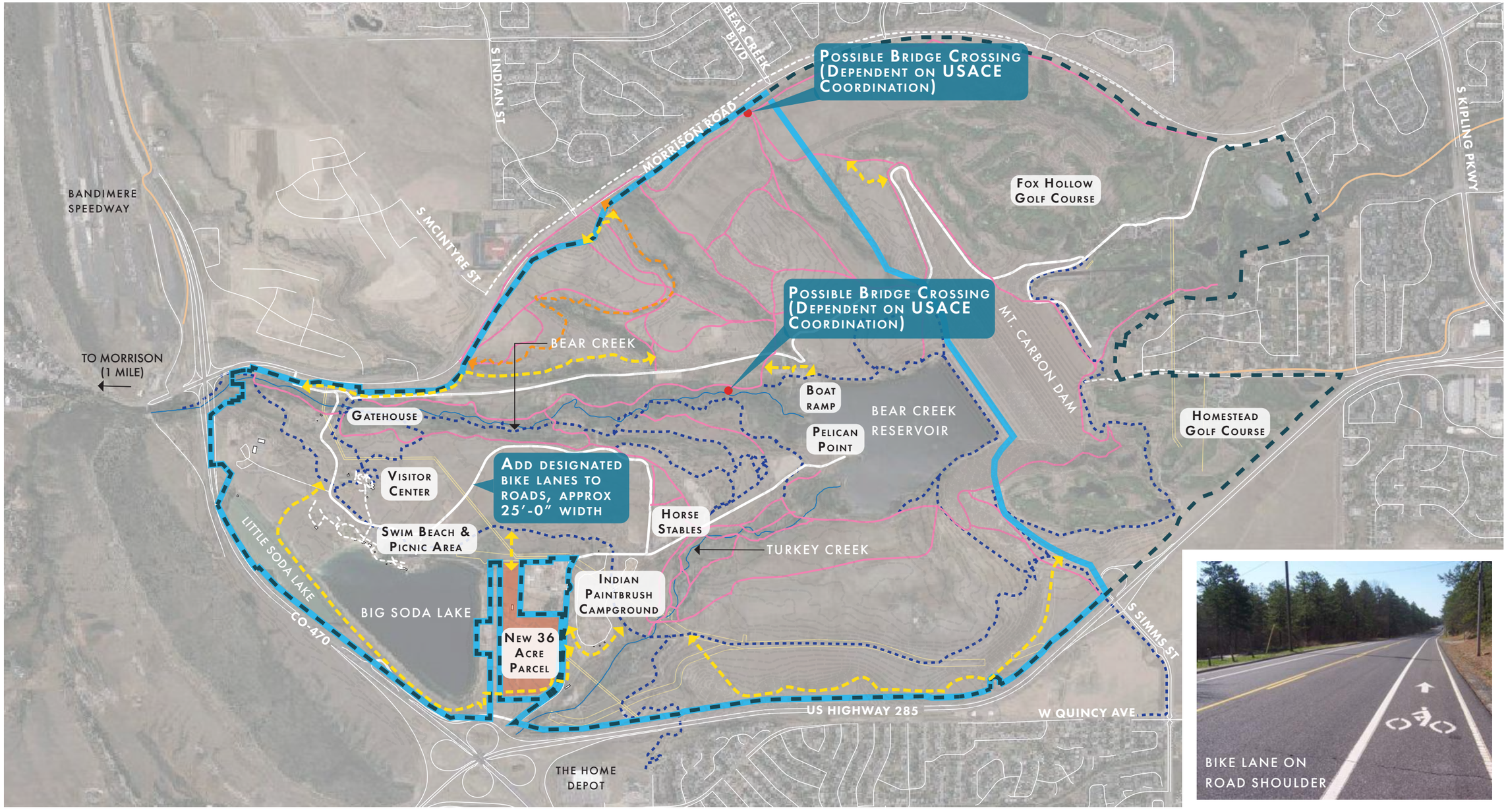


LEGEND

- Park Boundary
- Project Study Area
- Building/Structure
- Sidewalks
- New Bridge Crossing

Trail Keymap

- Hiking/Biking use only
- Hiking, Biking and Equestrian
- Connecting Trails
- Potential New Trail Connections*
- Existing Ditch Trail to be Formalized

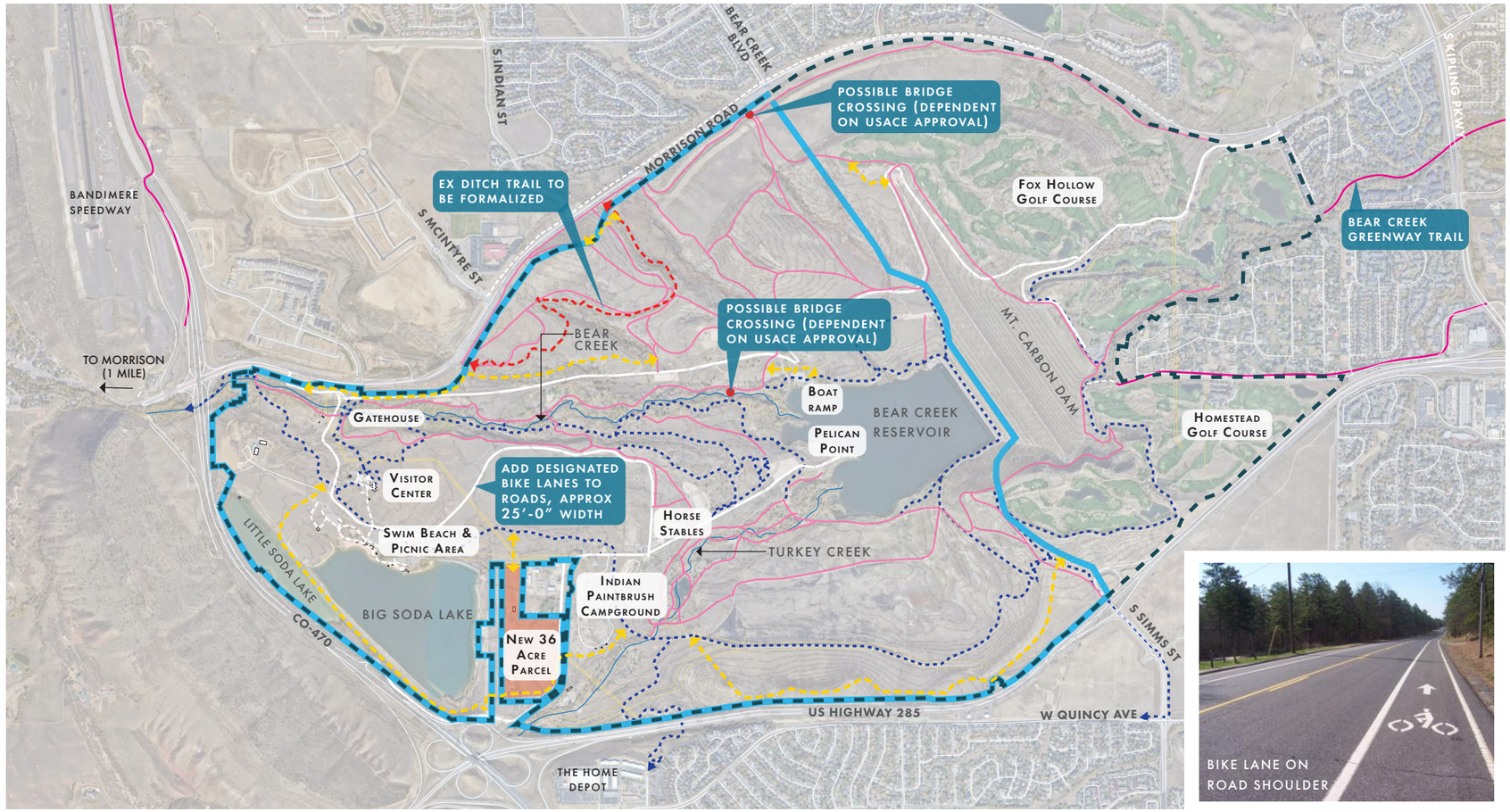
*Notes:

1. Potential new trail connections were determined in part by using the following references: *The Guidelines for A Quality Trail Experience* published by the International Mountain Bicycling Association (IMBA), *The Trails Development Handbook* by Jefferson County Open Space, and planning and design guidelines by the City of Lakewood.
2. Bear Creek Lake Park has approximately 21+ miles of trail within the project study area (approx 1733 acres). Most resources recommend 1 mile of trail per 35-50 acres of land.
3. 7 new trails are proposed with an appoximate length total length of 5-5.5 miles.
4. Maintain trail system for safety: Repair paved trails, maintain soft surface trails and repair rutting, provide more regular mowing.

0 1400 2800 Feet

CONCEPT - TRAILS

DRAFT CONCEPT



WALKING

HORSEBACK RIDING

LEGEND

- Easements
- Park Boundary
- Project Study Area
- Building/Structure
- Sidewalks
- Roads
- Possible New Bridge Crossing

Trail Keymap

- Hiking/Biking use only
- Hiking, Biking and Equestrian
- Connecting Trails
- Potential New Trail Connections*
- Existing Ditch Trail to be Formalized

*Notes:

1. Potential new trail connections were determined in part by using the following references: *The Guidelines for A Quality Trail Experience* published by the International Mountain Bicycling Association (IMBA), *The Trails Development Handbook* by Jefferson County Open Space, and planning and design guidelines by the City of Lakewood.
2. 7 new trails are proposed with an appoximate total length of 5-5.5 miles.
3. Maintain trail system for safety: Repair paved trails, maintain soft surface trails and repair rutting, provide more regular mowing.

0 1400 2800 Feet

ENTRY LEVEL MOUNTAIN BIKING

SOFT SURFACE TRAILS

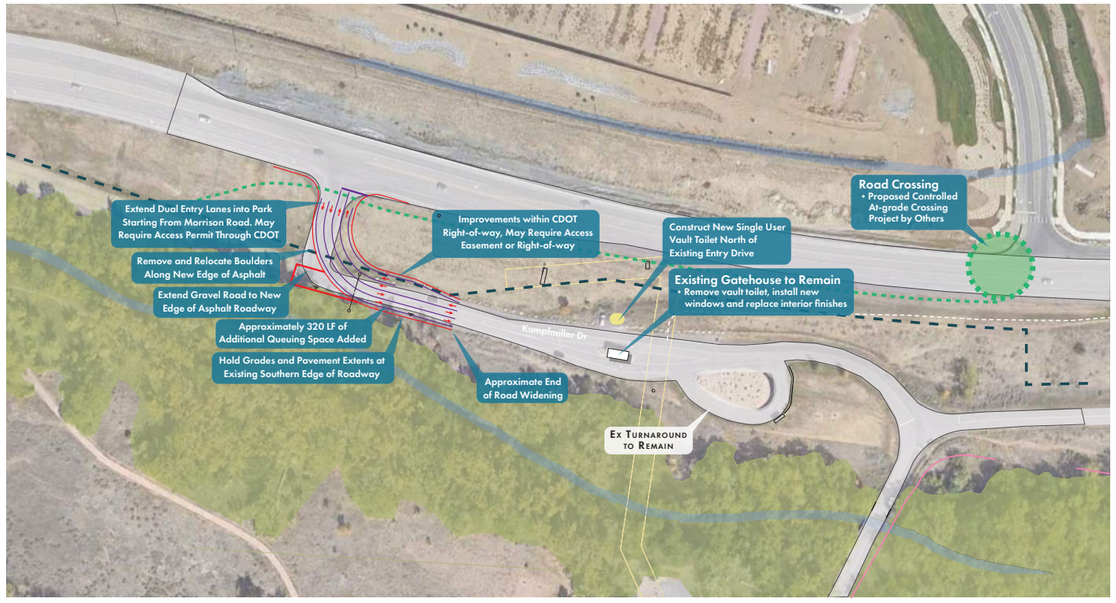
BEAR CREEK LAKE PARK - OPEN HOUSE 2 - TRAILS

Lakewood Community Resources

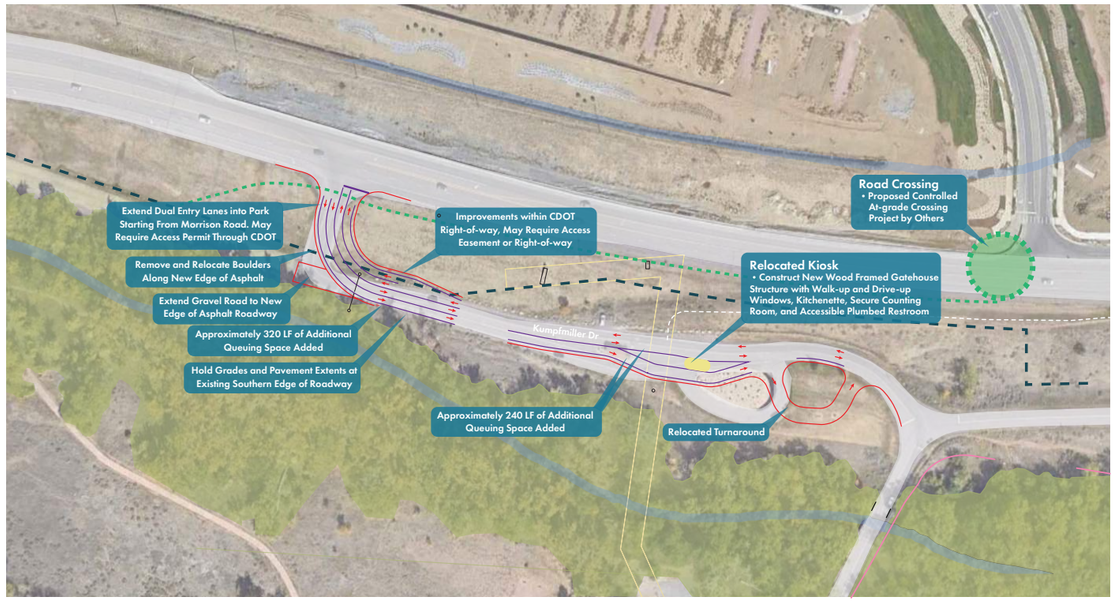
DHM DESIGN

MARCH 27, 2024

PREFERRED FOR PUBLIC INPUT



SITE ANALYSIS - GATEHOUSE / ENTRY TO PARK



SITE ANALYSIS - GATEHOUSE / ENTRY TO PARK

DRAFT CONCEPTS

ENTRY TURNAROUND

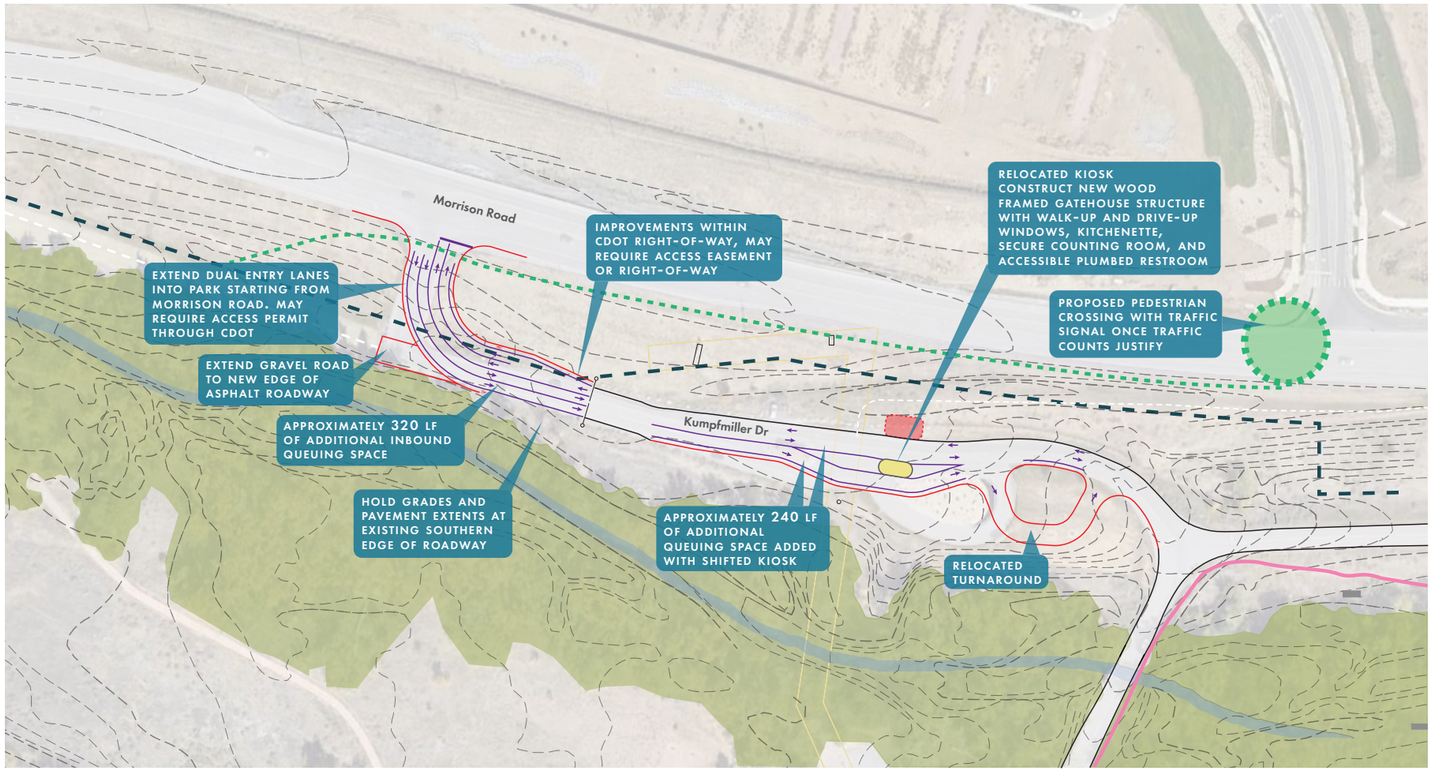
ENTRY TURNAROUND

OVERALL VIEW OF ENTRANCE AND GATEHOUSE

ENTRY

ENTRY GATE HOUSE

ENTRY SIGNAGE



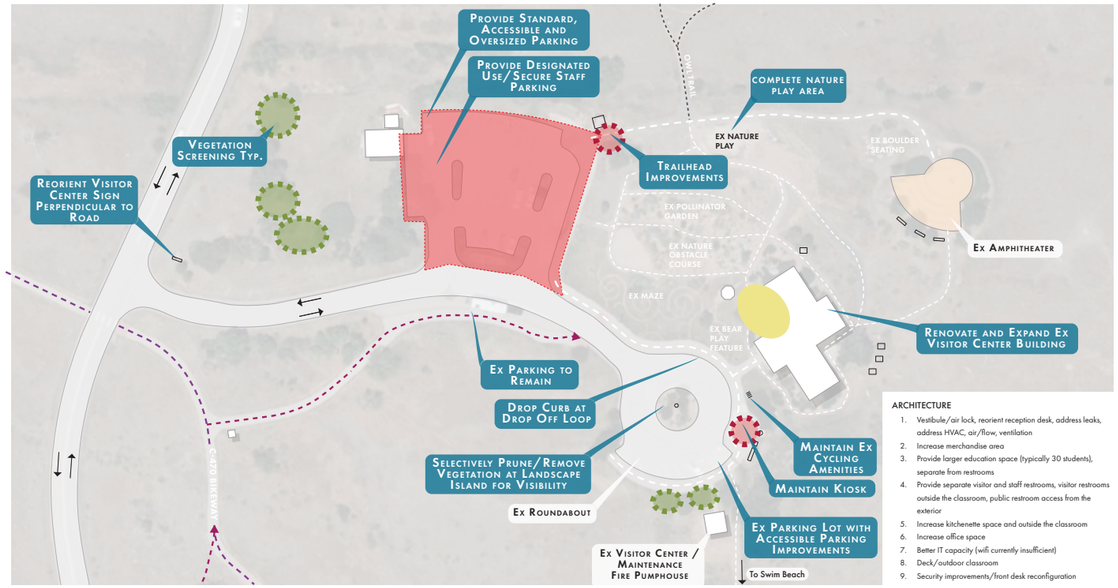
BEAR CREEK LAKE PARK - OPEN HOUSE 2 - GATEHOUSE / ENTRY TO PARK

Lakewood Community Resources

DHM DESIGN

MARCH 27, 2024

PREFERRED FOR PUBLIC INPUT



ARCHITECTURE

1. Vestibule/air lock, reorient reception desk, address leaks, address HVAC, air flow, ventilation
2. Increase merchandise area
3. Provide larger education space (typically 30 students), separate from restrooms
4. Provide separate visitor and staff restrooms, visitor restrooms outside the classroom, public restroom access from the exterior
5. Increase kitchenette space and outside the classroom
6. Increase office space
7. Better IT capacity (wifi currently insufficient)
8. Deck/outdoor classroom
9. Security improvements/front desk reconfiguration

UTILITY IMPROVEMENTS

Water: Connect to municipal system. Address leaking tank at Mainance Fire Pumphouse. Increase fire supression system.
Wastewater: Connect to municipal system.
Drainage: Regrade pavement at main entrance and/or install an ADA compliant trench drain. Clean out existing curb cuts/sidewalk chases.
Electrical/Communication: Electrical and communications work needed at expanded visitor center. Increase IT capacity.

LANDSCAPE ARCHITECTURE

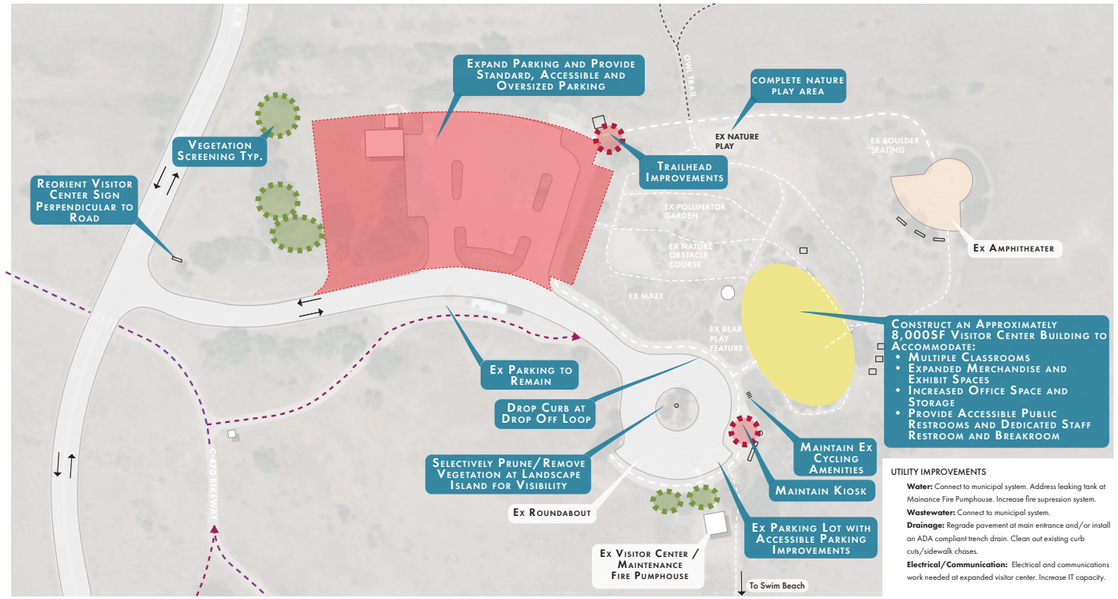
1. Crack filling, seal coating and restriping of the parking areas and road.
2. Provide localized repair and leveling of concrete walk sections.
3. Maintain outdoor programmed spaces and fully develop additional planned/ programmed areas.
4. Maintain site amenities in good condition.
5. Provide safe access from the Meadowlark Cove Picnic Area parking lot to the VC for overflow parking.

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Soft Surface Trails
Ex Paved Trails
Ex Paved Bike Trail
Ex Owl Trail
Proposed Trail
Vegetation Screening
Building/Structure
Parking

0 60 120 Feet

CONCEPT 1 - VISITOR CENTER & VISITOR CENTER MAINTENANCE FIRE PUMPHOUSE



UTILITY IMPROVEMENTS

Water: Connect to municipal system. Address leaking tank at Mainance Fire Pumphouse. Increase fire supression system.
Wastewater: Connect to municipal system.
Drainage: Regrade pavement at main entrance and/or install an ADA compliant trench drain. Clean out existing curb cuts/sidewalk chases.
Electrical/Communication: Electrical and communications work needed at expanded visitor center. Increase IT capacity.

ARCHITECTURE

1. Reorient reception desk.
2. Increase mechandise area, kitchenette, and office space.
3. Provide larger education space, seperate from restrooms
4. Include public restroom access from exterior
5. Include a desk or patio and outdoor classroom.

LANDSCAPE ARCHITECTURE

1. Crack filling, seal coating and restriping of the parking areas and road.
2. Provide localized repair and leveling of concrete walk sections.
3. Maintain outdoor programmed spaces and fully develop additional planned/ programmed areas.
4. Maintain site amenities in good condition.
5. Provide designated use/secures staff parking at Maintenance Yard.
6. Provide safe access from the Meadowlark Cove Picnic Area parking lot to the Visitor Center for overflow parking

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Soft Surface Trails
Ex Paved Trails
Ex Paved Bike Trail
Ex Owl Trail
Proposed Trail
Vegetation Screening
Building/Structure
Parking

0 60 120 Feet

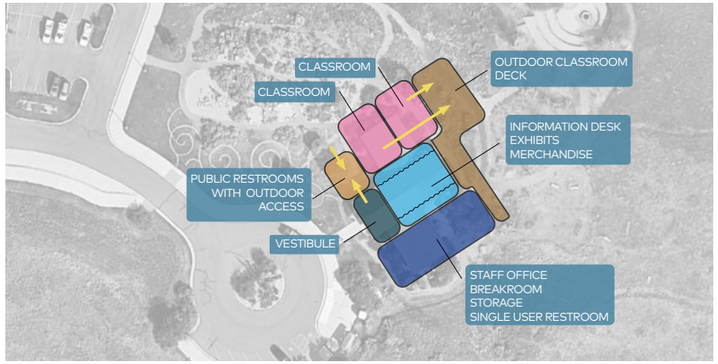
CONCEPT 2 - VISITOR CENTER & VISITOR CENTER MAINTENANCE FIRE PUMPHOUSE

DRAFT CONCEPTS

VISITOR CENTER ENTRANCE

VISITOR CENTER REAR ENTRANCE

ROUNDABOUT LANDSCAPE ISLAND



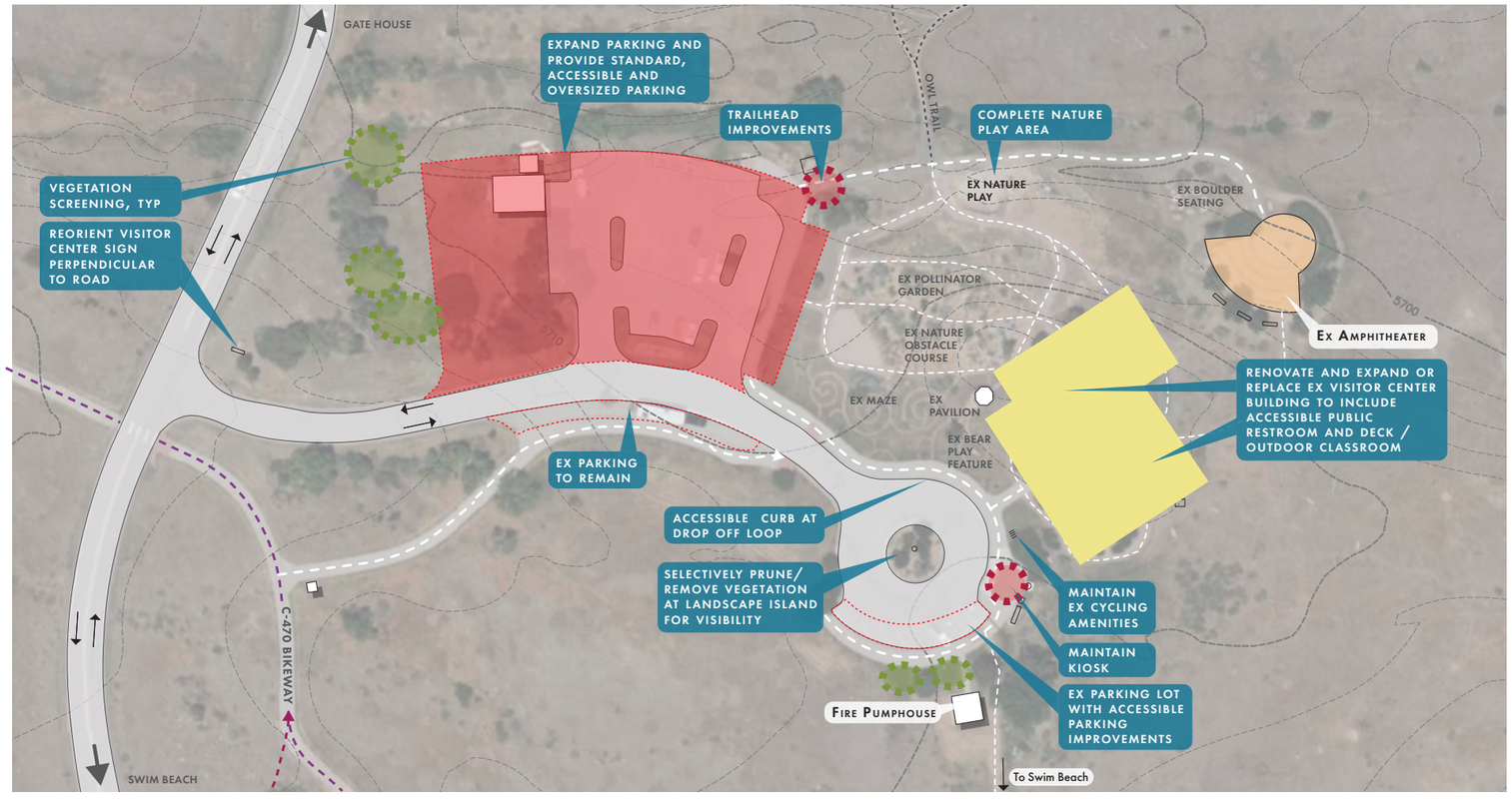
VISITOR CENTER BLOCKING DIAGRAM

ACCESS

VISITOR CENTER TRAILHEAD AND PORT-O-LET

VISITOR CENTER TRAILHEAD ACCESSIBLE PARKING

VISITOR CENTER ACCESSIBLE PARKING AT ROUNDABOUT



LEGEND

- Ex Contour Major
- Ex Contour Minor
- Ex Building/Structure
- Ex Road
- Ex Soft Surface Trails
- Ex Paved Trails
- Ex Paved Bike Trail
- Ex Owl Trail
- Proposed Trail
- Vegetation Screening
- Building/Structure
- Parking
- Improvements
- Traffic Arrows

0 60 120 Feet

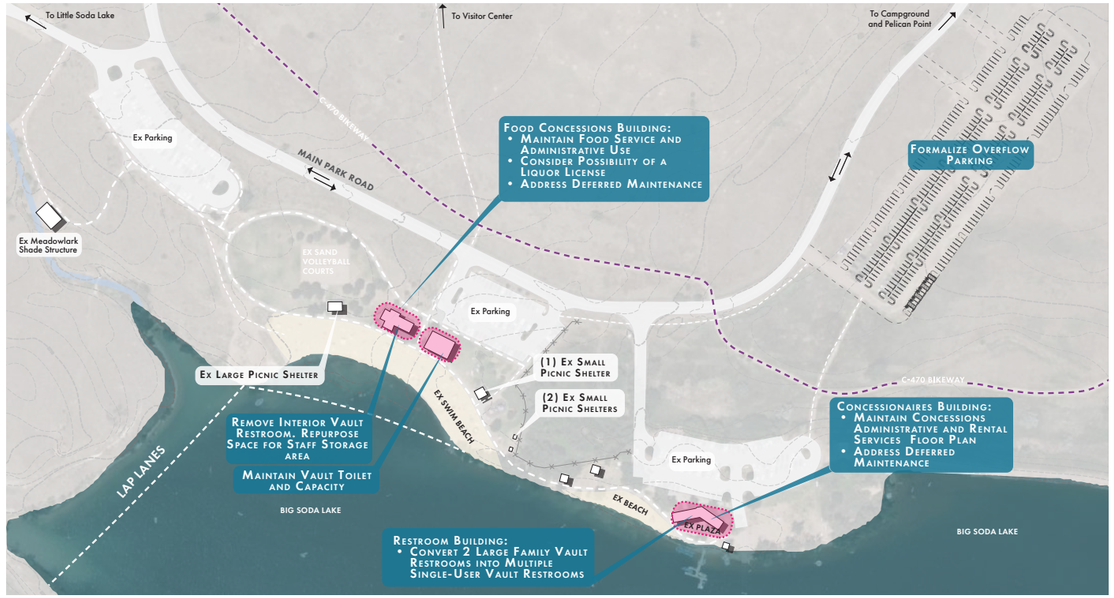
BEAR CREEK LAKE PARK - OPEN HOUSE 2 - VISITOR CENTER AND FIRE PUMPHOUSE

Lakewood Community Resources

DHM DESIGN

MARCH 27, 2024

PREFERRED FOR PUBLIC INPUT



LEGEND

Ex Contour Major, Ex Contour Minor, Ex Building/Structure, Ex Road, Ex Soft Surface Trails, Ex Paved Trails, Ex Paved Bike Trail, Ex Two Rail Split Fence, Ex Gate, Ex Beach, Improvements to Structures, FWS Wetland Type, Lake

CONCEPT 1 - BIG SODA LAKE (SWIM BEACH AND MARINA)

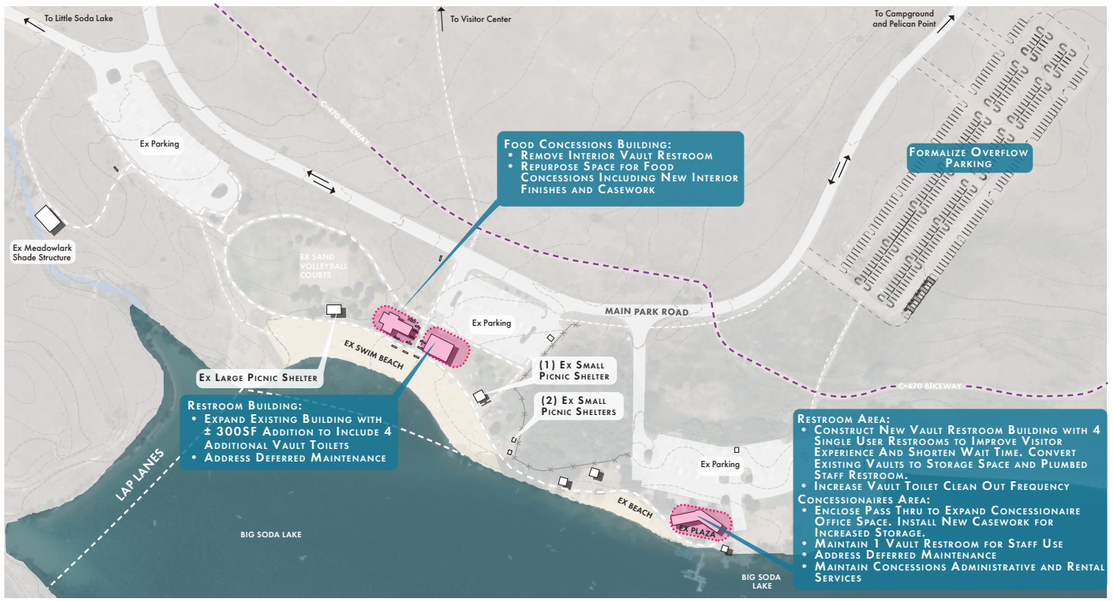
UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: Address existing ponding areas/low points with re-grading.
Electrical/Communication: Improve Overall Electrical Capacity and Wifi

ARCHITECTURE

1. Include assessment of ranger station needed improvements.
2. Address deferred maintenance of all existing structures: Replace deteriorated siding and trim, install sealant and paint. Repair/replace damaged interior finishes and casework

0 140 280 Feet



LEGEND

Ex Contour Major, Ex Contour Minor, Ex Building/Structure, Ex Road, Ex Soft Surface Trails, Ex Paved Trails, Ex Paved Bike Trail, Ex Two Rail Split Fence, Ex Gate, Ex Beach, Improvements to Structures, FWS Wetland Type, Lake

CONCEPT 2 - BIG SODA LAKE (SWIM BEACH AND MARINA)

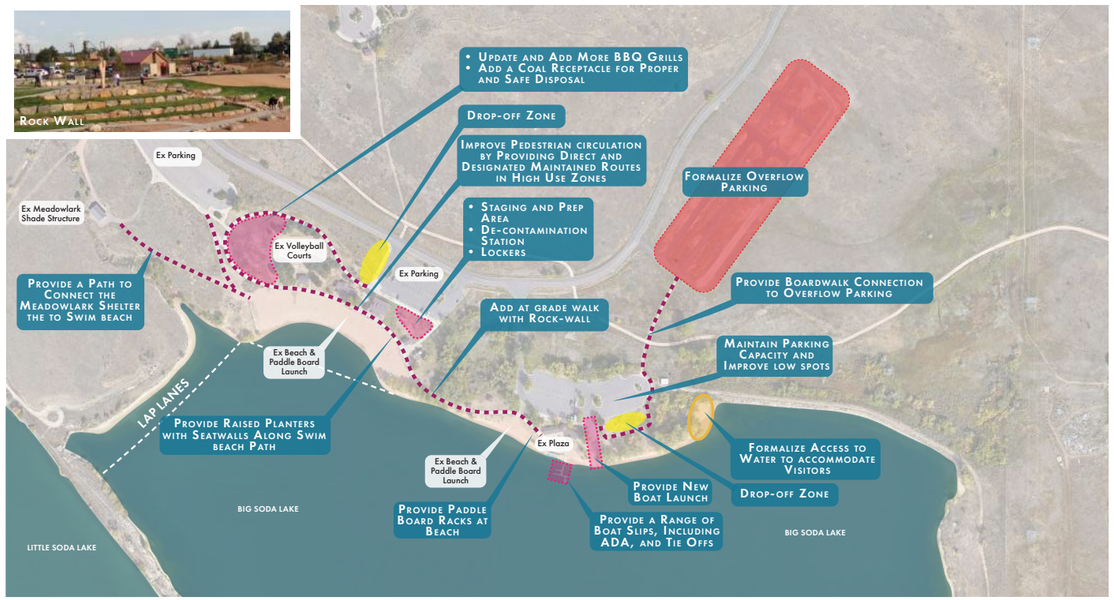
UTILITY IMPROVEMENTS

Electrical: Increase electrical capacity
Water: Provide Water
Wastewater: Plumb Facilities
Drainage:
Electrical/Communication: Update wifi and Communications.

ARCHITECTURE

1. Include assessment of ranger station needed improvements.
2. Address deferred maintenance of all existing structures: Replace deteriorated siding and trim, install sealant and paint. Repair/replace damaged interior finishes and casework.

0 140 280 Feet



LEGEND

Proposed Trail/ Trail Improvements, Drop-off Zone, Improvement, Parking, Water Access

CONCEPT 1 - BIG SODA LAKE (SWIM BEACH AND MARINA)

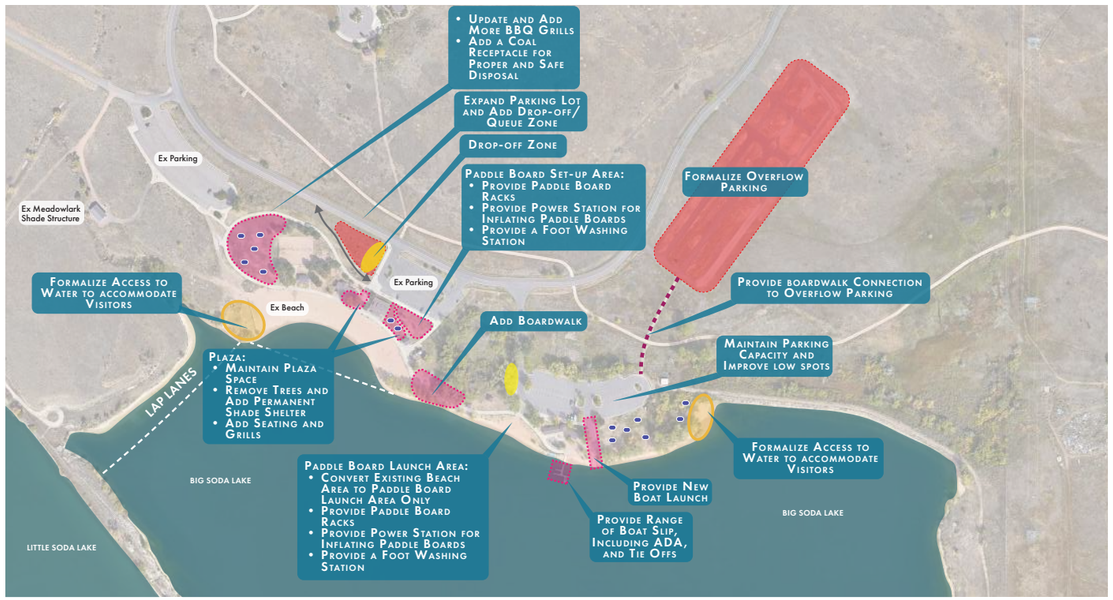
UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: Address existing ponding areas/low points with re-grading.
Electrical/Communication: None

LANDSCAPE ARCHITECTURE/NOTES

1. Address areas of undercutting, spalling, settling and uplift of concrete. Address low points in paving.
2. Work towards ADA recommendations.
3. Ensure positive drainage.
4. Provide a designated emergency staging area
5. Maintain current dog policy.
6. Assess and consider smoking zones.

