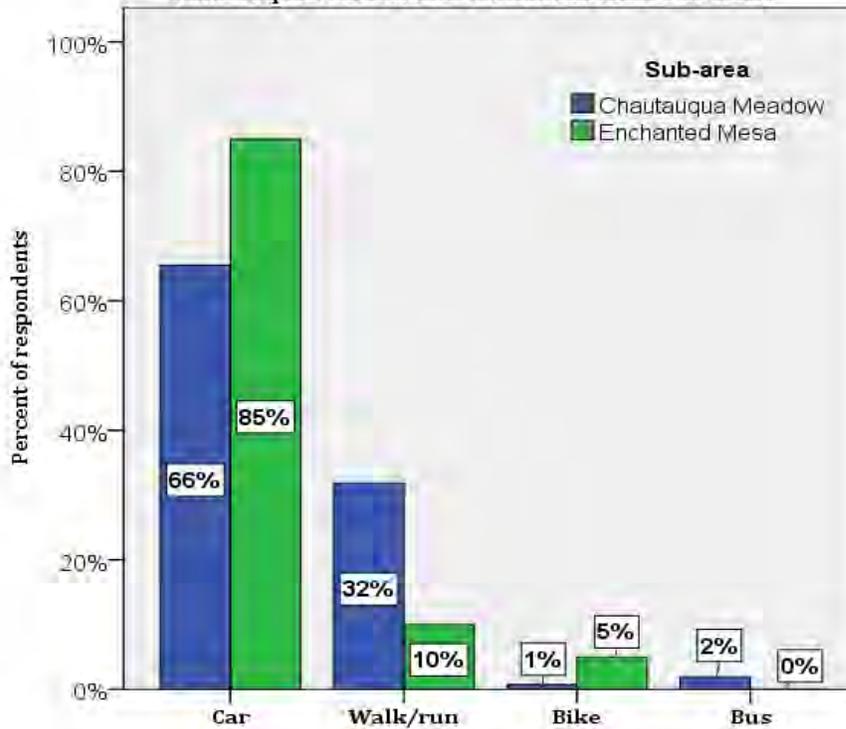
2010 Chautauqua Visitor Mode of Access to OSMP

Chautauqua Meadow and Enchanted Mesa Sub-areas



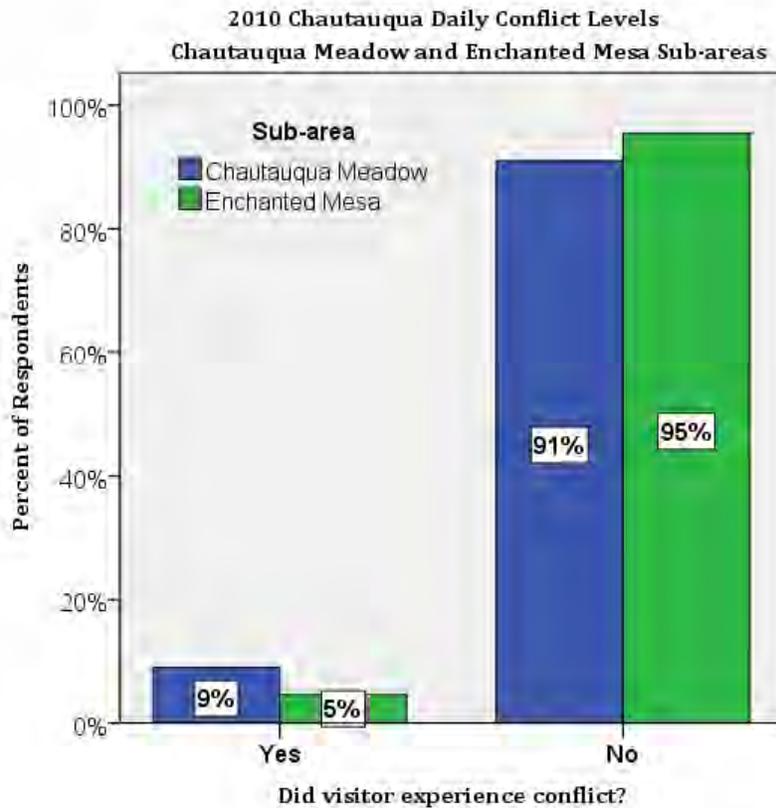
2004 Chautauqua Visitor Mode of Access to OSMP

Chautauqua Meadow and Enchanted Mesa Sub-areas



OSMP System-wide Visitor mode of access to OSMP - comparison of 2010-2011 results to 2004-2005 results

Mode of access	2010-2011	2004-2005
Car	57%	58%
Walk/Run	34%	32%
Bike	9%	9%
Other	<1%	NA
Bus	<1%	1%



OSMP System-wide

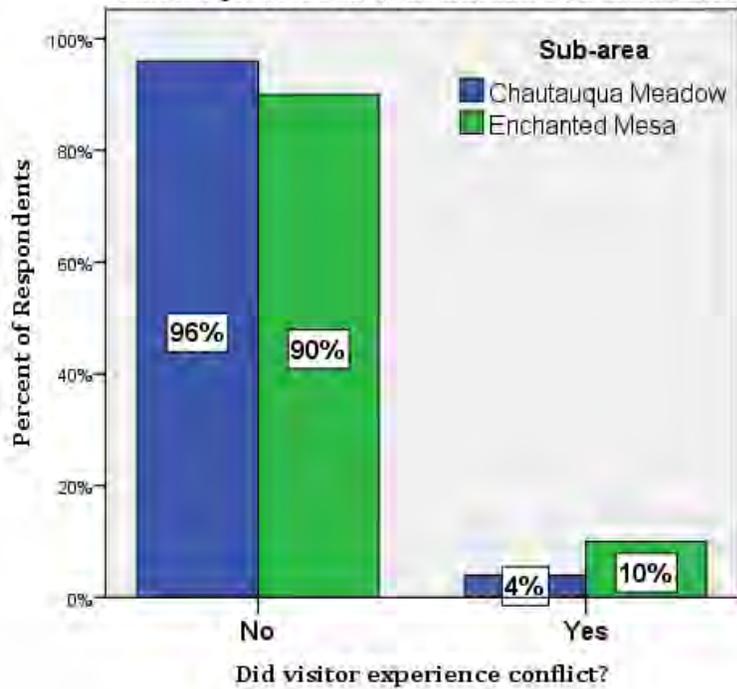
Percentage of visitors who report experiencing recreational conflict *on the day of their visit* - comparison of 2010-2011 results to 2004-2005 results*

Conflict?	2010-2011	2004-2005
Yes	7%	4%
No	93%	96%

*Question was worded differently during each survey year

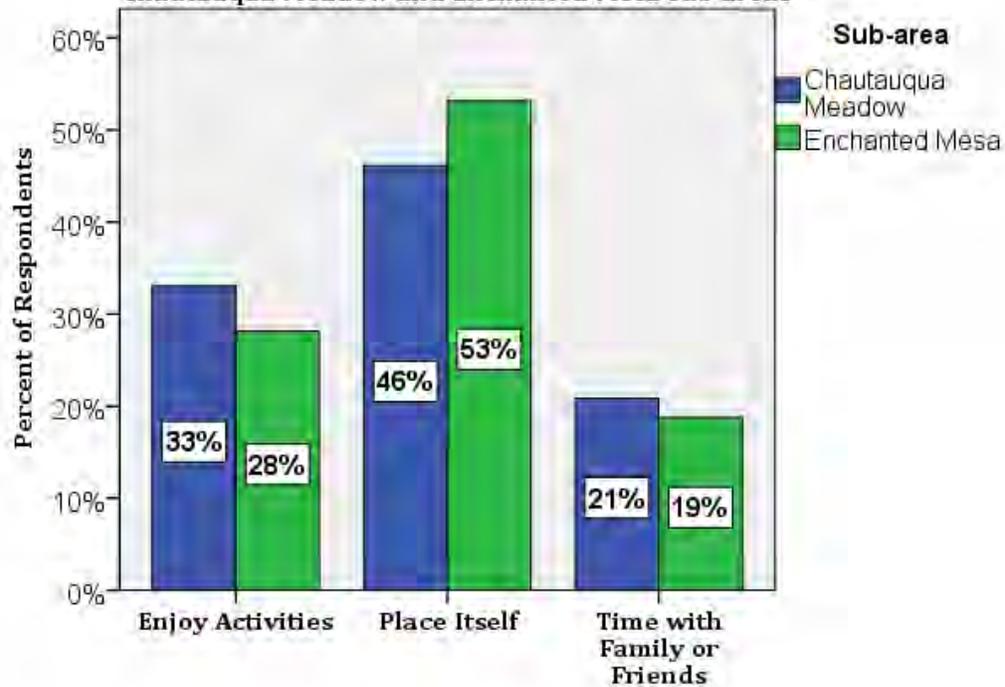
2004 Chautauqua Daily Conflict Levels

Chautauqua Meadow and Enchanted Mesa Sub-areas



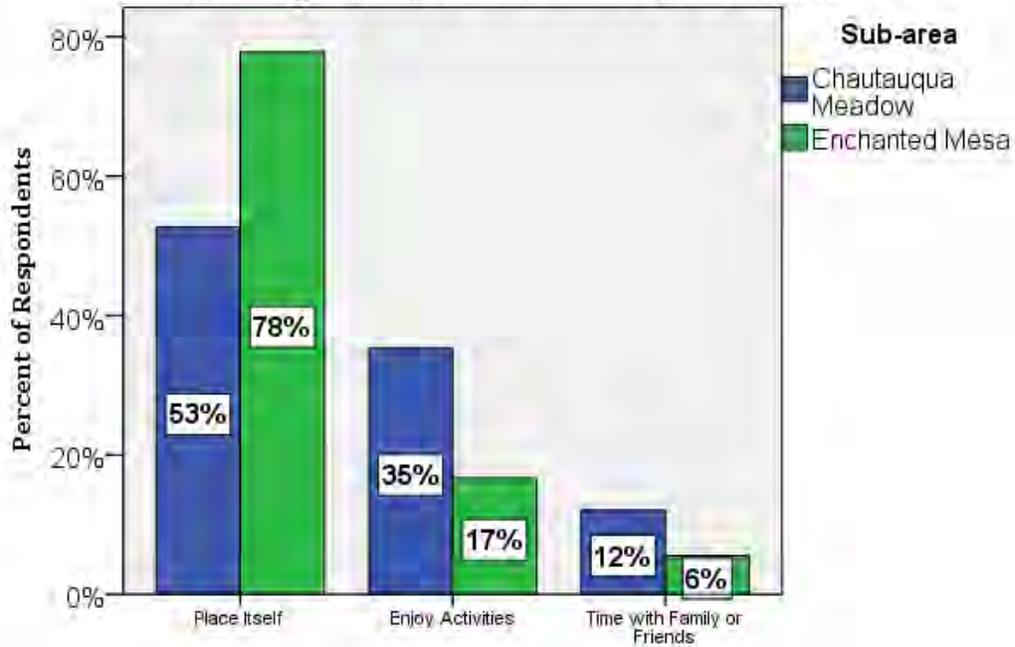
2010 Chautauqua Most Important Reason for Visiting OSMP

Chautauqua Meadow and Enchanted Mesa Sub-areas



2004 Chautauqua Most Important Reason for Visiting OSMP

Chautauqua Meadow and Enchanted Mesa Sub-areas

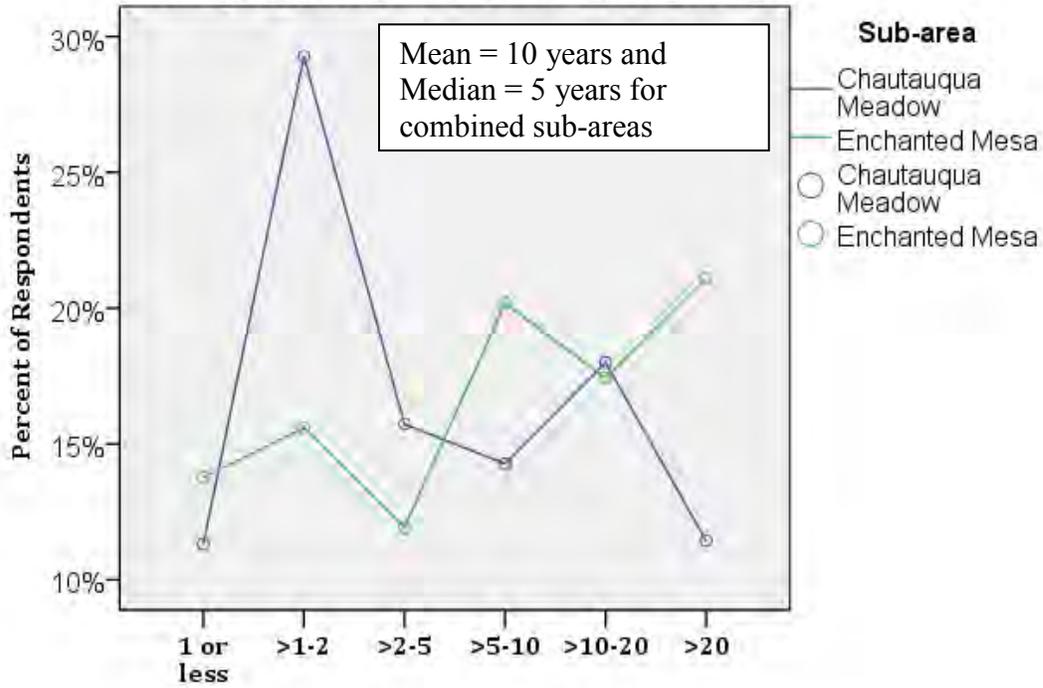


OSMP System-wide Most important reason for visiting OSMP - comparison of 2010-2011 results to 2004-2005 results

Reason	2010-2011	2004-2005
To do the activities I enjoy	49%	48%
To enjoy the place itself	42%	44%
To spend time with family or friends	9%	8%

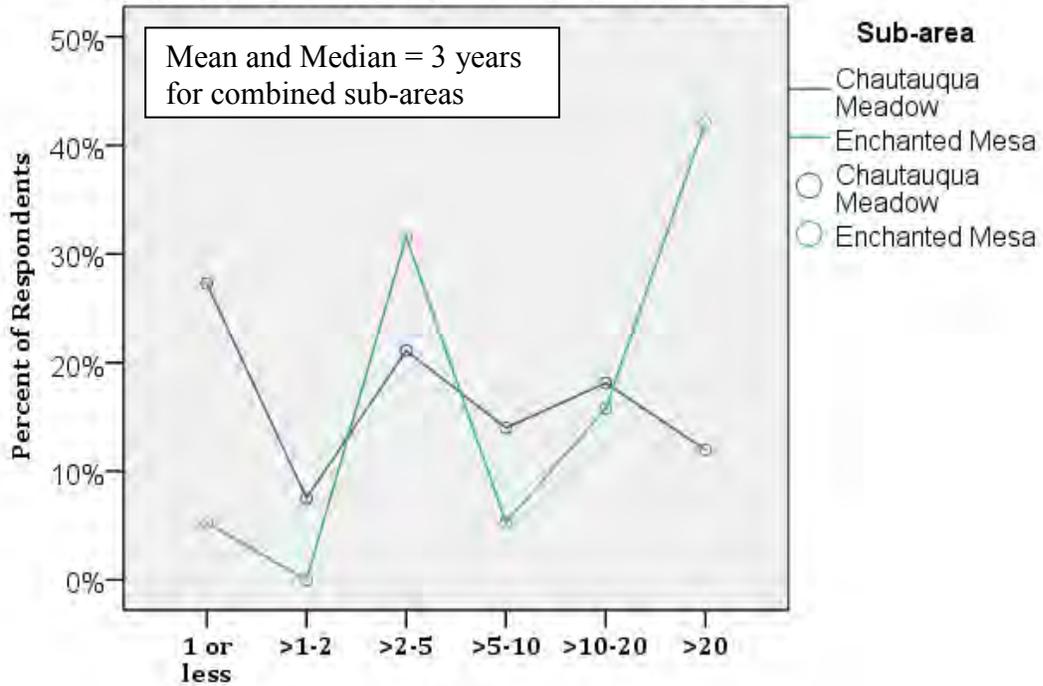
2010 Chautauqua Number of Years Visiting OSMP

Chautauqua Meadow and Enchanted Mesa Sub-areas



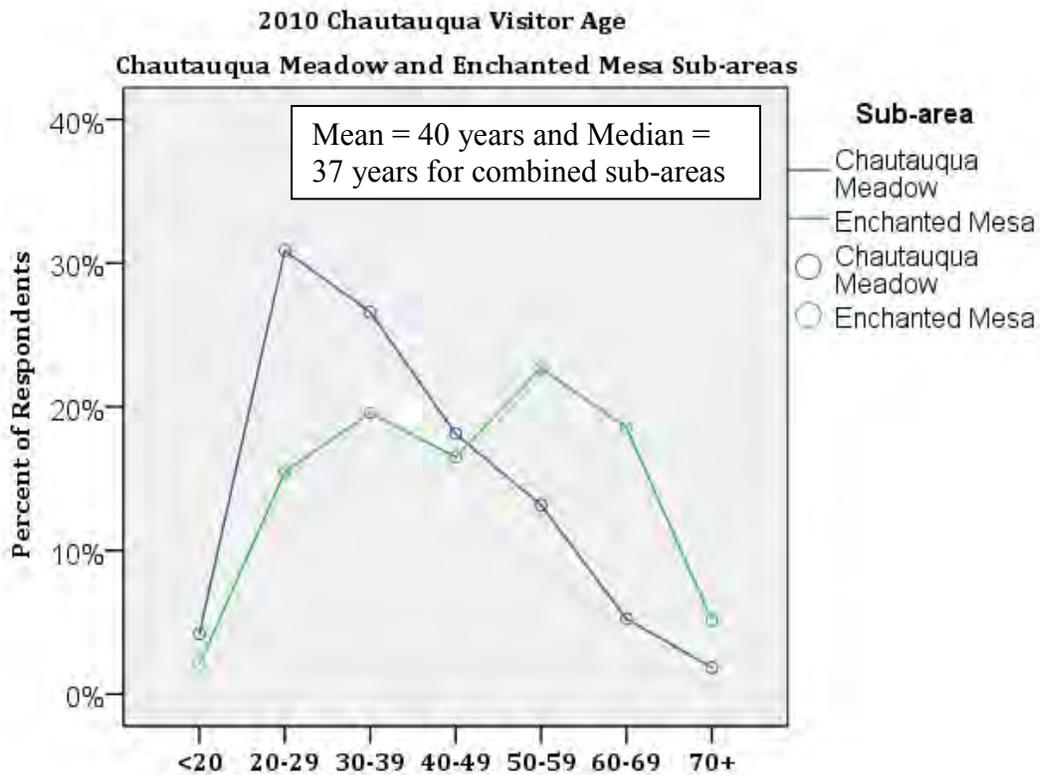
2004 Chautauqua Number of Years Visiting OSMP

Chautauqua Meadow and Enchanted Mesa Sub-areas

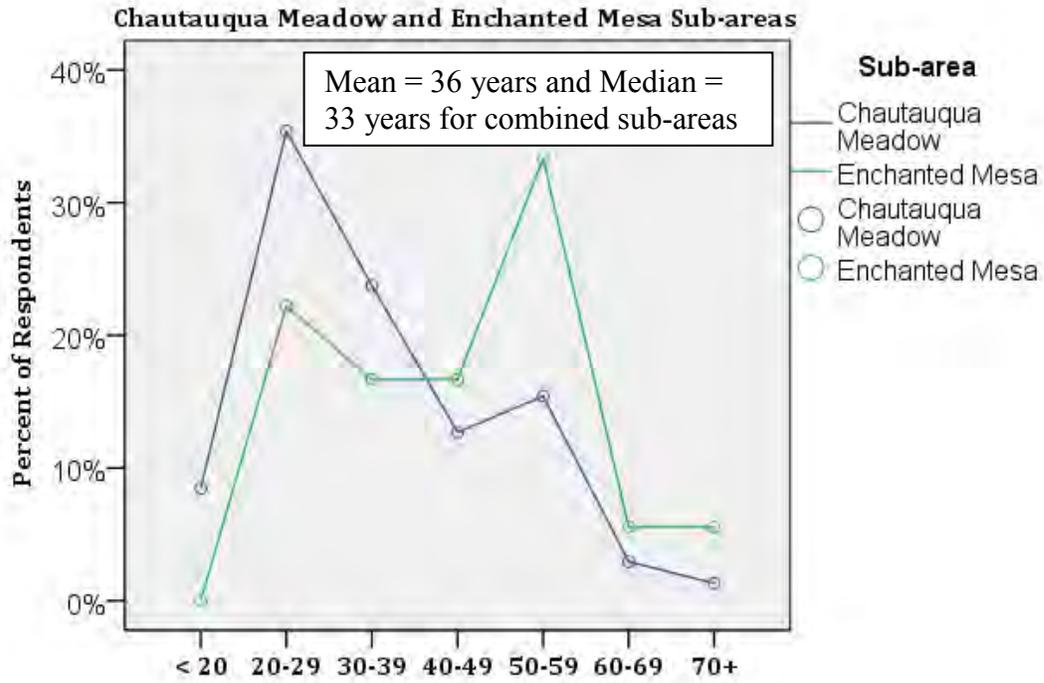


OSMP System-wide Number of years respondents have visited OSMP
 - comparison of 2010-2011 results to 2004-2005 results

Years visiting OSMP	2010-2011	2004-2005
Fewer than or equal to 1	15%	21%
Greater than 1 year up to 2	6%	
Greater than 2 years up to 5	14%	20%
Greater than 5 years up to 10	16%	22%
Greater than 10 years up to 20	25%	24%
Greater than 20 years	24%	13%
Median	10	8
Mean	14	11



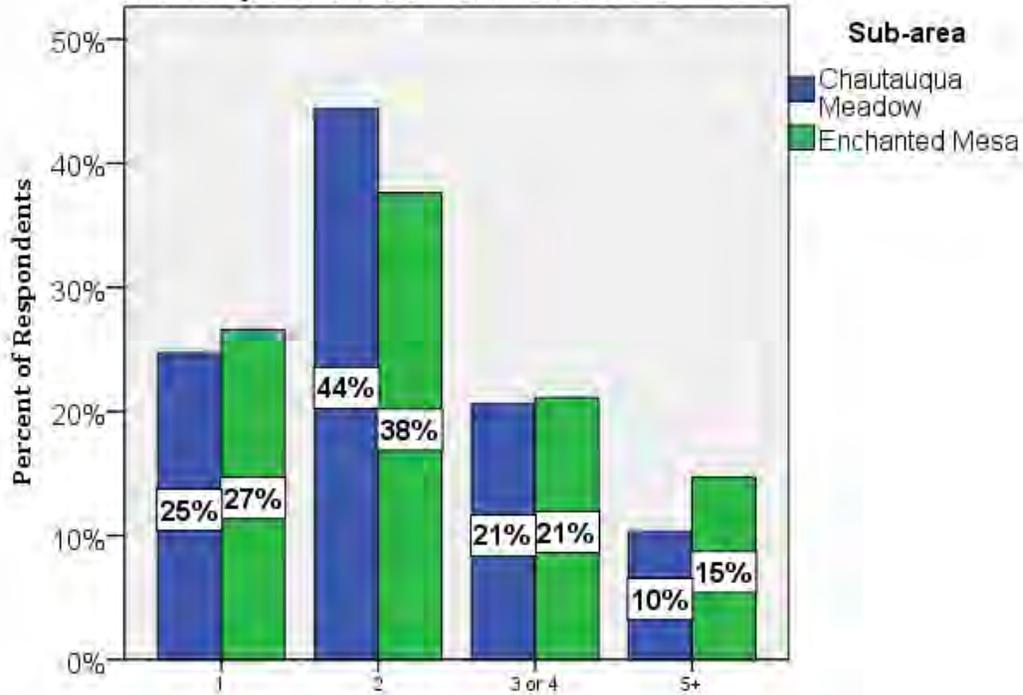
2004 Chautauqua Visitor Age



OSMP System-wide Visitor age in 10 year categories - comparison of 2010-2011 results to 2004-2005 results.

Age	2010-2011	2004-2005
<20	2%	3%
20-29	17%	23%
30-39	21%	25%
40-49	21%	23%
50-59	22%	18%
60-69	13%	6%
70+	4%	2%
Median	42	39
Mean	44	40

2010 Chautauqua Number of People in Visitor Party
Chautauqua Meadow and Enchanted Mesa Sub-areas



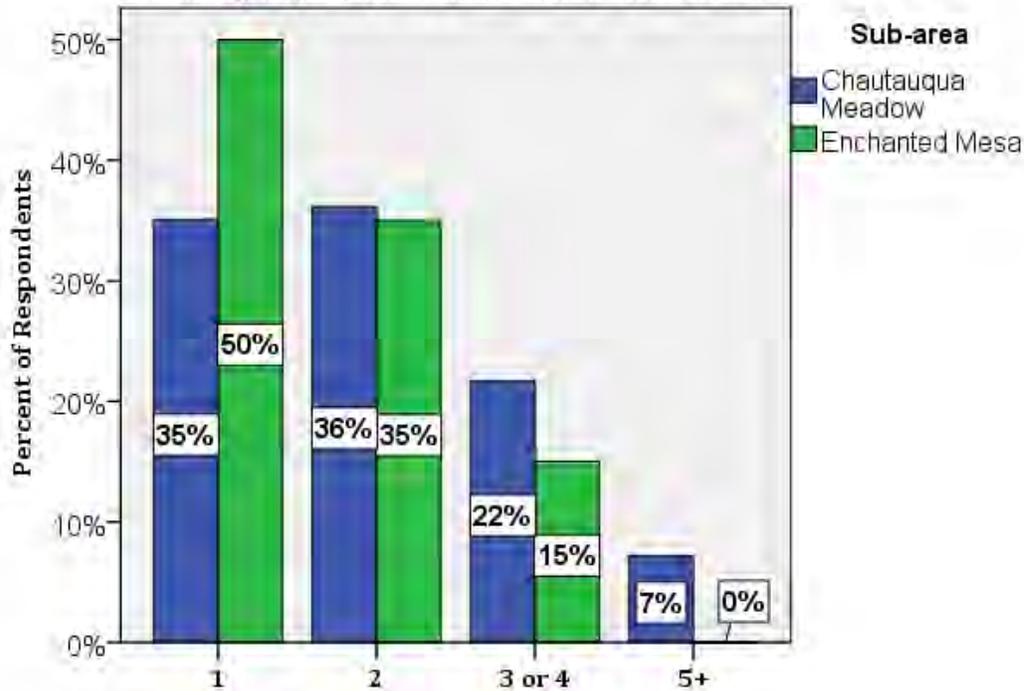
System-wide

Responses to the question “How many people are in your group?” - comparison of 2010-2011 results to 2004-2005 results

Response	2010-2011	2004-2005
1	47%	44%
2	37%	40%
3 or 4	11%	13%
5+	5%	3%

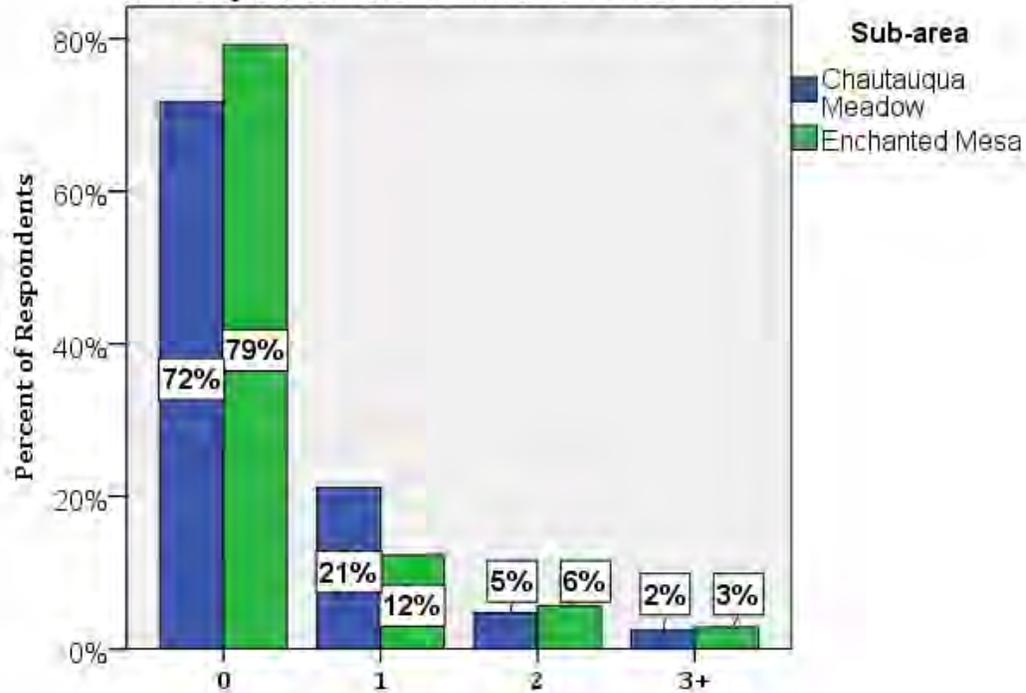
2004 Chautauqua Number of People in Visitor Party

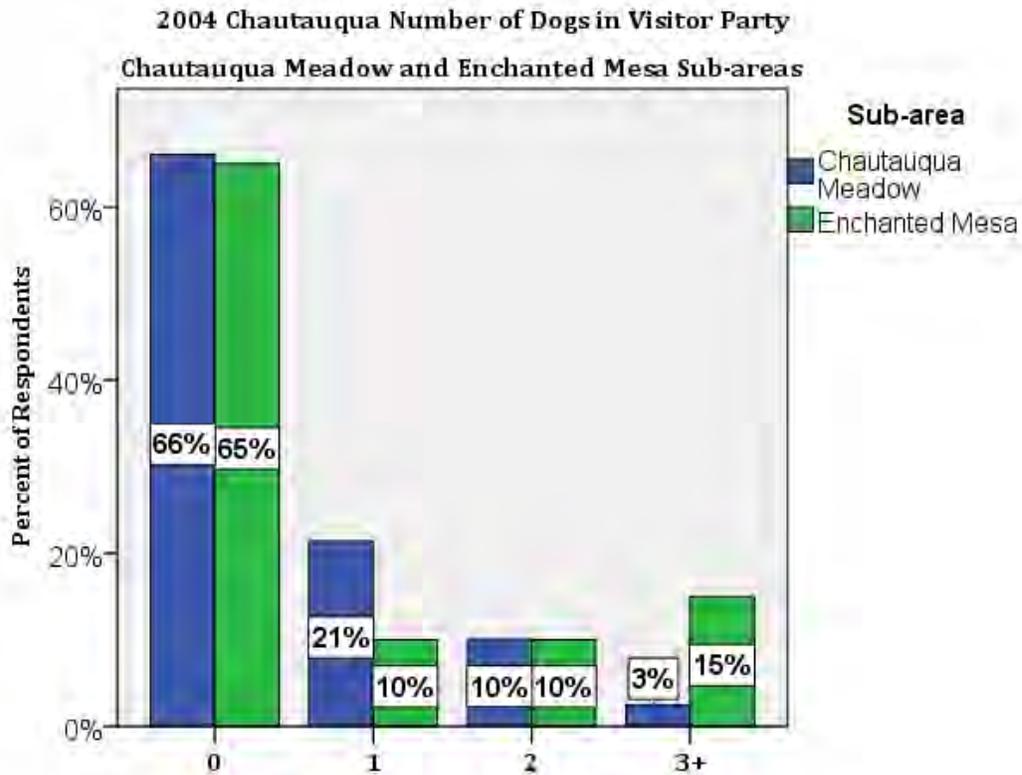
Chautauqua Meadow and Enchanted Mesa Sub-areas



2010 Chautauqua Number of Dogs in Visitor Party

Chautauqua Meadow and Enchanted Mesa Sub-areas





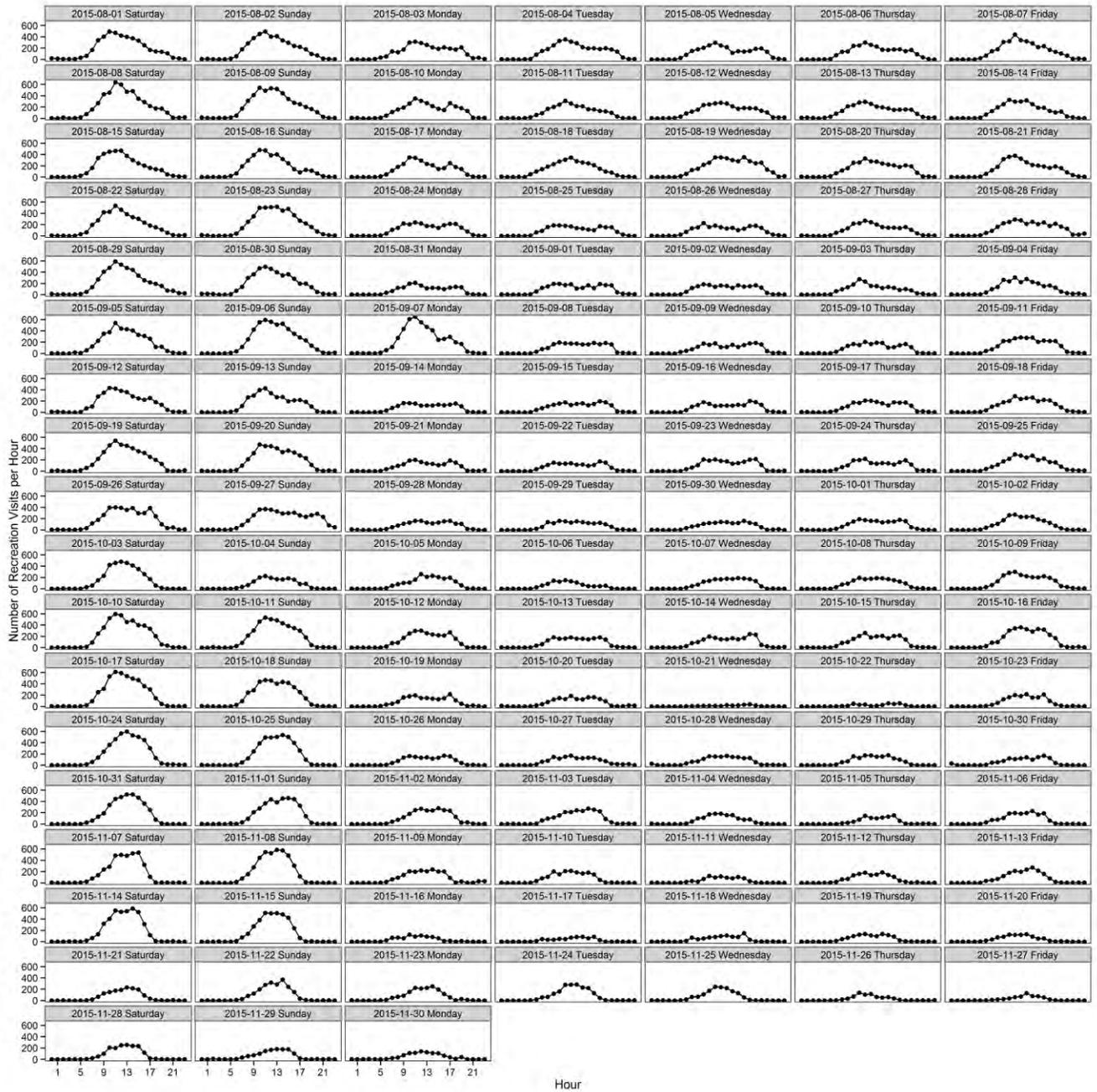
OSMP System-wide Percentage of respondents with dog(s) them on the day of their visit - comparison of 2010-2011 results to 2004-2005 results

# of dogs	2010-2011	2004-2005
0	69%	66%
1	24%	22%
2	6%	9%
3+	1%	2%

Appendix B. Calibration session data for the 2015 Chautauqua area study

2015 Chautauqua TRAFx Visitation Monitor Calibrations									
Date_Monitored	Day of Week	Time_Monitored	Location	Monitor_Type	People Counted by Observer	People Counted by Monitor	% Accurate	RIF	Average RIF by Location
8/1/2015	Saturday	11:15 AM	6th Street Access	TRAFx IR	46	43	93%	1.069767	1.086996
8/3/2015	Monday	12:52 PM	6th Street Access	TRAFx IR	56	53	95%	1.056604	
11/9/2015	Monday	3:51 PM	6th Street Access	TRAFx IR	59	52	88%	1.134615	
			Total		161	148	92%		
8/1/2015	Saturday	11:35 AM	Baseline East	TRAFx IR	47	36	77%	1.305556	1.361816
8/3/2015	Monday	12:20 PM	Baseline East	TRAFx IR	50	32	64%	1.562500	
11/9/2015	Monday	4:12 PM	Baseline East	TRAFx IR	56	46	82%	1.217391	
			Total		153	114	75%		
8/1/2015	Saturday	10:45 AM	Baseline West	TRAFx IR	47	38	81%	1.236842	1.320549
11/9/2015	Monday	3:28 PM	Baseline West	TRAFx IR	66	47	71%	1.404255	
			Total		113	85	75%		
8/1/2015	Saturday	9:22 AM	Bluebell Road	TRAFx IR	52	36	69%	1.444444	1.639151
9/24/2015	Thursday	11:00 AM	Bluebell Road	TRAFx IR	55	38	69%	1.447368	
11/9/2015	Monday	1:50 PM	Bluebell Road	TRAFx IR	79	39	49%	2.025641	
			Total		186	113	61%		
8/1/2015	Saturday	10:15 AM	Bluebell-Baird	TRAFx IR	53	35	66%	1.514286	1.390476
11/9/2015	Monday	2:59 PM	Bluebell-Baird	TRAFx IR	57	45	79%	1.266667	
			Total		110	80	73%		
8/1/2015	Saturday	9:45 AM	Chautauqua Trail	TRAFx IR	51	39	76%	1.307692	1.439938
9/24/2015	Thursday	11:50 AM	Chautauqua Trail	TRAFx IR	74	55	74%	1.345455	
11/9/2015	Monday	2:21 PM	Chautauqua Trail	TRAFx IR	70	42	60%	1.666667	
			Total		195	136	70%		
8/3/2015	Monday	10:26 AM	Enchanted Mesa	TRAFx IR	98	74	76%	1.324324	1.439940
11/9/2015	Monday	12:40 PM	Enchanted Mesa	TRAFx IR	70	45	64%	1.555556	
			Total		168	119	71%		
8/3/2015	Monday	9:30 AM	McClintock Lower	TRAFx IR	89	73	82%	1.219178	1.327538
11/9/2015	Monday	1:10 PM	McClintock Lower	TRAFx IR	56	39	70%	1.435897	
			Total		145	112	77%		
			Grand Totals	TRAFx IR total	1231	907	74%	Overall RIF	1.354458

Appendix C. Total number of visits by hour by individual day for the entire study area



Appendix D. Estimated annual number of visits at monitored access locations during the 2004/2005 OSMP system-wide visitation study (Vaske et al. 2009); 2015 re-monitored locations in grey

	Volume	Estimated Number of Visitors	Lower Bound	Upper Bound
Boulder Falls	VH	106,213	101,517	110,909
Bluebell Rd	VH	95,858	91,620	100,096
Chautauqua Trail	VH	114,921	109,841	120,002
Mt Sanitas Trail	H	99,224	94,837	103,611
Sanitas Valley Trail	H	114,130	109,085	119,176
Sanitas Valley View Trail	H	64,575	61,720	67,430
Wonderland Trail - Poplar Ave	H	98,375	94,026	102,725
Eagle Trailhead	H	38,887	37,168	40,606
Bobolink Trailhead	H	153,479	146,693	160,264
Dry Creek Trailhead	H	117,507	112,312	122,702
Marshall Mesa Trailhead	H	69,076	66,022	72,130
Doudy Draw Trailhead	H	32,773	31,324	34,222
South Mesa Trailhead	H	81,569	77,963	85,176
Gregory Canyon Trail	H	49,617	47,423	51,810
Settlers Trailhead - West	M	80,191	76,646	83,737
Wonderland Trail - Utica East	M	108,426	103,632	113,220
Fourmile Trailhead	M	90,638	86,631	94,645
Foothills Trail - Near US 36	M	23,770	22,719	24,821
Eagle Trail West	M	52,716	50,386	55,047
Boulder Valley Ranch - South	M	69,168	66,110	72,225
East Boulder Trail - White Rocks	M	32,808	31,357	34,258
Sawhill Entrance West	M	20,035	19,150	20,921
East Boulder Trail - Valmont	M	60,058	57,403	62,714
South Boulder Creek - Community Center	M	79,569	76,051	83,086
South Boulder Creek - Marshall	M	73,398	70,153	76,643
Greenbelt Plateau Trailhead	M	29,145	27,856	30,433
Flatirons Vista Trailhead	M	31,576	30,180	32,972
North Fork Shanahan Trail	M	45,308	43,305	47,311
Lower Bear Canyon Trail	M	42,038	40,179	43,896
Ranger Trail	M	14,236	13,606	14,865
Upper Crown Rock	M	24,916	23,814	26,017
Foothills Trail - Locust Place	L	16,550	15,818	17,281
Lefthand Trailhead	L	11,784	11,263	12,305
Cottontail Trail South	L	12,355	11,809	12,902
Steinbach Continental View	L	10,587	10,119	11,055
South Boulder Creek - Broadway	L	25,564	24,434	26,694
6th St	L	22,466	21,473	23,459
Ute Trail	L	9,972	9,531	10,413
Boy Scout Trail	L	3,024	2,890	3,158

MEMORANDUM

TO: Open Space Board of Trustees

FROM: Tracy Winfree, Director, Open Space and Mountain Parks
Kelly Wasserbach, Engineering & Project Management Supervisor
Chad Brotherton, Trails Specialist

DATE: May 9, 2016

SUBJECT: Chautauqua Meadow Trail Flood Repair

Open Space and Mountain Parks (OSMP) has plans to continue to implement the Chautauqua Trail Projects through 2016 per the West Trail Study Area (WTSA) Plan. The goal of these projects is to ensure the department does what is best for the community, balances ecological needs with visitor use, and maintains the historic significance of such a treasured area.

The Chautauqua Meadow Trail, which sustained damage in the 2013 floods, is one of these projects. This trail experiences high levels of year-round visitation; however, this trail does not follow a sustainable alignment. Over the years it has expanded to roughly 30' wide in certain areas due to the steepness of the grades, high visitation, and mud.

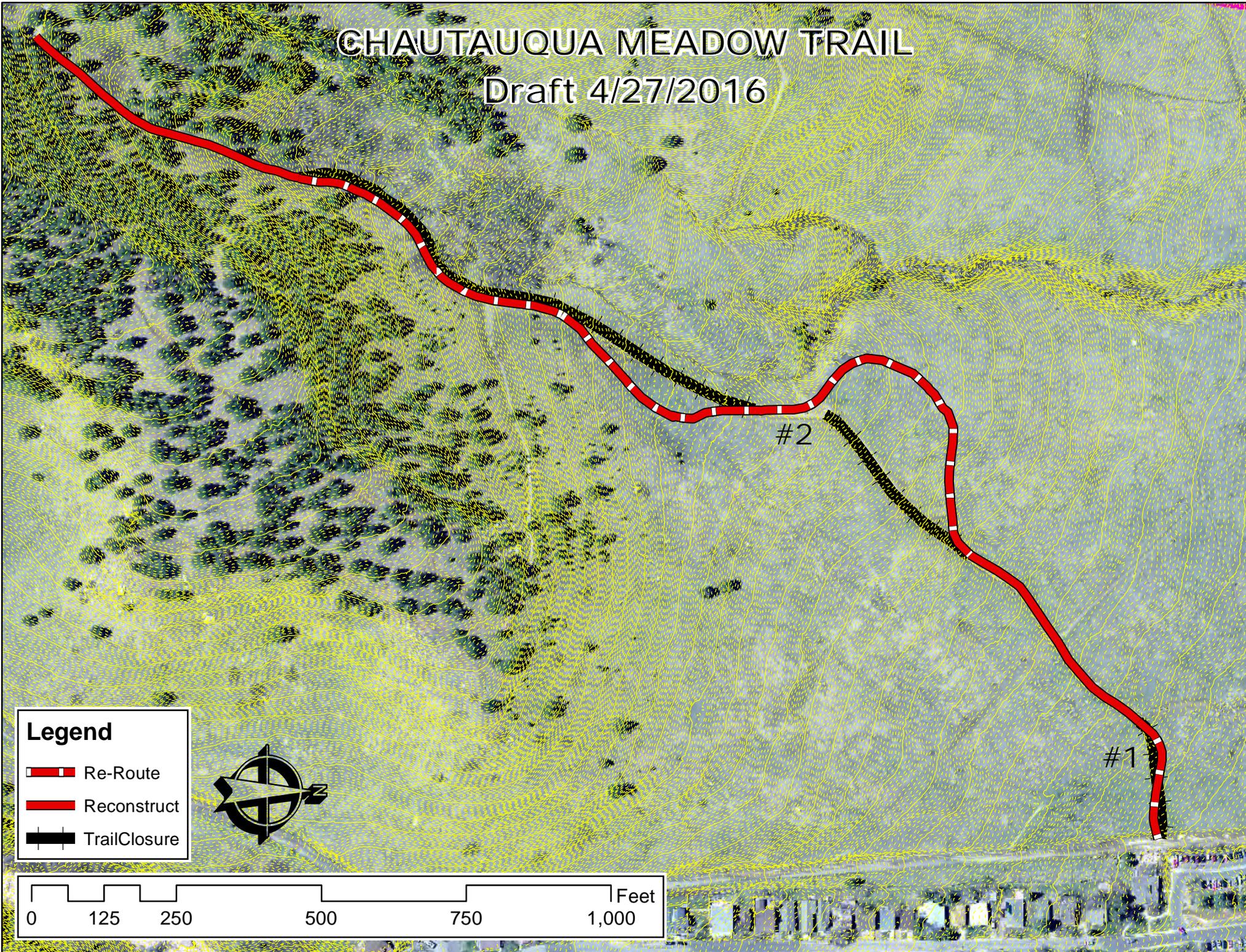
OSMP trail staff is looking to reduce the steepness of the trail where possible while still confining the impacts to adjacent resources. A proposed three-prong approach to manage the high levels of visitors is as follows:

- The **Chautauqua Meadow Trail** Map, attached, shows the proposed alignment of the Chautauqua Meadow Trail. Staff believes this will enhance visitor experience, potentially save the meadow from trail braiding, and allow for better drainage to protect the trail. The portion of the trail from the beginning to Area #1 will be accessible to ensure all visitors get a place to view the Flatirons with no roadway impeding their experience.
- The department also plans to include formal resting areas along the trail, per the West Trail Study Area Plan, as noted above. One will be accessible and the other will be located near the current junction of the Ski Jump Trail. These can be seen in **Gathering Areas #1** and **#2** (attached). Currently, these designated areas are popular as stopping points for photographs and interpretive tours and, with some formalization, could deter the wide-spread impacts of undesignated activities in the area.
- Finally, the trail will be surfaced with a stabilizing product similar to that already being used in Chautauqua and other areas of the system. Using this stabilization technique hopefully will reduce the amount of mud on the trail and encourage on-trail activity.
- Staff will initiate this project in September with a goal of completing the project by the end of the year, weather permitting.

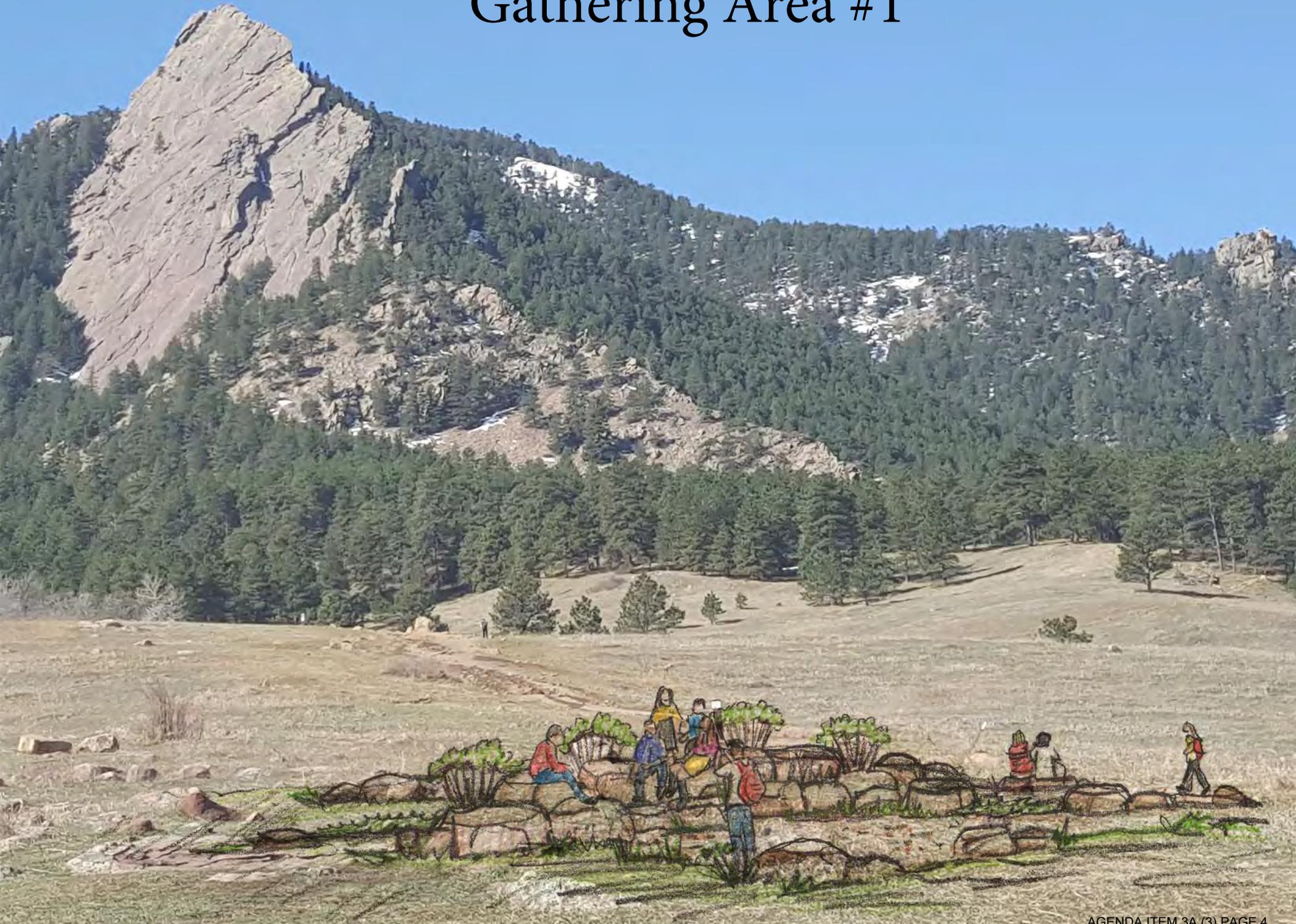
Since this part of the trail system is highly visible, OSMP staff is providing a brief verbal update to the Board along with this packet item so that the Board is informed about this trail project and its estimated schedule.

CHAUTAUQUA MEADOW TRAIL

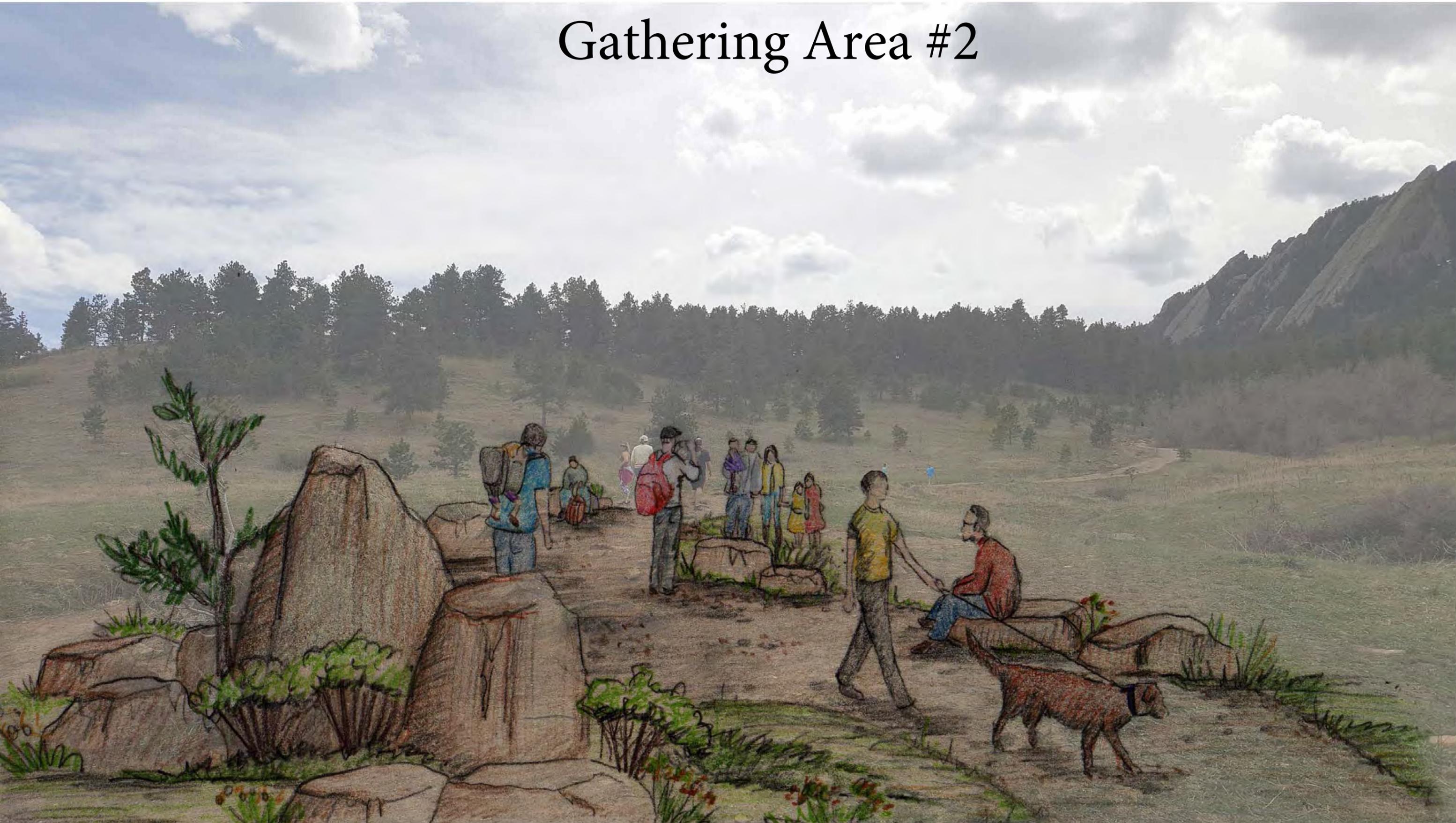
Draft 4/27/2016



Gathering Area #1



Gathering Area #2



CITY OF BOULDER MEMORANDUM

TO: Downtown Management Commission
Environmental Advisory Board
Human Relations Commission
Library Commission
Open Space Board of Trustees
Parks & Recreation Advisory Board
Planning Board
Transportation Advisory Board
Water Resources Advisory Board

FROM: Greg Guibert, Chief Resilience Officer
Mary Ann Weideman, Deputy City Manager
Casey Earp, Assistant City Manager I

DATE: April 27, 2016

SUBJECT: **City of Boulder Resilience Strategy – Full draft for public comment period**

PURPOSE

The purpose of this memo is to provide select boards and commissions the draft of the City of Boulder's Resilience Strategy and receive feedback.