0 140 280 Feet



LEGEND

Proposed Trail/ Trail Improvements, Traffic Flow, Drop-off Zone, Improvement, Parking, Water Access, Shade Structure

CONCEPT 2 - BIG SODA LAKE (SWIM BEACH AND MARINA)

UTILITY IMPROVEMENTS

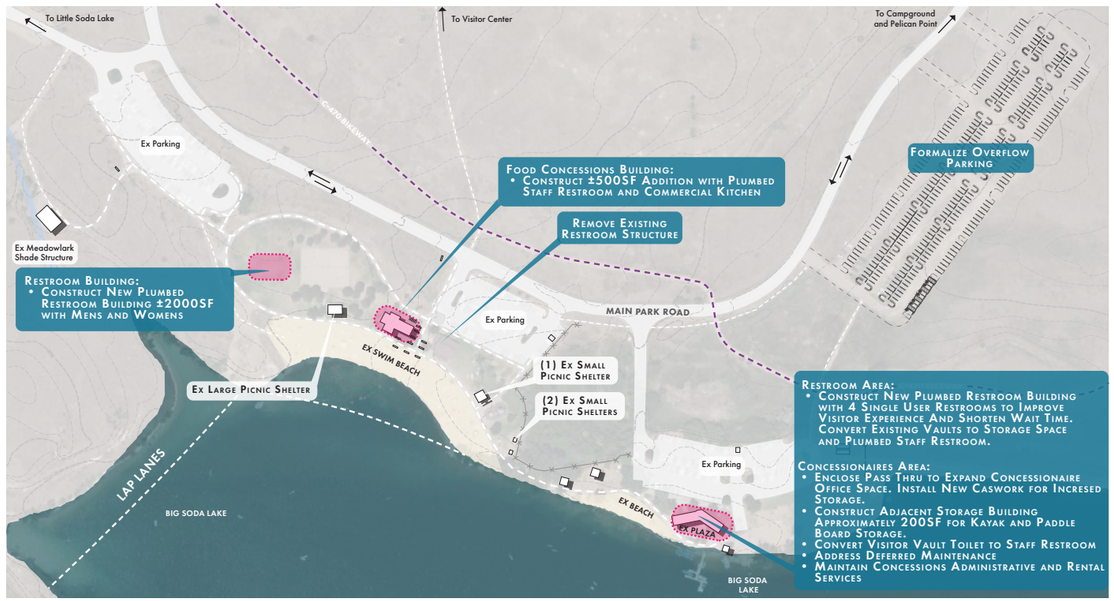
Water: Provide sewer connection to plumbed facilities.
Wastewater: Provide sewer connection to plumbed facilities.
Drainage: Address existing ponding areas/low points with re-grading.
Electrical/Communication: None.

LANDSCAPE ARCHITECTURE / NOTES:

1. Address areas of undercutting, spalling, settling and uplift of concrete. Address low points in paving.
2. Work towards ADA recommendations.
3. Ensure positive drainage.
4. Provide a designated emergency staging area
5. Maintain current dog policy.
6. Assess and consider smoking zones.

0 140 280 Feet

DRAFT CONCEPTS



LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Soft Surface Trails
Ex Paved Trails
Ex Paved Bike Trail
Ex Two Rail Split Fence
Ex Gate
Ex Beach
Improvements to Structures
FWS Wetland Type
Lake

CONCEPT 3 - BIG SODA LAKE (SWIM BEACH AND MARINA)

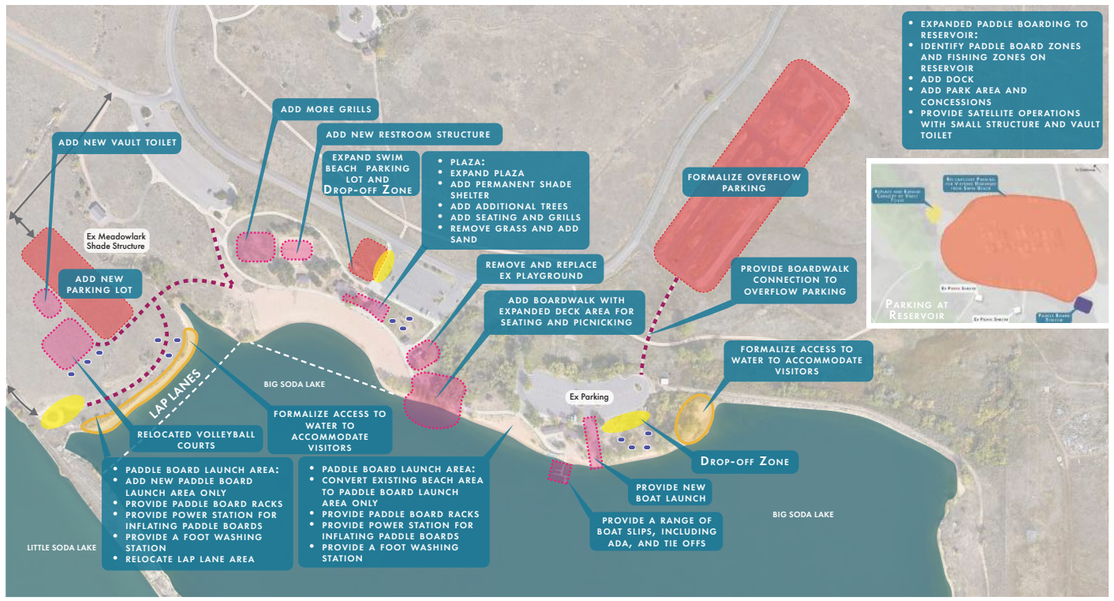
UTILITY IMPROVEMENTS

Electrical: Increase electrical capacity
Water: Provide Water
Wastewater: Plumb Facilities
Drainage:
Electrical/Communication: Update wifi and Communications.

ARCHITECTURE

1. Include assessment of ranger station needed improvements.
2. Address deferred maintenance of all existing structures: Replace deteriorated siding and trim, install sealant and paint. Repair/replace damaged interior finishes and casework.

0 140 280 Feet



LEGEND

Proposed Trail/ Trail Improvements
Traffic Flow
Drop-off Zone
Improvement
Parking
Water Access
Shade Structure

CONCEPT 3 - BIG SODA LAKE (SWIM BEACH AND MARINA)

UTILITY IMPROVEMENTS

Water: Provide sewer connection to plumbed facilities.
Wastewater: Provide sewer connection to plumbed facilities.
Drainage: Address existing ponding areas/low points with re-grading.
Electrical/Communication: None.

LANDSCAPE ARCHITECTURE / NOTES:

1. Address areas of undercutting, spalling, settling and uplift of concrete. Address low points in paving.
2. Assess areas to convert to artificial turf.
3. Work towards ADA recommendations.
4. Ensure positive drainage.
5. Provide a designated emergency staging area
6. Maintain current dog policy.
7. Assess and consider smoking zones.

0 140 280 Feet

DRAFT CONCEPTS

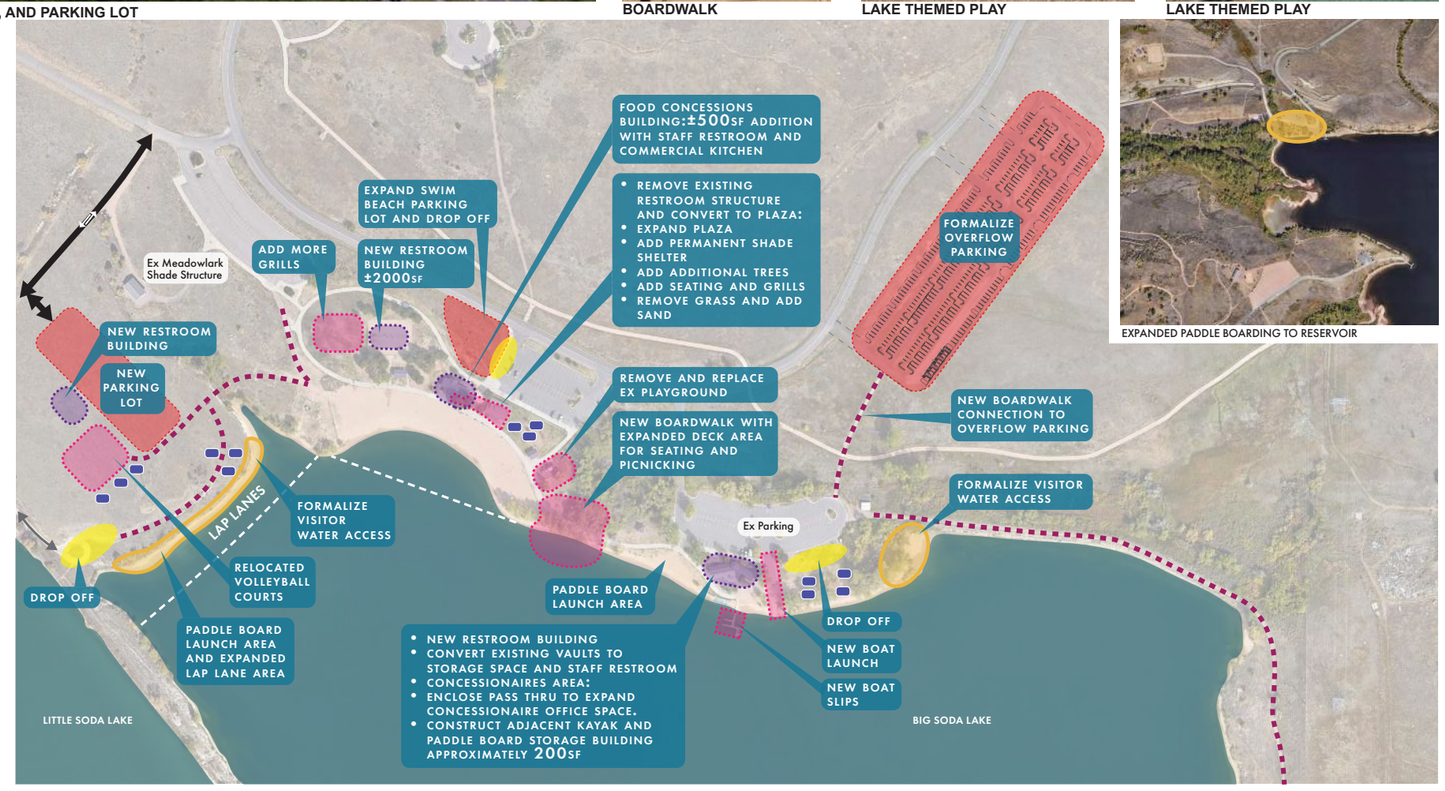
OVERALL VIEW OF SWIM BEACH, AMENITIES, AND PARKING LOT

BOARDWALK OVER LAKE

FOOT WASHING STATION

PADDLE BOARD POWER STATION

EXISTING SHADE STRUCTURE



EXPANDED PADDLE BOARDING TO RESERVOIR

BOARDWALK

LAKE THEMED PLAY

LAKE THEMED PLAY

WATER PLAY

PLAY STRUCTURE

ACCESSIBLE KAYAK LAUNCH

LEGEND

- Proposed Trail/ Trail Improvements
- Traffic Flow
- Drop-off Zone
- Improvement
- Parking
- Water Access
- Shade Structure
- Road

PADDLE BOARD LAUNCH AREA NOTES:

1. Convert existing Marina beach area to paddle board launch area only.
2. Provide paddle board racks.
3. Provide power station for inflating paddle boards.
4. Provide a foot wash station.

EXPANDED PADDLE BOARDING TO RESERVOIR NOTES:

1. Identify paddle board zones and fishing zones at reservoir.
2. Provide satellite concessions operations with small structure, vault toilet, and dock.

0 140 280 Feet

SEATING, BANK STABILIZATION, BEACH ACCESS

BOAT LAUNCH

KAYAK DOCK & BOAT LAUNCH

SHADE STRUCTURE

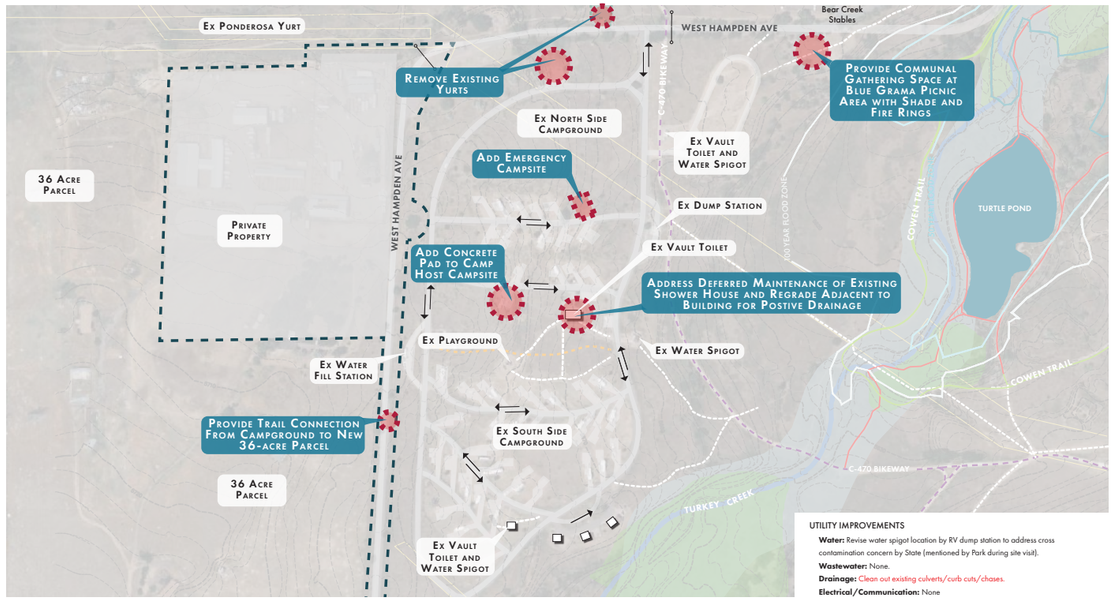
BEAR CREEK LAKE PARK - OPEN HOUSE 2 - BIG SODA LAKE (SWIM BEACH AND MARINA)

Lakewood Community Resources

DHM DESIGN

MARCH 27, 2024

PREFERRED FOR PUBLIC INPUT



UTILITY IMPROVEMENTS

Water: Revise water spigot location by RV dump station to address cross contamination concern by State (mentioned by Park during site visit).

Wastewater: None.

Drainage: Clean out existing culverts/curb cuts/chases.

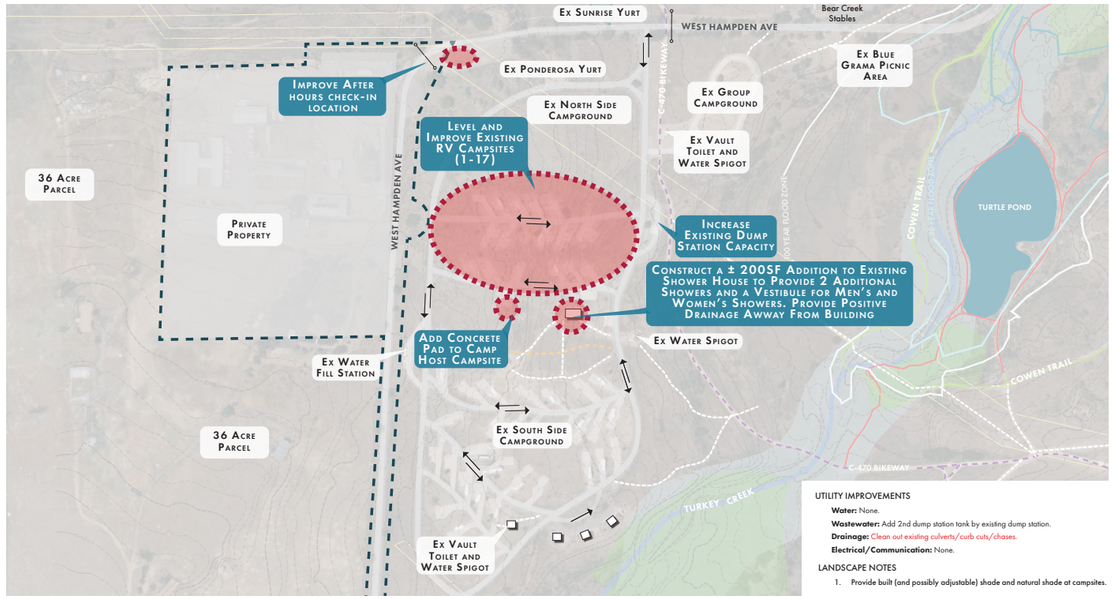
Electrical/Communication: None

LEGEND

Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex Private Property
20 Year Storm
50 Year Storm
100 Year Storm
Improvements
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

0 200 400 Feet

CONCEPT 1 - INDIAN PAINTBRUSH CAMPGROUND



UTILITY IMPROVEMENTS

Water: None.

Wastewater: Add 2nd dump station tank by existing dump station.

Drainage: Clean out existing culverts/curb cuts/chases.

Electrical/Communication: None.

LANDSCAPE NOTES

1. Provide built (and possibly adjustable) shade and natural shade at campsites.

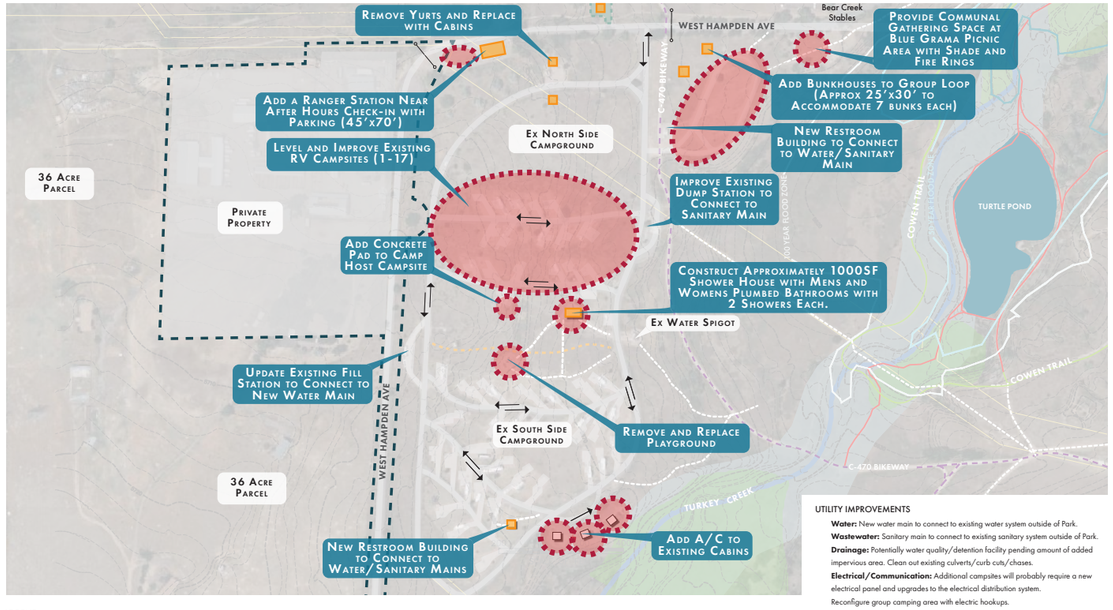
LEGEND

Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex Private Property
20 Year Storm
50 Year Storm
100 Year Storm
Improvements
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

0 200 400 Feet

CONCEPT 2 - INDIAN PAINTBRUSH CAMPGROUND

DRAFT CONCEPTS



UTILITY IMPROVEMENTS

Water: New water main to connect to existing water system outside of Park.

Wastewater: Sanitary main to connect to existing sanitary system outside of Park.

Drainage: Potentially water quality/detention facility pending amount of added impervious area. Clean out existing culverts/curb cuts/chases.

Electrical/Communication: Additional campsites will probably require a new electrical panel and upgrades to the electrical distribution system.

Reconfigure group camping area with electric hookups.

LEGEND

Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex Private Property
20 Year Storm
50 Year Storm
100 Year Storm
Improvements
New Structures
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

0 200 400 Feet

CONCEPT 3 - INDIAN PAINTBRUSH CAMPGROUND

OVERALL VIEW OF CAMPGROUND

CAMPSITE AMENITIES

GROUP TENT CAMPSITE

BACK-IN CAMPSITE WITH SHADE STRUCTURES THROUGHOUT CAMPGROUND

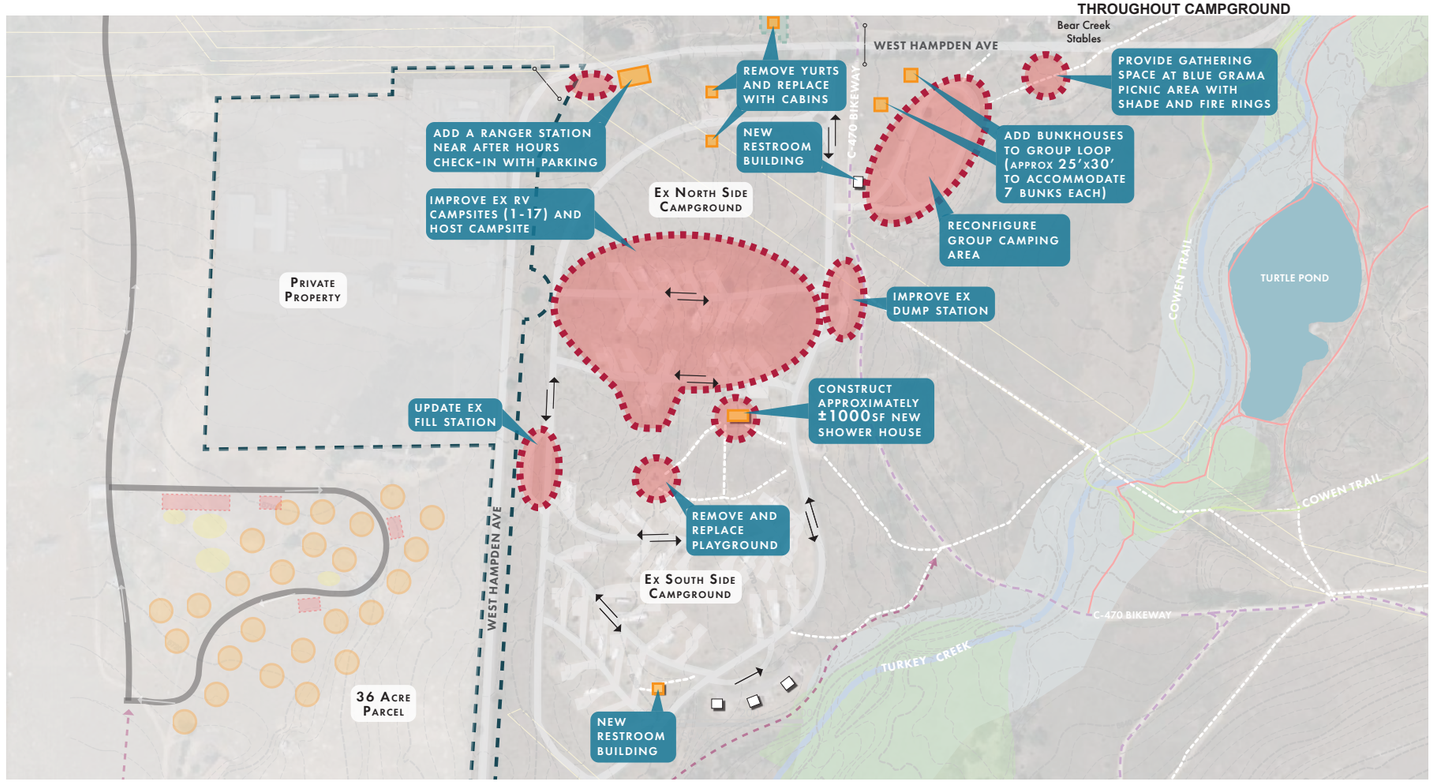
BACK-IN CAMPSITE

SHADE AT CAMPSITES

LARGE GROUP CAMPSITE SHADE STRUCTURE

LAKE THEMED PLAY

SHADED PICNIC TABLES



LEGEND

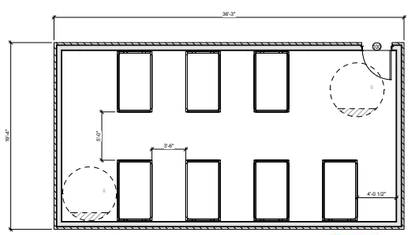
Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex Private Property
Improvements
New Buildings
Fish and Wildlife Service
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine

0 200 400 Feet

SHADED CLIMBING PLAY STRUCTURE

THEMED PLAYGROUND

CAMPING THEMED PLAY STRUCTURE



BUNK HOUSE DIAGRAM

BEAR CREEK LAKE PARK - OPEN HOUSE 2 - INDIAN PAINTBRUSH CAMPGROUND

Lakewood Community Resources

DHM DESIGN

MARCH 27, 2024

PREFERRED FOR PUBLIC INPUT

Utility Improvements

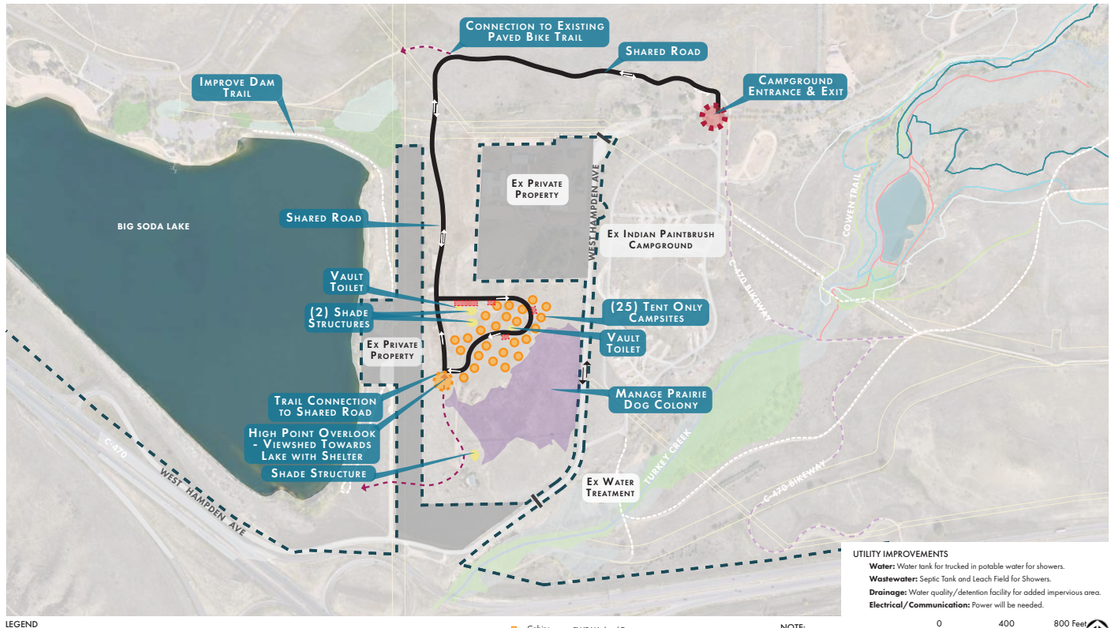
Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

LEGEND
Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex 50 Year Storm
Ex 100 Year Storm
Ex Private Property
Ex Prairie Dog Colony
Proposed Trail
Proposed Overlook
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine

NOTE:
1. Regrade and vegetate at removed buildings.

0 400 800 Feet

CONCEPT 1 - NEW 36 ACRE PARCEL - LAND ACQUISITION



Utility Improvements

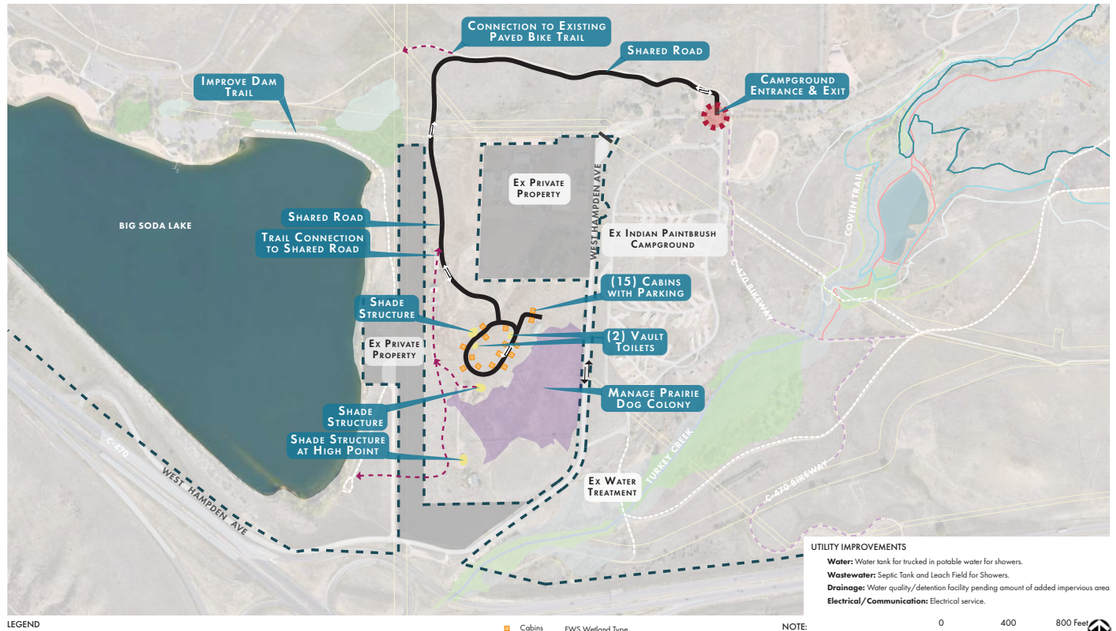
Water: Water tank for trucked in potable water for showers.
Wastewater: Septic Tank and Leach Field for Showers.
Drainage: Water quality/detention facility for added impervious area.
Electrical/Communication: Power will be needed.

LEGEND
Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex 50 Year Storm
Ex 100 Year Storm
Ex Private Property
Proposed Trail
Ex Prairie Dog Colony
Road
Cabins
Structure
Parking
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine

NOTE:
1. Regrade and vegetate at removed buildings.

0 400 800 Feet

CONCEPT 2 - NEW 36 ACRE PARCEL - LAND ACQUISITION



Utility Improvements

Water: Water tank for trucked in potable water for showers.
Wastewater: Septic Tank and Leach Field for Showers.
Drainage: Water quality/detention facility pending amount of added impervious area
Electrical/Communication: Electrical service.

LEGEND
Ex Park Boundary
Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Easements
Ex Soft Surface Trails
Ex Paved Bike Trail
Ex Cowen Trail
Ex Multi-use Trail
Ex 50 Year Storm
Ex 100 Year Storm
Ex Private Property
Proposed Trail
Ex Prairie Dog Colony
Road
Cabins
Structure
Parking
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine

NOTE:
1. Regrade and vegetate at removed buildings.

0 400 800 Feet

CONCEPT 3 - NEW 36 ACRE PARCEL - LAND ACQUISITION

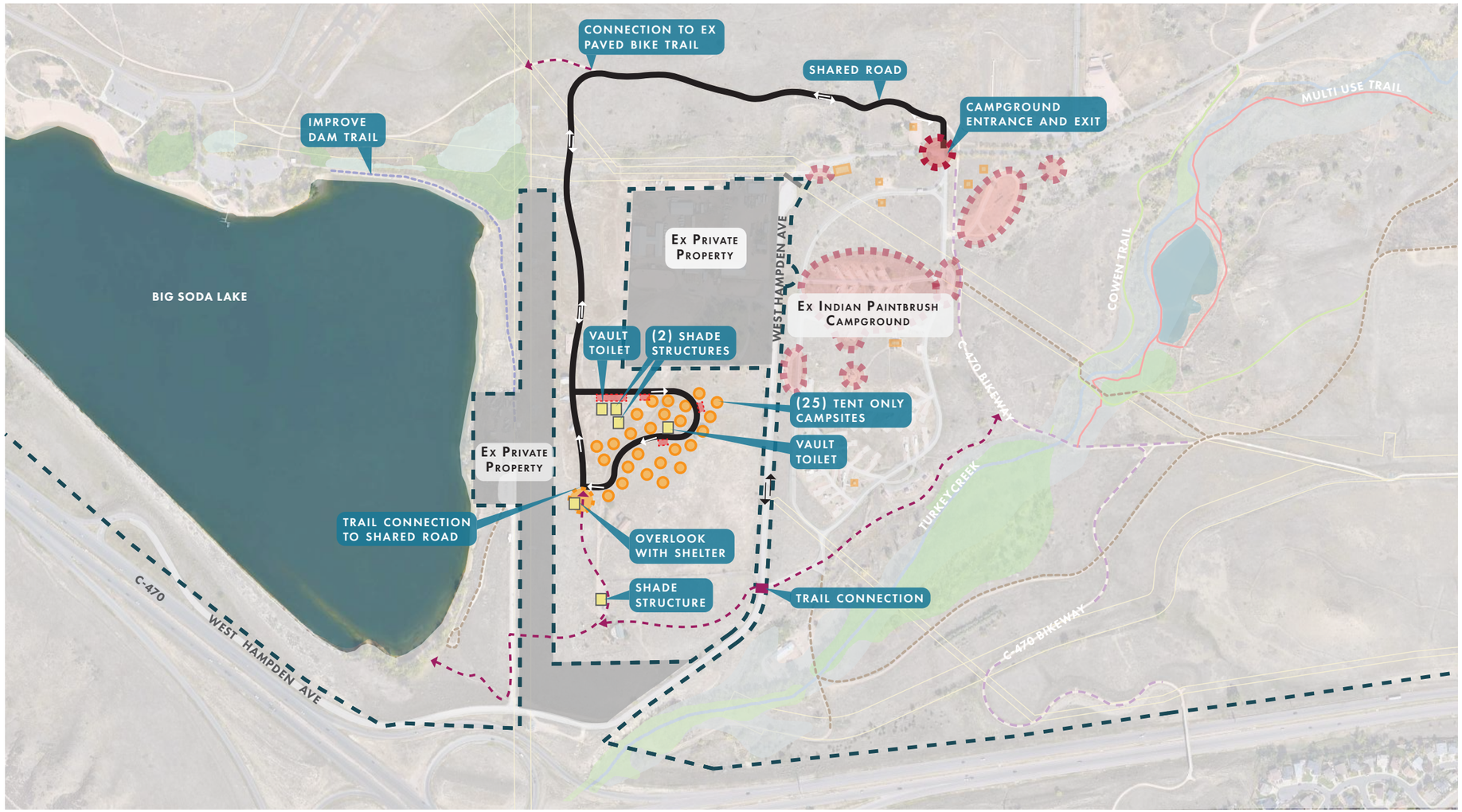
DRAFT CONCEPTS

OVERLOOK

PLAZA OVERLOOK

MEADOW LARK SHELTER

TENT CAMPSITE



LEGEND

- Ex Park Boundary
- Ex Road
- Ex Easements
- Ex Soft Surface Trails
- Ex Paved Bike Trail
- Ex Cowen Trail
- Ex Multi-use Trail
- Ex Private Property
- Proposed Trail
- Road
- Updated Trail
- Building/ Structure
- Parking
- Campsite

Fish and Wildlife Service

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

0 400 800 Feet

BEAR CREEK LAKE PARK - OPEN HOUSE 2 - 36 ACRE PARCEL

Lakewood Community Resources DHM DESIGN

MARCH 27, 2024

PREFERRED FOR PUBLIC INPUT

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Two Rail Split Fence
Ex Fence
Ex Soft Surface Trails
Cowen Trail
Mt. Carbon Loop
Multi-use Trail
20 Year Storm
50 Year Storm
100 Year Storm

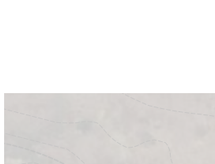
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Riverine

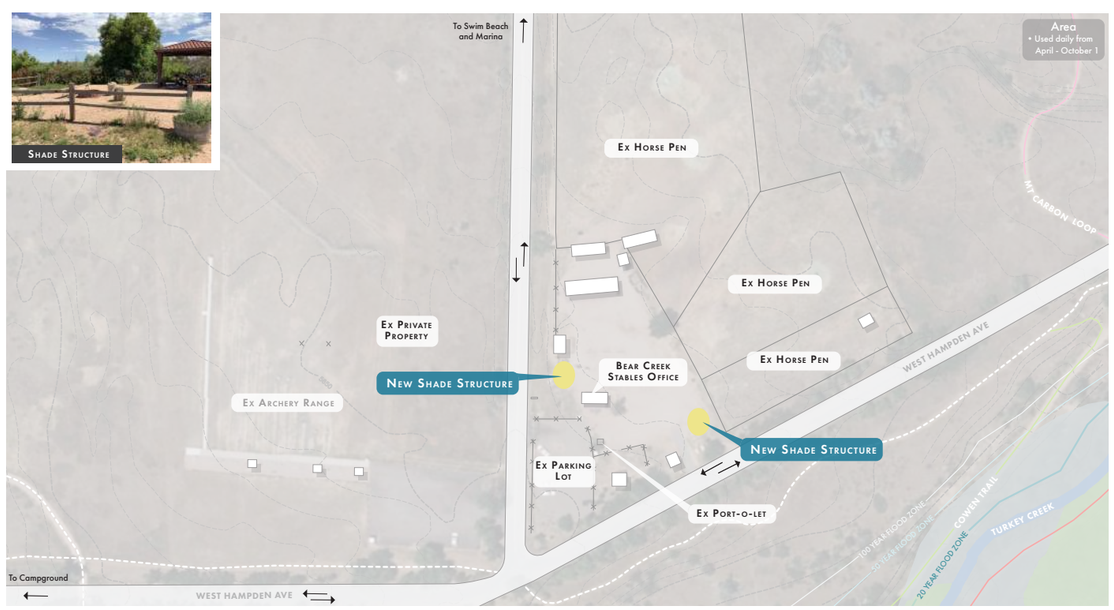
UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

0 80 160 Feet

CONCEPT 1 - BEAR CREEK STABLES





LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Two Rail Split Fence
Ex Fence
Ex Soft Surface Trails
New Structure
Cowen Trail
Mt. Carbon Loop
Multi-use Trail
20 Year Storm
50 Year Storm
100 Year Storm

FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Riverine

UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

0 80 160 Feet

CONCEPT 2 - BEAR CREEK STABLES

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Two Rail Split Fence
Ex Fence
Ex Soft Surface Trails
New Structure
New Cross walk
Cowen Trail
Mt. Carbon Loop
Multi-use Trail
20 Year Storm
50 Year Storm
100 Year Storm

FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Riverine

UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

0 80 160 Feet

CONCEPT 3 - BEAR CREEK STABLES

DRAFT CONCEPTS

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Soft Surface Trails
'83 Flood Pool
'93 Flood Pool
Improvements
Reservoir
FWS Riparian Type
Forested/Shrub Riparian

UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

NOTES

1. Water Reallocation TBD

0 40 80 Feet

CONCEPT 1 - REMOVE AND REPLACE BOAT RAMP - BEAR CREEK RESERVOIR BOAT RAMP

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Unpaved Road
Ex Soft Surface Trails
Ex Two Rail Split Fence
'83 Flood Pool
'93 Flood Pool
FWS Wetland Type
Freshwater Emergent Wetland
Freshwater Pond
Improvements
New Structure
Paddle Board Station

UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

0 80 160 Feet

CONCEPT 2 - BEAR CREEK RESERVOIR PELICAN POINT

LEGEND

Ex Contour Major
Ex Contour Minor
Ex Building/Structure
Ex Road
Ex Soft Surface Trails
'83 Flood Pool
'93 Flood Pool
New Structure
Reservoir
FWS Riparian Type
Forested/Shrub Riparian

UTILITY IMPROVEMENTS

Water: None.
Wastewater: None.
Drainage: None.
Electrical/Communication: None.

NOTES

1. Water Reallocation TBD

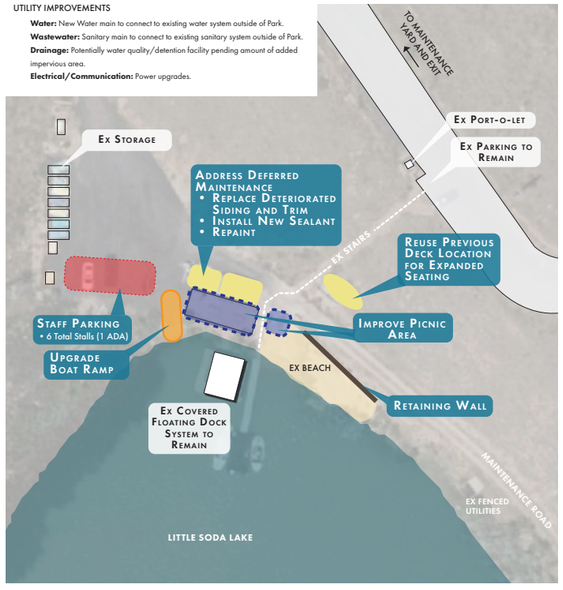
0 40 80 Feet

CONCEPT 2 - BEAR CREEK RESERVOIR BOAT RAMP

DRAFT CONCEPTS

UTILITY IMPROVEMENTS

Water: New Water main to connect to existing water system outside of Park.
Wastewater: Sanitary main to connect to existing sanitary system outside of Park.
Drainage: Potentially water quality/detention facility pending amount of added impervious area.
Electrical/Communication: Power upgrades.