QUESTIONS FOR THE BOARDS AND COMMISSIONS

- 1. Is anything important missing from the draft strategy?**
- 2. Are there proposed actions that the board feels aligns well with their strategic roadmap?**

BACKGROUND

100 Resilient Cities (100RC) is a global network pioneered by the Rockefeller Foundation to help cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century. Boulder joined the network as part of its first wave in 2013 and through its participation, is committed to demonstrating leadership in resilience as well as take advantage of the resources and opportunities it presents.

100RC supports the adoption and incorporation of a view of resilience that includes not just the shocks – floods, wildfires, violence, and other acute events – but also the stresses that weaken the fabric of a city on a day to day or cyclical basis, such as economic hardship or social inequality. By addressing both the shocks and the stresses in a holistic manner, a city becomes more able to respond to adverse events,

and is better able to deliver basic functions in both good times and bad, to all populations.

The 100RC program supports resilience building activities at the city level along four pathways:

- Financial support for the creation of a new position in the government who will lead the effort, the Chief Resilience Officer (CRO)
- Technical and logistical support for the development of a resilience strategy that will serve as the city’s roadmap to resilience activities and priorities
- Access to tools and specialized partnerships to help develop a sophisticated understanding of the city’s risks, assets, weaknesses, and opportunities and how they interlink in unanticipated ways
- Inclusion into a network of 99 other cities from which best practices, innovation, and peer-to-peer learning can advance the practice of resilience globally.

The objective of the City Resilience Strategy is to provide a roadmap for building resilience in the city. The strategy should trigger action, investment, and support within city government and from outside groups. Rather than a static road map, the resilience strategy should be a living document to be continuously fine-tuned as priorities are addressed and initiatives get implemented.

NEXT STEPS

Boards & Commissions	Meeting Date
Downtown Management Commission	5/2/2016
Environmental Advisory Board	5/4/2016
Library Commission	5/4/2016
Transportation Advisory Board	5/9/2016
Open Space Board of Trustees	5/9/2016
Planning Board	5/12/2016
Human Relations Commission	5/16/2016
Water Resources Advisory Board	5/16/2016
Parks & Recreation Advisory Board	5/23/2016

5/20: End of Public Comment Period

7/26: City Council Study Session

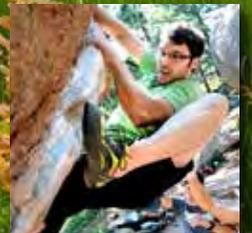
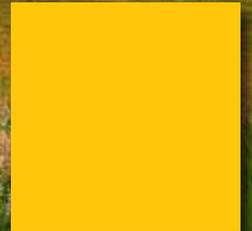
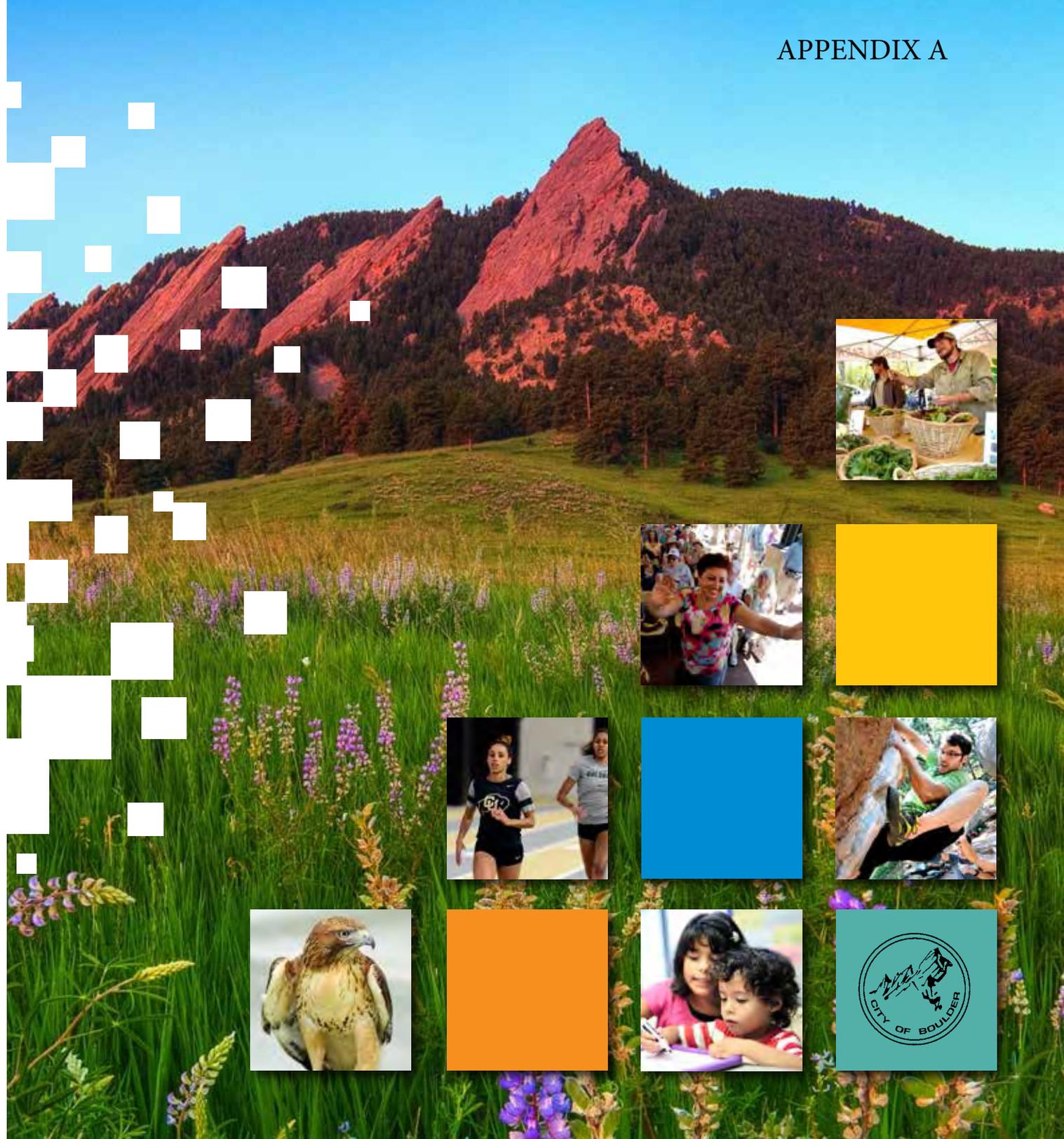
End of August: Final Strategy submitted for final adoption

APPENDIX

- A. City of Boulder Resilience Strategy

CITY OF BOULDER RESILIENCE STRATEGY

DRAFT FOR PUBLIC COMMENT
APRIL 2016 www.ResilientBoulder.com



PIONEERED BY THE
ROCKEFELLER FOUNDATION

100 RESILIENT CITIES



VISION

Building on a legacy of frontier innovation, Boulder will cultivate a creative spirit to adapt to and thrive in a changing climate, economy, and society.



RESILIENT BOULDER AND 100 RESILIENT CITIES (100RC)



MICHAEL BERKOWITZ
President of 100 Resilient Cities -
Pioneered by The Rockefeller
Foundation.

From its early history as a frontier town fueled by the discovery of gold in the middle of the 19th Century, Boulder has consistently served as a destination for individuals defined by their pioneering spirit. Boulder has originated some of the most progressive policies in the United States in a variety of areas. Its long history of preserving open space and its bold climate action plans and programs are just a few examples.

The launch of Boulder's first resilience strategy is a continuation of that legacy -- complementing your history of sustainability work and establishing Boulder at the vanguard of the urban resilience revolution that will define our time. This strategy takes a comprehensive and honest view of Boulder's resilience challenges and opportunities. It outlines a path forward for the city to confront not just its most obvious shocks, like flash flooding or wildfires, but also the chronic stresses, such as the need for affordable housing, integrated regional planning, and strong, cohesive communities, which exacerbate those shocks and impact the city over the long term.

None of this could have been accomplished without the stalwart support and vision of the Mayor, Suzanne Jones, City Manager, Jane Brautigam and the Boulder City Council. We also extend our thanks to Boulder's exceptional Chief Resilience Officer, Greg Guibert. Greg led a tremendous effort over the course of the past year of robust research, extensive community outreach, and thoughtful planning in order to make this strategy come to fruition.

What makes Boulder's strategy a leading example for our international network of member cities is the way in which it integrates world-class solutions from our platform of partners, while also highlighting the various city-to-city connections Boulder has facilitated through the 100RC network. Boulder has hosted resilience delegations from Da Nang, Vietnam around climate change mitigation efforts, and will do so again, with another 100 Resilient Cities partner, Wellington, New Zealand around a community based resilience outreach program, in the coming months.

Going forward, we know that this bold vision will strengthen your work to make Boulder a more resilient city for the entire community. As you begin to implement the various initiatives outlined in this strategy, I am confident that Boulder will continue to honor its history as an urban innovator, and begin to export the lessons we learn together to cities across the 100RC network and beyond. My congratulations to you all, on behalf of the entire 100 Resilient Cities team. We look forward to partnering with Boulder on its resilience journey for many years to come.

Dear neighbors,

We are delighted to present Boulder’s Resilience Strategy, a document that reflects approaches our community will be taking as we work to strengthen our preparedness for – and ability to respond to – future challenges. These approaches build on what we already know works in our highly engaged community, as well as best practices we have learned about as one of the inaugural cities participating in the 100 Resilient Cities program. We are so appreciative of the opportunity to work with 100RC and the cohort of other cities in the program, and want to acknowledge their leadership in this crucial endeavor.

You will notice that each of the strategic focus areas in our Resilience Strategy is defined by verbs. This is by design. We know that the best way to make Boulder more resilient in the face of stress is to act – to act now, to act strategically and with appropriate coordination, and to act together. And as you can see, there is an exciting group of initiatives underway under each of these focus areas.

In exploring what it means to be a “resilient” community, this resultant strategy recognizes the importance of broadening our understanding of potential future stresses. We know from recent experiences that wildfires and floods are very real dangers in Boulder. But this plan covers so much more. How can Boulder leverage the emerging risk of the Emerald Ash Borer beetle, for example, to make our forestry systems and practices stronger? How can we strengthen the social fabric of our neighborhoods and provide more support to particularly vulnerable populations so they can withstand potential economic downturns more effectively? How can the city work with the business community to ensure that they have plans in place to recover quickly after disruptions?

As you read through this strategy document, we hope you will feel the same pride we do for our community. Many of you have played a role in the creation of this framework. You’ve participated in forums and learning opportunities. You’ve engaged in dialogue with our Chief Resilience Officer Greg Guibert. And you’ve provided input that has helped us understand our community’s priorities. We are so grateful for this kind of support and engagement. Our people and our sense of community continue to be among our greatest assets as we work toward the shared goal of strengthening Boulder and implementing the many terrific programs outlined in this plan. Let’s work together to make Boulder the very best – and strongest – it can be!

Sincerely,



Suzanne Jones
Mayor



Jane Brautigam
City Manager



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BOULDER





1

CHALLENGE

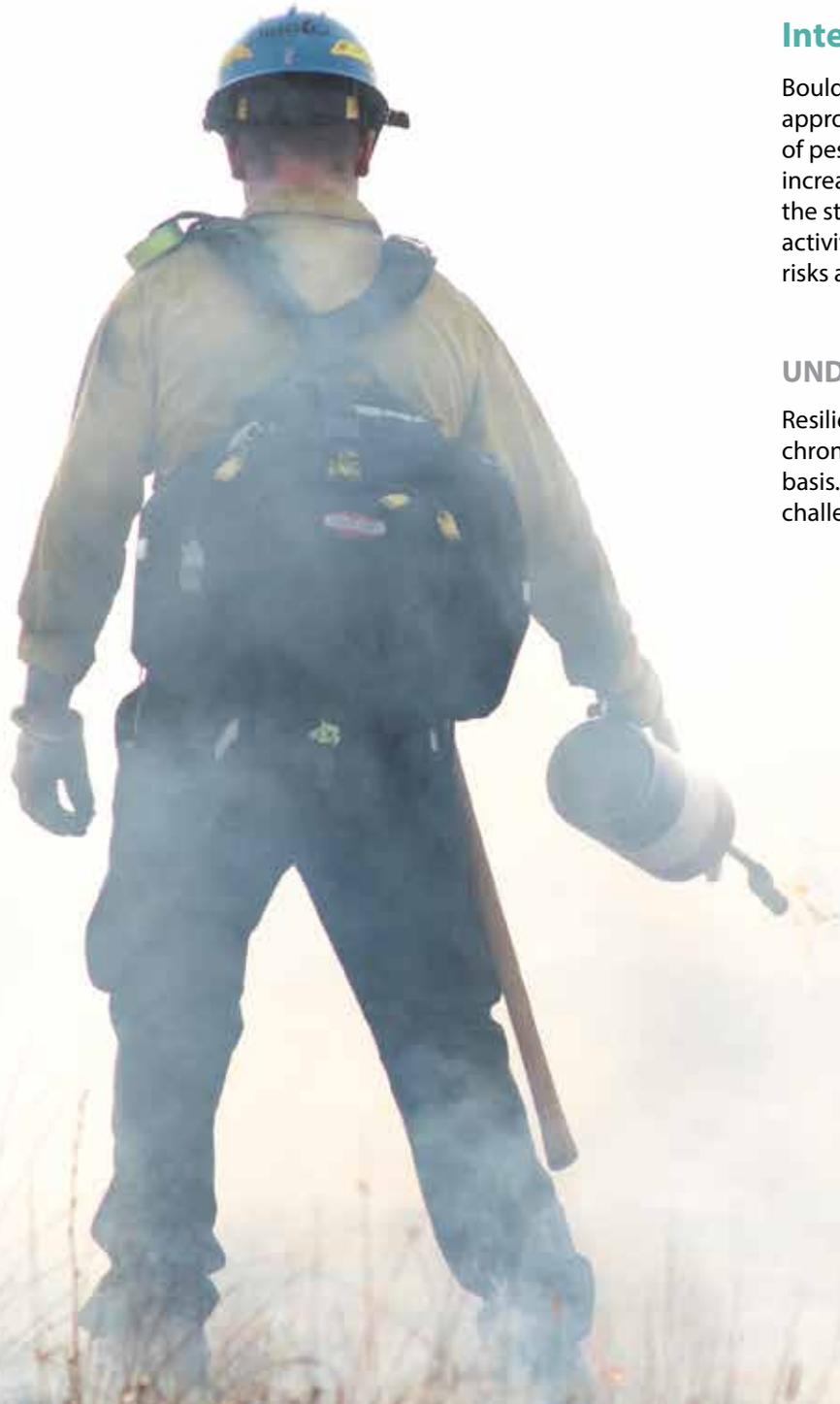
Interlinked Hazards

Boulder's natural hazards are tightly linked, necessitating a comprehensive and integrated approach to risk mitigation. Droughts stress the city's ecosystems, helping accelerate the damage of pests to forests, thereby increasing the fuel for wildfires, and consequently denuding slopes and increasing flash flooding risk. But this cycle itself is not linear; each event builds on another and sets the stage for even more complex interactions. Therefore, to address these interlinked hazards, activities and programs must be well coordinated, using a systemic approach to reduce multiple risks at the same time and prepare communities to handle disruptions of any kind.

UNDERLYING STRESSES

Resilience is not only about disaster preparedness and extreme events. It is about addressing the chronic stresses on a fundamental level that weaken the fabric of a city on a day-to-day or cyclical basis. By focusing on both shocks and stresses together, Boulder becomes more able to respond to challenging events and is more likely to thrive as a happy, healthy and inclusive community.

Boulder's regional Fire Training Center was completed in mid-2010 and is used across Boulder County by all 26 fire departments. It served as a regional hub and emergency control center during the September 7, 2010 Fourmile Canyon Fire.



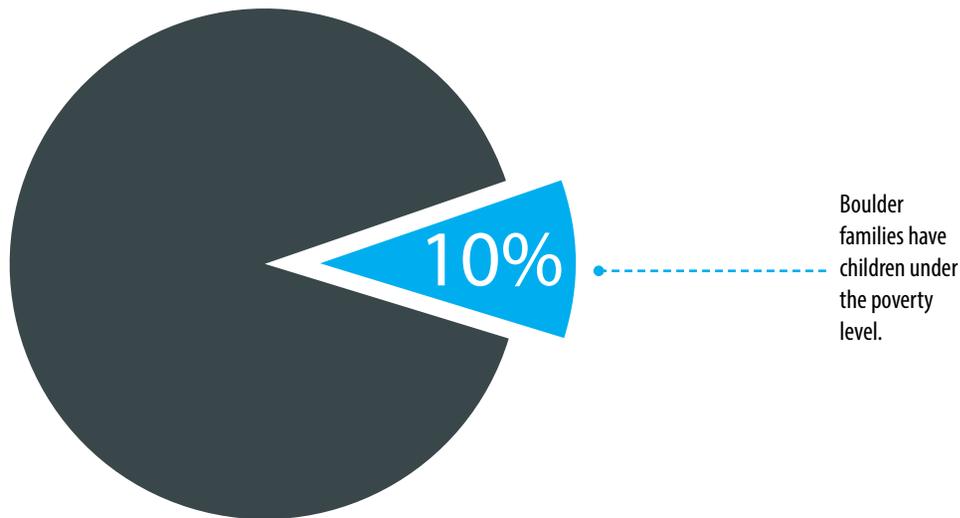
“Lower-income people are among the least able to recover, yet they are often central to the economy and culture of a community.”

- ISET INTERNATIONAL

Shocks Expose Stresses

Boulder’s social and economic stresses are sometimes harder to see, but can be exposed and exacerbated during a crisis or disaster. The city’s vibrant economy and high quality of life often mask latent stresses that strain the community and make it less resilient overall. Natural disasters like floods and fires disproportionately impact low-income residents who already struggle to thrive in a city that is becoming more unaffordable. A Boulderite living on a fixed income, for example, whose home is damaged in a disaster has limited options to find affordably-priced alternatives because the city has a constrained supply of housing.

Stresses can also present a threat to our economic future. Successful, thriving cities need young people to fuel their economic pipeline. However, in Boulder, individuals between the ages of 25 to 44 is a cohort that has declined by 15 percent since 2000. Similarly, increasing real estate prices have also affected the commercial sector. High office rents and limited commercial space hamper the opportunity of growth-stage firms seeking to expand from start-up status, and many of these companies choose to expand in places like Denver and Longmont where there may be more available space.



Boulder families have children under the poverty level.



Boulder's Core Resilience Challenges:



Natural events such as flooding and wildfires will become more frequent and severe as a result of climate change.



Ecological and social stresses are tied to hazards and will negatively impact and exacerbate each other.



Rising housing and commercial real estate costs may limit the diversity of residents and businesses and threaten long-term economic vitality.



Boulder's residents, businesses and government need to work together to be vigilant and prepared for future disruption.

Resilient Communities and Government

At a community level, preparing for an uncertain future means understanding our risks and being vigilant for the unexpected, whether it is a flash flood or global recession. It means that individuals, families and neighborhoods strengthen ties to support each other during times of need. Residents will need to reach out to their neighbors, particularly the most vulnerable and isolated individuals, to support each other when disaster strikes and critical systems fail. Business owners will need to create business continuity plans and understand the available public and private resources to prepare for the economic risks they face.

At the same time, local government must plan for and respond to shocks that affect the city and stresses by working collaboratively across departments and jurisdictional boundaries, as well as with private and institutional stakeholders. This collaborative approach will facilitate more robust information sharing and analysis, development of cross-cutting solutions and strategic private-public partnerships.

Leveraging Boulder's History of Planning Innovation

Boulder's pioneering spirit and commitment to advancing critical initiatives such as open space preservation, climate mitigation and inclusive affordable housing happened decades before the rest of the country adopted similar efforts. Through this strategy, and as reflected by the process leading up to the preparation of this document, the Boulder community will prepare and adapt to existing and future challenges by infusing resilience into the day-to-day operations and activities of residents, businesses and government.





City Highlight

FISCAL LEADERSHIP

Leadership in fiscal resilience is making Boulder better equipped to respond to and recover from economic shocks, whether this is withstanding a global recession or responding to a major event.

- For many Front Range cities, nearly 75 percent of revenues come from sales taxes; in Boulder, less than 45 percent of sales taxes comprise the city's general fund.
- One of the city's primary financial policies is that one-time revenues shall only be used to cover one-time expenses and that ongoing costs should not be greater than ongoing revenues.



City Highlight

HOUSING AFFORDABILITY INITIATIVES

We recognize that housing affordability is a key issue for the community. It ensures that Boulder remains a place for residents of different backgrounds, incomes and household sizes.

- Boulder's mandatory inclusionary housing ordinance requires 20 percent of housing in new developments to be priced affordably for low-income households.
- As of August 2015, there are 3,586 units in Boulder's affordable housing program. This represents 8 percent of the total units in the city, which puts Boulder 2 percent away from the city's goal of making 10 percent of all housing units affordable.



City Highlight

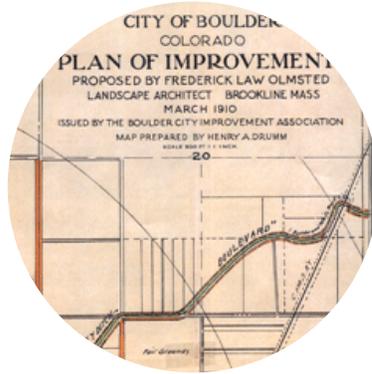
OPEN SPACE CONSERVATION

Nearly 50 years ago, Boulder voters enacted an open space initiative where residents taxed themselves to purchase and preserve undeveloped land surrounding the city, an unprecedented feat at the time and even today still rarely emulated.

- The roots of Boulder's robust open space system date back to 1875 to 1929 when the city acquired over 5,000 acres, including Chautauqua, Buckingham Park (in Left Hand Canyon) and much of the mountain backdrop.
- There are more than 102,000 acres of land in Boulder County's parks and open space system. Of these, approximately 62,000 acres (60 percent) are either publicly owned, leased from the State Land Board, or held in the form of access or trail easements. The remaining 40,000 acres in the system (40 percent of the total) are privately-owned lands with county conservation easements.

A photograph of a forest with a rocky path. The path is made of large, dark grey stones and leads through a dense forest of tall, thin trees. The lighting is soft, suggesting a late afternoon or early morning setting. A large, semi-transparent number '2' is overlaid on the left side of the image. The word 'CONTEXT' is written in a bold, teal, sans-serif font across the middle of the image, partially overlapping the path and the number '2'.

2 CONTEXT



Boulder has a long history of planning today for the challenges of tomorrow, creating innovative solutions and undertaking many successful resilience-building activities and projects.

Located at the base of the foothills of the Rocky Mountains, Boulder is a small city with a high quality of life, a diverse and vibrant economic base and tremendous open space resources. The community enjoys the natural and recreational amenities resulting from decades of progressive land use planning which preserves a vast rural and undeveloped landscape that encircles the city. Boulder is truly a city whose identity and future is inextricably linked with the natural environment, and environmental sustainability has been a long-standing and primary guiding principle in planning and policies. A strong commitment to sustainability is regularly reinforced through voter-initiated ballot measures to increase taxation for additional open space preservation or carbon reduction measures.



162 HOMES DESTROYED
IN THE 2010
FOUR MILE CANYON FIRE



BOULDER IS DEPENDENT ON
SNOWPACK, WHICH CAN VARY;
2011 WAS A RECORD YEAR FOR
SNOWPACK WHILE 2012
WAS AMONG THE WORST.



ALL 15 OF BOULDER'S
WATERWAYS FLOODED
IN 2013



230 ACRES BURNED
IN THE 2012 FLAGSTAFF
FIRE

Boulder is inextricably linked to the mountains, which contain the city's watershed and attract over 5.3 million visitors to its open spaces each year.

BOULDER'S natural terrain and location at the mouth of numerous canyons creates a constant flood risk for the city. Fifteen major creeks pass through town, including Boulder Creek, which flows right through downtown. The Front Range is also susceptible to wildfires and drought, which create dry, less vegetated conditions and contribute to increased flood risk. In addition, Boulder's propensity for sudden bursts of isolated and severe storms contributes to flash flooding risk. Flooding and wildfires demonstrate the connections between Boulder's natural environment, climate change-related conditions and the interconnections between major hazards.

BOULDER'S WATER RESOURCES

Like most western communities, Boulder depends on stored water most of the year. High streamflows from melting snowpack occur for only a few spring and summer months. Natural streamflows in late summer and the winter are not sufficient to meet customer demands and must be supplemented with previously stored water supplies. The amount of water available also changes from year to year depending on how much snow falls in the mountains. Therefore, Boulder must store water in reservoirs during wetter years to carry over for use in dry years.

The city stores water in seven reservoirs and several natural lakes in the headwaters of the North Boulder Creek basin within the Silver Lake Watershed. In addition, the city stores water in the Barker Reservoir facilities on Middle Boulder Creek and the Boulder Reservoir northeast of Boulder. The latter is supplied through Western Slope water diversions that come from miles away.

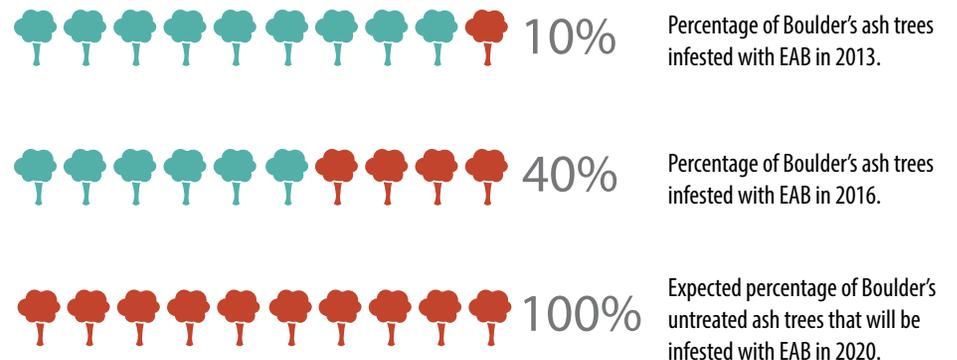
Investing in both source water protection and enhancing water infrastructure continue to be of chief importance to the city. This has included investments that secure additional capacity and redundancy at the city's water treatment facilities which help reduce risk from drought and other concerns. It also includes a long history of investing in the city's stormwater and wastewater systems which help mitigate flooding and sewer back-ups.

INVASIVE SPECIES ARE A MAJOR CONCERN FOR BOULDER

Boulder's urban forest provides nearly \$5.2 million in annual environmental, economic and social services benefits to the community. These services include air quality improvements, energy savings, stormwater runoff reduction, atmospheric CO2 reduction and aesthetic contributions to the social and economic health of the community. One of the largest threats faced by urban forests across the U.S. is from invasive insects and disease pests such as the Emerald Ash Borer (EAB). EAB will cause mortality of all untreated ash trees in Boulder and destroy a significant portion of urban tree canopy.



EAB is a green jewel beetle that feeds on ash tree species. The beetle originated from Asia and is thought to have been introduced to North America in the 1990s on solid wood packing material. In the U.S., EAB is a federally quarantined, invasive tree pest responsible for the death or decline of more than 50 million ash trees to date.

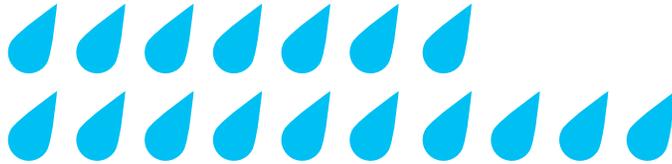


Putting It In Perspective

COMPARING HISTORICAL RAINFALL TO 2013 FLOOD

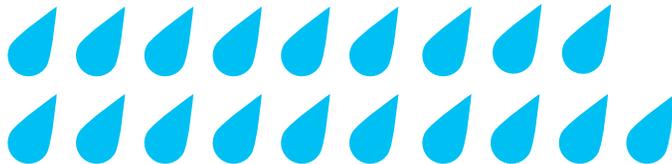
17"

September 2013
Total Rainfall



19"

Boulder's Average
Annual Rainfall



From Fire to Drought to Flood

Changing weather in Colorado is nothing new, but the arc of shocks from 2012 to 2013 offers a glimpse of the types of extreme events and swings that will only be exacerbated by the impacts of a warming climate. A dry summer with little rainfall set up conditions for Boulder's 2012 Flagstaff Fire. Drought concerns loomed larger in Boulder and across the state moving into 2013, only to have the year end with flooding and record rainfall.

The Greenways Program

The Greenways Program divides each of the city's 15 tributaries into reaches to facilitate a manageable implementation approach for improvements. The greenways system is maintained by the city and funded by the city's Transportation Fund, Stormwater and Flood Control Utility Fund and the state's Lottery Fund. Each of these funding sources provides \$150,000 annually to 1) protect and restore riparian, floodplain and wetland habitat; 2) enhance water quality; 3) mitigate storm drainage and floods; 4) provide alternative modes of transportation routes or trails for pedestrians and bicyclists; 5) provide recreation opportunities and 6) protect cultural resources



Boulder has a history of floods including the "Big Flood" of 1894 - the largest flood on record. Other major floods in 1938, 1969, 1995 and 2013 all reinforce the need to educate the public about flood safety. Each year, city staff coordinate with multiple groups to maximize the impact and reach of ongoing community engagement around flood outreach.

City Highlight

COMMUNITY RATING SYSTEM (CRS)

The federal Community Rating System provides flood insurance discounts to communities that exceed the minimum requirements to prevent and reduce flood damage to insurable property. The city's efforts have earned discounted flood insurance rates for Boulder property owners.

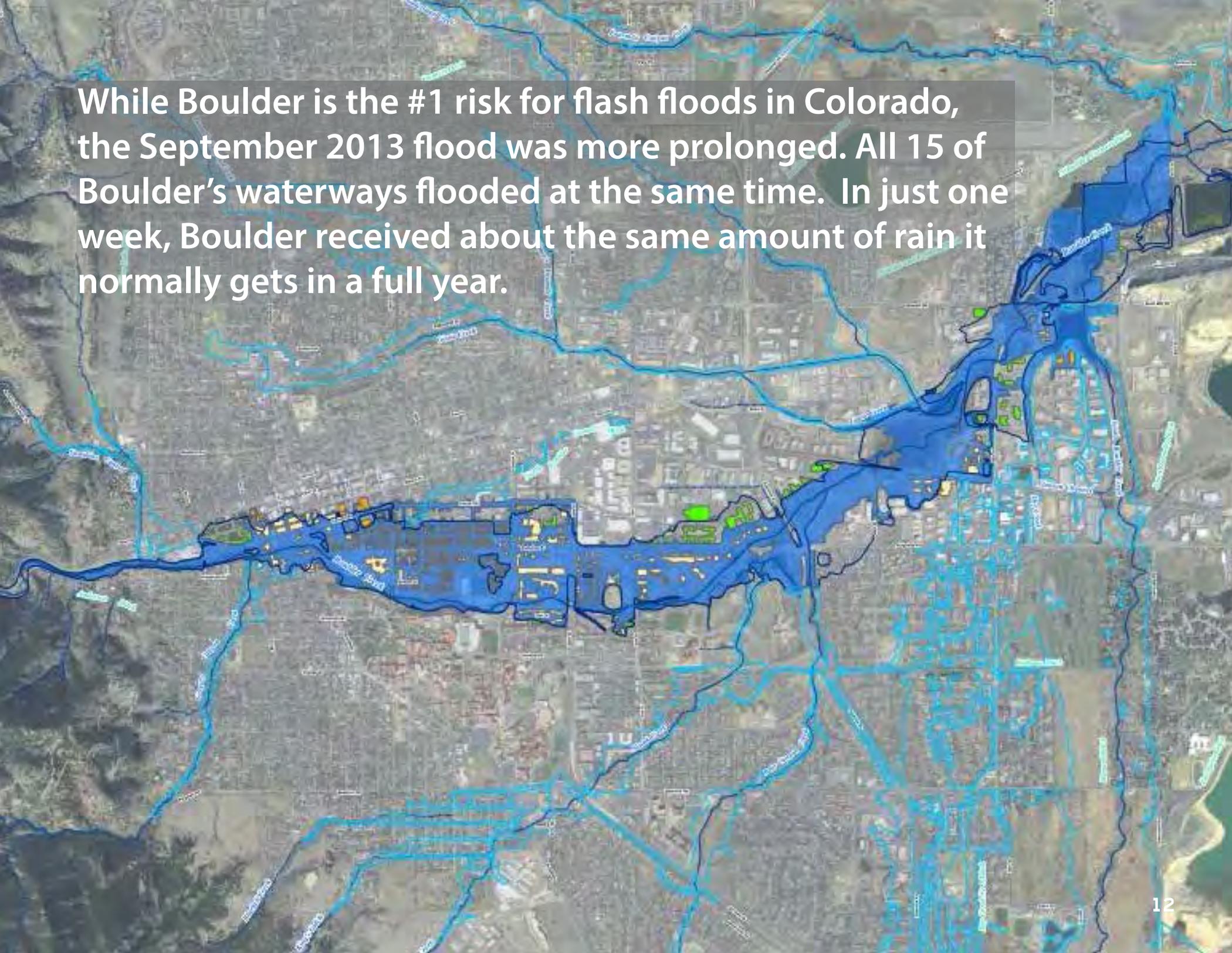
City Highlight

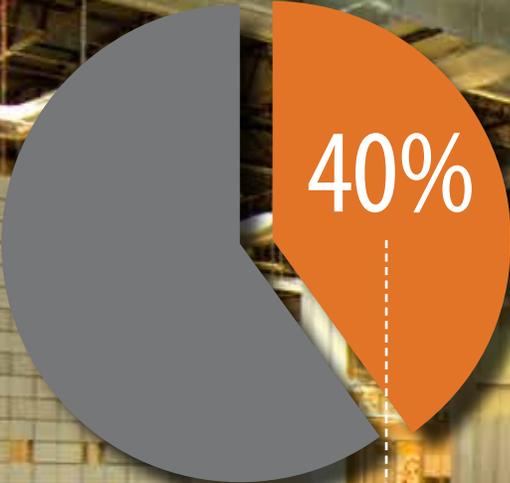
CIVIC CENTER FLOOD MEMORIAL

Gilbert F. White arguably did more to advance flood policy than anyone. While his efforts had broad impacts advancing natural hazard research, White was a tour de force in Boulder. The Gilbert F. White Memorial dedication monument marks the level of the 50-year, 100-year, 500-year and the Big Thompson floods (one of the biggest in Colorado).



While Boulder is the #1 risk for flash floods in Colorado, the September 2013 flood was more prolonged. All 15 of Boulder's waterways flooded at the same time. In just one week, Boulder received about the same amount of rain it normally gets in a full year.





40%

OF 1,000 TECH COMPANIES
STARTED IN COLORADO SINCE
2000, NEARLY HALF HAVE
BEEN IN BOULDER COUNTY

Boulder is nationally-recognized for its quality of life, thriving tech- and research-based economy and booming real estate market. In addition, Boulder has become a hub of entrepreneurship in the U.S., particularly for businesses that value the lifestyle that is rooted in a love of the outdoors, healthy living and access to tech resources. We have a robust and diverse economy defined by the research and institutional sector. Over the past 10 to 15 years, the tech industry has experienced pronounced growth throughout Boulder County.

“If you look at a lot of the green technology and the systems we’re implementing, they’re coming from Boulder.”

- Robert F. Kennedy Jr.
Speaking at the June 12, 2013
BizWest, Boulder Earth Conference



Owing to the presence of the University of Colorado's (CU) flagship campus in Boulder, the city maintains a relatively high proportion of young people. With a current enrollment of just under 30,000 students, CU accounts for approximately 29 percent of the total population. Boulder is also one of the most educated metropolitan areas in the country. The presence of the university and 17 federally-funded research labs support many of the jobs for this demographic including those that focus on weather, climate and geophysical research. Furthermore, this segment of the workforce is supported by the presence of tech jobs that draw from and attract scientists and engineers.



Regional Resilience

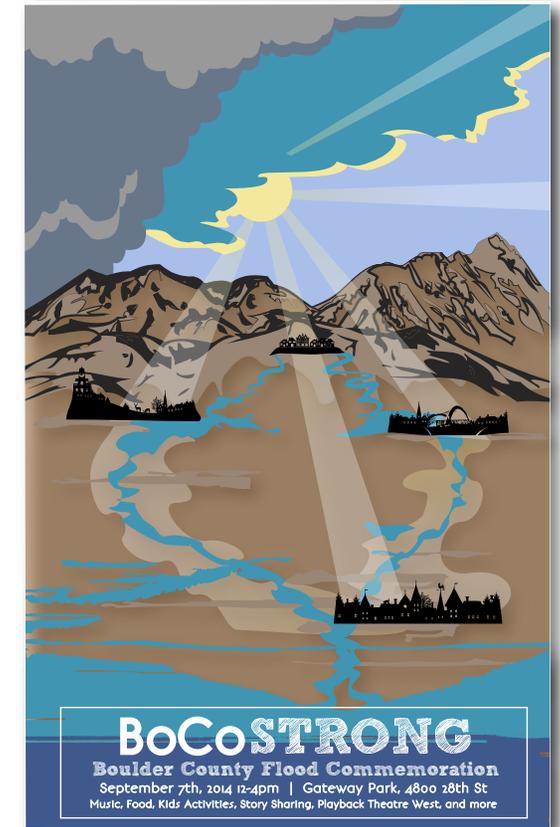
Boulder is part of a larger community and region, and, just as the shocks and stresses we face do not simply start at the borders, neither do the actions and partnerships necessary to address them. Even as recent disasters have motivated Boulder's own resilience building efforts, they have also spurred action at the county, state and national levels. Boulder has developed a strong network of partnerships that have helped inform activities and strategies, and it regularly participates in the collaborative development of this emerging field.

BoCo Strong

BoCo Strong is a countywide resilience hub that creates and supports collaborative relationships between individuals, communities, nonprofits, governments and businesses. BoCo Strong increases the web of connections among individuals, organizations and governments across Boulder County to foster inclusivity, increase disaster resilience and build vibrant and prosperous communities. Its vision is that all Boulder communities will have access to the resources and connections needed to allow all residents to adapt and thrive in the face of community stressors. From the outset, Boulder has recognized that the challenges we face do not start or stop at the city's edge. Building a sustaining effort requires close collaboration, learning from a broad base of experience and building enduring partnerships.

Colorado Resilience Framework

Governor John Hickenlooper adopted the Colorado Resiliency Framework in May of 2015, a first-of-its-kind statewide framework in the nation. The framework was developed under the leadership of the Colorado Resiliency and Recovery Office (CRRO) through a collaborative and inclusive process that engaged local, state, federal, non-profit and private sector partners, as well as individual Coloradans. The framework provides guiding principles for Colorado communities and concrete actions that the state commits to implement. One of the first priority strategies implemented under the framework was a pilot regional resiliency planning process to build and strengthen collaborative relationships locally, establish a unified regional vision for resilience, and put in place a coordinating framework for long-term regional resilience action. Starting in the summer of 2015, the CRRO partnered with some of the most heavily disaster-impacted communities to conduct the pilot process which utilized the state framework's guiding principles to help facilitate a vision and identify strategies unique to each participating region. The Boulder County region was one of three communities to participate.



Uniquely Boulder

GROWING UP BOULDER

In collaboration with Resilient Boulder, Growing Up Boulder (GUB) worked with approximately 120 children and youth to develop their perceptions of resilience within the city. Overall, access to nature and family, friends and supportive networks (from school and community) help support resilience, as do activities that help young people develop skills and confidence (including music, arts and skateboarding). Aspects of the community that do not support resilience include social, environmental and economic concerns (including the need for greater care of homeless residents, fracking and the cost of living). Children spoke about bullying and youth spoke about cultural exclusion as aspects of their community that need to be addressed in the city. High school students also participated in a poetry project in which they described a personal moment of resilience. Many of these stories included surviving the flood, family losses and coping with poor family health, and the challenges of immigration/immigration status. Access to nature in relatively close walking space could help some of the children and youth we worked with access greater opportunities for restoration and resilience.





5 APPROACH

Resilience and Sustainability

Resilience and sustainability are sometimes confused with one another. Resilience is a new way of thinking about the community in a holistic way that adds to and deepens the way we already plan for a sustainable future. Resilience and sustainability represent complementary values and ways of managing urban systems. Where sustainability is about actively and thoughtfully managing resources to achieve environmental, social and economic goals that preserve or enhance Boulder's quality of life, resilience is about anticipating the inevitable events that cause disruption and then developing the strategies to reduce their impacts to the greatest extent possible. While resilience itself is not new, 100 Resilient Cities is the first organization to use resilience as a systematic framework, on a global scale, for actively managing and prioritizing city operations and activities.

Sometimes metaphors can help explain complex topics. For some, the reasons for planting street trees help illustrate the relationship between resilience and sustainability.

SUSTAINABILITY:

- Urban heat island mitigation
- Carbon sequestration
- Cleaner air
- Community character
- Aesthetic value

RESILIENCE

- Summer cooling
- Reduced storm runoff
- Species diversification
- Neighborhood identity



re·sil·ience

/rə 'zilyəns/

Boulder defines resilience as the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses and acute shocks that may be experienced.

CITY RESILIENCE FRAMEWORK

The City Resilience Framework (CRF) provides a lens to understand the complexity of cities and the drivers that contribute to their resilience, and a common language that enables cities to share knowledge and experiences. The framework is built on four essential dimensions of urban resilience: Leadership & Strategy, Health & Wellbeing, Economy & Society, and Infrastructure & Environment. Each dimension contains three "drivers," which reflect the actions cities can take to improve their resilience.

Leadership & Strategy

The processes that promote effective leadership, inclusive decision-making, empowered stakeholders and integrated planning.

Health & Wellbeing

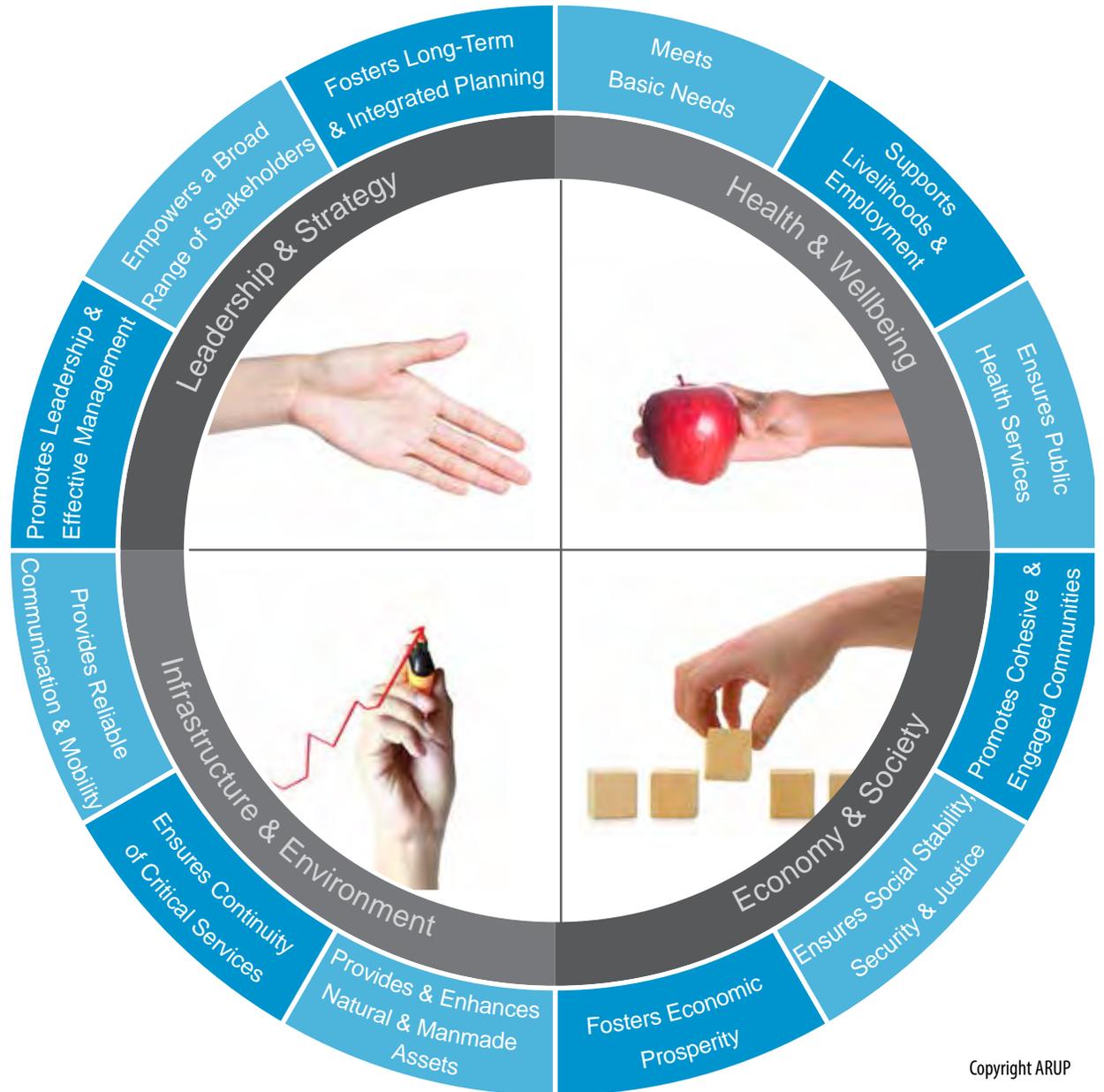
Everyone living and working in the city has access to what they need to survive and thrive.

Economy & Society

The social and financial systems that enable urban populations to live peacefully and act collectively.

Infrastructure & Environment

The physical and natural systems that provide critical services and protect and connect urban assets, enabling the flow of goods, services and knowledge.

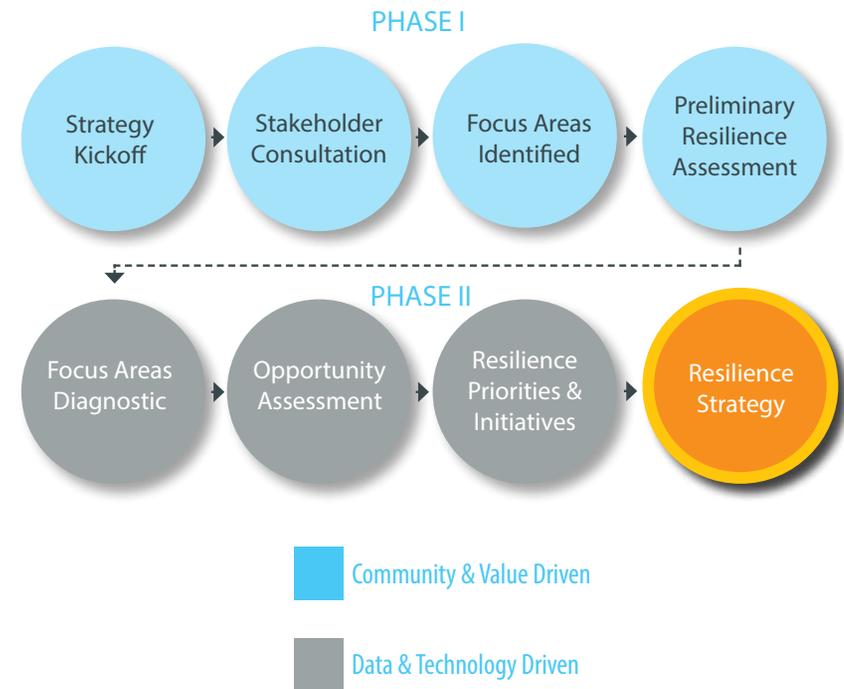


The Process

Building resilience is as much a process as it is a set of outcomes. The process itself must also embody the characteristics of resilient systems and be iterative, inclusive, integrated, adaptive and flexible. It must allow for the constant infusion of new information and accommodate often unpredictable change in the community, creating the ability for reassessment and reprioritization of activity to address new risks and opportunities.

From the outset, Boulder's goal has been to do things differently. The city set off to build on existing efforts, but recognized the opportunity to tap into the new energy around the 100 Resilient Cities network. For example, the city has explored new methods for community engagement and ownership through the MIT Climate CoLab, harnessing the creative potential of the whole community, and Growing Up Boulder (GUB), giving voice to youth in the process. This approach has given us the chance to position Boulder as a resilience testbed for new technologies, innovative partnerships and creative thinking.

In 2014, the city initiated its first resilience assessment, ultimately leading to the creation of this strategy. The assessment methodology was an analysis of current efforts that support resilience and identified important gaps in knowledge, capacity and activity. However, this initial assessment process itself highlighted areas where the existing methodology could be augmented by new diagnostics to be incorporated in future resilience assessments. New elements being developed as part of Boulder's resilience efforts will bring insights and depth of analysis for the continuous process of reflection and assessment.

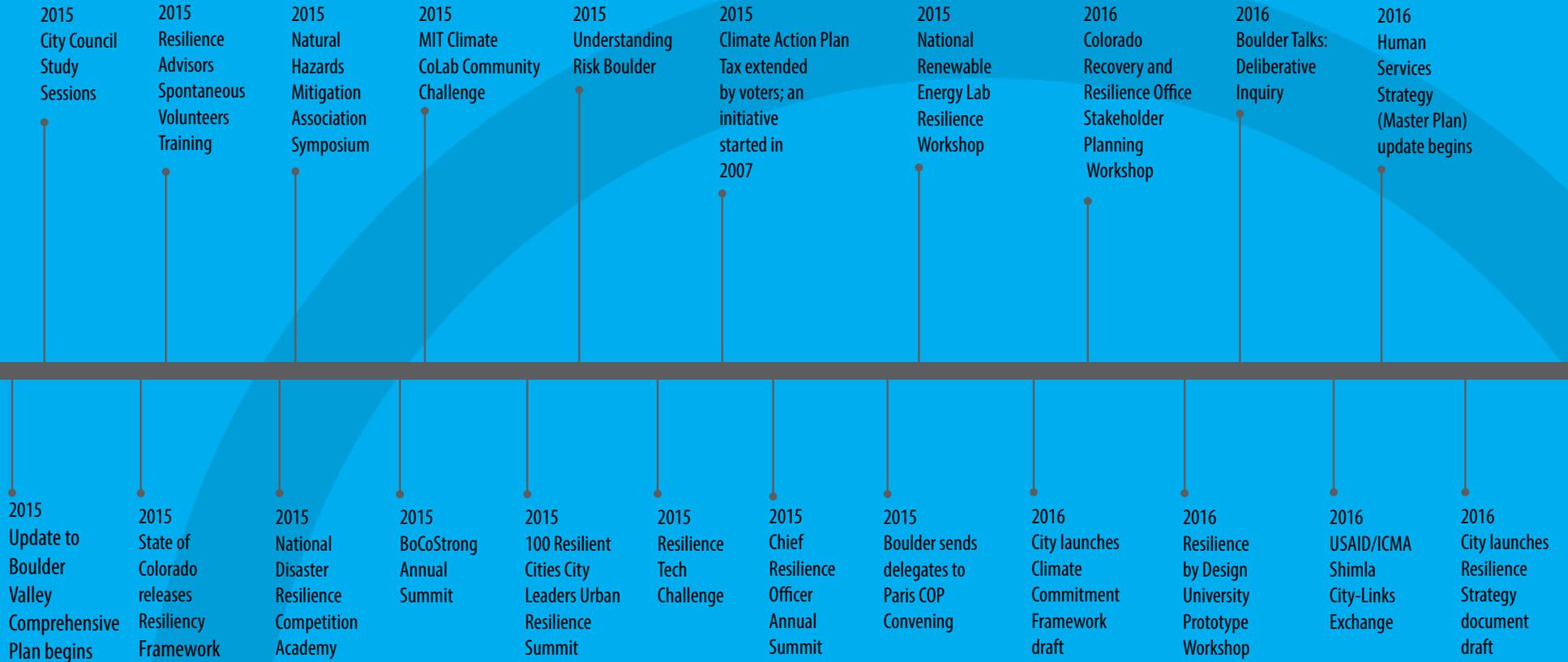


Learning with 100 Resilient Cities

WHAT ARE THE PLATFORM PARTNERS?

The 100RC Platform of Partners provides member cities with a curated suite of donated tools and services, supplied by partners from the private, public, academic, and non-profit sectors, to support cities in their resilience-building activities. Boulder has already partnered with a number of these service providers, including Trimble, a company that provides geospatial technical solutions and domains to capture, measure, analyze, monitor and share built and environmental information.

Since joining 100RC, the City of Boulder has increasingly leveraged opportunities, participated in events and utilized the Chief Resilience Officer to drive community engagement.



RESILIENT

A scenic landscape at sunset or sunrise. The sky is filled with dramatic, colorful clouds in shades of blue, purple, and pink. The sun is low on the horizon, casting a warm glow. In the foreground, there is a body of water reflecting the sky and clouds. The water is calm, with gentle ripples. The background shows a range of mountains under the colorful sky. A large, semi-transparent number '4' is overlaid on the left side of the image. The word 'STRATEGIES' is written in a bold, teal, sans-serif font across the middle of the image, partially overlapping the number '4' and the water.

4 STRATEGIES

THROUGH THE RESILIENCE assessment and community discussions, Boulder has identified three major resilience strategies. Working collaboratively to create actions that achieve these interconnected strategies will help build a resilient and adaptive community that is better able to address the unpredictable impacts of environmental, social and economic shocks and stresses.

Building community resilience is a never-ending process and requires constant adjustment to new conditions and opportunities. Through the actions identified here, we take steps towards meeting these goals, but as noted earlier, these are not the first steps. These new actions add to ongoing and historic efforts in a way that brings intentional direction toward catalyzing change across all sectors of the community.

Strategies

The following three strategies represent the main action areas for the city.

- CONNECT AND PREPARE** - Prepare all segments of the community for uncertainty and disruption by encouraging community preparedness, creating a culture of risk awareness and personalizing resilience.
- PARTNER AND INNOVATE** - Capitalize on the collective problem-solving and creativity of our community by leveraging advances in data, research and observations to address emerging resilience challenges.
- TRANSFORM AND INTEGRATE** - Embed resilience into city operations and systems by transforming our approach to community resilience.



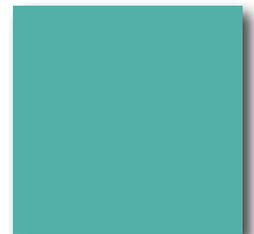
Actions

These are immediate priority activities to be implemented over the next two to three years that take advantage of partnerships and resources catalyzed by the 100RC network and program. The actions being proposed are intended to be responsive to existing city priorities and bring a resilience lens and added value to projects and initiatives that are already underway. A summary table of all the proposed activities is provided at the end of this document.



Frontiers

Transformative investments in community resilience that currently have no models to emulate, represent extremely complex areas for action and/or require an extensive community conversation to be successful.