Concept 1

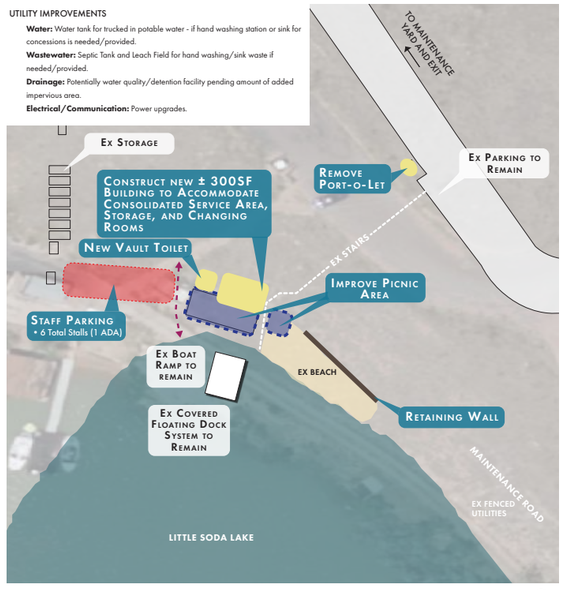
0 40 80 Feet

LEGEND

- Park Boundary
- Contour Major
- Contour Minor
- Building/Structure
- Unpaved Road
- Soft Surface Trails
- Beach
- Proposed Trail
- Parking
- Upgraded Boat Ramp
- Structure
- Improved Picnic Area
- FWS Wetland Type
- Lake

UTILITY IMPROVEMENTS

Water: Water tank for trucked in potable water - if hand washing station or sink for concessions is needed/provided.
Wastewater: Septic Tank and Leach Field for hand washing/sink waste if needed/provided.
Drainage: Potentially water quality/detention facility pending amount of added impervious area.
Electrical/Communication: Power upgrades.



Concept 2

0 40 80 Feet

LANDSCAPE ARCHITECTURE

1. Provide cyclical crack filling, seal coating and restriping of the parking area.
2. Maintain the stairs from the parking to facilities

LITTLE SODA LAKE - CONCEPTS

DRAFT CONCEPTS

BCLP Master Plan Advisory Committee Meeting

Tuesday, September 12 from noon to 1:30 p.m.

Meeting Objective

The Department of Community Resources has launched a year-long Bear Creek Lake Park master planning process to chart the course for the future of BLCP and create a sustainable vision that is equitable to all user groups and preserves the park's natural resources. The Department is working with the firm DHM Design to engage the community, evaluate current and future uses in the regional park, understand user needs and experiences, and present goals for the future. Once complete, the plan will address current challenges, determine strategies for meeting future demands and establish priorities for achieving BCLP visitor's shared vision.

Meeting Agenda

1. Overall introduction and welcome/get lunch started (City)
    a. Lakewood team introductions
2. Design team introductions
3. Stakeholder introductions
    a. Vision and project goals round table discussion – What is your vision or top priority for the park?
4. Project vision and goals (DHM)
5. Study area and overview of focus areas (DHM)
    a. High level overview of facilities conditions assessments
6. Review of public comments (DHM)
    a. Bar graphs
    b. Comments and key themes
7. What's next? (DHM)
    a. Open House #1; Wednesday, September 27 at 5:30 p.m. at BCLP Visitor Center
    b. Overall schedule and key milestones
8. Self-guided review of open house material

900 South Broadway, Suite 300 Denver, Colorado 80209 P: 303.892.5566 f: 303.892.4984

BCLP Master Plan Advisory Committee Meeting

Tuesday, September 12 from noon to 1:30 p.m.

Follow-up Items:

1. Depending on recommendations and implementation, do we need to validate the claim that the toilet vaults at the marina are leaking?
2. Discuss the idea of asking certain stakeholders to tackle their interest in the plan vs. the whole group providing feedback
3. How much do we need to cover in this plan regarding invasive species (plants and animals)?

Attendees:

City of Lakewood – Brad, Amber, Jim, Ross
Park – Grace, Lee, Kyle
Design Team in person – Michaela, Wells, Tracy

What does next 10 years at BCLP look like? Stakeholders Introductions and Responses:

- Save BCLP: Katie Gill, Liam Hopkins (also part of Colorado Reptilian/Amphibian Committee)
    - Started after hearing about reallocation proposal
    - Priority is to minimize impact to potential reallocation, zone of restoration, be involved with mitigation efforts if reallocation occurs
- Colorado Mountain Bike Assoc (COMBA) – Gary Moore, Gil McCormick
    - Gil is trails director
    - Priority - Hoping for more trails, better trails, trail management
- RMSW / RMP / Sue's Corner - Shawn Rodine
    - Top Priority = blue green algae removal
    - Growth has fluctuated, think it's related more to pandemic/weather than improvements to Park
- Runners Roost in Lakewood - Sonia Estes
    - Top priority – running, hiking, fitness trails and quality of those trails and accessibility to Park
- Rocky Mountain Paddleboard – Graham, General Manager
    - Priority – continue to be a hub for water sports
- Colorado Parks and Wildlife - Jerrie McKey
    - Priority - Maintain and keep wildlife habitats, educational programs, biodiversity for benefit of visitors
- Ski and Wake – Adam
    - Keep outdoor feel while still in City of Lakewood
- USACE - Gene Seagle
    - Priority - Keep flood control basin operational, and on downstream basins
    - Operations side, able to turn flood controls on/off – not in planning side
    - Let water out based on what state engineer says, unless under flood scenario and then take over to maintain flood levels

- Bear Creek Watershed Association – Russ, Manager
    - Involved with water quality in Park, comes up with ideas on how to solve issues that arise with water quality
    - Up to 16 species of blue green algae
    - Dissolved oxygen is currently crashing – impacts fisheries
    - Total Maximum Daily Load changing soon –
    - Had one person get sick from blue green algae, three dog deaths
    - Priority – address water quality and get Park sewered (big problem is wastewater)
- Jeffco Open Space – Kristina Duff
    - Priority - Regional connectivity to other parks nearby
- Volunteer – Vicki King
    - Been volunteering for 7 years
    - Here to see what can do with keeping Park open and accessible

Project Vision

- Realistic guidance on land use and site design
- Helping address deferred maintenance
- Guide future renovations/expansion
- 36-acre parcel development

Reallocation

- Still years away from a feasibility study
- USACE has let Park know impacts of various stages of reallocation
- Master Plan will move forward assuming reallocation does not happen

Traffic

- Morrison Town Board Meeting – Katie Gill
    - When traffic is backed up and park is closed, people will park in nearby neighborhoods and walk across Morrison Road to enter park
    - Concerns raised from residents in the neighborhoods

Visitor Center

- Being able to expand and increase capacity of programming in building
- Introduce airlock for energy efficiency standpoint
- Line of sights from ranger desk in lobby, limited ability to engage with public
- Create stronger connection to amphitheater

Big Soda Lake

- Update flow through space for concession stand
- Restroom building – roof at entry funnels water in instead of away from building
- Concern with capacity of vault toilets and odor at peak times
- Marina - Insufficient access to restrooms and number of restrooms
- Park capacity is determined by parking at swim beach

    - How to disperse visitors throughout park
    - Encourage people to enjoy other areas of park
- Landscape management and provide more shade

Campground

- Some accessibility upgrades to make
- Drainage issues at shower house
- Improvements to slopes of some campsites
- Improve lack of shade

Utilities

- Just replaced vault toilets in campground areas, have two more being replaced coming up
- Pelican Point/Boat House – 80s?
- Swim Beach area – late 90s
- VC – early 2000s

Review of Public Comments

- Better maintenance of existing infrastructure: trails, roads, restrooms, capacity issues
- Better signage

Next Steps

- 1st Open House – 9/27, 5:30-7
- Next Stakeholder Meeting – November, lunch time
- 2nd Open House – tentatively January

Questions/Open Discussion

1. Opportunities to submit comments directly to City?
    a. Email to Amber
    b. Project engagement website also has a link for comments
2. Incredibly broad scope – how is scope going to be attacked and broken down further?
    a. City/DHM will discuss how to do that at next Stakeholder Meeting
    b. Goal at next meeting – look at concepts developed as a team and get feedback
    c. Fill out index card with top focus and submit during this meeting to consider with concepts
3. Will invasive species be addressed in master plan?
    a. Will highlight what invasive species are, but will be on Park's side on ways to address and manage.
    b. Using burn strategy for invasive species may create inadvertent water quality issues

September Stakeholder Meeting

BEAR CREEK LAKE PARK

MEETING OBJECTIVE

The Department of Community Resources has launched a year-long Bear Creek Lake Park master planning process to chart the course for the future of BLCP and create a sustainable vision that is equitable to all user groups and preserves the park's natural resources.

The Department is working with the firm DHM Design to engage the community, evaluate current and future uses in the regional park, understand user needs and experiences, and present goals for the future.

Once complete, the plan will address current challenges, determine strategies for meeting future demands and establish priorities for achieving BCLP visitor's shared vision.

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    b. Overall schedule and key milestones
8. Self-guided review of open house material

DESIGN TEAM INTRODUCTIONS

DHM Design

- **Eileen Kemp**, Principal in Charge, Landscape Architect
- **Michaela Kaiser,** Project Manager, Landscape Architect
- **Sheena Kerstiens**, Landscape Designer
- **Jeremy Allinson**, Natural Resource Manager

Anderson Hallas

- **Wells Squire**, Principal Architect
- **Brooke Schubert**, Project Manager, Architect

Martin/Martin

- **Patsy Sullivan**, Principal Civil Engineer
- **Tracy Scurlock**, Project Manager, Civil Engineer

Civ Trans

- **Craig MacPhee**, Project Manager, Traffic Engineer

AE Design

- **Bryan Jass**, Project Manager, Electrical Engineer
- **Mike Rogers**, Electrical Engineer
- **Meribeth Wothe**, Electrical Engineer

Axias

- **Tom Hall**, Facilities Condition Assessment
- **Matt Owens**, Cost Estimating

NHN Consulting

- **Nora Neureiter**, Public Engagement
- **Dean Winstanley**, Public Engagement

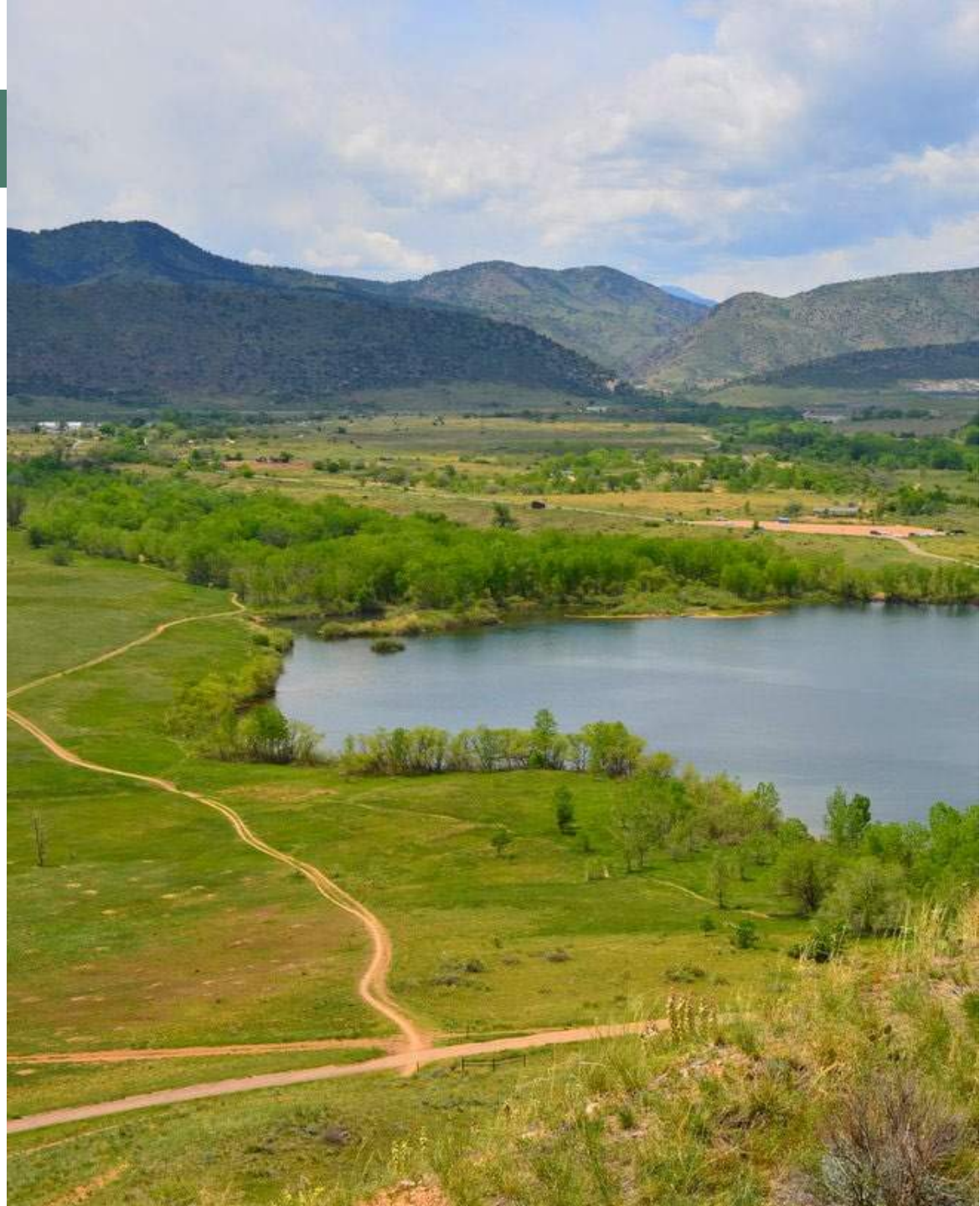
STAKEHOLDER INTRODUCTIONS

What is your vision or top priority for Bear Creek Lake Park?

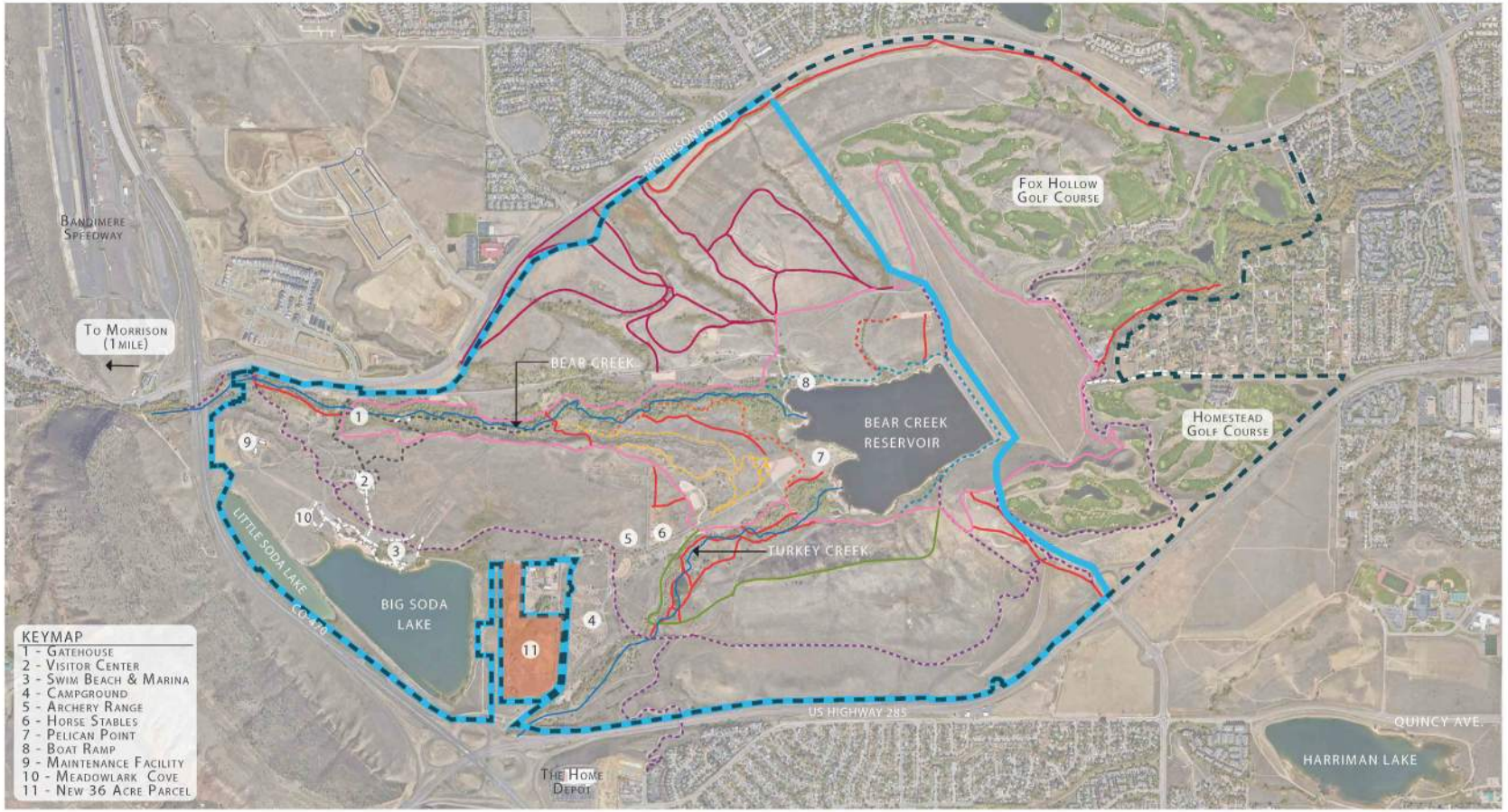
PROJECT VISION AND GOALS

The primary goals of this planning effort include:

- Create a sustainable vision that is equitable to all user groups and preserves the park's natural resources
  - Provide realistic guidance on future land use and site design
  - Address deferred maintenance
  - Guide future renovations or modifications and expansion
  - Incorporate the acquired 36-acre parcel east of Big Soda Lake



STUDY AREA AND OVERVIEW OF FOCUS AREAS



EXISTING CONDITIONS

DHM DESIGN LANDSCAPE ARCHITECTURE URBAN DESIGN + LAND PLANNING ECOLOGICAL PLANNING

Lakewood Community Resources

CONDITION ASSESSMENT TAKEAWAYS

Gatehouse was generally in fair condition with HVAC unit having been recently replaced.

- Recommended projects include interior and exterior finishes replacement with localized repair and replacement of roofing system.
- Foul smells were reported at the pit toilet room. Consideration should be made to improving ventilation.
- Building not provided with running water or sewer.

CONDITION ASSESSMENT TAKEAWAYS

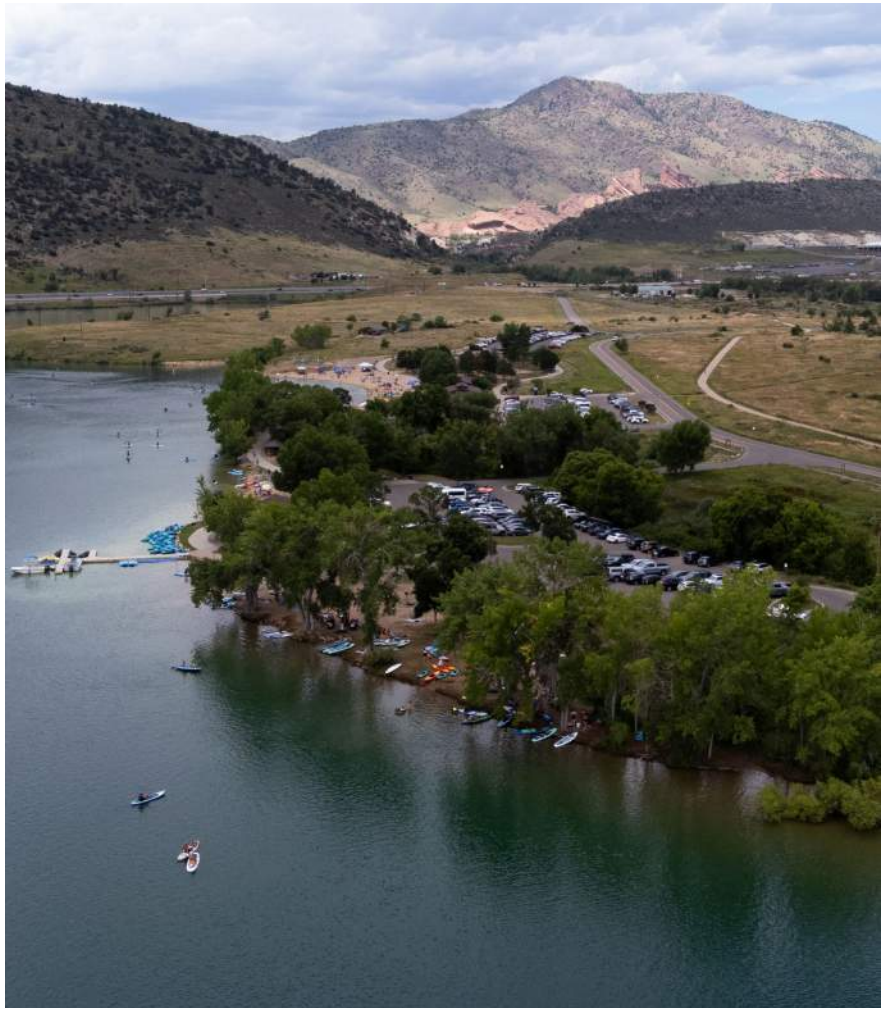
Visitors Center was generally in fair condition however below is a summary of major anticipated expenditures:

- Localized rot and deterioration noted at exterior cladding. Allowance included for localized repair and repainting (y1), followed by eventually replacement of the cladding (y8)
- Replacement of the original wood windows based on age and potential water ingress y4)
- The three packaged units were installed in 2013 and we have included allowances for their replacement in y10, based on typical useful life.
- Based on age and condition, fire pump and controller will likely require replacement (y6). Due to the size of the unit, this will likely be the most significant expenditure for the building.

CONDITION ASSESSMENT TAKEAWAYS

Lake Structures were generally in fair but dated condition with limited modern features such as air conditioning.

- Issues reported relating to cross contamination of lake and pit toilets. Further investigations recommended.
- Playground dated and in need of replacement (y3)
- Similar to visitor center, minor repair and repainting (y1) needed at exterior facades followed by eventual recladding (y8)
- Cyclical allowances included for interior finishes replacement.
- Fire panels generally obsolete and require replacement (y2)



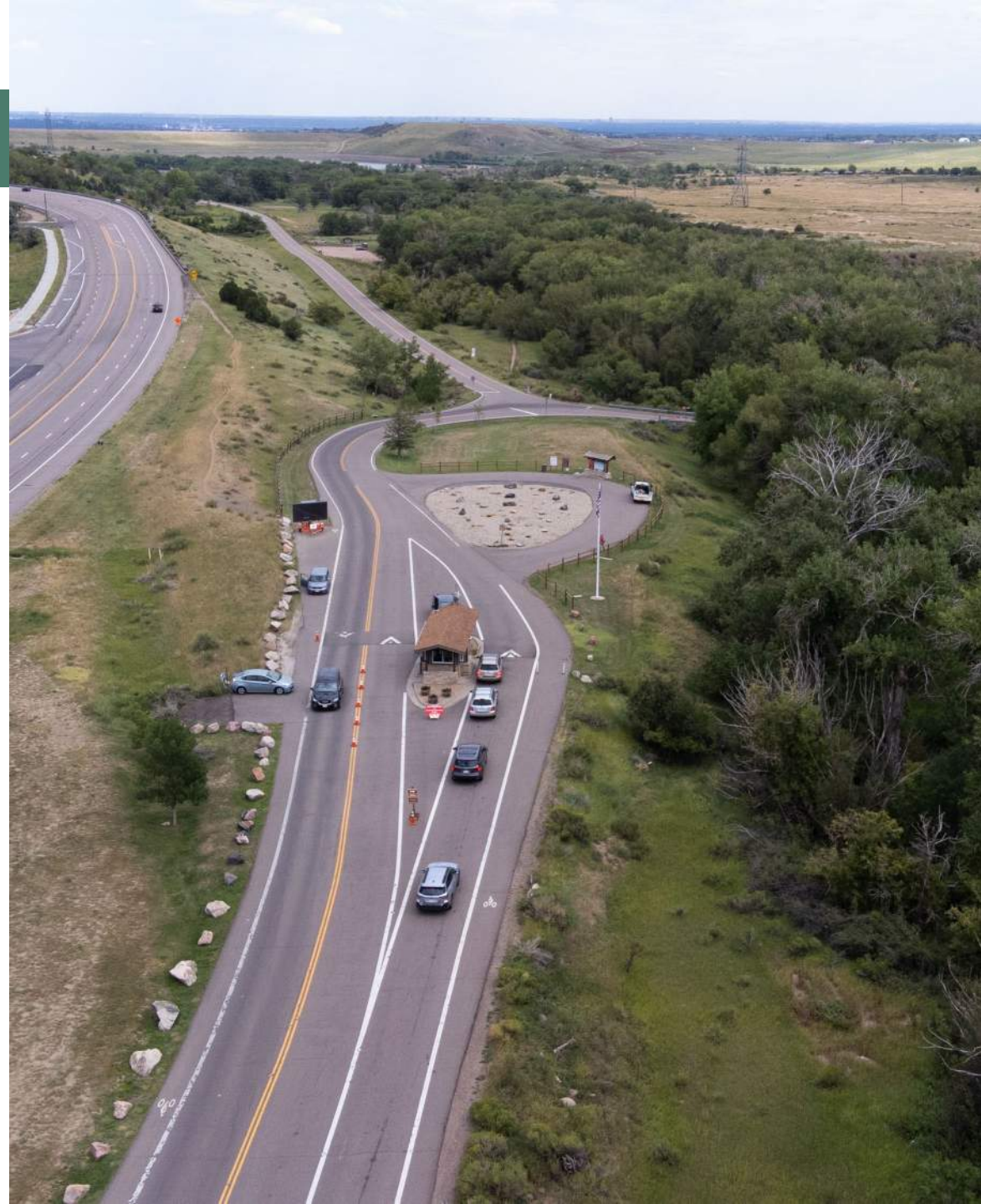
CONDITION ASSESSMENT TAKEAWAYS

Campground buildings were generally in fair condition.

- Some minor ADA upgrades recommended.
- Poor drainage noted at exterior of shower building.
- Based on age, have included allowances for roof and skylight replacement at shower building.
- Other expenditures are generally limited to interior finish replacement.

TRAFFIC

- Traffic counts conducted on July 29th.
- Traffic observations conducted on August 5th and 6th.
- The Park entrance did not need to be shut down and no significant queuing (more than 8 vehicles per lane) was observed during either visit.
- The Park staff took videos of traffic conditions and park entrance closing over Labor Day Weekend and provided to the traffic engineer for study.



UTILITIES

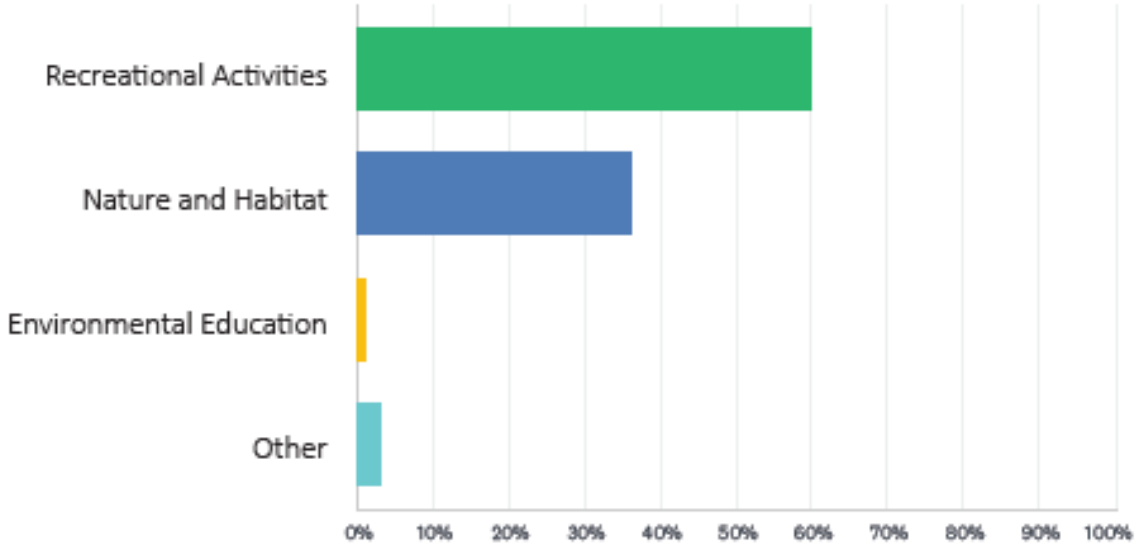
- No areas of the existing Park are connected to a City or Utility District water or sanitary system.
- Existing sanitary sewer systems on site consist of vault toilets, septic tanks and/or leach fields, and portolet toilets, with these areas being pumped out as needed when reaching capacity.
    - Some areas require more frequent maintenance to keep up with capacity, such as Swim Beach and Marina.
- Existing water systems on site consist of water tanks to store potable water that's trucked into the site and a north and south water system that are fed from gallery wells near Bear Creek and Turkey Creek.
    - There are concerns of proximity between water and sanitary systems at some areas, such as Swim Beach and Campground.
- The Visitor Center is the only area on site with a water storage tank for fire suppression.
- Portions of the site are located within or adjacent to special flood hazard areas (SFHA), floodplains, and wetlands.

UTILITY SUMMARY BY AREA

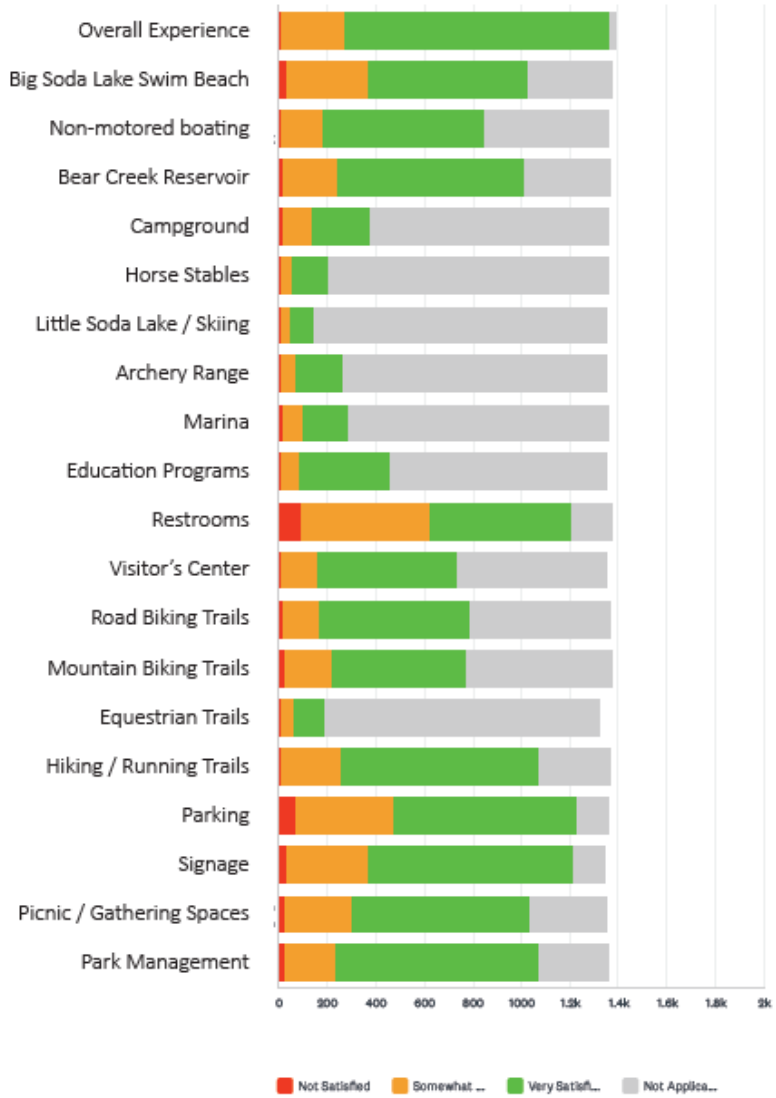
Area	Sanitary System	Potable Water System	Fire Suppression	Drainage
Park Entrance	Vault Toilet	None	None	In/Around FEMA Flood Zone A
Visitors Center	Flush Toilets to Septic Tank and Leach Field System Portolet	Water Storage Tank Water Trucked In	Sprinkler System and Storage Tank	Not in FEMA Flood Zone
Big Soda Lake Marina	Vault Toilets	Water Tank Water Trucked In	Fire Alarm, no Sprinkler System	Not in FEMA Flood Zone
Big Soda Lake Swim Beach	Vault Toilets Flush Toilets to Vault Portolet	Water Tank Water Trucked In	Fire Alarm, no Sprinkler System	Not in FEMA Flood Zone
Little Soda Lake Ski Beach	Portolet	None	None	Not in FEMA Flood Zone
Existing Campground	Vault Toilets Septic Tank and Leach Field System	Gallery Well from Turkey Creek and Water Distribution System	None	Not in FEMA Flood Zone
Big Soda Lake New 36 Acre Parcel	Unknown	Unknown	None	Not in FEMA Flood Zone
Bear Creek Stables	Portolet	Gallery Well from Turkey Creek and Water Distribution System	None	Not in FEMA Flood Zone
Bear Creek Reservoir/Pelican Point	Vault Toilet	None	None	Zone A

REVIEW OF PUBLIC COMMENTS

What would you consider the greatest value of Bear Creek Lake Park,or its top priority?

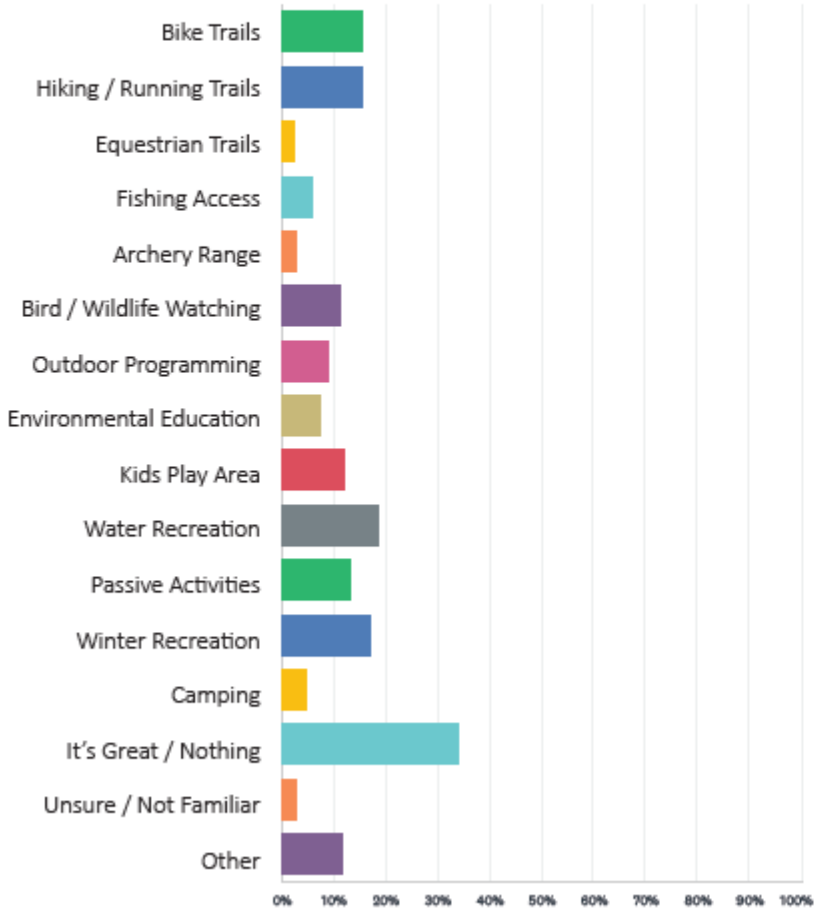


When visiting Bear Creek Lake Park, how satisfied are you with the condition of the facilities?

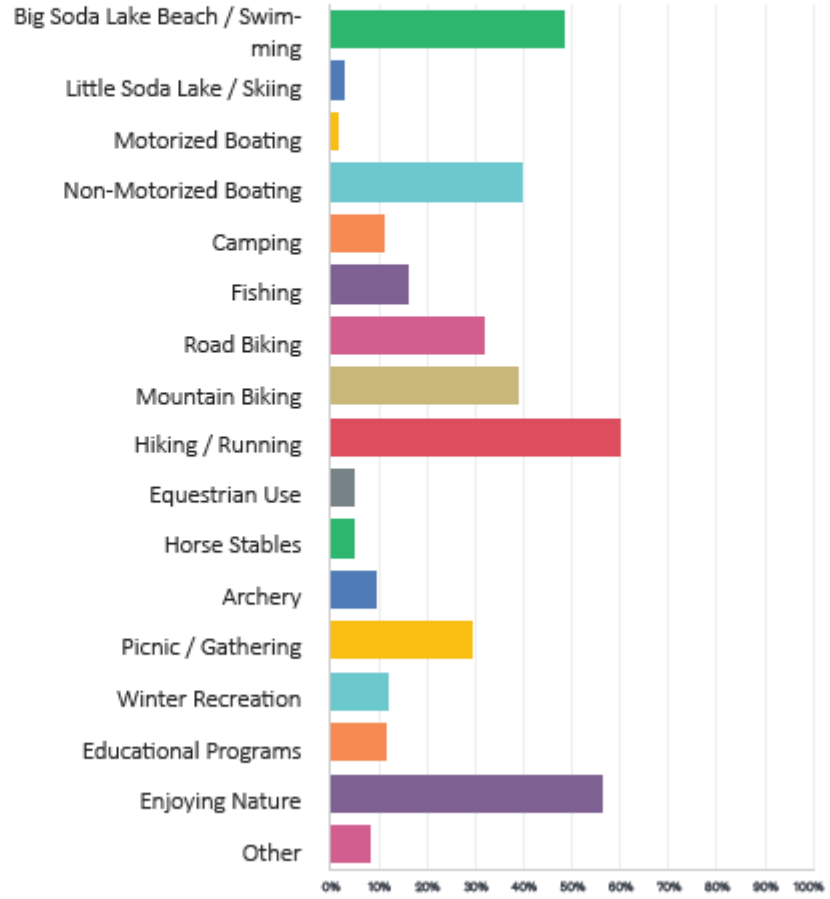


REVIEW OF PUBLIC COMMENTS

What activity is missing at Bear Creek Lake Park or should be enhanced/improved?



What best describes how you most commonly use Bear Creek Lake Park today?



COMMENTS + THEMES

WHAT'S NEXT?