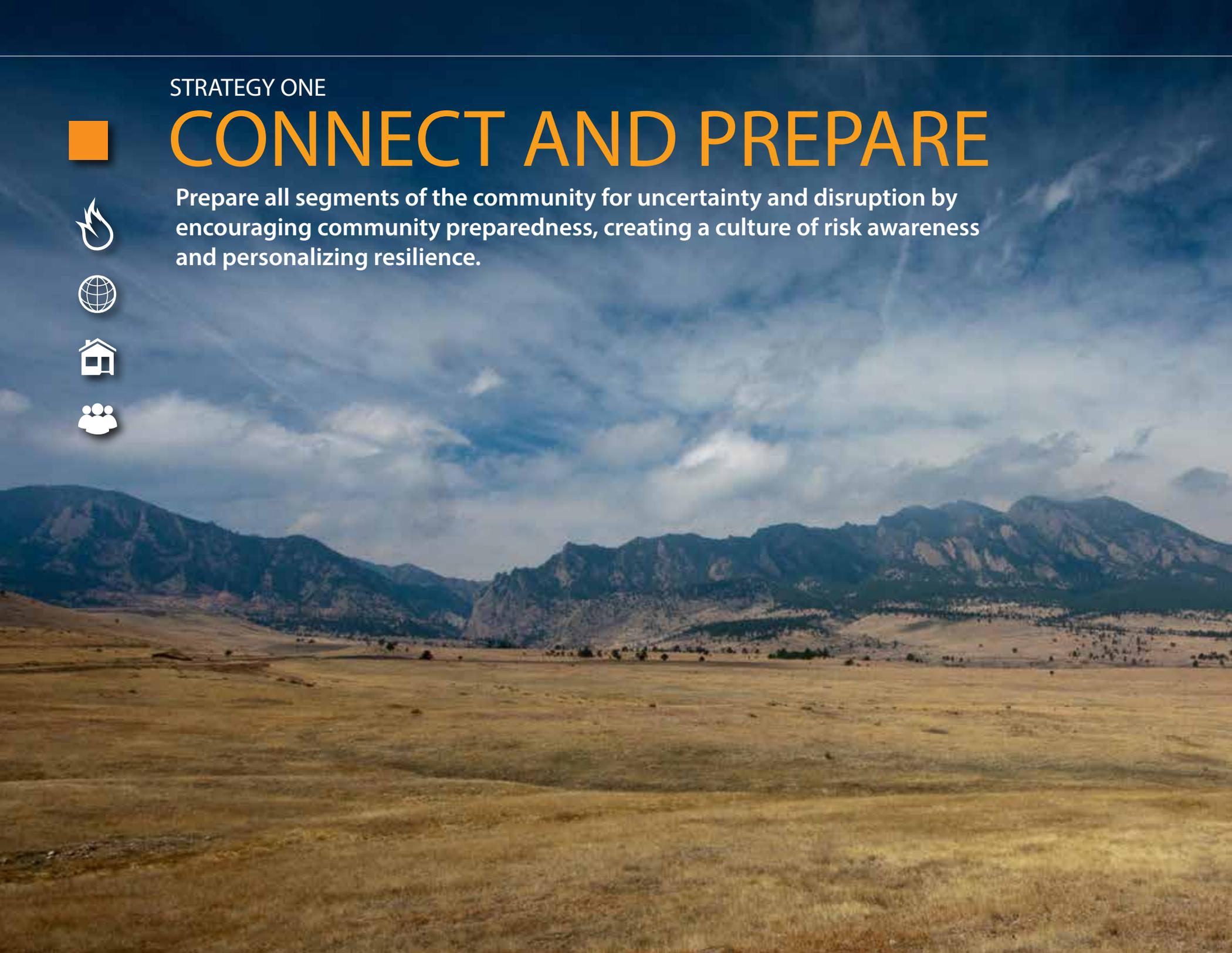


STRATEGY ONE



CONNECT AND PREPARE

Prepare all segments of the community for uncertainty and disruption by encouraging community preparedness, creating a culture of risk awareness and personalizing resilience.





ACTIONS:

1.1 Make Resilience Accessible

Deploy a community driven, interactive “Mobile Resilience Lab.”

1.2 Activate Volunteerism

Develop a volunteer community preparedness training program.

1.3 Assess Economic Strength

Identify risks to future economic vitality.

1.4 Prepare Businesses

Facilitate the use of continuity planning strategies with local businesses.

1.5 Connect for Rapid Recovery

Develop rapid post-disaster impact assessment capacity in partnership with the local business community.

1.6 Foster Artistic Engagement

Engage the creative power of the arts to convey and involve people in complex risk and resilience themes.

PURPOSE:

Despite several severe natural disasters over the last decade, most Boulder community members remain unprepared for future events. Many of the potential shocks the city faces require constant vigilance, a deeply personalized understanding of individual exposure and community risk, and an ability to act quickly in case of an emergency. Fundamental to preparedness is community connectivity and the ability for all members of the community to contribute to response and recovery when disaster strikes. Community connection can be as simple as knowing your neighbors, but it can also mean building new relationships and capacities between the city and local businesses. By enhancing preparedness and connection now, before the next disaster, the city can empower everyone to take quick action, while also deepening the city’s overall sense of community.

RESILIENCE VALUE:

Preparing for future disruption is a core aspect of building community resilience. To address gaps in the city’s response to the 2013 flood, the city is preparing for future uncertainty by building robust and flexible local capacity, inclusive plans and new opportunities for community collaboration.

Action 1.1 Make Resilience Accessible

Deploy a community driven, interactive “Mobile Resilience Lab.”

In partnership with BoCo Strong, the collaborative countywide resilience building organization, the City of Boulder will bring resilience and preparedness activities directly into neighborhoods and communities through a “Mobile Resilience Lab.” The lab will be a highly interactive space that accommodates programming as varied as developing your own bee-safe garden to creating personalized blueprints for individual resilience to building disaster “go kits.” Deploying a mobile lab recognizes that true resilience building occurs first and foremost at home and in your own neighborhood, with the people and places you know best. The lab will provide a fun and dynamic platform for building relationships around preparedness and will, literally, be a vehicle for the community to share challenges and solutions. By meeting people where they are, the city will deepen public ownership of resiliency and seek to address community concerns about the responsiveness and transparency of government.

Action 1.2 Activate Volunteerism

Develop a volunteer community preparedness program.

A key to effective and successful disaster response is community and individual preparedness. Boulder’s formal emergency response capabilities are well-resourced and effective; however, local neighborhoods and communities need to be better prepared and possess a deeper capacity to be first responders while formal systems gear up for relief operations. Developing a more robust and flexible capacity to respond to crisis when it occurs is a direct outcome of lessons learned from recent disasters.



In August 2015, Boulder was selected as one of 10 cities to host the inaugural class of Resilience AmeriCorps VISTA members. The program was created as a response to the recommendations made by President Barack Obama’s State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience. The AmeriCorps VISTAs will assist Boulder in developing and piloting a citizen corps disaster preparedness training initiative by partnering with 100RC network city, Wellington, New Zealand, and aligning these emerging efforts with deliberate ties to community volunteerism and civic ownership opportunities that already exist.

Action 1.3 Assess Economic Strength

Identify risks to future economic vitality.

Ensuring the continuing vitality of the local economy is an essential component of long-term community resilience. The City of Boulder will incorporate an analysis of the local business community’s vulnerability to disruptions in core infrastructure provision, workforce availability and financial services into an update to the Economic Sustainability Strategy. Boulder will also explore whether there are latent vulnerabilities to larger macro-economic trends that the city can plan for proactively. Cyclical swings in the economy are normal and are predictable stresses whose effects can be minimized through thoughtful preparation.

Learning with 100 Resilient Cities

RESILIENCY ADVISORS

During the 2013 flood, even before the rain had stopped falling, thousands of volunteers were out helping neighbors, friends and strangers protect their homes and clean up debris. This outpouring of assistance reflected the best of Boulder's spirit and was a vital unplanned resource during the flood recovery. However, without the coordination to direct, equip and support these activities, volunteers can place themselves in danger and unintentionally hamper or overwhelm formal responses. Recognizing the need to create the capacity to welcome this energetic community support, the City of Boulder, the newly-formed Boulder County Volunteers Active in Disaster (VOAD) and 100 Resilient Cities Platform Partner, Resiliency Advisors, partnered to deliver the "Leading and Managing Community Volunteers in Disaster" workshop. During this best practices workshop to manage and marshal spontaneous volunteerism, participants engaged in sharing lessons learned, assessing future risks and resourcing mapping, as well as applying proven disaster management concepts to manage spontaneous volunteers. Post session, the group was provided an after action report that outlined next steps including a strong focus on Volunteer Reception Center training. The session was delivered by Lisa Orloff, president of Resiliency Advisors.



Learning with 100 Resilient Cities

PARTNERSHIP WITH WELLINGTON, NEW ZEALAND

Wellington, New Zealand is a 100 Resilient Cities network city that is recognized globally for its community disaster preparedness program. Wellington's approach integrates volunteerism, community-based trainings and a network of district disaster hubs to create a multi-tiered preparedness and response capability across their region. Wellington's success rests largely on the accessibility of training courses to a wide range of community members, as well as an innovative approach to regularly scheduled activities that create new opportunities for community interaction with the program. In May 2016, experts from Wellington, NZ will visit with city staff and community organizations in a weeklong workshop to design and implement activities that will prepare the community for the next disaster.



Action 1.4 Prepare Businesses

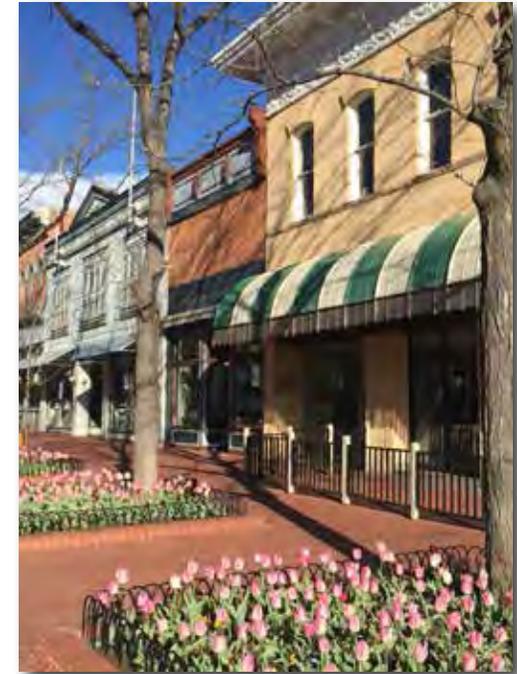
Facilitate the use of continuity planning strategies with local businesses.

The sooner local businesses return to normal operations after a disaster, the faster the surrounding neighborhoods and city recover. We will collaborate with public and private institutions and organizations to identify best practices; facilitate the use of continuity plan templates and other resources; develop policies and procedures for improved situational awareness; coordinate between business support organizations; and communicate with businesses after a disaster. Ultimately it is in each organization's interest to proactively plan for uncertainty and disruption, but our community at large has a clear stake in helping all businesses weather the inevitable crises and bounce back faster and better.

Action 1.5 Connect for Rapid Recovery

Develop rapid post-disaster impact assessment capacity in partnership with the local business community.

The ability for businesses to rapidly access resources and financial assistance after a disaster is essential for the successful return to operations. Each day that businesses remains idle represents lost revenue, wages and taxes, eliminating vital infusions of financial capital just when a community needs it most. Boulder will partner with local businesses and associations to develop the necessary capacity, relationships and systems to quickly and efficiently collect impact information and data, access recovery funds and return businesses to operation after a disaster with minimal disruption. The city will also explore the creation of a Business Disaster Assistance Center that would become operational when needed. By developing a user-friendly process to address gaps in our response to the 2013 flood, we are preparing for future uncertainty.



Action 1.6 Foster Artistic Engagement

Engage the creative power of the arts to convey and involve people in complex risk and resilience themes.

Mobilizing action at a broad scale also requires varied ways of communicating complex topics so that they are relatable and actionable to the diverse residents that make up our community. Breaking from the traditional model of community engagement, we will invest in the creative talent of our visual artists, filmmakers, poets, theatre-makers, dancers and musicians to broaden our vision, discussion and experience of risk and resilience. By enhancing our collective thinking about resilience and exploring creative ways to communicate it, we will broaden the circle of community ownership, action and perspective. This effort will lead to creative insights and solutions from community members who might not otherwise participate.



Uniquely Boulder

YOUTH “SHINE” IN PERFORMANCE FOR RESILIENCE

Performance can be a dynamic tool for including youth participation in authoring our city’s plan for resilience. Shine is a musical performance that weaves climate science and artist expression into a funny and powerful story that spans 300 million years of geological time to convey how humanity and climate are interrelated. Performed at NCAR in Boulder in June 2015 as a collaboration between NCAR scientists, Beth Osnes at CU and Boulder’s youth, rehearsing each part of the musical led participants through different aspects of climate science, from dancing the various phases of photosynthesis to creating flags to representing the ways in which our city utilizes fossil fuels. This show has gone on to engage youth in other 100 Resilient Cities, including New York City and London, with Durban, South Africa and New Orleans to come.



INVEST IN THE FUTURE

Prioritize city investments to promote community resilience and proactively address future risks.

The capital budgeting process is the critical intersection between public policy and program implementation. Given limited resources, city officials must choose among competing priorities. These choices are often significantly determined by the criteria that are used to prioritize and rank public expenditures. Given the relatively recent emergence of resilience capacity-building as a public policy priority, there are few formal evaluation criteria built into the capital planning process that provide guidance on how to weigh the costs of proposed actions against potential benefits. This is essential to enable systematic consideration of proposed resilience actions and measures against other priorities.

Currently, for example, city investments and budgets do not specifically consider likely climate impact on city systems, nor are there mechanisms for internalizing the cost implications of the city’s commitment to a zero-carbon energy policy. It is important to have valuation mechanisms that evaluate the potential cost of carbon and the potential for future constraints on carbon emissions. Implementing climate risk screening mechanisms in the Capital Improvement Program or internalizing the carbon cost of projects will reprioritize budgets and drive new conversations about risk and resilience tradeoffs across the entire city organization.



STRATEGY TWO



PARTNER AND INNOVATE

Capitalize on the collective problem solving and creativity of Boulder's community by leveraging advances in data, research and observations to address emerging resilience challenges.





ACTIONS:

2.1 Put Science in the Hands of the Community

Create a “citizen science” program to foster the co-creation of knowledge.

2.2 Ensure Food Security

Design and conduct a local food security assessment.

2.3 Make Data Accessible to All

Spur creative representation of data through investments in artistic visualization and knowledge display.

2.4 Crowd Source Solutions

Drive the creative use of community data through competitive challenges and hackathons.

PURPOSE:

In order to make the most informed decisions about the future, Boulder needs a better understanding of the changes taking place around us. The city must develop the ability to anticipate changes to proactively address emerging challenges. Rapid evolutions in remote sensing, data architecture and mobile technology now allow us to design integrated monitoring and observations systems to create new insights into the world and community. By using the power of people and place, tapping into vast research and educational resources, the city will develop the data, observation systems and partnerships necessary to understand and predict forces of change across social, economic and environmental factors, as well as create new opportunities for engagement from a wide range of stakeholders.

RESILIENCE VALUE:

The complex issues which the Boulder community faces lack easy or obvious solutions. By developing mechanisms and partnerships for inclusive and collective problem-solving, Boulder can elicit novel and innovative answers from a broad pool of expertise, creativity and talent.

Action 2.1 Put Science in the Hands of the Community

Create a “citizen science” program to foster the co-creation of knowledge.

Citizen science can take many forms, but as technologies have advanced over the last decade, each member of the community can now serve as independent, mobile data-collecting participants. To harness this potential, the city will develop the information architecture necessary to support community-driven mobile science applications and translate that data into information and metrics to inform city decision-making. The aggregation of information from so many data points can create new insights into changes in the community, collective behavior or climate, as examples. By relying on community members to play a role in the creation of data and shared knowledge, Boulder will foster co-ownership in understanding the factors of change affecting us all. The underlying architecture will be openly available to the public to creatively develop applications to support data collection from sources as diverse as the Boulder Valley School District to Boulder’s active and enthusiastic outdoor community.

Action 2.2 Ensure Food Security

Design and conduct a local food security assessment.

Boulder’s passion for safe, local and ethical food has made the community a global hub for natural foods. As a leader in the natural and organic industry, Boulder has world-class, locally sourced restaurants and has made revolutionary contributions to natural food packaging and labeling. However, Boulder needs a better understanding of what role locally produced food can play in buffering the community from a disruption in national or global food or transportation systems. The city will conduct an entirely new food security assessment, deviating from traditional scales of analysis and definitions of “security.” An assessment of this type will require a broad range of partnerships from the business, agricultural, transportation and water sectors, among others, to understand how changes in the complex dynamics of the food production, delivery and consumption system can both be impacted by disruption, but also meaningfully mitigated by local action.



Action 2.3 Make Data Accessible to All

Spur creative representation of data through artistic visualization and knowledge display.

New capabilities created by the integration of enhanced computational power, big data and visual representation systems provide the opportunity to bring many previously complex and abstract concepts into stunning visual relief for the first time. The city will convene some of the world's great artists and media professionals to work with scientists, librarians and city officials to develop and refine some of these data visualization systems to create a compelling community education and communication approach. Boulder will work with partners to put the vast amount of collected scientific and citizen science data in the hands of artists and hackers, giving them the tools they need to interpret and represent the data in a clear, resonant message. Through these creative partnerships, the city will unleash untapped knowledge to inform decisions and mobilize collective action.



Action 2.4 **Crowd Source Solutions**

Drive the creative use of community data through competitive challenges and hackathons.

As part of an ongoing effort to democratize the city's data through community dashboarding and a more accessible open-data portal, Boulder will create data and technology challenges to encourage the use of city and community data. These challenges are dynamic competitions intended to focus the creative and entrepreneurial talent of the city to help identify and solve collective problems. Similarly, the city will partner with the local coding and tech community to host hackathons—events that focus intense programming attention toward a collaborative solution to a single, discrete issue. Taken together, this approach taps into two powerful behavioral motivators—competition and collaboration—to find solutions to particularly complex resilience issues.

Uniquely Boulder

UNDERSTANDING RISK: BOULDER

In October 2015, the City of Boulder, in partnership with Ushahidi, a 100 Resilient Cities Platform Partner, the University of Colorado, the World Bank's Global Facility for Disaster Risk Reduction (GFDRR) and several local technology companies, hosted a two-day event called Understanding Risk Boulder (URBoulder). URBoulder convened the talent and expertise of the region's communities, scientists, technologists and government to develop a shared understanding of the challenges faced in building long-term resilience to natural hazards; understand the impacts of climate change; and develop innovative solutions to meet them.

In conjunction with UR Boulder, Ushahidi hosted a Tech Challenge that sought to use open-source technology to improve resilience in Boulder and strengthen community engagement. The UR Boulder Tech Challenge was designed to identify technological gaps in the resilience landscape of Boulder and provide seed funding for innovative solutions to them. The challenge was funded by The Rockefeller Foundation.



“With an estimated 2.8 million visitor nights in 2013, the tourism industry contributed to an estimated \$420 million total economic impact on the City of Boulder. The industry is supported by the area’s scenic beauty and recreational opportunities, variety of entertainment and attractions, support for arts and culture, and broad range of dining, shopping and lodging options.”

- BOULDER ECONOMIC COUNCIL





“We are working on a wide array of policies, programs and projects to reduce emissions and realize other important community outcomes. We know that long-term success will require better feedback loops, honest assessment, persistence and collective action.”

- City of Boulder's 2016
Climate Commitment Framework



ENVISION THE FUTURE OF ENERGY

Develop a sustainable, secure and equitable energy system.

Extreme weather events have created a call to action for deploying more resilient power systems. Communities face a growing number of stresses that pose risks to their energy systems and economies. These include aging infrastructure in need of costly maintenance upgrades and severe weather events. Energy efficiency and local power generation are strategies that enhance the resilience of energy systems and the communities they serve.

Boulder is committed to transitioning to a no-carbon energy system as part of its climate action plan. This wholesale transformation will fundamentally alter the landscape of energy production, storage, distribution and use in ways that are only now being fully explored. With this transition comes an additional opportunity—a chance to apply core resilience principles, such as flexibility, redundancy and robustness, as additional drivers of the system design. Many of the renewable energy sources we rely on as part of our strategies for reducing carbon are well suited to serve as the backbone for a resilient energy system.

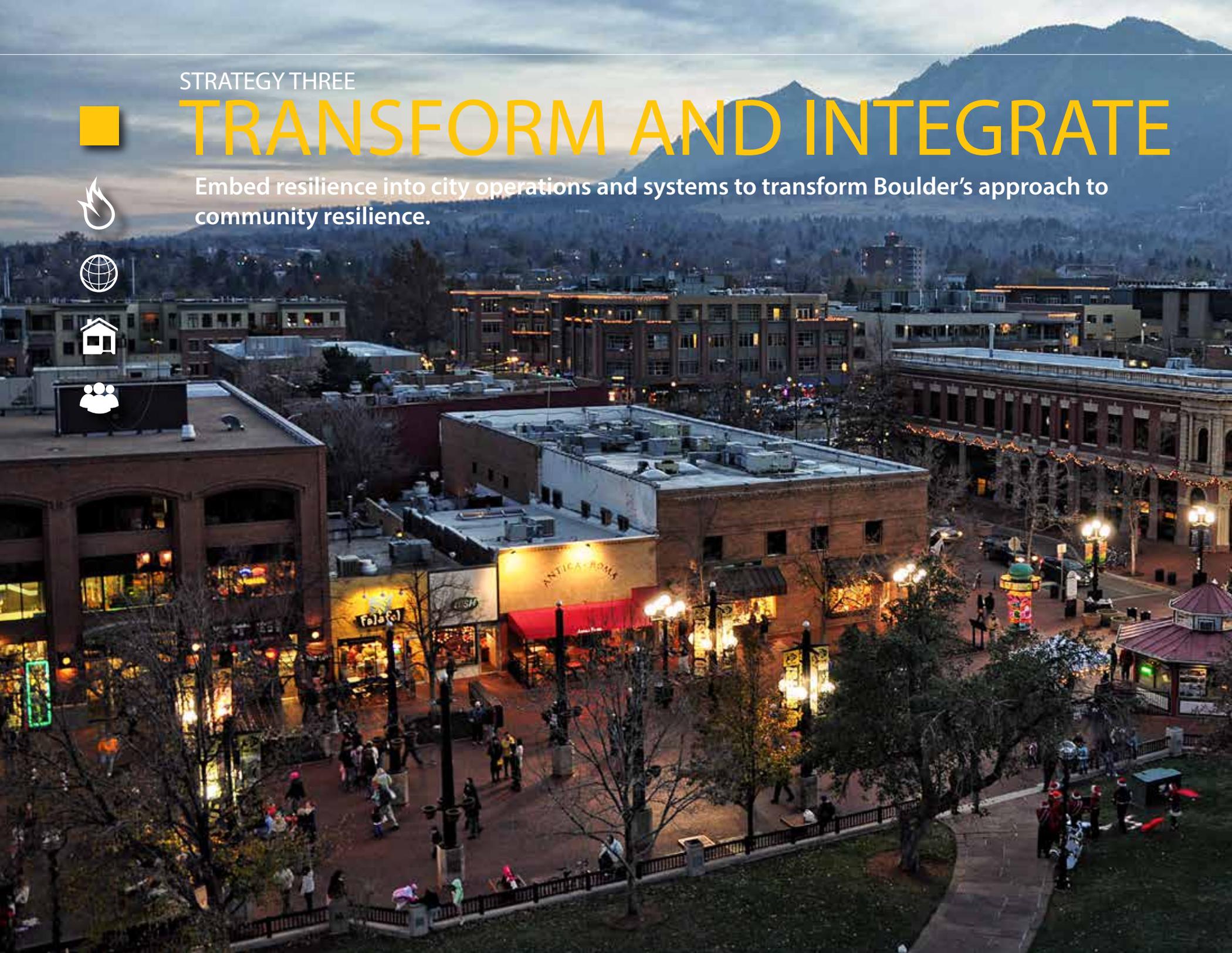
The city aims to improve resiliency and address economic and environmental concerns by prioritizing a local, clean energy system that combines Boulder-based generation, integrated storage and other distributed energy resources, increasing clean energy opportunities to low-income communities and protecting vulnerable populations by serving critical power needs. It will require careful consideration and extensive design, partnerships that span the entire community, and, ultimately, a collective leap of faith and the willingness to embrace change, even when the outcome is not yet entirely clear.



STRATEGY THREE

■ TRANSFORM AND INTEGRATE

Embed resilience into city operations and systems to transform Boulder's approach to community resilience.





ACTIONS:

3.1 Create Community Resilience Centers

Ensure the continuity of all critical life-safety services at a network of community resilience centers.

3.2 Foster Climate Readiness

Build climate preparedness capacity across the city organization.

3.3 Advance Sustainability with Resilience

Integrate resilience principles into Boulder's Sustainability Framework.

3.4 Embed Resilience in the Comprehensive Plan

Integrate resilience into the Boulder Valley Comprehensive Plan.

3.5 Manage Thriving Ecosystems

Develop an integrated urban ecosystem management plan.

PURPOSE:

The city's infrastructure, design and neighborhoods are driven by public investments and land use decisions. Choices made today will last for generations. These choices also must be considered on multiple scales and across issues and systems. Facing a future with so much uncertainty will ultimately require flexible and adaptive systems that do not lock the Boulder community into a single pathway.

RESILIENCE VALUE:

Embedding resilience into long-held sustainability values creates systemic change for both the city and the larger community that allows us to better address a wide range of climate, economic and social challenges.

Action 3.1 Create Community Resilience Centers

Ensure the continuity of all critical life-safety services at a network of community resilience centers.

Recent events have highlighted the extreme vulnerabilities and interdependencies of core life-safety infrastructure and utilities (e.g. energy, water and sanitation) and the need for their combined secure, continuous operation during crisis. Advance planning for large-scale, high-impact events is critical to ensuring that these incidents do not overwhelm either immediate response capabilities or the long-term well-being of highly vulnerable segments of Boulder's community. The city will design and implement a communitywide network of resilience centers that ensures continuity of critical community services, protection for high-risk populations and infrastructure, and an enhanced capacity to provide and maintain basic services at a neighborhood scale, and develop the capacity to 'island' critical infrastructure provision without jeopardizing core life-safety functions. These resilience centers will contain small-scale or compartmentalized infrastructure systems that can operate independent of the larger utility system to sustain a sheltering facility during wide-scale disruption.

Boulder will also create place-based platforms for assembly, cooperation and education. By basing and delivering community outreach, activities and other functions (e.g., mobile farmers markets, food trucks, fix it clinics, recycling support, etc.) from these locations, these centers can be integrated into the new focus on neighborhood-based engagement during good times as well as crisis. The likely integration of significant renewable energy assets at these locations can also provide foundational elements for a distributed energy system that could include neighborhood-based load balancing through on-site battery storage, neighborhood microgrid development or other emerging decentralized energy utility models.

By thoughtfully investing in public safety infrastructure as a response to lessons learned in previous events, the city can weave in multiple additional community benefits such as neighborhood development and energy transition.

Action 3.2 Foster Climate Readiness

Build climate preparedness capacity across the city organization.

Most of the city's climate risk is tied to larger scale changes in the global and regional climate, and the community's understanding of those impacts at the local scale is inconsistent. This is in part because of the complexities of Boulder's local topography, but also because the city currently uses a wide variety of models, methods and analysis to characterize potential "futures." In order to efficiently and effectively plan for Boulder's future climate impacts, the city will systematize the use of climate information across all departments and city functions in a way that is scientifically robust yet retains appropriate flexibility.



CLIMATE LEADERS PROGRAM

The City of Boulder will pilot a program to train department leaders, from Human Resources and Finance to Utilities and Parks and Recreation, in the science of climate change so that everyday decisions across the organization can be informed by a consistent foundation of knowledge and understanding.

SCENARIO PLANNING

We must prepare to accommodate a much wider range of possible future conditions than in the past. Part of the solution is to design a scenario-based process for planning that allows us to test programs, actions and investments against different plausible potential future conditions and prioritize actions that represent "no or low regrets" strategies. "No or low regrets" strategies are those that are sound investments and adaptations regardless of the severity of future change.

By investing in the core capacity of city staff to understand climate science and impacts, and by developing flexible mechanisms to plan for a range of potential climate impacts, Boulder is creating the adaptive governance structures necessary to address the wide-ranging effects that climate change will have on all functions of government.

Action 3.3 Advance Sustainability with Resilience

Integrate resilience principles into Boulder's Sustainability Framework.

Boulder's Sustainability Framework is the unifying mechanism that connects all of the city's policies and programs, and therefore represents the best point for integrating the resilience principles that will have the greatest impact across all of Boulder's departments and functions. The Sustainability Framework has been used successfully in practice for several years, informing the city's policies, budget prioritization and program design. The Boulder community has a deeply embedded sense of sustainability as a core value system, manifested through the well-established framework, among many other community-driven initiatives. Resilience, however, is a relatively new and emerging concept being systematically applied as a practice in cities for the first time. By thoughtfully integrating resilience into a familiar and operational framework, resilience activity will be placed in a relatable and immediately actionable context.



The city is continuously working to provide service excellence for an inspired future and moving towards the vision of One City, One Boulder.

Action 3.4 Embed Resilience in the Comprehensive Plan

Integrate resilience into the Boulder Valley Comprehensive Plan.

The Boulder Valley Comprehensive Plan (BVCP) serves as the city's highest level policy document, articulating the community's vision and core values. The BVCP contains sustainability principles and policies and chapters that convey discrete topics such as land use, transportation, housing and economy. By integrating new resilience policies and strategies into the BVCP, the plan can address key elements of a healthy, stable and adaptive community, reflect and address Boulder's highest risks so the community can be adaptive, underscore connectivity between systems and vulnerabilities, and illustrate ways that the BVCP can address Boulder's resilience, not only in times of disruption and crisis, but also on a day-to-day basis and over the long term. Integrating resilience into the BVCP will leverage interdisciplinary expertise and generate strategies that are responsive to Boulder's challenges, as well as align activities and priorities across city departments.



Action 3.5 Manage Thriving Ecosystems

Develop an integrated urban ecosystem management plan.

By creating an integrated ecosystem management plan, Boulder will support its complex local ecosystem and plan for the systemic stresses and changes anticipated with climate change impacts. As part of Boulder's long history of progressive planning, the city actively manages many aspects of the urban ecosystem, including monitoring wildlife-human interactions, maintaining a healthy forest canopy and conducting regular riparian renewal and restoration efforts. The success of these programs contributes to the city's rich quality of life and sense of community. These programs also add to the ongoing success of Boulder's signature planning achievement—the vast greenbelt of open space that encircles the city. Building on these efforts, Boulder will develop an integrated strategy that aims to knit disparate efforts to create a single ecosystem management plan.

Learning with 100 Resilient Cities

TRIMBLE AND DIGITALGLOBE

Boulder's urban forest faces unique challenges due to both the higher stresses already caused by geographic conditions and the onset of diseases and exotic pests such as the recently arrived Emerald Ash Borer (EAB). Given these factors and the need to develop a more robust set of urban forest management tools, the City of Boulder partnered with 100RC Platform Partners Trimble and DigitalGlobe to map the urban tree canopy.

DigitalGlobe was able to provide Boulder with the high-resolution multi-spectral satellite imagery needed to extract, map, and measure the trees throughout the city. Trimble presented an initial citywide urban tree canopy analysis, as well as provided free training to city staff on the use of the eCognition software necessary to map changes to the urban tree canopy over time.

The result provided the city with a baseline to prioritize future management plans and track green infrastructure changes whether through loss due to EAB infestation or gain through green infrastructure improvements. The urban tree canopy analysis will be published in Boulder's Open Data Catalog. In addition to working with Boulder, Trimble and DigitalGlobe are assessing how to replicate and offer similar outcomes to other municipalities based on the work done and lessons learned with Boulder.

The 18-month "Tree Debris to Opportunity" project (see pg 42) aims to transform Emerald Ash Borer infested wood debris into items area residents can use. In partnership with the Bridge House Ready to Work program, participants will receive expert training to turn milled wood into practical items and artistic expressions at the new Building 61 Makerspace at the Boulder Main Library.





Uniquely Boulder

TRAINING THE HOMELESS TO TURN “TREE DEBRIS TO OPPORTUNITY”

The City of Boulder has won a prestigious Knight Cities Challenge grant to develop an innovative program that will train homeless community members to turn trees impacted by Emerald Ash Borer into beautiful products. This 18-month project addresses a variety of community challenges, including Emerald Ash Borer infestation and homelessness. The program, called Tree Debris to Opportunity, was one of 37 recipients chosen by the Knight Cities Challenge for support and funding. The city’s application was submitted in partnership with the Bridge House and Library Maker Space.

The goal is to engage the Boulder community in repurposing Ash tree debris to usable products to be sold back to the community. The program will hire participants of the Bridge House Ready to Work program. These individuals will complete a multi-month apprenticeship at the Maker Space, located in the Main Library, to learn how to become woodworkers. The group will make products that will then be sold at the Farmers Market and other locations. Public classes will also be offered for free. The Bridge House participants will help teach and facilitate the classes, encouraging collaboration between all members of the community. The project is expected to begin in mid- to late summer and is made possible through the generous support of the Knight Cities Challenge. The grant amount totals \$200,000.

FRONTIER

CREATE ADAPTIVE SOCIAL SERVICES

Reduce homelessness by designing an adaptive and predictive social service network.

Human Services provides vital support for large segments of the Boulder community through grants to community agencies, direct services and community capacity-building partnerships. These programs provide a range of community services for vulnerable residents—from access to mental and physical health, child care and family support to emergency services. The 2016 revision to the Human Services Strategy seeks to shift how Human Services conducts business, away from primarily tracking program-based success metrics, such as the number of shelter beds filled or meals served, to a predictive and adaptive service provision based on achieving social outcomes. This shift will allow us to identify “tipping points” in the social safety net that cause individuals and families to move from relative stability into homelessness. It will allow us to monitor for those changes and preemptively adjust resources to avoid them.

Homelessness represents a profound threshold for the most vulnerable in our society and once crossed, individuals and families encounter significantly more social, economic and health barriers. Reducing homelessness not only brings obvious and important benefits for the individuals and families involved, but ultimately saves substantial resources in the social safety net that can be redirected toward additional positive investments. Boulder is a prosperous and innovative city, and it has pioneered many important cultural and environmental issues. Thus, developing new ways to assist residents with the greatest needs, so that no one falls into homelessness, is a resilience frontier.



BOLDERBOULDER



A RUNNING START

The actions listed to the right showcase many of the resilience activities the city is currently undertaking across the community. Boulder has taken inspiration and learned from its successes in the design of the new actions proposed earlier in this strategy. However, the list is not comprehensive – Boulder is doing much more. Let us know what you, your organization or company is already doing to build community resilience at www.resilientboulder.com. Add to the ever-growing list of resilience building projects, programs and activities!

2016-2017 Resilience Actions	Resilience Challenge Area	Boulder's Running Start
Strategy 1: CONNECT AND PREPARE Prepare all segments of the community for uncertainty and disruption by encouraging community preparedness, creating a culture of risk awareness, and personalizing resilience.		
1.1 Make Resilience Accessible: Deploy a community driven, interactive "Mobile Resilience Lab."		NEW!
1.2 Activate Volunteerism: Develop a volunteer community preparedness training program.		City of Boulder Fire Rescue's Citizen's Fire Academy
1.3 Assess Economic Strength: Identify risks to future economic vitality.		City of Boulder's Economic Sustainability Strategy
1.4 Prepare Businesses: Incentivize the use of continuity planning strategies with local businesses.		Boulder Office of Emergency Management
1.5 Connect for Rapid Recovery: Develop rapid post-disaster impact assessment capacity in partnership with the local business community.		NEW!
1.6 Foster Artistic Engagement: Engage the creative power of the arts to convey and involve people in complex risk and resilience themes.		Boulder's Community Cultural Plan
FRONTIER 1: Invest in the Future: Prioritize city investments to promote community resilience and proactively address future risks.		City of Boulder Capital Improvements Program
Strategy 2: PARTNER AND INNOVATE Capitalize on the collective problem solving and creativity of Boulder's community by leveraging advances in data, research and observations to address emerging resilience challenges.		
2.1 Put Science in the Hands of the Community: Create a "citizen science" program to foster the co-creation of knowledge.		NEW!
2.2 Ensure Food Security: Design and conduct a local food security assessment.		City of Boulder's Local Foods Initiative
2.3 Make Data Accessible to All: Spur creative representation of data through investments in artistic visualization and knowledge display.		Bold Measures, Boulder's Community Dashboard (Coming Soon!)
2.4 Crowd Source Solutions: Drive the creative use of community data through competitive challenges and hackathons.		Understanding Risk Boulder
FRONTIER 2: Envision the Future of Energy: Develop a sustainable, secure, and equitable energy system.		City of Boulder's Energy Future
Strategy 3: TRANSFORM AND INTEGRATE Embed resilience into city operations and systems to transform Boulder's approach to community resilience.		
3.1 Create Community Resilience Centers: Ensure the continuity of all critical life-safety services at a network of community resilience centers.		City of Boulder's Climate Commitment
3.2 Foster Climate Readiness: Build climate preparedness capacity across the city organization.		Colorado's Water Plan - Chapter 6, Water Supply Management for the Future
3.3 Advance Sustainability with Resilience: Integrate resilience principles into Boulder's Sustainability Framework.		Boulder's Sustainability Framework
3.4 Embed Resilience in the Comprehensive Plan: Integrate resilience into the Boulder Valley Comprehensive Plan (BVCP).		Our Legacy. Our Future. BVCP 2015 Update
3.5 Manage Thriving Ecosystems: Develop an integrated urban ecosystem management plan.		City of Boulder's Urban Forest Strategic Plan
FRONTIER 3: Create Adaptive Social Services: Reduce homelessness by designing an adaptive and predictive social service network.		City of Boulder's Human Services Strategy



5
CREDITS

ACKNOWLEDGMENTS

Resilient Boulder would like to thank the many partners that contributed to Boulder's Resilience Strategy. Most importantly, we thank the thousands of community members who participated in workshops, surveys and conversations and provided boundless energy, creativity and insights during the strategy process.

The city would like to extend a very special thanks to the tremendous support provided by the team at 100 Resilient Cities, including Michael Berkowitz, Bryna Lipper, Andrew Salkin, Amy Armstrong, Leah Flax, Corinne LeTourneau, Katherine Michonski, Paul Nelson, David Schreiner, Roya Shariat, Max Young and the rest of the team. The success of this effort and partnership, however, would not have been possible without the immeasurable contributions of Katya Sienkiewicz.

Finally, we offer our sincere thanks and appreciation to our 100RC platform and strategy partners listed below.

STRATEGY PARTNER:

HR&A Advisors



100RC PLATFORM PARTNERS:

AGU Thriving Earth Exchange

Climate CoLab

DigitalGlobe

Earth Economics

Resiliency Advisors LLC

Trimble

Ushahidi

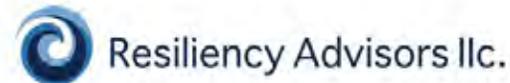


PHOTO CREDITS:

Pg. 03, Full Page Nate Paradiso, Open Space & Mountain Parks Photo Contest
Pg. 10, Top Left Art Source International
Pg. 10, Top Right Art Source International
Pg. 10, Middle Left The Sink
Pg. 11, Full Page Earth Observatory, NASA

Pg. 15, Full Page University of Colorado Sports Video & Athletics
Pg. 31, Middle Walk My Path in Class 18- AmeriCorps NCCC
Pg. 38, Bottom UR Boulder
Pg. 45, Full Page Austin Baily, Open Space & Mountain Parks Photo Contest



BOULDER



MEMORANDUM

TO: Open Space Board of Trustees

FROM: Tracy Winfree, Director, Open Space and Mountain Parks
Abbie Poniatowski, Central Services Division Manager
Lauren Kilcoyne, Finance Manager

DATE: May 9, 2016

SUBJECT: *Draft 2017-2022 Capital Improvement Program (CIP)*

Executive Summary

The purpose of this discussion item is to share the Open Space and Mountain Parks (OSMP) Department draft 2017-2022 Capital Improvement Program (CIP). The Open Space Board of Trustees (OSBT) will have an opportunity to ask questions to ensure the OSBT is prepared to review, approve and recommend OSMP's 2017-2022 Capital Improvement Program (CIP), including Lottery Fund funding, for Planning Board and City Council review and approval.

This series of agenda items is three-fold. At the April 13 business meeting, staff provided a briefing, information sharing and Q&A on the draft 2017 Work Plan and Budget. In May, staff is presenting a draft CIP Budget for discussion. In June, there will be a public hearing for the community to comment on the proposed 2017-2022 CIP. After considering public comment, the OSBT will make a recommendation. The public will also have an opportunity to comment during the Planning Board's CIP review in July and City Council's discussions and review of the 2017 recommended budget during future public hearings later this fall. The staff also has a goal of presenting the operating budget earlier in the budget process relative to previous years. Last year the Board made its recommendation at the September meeting and staff anticipates presenting the proposed operating budget for recommendation by the July or August meeting.

Background

Staff is providing a draft 2017 CIP (Attachment A) for OSBT's review and consideration. In order to plan and prioritize capital investments, staff applies specific guiding principles based on the city's [CIP Guiding Principles](#) (page 18, figure 1-1), the department's priority projects and budget guiding principles (below). This framework is utilized to determine and plan CIP projects and make budget decisions that are sustainable over time.

Department Priority Projects for 2017

- 1. Complete Flood Recovery of Trails and Habitat** that are FEMA reimbursable and continue work on flood projects that are not reimbursable (includes county coordination);

2. **Visitor Master Plan Update** to be Recast as **Open Space Master Plan or OS(MP)²** – Continue plan, completing it in 2019 - establishes policy guidance, goals, objectives, priorities and measures of success across services and programs, and addresses overarching issues such as carrying capacity, night-time and temporal use and climate change mitigation and adaptation;
3. **Implement Top Priorities of West TSA, North TSA, Agricultural Resource Management Plan, and reduce facility deficiencies and maintenance backlogs. Implement plans through the formation of cross-departmental implementation teams convened for each plan;**
4. **Continue to Implement Grassland Ecosystem Management Plan and Forest Ecosystem Management Plan (FEMP)**, giving special attention/guidance to elements that need updating or refreshing, particularly the FEMP. The OS(MP)² may be a good opportunity for such guidance;
5. **Continue to Improve the Visitor Experience** – Implement Community Ranger model; continue the development of the Community Connections division; focus on community and department relationships and interdepartmental coordination. Follow through on initiatives such as recycling/dog waste composting at trailheads and monitoring and reporting results on Voice & Sight program;
6. **Develop Regional Trails** through strategic property acquisition, coordination with other agencies, and other avenues as needed (e.g., Eldorado to Walker Ranch, Joder and the Boulder Creek Path extension);
7. **Focus on Continuous Improvement within the OSMP Department** - Continue to assess and develop best practices related to OSMP’s scientific approach, data stewardship, recreation planning and design, work plan and budget management, staff training and development, staff work space, equipment and facilities, communication and coordination internally and externally.

Budget Guiding Principles

Open Space and Mountain Parks is committed to fiscal responsibility and sustainability.

- Judiciously generating and investing funds.
- Creating, optimizing and maintaining a budget that manages debt and plans for near- and long-term futures.
- Maintaining financial transparency.

These principles will guide the development and prioritization of the OSMP budget and work plan:

SAFETY FIRST

- OSMP will first address essential safety issues for visitors and staff.

PLAY BY THE RULES

- Comply with all (internal, local, state and federal) laws, regulations, policies, etc.

TAKE CARE OF WHAT WE HAVE

- As top priority, restore and maintain valuable ecological systems, agricultural operations, trails and trailheads.
- As additions are made to the system, address ongoing operation and maintenance needs.
- Continue to innovate and advance efficiency in the restoration, protection, operation, investments in and maintenance of the OSMP system. Specifically, efficiencies will be sought through:
 - Investments in regular maintenance (taking care of what we have to extend life cycle), and
 - Reductions in resource waste and use.

STICK TO THE PLAN

- Actions committed to in plans or agreements should be included in either short-, mid- or long- term budgets and work plans so staff can answer the question: *“When do you plan to take this action on this project?”*
- Strategically enhance visitor amenities, ecological systems, and agricultural operations, prioritizing projects that will best achieve resource and master plan objectives.

LEVERAGE OTHER FUNDING

- Leverage external funds, especially long-term funding, and capacity extending the ability of local dollars to implement OSMP plans.
- Continue to involve community members as volunteers to advance the departmental mission and management objectives.
- Work with partner agencies to accomplish shared goals.
- Take no actions which would compromise the city’s bond rating or ability to leverage debt.

ADAPT AND LEARN

- Advance research and monitoring to increase the likelihood of success and better integrate principles of sustainability and resilience.

As staff plans for 2017, OSMP recognizes the need to remain flexible considering the community and City Council’s interests, as well as a department that is experiencing organizational change with the implementation of a new structure and inclusion of new talent on the OSMP team. An example of maintaining flexibility includes the strong message from council at its January retreat to give the community a “breather” from significant public process on Open Space planning initiatives. Following the acceptance of the North TSA and the Agricultural Resources Management Plan, the staff will bring a recommended scope and

schedule to the OSBT for consideration, likely in the first half of 2017. The community process “breather” will be advantageous to updating the Visitor Master Plan/OSMP Master Plan since it allows time for data gathering, surveying and inventory work, which will inform the issues and scoping of the planning process.

Additionally, staff is in the midst of multiple analyses to understand gaps and needs related to: space and facilities for department-wide operations and management; system assets (trails, habitat, buildings, water infrastructure); and resources for visitor services. Findings and recommendations from these efforts will be funded in future years of the department’s CIP.

Budget and Funding Status/Citywide Economic Forecast

Ninety percent of the OSMP Department budget is funded from sales and use tax revenues. The City of Boulder’s 2015 sales and use revenue collections are lower than projected. An Information Item to City Council on April 19, [Fiscal Update - Caution Flags Flying](#), (pages 717-721) details projected economic trends.

Revenue projections will be lower than previously projected and adjusted for the out years accordingly. Furthermore, the city’s Chief Financial Officer, Bob Eichem, is recommending that the 2017 Budget be more conservative overall.

As part of the annual budget process, the City’s Budget Office provides projections for taxes and conservation trust fund allocations at the end of April for next year’s (2017) budget development. However, it is unlikely that the final projections will be available as scheduled; therefore, OSMP staff is preparing a draft CIP budget that is relatively conservative. In addition, the department is not projecting FEMA reimbursement in its cash flow at this time and will recognize those revenues as they are received. Since OSMP staff is receiving revenue projections later than usual, the final numbers in the proposed 2017-2022 CIP could be adjusted.

Please note that the department continues to be in a state of transition. Staff is striving to establish a reasonable and responsive direction in the proposed 2017–2022 CIP. As leadership and the organization transitions, there continues to be opportunity to make adjustments in the out years of the CIP while the OSMP fund remains fiscally sound.

Proposed/Recommended 2017 CIP Projects

The draft CIP strives to complete flood recovery, allow for implementation of various ecosystem and area plan implementation, and address core services across the department. There are a number of recommended refinements in the proposed CIP. For example, in service of the guiding principle “take care of what we have” there are changes in OSMP’s Capital Maintenance category, such as anticipating the outcome of the buildings/structures assessment in Facilities Maintenance; a new budget item to invest in proactive conservation projects addressing ecosystem preservation and habitat restoration; and annualizing major trail maintenance.

Past budgeting practices in Land and Asset Acquisition included a portion of property acquisition funds to stabilize newly acquired property. For improved transparency, the budget

proposes breaking out new property stabilization as its own line item rather than embedding it in new property acquisition. For planning purposes, the OSBT will notice a reduction in property acquisition funding beginning in 2020, which ties to retiring sales taxes. However, please note that the department is carrying over \$13M in previously approved acquisition funds and has the authority and capacity to issue up to an additional \$23M in property acquisition bonds.

In addition, OSBT will see updated estimates for implementing Open Space Campus relocation / modification; North TSA implementation; the Phase II Confluence Area Restoration (following Phase I design) and including the Amphitheater Bridge project as flood related project, with a goal of achieving additional FEMA reimbursement.

The proposed 2017 CIP projects, categorized by citywide capital project types, are as follows:

Project Category	Project	Description*	Proposed 2017 Funding
<p>Capital Enhancement</p> <ul style="list-style-type: none"> • Construction resulting in the expansion or significant improvement of an existing facility or asset • Projects have a discrete start and end date • Projects are location specific 	Confluence Area Restoration - Phase II	Restore riparian habitat in the Boulder Creek and South Boulder Creek confluence area	\$300,000
	Farm Site Improvements	Improvements to existing agricultural buildings and infrastructure, used for agricultural production, hay and equipment storage, livestock shelters and grain storage	\$60,000
	Flood Eng. Trails – Skunk/Mesa Trail Crossing and Restoration	Flood recovery project within the “Flood Eng. Trails” CIP that addresses recommendations of the WTSA	\$150,000
	Flood Trails – Amphitheatre Bridge	Flood recovery project within the “Flood Trails” CIP that incorporates the recommendations of the WTSA	\$305,000
	Innovations (e.g. Biomimicry)	Explore and encourage the use of different approaches to design and management of the OSMP system	\$75,000
	NTSA Implementation	Implementation of trail and conservation projects that were identified in the North Trail Study Area	\$400,000
	S. Boulder Creek at E. Boulder Ditch Headgate	Flood restoration project to improve existing ditch infrastructure while ensuring delivery of water rights and allowing fish passage	\$300,000
	Visitor Infrastructure Amenities - System Wide	Improve amenities, including bike racks, trash cans, and visitor center improvements	\$200,000

	W TSA Implementation	Implementation of trail and conservation projects that were identified in the West Trail Study Area	\$400,000
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Project Category	Project	Description*	Proposed 2017 Funding
Capital Maintenance <ul style="list-style-type: none"> • Projects result in the repair, replacement, or renovation of an existing asset • Projects may or may not have a discrete start and end date • Projects are location specific or programs that cover a geographic area 	Agricultural Facilities Projects	Repair, replacement or renovation of existing agricultural infrastructure, including fencing and agricultural irrigation items	\$110,000
	Cultural Resource/Facility Restoration	Improvement of the condition of historic structures, including but not limited to barns, houses, sheds, and shelters	\$110,000
	Ecological System Maintenance/ Restoration	Ecological system maintenance and restoration advancing resource conservation as directed by Grassland and Forest Management Plans, Trail Study Area Plans, Agricultural Plan and eventually the Open Space Master Plan	\$110,000
	Facilities Maintenance	Implement facilities assessment recommendations on priority projects, deferred maintenance, and other capital facilities projects	\$200,000
	Major Trail Maintenance	Trail Study Area Plans and the trails capacity study results will inform major trail maintenance investments	\$110,000

Project Category	Project	Description*	Proposed 2017 Funding
Capital Planning Studies <ul style="list-style-type: none"> • Project results in development of a study or plan which is intended to 	OSMP Master Plan Update	Recast the Visitor Master Plan update to develop an OSMP Master Plan, establishing policies and priorities that align the department with shared goals, measureable objectives and metrics to	\$300,000

identify, plan, or prepare for the construction or acquisition of capital assets or capital program • Projects have discrete start and end date		implement the Open Space Charter.	
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Project Category	Project	Description*	Proposed 2017 Funding
Land & Asset Acquisition • Project or program results in the acquisition of real property, such as land, mineral or water rights, or permanent easements • Projects may have discrete start and end dates, or may be programmatic • Projects or programs may be location specific or city-wide	OSMP Campus Relocation / Modification	Study and analysis to identify preferred alternatives that may require remodeling existing spaces and/or reconstruction of some facilities, and/or evaluating new space on currently owned or potentially acquired property	\$700,000
	Real Estate Acquisition	Acquisition of additional acres of open space, aligned with the OSMP acquisition plan area as approved by OSBT and the City Council	\$4.5M
	Mineral Rights Acquisition	Purchase underlying mineral interests from private property owners as they become available on the real estate market	\$100,000
	New Property Stabilization	Funds for new property stabilization/immediate improvements on OSMP Real Estate Acquisitions	\$200,000
	Water Rights Acquisition	Purchase additional water from private owners or others for use on Open Space and Mountain Parks for agricultural and environmental purposes	\$200,000

Questions for the Board

- What questions does the OSBT have regarding the department’s draft 2017 CIP project list?
- Does the OSBT support the recommended priorities for 2017 CIP projects?
- Does the OSBT have priorities or projects that are not included in the draft 2017-2022 CIP?

Operating and Capital Budget Development Processes

Key dates for the budget development processes are included below:

Milestone	Date
Citywide CIP Information Sharing Meeting	April 1
<i>OSBT Information Item (1st Touch)</i>	<i>April 13</i>
Budget Guidelines and Targets to Departments	April 18
1 st Draft CIP to Planning	April 29
Budget and Revenue Update to City Council	May 10
<i>OSBT Draft CIP Discussion Item (2nd Touch)</i>	<i>May 9*</i>
Proposed Operating and CIP Budget Submittals Due to CMO	May 31
<i>OSBT CIP Public Hearing, Discussion and Recommendation (3rd Touch)</i>	<i>June 15</i>
Executive Budget Meeting with OSMP	June 30
<i>OSBT Operating Budget Public Hearing, Discussion and Recommendation</i>	<i>July 13</i>
Planning Board CIP Hearing	July 28
City Council CIP Study Session	August 9
City Council Budget Study Session	September 13
City Council Budget Consideration (1 st & 2 nd Readings)	October 4 & 18

*OSBT Regular Meeting Date changed from May 11 to May 9

Attachment

A: Draft 2017-2022 CIP, Summary and Project Sheets

B: CIP Project Descriptions

ATTACHMENT A

Column1	Column2	Estimated Total Cost	2017 Recommended	2018 Projected	2019 Projected	2020 Projected	2021 Projected	2022 Projected	Unfunded Amount
OPEN SPACE & MOUNTAIN PARKS	Department Total	\$38,775,000	\$8,830,000	\$8,115,000	\$7,365,000	\$4,455,000	\$4,880,000	\$5,130,000	-
CIP - CAPITAL ENHANCEMENT	Subtotal	\$7,415,000	\$2,190,000	\$1,635,000	\$1,010,000	\$910,000	\$910,000	\$760,000	-
	Confluence Area Restoration Phase II	\$300,000	\$300,000	-	-	-	-	-	-
	Farm Site Improvements	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	-
	Flood Eng. Trails - Skunk/Mesa Trail Crossing and Restoration	\$150,000	\$150,000	-	-	-	-	-	-
	Flood Trails - Amphitheatre Bridge	\$305,000	\$305,000	-	-	-	-	-	-
	Goodhue Ditch Fish Passage	\$300,000	-	\$300,000	-	-	-	-	-
	Innovations (Biomimicry)	\$650,000	\$75,000	\$175,000	\$100,000	\$100,000	\$100,000	\$100,000	-
	NTSA Implementation	\$2,500,000	\$400,000	\$500,000	\$500,000	\$400,000	\$400,000	\$300,000	-
	S. Boulder Creek at E. Boulder Ditch Headgate	\$300,000	\$300,000	-	-	-	-	-	-
	Visitor Infrastructure Amenities System Wide	\$1,200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	-
	WTSA Implementation	\$1,350,000	\$400,000	\$400,000	\$150,000	\$150,000	\$150,000	\$100,000	-
CIP - CAPITAL MAINTENANCE	Subtotal	\$4,310,000	\$640,000	\$680,000	\$705,000	\$745,000	\$770,000	\$770,000	-
	Agricultural Facilities Projects	\$740,000	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000	-
	Cultural Resource/Facility Restoration	\$740,000	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000	-
	Ecological System Maintenance/Restoration	\$740,000	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000	-
	Facilities Maintenance	\$1,350,000	\$200,000	\$200,000	\$225,000	\$225,000	\$250,000	\$250,000	-
	Major Trail Maintenance	\$740,000	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000	-
CIP - CAPITAL PLANNING	Subtotal	\$1,450,000	\$300,000	\$100,000	\$150,000	\$200,000	\$300,000	\$400,000	-
	ETSA Planning and Implementation	\$950,000	-	-	\$50,000	\$200,000	\$300,000	\$400,000	-
	OSMP Master Plan Update	\$500,000	\$300,000	\$100,000	\$100,000	-	-	-	-
CIP - LAND ACQUISITION	Subtotal	\$25,600,000	\$5,700,000	\$5,700,000	\$5,500,000	\$2,600,000	\$2,900,000	\$3,200,000	-
	OSMP Campus Relocation	\$2,200,000	\$700,000	\$700,000	\$500,000	\$100,000	\$100,000	\$100,000	-
	OSMP Real Estate Acquisition	\$20,400,000	\$4,500,000	\$4,500,000	\$4,500,000	\$2,000,000	\$2,300,000	\$2,600,000	-
	Mineral Rights Acquisition	\$600,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	-
	New Property Stabilization	\$1,200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	-
	Water Rights Acquisition	\$1,200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	-

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Project Name: Confluence Area Restoration Phase 2

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT
Department: OPEN SPACE & MOUNTAIN PARKS **Subcommunity:** AREA III
Project Number: 555ES15002 **BVCP Area:** AREA III
CEAP Required: No **CEAP Status:** N/A

Project Description

Project will restore riparian habitat in the Boulder Creek and South Boulder Creek confluence area. The September 2013 flood impacted the creeks through this area by eroding banks and depositing sediment in the channel. The work will entail restoring streambank and streambed structure, creating aquatic habitat and planting riparian trees and shrubs to create a sustainable riparian area.