PROJECT TIMELINE

Summer 2023
Vision & Inventory

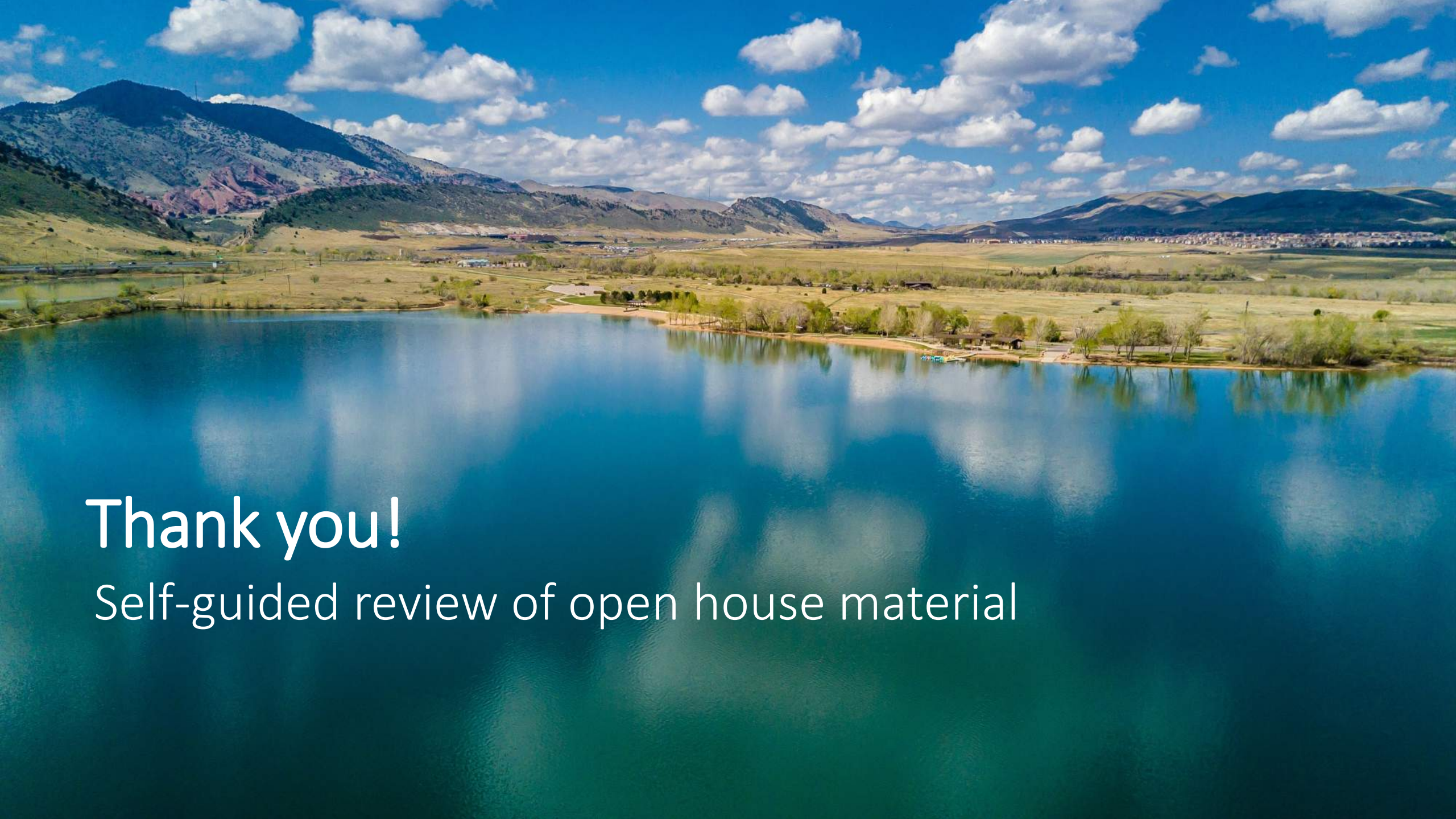
Fall/Winter 2023-24
Design

Winter 2024
Open House #2

Spring 2024
Preliminary Draft Plan

Summer/Fall 2024
Final Plan

SAVE THE DATE!
JOIN US FOR THE FIRST OPEN HOUSE
WEDNESDAY SEP 27
FROM 5:30-7:00PM
AT THE VISITOR CENTER



Thank you!

Self-guided review of open house material

Lakewood
Community Resources

Bear Creek Lake Park Master Plan Survey #1 – Summary

Public engagement during the first phase of the Bear Creek Lake Park Master Plan process included an initial online user survey. The survey was open for one month and closed on August 21, 2023. The survey asked a series of questions to help the project team understand what the 1,416 respondents enjoy about the park and what they think could be improved in the future.

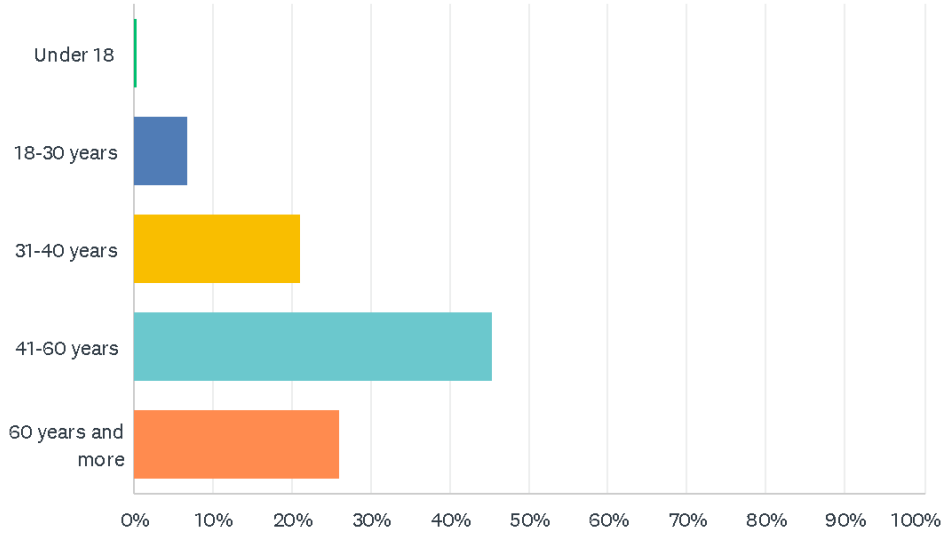
Respondents strongly support the park and the current configuration and functioning of the amenities and natural areas - many people said they love everything about the park. They appreciate the ease of access to the park and the park's close proximity to where they live. Most consider access to the park's varied recreational activities to be the greatest value of the park, but the natural character and wildlife habitat are very important as well.

Survey respondents love the wide variety of **outdoor recreation activities** available, especially the hard and soft-surface trail system, the Big Soda Lake beach and swimming, and the non-motorized water-based activities, especially stand up paddleboarding. Although visitors are generally satisfied with the facilities at the park, they would like to see some improvements, especially upgrading or enhancing the roads, trails and restrooms, and managing patron access during the park's busiest times (summer weekends).

More detailed results from the survey questions are included below.

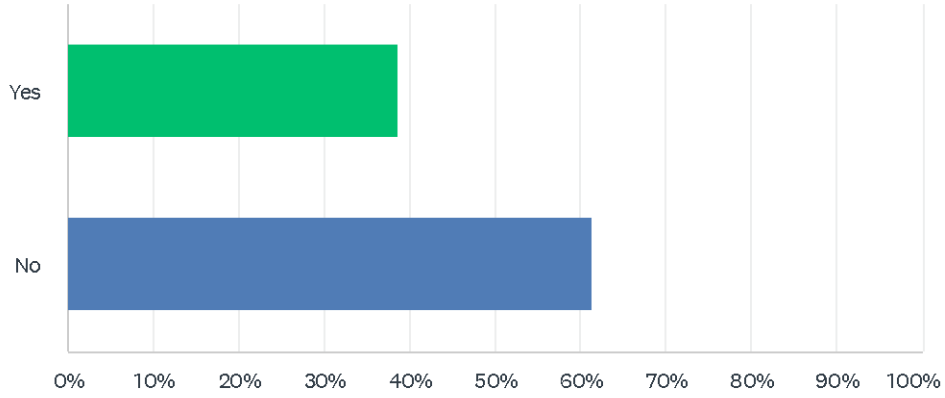
Q3 What is your age?

Answered: 1,415 Skipped: 1



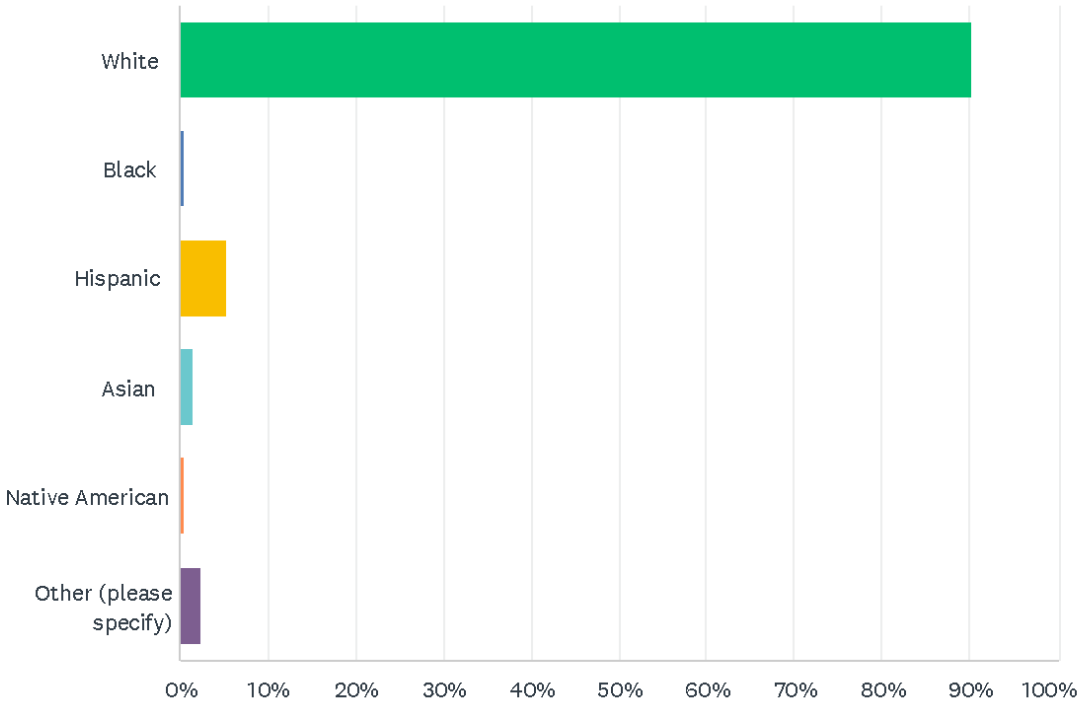
Q4 Children under 18 in household

Answered: 1,410 Skipped: 6



Q5 Ethnicity (Optional)

Answered: 1,356 Skipped: 60



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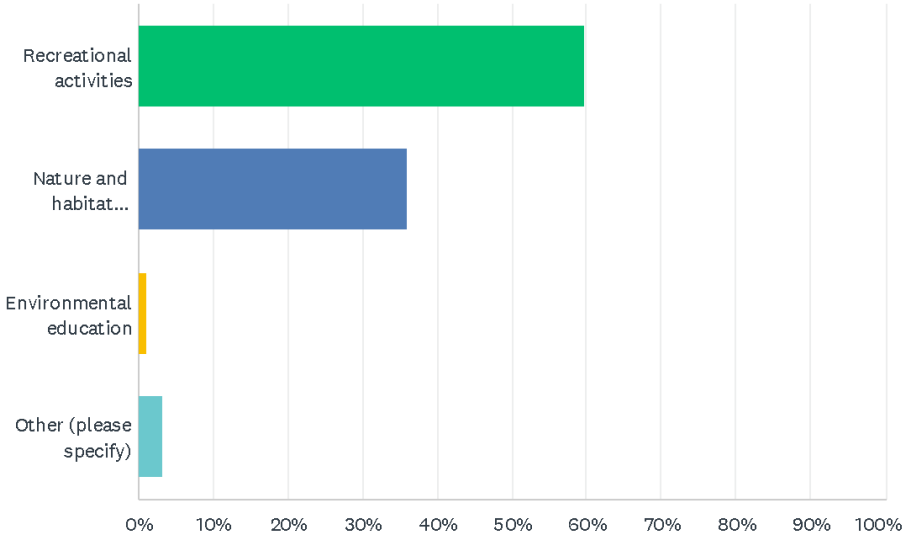

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Q7 What best describes how you most commonly use Bear Creek Lake Park today? (Select all that apply)

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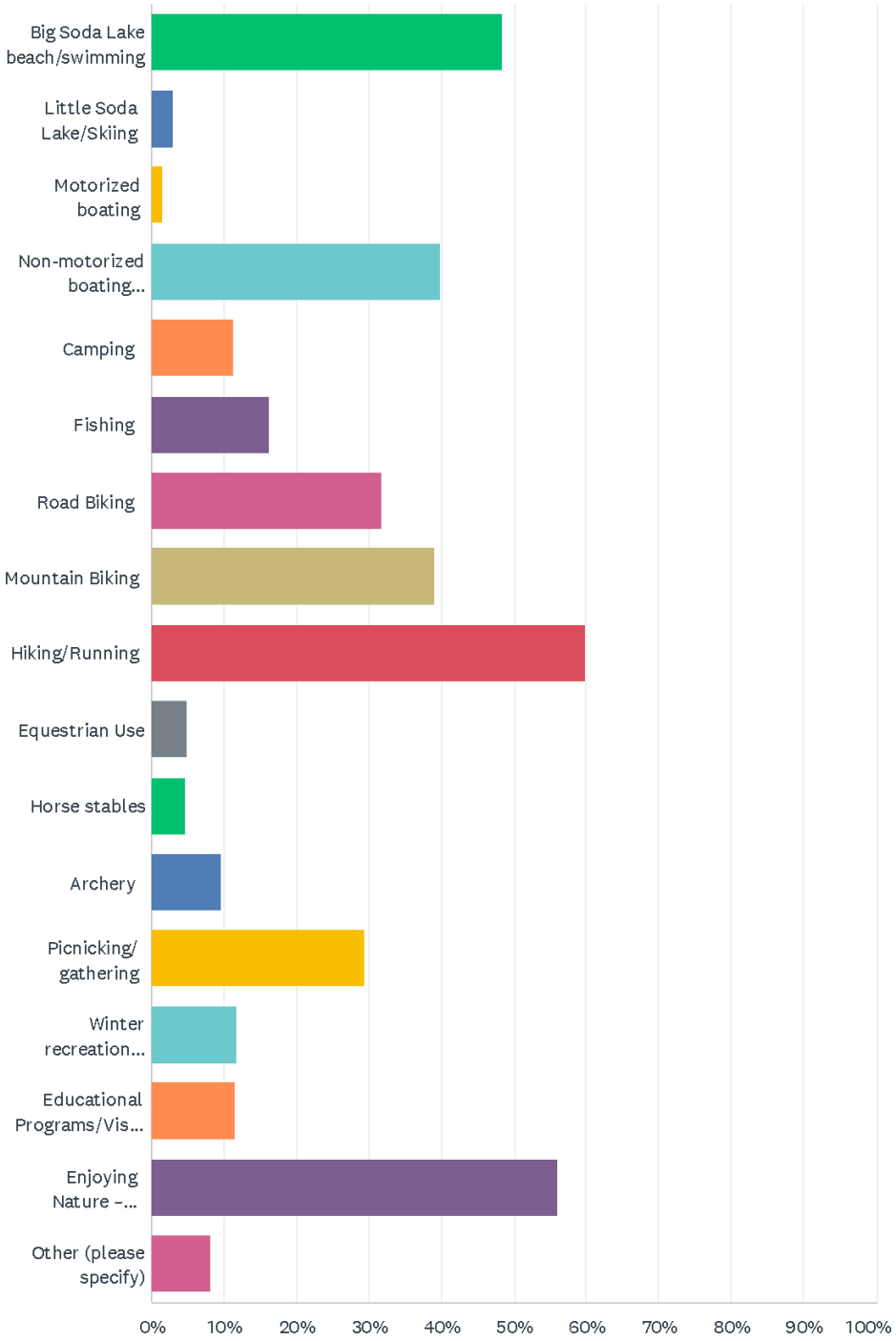

Of the 115 answering “Other”, paddleboarding was by far the most popular response, followed by birding, dog walking and attending events in the park.

Q8 Which four facilities or amenities at Bear Creek Lake Park are most important to your household?

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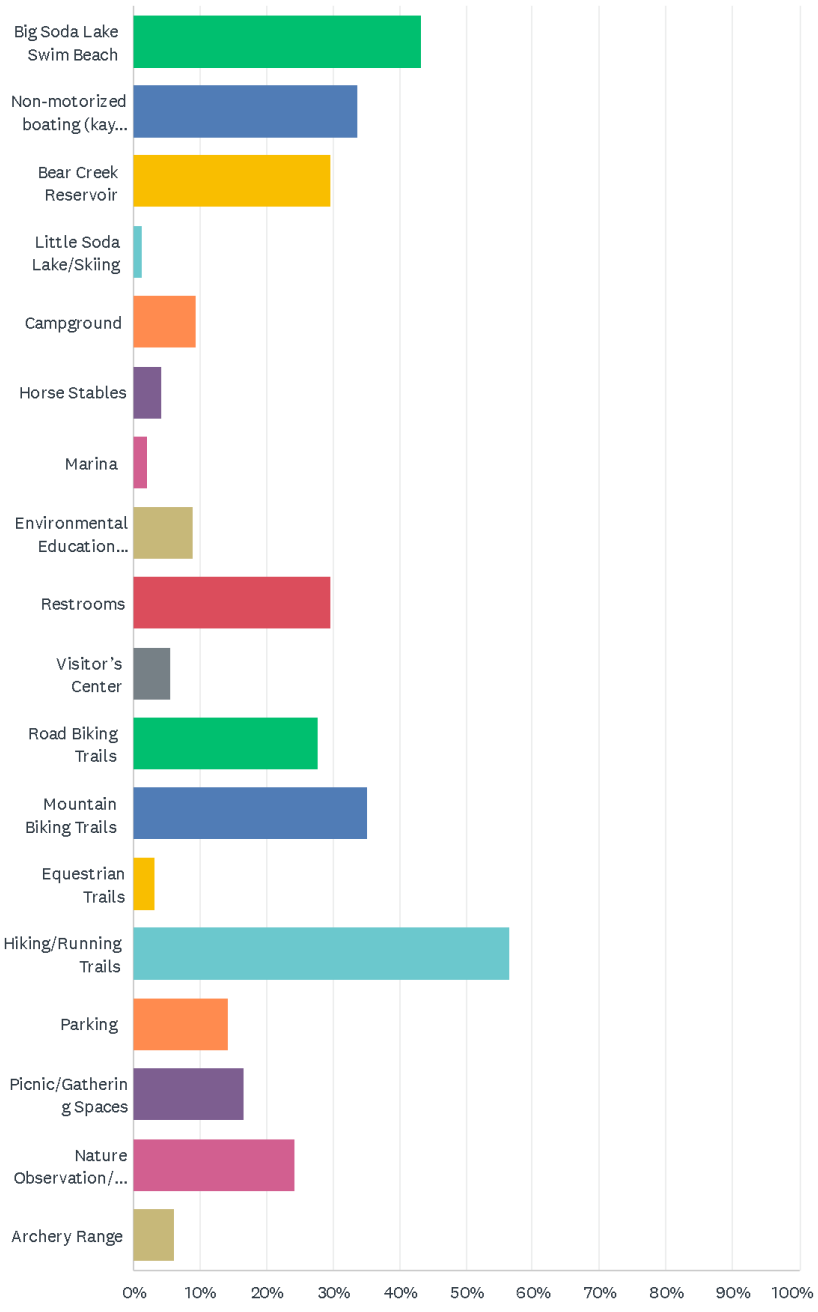

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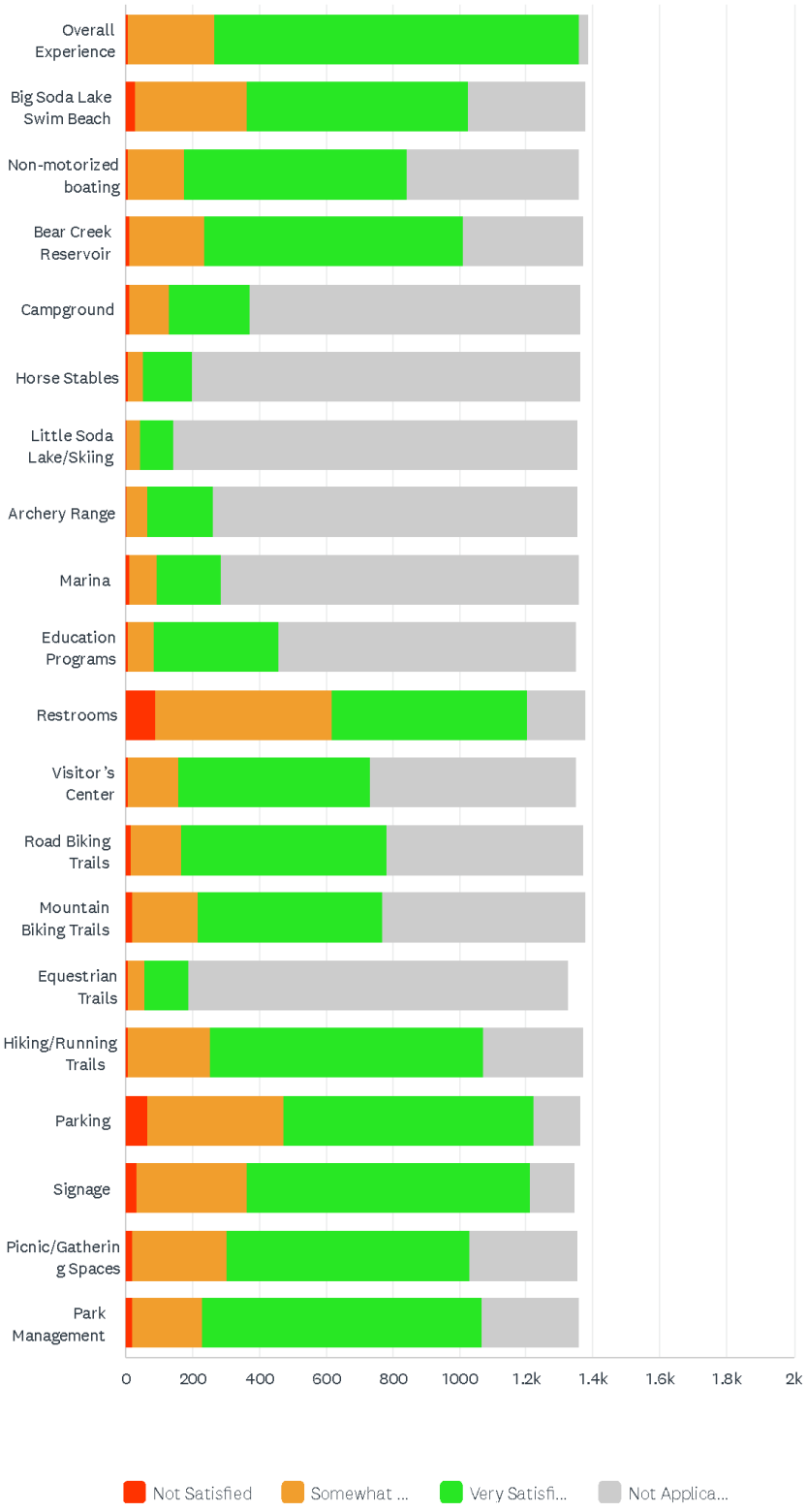
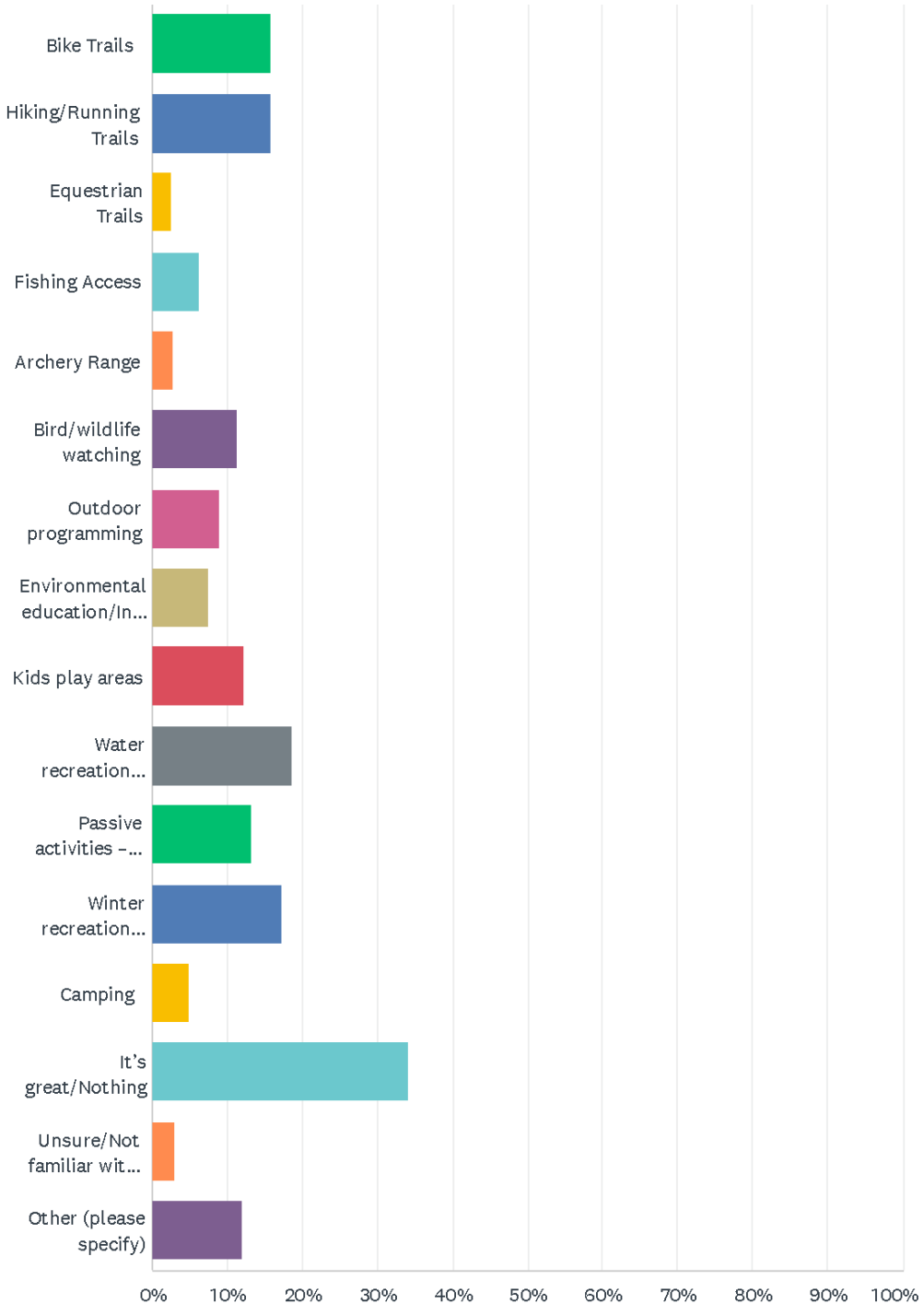


In addition to the satisfaction levels described in the Q9 graph above, 232 additional comments were provided and are summarized as follows:

- Many respondents **love the park facilities as they are** and think that the park is well managed.
- **Better maintenance of some existing infrastructure is desired**. Specific items mentioned most often were:
    - **Trail system** – repair the paved trails; maintain the soft surface trails, especially the rutting after rain events. And, provide more regular mowing of vegetation.
    - **Roads** – repair and add designated bike lanes
    - **Restrooms** – clean more regularly, improve smell and provide hand washing stations.
- **Address capacity issues.** Large crowds and inadequate facilities impact satisfaction for many survey respondents. This is especially a problem on weekends. Respondents would like to see:
    - Additional **parking lots**
    - Additional and upgraded (flush) **restrooms**
    - Additional **campsites with full hookups**
    - Consider potential **capacity limits** at the park – control park access when at capacity; limit the number of visitors to Big Soda Lake area
- Would like **better signage** on trails and roads in the park to increase safety and helpful information.

Q10 What activity is missing at Bear Creek Lake Park or should be enhanced/improved? (Select all that apply)

Answered: 1,390 Skipped: 26

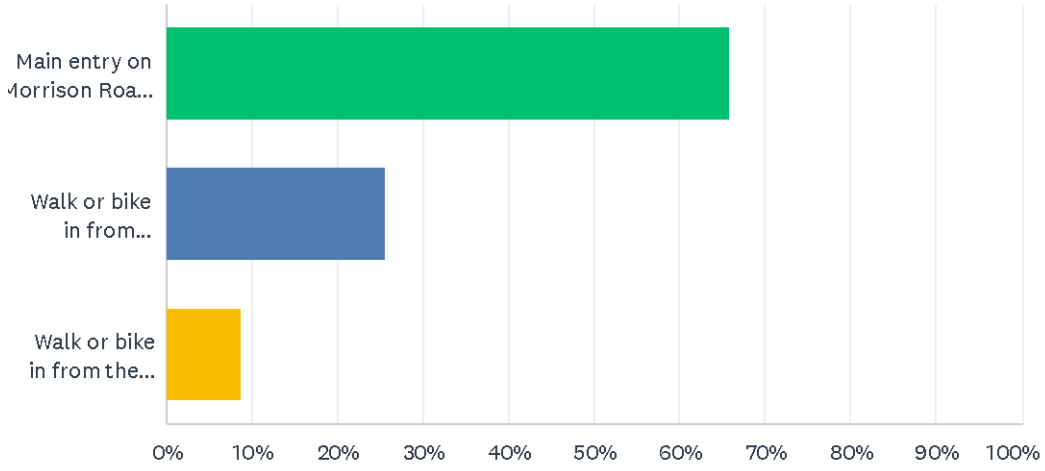


Those who answered "Other", primarily answered as follows:

- **Improvements to trails** – enhance the hiker/walker-only opportunities, increase total mileage of system, re-pave hard surface trails that need it, better maintenance of trails in general.
- Add **bike lanes** to park roads
- Add **more mountain biking opportunities**, especially a track or other skill-enhancing feature
- Bring back **rocketry** to the park, at least on certain designated days
- Improve and add **restrooms**
- Consider a **dog off-leash area**
- **Improved winter sports** such as groomed cross-country trails and ice skating
- **Capacity-related suggestions** ranging from adding **additional parking** to **limiting access** to the park and Big Soda Lake.
- Add more **food and drink concessions**

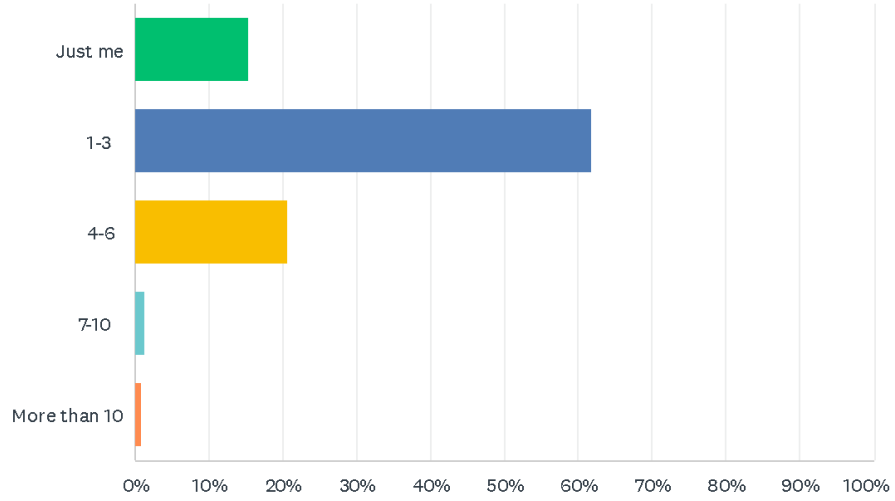
Q11 How do you typically enter Bear Creek Lake Park?

Answered: 1,412 Skipped: 4



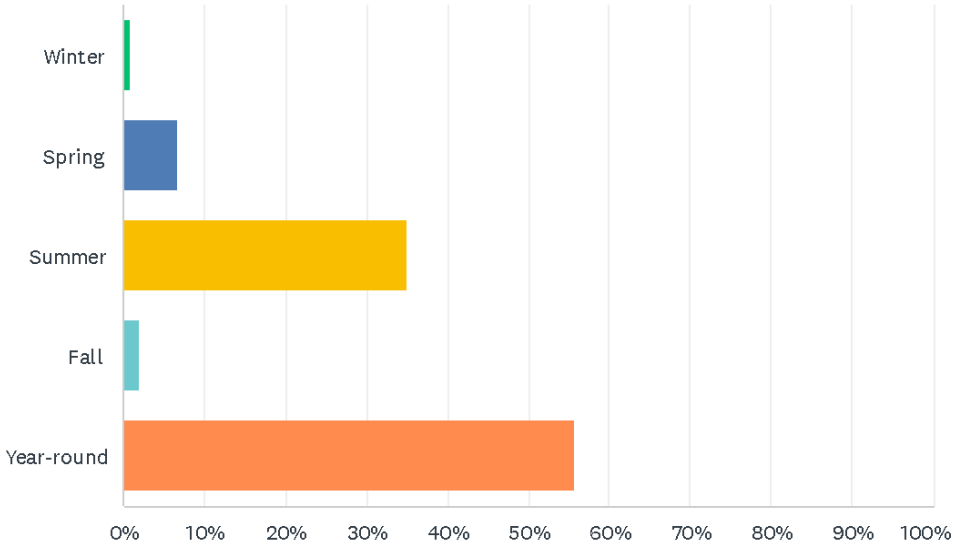
Q12 How many people are typically in your group when visiting Bear Creek Lake Park?

Answered: 1,411 Skipped: 5



Q13 What time of year do you use the Bear Creek Lake Park area?

Answered: 1,412 Skipped: 4



Q17 What makes this area special for you? What would you not want to be changed at Bear Creek Lake Park?

Answered: 1,320 Skipped: 96

Of the 1,320 total responses to Q17, the highlights are included below:

What makes the area special?

- **Everything**. This park is beloved and many people said they love everything about it.
- Bear Creek Lake Park is **easy to access** and in very **close proximity** to where many of the survey respondents live.
- The park is a **unique, large,** water-based **open space** on the Front Range and so close to the city.
- Visitors love the **natural character** of the park. Responses were varied and passionate! The love of the natural features are shared by users who are recreating or specifically at the park to view nature. Many elements specifically listed:
    - Green space, especially the tree canopy
    - Riparian areas along Bear Creek and Turkey Creek
    - Wildlife, especially the wide variety of birds
    - Natural beauty
    - Peace and quiet; ability to connect with nature
- Survey respondents love the wide variety of **outdoor recreation activities** available, especially:
    - The **Trail system** – all types of users and trail types. Survey responses were mostly from hikers and mountain bikers.
    - Non-motorized **water-based activities**, especially stand up **paddleboarding** (SUP), swimming, and the Big Soda Lake beach.

Don't change:

- **Anything** listed above! Most responses were regarding support for and enjoyment of the existing trail system.
- **Do not reallocate the water levels**. This would ruin what everyone loves so much about the park as it is, especially the trail system, Big Soda Lake, riparian areas, tree canopy and wildlife habitat.
- **Do not overdevelop**. The level of infrastructure is adequate as it is. Respondents don't want to see the park getting more crowded than it already is. Many respondents did not want to see the park further developed to attract many more visitors.

Lakewood
Community Resources

Bear Creek Lake Park Master Plan –
Public Open House
September 27, 2023

Public engagement during the Bear Creek Lake Park Master Plan process continued on Wednesday, September 27th, with a public open house at the Visitor Center. 85 attendees were provided with detailed information about the planning goals, process, timeline, and public input received through the initial public survey. Members of the master plan team were present to answer questions and gather ideas from the attendees about what they would like to see in the park in the future.

Attendees provided over 50 comments regarding the future of the park. Generally, community members:

- Support the current trail system but would like to see improvements with trail maintenance and safety, and expansion of the trail system.
- Support expanding and upgrading hookups in the campground as well as broader opportunities for the equestrian community to stable and pen horses in the park.
- Would like to see improved safety at the park entrance, including the addition of a traffic light on Morrison Road.
- Offered a number of suggestions for the future use of the 36-acre parcel including adding a horse camping area with pens, additional recreation opportunities, and housing for the park rangers.
- Support expanded swimming and beach access, and improved maintenance of the shore at Big Soda Lake.
- Would like to have additional winter recreation opportunities (camping, ice fishing, etc.).

Several individuals attended the open house to learn about the Bear Creek Reservoir Reallocation Project and to provide comments opposing the reallocation. Members of the master plan team were able to explain that the reallocation project is separate from the Bear Creek Lake Master Plan and encouraged interested individuals to seek additional information on the Colorado Water Conservation Board's website.

Lakewood
Community Resources

Bear Creek Lake Park Master Plan Survey #1 – Summary

Public engagement during the first phase of the Bear Creek Lake Park Master Plan process included an initial online user survey. The survey was open for one month and closed on August 21, 2023. The survey asked a series of questions to help the project team understand what the 1,416 respondents enjoy about the park and what they think could be improved in the future.

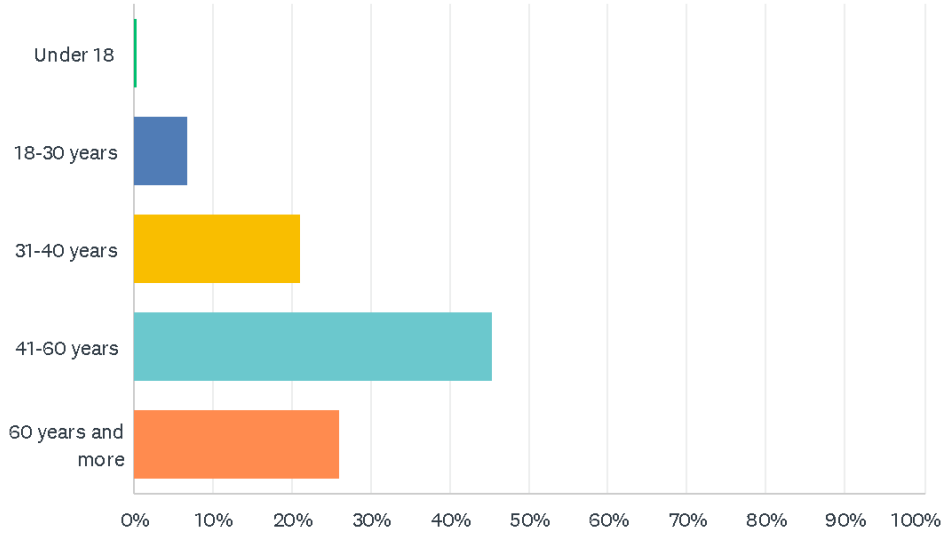
Respondents strongly support the park and the current configuration and functioning of the amenities and natural areas - many people said they love everything about the park. They appreciate the ease of access to the park and the park's close proximity to where they live. Most consider access to the park's varied recreational activities to be the greatest value of the park, but the natural character and wildlife habitat are very important as well.

Survey respondents love the wide variety of **outdoor recreation activities** available, especially the hard and soft-surface trail system, the Big Soda Lake beach and swimming, and the non-motorized water-based activities, especially stand up paddleboarding. Although visitors are generally satisfied with the facilities at the park, they would like to see some improvements, especially upgrading or enhancing the roads, trails and restrooms, and managing patron access during the park's busiest times (summer weekends).

More detailed results from the survey questions are included below.

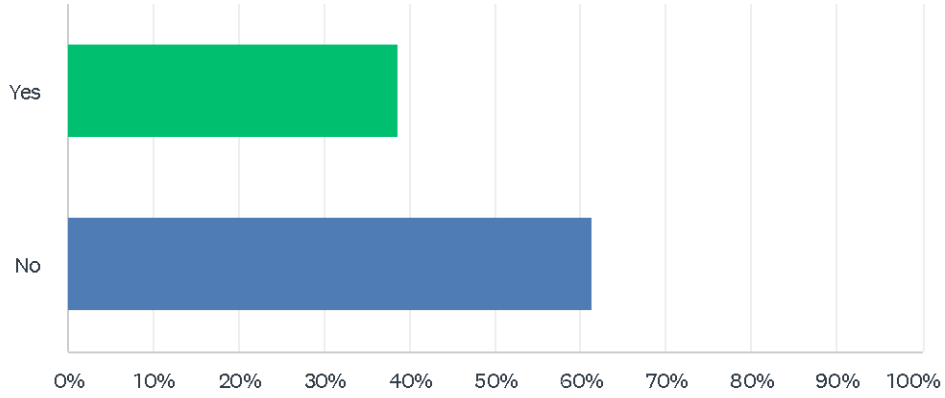
Q3 What is your age?