Project Phasing

Phase 1 permitting and design completed in 2016.

Construction - \$300k for Phase 2
 2017 funds are additional construction funds added to prior year design and construction funds.

Public Process

Public input opportunities at OSBT public meeting, press release, and notification via the permitting process.

Interdepartmental and Interagency Collaboration

This project will be coordinated with the COB utilities and transportation workgroups and the existing city utilities in this area, the CDOT US36 Wetland Mitigation project, the Colorado Water Conservation Board, the Colorado Parks and Wildlife Division, affected landowners.

Change From Past CIP

Added 2017 funding.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$101,386	\$300,000	\$0	\$0	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$401,386

Additional Annual Operating and Maintenance

Additional Annual O&M: 0 **Funding Source for O&M:**

Additional Annual O&M Description:

Monitoring and weed control during establishment by staff.

Project Name: Farm Site Improvements

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: SYSTEM-WIDE

Project Number: 555AG16001

BVCP Area: SYSTEM-WIDE

CEAP Required: No

CEAP Status: N/A

Project Description

This funding is for deferred maintenance to existing agricultural buildings and infrastructure. It is mainly for out-buildings and structures that are used for hay and equipment storage, livestock shelters and grain storage. The funding could also be used for maintenance on farm homes that exist on OSMP properties that are used to support agricultural production. The improvements may be identified in the Agricultural Resource Management Plan that is expected to be approved in 2016 or through other methods such as prioritization of the soon-to-be-completed facilities condition assessment. The necessary work and funding level may be revised in future years as the needs and the work planning is completed.

Project Phasing

Construction Phase for maintenance to existing OSMP infrastructure. Planning and Design: \$0
Construction: \$60,000 in 2017 (same through 2022)

Public Process

The projects are maintenance to existing structures on OSMP properties so no process is anticipated.

Interdepartmental and Interagency Collaboration

Most of this maintenance work is on OSMP property and, if needed, will be coordinated with the adjacent property owners and the cultural resources staff in OSMP.

Change From Past CIP

None. This program is funded annually in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$420,000

Additional Annual Operating and Maintenance

Additional Annual O&M: 0

Funding Source for O&M:

Additional Annual O&M Description:

The maintenance will lessen O&M requirements.

Project Name: Flood Eng. Trails

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: AREA III

Project Number: 555BOULD33

BVCP Area: AREA III

CEAP Required: No

CEAP Status: N/A

Project Description

This CIP project titled Flood Engineered Trails is a group of repairs that are intended to correspond with the related FEMA project, or worksheet, for OSMP trail reconstruction when the trail is replaced at least partially outside of the existing trail alignment.

Locations included in this project include the Lower Big Bluestem Trail repair, the South Mesa Trail repair and smaller trails that will be partially reconstructed outside of their current alignment.

In 2017, funding will be added to support the Skunk/Mesa Trail Crossing and Restoration project, initially outside of the FEMA scope of work but now potentially eligible for reimbursement.

Project Phasing

2017 Expected:

Lower Big Bluestem Trail Repairs; Construction - \$155.3k

South Mesa Trail Repair: Construction - \$317.3k

Small Trail Repairs: Construction - \$100k

Public Process

Staff will provide updates to the Open Space Board and will hold public hearings for these discussions, if the trail realignments are significant.

Interdepartmental and Interagency Collaboration

All work will be coordinated with OSMP Ecologists and Cultural Resources Staff. In addition OSMP will coordinate with city's central flood recovery group.

Change From Past CIP

Added 2017 funding for Skunk/Mesa project.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Lottery	\$360,364	\$0	\$0	\$0	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0
Open Space	\$1,007,342	\$150,000	\$0	\$0	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0
Total Funding Plan:	\$1,517,706						

Additional Annual Operating and Maintenance

Additional Annual O&M: 0

Funding Source for O&M:

Additional Annual O&M Description:

Trail reconstruction will reduce O&M cost

Project Name: Flood Trails

Project at a Glance

Project Type: CIP-CAPITAL MAINTENANCE

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: AREA III

Project Number: 555BOULD24

BVCP Area: AREA III

CEAP Required: No

CEAP Status: N/A

Project Description

This project is a grouping of flood recovery locations intended to correspond with the related FEMA project (worksheet) for OSMP trail reconstruction when trails are replaced in the previously existing trail alignment.

Specific projects to be continued or started in 2017 include: Chautauqua trail repairs, Shanahan trail repairs, and other smaller trail repairs.

In 2017, funding will be added to support the Amphitheatre Bridge project, initially outside of the FEMA scope of work but now potentially eligible for reimbursement.

Project Phasing

Chautauqua Trail Repairs: Design - \$25k, Construction - \$450k

Shanahan Trail Repair: Design - \$30k, Construction - \$786k

Small Trail Repairs: Construction - \$100k

Public Process

No public process is planned as the trail repair is occurring in the current location and considered maintenance to the existing system. Trail users will be notified through public outreach methods including press releases and the website.

Interdepartmental and Interagency Collaboration

Work will be coordinated with OSMP Ecologists and Cultural and Historical Staff along with City and County Planning staff. In addition OSMP will coordinate with city's central flood recovery group.

Change From Past CIP

Added 2017 funding for Amphitheatre Bridge project.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$2,472,935	\$305,000	\$0	\$0	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$2,777,935

Additional Annual Operating and Maintenance

Additional Annual O&M: 0

Funding Source for O&M:

Additional Annual O&M Description:

Trail reconstruction will reduce O&M cost from flood damage.

Project Name: Goodhue Ditch Fish Passage

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: AREA III

Project Number: 555ES16001

BVCP Area: AREA III

CEAP Required: No

CEAP Status: N/A

Project Description

Design and construct a fish passage structure on the Goodhue Ditch Diversion on South Boulder Creek to allow for the passage of native and sport fish and to connect upstream and downstream aquatic habitat.

Originally programmed in the 2017 CIP, this project has been delayed to 2018 to complete time sensitive flood recovery efforts related to Boulder and South Boulder Creek confluence area restoration.

Project Phasing

- 1. Design \$25,000
- 2. Permitting \$20,000
- 3. Construction \$255,000

Public Process

Public input opportunities at OSBT public meeting, press release, and notification via the permitting process.

Interdepartmental and Interagency Collaboration

Collaborate with the ditch company and shareholders, Colorado Parks and Wildlife, local conservation groups and the affected public.

Change From Past CIP

Project shifted from 2017 to 2018 to complete flood recovery projects

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$0	\$0	\$300,000	\$0	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$300,000

Additional Annual Operating and Maintenance

Additional Annual O&M: No

Funding Source for O&M:

Additional Annual O&M Description:

Project Name: OSMP Innovations

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: AREA III

Project Number: 555CO16001

BVCP Area: AREA III

CEAP Required: No

CEAP Status: N/A

Project Description

Explore and encourage the use of innovations on OSMP property, to evaluate different approaches to design and management of the OSMP system. For example, an initial biomimicry innovation project could utilize biological concepts to rethink road and trail design.

The use of innovations will be explored further starting in 2016 and continuing with the first year of funding in 2017.

Project Phasing

Funding will be defined in late 2016 and early 2017 to determine next steps likely starting with design and followed by construction in 2018 and beyond.

Public Process

These projects will be noticed on the OSMP web site. OSBT will be informed of these projects and asked for guidance as to appropriateness.

Interdepartmental and Interagency Collaboration

Interdepartmental and Interagency Collaboration will be defined in 2016 and into early 2017 depending on the type and extent of the innovation projects. Specifically for biomimicry, the EPA consultant will continue to provide guidance throughout the process, as available.

Change From Past CIP

None. This program is funded annually in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$0	\$75,000	\$175,000	\$100,000	\$100,000	\$100,000	\$100,000
					Funding to Completion	\$0	
					Future Unfunded	\$0	

Total Funding Plan: \$650,000

Additional Annual Operating and Maintenance

Additional Annual O&M: TBD

Funding Source for O&M:

Additional Annual O&M Description:

Project Name: NTSA Implementation

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: AREA III

Project Number: 555NTSA001

BVCP Area: AREA III

CEAP Required: No

CEAP Status: N/A

Project Description

The NTSA encompasses approximately 7,700 acres and includes the North Foothills area north of Lee Hill Road and the Boulder Valley Ranch area extending east to SH 119/Diagonal Highway. The Plan will delineate some new trails and major maintenance for some designated trails and closure and reclamation of the other undesignated trails, conservation projects, trailhead improvements and upgraded and or additional regulatory, way-finding and interpretive signs. The Plan will be completed in 2016 with implementation beginning in 2016 taking up to ten years to complete.

Project Phasing

2017 implementation will include trailhead projects including Degge and Daggel and design and initial implementation of conservation projects. Further NTSA costing will be completed in 2016 and may affect out-year funding.

Total implementation costs are divided across a 6-year implementation horizon.

Public Process

The public process includes email, newsletters, public workshops, on trail and at trailhead outreach, engagement with the youth and outreach at local businesses. There are regular check-ins with the OSBT, updates to the city council and final review and acceptance with a public hearing by the OSBT and city council.

Interdepartmental and Interagency Collaboration

Coordination with the city Parks and Recreation Department for the Boulder Reservoir Master Plan, with Boulder County Parks and Open Space on neighboring properties and with CDOT on properties adjacent to their facilities, including US36.

Change From Past CIP

Funding added in out years based on plan costing.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$100,000	\$400,000	\$500,000	\$500,000	\$400,000	\$400,000	\$300,000
						Funding to Completion	\$0
						Future Unfunded	\$0
Total Funding Plan:	\$2,600,000						

Additional Annual Operating and Maintenance

Additional Annual O&M: TBD

Funding Source for O&M:

Additional Annual O&M Description:

Monitor, maintain, rehabilitate trails when needed

Project Name: S.Bldr Crk at E.Bldr Ditch Const

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT
Department: OPEN SPACE & MOUNTAIN PARKS
Subcommunity: EAST BOULDER
Project Number: 555ES16003
BVCP Area: AREA III
CEAP Required: No
CEAP Status: N/A

Project Description

Improve existing ditch infrastructure to minimize impacts to OSMP land from ditch maintenance activities while ensuring delivery of water rights. Improvements will also allow fish passage at the existing diversion.

Project Phasing

- 1. Design \$50,000
- 2. Permitting \$60,000
- 3. Construction \$190,000

Public Process

Public input opportunities at OSBT public meeting, press release, and notification via the permitting process.

Interdepartmental and Interagency Collaboration

Collaborate with Ditch Company and shareholders, Colorado Parks and Wildlife, local conservation groups and the affected public.

Change From Past CIP

One-time funding to complete flood recovery project.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$0	\$300,000	\$0	\$0	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$300,000

Additional Annual Operating and Maintenance

Additional Annual O&M: 0

Funding Source for O&M:

Additional Annual O&M Description:

O&M costs for ditch maintenance are reduced by this project.

Project Name: Visitor Infrastructure Amenities

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT
Department: OPEN SPACE & MOUNTAIN PARKS
Subcommunity: SYSTEM-WIDE
Project Number: 555VISW001
BVCP Area: AREA III
CEAP Required: No
CEAP Status: N/A

Project Description

In the past, this program provided funding on a system-wide basis for planning capital maintenance and new construction on existing trails and trailheads, other facilities that improved the visitor experience (e.g. safe roads crossings) and capital restoration of areas where visitor impacts are high. In 2017, the project will be updated to support amenities, for example bike racks, trash and recycle cans, and visitor center improvements. Projects will be identified by staff, public concerns and through the various trail study area plans or opportunistically as needs arise throughout the year.

Project Phasing

2017-2022 Construction- \$200k/year

Public Process

OSBT, CC and the public will have input as the various OSMP plans are developed. In addition, these projects will be noticed on the OSMP web site.

Interdepartmental and Interagency Collaboration

Work will be coordinated with OSMP Ecologists and Cultural and Historical Staff. Where appropriate OSMP will coordinate with City of Boulder Parks and Recreation, City Planning, Boulder County staff and CDOT staff, depending on the project and its location.

Change From Past CIP

Funding added in out years to make this an annual OSMP CIP project.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$100,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$1,300,000

Additional Annual Operating and Maintenance

Additional Annual O&M: 0
Funding Source for O&M:

Additional Annual O&M Description:

Monitor, Maintain, rehabilitate trails when needed

Project Name: WTSA Implementation

Project at a Glance

Project Type: CIP-CAPITAL ENHANCEMENT

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: AREA III

Project Number: 555WTSA001

BVCP Area: AREA III

CEAP Required: No

CEAP Status: N/A

Project Description

This funding is for implementation of trail projects that were identified in the West Trail Study Areas. The funds will allow for implementation of the following projects: Chautauqua Phase II (Ski Jump reroute, Chautauqua Trail repair, 6th street connector designation and repair), Flagstaff Trail reroute (as it drops down into Gregory Canyon Trailhead/Road), Royal Arch repairs, Long Canyon Reroute, Completion of Lion's Lair (Wittemyer), partial implementation of trail projects on NIST, the Dakota Ridge connector trails (in conjunction with the work occurring at Sanitas).

Project Phasing

In 2017, WTSA funds will support Chapman Drive TH Infrastructure, Amphitheatre, Baseline Trail to Sidewalk Connections, 3rd Flatiron Descent, Lower Flagstaff, and Ski Jump.

Future years- Construction (\$400k in 2018, \$150k/year 2019-2021, \$100k in 2022).

Public Process

All of the trail project were identified in the West Trail Study Area Plan, which went through a lengthy public involvement process. However, the Flagstaff Trail Reroute and next steps of the NIST project may require additional public process including outreach to interested community members and OSBT.

Interdepartmental and Interagency Collaboration

Depending on which alternative is pursued for the Flagstaff Trail project, additional collaboration with City Transportation may be needed.

Change From Past CIP

Funding adjusted in out years based on implementation status.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$69,530	\$400,000	\$400,000	\$150,000	\$150,000	\$150,000	\$100,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$1,419,530

Additional Annual Operating and Maintenance

Additional Annual O&M: 0

Funding Source for O&M:

Additional Annual O&M Description:

Trail repairs will reduce on-going O&M.

Project Name: Agriculture Facilities Projects

Project at a Glance

Project Type: CIP-CAPITAL MAINTENANCE
Department: OPEN SPACE & MOUNTAIN PARKS
Subcommunity: SYSTEM-WIDE
Project Number: 555AG15001
BVCP Area: SYSTEM-WIDE
CEAP Required: No
CEAP Status: N/A

Project Description

This item funds smaller capital maintenance projects for the repair, replacement or renovation of existing OSMP agricultural infrastructure. Typically this money is used for replacement or new installation of fences (approx. 8-10 fence projects per year at \$5k-\$10k per project) and agricultural irrigation items such as head gates, division boxes and irrigation ponds (approx. 4-6 irrigation projects per year at \$7k to \$12k). The projects are either identified in the Agricultural Resource Management Plan that is on track to be adopted in early 2016, the current OSMP fence inventory, or as opportunistic projects identified throughout the year.

Project Phasing

Construction Phase for smaller capital maintenance projects. Planning and Design: \$0
 Construction: \$110,000 in 2017, similar costs projected through 2022 (\$120,000 in 2018 and 2019, \$130,000 in 2020, 2021 and 2022).

Public Process

The Agricultural Resource Management Plan will go through a public process and may identify some of the projects to be funded in this category. For the individual sites, the infrastructure is already present and these funds will generally be used to replace the existing infrastructure with facilities of similar design and function. Adjacent property owners will be consulted, as necessary.

Interdepartmental and Interagency Collaboration

The city's Utilities staff may be involved with some water infrastructure projects as they are often shareholders in the same local ditch companies as OSMP.

Change From Past CIP

None. This program is funded annually in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$110,000	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000
					Funding to Completion	\$0	
					Future Unfunded	\$0	

Total Funding Plan: \$850,000

Additional Annual Operating and Maintenance

Additional Annual O&M: 0
Funding Source for O&M:

Additional Annual O&M Description:

This maintenance work will reduce future O&M costs.

Project Name: Cultural Resource/Facility Restorat

Project at a Glance

Project Type: CIP-CAPITAL MAINTENANCE
Department: OPEN SPACE & MOUNTAIN PARKS **Subcommunity:** SYSTEM-WIDE
Project Number: 555CR15001 **BVCP Area:** SYSTEM-WIDE
CEAP Required: No **CEAP Status:** N/A

Project Description

Improvement of the condition of historic structures, including but not limited to barns, hosues, sheds, and shelters, as well as planning and development of a cultural preservation assessment and prioritization plan that will inform the priorities for the future.

Project Phasing

Planning - \$30k. The early fundng will cover an assessment and prioritization of the OSMP cultural and historic resources. This effort will inform the future spending in coordination with the department master plan.
 Construction - \$80k. All remaining funds will be used for maintenance activities.

Similar funding is scheduled for out years (\$120k in 2018 and 2019, \$130k in 2020, 2021, and 2022).

Public Process

Updates on work will be provided to the OSBT, as needed. Most work is maintenance to existing structures so public process is not anticipated.

Interdepartmental and Interagency Collaboration

Work will be coordinated with Boulder County Preservation staff and the State Historic Preservation office

Change From Past CIP

None. Program is funded annually in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$48,336	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000
					Funding to Completion	\$0	
					Future Unfunded	\$0	

Total Funding Plan: \$788,336

Additional Annual Operating and Maintenance

Additional Annual O&M: Unknown **Funding Source for O&M:**

Additional Annual O&M Description:

Improvements to facilities will likely reduce O&M needs

Project Name: Ecological System Maintenance/Restr

Project at a Glance

Project Type:	CIP-CAPITAL MAINTENANCE		
Department:	OPEN SPACE & MOUNTAIN PARKS	Subcommunity:	SYSTEM-WIDE
Project Number:	555ES17001	BVCP Area:	SYSTEM-WIDE
CEAP Required:	No	CEAP Status:	N/A

Project Description

As OSMP shifts from acquisition to system stewardship, these ongoing capital dollars will support ecological system maintenance and restoration as directed by the Open Space Master Plan, Trail Study Area Plans, Grassland and Forest Management Plans, and Agricultural Plan.

Project Phasing

Funding will begin in 2017 with \$110k, with similar funding in subsequent years.

2018 and 2019 - \$120k
2020-2022 - \$130k

Public Process

Per above referenced plans.

Interdepartmental and Interagency Collaboration

Adjacent agency property owners.

Change From Past CIP

New project with annual funding in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$0	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000
					Funding to Completion	\$0	
					Future Unfunded	\$0	

Total Funding Plan: \$740,000

Additional Annual Operating and Maintenance

Additional Annual O&M:	Unknown	Funding Source for O&M:
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Additional Annual O&M Description:

Improvements will likely reduce O&M needs

Project Name: Facilities Maintenance

Project at a Glance

Project Type: CIP-CAPITAL MAINTENANCE

Department: OPEN SPACE & MOUNTAIN PARKS

Subcommunity: SYSTEM-WIDE

Project Number: 555FA17001

BVCP Area: SYSTEM-WIDE

CEAP Required: No

CEAP Status: N/A

Project Description

In 2016, OSMP will conduct a facilities assessment with Case Forensics to inventory all OSMP structures, determine their condition and what is needed to maintain them including the priority of each facility along with estimated maintenance and repair costs both immediate and long term. This information will be delivered to OSMP in a database to which additional structures and their data can be added and from which reports can be generated.

Project Phasing

Funding will begin in 2017 at \$250K with slightly increasing funding in future years.

- 2018 - \$270k
- 2019 - \$290k
- 2020 - \$310k
- 2021 - \$330k
- 2022 - \$350k

Public Process

Interdepartmental and Interagency Collaboration

Change From Past CIP

New project with annual funding in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$175,000	\$200,000	\$200,000	\$225,000	\$225,000	\$250,000	\$250,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$1,525,000

Additional Annual Operating and Maintenance

Additional Annual O&M:

Funding Source for O&M:

Additional Annual O&M Description:

This will reduce future O&M costs.

Project Name: Major Trail Maintenance

Project at a Glance

Project Type: CIP-CAPITAL MAINTENANCE

Department: **Subcommunity:** SYSTEM-WIDE

Project Number: 555OSTP001 **BVCP Area:** SYSTEM-WIDE

CEAP Required: No **CEAP Status:** N/A

Project Description

In 2016 OSMP initiated a trails capacity study, the results of which will shape major trail maintenance investment in the coming years. This CIP project is part of an increased department-wide investment in land and system stewardship. Spending will be guided by the Open Space Master Plan and Trail Study Area Plans.

Project Phasing

Funding will begin in 2017 at \$110k with similar funding in subsequent years.

2018 and 2019 - \$120k

2020-2022 - \$130k

Public Process

These projects will be noticed on our web page.

Interdepartmental and Interagency Collaboration

Work will be coordinated with OSMP Ecologists and Cultural and Historical Staff.

Change From Past CIP

New project with annual funding in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	-\$253,990	\$110,000	\$120,000	\$120,000	\$130,000	\$130,000	\$130,000
					Funding to Completion	\$0	
					Future Unfunded	\$0	

Total Funding Plan: \$486,010

Additional Annual Operating and Maintenance

Additional Annual O&M:

Additional Annual O&M Description:

Improvements will likely reduce O&M needs

Funding Source for O&M:

Project Name: ETSA - Plan and Implementation

Project at a Glance

Project Type: CIP-CAPITAL PLANNING STUDIES
Department: OPEN SPACE & MOUNTAIN PARKS **Subcommunity:** AREA III
Project Number: 555ETSA001 **BVCP Area:** AREA III
CEAP Required: No **CEAP Status:** N/A

Project Description

The East Trail Study Area (TSA) encompasses approximately 11,000 acres of OSMP including Sawhill Ponds, the East Boulder Trail, the Bobolink and Teller Farm trailheads. It extends general east of the City of Boulder, southeast of the Diagonal Highway and north of US 36. The East Trail Study Area (TSA) Plan seeks to improve visitor experiences and increase the sustainability of trails and trailheads while conserving the area’s natural, cultural and agricultural resources. Outcomes may include:
 -strategies to provide high-quality visitor experiences for a diversity of recreational opportunities,
 -visitor infrastructure enhancements, such as trail connections, and trail and trailhead improvements,
 -actions that sustain trails and surrounding landscapes.
 --projects to reduce trail erosion, the re-routing of trails around wildlife habitats,
 --the removal of redundant paths and
 --the restoration of disturbed areas.
 -protection of sensitive ecological areas and the restoration of disturbed areas.

Project Phasing

Funding was originally scheduled to begin in 2018. This has been delayed to 2019 to first complete the Open Space Master Plan update.
 Planning - 2019: \$50,000, 2020: 200,000 Followed by implementation in 2021 and beyond.

Public Process

There will be ample opportunity for community input. Staff is currently experimenting with a number of techniques to broaden community participation in the North TSA plan and will also learn from the OSMP masterplan effort. The results of these processes will inform staff’s approach to public process in the East TSA.

Interdepartmental and Interagency Collaboration

The East TSA plan includes opportunities to collaborate with other departments around issues such as ecological conservation, fitness and health, climate action, multi-modal linkages, etc. The level of collaboration with Boulder County, Colorado Parks and Wildlife, and other agency partners will be commensurate with their interest and the benefit to the community.

Change From Past CIP

Shifted start date to 2019 to focus on Open Space Master Plan.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$0	\$0	\$0	\$50,000	\$200,000	\$300,000	\$400,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$950,000

Additional Annual Operating and Maintenance

Additional Annual O&M: TBD **Funding Source for O&M:**

Additional Annual O&M Description:

Monitor, maintain, rehabilitate trails when needed.

Project Name: OSMP Master Plan Update

Project at a Glance

Project Type: CIP-CAPITAL PLANNING STUDIES
Department: OPEN SPACE & MOUNTAIN PARKS **Subcommunity:** SYSTEM-WIDE
Project Number: 555OSMP001 **BVCP Area:** SYSTEM-WIDE
CEAP Required: No **CEAP Status:** N/A

Project Description

At the 2016 retreat, City Council requested that staff provide a public process breather for the community and focus on an update to the Visitor Master Plan. The department will recast this plan as the Open Space Master Plan, which will address a set of previously identified overarching issues such as carrying capacity, night-time and temporal use and climate change mitigation and adaptation. The plan will also establish a set of policies and priorities and to align the department with shared goals, measurable objectives and metrics to implement the Open Space sections of the City Charter. An OSMP Master Plan will improve integration of departmental work group efforts and be clearly linked to the Boulder Valley Comprehensive Plan. The process is anticipated to take between 18 and 24 months to complete.

Project Phasing

2016 - Data gathering and inventory - \$252k
 2017 - Planning begins in first half of year - \$300k

Implementation - 2018 - 2022 - the amount to be refined or reallocated based on the outcome of the plan.

Public Process

There will be ample opportunity to community input. Staff is currently experimenting with a number of techniques to broaden community participation in the North TSA plan. The results of that effort will inform staff's approach to public process in for the OSMP master plan.

Interdepartmental and Interagency Collaboration

The OSMP Master plan will link with the Boulder Valley Comprehensive Plan. This will provide a nexus for interdepartmental collaboration around issues such as ecological conservation, fitness and health, climate action, multi-modal linkages, etc. The level of collaboration with Boulder County, Colorado Parks and Wildlife, and other agency partners will be commensurate with their interest and the benefit to the community.

Change From Past CIP

Funding adjusted in out years based on revised costing.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$252,000	\$300,000	\$100,000	\$100,000	\$0	\$0	\$0
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$752,000

Additional Annual Operating and Maintenance

Additional Annual O&M: TBD **Funding Source for O&M:**

Additional Annual O&M Description:

Not known at this time.