Answered: 1,415 Skipped: 1



Q4 Children under 18 in household

Answered: 1,410 Skipped: 6



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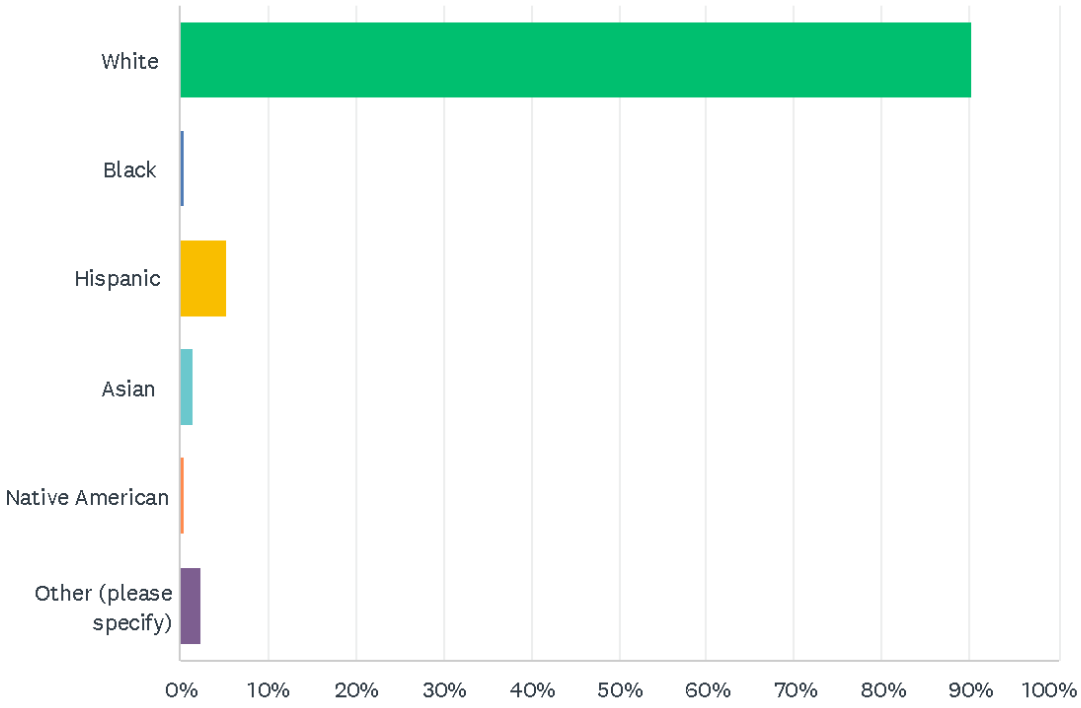

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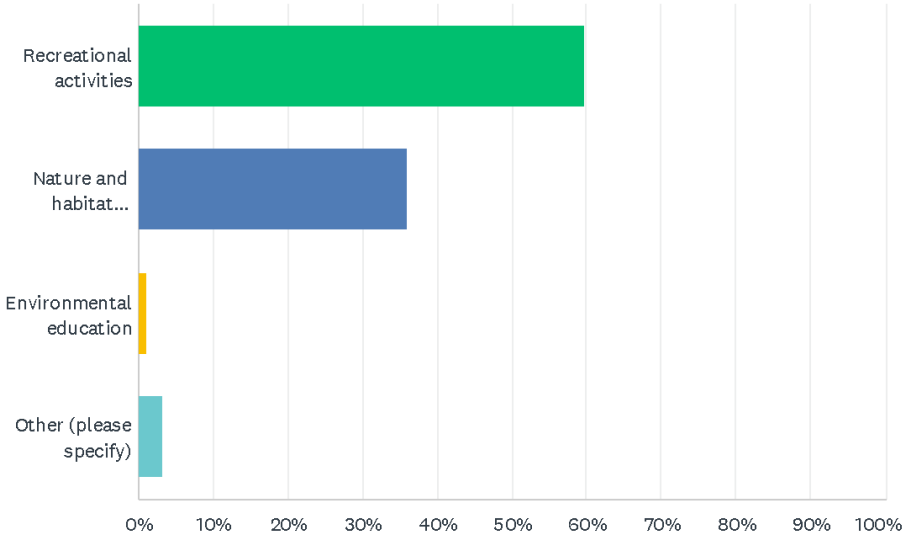

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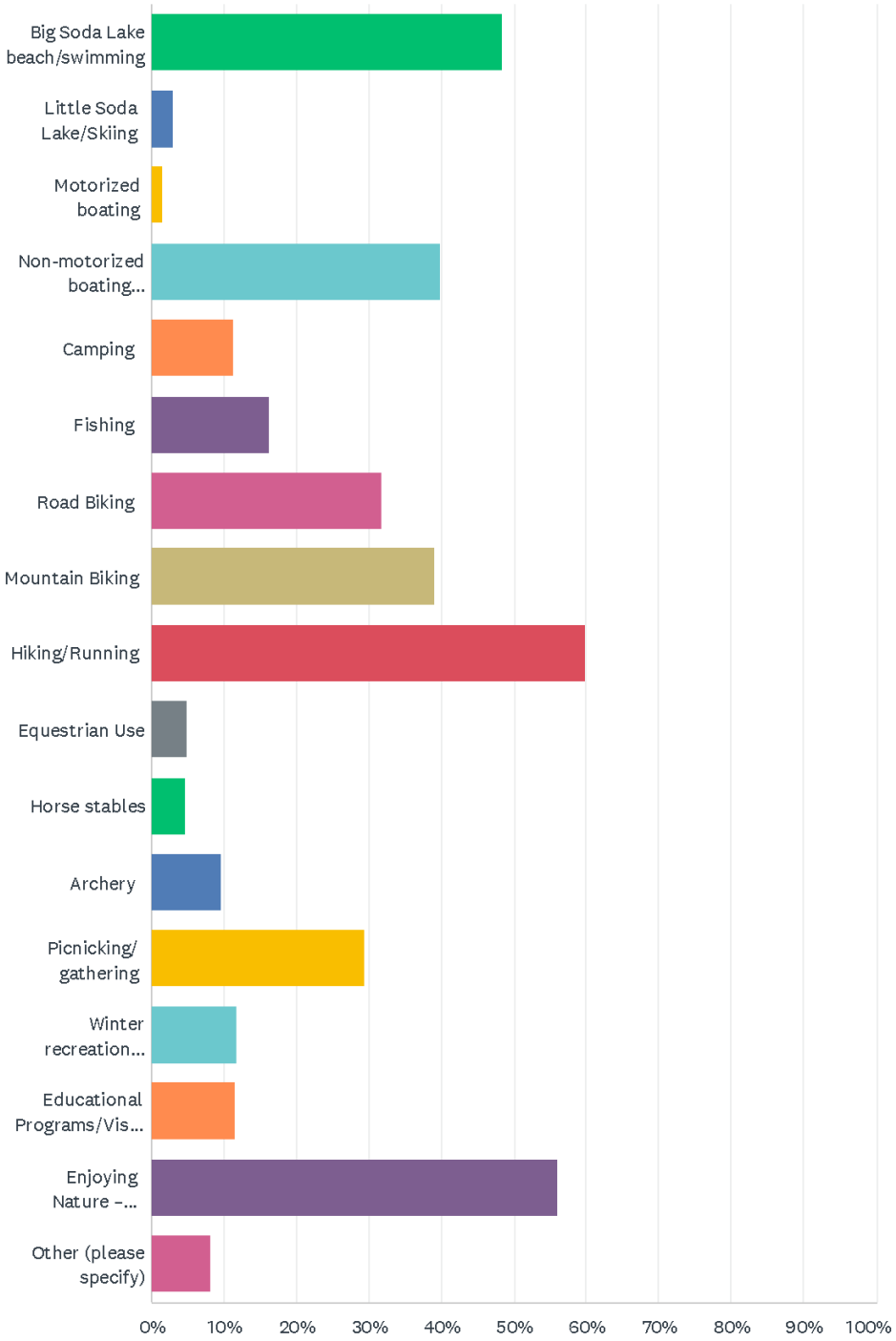

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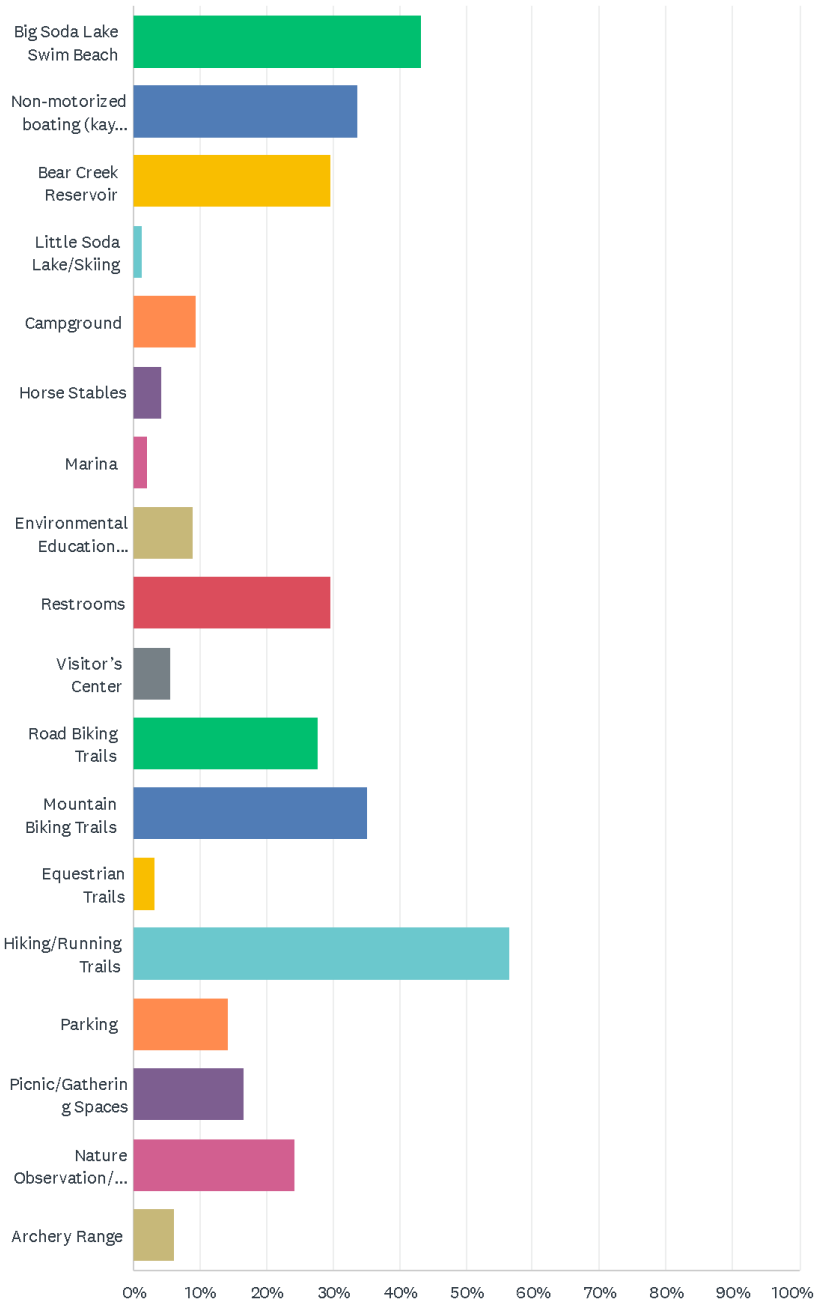

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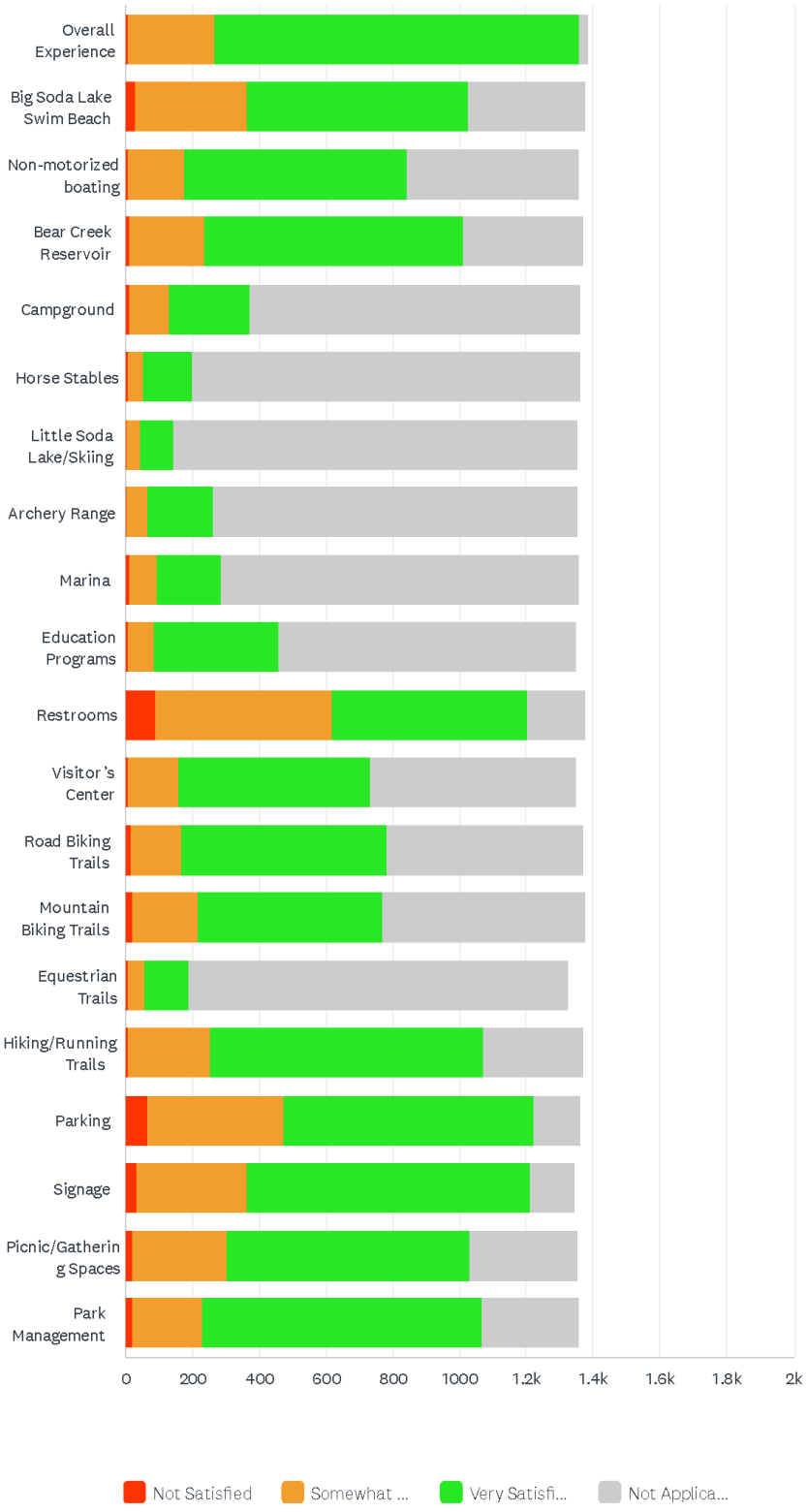

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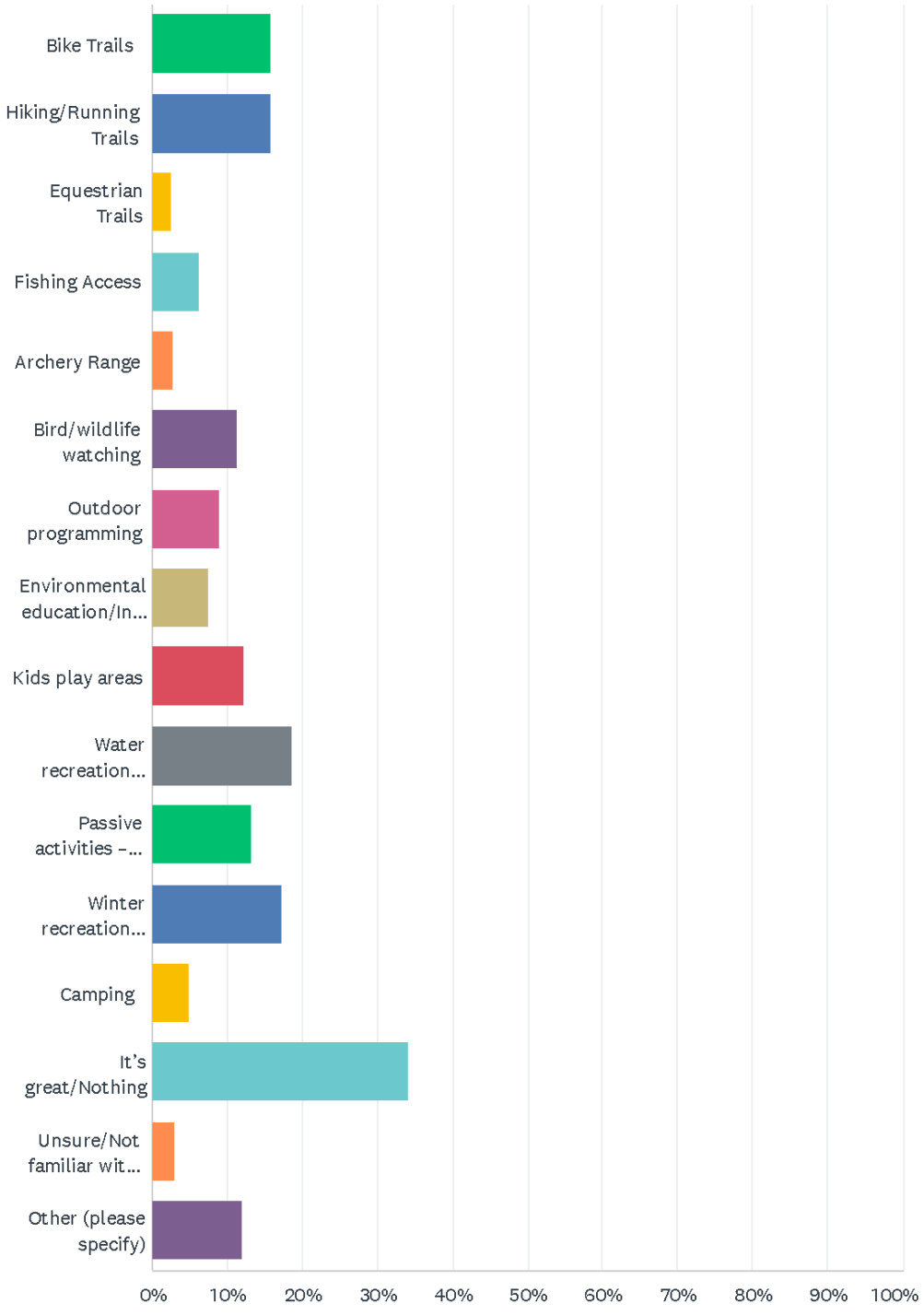

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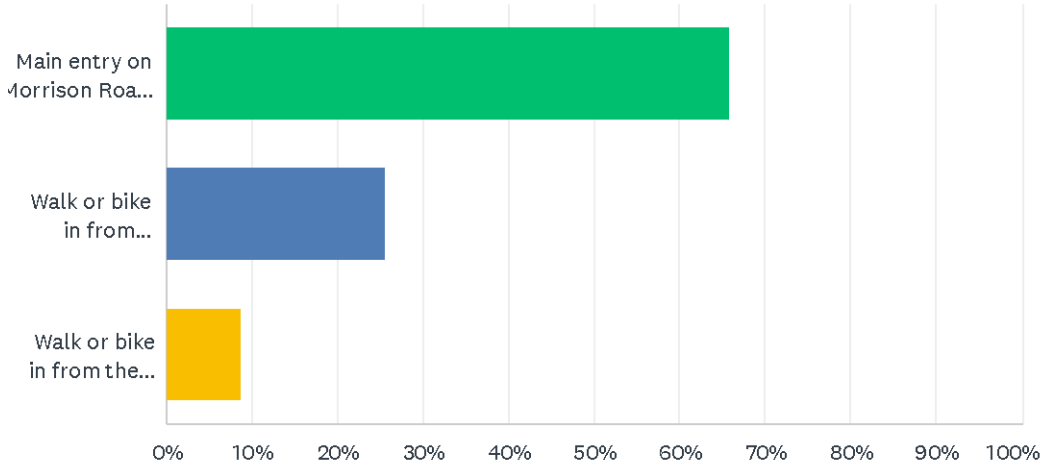

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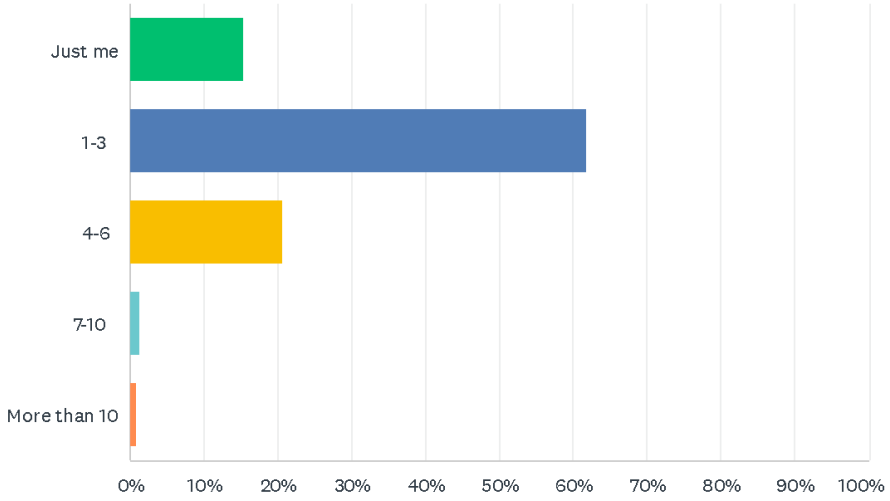

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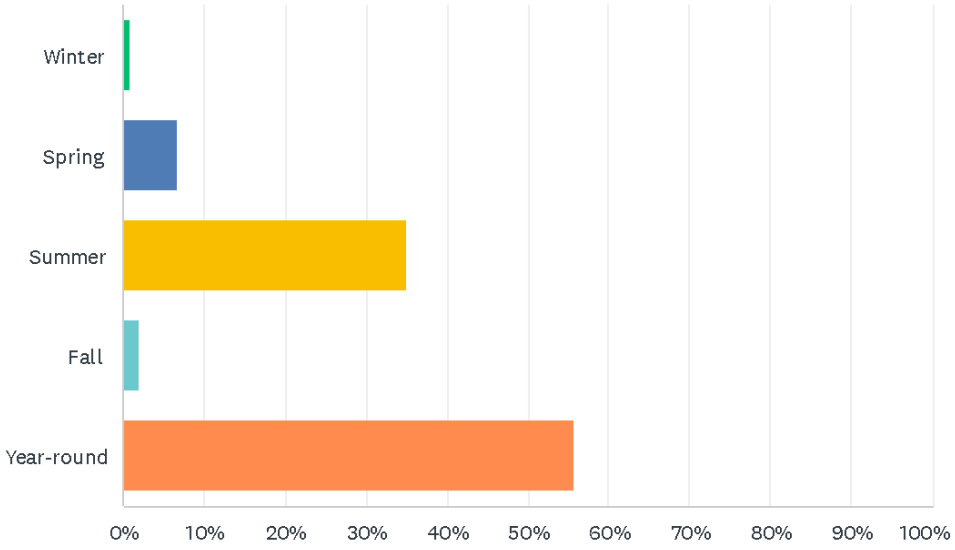

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BCLP Master Plan Advisory Committee Meeting

Tuesday, December 5 from noon to 1:30 p.m.

Meeting Objective

The Bear Creek Lake Park master planning process is underway to chart the course for the future of BLCP and create a sustainable vision that is equitable to all user groups and preserves the park's natural resources. The initial stakeholder meeting and public open house occurred in September. Feedback was reviewed and incorporated into draft concept plans for consideration. A second public open house is anticipated in early 2024 to present the draft concept plans.

Meeting Agenda

30 min

1. Overall introduction and welcome/get lunch started (City)
2. Recap of work to date (DHM)
    a. Project vision and goals
    b. Study area and overview of focus areas
    c. High level overview of public comments
3. Draft Natural Resource Memo (DHM)
4. Review of draft concepts common to all (DHM)
5. What's next? (DHM)
    a. Concept updates
    b. Rough Order of Magnitude Cost Estimates
    c. Open House #2; Date and time TBD

1 hour

6. Group breakout/rotation; approximately 20 min at each topic (3 topics total)
    a. Break into small groups and rotate through
    b. Draw and add notes on range of concepts

900 South Broadway, Suite 300 Denver, Colorado 80209 P: 303.892.5566 f: 303.892.4984

DHM DESIGN

Attendees:

City of Lakewood – Brad, Amber, Jim, Ross, Allen
Park – Lee, Kyle, Todd
Design team in person – Michaela, Eileen, Wells, Tracy
Stakeholders – Sonia, Gram, Jeri, XXX, Russ, Katie, Sean, Adam, Gary

Overall Discussion:

1. Can the powerpoint be shared with the stakeholders internally? City will share select slides.
2. Natural Resource Regulations – Russ will share fact sheet with Amber on Reg 43, 38, 74 and 75.

Breakout Groups:
Meeting notes/comments are captured below and on the plans.

Big Soda Lake

Swim Beach Area:

- Explore all opportunities to expand the swim beach and beach areas.
- Demarcate existing swimming area and lap lanes on plan graphics.
- Consider improving shoreline east of marina area with additional swimming, wading and or picnicking. Currently used by visitors, formalize access.
- Precedent imagery for seating/bank stabilization/beach access was liked. Consider adding this treatment between the swim beach area and marina beach area.
- Continue to distinguish between use zones and access; swim area, wading area, paddle board launch and lap lanes.

Food Concessions:

- Definite need and desire to expand concessions. The current facility is:
    - Too small/tight of a space to function efficiently.
    - Unsanitary (there is a vault toilet in the building that they try not to use). As a result, can not obtain a food handlers license
    - Has insufficient electrical capacity. Many plugs in only a few outlets and the A/c, when used, trips the breaker regularly.
- Consider possible access for food trucks, to supplement the existing food concessions?
    - And rehab the existing facility
- Cuing lines work well now, based on limited days of operation (Fri-Mon) and the simplified menu.
- Only prepackaged meals can currently be served, limiting menu options.
- If they had a full kitchen, they could operate 7 days a week (and they feel as though there would be good demand).
- The existing restroom building's proximity to the food concessions is problematic, specifically due to immense odor and wind patterns that blow towards the concessions building.
- Separate restroom facility at this location has sufficient capacity.

- They would like to get a liquor license for just canned beer and other canned alcoholic drinks. This might impact people's ability to bring their own alcohol, as they do now.

Regarding existing shade shelters:

Currently they have 5 shelters they rent out for an entire day. Consider reserved windows of time (versus a full day) for the shelters, at least for any new, smaller shelters that may be added.

Paddle Board Operations:

- Multiple paddle board stations would likely strain available staffing.
- They need more restrooms, as the two at the boat house are grossly insufficient. Also, the congestion of people waiting interferes with boat rental operations. Would be great if they could be located elsewhere to reduce the congestion of the area, especially on busy weekend days.
    - If new vault toilets are added, maintain 100' buffer from the lake and reservoir
    - Consider a new restroom facility between the marina parking lot and overflow parking lot
    - Consider a new restroom facility east of the playground, central between the swim beach and marina
- Consider adding food concessions to the rental facility.
- Pump stand/stations for paddle boards would be popular and may help keep people from inflating their boards in drive aisles and roads, as happens now. Ideally these stations would have power outlets (like a car cigarette lighter) so people could use their own pumps, to avoid liability for the boat concessioner, since sometimes people over-inflate and ruin their paddle boards. Add max P.S.I.
    - Add a contamination station at the paddle board stations
    - Is solar and option?
    - Takes approximately 10min to fill a paddle board
    - Lockers?
    - Incorporate a staging area along the parking lot for ease of access and use
- The existing dock is needed and is of the appropriate size as-is. This is used for safety boats.
- We discussed an idea of paddle board operations at the reservoir. If water quality can be maintained, this is an idea that the boat concessioner really liked. It could also assist to disperse water recreations more broadly through the park, reducing the overuse currently experienced at Big Soda Lake.
    - Boat ramp preferred to Pelican Point
    - Consider satellite operation with a small structure and vault toilet (not a full marina)
    - Establish activity zones (i.e. paddle board here and fish here)
    - Will require a dock for rescue boats, both park and concessionaire
    - Concerned about how to co-mingle fishing and paddle boarding
- Wherever paddle board operations may be located, they need to be near parking and toilets.
- Continue to launch paddle boards from the beach. Do not launch from docks.
- Desire to maintain existing paddle board access west of swim beach. Provide a designated maintained route with signage.
- Perhaps consider a permit system for personal paddle boards, as another means of limiting/reducing overuse. This could be limited to 2000 permits/year for example.
    - Could also help with monitoring zebra mussels
- Current paddle board concessions can support rentals of up to 120 boards/hour.

    - What is the desired experience on the water?

Arrival Sequence and Parking:

- Alleviate congestion in swim beach parking by disbursing use zones and associated parking needs.
- Parking lots are in high demand during peak season.
- The overflow parking lot is almost full year-round.
- The preference is to formalize and pave the overflow parking lot.
    - The Southern section is typically very wet. Assess necessary adjustments, as needed.
    - Due to wet soils, a boardwalk may be necessary between the overflow parking lot and rental facility parking lot.
- A new parking lot or parking lot expansion could be considered near the volleyball courts. Natural resource impacts to be considered.
- For any new parking lots, consider paved pedestrian circulation for ease of access.
- There is a desire to pave the walks from the overflow parking area to both the marina and swim beach lots. Visitors are often seen walking in the street for ease of carrying wheeled equipment.
- Shuttle system - Consider the use of a shuttle system to help offset the congestion at the Soda Lake Beach parking lot.
- Drop-off: Add a drop-off as another means to alleviate congestion at the Soda Lake Beach parking lot.

Amenities:

- Volleyball courts are very popular
- Playground is popular
- Trash removal – consider trash receptables & operations seasonally and year-round. Mindfulness of volume of waste and wildlife management.
- See plan notes for more feedback

Trails

Wayfinding – primary concern

- Create advised routes to get between areas
- Loops – check in with Lee
- Turtle Pond is a confusing area
- Trails don't need to be over maintained
    - Continue to provide 5'-0" ft width mowed buffer for snakes
- Mt. Carbon conflicts between bikers/hikers and sight lines
- Include signs for what e-bikes are allowed or not
    - Coming downhill with e-bikes is dangerous
    - Signage may not be enough

Bike lane on road shoulder

- Good idea, see a lot of people that ride side by side with up to 5 bikes. This might keep people closer to the edge

Road between gatehouse & boat ramp – straight, no curves and people speed in cars. Provide solar powered sign? Or non-flash signs?

- Trails on north side of road get muddy
- Some tree coverage/bling spots along road

Don't think there is a need to separate hikers/bikers. Prefer that it's open to all. Consider additional signing for certain areas for safety, i.e. widening sections of the trail.

Would like to see drainage cuts longer which would be less abrupt for bike riders.

Don't like inconsistency with what vault toilets/water spigots are open/available. Provide a better understanding of when everything is open.

Mud closures work well at Green Mtn. but they are not yet setup at BCLP. It is challenging with so many access points. The park is working on this at Mt. Carbon trail area.
Question on adding skills/pump track close to campground? BLCP only beginner level trail in area.

Trails are good for people with wheelchairs/adaptive wheelchairs to use. Gary know groups in the area who could test sections of trails and provide feedback on sections that don't work with adaptive "vehicles".

City has asked USACE previously about bridge connecting trails on west side of reservoir. Any structures would need to be approved by USACE. Primary concern is things not blocking/preventing water from leaving the reservoir.

Proposed Big Soda Lake loop

- Consider hiker only? Or hike one direction, bikers opposite direction? Or provide enough width for both uses.

Options for natural surface next to paved trails?

Question on raising entrance fees

- Depends on operations, prefer to keep it down for more people to enjoy the park
- People would park outside and walk in
- Need to provide ways for people to enter for free per lease with USACE
- Fees goes to the City general fund, not directly to the park unless budgeted for
- Number of visitors per year is 800k – 1 million. Hard to estimate because annual pass holder cars are not county and people who don't enter in a vehicle.

36-Acre Parcel & Campground

Campground

- Additional campsites to the north of existing campground would be over Denver Water Easements.
- If tent only, provide east of campground, consider wind.
- Make sure shade is functional throughout the day, i.e. tilt/larger shelter, etc.
- Like the idea of replacing the yurts with cabins. Consider geodomes?

- Vaults should be at least 150’ from any water body. Yes, connection to water/wastewater outside the park is desired.

36-Acre Parcel

- Access through Xcel easement to the Lake is desired.
    - Paddle board station likely not needed on the east side of the lake. Consider water enjoyment through viewing only.
- Winter activities aside from snowshoeing are not feasible due to frequency of snowfall.
- Think regionally about migratory birds and habitat impacts. Maintain the prairie dog colony.
- Consider a regional trail “loop” to the C-470 Bikeway
- Provide safe access from campground to new parcel if trails are provided.
- Additional campsites increases utilities and bear proof containers. Consider return on investment/revenue and staff requirements. Consider additional day use opportunities over additional campsites. Or day use with tent only.
    - First come first serve not desired due to Red Rocks users.
- Should the City push to acquire the areas currently in private ownership? Yes. There will need to be good justification for why it would be beneficial.

BCLP Master Plan Park Meeting

Wednesday, December 13 from noon to 2:00 p.m.

Meeting Objective

The Bear Creek Lake Park master planning process is underway to chart the course for the future of BLCP and create a sustainable vision that is equitable to all user groups and preserves the park's natural resources. The initial stakeholder meeting and public open house occurred in September. Feedback was reviewed and incorporated into draft concept plans for consideration. A second public open house is anticipated in early 2024 to present the draft concept plans.

Meeting Agenda

20 min

1. Overall introduction and welcome/get lunch started (City)
2. Recap of work to date (DHM)
    a. Project vision and goals
    b. Study area and overview of focus areas
    c. High level overview of public comments
3. Draft Natural Resource Memo (DHM)
4. Review of draft concepts common to all (DHM)
5. What's next? (DHM)
    a. Concept updates
    b. Rough Order of Magnitude Cost Estimates
    c. Open House #2; Date and time TBD

1 hour 40 minutes

6. Group breakout/rotation; approximately 30 min at each topic (3 tables total)
    a. Break into small groups and rotate through
    b. Draw and add notes on range of concepts

	Visitor Center/Gatehouse	Big Soda Lake	36 acre parcel & campground
Design Team	Rebecca/Tracy	Eileen	Michaela

900 South Broadway, Suite 300 Denver, Colorado 80209 P: 303.892.5566 f: 303.892.4984

DHM DESIGN

Attendees:

City of Lakewood – Brad, Amber, Jim, Ross
Park – See breakout below.
Design team in person – Michaela, Eileen, Rebecca, Tracy

Breakout Groups:
Meeting notes/comments are captured below and on the plans.

Big Soda Lake

Session 1: Jerry, Grace, Todd, Matt

Gatehouse

- Splitting lanes earlier
    - Concern with separation of designed lanes – people don't know what lane they need to be in, switch lanes at last minute, increase backups.
- Could we add a loop to the west for additional queuing?
    - Likely insufficient space between Morrison Rd & Creek
- Traffic backs up onto 470 – safety concern, they get calls from CO state patrol
- If park shuts down - Traffic lines up on roadside east of entry, does U-turns when park opens – safety concern
- Staff would like a traffic light at the entry
- Should physically separate bike lanes from vehicular traffic – cars often pull over into the bike lane
- Gatehouse building is not aligned with flow of traffic – often gets hit by campers
- Vault toilet is a big problem – prefer a plumbed toilet within the same building, but could be separated
- Money counting in a separate building is not a great idea – safety concern of carrying the money across the road to a separate building
    - Doesn't seem like a big issue how it works currently
- Automated gate for pass holders?
    - They receive lots of visitors who think this is a state park.
    - Concern that people with the state parks pass would think they can use this lane – cause more backups

Visitor Center

- A renovation of the existing building is worth considering.
- Per Grace, Atrium is the least concern
- Staff RR needed
- Larger office space
- Breakroom and public restrooms that are not within the classroom – very disruptive
- More storage needed – could be separate from existing building – but needs to be secure and conditioned (tech equipment)
- Security at front desk a concern – public can just come right in

- Public RR accessed from the exterior is desired
- General location of VC is good – close proximity to amphitheater is desired
- Need better IT capacity – currently wifi doesn't work – Design team to check with AE on status of current infrastructure
- Dedicated staff parking is desired – for personal and work vehicles
- School buses – can turn around but it's tight, parking for buses currently sufficient
- Grace would love to have better access from classroom to outside – deck/ outdoor classroom

Session 2: Ross, Nick, Jason, Keith

Gatehouse

- They like how Chatfield entry works
- Double gatehouse – don't think they have enough personnel to staff it
- Automated gate – possibly
- Would like electronic sign/ message board
- Maybe 2 smaller gatehouses – only open the 2nd one on busy days
- Swim beach reservation system – not popular idea
- Left turn after gatehouse for rejected entries
- Roundabout instead of pull out after gatehouse – concern with monitoring people that say they're leaving

Visitor Center

- Classroom should be double its current size
- Typically 30 students
- Would be nice to have parking closer to the visitor center
- Would be nice to have the VC closer/ more visible from the road
- View out the back of the current VC – nicest view in the park
- Having a flush toilet is important for public and staff
- Separate staff/fleet parking would be nice – secured/fenced not needed
- IT concerns – wifi insufficient – only 1 phone line to the building currently
- No interest in renovating the existing building – think more space is the biggest issue
- Ross: could we look at a different location for the park entry?

Session 3: Deneen (sp?), Wayne, Luke

Gatehouse

- Sundays are busier than Saturdays
- Traffic backs up onto 470 – safety concern, they get calls from CO state patrol
- Could the entry cut in further to the west on Morrison?

    - May not help the backups, but would get them off Morrison sooner
- CDOT didn't want 2 turn lanes
- Gatehouse & Entry is the biggest issue for the park
- Electronic signs would be helpful
- Restroom situation is a larger issue than money counting

Visitor Center

- Storage is biggest need
- Closer to Amphitheater would be nice
- Move or add parking to south of entry drive
- More parking at turnaround
- Parking lot is rarely full
- Shade structure for parking would be nice

Big Soda Lake

Swim Beach Area:

- Explore all opportunities to expand the swim beach and beach areas.
    - Expand zone in lake.
    - Add new area east of marina boat launch. Stop at edge of marina parking to maintain management and visibility. Currently used by visitors, formalize access.
    - Existing beach area by marina (west of plaza), consider changing to a paddle board launch area only. The area is too small for multiple uses.
    - Assess and consider smoking zones
- Precedent imagery for seating/bank stabilization/beach access was liked. Consider adding this treatment between the swim beach area and marina beach area.
- Continue to distinguish between use zones and access; swim area, wading area, paddle board launch and lap lanes.
- Area between swim beach and beach is narrow. Consider adding a boardwalk with an expanded deck area for seating and picnicking.

Food Concessions:

- Separate restroom facility – consider removing to open up area for more swim beach seating and shade shelters. Relocate the restroom northwest of the volleyball courts.
- Consider removing trees in plaza area between concessions and restrooms and provide permanent shade structure and seating.

Regarding existing shade shelters:

- Add more small shade shelters throughout
- No more large shade shelters
- Add BBQ grills/coal to existing and new shade shelters
- Very popular

- Addition of grills may eliminate visitors bringing grills, which is prohibited
- Regardless, add a coal receptable for proper and safe disposal of coals

Paddle Board Operations:

- Maintain existing launch by lap area. Concerned about how to manage a location change.
- Provide direct and designated maintained access to existing launch area by lap area.
- East of the marina there is an existing boat ramp under water.

Arrival Sequence and Parking:

- Establish a clear drop-off queue zone for visitors.
- Provide designated separate staff parking and emergency staging areas.
- Consider expanding the Meadowlark shelter parking lot, could also extend closer to the lake. Area is relatively flat with no trees.
- Consider adding a new parking lot (with a restroom and small shelters) along NW shoreline (where lap lanes are). Relocate lap lanes. Intent is to disburse visitor around the lake.
    - Overflow parking lot could then be reduced in size
- Overflow parking
    - Fire hazard – hot vehicles park over tall grass. Change to gravel or pave.
    - Used as a designated large vehicle overflow parking for campers waiting for their site. Visitors can utilize the beach area until campsite becomes available.
    - Some would prefer to remove this lot
    - Some would like to reduce the size and not formalize

Amenities:

- Move the volleyball court out of the high use zone. Add small shade shelters with grills in its place.
- Existing dumpster location to be relocated out of congested area and located for sufficient truck maneuverability.
- Adding power stations was desirable.

Trails, 36-Acre Parcel & Campground

Trails

- Bid Soda Lake proposed trail on the south side presents constructability concerns as well as:
    - Safety for visitors and staff
        - Additional rangers needed? Fencing?
        - Increase
    - Very steep
    - Encouraging undesirable increased use from afterhours campground entrance
    - Wind
    - Possible archeological resources
    - Additional people trying to launch paddle boards in undesirable locations

- Explore if additional beach and parking access might be accommodated on the south side of Big Soda Lake if additional land acquisitions were possible.
    - It is a preferred location to be because of natural tree shade protection, shallow, protected from the wind
    - The dirt road is a Denver Water Access road
    - Paddle boards do congregate in the area because of wind
    - People access the south side now through a hole in the fence.
    - Visitors use it as a dog off leash area and rangers have problems with alcohol a that area
    - At a minimum, improve the fending
- Incorporate ¼ mile increment signs on trails for better communication with rangers.
- One individual commented that the designated bike lane is a good idea.

36-Acre Parcel

- Programming ideas
    - Fitness circuit
        - Previous fitness circuit trail was removed, is it the right fit to re-incorporate?
    - Like overlook idea
    - Formal winter activities are not desired due to maintenance concerns and lack of snow
    - Tent only is generally preferred due to utility considerations (30-40 sites max).
        - Consider vault smells and dump station capacity
    - Mixing picnicking (day use) and camping (overnight use) is not desired.
    - Possibly incorporate cabins on the parcel?
- Ideas for additional land acquisition
    - Improved circulation and roadway maintenance. The current access road from C470 is not well maintained due to ownership.

Campground

- Consider raising RV rates only
- Consider ranger facility/station at campground. It is the first and last stop LE makes during the day. It could relieve some needs/use at the VC.
- Water/utilities are the limiting factors for improvements/additions
    - A/C and power upgrades may not be feasible
- 2 more showers desired
- Convert yurts to cabins
- Consider adding a bunk house for retreats/family groups, scout groups intro to camping
- Maybe consider tents near the cabins
    - Safety concerns with later arrivals from Red Rocks
    - Walk in tent sites may encourage undesirable trampling and dispersion outside designated areas
    - Area is too hot for tent camping without additional shade
- Make area from Blue grama picnic area, group campground and to sites 1-17 more unified/functional
    - Group campground serves more as overflow
    - Group loop; add central fire and shelter and communal use area
- Sites 1-17; consider longer campsites and improved surface stabilization to reduce washouts

DHM DESIGN

- Add an emergency campsite
- Adding additional RV campsites not necessarily desired
- Trees are very difficult to grow at the campground.
    - If they are established, they are habitat for predators.
    - Limit visibility across the campground for staff
    - Provide a firewood source
    - Water diapers are working well
- Provide a combination of built and natural shade
    - Incorporate hooks on the shelters for a hammock location. Lee to get photo.

Lakewood
Community Resources

Bear Creek Lake Park Master Plan
Public Open House
March 27, 2024

Phase 2 public engagement for the Bear Creek Lake Park Master Plan process kicked off on Wednesday, March 27th, with a public open house at the Bear Creek Lake Park Visitor Center. The project team shared design and park improvement concepts with the public based on public input gathered during phase 1 of this planning effort.

Approximately forty (40) attendees were provided with detailed information about proposed upgrades and improvements to the park specifically at the following park features:

- the gatehouse,
- the visitor center,
- the trail system,
- the new 36-acre parcel,
- the campground, and
- Big Soda Lake

Members of the plan team were present to answer questions and gather ideas from the attendees about what they would like to see in the park in the future.

Attendees were asked to prioritize improvements in the park by allocating $100 worth of play money among the six park features. Attendees were also given red and green sticky dots to express prioritization of improvements within each of the six distinct features of the park.

Attendees prioritized improvements to the park in the following manner (in descending order of priority):

- Maintain and improve the existing trail system (75 notes/$1500)
- Upgrade the gatehouse (33 notes/$660)
- Upgrade the Visitor Center (27 notes/$540)
- Improve the experience at Big Soda Lake (20 notes/$400)
- Connect and activate the new 36-acre parcel (14 notes/$280)
- Improve the campground experience (7 notes/$140)

For the dot exercise, attendees prioritized specific improvements within each park feature (in descending priority):

TRAILS:
- Maintain existing trails – highest
- Provide new trails – high
- Formalize existing ditch trail – neutral

- Add a loop trail around Big Soda Lake – neutral
- Add a designated bike lane to the road shoulder – low.

GATEHOUSE:

- Improve vehicle congestion – highest
- Relocate gatehouse for a better staff and visitor experience – neutral
- Address pedestrian safety – neutral

VISITOR CENTER:

- Renovate and expand or replace the Visitor Center – highest
- Provide public restroom with outdoor access – high
- Expand parking – neutral

BIG SODA LAKE:

- Expand the Swim Beach – highest
- Expand parking – high
- Add new restrooms with increased capacity – high
- Provide new playground in existing location – neutral
- Increased areas to gather/picnic – low
- Provide designated paddleboard launch areas – low
- Expanded food concessions – low

36 ACRE PARCEL:

- Provide tent camping only - high
- Provide trail and pedestrian bicyclist connectivity – neutral
- Improve Dam Trail to Big Soda Lake – low

CAMPGROUND:

- Improve existing campsites – highest
  Add a ranger station near the afterhours check-in – high
- Improve camper shower house – high
- Reconfigure and add bunkhouses to the group camping area – low
- Provide a new playground in the existing location - low

Lakewood
Community Resources

Bear Creek Lake Park Master Plan Survey #2 – Summary

Public engagement during the second phase of the Bear Creek Lake Park Master Plan process included a public open house (3/27/24) and a second community survey. The second survey opened on March 27, 2024 and closed on April 29, 2024. The survey asked respondents to prioritize the recommendations for future improvements to the park at six key features within the park: the gatehouse, the visitor center, the trail system, the new 36-acre parcel, the campground, and Big Soda Lake. Survey response was robust with 477 community members answering survey questions.

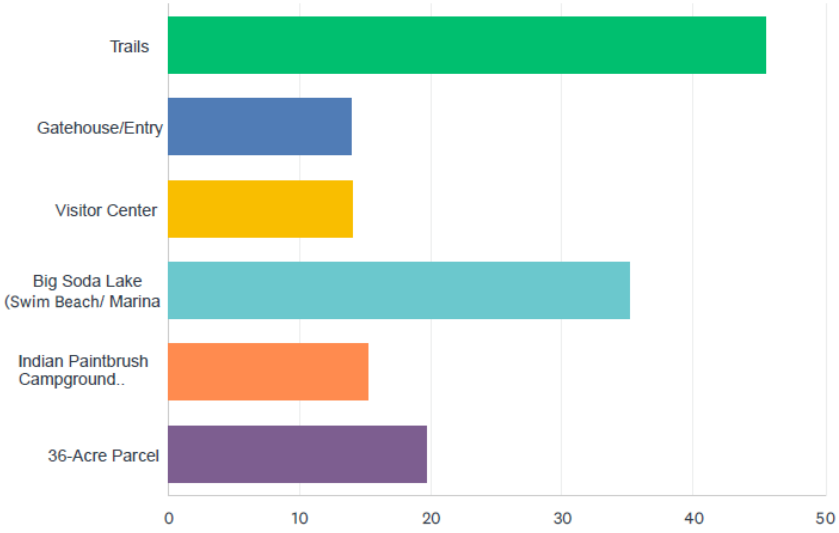
Survey #2 THEMES:

- Improvements to the trail system and to Big Soda Lake are of the highest priority;
- With regards to TRAILS, focus should be on maintaining existing trails, providing new trails, and adding a loop trail around Big Soda Lake;
- An expanded swim beach, expanded parking, new restrooms, and a paddleboard launch area are the most desired improvements at BIG SODA LAKE;
- Respondent would like better connectivity to and within the 36 ACRE PARCEL;
- Survey takers would like to see improvements at the INDIAN PAINTBRUSH CAMPGROUND including better campsites and showers, a ranger station, and an upgraded bunkhouse.
- At the VISITOR'S CENTER respondents would like to see restrooms that can be accessed from the outdoors, but were less interested in a brand new visitor's center or increased parking;
- At the GATEHOUSE respondents' priority is to address traffic congestion during peak visitation days at the park.

More detailed results from the survey questions are included below.

Q2 Refer to the Bear Creek Lake Park Master Plan Exhibits. If you had $100 to spend on improvements at Bear Creek Lake Park, how would you allocate / prioritize these funds? Indicate a whole dollar amount (without the dollar sign) below where you would like the money spent:

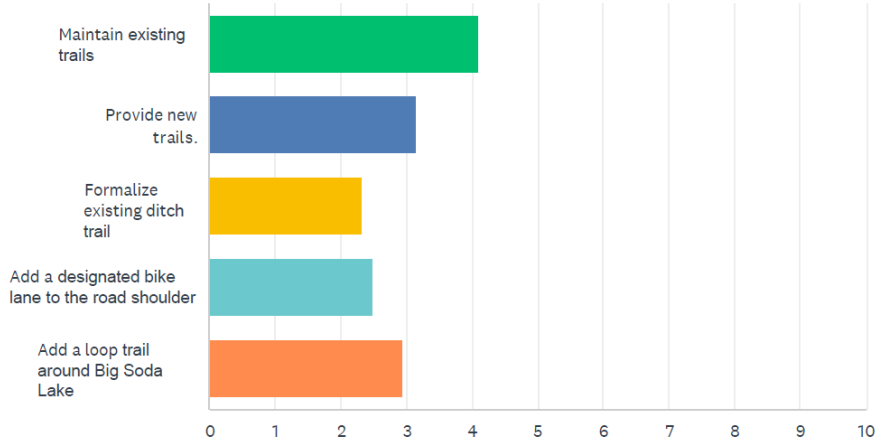
Answered: 466 Skipped: 11



Bear Creek Lake Park Survey #2

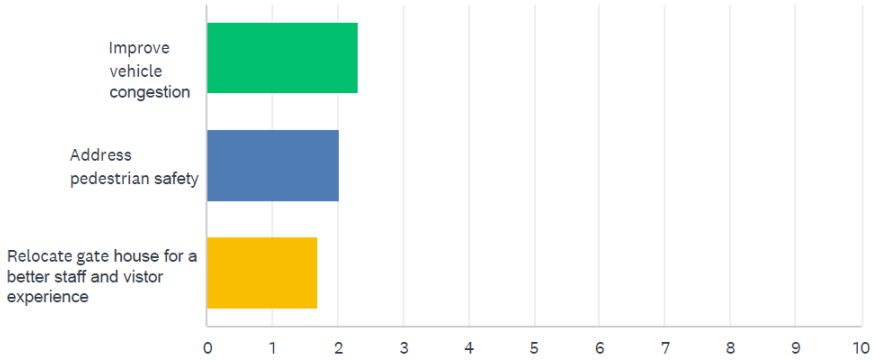
Q3 Use the arrows to rank your TRAIL priorities with your most important priority first and the least important priority last.

Answered: 473 Skipped: 4



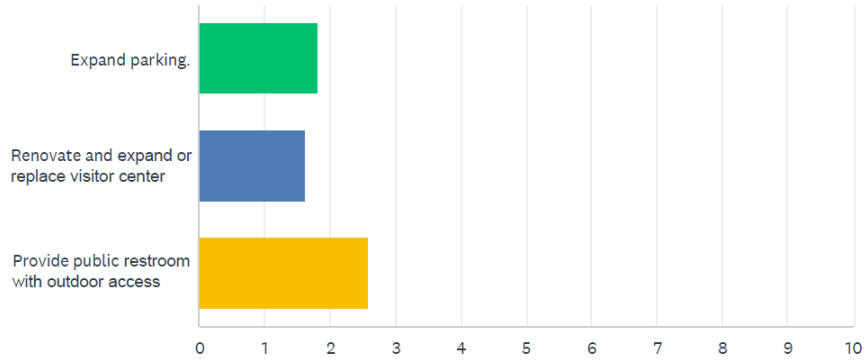
Q4 Use the arrows to rank your GATEHOUSE priorities with your most important priority first and the least important priority last.

Answered: 374 Skipped: 103



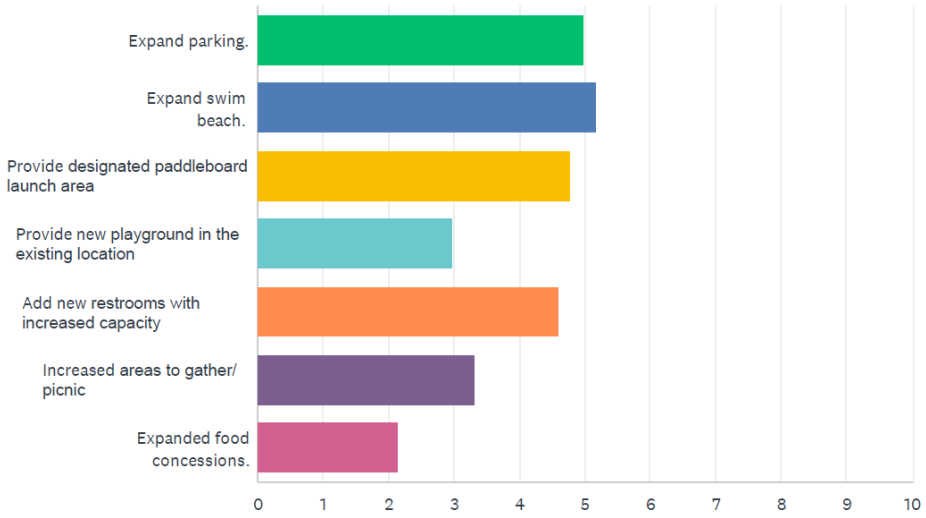
Q5 Use the arrows to rank your VISITOR CENTER priorities with your most important priority first and the least important priority last.

Answered: 449 Skipped: 28



Q6 Use the arrows to rank your BIG SODA LAKE priorities with your most important priority first and the least important priority last.

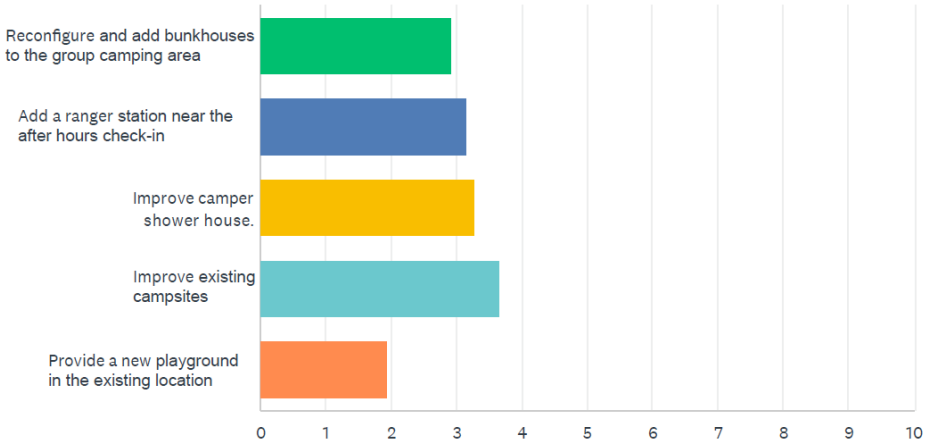
Answered: 466 Skipped: 11

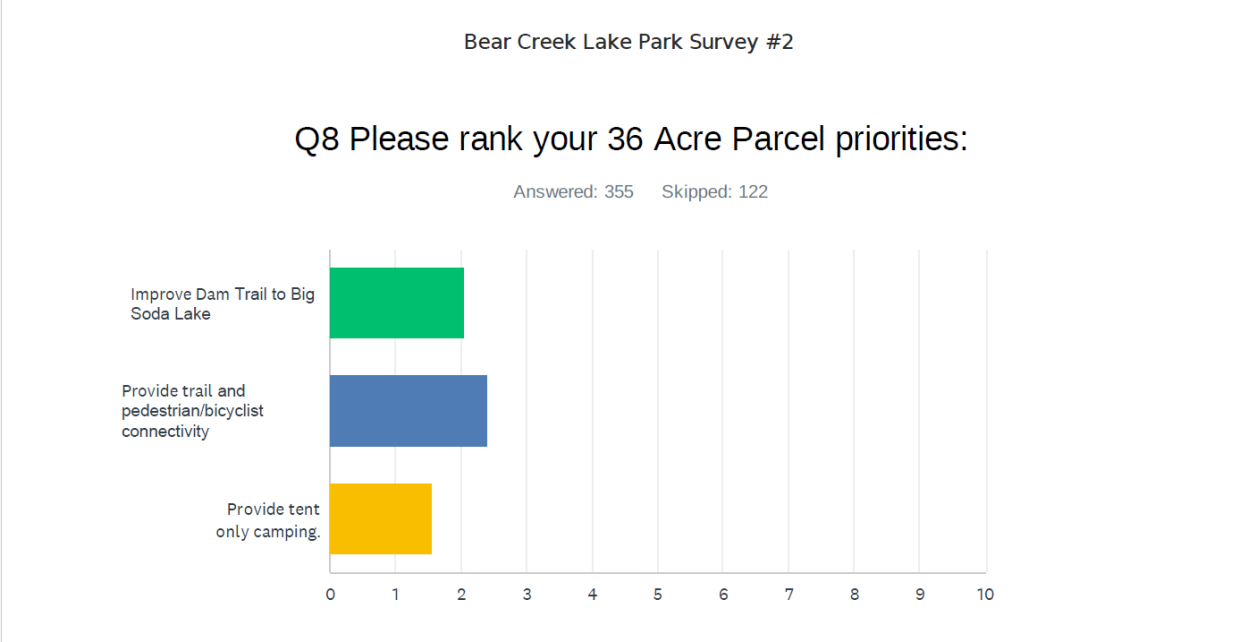


Bear Creek Lake Park Survey #2

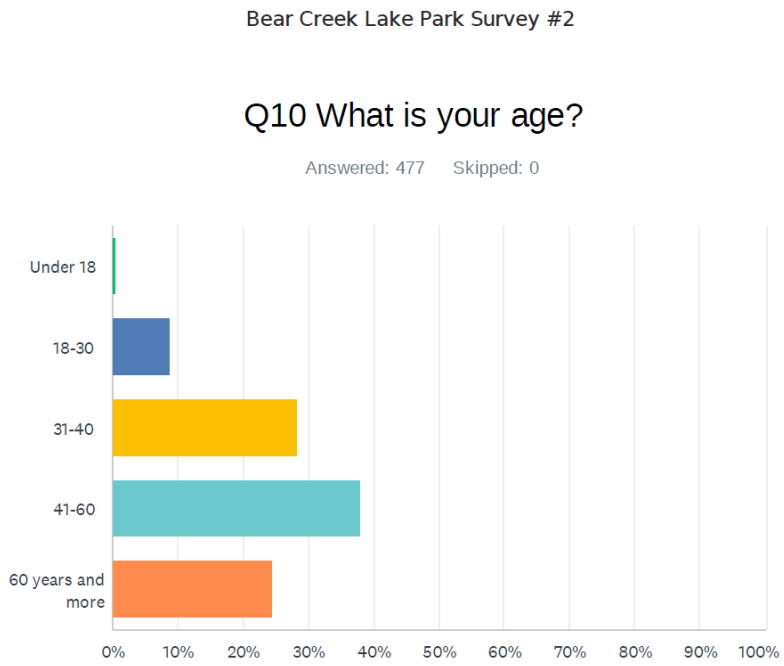
Q7 Use the arrows to rank your CAMPGROUND priorities with your most important priority first and the least important priority last.

Answered: 418 Skipped: 59





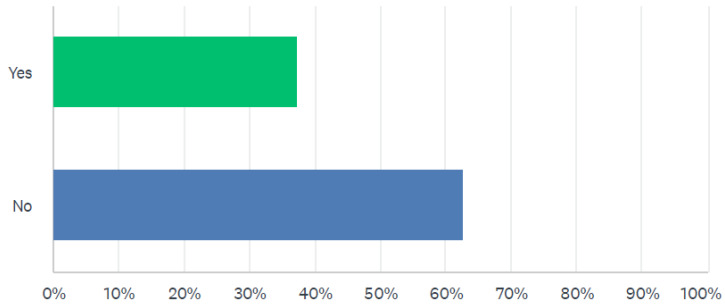
Who Answered Survey #2?



Bear Creek Lake Park Survey #2

Q11 Children under 18 in the household

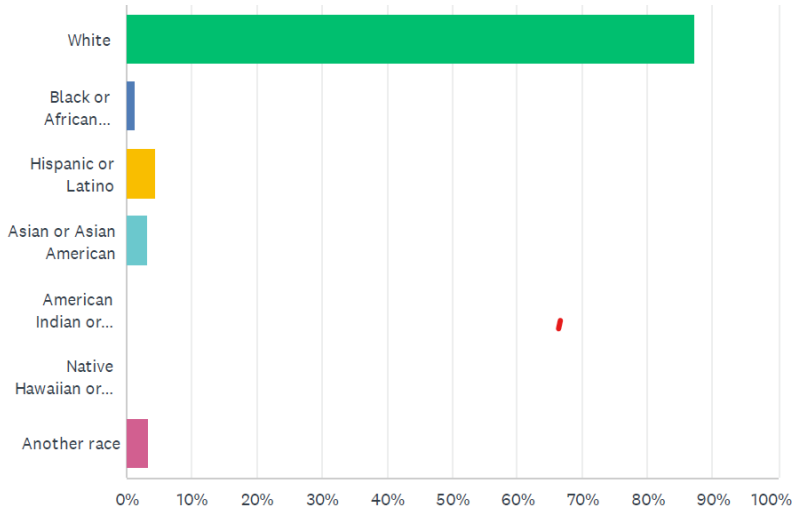
Answered: 470 Skipped: 7



Bear Creek Lake Park Survey #2

Q12 Ethnicity (Optional)

Answered: 417 Skipped: 60



COMMENTS:

110 survey respondents offered additional comments on the recommended improvements including the following topics:

Parking:

- Offer Level 2 EV charging stations

Morrison Road:

- Build a bike/ped bridge over Morrison Road
- Improve Morrison Road crossings at Bear Creek Blvd and/or Indiana Street
- Prohibit parking along Morrison Road
- Bike/ped path along the south side of Morrison Road
- Add a traffic signal at the entrance to the park on Morrison Road

Indian Paintbrush Campground:

- Increase tree canopy
- Add campsites closer to Big Soda Lake
- Provide flush toilets

Trails:

- Consider separating bike and pedestrian trails
- Make the Owl Trail pedestrian only

Lake Amenities:

- Add a kayak and paddleboard launch pad
- Stock more Walleyes
- Add a fishing dock
- Add rinse showers at the beach
- Create a passenger drop zone at the beach
- Make the fishing trail more accessible, it's difficult to go beyond the second bench
- Flush toilets at Big Soda Lake
- Move the swim lanes east of the marina where the water quality is better
- Continue to maintain a protected swim area
- Allow flyfishing

Golf Course:

- Update the street configuration between the park exit and the golf course entrance
- Connect the trail on the south side of the golf course back to the concrete path

Horse Trails:

- Offer more challenging trails
- Improve trail connectivity
- Add equestrian uses to the new 36 acre parcel

Pests:

- Reduce wasps
- Contain prairie dogs

Park Entrance Fees:

- Better annual pass discounts for local residents
- Prevent people from accessing the park for free
- Lower entrance fees so that people don't park outside the park and walk in

Trash:

- Enforce fines for littering and defacing the park
- Host a trash pickup day in the park

Other Amenities:

- Build a dog park
- Offer a picnic area with shade

BCLP Master Plan Advisory Committee Meeting

Wednesday, July 31 from noon to 1:30 p.m.

Meeting Objective

The Bear Creek Lake Park master planning process is underway to chart the course for the future of BLCP and create a sustainable vision that is equitable to all user groups and preserves the park's natural resources. The initial stakeholder meeting and public open house occurred in September 2023. Feedback was reviewed and incorporated into draft concept plans for consideration. The second stakeholder and public open house occurred in December 2023 and March 2024. Based on feedback received to date, the City and Park narrowed concepts to one preferred concept for each focus area, which will be presented today.

Meeting Agenda

30 min

1. Overall introduction and welcome/get lunch started (City)
2. Recap of work to date (DHM)
    a. Project vision and goals
    b. Study area and overview of focus areas
    c. High level overview of public & stakeholder comments
    d. Utility coordination - The Project Team thoroughly pursued, designed and priced providing water and sewer to every applicable area of the park. Due to costs and unknown water commitments, the concepts shown today are not recommending investing in these enhancements at this time. We will continue to monitor and engage with providers as appropriate through the plan implementation.
3. Review of preferred concepts
    a. Trails
    b. Gatehouse
    c. Visitor Center
    d. Big Soda Lake
    e. Little Soda Lake
    f. Campground
    g. Parcel
    h. Stables
    i. Boat Ramp at Reservoir
    j. Pelican Point
4. What's next? (DHM)
    a. Online public review
    b. Final revisions based on stakeholder/public input
    c. Council presentation – anticipated late November/early December

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DHM DESIGN

Attendees:
City of Lakewood – Brad, Amber, Jim, Alan
Park – Lee, Kyle, Todd
Design in person – Michaela, Rebecca
Stakeholders – Russell, Kristina, Russ, Graham, Gary, Sonya, Katie, Adam, Jerrie, Katie

1. Overall Discussion:
    a. Discussion on overall usage of vault toilets; i.e. stainless steel options available?
    b. Water quality related to use of vault toilets
        i. Expressed concerns for water quality with vault toilets close to creek/lakes, especially with flooding. Ideally the park pumps vault toilets prior to flooding but that's not always feasible. Design team to investigate "flood- proof" vault toilets. City continue investigating future tie into municipal water supply.

2. Preferred concept review
    a. Utilities
        i. Updates on City discussions and availability of water
        ii. City will continue to monitor and engage with providers as appropriate through the plan implementation.
    b. Trails
        i. Continued desire for soft surface trails along with paved trails.
    c. Gatehouse
        i. Discussion was had on what other options were considered to alleviate traffic congestion
            1. Questions arose related to contactless payment/adding automatic gate/etc.
        ii. Clarifying notes on the length of added lanes, CDOT projects in progress, and notes for Morrison Rd.
    d. Visitor Center
        i. Question related to operations and if the addition is necessary. For current park operations, the current building is not adequate and there are interruptions to programming due to the current floorplan.
    e. Big Soda Lake
        i. Spillway – nothing to add to graphics
        ii. EV charging/designated parking – not at this time, add as a possible future phase 2? Any requirements for expansion of Meadowlark parking? Coordinate with new City requirements. Brad/Amber will follow up with any needs for the MP.
        iii. Decontamination station - not at this time
        iv. Considerations for paving the overflow parking was discussed. This may be part of a phased approach. The current overflow parking lot is heavily used.
    f. Little Soda Lake
        i. Emergency shelter – add to the plan
        ii. Buildings are in poor condition - Building removal and replacement? – not at this time
            1. There may be a future partnership opportunity with the concessionaire for a new building.
        iii. Shift existing storage label on the plans

g. Campground
    i. No comments
h. Parcel
    i. Add trail length to graphic
i. Stables
    i. Add crosswalk to east
j. Reservoir - Boat ramp
    i. Discussion on additional visitor use at the Reservoir
k. Pelican Point
    i. Discussion on additional visitor use at the Reservoir
    ii. Shift vault towards picnic shelter? Leave where proposed
    iii. Proceed with showing possible future paddle board station? Yes

Lakewood
Community Resources

Bear Creek Lake Park Master Plan Survey #4 – Summary

The final phase of stakeholder and public online engagement occurred in November and December of 2024 on the City of Lakewood project page. The project team asked residents and park visitors to review the draft plan. The project team heard support for surge pricing, signage along Morrison Road, and repaving from the Visitor Center to the Stables, from the Stables to the Soda Lake parking lot, and the north road around the dam on the East. There was also community support for prioritizing improvements to the Visitor Center and Gatehouse, and a hope the park could connect with municipal water.

Some community members expressed concern about bringing more visitors to Pelican Point to park and rent paddleboards, and opposition to widening the existing asphalt road to add a bike lane as speeds are already low and there are other hard surface trails for bikers to ride on.

Questions were raised about the possibility of a bridge or tunnel for pedestrians to safely cross Morrison Road, and community members continued to raise questions about the Army Corps of Engineers' plans to increase reservoir capacity.

The final draft is scheduled to be presented to Lakewood City Council for adoption in early 2025.

Phase 1	
Stakeholder Meeting	19 participants
Pop-Up Event	50 participants
Open House	85 participants
Community Survey	1,416 participants
Project Page Quick Poll about Bear Creek Lake Park's Greatest Value	392 participants
Phase 2	
Stakeholder Meeting	15-18
Park Staff Meeting	15-18
Open House	40+ participants
Community Survey	477 participants
Project Page Comments on Design Concepts	11
Project Page Questions about Plan	8
Phase 3: Draft Final Concepts	
Stakeholder Meeting	15-18
Phase 3: Final Concepts	
Project Page Views	10,000+
Draft Plan Views	360
Project Page Comments on Draft Plan	6

BEAR CREEK LAKE PARK

UTILITY MASTER PLAN REPORT
BEAR CREEK LAKE PARK

Martin/Martin, Inc. Project No.: 23.0459

October 23, 2024

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I. OVERALL UTILITY SUMMARY

A. Utilities

The preferred alternative for utility improvements is anticipated to vary based on location. Some areas will maintain existing utility systems, modify systems already in place, or install new similar utility systems. Refer to Table 1 - Proposed Utility Improvement Summary by Area for a breakdown of the anticipated utility improvements by area. The existing utility systems at the Park are described in the Final Existing Conditions and Site Analysis Report dated November 2023.

Wastewater:
Planned improvements consist of new vault toilets in several areas of the Park and a new septic tank and soil treatment area for the expanded campground shower house.

Potable Water:
Planned improvements consist of a new potable water tank near the Gatehouse, upsizing the potable water tank at the Marina, and upgrading the water yard hydrant at the campground RV dump station.

Fire Suppression:
No fire suppression improvements are anticipated.

Storm Drainage:
Planned improvements consist of cleaning out existing storm infrastructure and potentially addressing storm water quality and detention pending the amount of impervious areas added as part of the improvements. New parking areas are anticipated to be able to sheet flow such that storm infrastructure is not needed to convey drainage.

Proposed Utility Improvement Summary by Area				
Area	**Wastewater System**	**Potable Water System**	**Fire Suppression**	**Drainage**
Gatehouse	Vault Toilet	100 Gallon Water Tank 5 Gallon Pressure Tank New Water Lines	None	None
Visitors Center	None	None	None	Potential Water Quality & Detention, Clean Out Existing Curb Cuts/Sidewalk Chases
Big Soda Lake Marina	None	Remove Existing 5,000 Gallon Buried Water Tank, New 15,000 Gallon Buried Water Storage Tank, 30 Gallon Pressure Tank, New Water Lines	None	Clean Out Existing Curb Cuts/Sidewalk Chases, Re-grading to Address Existing Low Areas, Potential Water Quality & Detention
Big Soda Lake Swim Beach	None	None	None	Clean Out Existing Curb Cuts/Sidewalk Chases, Re-grading to Address Existing Low Areas, Potential Water Quality & Detention
Little Soda Lake Ski Beach	Vault Toilet	None	None	Potential Water Quality & Detention
Existing Campground	Effluent Dosing Pump, Two Soil Treatment Areas, Automatic Distributing Valve, New Sanitary Lines	Remove and Replace Existing Yard Hydrant by RV Dump Station with New Yard Hydrant + Backflow Preventer	None	Clean Out Existing Culverts, Potential Water Quality & Detention
Big Soda Lake New 36 Acre Parcel	None	None	None	Potential Water Quality & Detention
Bear Creek Stables	Vault Toilet	None	None	None
Bear Creek Reservoir/Pelican Point	Vault Toilets	None	None	None

Table 1 - Proposed Utility Improvement Summary by Area

B. Design Criteria

Visitor Counts

Wastewater flows and water demands were estimated using an estimated visitor count per area in the Park. The City of Lakewood supplied an estimated breakdown of visitors per area per day and employees per area per day, see Table 2 below. These numbers are based on the peak

visitation day from 2022, and the number of passes sold to vehicles entering the Park on that day. The Park uses a metric of three and a half visitors per car to account for groups coming in one vehicle, annual pass holders, and walk-in and cyclist visitors.
The City of Lakewood website indicates that the existing campground has 47 campsites, three cabins, two yurts, and one group campsite. Each cabin and yurt are assumed to be equivalent to one campsite. The group campsite is assumed to be equivalent to five campsites. It is assumed there is an average of three and a half people per campsite.

Area	Visitors/Day	Employees/Day	# of Campsites
Gatehouse	0	3	0
Visitor Center	128	10	0
Swim Beach	2,562	4	0
Marina	2,498	6	0
Campground	128	0	57
Little Soda Lake	64	2	0
Pelican Point	256	0	0
Boat Ramp	192	0	0
Stables/Archery	64	3	0

Table 2 - 2022 Estimated Visitors and Employees Per Area

The Park closes its entrance once the Park reaches capacity, which is typically based on when the parking lots at Swim Beach and Marina are full. Since parking improvements are proposed at some of the areas to increase the number of parking spots as part of this Master Plan, this could allow more visitors to access the Park. It was assumed that the increase in the number of additional parking stalls at an area correlate to the increase in number of visitors to that area. See Table 3 below for a summary of the areas of the Park proposed to have additional parking.

Parking Area	Existing # of Parking Stalls	Proposed # of Parking Stalls	Factored Increase
Visitor Center	44	72	1.64
Swim Beach & Marina	212	301	1.42

Table 3 - Proposed Parking Stall Additions

Two bunkhouses are proposed to be added to the campground. Each bunkhouse is proposed to have seven bunk beds, able to house 14 people. One bunkhouse is assumed to be equivalent to four campsites.

Table 4 below shows the proposed visitor counts with the Factored Increase from additional parking applied to the Visitor Center, Swim Beach, and Marina areas, and additional campsites at the Campground.

Area	Visitors/Day	Employees/Day	# of Campsites
Gatehouse	0	3	0
Visitor Center	210	10	0
Swim Beach	3,638	4	0
Marina	3,547	6	0
Campground	128	0	65
Little Soda Lake	64	2	0
Pelican Point	256	0	0
Boat Ramp	192	0	0
Stables/Archery	64	3	0

Table 4 - Proposed Estimated Visitors and Employees Per Area

Wastewater

The Colorado Department of Public Health and Environment Wastewater Design Criteria Policy, effective June 7, 2022, was first used to estimate wastewater flow for each area. Refer to Table 5 below for the categories referenced from CDPHE Regulation 43
Table 6-2, and associated gallons per day, to estimate the average wastewater flow at each area in the Park.

Category	GPD
Facilities with Short Term or Transient Visitors, per person	5
Office Buildings per employee per eight-hour shift	15
Campground per campsite	50
Travel trailer parks with individual water and sewage hookup per unit	100
Public park shower per fixture when park is open	100
Laundry Washer, Residential	19.5

Table 5 - CDPHE Regulation 43: On-site Wastewater Treatment System Regulation, Table 6-2

Using the CDPHE average wastewater flows can be conservative since it assumes that every visitor or employee uses the restroom and produces that much waste, which is not always the case. The City of Lakewood was able to provide approximately how many gallons of wastewater they haul out from the Swim Beach, Marina, and Campground on an annual basis to help estimate more accurate wastewater flows within the Park.

Since the number of wastewater gallons was provided on an annual basis, an average day wastewater flow per person needed to be estimated. This was done by:

- Taking the total number of Park passes sold in 2022 (provided by City of Lakewood) and using the Park's metric of assuming three and a half people/vehicle (or per pass sold) to estimate total number of visitors.

- Using the Park's percent breakdown of how many of the total visitors go to each area of the Park to estimate total number of visitors to each area.
- Estimating each area's average day visitation number based on percentage of total visitors that go to that area over the number of months that the area is open during the year.
- Taking the annual wastewater volume hauled out of the area (provided by City of Lakewood), dividing by the number of months that area is open to get an average volume per month.
- Dividing the average volume per month by 31 days to estimate average volume per day.
- Dividing the average volume per day by the average day visitation number to get the estimated average wastewater flow per person per day.

For areas with a vault toilet and no water source for handwashing, a generally accepted waste production rate for vault toilets is eight gallons of waste for every 100 uses. An average wastewater flow per person per day of 0.08 was used.

Footnotes:

1. Gatehouse annual wastewater volume assumed to be the same as the minimum vault toilet size required by Jefferson County Onsite Wastewater 2018 Regulations.
2. Visitor Center annual wastewater volume assumed to be the same as the Yearly Potable Water Use provided by City of Lakewood (see water section below).
3. Little Soda Lake, Stables/Archery, Pelican Point, and Boat Ramp will have vault toilets only, no associated water source for handwashing.

below provides a summary of the estimated average wastewater flow per person per day at each area using the City's provided annual wastewater volume or the generally accepted rate for vault toilets. See the full spreadsheet estimate in the Appendices.

Area	City Provided Annual Wastewater Volume Hauled Off (Gallons)	Assumed Annual Wastewater Volume Hauled Off (Gallons)	Estimated # of Visitors on Average Day (Gatehouse is Employees)	Estimated Average Flow per Person per Day (Campground is per Campsite) (GPD)
Gatehouse	Not Data Provided.	400[1]	3	0.36
Visitor Center	Existing Soil Treatment Area.	150,000[2]	169	2.39
Swim Beach	37,500	-	2,548	0.14
Marina	37,500	-	2,484	0.14
Campground	75,000	-	159	6.06
Little Soda Lake	Vault Toilet, no connected water tank for handwashing.[3]			0.08
Pelican Point	Vault Toilet, no connected water tank for handwashing.[3]			0.08

Boat Ramp	Vault Toilet, no connected water tank for handwashing.[3]	0.08
Stables/Archery	Vault Toilet, no connected water tank for handwashing.[3]	0.08

Table 6 – Summary of estimated average wastewater flow per person per day at each area

Footnotes:

4. Gatehouse annual wastewater volume assumed to be the same as the minimum vault toilet size required by Jefferson County Onsite Wastewater 2018 Regulations.
5. Visitor Center annual wastewater volume assumed to be the same as the Yearly Potable Water Use provided by City of Lakewood (see water section below).
6. Little Soda Lake, Stables/Archery, Pelican Point, and Boat Ramp will have vault toilets only, no associated water source for handwashing.

The average wastewater flows per person per day listed in Table 6 were used when estimating proposed average wastewater flow at each area since this is based on City provided data that is more reflective of actual wastewater flows within the Park. CDPHE values were used for employees at each area, except at the Gatehouse where the value in Table 6 was used.

Peaking Factors were applied to the average flow to estimate Peak Day and Peak Hour flows. An industry standard of 2.5 was applied as a Peaking Factor for estimating the Peak Day flow. The formula provided in the Town of Morrison Subdivision Regulations dated December 2020, shown below was used obtain a Peaking Factor for estimating Peak Hour Flow.

Peak Hour Factor = PHF*

$PHF = 1 + 14/(4 + P^{0.5})$ or $PHF = 1 + 14/(4 + 10Q^{0.5})$

Where: P = saturation population in 1000's or fraction thereof.
Where: Q = average day flow in cfs.

Potable Water

Water demand for each area was first estimated by taking the CDPHE gallon per day values used for wastewater and increasing by 25 percent based on the industry standard to account for consumptive use. Refer to Table 7 below for the categories referenced from CDPHE Regulation 43 Table 6-2, and associated gallons per day increased by 25 percent, to estimate the average gallon per day water demand at each area in the Park.

Category	GPD Adjusted to Account for Water Consumption (25% Increase)
Facilities with Short Term or Transient Visitors, per person	6.25
Office Buildings per employee per eight hour shift	18.75
Campground per campsite	62.5
Travel trailer parks with individual water and sewage hookup per unit	125
Public park shower per fixture when park is open	NA
Laundry Washer, Residential	NA

Table 7 - CDPHE Regulation 43: On-site Wastewater Treatment System Regulation , Table 6-2 With Adjustments for Water Demand

Similar to wastewater, using the CDPHE average flows can be conservative since it assumes that every visitor or employee goes to the bathroom or uses water on site, which is not always the case. The City of Lakewood was able to provide approximately how many gallons of water is trucked to the Visitor Center, Swim Beach, and Marina, as well as approximate gallons of water pumped from the water wells for the North and South water systems, on an annual basis to help estimate more accurate water usage within the Park.

The same process was followed to estimate the average water demand per person per day at each area using the City's provided annual water volumes. See a summary in Table 8 below, and the full spreadsheet estimate in the Appendices.

Area	City Provided Annual Potable Water Trucked In (Gallons)	Assumed Annual Potable Water Trucked In (Gallons)	Estimated # of Visitors on Average Day (Gatehouse is Employees)	Estimated Average Demand per Person per Day (Campground is per Campsite) (GPD)
Gatehouse	No Existing Water System.[1]			2.39[1]
Visitor Center	150,000	-	169	2.39
Swim Beach	75,000	-	2,548	0.27
Marina	75,000	-	2,484	0.28
Campground	950,000 for entire South System[2]	855,000	159	69.12
Little Soda Lake	No Existing Water System.[3]			0.28[3]
Pelican Point	No Existing or Proposed Water System.			
Boat Ramp	350,000 for entire North System[4]	35,000	191	1.69
Stables/Archery	950,000 for entire South System[2]	95,000	64	5.52

Table 8 – Summary of Annual Water Volumes

Footnotes:

1. Since the Gatehouse does not have an existing water system to compare water volume to visitation numbers, it is assumed that it will have a similar average water demand per person per day as the Visitor Center to understand potential water demand from that area.
2. Of the water use for the entire South System, 90% assumed by Campground, 10% by Stables/Archery.
3. Since Little Soda Lake does not have an existing water system to compare water volume to visitation numbers, it is assumed that it will have a similar average water demand per person per day as the Marina to understand potential water demand from that area.
4. Of the water use for entire North System, 10% assumed by Boat Ramp.

The average water demands per person per day listed in Table 8were used when estimating proposed average water demand at each area since this is based on City provided data that is more reflective of actual water demand within the Park. CDPHE values were used for employees at the Visitor Center, Swim Beach, and Marina since those areas have more fixtures than just a vault toilet and sink for handwashing. The value listed for the Gatehouse in Table 8 above was

used for employees at the Gatehouse, Little Soda Lake, and Stables/Archery since these areas have vault toilets with no other fixtures.

The same Peaking Factors used for wastewater were applied to the average water demand to estimate Peak Day and Peak Hour demands.

To estimate the size of the water storage tank needed to meet water demand, a maximum tank residence time of four days was used for water quality. The estimated Peak Day Demand was multiplied by four to see how many gallons would be needed during those four days to meet the demand and see what size tank could accommodate.

An online calculator provided by Wessels Company (Tank Manufacturer) was used to estimate pressure tank size needed for an area based on the estimated water demand for that area.

Fire Suppression

No fire suppression system improvements are anticipated with the preferred concepts.

Storm Drainage

Existing storm infrastructure will be cleared of debris. New storm water quality and detention facilities may be needed depending on the amount of additional impervious areas being added at each subarea. City of Lakewood Storm Drainage Criteria Manual dated August 1982 includes in Section III Technical Design Criteria, Part C Detention Facilities a chart outlining an area threshold per land use type when storm water quality and detention is required. This chart does not include a park zoning type, so the threshold for if improvements at one of the Bear Creek subareas requires storm water quality and detention should be coordinated with the City of Lakewood during the design phase.