Project Name: OSMP Campus Relocation

Project at a Glance

Project Type:	CIP-LAND ACQUISITION		
Department:	OPEN SPACE & MOUNTAIN PARKS	Subcommunity:	SYSTEM-WIDE
Project Number:	555FA16001	BVCP Area:	AREA III
CEAP Required:	No	CEAP Status:	N/A

Project Description

In 2015, OSMP completed Phase 1 of its space analysis with Studio Terra, which identified short-, medium-, and long-term departmental space needs. In 2016, Phase 2 will evaluate space alternatives including utilization of the current space (spread across various locations either as it exists or reconfigured), or if there is a need to pursue a new OSMP campus. The analysis will identify preferred alternatives that may require remodeling existing spaces and/or reconstruction of some facilities, and/or evaluating new space on currently owned or potentially acquired property.

Project Phasing

2017 funding will likely cover the short term alternatives identified in the space needs analysis. In 2017, further analysis will be completed by internal teams around potential future sites for an OSMP campus. The medium to long term solutions will be identified and funded in out years of the CIP. Funding amounts will be modified in out years, if needed.

Public Process

N/A

Interdepartmental and Interagency Collaboration

This effort will be coordinated with FAM so they can serve as a technical resource to help direct and review any proposals and cost estimates. Furthermore, coordination with FAM allows for potential collaboration on current and future citywide solutions.

Change From Past CIP

Increased annual funding in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$200,000	\$700,000	\$700,000	\$500,000	\$100,000	\$100,000	\$100,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$2,400,000

Additional Annual Operating and Maintenance

Additional Annual O&M:	TBD	Funding Source for O&M:
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Additional Annual O&M Description:

Any additional O&M can't be quantified until the plan is developed.

Project Name: OSMP Real Estate Acquisition

Project at a Glance

Project Type: CIP-LAND ACQUISITION
Department: OPEN SPACE & MOUNTAIN PARKS
Subcommunity: SYSTEM-WIDE
Project Number: 555REA001
BVCP Area: SYSTEM-WIDE
CEAP Required: No
CEAP Status: N/A

Project Description

This project is the acquisition of additional acres of open space, subject to available funding within the Open Space and Mountain Parks acquisition plan area as approved by OSBT and the City Council.

The amount of this CIP project will decrease in 2017 as funds from this project are shifted to the OSMP Campus Relocation and New Property Stabilization projects.

Project Phasing

All of this funding is for property acquisition. Beginning in 2017, associated costs including immediate deferred maintenance needs will be funded separately, in the New Property Stabilization project.

Public Process

Property acquisition is reviewed at an OSBT hearing and then by the city council with an associated public hearing.

Interdepartmental and Interagency Collaboration

Coordinate with internal OSMP staff including ecologists, cultural and historic, integrated pest management, agricultural management and water resources. Typically other department or outside agency coordination is not required.

Change From Past CIP

Reduced over time to reflect shift to stewardship.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$5,400,000	\$4,500,000	\$4,500,000	\$4,500,000	\$2,000,000	\$2,300,000	\$2,600,000
						Funding to Completion	\$0
						Future Unfunded	\$0
Total Funding Plan:	\$25,800,000						

Additional Annual Operating and Maintenance

Additional Annual O&M: Minimal
Funding Source for O&M:

Additional Annual O&M Description:

Incremental maintenance costs for new properties

Project Name: Mineral Rights Acquisition

Project at a Glance

Project Type:	CIP-LAND ACQUISITION		
Department:	OPEN SPACE & MOUNTAIN PARKS	Subcommunity:	SYSTEM-WIDE
Project Number:	555MRA001	BVCP Area:	SYSTEM-WIDE
CEAP Required:	No	CEAP Status:	N/A

Project Description

This on-going program provides funding to purchase underlying mineral interests from private property owners as they become available on the real estate market. Many of these interests in minerals, gas, oil and aggregates were severed from the lands before properties were purchased by the city and could cause future management issues. The definition of a CIP project includes "the purchase of the physical assets of the community." By purchasing the rights to the mineral, the city is purchasing a physical asset. Funds also provide for research, mapping and analyzing potential acquisitions. This project is for ongoing funding program. In addition, should water rights or real property become available to purchase and funds allocated for that purpose are insufficient, mineral rights acquisition funds may be utilized to make up the deficiency.

Project Phasing

Funding is for mineral acquisitions and associated costs only.

Public Process

None

Interdepartmental and Interagency Collaboration

Collaboration with other departments and agencies are generally not required for the acquisition of mineral rights.

Change From Past CIP

None

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$700,000

Additional Annual Operating and Maintenance

Additional Annual O&M: 0

Funding Source for O&M:

Additional Annual O&M Description:

Included in annual appropriation for operations

Project Name: New Property Stabilization

Project at a Glance

Project Type:	CIP-LAND ACQUISITION		
Department:	OPEN SPACE & MOUNTAIN PARKS	Subcommunity:	SYSTEM-WIDE
Project Number:	555RE15001	BVCP Area:	SYSTEM-WIDE
CEAP Required:	No	CEAP Status:	N/A

Project Description

Funds for new property stabilization/immediate improvements on OSMP Real Estate Acquisitions. Previously, the amount of funding allocated to this project was by property as indicated in the Closing Memo at the time of acquisition. This has resulted in insufficient funding to bring new properties to OSMP standards, including breakdown and/or restoration of structures, fencing, etc. Beginning in 2017, there will be a set amount per year dedicated to this purpose. In the past, approved funds have included:

- Schnell Property - \$20,000
- Robert Oliver- \$22,000
- Coleman - \$50,000
- Delier Ranch - \$100,000

Project Phasing

2017-2022 - \$200k per year

Public Process

Each property acquisition is presented to the OSBT and City Council for approval.

Interdepartmental and Interagency Collaboration

Change From Past CIP

New project with annual funding in the OSMP CIP.

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$159,150	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
						Funding to Completion	\$0
						Future Unfunded	\$0

Total Funding Plan: \$1,359,150

Additional Annual Operating and Maintenance

Additional Annual O&M:

Funding Source for O&M:

Additional Annual O&M Description:

Improvements will likely reduce O&M needs

Project Name: Water Rights Acquisition

Project at a Glance

Project Type:	CIP-LAND ACQUISITION		
Department:	OPEN SPACE & MOUNTAIN PARKS	Subcommunity:	SYSTEM-WIDE
Project Number:	555WRA001	BVCP Area:	SYSTEM-WIDE
CEAP Required:	No	CEAP Status:	N/A

Project Description

This on-going project provides funding to purchase additional water from private owners or others for use on Open Space and Mountain Parks for agricultural and environmental purposes. By purchasing the water rights, the city is purchasing a physical asset. Program funding includes water acquisitions in the Coal Creek, South Boulder, Boulder and Lefthand Creek watersheds. Funding will also be used for professional fees, legal and engineering fees, analysis and mapping necessary to manage and protect the water rights portfolio. Because of continuing wildlife and habitat concerns, the Open Space and Mountain Parks Resource Operations staff will continue to work with other city departments to assist in enhancing in-stream flow where possible. Senior water rights can exceed \$100,000 per share. Additionally, the department has annual expenditures for the attorney fees and engineering fees that are required, as noted in this project's description, to defend the departments water rights portfolio. This project is for an ongoing funding program. In addition, should mineral rights or real property become available to purchase and funds allocated for that purpose are insufficient, water rights acquisition funds may be utilized to make up the deficiency.

Project Phasing

All funds are for water rights acquisition and associated costs.

Public Process

None

Interdepartmental and Interagency Collaboration

Coordinate with internal OSMP staff including ecologists, cultural and historic, integrated pest management, agricultural management and water resources. Typically other department or outside agency coordination is not required.

Change From Past CIP

None

Capital Funding Plan

Fund(s)	Revised 2016 Budget - Current Year	2017 Requested Funding	2018	2019	2020	2021	2022
Open Space	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000
						Funding to Completion	\$0
						Future Unfunded	\$0
Total Funding Plan:	\$1,400,000						

Additional Annual Operating and Maintenance

Additional Annual O&M:	Minimal	Funding Source for O&M:
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Additional Annual O&M Description:

Included in annual appropriations for operations

MEMORANDUM

TO: Open Space Board of Trustees

FROM: Tracy Winfree, Director, Open Space and Mountain Parks

DATE: May 9, 2016

SUBJECT: Greenways Advisory Committee (GAC) Items

The following memos are being brought before the Open Space Board of Trustees (OSBT) as a “Matter from the Board” to inform discussion about the Greenways Capital Improvement Program (CIP) and Fourmile Canyon Creek Community Environmental Assessment Process (CEAP). This process approach and these packet materials are consistent with other boards with Greenways Advisory Committee liaisons.

No formal OSBT action is requested and results of the discussion will be taken to the GAC by Molly Davis, the OSBT GAC liaison.

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**CITY OF BOULDER
INFORMATION ITEM FOR:**

TRANSPORTATION ADVISORY BOARD – May 9, 2016
OPEN SPACE BOARD OF TRUSTEES – May 11, 2016
PLANNING BOARD – May 5, 2016
ENVIRONMENTAL ADVISORY BOARD – May 4, 2016
WATER RESOURCES ADVISORY BOARD – May 16, 2016
PARKS AND RECREATION ADVISORY BOARD – April 25, 2016

GREENWAYS ADVISORY COMMITTEE AGENDA ITEM

MEETING DATE: May 17, 2016

SUBJECT:

2017-2022 Greenways Capital Improvement Program

REQUESTING DEPARTMENT:

Annie Noble – Flood and Greenways Engineering Coordinator

PURPOSE: The 2017-2022 Greenways Capital Improvement Program is being provided to board members as an information item. If you have any comments or concerns regarding the 2017-2022 Greenways Capital Improvement Program, please pass them along to your Greenways Advisory Committee representative. If you have questions on this material, please contact Annie Noble at 303-441-3242 or noblea@bouldercolorado.gov

GREENWAYS ADVISORY COMMITTEE ACTION REQUESTED:

A recommendation from the Greenways Advisory Committee to the City's Planning Board and City Council concerning the proposed Greenways Capital Improvement Program is requested.

Attached is information concerning the proposed 2017-2022 Greenways Capital Improvement Program (CIP) for review and consideration. A recommendation by the Greenways Advisory Committee to the city's Planning Board and Council will be requested at the May GAC meeting.

Attachment A: Greenways 2017-2022 Capital Improvement Program Overview

Attachment B: Greenways 2017-2022 Capital Improvement Program Summary Spreadsheet

Attachment C: Greenways Program CIP Map

Attachment A

Greenways 2017-2022 Capital Improvements Program

Overview of Department Mission

The City of Boulder Greenways System is comprised of a series of corridors along riparian areas including Boulder Creek and its 14 tributaries, which provide an opportunity to integrate multiple objectives, including habitat protection, water quality enhancement, storm drainage and floodplain management, alternative transportation routes for pedestrians and bicyclists, recreation and cultural resources.

The Greenways CIP follows an opportunistic approach, contributing funding toward projects that are being completed by other departments or private development in order to meet the various objectives of the Greenways Program. The Greenways CIP also looks to leverage funds with outside agencies in order to move projects forward that meet more than one objective of the Greenways Program, but may not be the highest priority when evaluating any one particular objective. Projects included in the Greenways CIP are typically called out in the Greenways Master Plan and are projects that Greenways staff can take the lead in coordinating.

Funding Overview

The total 2017 Greenways capital budget is \$320,441, with an additional \$105,000 in the operating budget. Greenways projects are funded from the Transportation Fund, Stormwater and Flood Management Utility Fund, and the Lottery Fund. Annual funding distribution for the Greenways Capital Program for 2017 is as follows:

Transportation	-	\$97,500
Flood Utility	-	\$97,500
Lottery Fund	-	\$125,441

Historically the Lottery contribution to the Greenways Program has been \$150,000 per year. As a result of a projected reduction of the city's allocation of Lottery funds, starting in 2015, the Lottery contribution to Greenways was reduced to \$125,441 (based on Greenways receiving 15% of the city's funding allocation, with a projection of total Lottery proceeds assumed to be \$836,275). The city's allocation of Lottery funds in 2015 exceeded the projected amount, therefore a budget adjustment will be made in the amount of \$26,949 to reflect the increase.

The focus of the Greenways CIP in 2017-2019 is on flood mitigation, bicycle and pedestrian

multi-use paths and underpasses, and habitat and water quality improvements along the Fourmile Canyon Creek corridor. These improvements are also being coordinated with the development of the Violet Park site. In 2020-2022, funding for these types of improvements is shown for Bear Canyon Creek and Skunk Creek in anticipation of future major drainageway improvements along these corridors. For more information about the timing and details of these projects, please see the Utilities -Stormwater/Flood web page:

<https://bouldercolorado.gov/flood/creek-projects>

In addition to these projects, possible habitat restoration projects during the next few years include:

- Habitat improvements along Boulder Creek in conjunction with flood mitigation maintenance (sediment removal)
- Habitat improvements along Fourmile Canyon Creek upstream of Broadway in conjunction with flood mitigation maintenance (sediment removal)
- Habitat improvements at the confluence of Bear Creek and Boulder Creek at Foothills Community Hospital in conjunction with sediment removal
- Dry Creek habitat improvements through Flatirons Golf Course
- Goose Creek, railroad to 47th Street tree plantings
- Fish Passage enhancement projects in association with Fishing is Fun grants
- South Boulder Creek minimum stream flow
- Removal of Russian Olive trees east of 75th Street along Boulder Creek

Board Action

The Greenways Advisory Committee will meet on May 17, 2016 to review the 2017-2022 Greenways Program CIP and make a recommendation to Planning Board and City Council.

Guiding Principles & Project Prioritization

Greenways projects address many of the CIP guiding principles. Greenways projects are identified in multiple master plans and meet the community sustainability goals. Most of the Greenways projects leverage outside or interdepartmental funding. Greenways habitat improvements seek to be sustainable and are intended to reduce the future maintenance required.

The Greenways CIP has been developed within the context of and is consistent with the Boulder Valley Comprehensive Plan (BVCP), the Transportation Master Plan (TMP), the major drainageway flood mitigation plans, the Comprehensive Flood and Stormwater Master Plan and the Greenways Master Plan. The Greenways Master Plan was updated in 2011 to reflect

improvements that had been completed, and adopted changes that have been made in other master plans, city policies and ordinances that affect the Greenways Program since the last Master Plan update in 2001.

Prioritization:

Many of the Greenways projects shown in the CIP are being designed and constructed in coordination with major flood or transportation improvements. The Greenways funding associated with these projects focuses on habitat restoration, water quality improvements and trail connections. In addition to leveraging funding with the Transportation and Flood Utilities budgets, funding for Greenways projects is also available through the Urban Drainage and Flood Control District and Federal Transportation funds.

Projects not in Master Plans:

It should be noted that the city experienced a major flood in September 2013 that resulted in extensive flooding along most of the city's major drainageways. Following the flood, additional funds have been allocated in the Flood Utility CIP to reflect an increased interest in pursuing flood mitigation efforts along the city's major drainageways. As a result of updated mapping and the September 2013 flood, flood mitigation plans were initiated for Gregory Creek, Bear Canyon Creek and Boulder Creek to identify economically feasible improvement projects. Flood mitigation plans will be initiated in 2016 for Upper Goose Creek and Twomile Canyon Creek, and in 2017 for Skunk, King's Gulch and Bluebell Creeks after completion of flood mapping updates on these drainageways. Results from these flood mitigation plans will inform future capital improvements. Continued evaluation of potential improvement may result in additional changes to the Flood Utility and Greenways CIP in upcoming years.

New Facilities or Infrastructure Projects

Flood mitigation plans are currently being developed for several of the drainageways as a result of either flood mapping updates or deficiencies identified during the September 2013 flood. These plans will identify potential economically feasible CIP projects which may provide opportunities for future Greenways improvements. The Transportation Division is currently completing a minor structure inspection effort in order to develop a formal bridge asset management program. Information from this evaluation will help prioritize capital maintenance needs with funding that can be leveraged with the Greenways and Flood CIP.

Operation and Maintenance Impacts

\$105,000 is budgeted each year for Greenways operations and maintenance. \$80,000 of the

operating budget is dedicated to habitat maintenance. The Greenways habitat crew works closely with Parks and Open Space maintenance staff to provide on-going maintenance, as well as on collaborative projects as part of the operations budget. Major drainageway improvements are maintained by the flood maintenance staff and multi-use paths and underpasses are maintained by either Transportation or Parks maintenance, depending upon jurisdiction.

Deferred, Eliminated, or Changed Projects

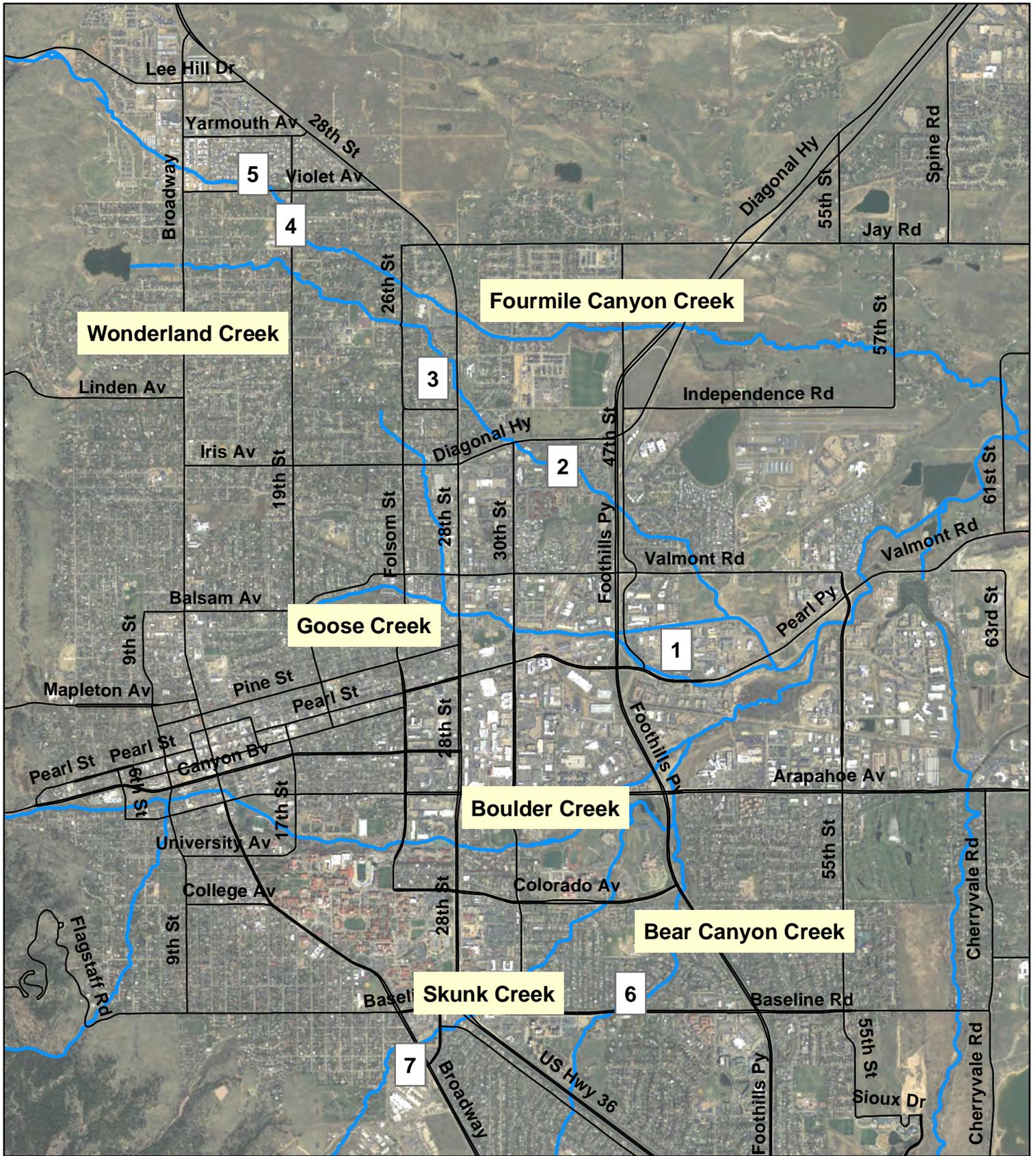
None

Unfunded Projects and Emerging Needs

Since the Greenways Program is opportunistic, taking advantage of projects that are funded through other departments, there are no unfunded needs.

Attachment B		Greenways Program Summary Spreadsheet										
		2016 Greenways Budget				2017-2022 Greenways CIP						
		2015 Budget with Carry Overs	2016 Lottery	2016 Flood	2016 Trans	2016 Budget with Carry Overs	2017	2018	2019	2020	2021	2022
#	Description		610SW63100	610SW63000	310TR6300C							
	2015 Additional Lottery Revenues	ATB	\$ 26,949			\$ 26,949						
	CU Bridges	\$200,000		\$100,000	\$100,000	\$200,000						
1	Goose Creek Restoration	\$0		\$152,399		\$152,399						
2/3	Wonderland Foothills to 28th	\$914,467	\$857,210		\$57,257	\$914,467						
4	Fourmile 19th-22nd - Crestview	\$718,828		\$457,883	\$260,945	\$718,828						
5	Fourmile Upland to Violet	\$0	\$100,000	\$85,200	\$85,200	\$270,400	\$270,400	\$270,400	\$270,400			
6/7	Bear/Skunk Creek Restoration, Water Quality and Trail Improvements	\$152,399	\$25,441	\$12,300	\$12,300	\$50,041	\$50,041	\$50,041	\$50,041	\$50,041	\$50,041	\$50,041
	Total	\$1,985,694	\$982,651	\$807,782	\$515,702	\$2,306,135						
	2016 Budget		\$125,441	\$97,500	\$97,500	\$320,441						
	2015 Carry Overs		\$857,210	\$710,282	\$418,202	\$1,985,694						
	Total					\$ 2,306,135						

Attachment C



- Projects
- 1 Goose Creek Restoration
 - 2 Wonderland Foothills to 30th St
 - 3 Wonderland 28th St Underpass
 - 4 Fourmile - 19th to 22nd
 - 5 Fourmile - Upland to Violet
 - 6 Bear Canyon Creek
 - 7 Skunk Creek

2017 - 2022 Greenways Program CIP Attachment C



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**CITY OF BOULDER
INFORMATION ITEM FOR:**

TRANSPORTATION ADVISORY BOARD – May 9, 2016
OPEN SPACE BOARD OF TRUSTEES – May 11, 2016
PLANNING BOARD – May 5, 2016
ENVIRONMENTAL ADVISORY BOARD – May 4, 2016
WATER RESOURCES ADVISORY BOARD – May 16, 2016
PARKS AND RECREATION ADVISORY BOARD – April 25, 2016

GREENWAYS ADVISORY COMMITTEE AGENDA ITEM

MEETING DATE: May 17, 2016

SUBJECT:

Draft CEAP for Fourmile Canyon Creek Greenways Improvements from Upland Avenue to West of Broadway

REQUESTING DEPARTMENT:

Annie Noble – Greenways Coordinator
Ward Bauscher – Engineering Project Manager, Flood & Greenways
Christin Shepherd-Civil Engineer I, Flood & Greenways

PURPOSE: A summary of the draft CEAP is being provided to board members as an information item. It is requested you review the full CEAP and forward any comments or concerns regarding the draft CEAP to your Greenways Advisory Committee representative. If you have questions on this material, please contact Ward Bauscher at 303-441-4199 or BauscherW@bouldercolorado.gov. The full CEAP is available at: https://www-static.bouldercolorado.gov/docs/DRAFT_2016_Fourmile_Upland_to_Broadway_CEAP-1-201604061106.pdf

GREENWAYS ADVISORY COMMITTEE ACTION REQUESTED:

A recommendation from the Greenways Advisory Committee to City Council concerning the CEAP for the Fourmile Canyon Creek Greenways Improvements from Upland Avenue to West of Broadway is requested. Pending GAC approval, City Council will receive the CEAP as a call up item in summer of 2016.

Attached is the Executive Summary from the Fourmile Canyon Creek Greenways Improvements from Upland Avenue to West of Broadway CEAP summarizing the proposed recommendations.

FOURMILE CANYON CREEK GREENWAYS IMPROVEMENT PROJECT UPLAND AVENUE TO WEST OF BROADWAY EXECUTIVE SUMMARY

In 2009, a Major Drainageway Plan was approved by City Council for Fourmile Canyon Creek and Wonderland Creek. The recommendations of the 2009 plan were finalized in the Fourmile Canyon Creek and Wonderland Creek Major Drainageway Planning Final Plan in May 2011 (MDP). The MDP proposed specific levels of flood mitigation for each reach along Fourmile Canyon Creek between Violet Avenue and Upland Avenue. In 2013, a formal CEAP process was underway for the mitigation measures outlined in the 2011 MDP as well as mitigation measures further upstream, from Violet to Broadway. Then, the September 2013 flood occurred, effectively halting further development of the CEAP document.

The September 2013 flood event produced high quantities of sediment, spill flows outside of the channel, and impassable roadways in the Fourmile Canyon Creek drainageway and created incentive for staff to revisit the mitigation measures outlined in the 2011 MDP. It also gave an incentive to revisit mitigation measures west of Broadway to see if new alternatives were feasible. Staff reviewed the 2011 MDP alternatives and investigated further options for spill flow control, sediment capture, and large scale detention ponds.

The existing Fourmile Canyon Creek floodplain between Violet and Upland Avenue extends beyond the creek channel, resulting in:

- One fire station in the 500year floodplain,
- One residential structure in the high hazard zone, and
- Water depths along Violet Avenue and Upland Avenue that preclude safe vehicular access to and from Crest View Elementary during a major storm event.

Staff reviewed the following flood mitigation alternatives:

- FM1: Multiple Detention Facilities
- FM2: Single Detention Facility
- FM3: Fourmile Canyon Creek 100-year Channel Improvements
- FM4: Spill Flow Diversion to Wonderland Creek
- FM5: Fourmile Canyon Creek 50-year Channel Improvements
- FM6: Fourmile Canyon Creek Sediment Capture Facility
- FM7: 2011 MDP recommendations

In 2012, a CEAP was developed for Fourmile Canyon Creek from 19th to 22nd Street that proposed alternatives for flood improvements, emergency access improvements, as well as pedestrian and bicycle access. The selected alternative includes an underpass at 19th Street that will allow the passage of the 100-year flood, as well as a grade-separated multi-use path. Construction of these improvements is anticipated to begin in 2016-2017. This CEAP will also evaluate alternatives for extending the multi-use path that was approved in the 2012 CEAP. Staff reviewed the following path alignment alternatives:

- Option 1: Connection to Countryside Village (mobile home park)
- Option 2A: North Alignment through Violet Park

- Option 2B: South Alignment through Violet Park
- Option 3A: Connect Upland to Violet via Fourmile Canyon Creek
- Option 3B: Connect Upland to Violet via 17th Alignment
- Option 3C: Connect Upland to Violet via South Alignment on Violet Avenue
- Option 3D: Connect Upland to Violet via North Alignment on Violet Avenue

STAFF RECOMMENDATION

Based on analysis that will be presented in this CEAP, the primary recommendation from City of Boulder staff is to pursue the recommendations outlined in the 2011 Major Drainageway Plan. These include replacing existing culverts under Violet and Upland Avenue, modifying the channel between these culverts to eliminate high hazard zone risk, and allowing for safe vehicular access to Crest View Elementary School. Sediment capture is recommended within Violet Park and staff recommends path alignment options 1, 2A, and 3A.

This approach allows for uninterrupted access to both the fire station and Crestview Elementary and the potential for the Fourmile Canyon Creek multi-use trail to be integrated into the flood improvements including trail underpasses at Violet Avenue, Upland Avenue, and 19th Street. Improvements have been budgeted in the Greenways and Flood Utility Capital Improvement Programs (CIP).