II. ALTERNATIVES CONSIDERED

The following summarizes the different concepts for each area that were studied, as well as which concept was selected as the Preferred Alternative to move forward, and which were dismissed. The Preferred Alternatives are further discussed in this Report.

Gatehouse

Traffic

- **Concept 1 – Realign entrance curve, extend dual entry lanes to existing kiosk, automated gate for annual pass holders – Preferred.**
- Concept 2 – Realign entrance curve, extend dual entry lanes to relocated kiosk, automated gate for annual pass holders, realign turnaround area – Dismissed.
- No Concept 3.

Utilities

- **Concept 1 – Vault Toilet with Potable Water Storage Tank – Preferred.**

- Concept 2 – Wastewater and Water Connections to Municipal System – Dismissed.
- No Concept 3.

Visitor Center
Utilities

- **Concept 1 – Maintain existing utility systems – Preferred.**
- Concept 2 – Wastewater and Water Connections to Municipal System – Dismissed.
- No Concept 3

Big Soda Lake Marina
Utilities

- **Concept 1 – Replace vault toilets, Upsize existing potable water storage tank – Preferred.**
- Concepts 2 and 3 – Wastewater and Water Connections to Municipal System – Dismissed.

Big Soda Lake Swim Beach
Utilities

- **Concept 1 – Maintain existing utility systems – Preferred.**
- Concepts 2 and 3 – Wastewater and Water Connections to Municipal System – Dismissed.

Little Soda Lake
Utilities

- Concept 1 – No utility improvements – Dismissed.
- **Concept 2 – Add Vault Toilet – Preferred.**
- No Concept 3.

Campground
Utilities

- Concept 1 – Replace yard hydrant at RV Dump Station – Dismissed.
- **Concept 2 – Replace yard hydrant at RV Dump Station, Replace septic tank and soil treatment area for expanded shower house – Preferred.**
- Concept 3 – Wastewater and Water Connections to Municipal System, Add 2nd RV Dump Station – Dismissed.

New 36 Acre Parcel

Utilities

- **Concept 1 – No utility improvements – Preferred.**
- Concepts 2 and 3 – Add Vault Toilets – Dismissed.

Bear Creek Stables/Archery
Utilities

- Concepts 1 and 2 – No utility improvements – Dismissed.
- **Concept 3 – Add Vault Toilets – Preferred.**

Bear Creek Reservoir and Pelican Point
Utilities

- Concept 1 – No utility improvements – Dismissed.
- **Concept 2 – Replace Vault Toilets – Preferred.**
- No Concept 3.

III. PREFERRED ALTERNATIVE – GATEHOUSE

A. Traffic

A Traffic Study prepared by CivTrans Engineering Inc. dated September 25, 2023, was completed for the Project. Traffic observations were conducted on July 29, 2023 and August 5, 2023. On both days the park did not reach capacity and did not have to close the Park entrance. While the traffic observations did not see traffic issues at the Park entrance on those two days, Park personnel have noted that high volumes of traffic on weekends and holidays have caused backups onto Morrison Road and C-470 in the past. The Traffic Study provided mitigation options to help with queuing and capacity closure operations at the Park. See the Traffic Study included in the Appendices.

The preferred alternative traffic improvements consist of revising the curvature of the entrance road, extending the dual entrance lanes, installing an automated gate for annual pass holders, and improvements to the bike lane/bike trail.

Currently the existing entrance road has a sharp curve between the Morrison Road connection and the existing kiosk. Revising the curvature to be less sharp will help with vehicle maneuverability, especially longer RVs that are going to and from the campground. The existing inside radius of the entrance road is approximately 25 feet. The revised entrance road will have an inside radius of approximately 64 feet. See exhibit of proposed improvements in the Appendices.

The existing dual entrance lanes start approximately 220 feet west of the existing kiosk building. The dual entrance lanes are proposed to extend back to the Park entrance off Morrison Road, an

additional approximately 320-feet further west from the existing kiosk building. Extending the dual entrance lanes would allow more vehicle queuing on the Park entrance road and not on Morrison Road.

One of the existing entrance lanes is restricted to annual pass holders. Currently people in the annual pass holder lane still need to stop and show their annual pass to an employee at the kiosk prior to being able to enter the Park. Installing an automated gate for the annual pass holder lane would allow Park personnel in the kiosk to focus solely on the day pass lane and potentially speed up the amount of time to get day pass holders through the Park entrance, reducing queue time.

The pavement markings in the entrance area are proposed to be re-striped to allow for a two-way attached bike lane on the south side of the entrance road. South of the kiosk, the attached bike lane would detach as a bike trail leading to the three-way intersection to the east. Additional striping is proposed at the three-way intersection for additional safety of the bike lane continuations onto the roadways.

B. Utilities

Wastewater

The preferred alternative wastewater improvements consist of removing the existing vault toilet from within the existing kiosk building and installing a new vault toilet within the median island just east of the kiosk, separate from the kiosk building. See the Architecture section for additional information.

The vault toilet at the Gatehouse is anticipated to be for employees only. See the summary table below for the estimated wastewater flows at this area based on the City provided visitor/employee numbers and using the average wastewater flow per person per day from City data. See the full spreadsheet estimate in the Appendices.

Area	Gatehouse
Total Average Day Flow (GPD)	4
Peak Hour Flow (GPM)	0.01
Peak Day Flow (GPD)	11

Table 9 - Gatehouse Estimated Wastewater Flows

Potable Water

The preferred alternative water improvements include adding a water tank to provide potable water to the vault toilet for handwashing. Potable water would be trucked in to fill the tank, similar to what is done to other water tanks in the Park. Based on the estimated water demand and a four-day turnover time for water quality, the proposed water tank is estimated to be 100 gallons to supply this area. A new five-gallon water pressure tank will be housed inside the vault toilet building.

New one to 1 to 1 ½ inch HDPE water lines will be needed between the water tank, pressure tank/backflow preventer, and sinks within the vault toilet building.
See the summary table below for the estimated water demand and water tank sizing at this area based on the City provided visitor/employee numbers and City provided average day demand. See the full spreadsheet estimate in the Appendices.

Area	Gatehouse
Total Average Day Demand (GPD)	7
Peak Hour Demand (GPM)	0.02
Peak Day Demand (GPD)	18
Minimum Water Tank Size Needed (based on 4-day residence time) (Gallons)	72

Table 10 - Gatehouse Estimated Water Demand

Fire Suppression
No fire suppression system improvements are anticipated for the Gatehouse.

Storm Drainage
Storm water quality and detention may be needed depending on the amount of additional impervious areas being added.

IV. PREFERRED ALTERNATIVE – VISITOR CENTER

A. Utilities

Wastewater
No wastewater improvements are anticipated for the Visitor Center based on the City provided visitor/employee count, proposed visitor count based on proposed parking and using the average wastewater flow per person per day from City data. The number of visitors at the Visitor Center used for flow estimating is based on when special events are held at the Visitor Center and when the wastewater system would be at its peak use, not typical everyday visitation numbers.

See the summary table below for the estimated wastewater flows at this area. Since the peak day flow shown below is based on the occasional special event and not an everyday occurrence, the existing 2,000-gallon septic tank and 1,650-square foot soil treatment area are anticipated to be adequate in size. The existing septic tank would have time to draw down and the existing soil treatment area time to recharge in between the larger group events. See the full spreadsheet estimate in the Appendices.

Area	Visitor Center
Total Average Day Flow (GPD)	652
Peak Hour Flow (GPM)	1.92
Peak Day Flow (GPD)	1,629

Table 11 - Visitor Center Estimated Wastewater Flows

Potable Water

No water improvements are anticipated for the Visitor Center based on the City provided visitor/employee count, proposed visitor count based on proposed parking and using the average water demand per person per day from City data. See the summary table below for the estimated water demand showing that the existing 15,000-gallon water tank is anticipated to be adequate in size. See the full spreadsheet estimate in the Appendices.

Area	Visitor Center
Total Average Day Demand (GPD)	689
Peak Hour Demand (GPM)	2
Peak Day Demand (GPD)	1,723
Minimum Water Tank Size Needed (based on 4-day residence time) (Gallons)	6,892

Table 12 - Visitor Center Estimated Water Demand

Fire Suppression

No fire suppression improvements are anticipated for the Visitor Center and the existing fire suppression system will be maintained.

Storm Drainage

The proposed storm drainage improvements at the Visitor Center include cleaning out existing curb cuts and sidewalk chases. Additional curb cuts and sidewalk chases may be needed for the expanded parking lot. Storm water quality and detention may be needed depending on the amount of additional impervious areas being added.

V. PREFERRED ALTERNATIVE – BIG SODA LAKE MARINA

A. Utilities:

Wastewater

The preferred alternative wastewater improvements consist of maintaining the existing vault toilets within the existing marina building and installing a new vault toilet building with six individual pits to the east of the existing marina building, separate from the marina building. See the Architecture section for additional information.

The vault toilets are anticipated to be for visitors and employees. See the summary table below for the estimated wastewater flows at this area based on the City provided visitor/employee count, proposed visitor count based on proposed parking and using the average wastewater flow per person per day from City data. See the full spreadsheet estimate in the Appendices.

Area	Marina
Total Average Day Flow (GPD)	587
Peak Hour Flow (GPM)	1.73
Peak Day Flow (GPD)	1,467

Table 13 - Marina Estimated Wastewater Flows

Potable Water

Water improvements are anticipated to be needed for the Marina based on the City provided visitor/employee count, proposed visitor count based on proposed parking and using the average water demand per person per day from City data. See the summary table below for the estimated water demand showing that the existing 5,000-gallon water tank is not anticipated to be adequate in size. See the full spreadsheet estimate in the Appendices.

Area	Marina
Total Average Day Demand (GPD)	1,106
Peak Hour Demand (GPM)	3
Peak Day Demand (GPD)	2,764
Minimum Water Tank Size Needed (based on 4-day residence time) (Gallons)	11,056

Table 14 - Marina Estimated Water Demand

The preferred alternative water improvements include upsizing the existing buried water tank to better meet the water demand. Potable water would continue to be trucked in to fill the tank, similar to what is done today. Based on the estimated water demand and a four-day turnover time for water quality, the proposed water tank is estimated to be 15,000 gallons to supply this area. A new water pressure tank for the new vault toilet building will be needed. A new 120-gallon water pressure tank will be housed inside the vault toilet building. Buried one to 1 to 1 ½ inch HDPE water lines will be needed between the water tank, pressure tank/backflow preventer, and sinks within the vault toilet building.

Fire Suppression

No fire suppression system improvements are anticipated for the Marina building.

Storm Drainage

The proposed storm drainage improvements include cleaning out existing curb cuts, sidewalk chases, and culverts. Additional curb cuts, sidewalk chases, and culverts may be needed for the

expanded parking lot. Several areas were observed on site as being a low spot with ponding water; these areas should be regraded as part of the improvements. Storm water quality and detention may be needed depending on the amount of additional impervious areas being added.

VI. PREFERRED ALTERNATIVE – BIG SODA LAKE SWIM BEACH

A. Utilities

Wastewater

No wastewater improvements are anticipated for the Swim Beach based on the City provided visitor/employee count, proposed visitor count based on proposed parking and using the average wastewater flow per person per day from City data. See the summary table below for the estimated wastewater flows at this area, showing that the existing 7,110-gallon vault below the restroom building is anticipated to be adequate in size. See the full spreadsheet estimate in the Appendices.

Area	Swim Beach
Total Average Day Flow (GPD)	569
Peak Hour Flow (GPM)	1.69
Peak Day Flow (GPD)	1,423

Table 15 - Swim Beach Estimated Wastewater Flows

Potable Water

No water improvements are anticipated for the Swim Beach based on the City provided visitor/employee count, proposed visitor count based on proposed parking and using the average water demand per person per day from City data. See the summary table below for the estimated water demand showing that the existing 15,000-gallon water tank is anticipated to be adequate in size. See the full spreadsheet estimate in the Appendices.

Area	Swim Beach
Total Average Day Demand (GPD)	1,057
Peak Hour Demand (GPM)	3
Peak Day Demand (GPD)	2,643
Minimum Water Tank Size Needed (based on 4-day residence time) (Gallons)	10,572

Table 16 - Swim Beach Estimated Water Demand

Fire Suppression

No fire suppression system improvements are anticipated for the swim beach.

Storm Drainage

The proposed storm drainage improvements include cleaning out existing curb cuts, sidewalk chases, and culverts. Additional curb cuts, sidewalk chases, and culverts may be needed for the expanded parking lot. Several areas were observed on site as being a low spot with ponding water; these areas should be regraded as part of the improvements. Storm water quality and detention may be needed depending on the amount of additional impervious areas being added.

VII. PREFERRED ALTERNATIVE – LITTLE SODA LAKE

A. Utilities

Wastewater

The preferred alternative wastewater improvements consist of adding a new vault toilet near Little Soda Lake. See the Architecture section for additional information.

The vault toilet is anticipated to be for visitors and employees. See the summary table below for the estimated wastewater flows at this area based on the City provided visitor/employee numbers and using the waste production rate for vault toilets with no connected water source. See the full spreadsheet estimate in the Appendices.

Area	Little Soda Lake
Total Average Day Flow (GPD)	5
Peak Hour Flow (GPM)	0.02
Peak Day Flow (GPD)	13

Table 17 - Little Soda Lake Estimated Wastewater Flows

Assuming a proposed vault size equivalent to 400 gallons, the minimum size required by Jefferson County Onsite Wastewater 2018 Regulations, the vault is estimated to reach capacity after approximately 30 peak days.

Potable Water

No water system improvements are anticipated for Little Soda Lake as part of the preferred alternative. Water demand was still estimated for the area for consideration for future infrastructure improvements. See the summary table below for the estimated water demand at this area based on the City provided visitor/employee numbers and City provided average day demand. See the full spreadsheet estimate in the Appendices.

Area	Little Soda Lake
Total Average Day Demand (GPD)	23
Peak Hour Demand (GPM)	0.07
Peak Day Demand (GPD)	57

Table 18 - Little Soda Lake Estimated Water Demand

Fire Suppression
No fire suppression system improvements are anticipated for the Little Soda Lake.

Storm Drainage
Storm water quality and detention may be needed depending on the amount of additional impervious areas being added.

VIII. PREFERRED ALTERNATIVE – CAMPGROUND

A. Utilities

Wastewater
No wastewater improvements are anticipated for the Campground existing vault toilets, existing 10,000-gallon RV dump station tank, or existing two 2,000 gallon septic tanks for the shower house based on the City provided visitor/employee count, proposed number of campsites, and using the average wastewater flow per person per day from City data. The existing 3,200 square foot soil treatment area (STA) for the shower house appears to be undersized and will need to be abandoned/removed, with a new 4,000 square foot STA to be constructed.

See the summary table below for the estimated wastewater flows at this area. See the full spreadsheet estimate in the Appendices.

Area	Campground
Total Average Day Flow (GPD)	5,213
Peak Hour Flow (GPM)	13.98
Peak Day Flow (GPD)	13,034

Table 19 - Campground Estimated Wastewater Flows

The STA was preliminarily sized using soil information collected via USDA's Web Soil Survey. Available information indicated that soils throughout the majority of the Park are loamy, and therefore have a long term acceptance rate (LTAR) of 0.5 gpd/square foot. The STA requires a minimum of 4,000 square feet of infiltrative area. Utilizing infiltration chambers in the dosing beds of the STA allows for a total infiltrative area reduction of 30%, which helps reduce the footprint of the STA.

The wastewater improvements for the new STA will consist of new buried 6-inch PVC sanitary sewer piping from the existing septic tanks to the new STA, a new effluent dosing pump in a 4-foot diameter precast concrete manhole, an automatic distributing valve, and rows of infiltration chambers.

Potable Water

No water improvements are anticipated for the Campground water tank or water distribution system based on the City provided visitor/employee count, proposed number of campsites, and using the average water demand per person per day from City data. The campground is anticipated to continue to be able to be served by the existing water well and existing 10,000-gallon water tank. The water well is understood to have a pump rate of 15 gallons per minute, which can produce approximately 21,600 gallons over 24 hours, which is more than the estimated peak day demand for both the campground and stables areas. See the full spreadsheet estimate in the Appendices.

Area	Campground
Total Average Day Demand (GPD)	6,912
Peak Hour Demand (GPM)	18
Peak Day Demand (GPD)	17,281
Water Well Pump Rate (GPM)	15
# of Gallons Able to Pump in 24 hours (Gallons)	21,600

Table 20 - Campground Estimated Water Demand

The existing yard hydrant at the RV dump station is proposed to be replaced with a yard hydrant and backflow preventer to meet CDPHE criteria.

Fire Suppression

No fire suppression system improvements are anticipated for the campground.

Storm Drainage

The proposed storm drainage improvements include cleaning out existing culverts. Several areas were observed on site as being a low spot with ponding water; these areas should be regraded as part of the improvements. Storm water quality and detention may be needed depending on the amount of additional impervious areas being added.

IX. PREFERRED ALTERNATIVE - BIG SODA LAKE NEW 36 ACRE PARCEL

A. Utilities

Wastewater

No wastewater system improvements are anticipated for the New 36 Acre Parcel as part of the preferred alternative. Wastewater flow was still estimated for the area for consideration for future infrastructure improvements. See the summary table below for the estimated wastewater flow at this area based on assuming this area was to become campsites, as explored with Concepts 2 and 3 which were dismissed and using the waste production rate for vault toilets with no connected water source. See the full spreadsheet estimate in the Appendices.

Area	New 36 Acre Parcel

Total Average Day Flow (GPD)	4
Peak Hour Flow (GPM)	0.01
Peak Day Flow (GPD)	11

Table 21 - New 36 Acre Parcel Estimated Wastewater Flows

Assuming a proposed vault size equivalent to 400 gallons, the minimum size required by Jefferson County Onsite Wastewater 2018 Regulations, the vault is estimated to reach capacity after approximately 36 peak days.

Potable Water

No water system improvements are anticipated for the New 36 Acre Parcel as part of the preferred alternative. Water demand was still estimated for the area for consideration for future infrastructure improvements. See the summary table below assuming this area was to become campsites, as explored with Concepts 2 and 3 which were dismissed, and using the same average water demand per campsite per day from City data as the campground. See the full spreadsheet estimate in the Appendices.

Area	New 36 Acre Parcel
Assumed # of Campsites	15
Total Average Day Demand (GPD)	1,037
Peak Hour Demand (GPM)	3
Peak Day Demand (GPD)	2,592

Table 22 - New 36 Acre Parcel Estimated Water Demand

Fire Suppression

No fire suppression system improvements are anticipated for the New 36 Acre Parcel.

Storm Drainage

Storm water quality and detention may be needed depending on the amount of additional impervious area being added.

X. PREFERRED ALTERNATIVE– BEAR CREEK STABLES

A. Utilities

Wastewater

The preferred alternative wastewater improvements consist of adding a new vault toilet near the Stables for use by both the Stables and Archery areas. See the Architecture section for additional information.

The vault toilet is anticipated to be for visitors and employees. See the summary table below for the estimated wastewater flows at this area based on the City provided visitor/employee

numbers and using the waste production rate for vault toilets with no connected water source. See the full spreadsheet estimate in the Appendices.

Area	Stables
Total Average Day Flow (GPD)	5
Peak Hour Flow (GPM)	0.02
Peak Day Flow (GPD)	13

Table 23 - Stables Estimated Wastewater Flows

Assuming a proposed vault size equivalent to 400 gallons, the minimum size required by Jefferson County Onsite Wastewater 2018 Regulations, the vault is estimated to reach capacity after approximately 30 peak days.

Potable Water

No water improvements are anticipated for the Campground water tank or water distribution system based on the City provided visitor/employee count and using the average water demand per person per day from City data. The stables area is anticipated to continue to be able to be served by the existing water well and existing 10,000-gallon water tank from the campground system. The water well is understood to have a pump rate of 15 gallons per minute, which can produce approximately 21,600 gallons over 24 hours, which is more than the estimated peak day demand for both the campground and stables areas. See the full spreadsheet estimate in the Appendices.

Area	Stables
Total Average Day Demand (GPD)	410
Peak Hour Demand (GPM)	1
Peak Day Demand (GPD)	1,024
Water Well Pump Rate (GPM)	15
# of Gallons Able to Pump in 24 hours (Gallons)	21,600

Table 24 - Stables Estimated Water Demand

Fire Suppression

No fire suppression system improvements are anticipated for the Bear Creek Stables.

Storm Drainage

No storm drainage improvements are anticipated for the Stables.

XI. PREFERRED ALTERNATIVE – BEAR CREEK RESERVOIR/PELICAN POINT VAULT TOILETS

A. Utilities

Wastewater

The preferred alternative wastewater improvements consist of removing the existing vault toilet building and installing a new vault toilet building. See the Architecture section for additional information.

See the summary table below for the estimated wastewater flows at each area based on the City provided visitor/employee count and using the waste production rate for vault toilets with no connected water source. See the full spreadsheet estimate in the Appendices.

Area	Pelican Point
Total Average Day Flow (GPD)	20
Peak Hour Flow (GPM)	0.06
Peak Day Flow (GPD)	51

Table 25 - Pelican Point Estimated Wastewater Flows

Assuming a proposed vault size equivalent to 400 gallons, the minimum size required by Jefferson County Onsite Wastewater 2018 Regulations, the vault is estimated to reach capacity after approximately seven peak days.

Area	Boat Ramp
Total Average Day Flow (GPD)	15
Peak Hour Flow (GPM)	0.05
Peak Day Flow (GPD)	38

Table 26 - Boat Ramp Estimated Wastewater Flows

Assuming a proposed vault size equivalent to 400 gallons, the minimum size required by Jefferson County Onsite Wastewater 2018 Regulations, the vault is estimated to reach capacity after approximately 10 peak days.

Potable Water

No water system improvements are anticipated for Pelican Point or the Boat Ramp as part of the preferred alternative. A water demand was still estimated for each area for consideration for future infrastructure improvements. See the summary table below for the estimated water

demand at each area based on the City provided visitor/employee numbers and City provided average day demand. See the full spreadsheet estimate in the Appendices.

Area	Pelican Point
Total Average Day Demand (GPD)	433
Peak Hour Demand (GPM)	1
Peak Day Demand (GPD)	1,082

Table 27 - Pelican Point Estimated Water Demand

Area	Boat Ramp
Total Average Day Demand (GPD)	324
Peak Hour Demand (GPM)	1
Peak Day Demand (GPD)	811

Table 28 - Boat Ramp Estimated Water Demand

Fire Suppression

No fire suppression system improvements are anticipated for these areas.

Storm Drainage

No storm drainage improvements are anticipated for these areas.

XII. FUTURE ALTERNATIVE – CONNECTION TO MUNICIPAL UTILITIES

This master plan effort included looking at an option to connect Bear Creek Lake Park to municipal water and wastewater systems outside of the park, owned by Town of Morrison and Mount Carbon Metro District (MCMD). A meeting was held between City of Lakewood, Town of Morrison, Mount Carbon Metro District Engineer Representative, and the Design Team to understand steps that would need to be taken to connect the Park to the outside utility systems.

Future utility demands were estimated to help inform Town of Morrison and MCMD how much demand the Park would have on their systems, as well as to size onsite water and wastewater infrastructure that would be needed within the Park to help with estimating a cost for these improvements. Coordination of the anticipated utility demands for the Park should be further coordinated with the Town of Morrison and MCMD to understand if off-site infrastructure improvements would be needed for the Park to connect to their systems. City of Lakewood, Town of Morrison, and MCMD should continue to coordinate on costs associated with the Park connecting to the off-site systems to understand requirements of an Intergovernmental Agreement (IGA) and cost sharing of the off-site improvement upgrades.

The same design criteria listed earlier were used to estimate future utility demands, except that CDPHE values were used to estimate average wastewater flows and water demands instead of supplementing with City provided data. Using CDPHE values is typical for utility system planning

and provides some conservancy that can account for future Park visitation growth. The same Peaking Factors were applied to the average flows to obtain peak flows. See estimated wastewater flow and water demands using CDPHE criteria in the Appendices.

Wastewater

The connection to the MCMD wastewater system was considered to occur north of the Park, near the northeast corner of the E-470 and Morrison Road interchange. This connection point is located higher in elevation than most of the Park and is anticipated to require a combination of gravity piping, force main piping, and lift stations. Based on the estimated peak wastewater flows from the Park, the proposed gravity piping is anticipated to be 8-inch PVC pipe and the proposed force main piping is anticipated to be 3-inch HDPE pipe. Three lift stations were contemplated for pricing, based on keeping the proposed gravity portion of the wastewater system from going greater than 10-feet in depth to mitigate trenching costs. The lift stations are anticipated to consist of two 6-foot diameter manholes, one as the main wet well and one for emergency storage, and two grinder pumps for redundancy.

The routing of this proposed wastewater infrastructure is anticipated to cross existing water and gas easements within the Park and would likely require coordination with the entities associated with those easements during design and construction of the wastewater system. The new wastewater infrastructure is also anticipated to cross Bear Creek and Colorado Department of Transportation (CDOT) right-of-way and would likely require floodplain and/or wetland permitting, as well as permitting through CDOT.

Potable Water

The connection to the MCMD water system was considered to occur at two locations north of the Park for water looping: one connection to occur at the intersection of Morrison Road with Rooney Road and the other to occur at the intersection of Morrison Road and McIntyre Road. Two parallel water mains were contemplated within the Park to provide water looping in the event one of the connection points outside of the Park was ever down. Based on the estimated water demand from the Park, the proposed water main is anticipated to be an 8-inch PVC pipe. The proposed size for the water main was estimated based on maintaining a velocity below 15 feet per second in the lines during the domestic peak day flow event plus fire flow event (see next section).

Through coordination with the Park, Town of Morrison, and MCMD, it is anticipated that the Park would have a master water meter to read all water consumption by the Park, and individual water meters for each subarea of the Park. USGS topography was located at along the anticipated water main routing to estimate where high or low points may occur in the system and account for air release and blowoff valves for costing purposes.

The routing of this proposed water infrastructure is anticipated to cross existing water and gas easements within the Park and would likely require coordination with the entities associated with those easements during design and construction of the water system. The new wastewater infrastructure is also anticipated to cross Bear Creek and Colorado Department of

Transportation (CDOT) right-of-way and would likely require floodplain and/or wetland permitting, as well as permitting through CDOT.

Fire Suppression

To help with sizing the proposed future water infrastructure for the Park, fire suppression being provided at all areas of the Park was considered. The largest building within the Park was looked at to estimate the largest fire flow demand on the water system.

The largest building would be the alternative considered to expand the Visitor Center to approximately 11,000-square feet. The required fire flow demand was estimated using the 2021 IFC criteria using Tables B105.1(1), B105.1(2), and B105.2 found in the IFC Appendix B and table C102.1 found in IFC Appendix C. The proposed building size and building type was provided by the Architect. The estimated fire flow assumes that it can be reduced to 75% of the value listed in Table B105.1(2) if the building will be sprinklered but shall not be less than 1,500 GPM. The estimated fire flow shall be reviewed and approved by the City of Lakewood Fire Department.

REFERENCES

1. Subdivision Regulations Town of Morrison, Colorado, December 2020
2. Storm Drainage Criteria Manual, City of Lakewood, August 9, 1982
3. Wastewater Design Criteria Policy, Colorado Department of Public Health and Environment, June 7, 2022
4. Department of Public Health and Environment Regulation No. 43 – On-site Wastewater Treatment System Regulation, June 30, 2017

APPENDICES

Appendix A - City Provided Visitation Numbers

Tracy Scurlock

From: Jim Haselgren <JimHas@lakewood.org>
Sent: Tuesday, October 31, 2023 7:07 AM
To: Bradley Chronowski; Michaela Kaiser; Amber Thill
Cc: Tracy Scurlock; Jackie Norris; Patsy Sullivan; Eileen Kemp; Erin Anderson
Subject: Re: BCLP - Visitation
Attachments: Visitor Location Estimate.xlsx

Hello all,

Thank you for your patience in my response as I was getting back into town, and I wanted to make sure the visitation information is as accurate as possible. I filled out the spreadsheet (thanks Brad for creating this section!) utilizing information from staff.

There is one very important distinction - the 1830 number referenced, represents passes sold that day at the gatehouse, **NOT** the actual number of visitors to the park that day. We have utilized the metric of 3.5 visitors per car to account for groups coming in one vehicle, annual pass holders, walk in visitors and cyclists visiting the park. The actual number of visitors to the park on that day is closer to **6,405,** with the bulk of those at the swim beach and marina.

Please let me know if you have any questions.

Thank you again,
Jim

From: Bradley Chronowski <BraChr@lakewood.org>
Sent: Wednesday, October 25, 2023 5:53 PM
To: Michaela Kaiser <MKaiser@dhmdesign.com>; Amber Thill <ambthi@lakewood.org>; Jim Haselgren <JimHas@lakewood.org>
Cc: Tracy Scurlock <TScurlock@martinmartin.com>; Jackie Norris <JNorris@martinmartin.com>; 'PE LEED AP Patsy Sullivan (PSULLIVAN@martinmartin.com)' <PSULLIVAN@martinmartin.com>; Eileen Kemp <EKemp@dhmdesign.com>; Erin Anderson <EAnderson@dhmdesign.com>
Subject: RE: BCLP - Visitation

Hi Michaela-

I prepared this spreadsheet for Jim / Lee to populate for this task. I filled in the percentages as a sample to see if the formula worked.

I added other places in the park in case they had enough use (don't need utilities), but if that's incorrect, please highlight the ones you need and send it back.

I also separated the Swim Beach from the Marina.

Thanks

Brad Chronowski, PLA
LANDSCAPE ARCHITECT
COMMUNITY RESOURCES DEPARTMENT

303.987.7805 (o)
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480 S. ALLISON PARKWAY
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From: Michaela Kaiser <MKaiser@dhmdesign.com>
Sent: Wednesday, October 25, 2023 12:49 PM
To: Bradley Chronowski <BraChr@lakewood.org>; Amber Thill <ambthi@lakewood.org>; Jim Haselgren <JimHas@lakewood.org>
Cc: Tracy Scurlock <TScurlock@martinmartin.com>; Jackie Norris <JNorris@martinmartin.com>; 'PE LEED AP Patsy Sullivan (PSULLIVAN@martinmartin.com)' <PSULLIVAN@martinmartin.com>; Eileen Kemp <EKemp@dhmdesign.com>; Erin Anderson <EAnderson@dhmdesign.com>
Subject: RE: BCLP - Visitation

 # EXTERNAL – USE CAUTION #
Forgot to include the pdf.

Michaela Kaiser
Senior Associate | PLA | ASLA

DHM DESIGN
Landscape Architecture | Land Planning | Ecological Planning | Urban Design
D: 720.763.3968 | O: 303.892.5566 x371 | C: 719.588.6446
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From: Michaela Kaiser
Sent: Wednesday, October 25, 2023 12:48 PM
To: 'Bradley Chronowski' <BraChr@lakewood.org>; Amber Thill <ambthi@lakewood.org>; Jim Haselgren <JimHas@lakewood.org>
Cc: 'Tracy Scurlock' <TScurlock@martinmartin.com>; Jackie Norris <JNorris@martinmartin.com>; PE LEED AP Patsy Sullivan (PSULLIVAN@martinmartin.com) <PSULLIVAN@martinmartin.com>; Eileen Kemp (ekemp@dhmdesign.com) <ekemp@dhmdesign.com>; Erin Anderson <EAnderson@dhmdesign.com>
Subject: BCLP - Visitation

Hello,
It looks like Saturday July 9th was the peak visitation day in 2022 based on the attached spreadsheet. Can you provide an estimated percentage of those 1830 visitors on Saturday that might have visited each of our focus areas? Understanding an estimated number of visitors to each subarea will help us with our sanitary flow and water demand estimates.

Thank you,
Michaela

BCLP Visitor Split

7/9/2022

Focus Area	Overall % (out of 100)	Corresp. #
Gatehouse	0	0
Visitor Center	2	128.1
Swim Beach	40	2562
Marina	39	2497.95
Campground	2	128.1
Horse Stables / Archery	1	64.05
Pelican Point (Upper)	3	192.15
Pelican Point (Lower)	1	64.05
BC Boat Ramp	3	192.15
Little Soda Lake	1	64.05
Meadowlark Cove	1	64.05
Skunk Hollow	1	64.05
Cottontail	1	64.05
Muskrat Meadow	1	64.05
Whitetail	1	64.05
Coyote Crossing	2	128.1
Mountain View	1	64.05
TOTAL	**100**	**6405**

Tracy Scurlock

From: Bradley Chronowski <BraChr@lakewood.org>
Sent: Thursday, November 30, 2023 9:23 AM
To: Michaela Kaiser
Cc: Tracy Scurlock
Subject: FW: DHM questions

Hi Michaela-

Here's the info on staffing for the utility study. Please let me know if this doesn't make sense.

Also, we're working on more data for the campground water system from the Ops. Side. Did the other stuff provide what you needed?

Gracias!

Brad Chronowski, PLA
LANDSCAPE ARCHITECT
COMMUNITY RESOURCES DEPARTMENT

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480 S. ALLISON PARKWAY
LAKEWOOD, COLORADO 80226
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From: Lee L. Blair <LeeBla@lakewood.org>
Sent: Thursday, November 30, 2023 9:06 AM
To: Amber Thill <ambthi@lakewood.org>
Cc: Bradley Chronowski <BraChr@lakewood.org>; Jim Haselgren <JimHas@lakewood.org>
Subject: RE: DHM questions

I had Todd put together our peak staffing numbers:

Visitor center- 1 OS Sup., 6 rangers, 1 Visitor Center Specialist, 2 naturalists
Gatehouse- 3
Swim Beach- 3 rangers, 1 concession
Marina- 6 RMP concessionaire

Are we still holding off asking Jason more information about the pumphouse, Brad?

Lee Blair
Open Space Supervisor
Bear Creek Lake Park/Open Space

303.697.6154

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www.Lakewood.org

Lakewood
Parks

From: Amber Thill <ambthi@lakewood.org>
Sent: Tuesday, November 28, 2023 12:37 PM
To: Lee L. Blair <LeeBla@lakewood.org>
Cc: Bradley Chronowski <BraChr@lakewood.org>; Jim Haselgren <JimHas@lakewood.org>
Subject: DHM questions

Lee and Jim,
Are you comfortable following up with DHM on the two outstanding requests today? Or you can send to Brad or I and we can forward along.

They asked for:
# of employees at peak for each location
Gatehouse
Visitor's Center
Big Soda Facilities
Marina
????

Information on the well, pumps and tank at the campground.

Let me know how we can help,

Amber Thill, AICP
PUBLIC ENGAGEMENT & OPERATIONS MANAGER
COMMUNITY RESOURCES DEPARTMENT

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Appendix B - City Provided Annual Wastewater and Water Volumes

Tracy Scurlock

From: Jim Haselgren <JimHas@lakewood.org>
Sent: Monday, February 5, 2024 10:12 AM
To: Tracy Scurlock; Bradley Chronowski; Eric King; Raymond Hill
Cc: Amber Thill; mkaiser
Subject: Re: Bear Creek Lake Park - Water/Sanitary Systems
Attachments: Drinking_Waterr_Systems map.jpg

Hello Tracy,

Please find my responses to you questions below in red. The numbers provided will be pretty close, based on removal and delivery trip numbers, capacites and frequencies, but we do not have a metered metric of the gallons of wastewater, or delivered water. I have provided a map as well that outlines the Bear Creek and Turkey Creek gallery wells that we treat water from and the areas and amenities those wells service for reference.

1. Any chance you have a breakdown of gallons of wastewater pumped out from each sub-area?
   The breakdown for wastewater is pretty evenly divided due to both the volume of use at the Beach and Marina, and the size of RV tanks being emptied at the BCLP Campground

   - Beach/Marina area: 75,000 gallons
   - BCLP Campground dump station: 75,000 gallons

3. Same question for breakdown of gallons of water delivered to the subareas that get water delivery.
   The breakdown for water delivery is a bit more complicated based on demand, delivery frequency and tank size, but can be broken down closely as:

   - Maintenance Shop - 200,000 gallons
   - Marina - 75,000 gallons
   - Beach - 75,000 gallons
   - Visitor Center - 150,000 gallons

5. Is the treated water value for both north and south well systems? Are you able to give a breakdown for each system?
   Yes, the number given is for both north and south well systems, but they breakdown for each system is below with the higher demand being on the South system due to the campground:

   - North System - 350,000 gallons
   - South System - 950,000 gallons

6. How was the potential future use number estimated?
   This estimate was based on potential future use, and to be honest may be a bit high, but I wanted to capture any additional restrooms or restroom features, washing stations on the beach and marina area, shower facilities, and limited vegetation irrigation needs. Currently, we irrigate turf and vegetation utilizing a pump

system out of Big Soda Lake, which is manageable at this time, and do not plan on altering the watering of existing vegetation, but I wanted to estimate if landscape improvements were made in the future that would need to be watered another way.

8. I wanted to confirm what areas of the Park we should be looking at utility line routing to.
    a. Not currently looking at utility routing to any north areas of the Park that connect to the north well system. Correct
    b. Based on the concepts matrix and associated utility improvements to each area, this is where we are and are not looking at utility line routings to. Please let me know if we need to update these lists.
        i. ARE looking at utility line layouts to: Gatehouse, Visitor Center, Swim Beach, Marina, Campground Correct - with the addition of the BCLP Maintenance Building. The campground is manageable through our current water treatment operations, but would be a good idea to explore the capabilities of a utility in that area.
        ii. ARE NOT looking at utility line layouts to: New 36 Acre Parcel, Little Soda Lake, Pelican Point, Boat Ramp, Stables/Archery Correct
    a. We'll still want to know what the north and "ARE NOT" water/wastewater usage is to account for it in the estimated EQRs for connection to MCMD and for main line sizing (so they can be connected in the future, if desired), just want to make it clear that we aren't currently looking at utility routings to these areas as part of our effort. Thank you - I appreciate the forethought in the planning for the future possibilities!

Thank you,
Jim

Jim Haselgren
Parks Manager
Parks Division
720-963-5242
2775 S. Estes St.
LAKEWOOD, COLORADO 80227
jimhas@lakewood.org

Lakewood
Community Resources

From: Tracy Scurlock <TScurlock@martinmartin.com>
Sent: Friday, February 2, 2024 2:50 PM
To: Jim Haselgren <JimHas@lakewood.org>; Bradley Chronowski <BraChr@lakewood.org>; Eric King <EriKin@lakewood.org>; Raymond Hill <RayHil@lakewood.org>
Cc: Amber Thill <ambthi@lakewood.org>; mkaiser <MKaiser@dhmdesign.com>
Subject: RE: Bear Creek Lake Park - Water/Sanitary Systems

 # EXTERNAL – USE CAUTION #
Sounds good, thank you Jim!

Tracy Scurlock, PE
(she/her)
Senior Project Engineer
PE (CO, IL)
O 303.431.6100 ext. 379

Appendix C - CDPHE Regulation 43 Table 6-2

(iii) Explanation and justification for the comparability of the tested facilities with the proposed facility.

5. Flow Equalization

a. Flow equalization may be used if a facility has flows that vary from day to day by more than four times the average flow.

b. The highest peak assumed must be at least equal to the full capacity of the facility.

c. The stored flow must be distributed to the soil treatment area before the next greater-than-average peak.

d. Flow equalization may be used only if:

(1) The facility is non-residential;

(2) The facility is only used for one purpose;

(3) Flows will follow a predictable pattern; and

(4) There is a long-term expectation that size and pattern of the flows will remain the same.

e. Timed dosed pressure distribution or timed dosed NDDS must be used. The soil treatment area reduction for pressure distribution (Table 10-2) must not be used in addition to the flow equalization reduction.

f. Contingency plans must be made for expanding the capacity of the OWTS in the event of changed use at the facility.

TABLE 6-2 For Design Purposes, the Estimated Daily Wastewater Flow and BOD_5 Load Per Person Unless Otherwise Noted

RESIDENTIAL WASTEWATER	**GPD**	**BOD_5 IN POUNDS PER DAY**
Single-family dwellings	75	.20
Auxiliary buildings, by fixture type		
Bath/Shower	14.7	.014
Dishwasher	1.8	.002
Kitchen sink with garbage grinder	5.8	.052
Laundry washer	19.5	.037
Lavatory	8.4	.021
Water closet (toilet)	24.8	.029
Hotels and motels per room	75	.15
Multiple-family dwellings or apartments	75	.20
Boarding and rooming houses (users absent during working hours)	50	.15
Tiny Homes[3], per unit	150	.40
Mobile home	75	.20
Mobile home park per space	300	.80

COMMERCIAL WASTEWATER	**GPD**	**BOD_5 IN POUNDS PER DAY**
Facilities with short-term or transient visitors		
Examples: Airports or bus stations per passenger; fairgrounds per person attending; ball parks, race tracks, stadiums, theaters or auditoriums per seat	5	.02
Airport per employee	10	.06
Barber and beauty shops per chair	100	.70[1]
Bowling alleys per lane - toilet wastes only	5	.03[1]
Country club per member	30	.02
County club per employee	20	.06
Dentist offices per non-wet chair	50	.14[1]
Doctor offices per doctor	250	.80[1]
Factories and plants exclusive of industrial wastewater per employee per eight-hour shift – no showers	20	.05
Factories and plants exclusive of industrial wastewater per employee per eight-hour shift - showers provided	35	.08
Kennels per dog	30	.20
Laundries, self-service per commercial washer	400	.75
Office buildings per employee per eight-hour shift	15	.06
Service stations per toilet fixture	250	.50[1]
Stores and shopping centers per square foot of retail space	.1	.01[1]
Work or construction camps semi-permanent with flush toilets	50	.17
Work or construction camps semi-permanent without flush toilets	35	.02
FOOD SERVICE ESTABLISHMENT	**GPD**	**BOD_5 IN POUNDS PER DAY**
Restaurant open 1 or 2 meals per seat	50	.06/meal
24-hour restaurant per seat	75	.07/meal served
Restaurant with paper service only per seat	25	.01/meal served
Additional for bars and cocktail lounges per seat	30	.02
Drive-in restaurant per car space	50	.02
INSTITUTIONAL WASTEWATER WITHOUT KITCHENS UNLESS OTHERWISE NOTED	GPD	**BOD_5 IN POUNDS PER DAY**
Churches per seat; without any food service, or other uses	3.5	.01
Churches, per seat; warming kitchen only, no major food service	5	.01
Churches, per seat; with food service, per meal served[4]	4	.02
Hospitals per bed space	250	.20
Nursing homes; Group homes for developmentally disabled, per bed space	125	.20
Schools, Boarding per person	100	.17
Schools, Day without cafeteria, gym or showers	15	.04
Schools, Day with cafeterias, no gym or showers	20	.08
Schools, Day with cafeterias, gym and showers	25	.10
Schools, Day additional for school workers	15	.06

RECREATIONAL AND SEASONAL WASTEWATER USE	GPD	BOD_5 IN POUNDS PER DAY
Camps, day, no meals served	15	.12
Luxury resort	125	.17
Resort night and day	50	.12
Campground per campsite[2]	50	.12
Public park flush toilet per fixture per hour when park is open	36	.04 lbs./ fixture
Public park urinal per fixture per hour when park is open	10	.01 lbs./fixture
Public park shower per fixture per hour when park is open	100	.10 lbs./ fixture
Public park faucet per fixture per hour when park is open	15	.04 lbs./ fixture
Swimming pools and bathhouses	10	.06
Travel trailer parks with individual water and sewage hookup per unit [2]	100	.24
Travel trailer park without individual water and sewage hookup per unit [2]	50	.12

1 BOD levels need further verification depending on the specific use of the facility.

2 Laundry facilities are to be calculated on a per commercial washer basis in accordance with other elements of this table.

3 For the purposes of this Table, a "Tiny home" is a structure (a non-recreational vehicle) that has only one bedroom and has <400 sq.ft. of livable space, including lofts. In this instance, the OWTS may be sized for only one bedroom.

4 For churches with food service, the 4 gal/meal must be added to the 3.5 gal/seat to determine projected design flows.

B. Wastewater Strength

1. Table 6-3 includes levels of treatment that can be achieved by various OWTS components, excluding the soil treatment area. Systems qualifying for these treatment levels except TL1 produced by a septic tank alone must be approved under section 43.13. of this regulation. If soil treatment area or vertical separation distance reductions are permitted, the local public health agency must have a maintenance oversight program under section 43.14.D. in place.

2. High strength waste must be reduced to at least Treatment Level TL1 quality or lower before applying to a soil treatment area. Waste strength levels defined in Tables 6-3 and 6-4 must be used to determine compliance.

Table 6-3 Treatment Levels

Treatment Level	BOD_5 (mg/L)	$CBOD_5$[1] (mg/L)	TSS (mg/L)	Total Nitrogen (mg/L)
TL1[2]	180	-	80	60-80
TL2	-	25	30	N/A[3]
TL2N	-	25	30	>50% reduction[4]
TL3	-	10	10	N/A[3]
TL3N	-	10	10	20 mg/L

Shading indicates higher treatment levels.

1 Requirements for $CBOD_5$ are only related to effluent samples from a higher level treatment system.

Appendix D - Estimated Average Flow/Demand based on City Data

PROJECT INFORMATION

PROJECT NAME:	Bear Creek Lake Park
PROJECT NO:	23.0459
PREPARED BY:	TFS
JURISDICTION:	Lakewood, CO
REPORT TYPE:	Average Use Per Person Estimates Based on City Provided Data
DATE:	06/30/24

Table 1. Annual Visitation Breakdown per Month

Month	# of Passes Sold at Park in 2022[1]	% of Total Visitation[1,2]	Facilities Open Memorial Day - Labor Day[3]	Facilities Open April 1 - October 30[4]
Jan	718	0.96%	0.00%	0.00%
Feb	920	1.23%	0.00%	0.00%
March	1,480	1.98%	0.00%	0.00%
April	3,143	4.20%	0.00%	4.48%
May	8,214	10.99%	14.56%	11.70%
June	18,476	24.71%	32.75%	26.31%
July	23,053	30.84%	40.86%	32.83%
Aug	6,674	8.93%	11.83%	9.50%
Sept	8,005	10.71%	0.00%	11.40%
Oct	2,659	3.56%	0.00%	3.79%
Nov	883	1.18%	0.00%	0.00%
Dec	537	0.72%	0.00%	0.00%
TOTAL	74,762			

Table 2. Peak and Average Day Visitation Breakdown per Sub-Area

Total # of Visitors on Peak Day[1]	**6,405**
Total # of Visitors May-August[6]	197,460
Total # of Visitors April-October[6]	245,784
Total # of Visitors Year Round[6]	261,667
# of Existing Campsites	57

Sub-Area	Estimated % of Visitors going to each Sub-Area[5]	Estimated # of Visitors on Peak Day to Each Sub-Area	Estimated # of Visitors on Average Day to Each Sub-Area
Gatehouse	0%	0	0
Visitor Center	2%	128	169
Swim Beach	40%	2,562	2,548
Marina	39%	2,498	2,484
Campground	2%	128	159
Horse Stables / Archery	1%	64	79
Pelican Point (Upper)	3%	192	191
Pelican Point (Lower)	1%	64	64
BC Boat Ramp	3%	192	191
Little Soda Lake	1%	64	64

Meadowlark Cove	1%	64	Not in Study Area
Skunk Hollow	1%	64	Not in Study Area
Cottontail	1%	64	Not in Study Area
Muskrat Meadow	1%	64	Not in Study Area
Whitetail	1%	64	Not in Study Area
Coyote Crossing	2%	128	Not in Study Area
Mountain View	1%	64	Not in Study Area
TOTAL	**100%**	**6,405**	

Footnotes for Tables 1 & 2:

1. Data provided from City of Lakewood for 2022.
2. Gatehouse and Visitor Center are open year round.
3. Includes Swim Beach, Marina, Little Sode Lake, Pelican Point, and Boat Ramp areas (open 3.5 months).
4. Includes Campground and Stables/Archery (open 7 months).
5. Percent breakdown of visitors to each sub-area provided by City of Lakewood staff.
6. From City of Lakewood staff, assume 3.5 vehicles per car that pass is sold to.

Table 3. Existing Estimated Peak and Average Wastewater Use

Sub-Area	Existing Wastewater Tank Size[1] (Gallons)	Provided Annual Wastewater Volume Hauled Off[2] (Gallons)	Assumed Annual Wastewater Volume Hauled Off[3] (Gallons)	Peak Month Estimated Usage[4] (Gallons)	Peak Day Estimated Usage[5] (Gallons)	Average Month Estimated Usage[6,7] (Gallons)	Average Day Estimated Usage[8] (Gallons)	Average Use per Person[9] (Campground is Per Campsite) (Gallons Per Day)
Gatehouse	Unknown	-	400	123	4	33	1	0.36
Visitor Center	2,000	Soil Treatment Area	Soil Treatment Area	-	-	12,500	403	2.39
Swim Beach	7,110	37,500	-	15,323	494	10,714	346	0.14
Marina	2,000	37,500	-	15,323	494	10,714	346	0.14
Campground	10,000	75,000	-	24,621	794	10,714	346	6.06
New 36 Acre Parcel	Vault Toilet, no connected water tank for handwashing.[3]							0.08
Little Soda Lake	Vault Toilet, no connected water tank for handwashing.[3]							0.08
Pelican Point	Vault Toilet, no connected water tank for handwashing.[3]							0.08
Boat Ramp	Vault Toilet, no connected water tank for handwashing.[3]							0.08
Stables/Archery	Vault Toilet, no connected water tank for handwashing.3							0.08

Footnotes for Table 3:

1. Sizes of Existing Septic Tanks/Vaults for Toilets obtained from previous plans provided by City of Lakewood.
2. Yearly Wastewater Volumes pumped out of Sub-Areas provided by City of Lakewood.
3. Gatehouse volume assumed to be minimum vault toilet size required by Jefferson County Onsite Wastewater 2018 Regulations. New Parcel, Little Soda Lake, Stables/Archery, Pelican Point, and Boat Ramp will have vault toilets only, no associated water source for handwashing.
4. Yearly Wastewater Volume multiplied by the highest percentage when looking at monthly visitation numbers divided by annual visitation numbers.
5. Peak Month Estimated Usage divided by 31 days.
6. Yearly Wastewater Volume divided by number of months that the sub-area is open (see Footnotes for Tables 1 & 2 #2-4). Except for Visitor Center, see next footnote.
7. For Visitor Center, assume that the average Month Wastewater Usage is the same as Average Month Water Usage (Yearly Potable Water Use divided by 12 months).
8. Average Month Estimated Usage divided by 31 days.
9. Average Day Estimated Usage divided by Estimated # of Visitors on Average Day to Each Sub-Area from Table 2.

Table 4. Existing Estimated Peak and Average Water Use								
Sub-Area	**Existing Water Tank Size[1] (Gallons)**	**City Provided Annual Potable Water Trucked In[2] (Gallons)**	**Assumed Yearly Potable Water Use[3] (Gallons)**	**Peak Month Estimated Usage[4] (Gallons)**	**Peak Day Estimated Usage[5] (Gallons)**	**Average Month Estimated Usage[6] (Gallons)**	**Average Day Estimated Usage[7] (Gallons)**	**Average Use per Person[9] (Campground is Per Campsite) (Gallons Per Day)**
Gatehouse	No Existing Water System. When looking at Proposed Water Flows for Concepts, assume similar to Visitor Center Usage.							
Visitor Center	15,000	150,000	-	46,253	1,492	12,500	403	2.39
Swim Beach	15,000	75,000	-	30,646	989	21,429	691	0.27
Marina	5,000	75,000	-	30,646	989	21,429	691	0.28
Campground	South Well System	950,000 for entire South System	855,000	280,678	9,054	122,143	3,940	69.12
New 36 Acre Parcel	No Existing Water System. When looking at Proposed Water Flows for Concepts, assume similar to Campground Usage.							
Little Soda Lake	No Existing Water System. When looking at Proposed Water Flows for Concepts, assume similar to Marina Usage.							
Pelican Point	No Existing Water System. When looking at Proposed Water Flows for Concepts, assume similar to Marina Usage.							
Boat Ramp	North Well System	350,000 for entire North System	35,000	85,655	2,763	10,000	323	1.69
Stables/Archery	South Well System	Included in Campground Number	95,000	289,389	9,335	13,571	438	5.52

Footnotes for Table 4:

1. Sizes of Existing Water Tanks obtained from previous plans provided by City of Lakewood.
2. Yearly Potable Water Use for Sub-Areas provided by City of Lakewood.
3. Of the water use for the entire South System, 90% assumed by Campground, 10% by Stables/Archery. Of the water use for entire North System, 10% assumed by Boat Ramp.
4. Yearly Potable Water use multiplied by the highest percentage when looking at monthly visitation numbers divided by annual visitation numbers.
5. Peak Month Estimated Usage divided by 31 days.
6. Yearly Potable Water Use divided by number of months that the sub-area is open (see Footnotes for Tables 1 & 2 #2-4).
7. Average Month Estimated Usage divided by 31 days.
8. Average Day Estimated Usage divided by Estimated # of Visitors on Average Day to Each Sub-Area from Table 2.

Appendix E - Wastewater Flow Estimates

PROJECT INFORMATION

PROJECT NAME:	Bear Creek Lake Park
PROJECT NO:	23.0459
DESIGN BY:	JKN
REVIEWED BY:	TFS
JURISDICTION:	Lakewood, CO
REPORT TYPE:	Proposed Wastewater Flow Estimates based on City Data
DATE:	06/30/24

Average Use From CDPHE Regulation 43: On-Site Wastewater Treatment System Regulation, Table 6-2:

Category	GPD
Facilities with Short Term or Transient Visitors, per person	5
Office Buildings per employee per eight hour shift	15
Campground per campsite	50
Travel trailer parks with individual water and sewage hookup per unit	100
Public park shower per fixture when park is open	100
Laundry Washer, Residential	19.5

Vault Toilets, No Water Service: a generally accepted waste production rate for vault toilets is 8 gallons of waste for every 100 uses

Vault Toilets with No Water Service, gallon per person per day	0.08

Wastewater Flow Estimates per Area:

Area	New Visitors/day[1]	Employees/day[2]	New # of Campsites[7]	Use Type	Number of Fixture Units[3]	CDPHE GPD per Use Type[4]	CDPHE GPH per Fixture Type[4]	City Provided Data GPD	Vault Toilet No Water Source GPD	Average GPD per Area	Hours Open	Total Average GPD	Total Average CFS	Peak Hour Factor per Town of Morrison Criteria[5]	Peak Hour Flow CFS	Peak Hour Flow GPM	Industry Standard Peak Day Factor	PeakDay Flow GPD
Gatehouse (Vault Toilet with Water Source)	0	3	NA	Employees Only, Vault Toiles with No Water Service, per person (Assume employees use bathroom 4x per 8 hour shift)	NA	-	NA	0.36	-	4	NA	4	0.000	4.48	0.000	0.01	2.50	11
Visitor Center (Maintain Existing Septic System)	210	10	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	2.39	-	502	NA	652	0.001	4.24	0.004	1.92	2.50	1,629
				Office Buildings per employee per eight hour shift	NA	15	NA	-	-	150								
Swim Beach (Vault Toilets with Water Source)	3,638	4	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	0.14	-	509	NA	569	0.001	4.26	0.004	1.69	2.50	1,423
				Office Buildings per employee per eight hour shift	NA	15	NA	-	-	60								
Marina (Vault Toilets with Water Source)	3,547	6	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	0.14	-	497	NA	587	0.001	4.25	0.004	1.73	2.50	1,467
				Office Buildings per employee per eight hour shift	NA	15	NA	-	-	90								
Campground (Vault Toilets with Water Source)	128	0	65	Laundry Washer, Residential[6]	1	19.5	NA	-	-	19.5	12	5213	0.008	3.86	0.031	13.98	2.50	13,034
				Public park shower per hour per fixture when park is open	4	NA	100	NA	-	400								
				Campsites	NA	-	NA	6.06	-	394								
New Parcel (Campsite with Vault Toilets, No Water Source)	-	-	15	Campsites	NA	-	NA	-	0.08	4	NA	4	0.000	4	0.000	0.013	2.50	11
Little Soda Lake (Vault Toilet no Water Source)	64	2	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	-	0.08	5	NA	5	0.000	4.48	0.000	0.02	2.50	13
				Office Buildings per employee per eight hour shift	NA	-	NA	-	0.08	0								
Pelican Point (Vault Toilet no Water Source)	256	0	NA	#REF!	NA	-	NA	-	0.08	20	NA	20	0.000	4.45	0.000	0.06	2.50	51
Boat Ramp (Vault Toilet no Water Source)	192	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	-	0.08	15	NA	15	0.000	4.46	0.000	0.05	2.50	38
Stables/Archery (Vault Toilet no Water Source)	64	3	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	-	0.08	5	NA	5	0.000	4.47	0.000	0.02	2.50	13
				Office Buildings per employee per eight hour shift	NA	-	NA	-	0.08	0								
											TOTAL	**7,076**			**0.04**	**19**		**17,690**

Footnotes:

1. Based on estimated breakdown of visitors per day to each area provided by City of Lakewood. Estimated increase in number of visitors is based on increased number of parking stalls for each concept sub-area
2. Based on estimated number of employees per area provided by City of Lakewood.
3. Based on observations during Site visit in July, 2023.
4. From Colorado Department of Public Health and Environment, Regulation 43 On-Site Wastewater Treatment System Regulation, Table 6-2.
5. From Town of Morrison Subdivision Regulations dated December, 2020, section 4 Sanitary Sewer: Peak Hour Factor = 1 + 14/(4+10Q^0.5), Q = average day flow in cfs
6. From Park staff, washer is understood to only be available for use by Campground Host (no visitor use).
7. One bunkhouse is assumed to be equivalent to 4 campsites, assuming an average of 3.5 people per campsite.

PROJECT INFORMATION

PROJECT NAME:	Bear Creek Lake Park
PROJECT NO:	23.0459
DESIGN BY:	JKN
REVIEWED BY:	TFS
JURISDICTION:	Lakewood, CO
REPORT TYPE:	Future Wastewater Flow Estimates based on CDPHE
DATE:	01/31/24

Average Use From CDPHE Regulation 43: On-Site Wastewater Treatment System Regulation, Table 6-2:

Category	GPD
Facilities with Short Term or Transient Visitors, per person	5
Office Buildings per employee per eight hour shift	15
Campground per campsite	50
Travel trailer parks with individual water and sewage hookup per unit	100
Public park shower per fixture when park is open	100
Laundry Washer, Residential	19.5

Vault Toilets, No Water Service: a generally accepted waste production rate for vault toilets is 8 gallons of waste for every 100 uses

Vault Toilets with No Water Service, per person	0.08

Wastewater Flow Estimates per Area:

Area	New Visitors/day[1]	Employees/day[2]	New # of Campsites[7]	Use Type	Number of Fixture Units[3]	CDPHE GPD per Use Type[4]	CDPHE GPH per Fixture Type[4]	City Provided Data GPD	Average GPD per Area	Hours Open	Total Average GPD	Total Average CFS	Peak Hour Factor per Town of Morrison Criteria[5]	Peak Hour Flow CFS	Peak Hour Flow GPM	Industry Standard Peak Day Factor	PeakDay Flow GPD
Gatehouse (Connect to Municipal System)	0	3	NA	Office Buildings per employee per eight hour shift	NA	15	NA	0.36	45	NA	45	0.000	4.43	0.000	0.14	2.50	113
Visitor Center (Connect to Municipal System)	210	10	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	2.39	1,050	NA	1,200	0.002	4.16	0.008	3.47	2.50	2,999
				Office Buildings per employee per eight hour shift	NA	15	NA	-	150								
Swim Beach (Connect to Municipal System)	3,638	4	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	0.14	18,190	NA	18,250	0.028	3.46	0.098	43.95	2.50	45,626
				Office Buildings per employee per eight hour shift	NA	15	NA	-	60								
Marina (Connect to Municipal System)	3,547	6	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	0.14	17,736	NA	17,826	0.028	3.47	0.096	43.03	2.50	44,565
				Office Buildings per employee per eight hour shift	NA	15	NA	-	90								
Campground (Connect to Municipal System)	128	0	65	Laundry Washer, Residential[6]	1	19.5	NA	-	19.5	12	11320	0.018	3.63	0.064	28.56	2.50	28,299
				Public park shower per hour per fixture when park is open	4	NA	100	NA	400								
				Campsites	NA	100	NA	7.35	6500								
New Parcel (Connect to Municipal System)	-	-	15	Campsites	NA	100	NA	7.35	1,500	NA	1,500	0.002	4	0.010	4	2.50	3,750
Little Soda Lake (Connect to Municipal System)	64	2	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	0.14	320	NA	350	0.001	4.31	0.002	1.05	2.50	875
				Office Buildings per employee per eight hour shift	NA	15	NA	-	30								
Pelican Point (Connect to Municipal System)	256	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	1.36	1,280	NA	1,280	0.002	4.15	0.008	3.69	2.50	3,200
Boat Ramp (Connect to Municipal System)	192	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	1.81	960	NA	960	0.001	4.19	0.006	2.80	2.50	2,400
Stables/Archery (Connect to Municipal System)	64	3	NA	Facilities with Short Term or Transient Visitors, per person	NA	5	NA	0.14	320	NA	365	0.001	4.30	0.002	1.09	2.50	913
				Office Buildings per employee per eight hour shift	NA	15	NA	-	45								
Maintenance Shop (Not Part of Scope) (Connect to Municipal System)	0	10	NA	Office Buildings per employee per eight hour shift	NA	15	NA	-	150	NA	150	0.000	4.37	0.001	0.46	2.50	375
										TOTAL	**53,095**			**0.29**	**132**		**132,738**

Footnotes:

1. Based on estimated breakdown of visitors per day to each area provided by City of Lakewood. Estimated increase in number of visitors is based on increased number of parking stalls for each concept sub-area
2. Based on estimated number of employees per area provided by City of Lakewood.
3. Based on observations during Site visit in July, 2023.
4. From Colorado Department of Public Health and Environment, Regulation 43 On-Site Wastewater Treatment System Regulation, Table 6-2.
5. From Town of Morrison Subdivision Regulations dated December, 2020, section 4 Sanitary Sewer: Peak Hour Factor = 1 + 14/(4+10Q^0.5), Q = average day flow in cfs
6. From Park staff, washer is understood to only be available for use by Campground Host (no visitor use).
7. One bunkhouse is assumed to be equivalent to 4 campsites, assuming an average of 3.5 people per campsite.

Equivalent Resident Units - Based on Average GPD
From Subdivision Regulations for Town of Morrison dated December 2020, Section 4 Sanitary Sewer:

Single Family Occupancy:	3.3	residents per unit
Usage	100	gallons per capita per day
Total SFE Usage	330	gallons per day
Equivalent Resident Units	161	

Increase in Number of Parking Stalls -> Correlates to Number of Visitors			
Parking Area	**Existing Total Stalls**	**Proposed Total Stalls**	**Factored Increase**
Visitor Center	44	72	1.64
Swim Beach & Marina	212	301	1.42

Appendix F - Water Demand Estimates

PROJECT INFORMATION

PROJECT NAME:	Bear Creek Lake Park
PROJECT NO:	23.0459
DESIGN BY:	JKN
REVIEWED BY:	TFS
JURISDICTION:	Lakewood, CO
REPORT TYPE:	Proposed Water Demand Estimates based on City Data
DATE:	06/30/24

From CDPHE Regulation 43: On-Site Wastewater Treatment System Regulation, Table 6-2:

Category	GPD	GPD Adjusted to Account for Water Consumption (25% Increase)
Facilities with Short Term or Transient Visitors, per person	5	6.25
Office Buildings per employee per eight hour shift	15	18.75
Campground per campsite	50	62.5
Travel trailer parks with individual water and sewage hookup per unit	100	125
Public park shower per fixture when park is open	100	NA
Laundry Washer, Residential	19.5	NA

Water Demand Estimates per Area:

Area	New Visitors/day[1]	Employees/day[2]	New # of Campsites[7]	Use Type	Number of Fixture Units[3]	GPD per Use Type[4]	GPH per Fixture Type[4]	City Provided Data GPD	Average GPD per Area	Hours Open	Total Average GPD	Total Average CFS	Peak Hour Factor per Town of Morrison Criteria[5]	Peak Hour Demand CFS	Peak Hour Demand GPM	Industry Standard Peak Day Factor	Peak Day Flow GPD
Gatehouse (New Water Tank)	0	3	NA	Employees Only, Vault Toilet w/ Water Service, per person	NA	-	NA	2.39	7	NA	7	0.000	4.47	0.000	0.02	2.50	18
Visitor Center (Maintain Existing Water Tank)	210	10	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	2.39	502	NA	689	0.001	4.24	0.005	2	2.50	1,723
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	188								
Swim Beach (Maintain Existing Water Tank)	3,638	4	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	0.27	982	NA	1,057	0.002	4.18	0.007	3	2.50	2,643
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	75								
Marina (Upsize Water Tank)	3,547	6	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	0.28	993	NA	1,106	0.002	4.17	0.007	3	2.50	2,764
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	113								
Campground (Maintain Existing Water System)	128	0	65	Laundry Washer, Residential[6]	1	19.5	NA	-	19.5	12	6,912	0.011	3.78	0.040	18	2.50	17,281
				Public park shower per hour per fixture when park is open	2	NA	100	NA	200								
				Campsites	NA	-	NA	69.12	4493								
New Parcel (No Water)	-	-	15	Campsites	NA	-	NA	69.12	1,037	NA	1,037	0.002	4	0.007	3	2.50	2,592
Little Soda Lake (No Water)	64	2	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	0.28	18	NA	23	0.000	4.45	0.000	0.07	2.50	57
				Office Buildings per employee per eight hour shift	NA	-	NA	2.39	5								
Pelican Point (No Water)	256	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	1.69	433	NA	433	0.001	4.29	0.003	1	2.50	1,082
Boat Ramp (Water Spigot)	192	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	1.69	324	NA	324	0.001	4.31	0.002	1	2.50	811
Stables/Archery (No Water)	64	3	NA	Facilities with Short Term or Transient Visitors, per person	NA	-	NA	5.52	353	NA	360	0.001	4.30	0.002	1	2.50	901
				Office Buildings per employee per eight hour shift	NA	-	NA	2.39	7								
										TOTAL	**11,949**			**0.073**	**33**		**29,872**

Footnotes:

1. Based on estimated breakdown of visitors per day to each area provided by City of Lakewood. Estimated increase in number of visitors is based on increased number of parking stalls for each concept sub-area
2. Based on estimated number of employees per area provided by City of Lakewood.
3. Based on observations during Site visit in July, 2023.
4. From Colorado Department of Public Health and Environment, Regulation 43 On-Site Wastewater Treatment System Regulation, Table 6-2. Increased by 25% to account for water consumption
5. From Town of Morrison Subdivision Regulations dated December, 2020, no peaking factors for water provided, followed section 4 Sanitary Sewer: Peak Hour Factor = 1 + 14/(4+10Q^0.5), Q = average day flow in cfs
6. From Park staff, washer is understood to only be available for use by Campground Host (no visitor use).
7. Assume 4 campsite equivalents for new bunkhouses.

PROJECT INFORMATION

PROJECT NAME:	Bear Creek Lake Park
PROJECT NO:	23.0459
DESIGN BY:	JKN
REVIEWED BY:	TFS
JURISDICTION:	Lakewood, CO
REPORT TYPE:	Future Water Demand Estimates based on CDPHE
DATE:	06/30/24

From CDPHE Regulation 43: On-Site Wastewater Treatment System Regulation, Table 6-2:

Category	GPD	GPD Adjusted to Account for Water Consumption (25% Increase)
Facilities with Short Term or Transient Visitors, per person	5	6.25
Office Buildings per employee per eight hour shift	15	18.75
Campground per campsite	50	62.5
Travel trailer parks with individual water and sewage hookup per unit	100	125
Public park shower per fixture when park is open	100	NA
Laundry Washer, Residential	19.5	NA

Water Demand Estimates per Area:

Area	New Visitors/day[1]	Employees/day[2]	New # of Campsites[7]	Use Type	Number of Fixture Units[3]	GPD per Use Type[4]	GPH per Fixture Type[4]	City Provided Data GPD	Average GPD per Area	Hours Open	Total Average GPD	Total Average CFS	Peak Hour Factor per Town of Morrison Criteria[5]	Peak Hour Demand CFS	Peak Hour Demand GPM	Industry Standard Peak Day Factor	Peak Day Flow GPD
Gatehouse (Connect to Municipal System)	0	3	NA	Office Buildings per employee per eight hour shift	NA	18.75	NA	2.00	56	NA	56	0.000	4.42	0.000	0.17	2.50	141
Visitor Center (Connect to Municipal System)	210	10	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	2.39	1,312	NA	1,500	0.002	4.12	0.010	4	2.50	3,749
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	188								
Swim Beach (Connect to Municipal System)	3,638	4	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	0.27	22,738	NA	22,813	0.035	3.38	0.119	54	2.50	57,032
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	75								
Marina (Connect to Municipal System)	3,547	6	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	0.28	22,170	NA	22,282	0.035	3.39	0.117	53	2.50	55,706
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	113								
Campground (Connect to Municipal System)	128	0	65	Laundry Washer, Residential[6]	1	19.5	NA	-	19.5	12	10,545	0.016	3.65	0.060	27	2.50	26,361
				Public park shower per hour per fixture when park is open	2	NA	100	NA	200								
				Campsites	NA	125	NA	-	8125								
New Parcel (Connect to Municipal System)	-	-	15	Campsites	NA	125	NA	-	1,875	NA	1,875	0.003	4	0.012	5	2.50	4,688
Little Soda Lake (Connect to Municipal System)	64	2	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	0.28	400	NA	438	0.001	4.29	0.003	1.30	2.50	1,094
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	38								
Pelican Point (Connect to Municipal System)	256	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	1.69	1,600	NA	1,600	0.002	4.11	0.010	5	2.50	4,000
Boat Ramp (Connect to Municipal System)	192	0	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	1.69	1,200	NA	1,200	0.002	4.16	0.008	3	2.50	3,000
Stables/Archery (Connect to Municipal System)	64	3	NA	Facilities with Short Term or Transient Visitors, per person	NA	6.25	NA	5.52	400	NA	456	0.001	4.28	0.003	1	2.50	1,141
				Office Buildings per employee per eight hour shift	NA	18.75	NA	-	56								
Maintenance Shop (Not Part of Scope) (Connect to Municipal System)	0	10	NA	Office Buildings per employee per eight hour shift	NA	18.75	NA	-	187.5	188	188	0.000	4.36	0.001	0.57	2.50	469
										TOTAL	**62,952**			**0.342**	**153**		**156,910**

Footnotes:

1. Based on estimated breakdown of visitors per day to each area provided by City of Lakewood. Estimated increase in number of visitors is based on increased number of parking stalls for each concept sub-area
2. Based on estimated number of employees per area provided by City of Lakewood.
3. Based on observations during Site visit in July, 2023.
4. From Colorado Department of Public Health and Environment, Regulation 43 On-Site Wastewater Treatment System Regulation, Table 6-2. Increased by 25% to account for water consumption
5. From Town of Morrison Subdivision Regulations dated December, 2020, no peaking factors for water provided, followed section 4 Sanitary Sewer: Peak Hour Factor = 1 + 14/(4+10Q^0.5), Q = average day flow in cfs
7. Assume 4 campsite equivalents for new bunkhouses.

Equivalent Resident Units - Based on Average GPD
From Subdivision Regulations for Town of Morrison dated December 2020, Section 3 Water Mains:

Single Family Occupancy:	3.2	residents per unit
Usage	70	gallons per capita per day
Total SFE Usage	300	gallons per day
Equivalent Resident Units	210	

Increase in Number of Parking Stalls -> Correlates to Number of Visitors			
Parking Area	**Existing Total Stalls**	**Proposed Total Stalls**	**Factored Increase**
Visitor Center	44	72	1.64
Swim Beach & Marina	212	301	1.42

PROJECT INFORMATION

PROJECT NAME:	Bear Creek Lake Park
PROJECT NO:	23.1318
DESIGN BY:	JKN
REVIEWED BY:	TFS
JURISDICTION:	Morrison, CO
REPORT TYPE:	Fire Demand Estimate
DATE:	02/05/24

Estimated Fire Flow[1]

Building	Building Type	Gross Floor Area (SF) *USED IN TABLE 105.1(2)*	Fire Flow (gpm)	Sprinklered?	Min. Required Flow[2] (gpm)	Min. Required Flow (cfs)	Total Site Peak Day Domestic Flows (cfs)	Total (cfs)	# of hydrants	Water Main Size to keep Fire + Domestic flows at 15 fps velocity or less
Visitor Center -Option 2 MP	Type V - B	11,012	2,750	Yes	1,500	3.345	0.243	3.588	1	8"

1. From 2021 International Fire Code, Tables B105.1(1), B105.1(2), and B105.2, reduction in fire flow of 75% if sprinklered, but not below 1500 gallons per minute.

Appendix G - Traffic Study prepared by CivTrans

October 2, 2023

Tracy Scurlock
Martin/Martin Inc.
12499 W Colfax Avenue
Lakewood, CO 80215

Re: Bear Creek Lake Park – Traffic Observation Notes and Mitigation Options

Traffic observations were conducted at the Bear Creek Lake Park access from Morrison Road (State Highway 8) on July 29 and August 5, 2023. Traffic counts were also collected at the intersections of Morrison Road & the Park Entrance and Morrison Road & C-470 ramps on July 29 from 10 AM to 2 PM. The following includes notes from my observation and conversations with park staff, traffic and queuing issues observed or discussed with park staff, and a preliminary list of mitigation alternatives for consideration and discussion.

Existing Condition Observations

Traffic observations were conducted from 8 AM to 2 PM on Saturday, July 29, 2023 at the entrance station. On this day, the park did not reach capacity. The entrance station operated two lanes with one park staff member managing each lane. Ingress traffic to the park at the entrance station was steady, but never queued more than 8 vehicles per lane. Video was captured of the ingress traffic and a service rate of 5.4 vehicles per minute (for two lanes) was measured. This corresponds to a capacity of approximately 300-350 vehicles per hour under the current configuration. When ingress rates exceed this capacity, excessive queuing can occur.

Bicycles enter the park from the Bear Creek & C-470 trail, traversing along various bicycle trails provided in the park. Many of these bicycles travel to the park entrance in a dedicated bike lane. Beyond the entrance station, bicycles travel on the roadway, which is shared with vehicles. During observations bicycle and vehicle interaction was frequent, but appeared to be safe. A new connection to the Bear Creek & C-470 trail is proposed from the Red Rocks Ranch development on the north side of Morrison Road. The trail connection is proposed to parallel Morrison Road between the entrance station and the highway. It is proposed to cross the park entrance roadway at its intersection with Morrison Road and then connect to the Bear Creek & C-470 trail. Depending on the volume of bicycle traffic that will utilize this connection, it may significantly impact entering and exiting vehicles at the park entrance.

Traffic observations were conducted again on Saturday, August 5 from noon to 3 PM. The park did not reach capacity on this day either and less queuing occurred than on July 29. Per conversations with park staff, closures due to the park reaching capacity are common on Sundays and less common on Saturdays. However, July 30 and August 6 (Sundays) did not require closures to address park capacity.

Two short videos were taken on Labor Day (September 4) by park staff showing vehicles queued from the entrance station to Morrison Road and on Morrison Road to C-470. This queuing occurred prior to the park reaching capacity and was a result of a high rate of ingress traffic.

Intersection Capacity Evaluation

Capacity evaluation utilizing the *Highway Capacity Manual* methodology was conducted for the intersections of Morrison Road & the Park Entrance and Morrison Road & C-470 ramps based on the Saturday midday peak hours from the traffic counts. The peak hours represent the time periods where the demand on the transportation system is at its highest. Any congestion, safety or delay issues are most likely to occur during the peak hours. The park is at its peak usage on weekends during the summer and typically Sundays are busier than Saturdays. The counts were collected on a Saturday. Therefore, this time period was evaluated for intersection capacity.

The *Highway Capacity Manual* methodology is the standard within the transportation engineering industry for evaluating operational performance of intersections. A letter grade (A through F), level of service (LOS), is assigned to an intersection based on the computed average delay. LOS A indicates very little delay or congestion, whereas LOS F indicates an intersection over capacity and experiencing significant delay and congestion. Typically, jurisdictions (including CDOT) require intersections to operate at LOS D or better during peak hours as this indicates the intersection is generally operating within capacity. Off-peak hours are anticipated to operate better than peak hours.

The intersections of Morrison Road & the Park Entrance and Morrison Road & C-470 ramps are currently operating at LOS D or better during the Saturday peak. Sunday peak hour was not evaluated so no determination can be made for its operating capacity or level of service.

Conditions during Park Closure

Per conversations with park staff, holidays, most Sundays and some Saturdays during the summer, the Bear Creek Lake Park reaches capacity (at Big Soda Lake Beach) and must restrict any additional visitors from entering the park until sufficient parking vacancy is reached to allow visitors to continue to enter. Once the entrance is closed, vehicles begin to queue on Morrison Road, which can block the C-470 ramps. Bear Creek Lake Park has implemented a capacity procedure plan that directs rangers when to close the park entrance, the minimum duration of the closure (2 hrs), how to accommodate campers and other non-beach users with reservations, and how to address Morrison Road traffic at the park entrance. Park capacity procedures are always tied to the overall parking capacity of the Big Soda Lake Beach parking areas. Once those near capacity, closure procedures are implemented. Unfortunately, no closure procedure occurred during observations and no video has been provided by park staff to assess the implementation of the capacity procedure.

Traffic Issues

The park experiences delay and queuing issues for differing reasons at the park entrance and along Morrison Road. Traffic issues occur due to the park reaching capacity and closing or due to excessive rate of ingress vehicles. These occur on most weekends and holidays from May to September. The park generally does not experience capacity issues on weekdays or during late

fall, winter or early spring months. The park is experiencing growth in visitors and is anticipated to continue to see increased usage in the future. While these traffic issues occur infrequently (20-30 times per year) currently, they are anticipated to occur more and more in the future. It is reasonable to question whether infrastructure improvements (widening roadways, adding queue lanes, improving intersections) should be implemented to address a handful of days per year where traffic creates these queuing and delay issues, but with continued growth in visitation, these traffic issues are likely to be more frequent. Modifications to the existing capacity procedure should be conducted to address inadequacies and improve its efficiency.

Mitigation Options

The following mitigation options are offered for consideration and discussion. These should be viewed as a starting point for addressing the traffic issues encountered by Bear Creek Lake Park.

Queuing Mitigation:

Queuing at the park entrance occurs due to a lack of storage capacity for the queue or a service rate that is less than the demand. The following queuing mitigation options seek to address each of these deficiencies.

- Automated Entrance: An automated entrance where the visitor enters with a pre-purchased day or annual pass could improve the service rate at the entrance station. A manned entrance may continue to be necessary for visitors that arrive without a pre-paid pass.

  This improvement may alleviate queuing during high ingress periods, but would not help with queuing issues that occur during park closures during capacity events. Pre-paid passes would need to be refundable if the visitor arrived during a capacity closure or be tied to a reservation system for the park. An automated entrance should have an “escape” to the manned entrance in case a vehicle without a pre-paid pass accidentally ends up in this lane.

- Extend Dual Entry Lanes: The entrance station currently has two lanes that feed into each side of the station. The lanes are each approximately 240’ in length, which can accommodate approximately nine (9) to ten (10) vehicles per lane. There is sufficient space to widen the entry road from Morrison Road to provide dual entry lanes for approximately 580’, which could alleviate some queuing onto Morrison Road that occurs during peak ingress times. The available space for the access is limited by Bear Creek and its riparian/wetlands area to the south and CDOT right-of-way for State Highway 8 to the north. A conceptual layout should be completed to verify there is adequate space to widen the entry lanes along this segment.

- Dual Right Turn from Morrison Road: Entrance into the park from Morrison Road can be made from eastbound Morrison Road (Highway 8) in a single right turn lane or from westbound Morrison Road in a single left turn lane. Two-thirds or more of the ingress traffic to the park enters as a right turn from eastbound Morrison Road. If the entry lanes on the site are expanded to two lanes from the entrance station to Morrison Road, then the right turn from Morrison Road could also be widened to two right turn lanes. This could alleviate

some of the queuing issues that occur when vehicle queue back to C-470. It could also be utilized as a queue area for vehicles waiting to enter the park during a temporary closure. Coordination with CDOT would be required to modify the access and add a second right turn lane.

- Relocate Entrance Station: The entrance station could be moved east to provide additional queuing capacity between the entrance station and Morrison Road. An entrance station located immediately west of the three-way stop could provide up to 300' of additional lane storage in advance of the entrance station. A split entry configuration could also be implemented beyond the three-way stop to allow for additional queuing and flexibility in controlling entry to the north and south portions of the park. A split entrance would likely require modifications to the three-way stop intersection to allow vehicles destined for the northern portion of the park to bypass queued vehicles entering the southern portion of the park.

Closure Mitigation:

Mitigating traffic issues associated with the closure of the park are less about roadway and intersection configuration and more about improving traffic control procedures.

- *Reservation System*: Many of the most popular parks that have capacity issues have moved to a reservation system. As Bear Creek Lake Park continues to increase in visitation, the need for a reservation system grows. Depending on the park entrance configuration, a reservation system could be segregated to different areas of the park. It could also be utilized for weekends during the peak season only at first until there is a need for it to expand to other days. My expertise does not include the intricacies of developing and implementing a reservation system. Therefore, an expert in this field should be consulted if the City chooses to pursue a reservation system for the park.

- Hard Closure: One of the primary queuing issues that occurs at the park is when the entrance is closed due to Big Soda Lake Beach reaching capacity. Vehicles queue waiting for the park to start allowing visitors to enter once space becomes available. If the park modified their closure policy to a hard closure, meaning once the park closes it does not reopen that day or is closed for an extended duration (e.g. 4+ hours). The goal of establishing a hard closure is to discourage visitors from queuing near the entrance or along Morrison Road waiting for space to become available and would instead try to visit the park another day. Some allowance for vehicles to re-enter would be needed to accommodate vehicles that are picking up visitors already in the park.

- Create Turnaround: The park lacks a sufficient turnaround area in advance of the entrance that can be used by visitors that decide not to enter (usually because their State Park pass is not valid). There is a turnaround immediately beyond the entrance station that can be used, but there is not an easy way to police this and it wasn't utilized for this purpose during observations. Vehicles that try to turn around before the entrance station take a significant amount of time to make the maneuver, blocking egress traffic and impeding queued vehicles from entering.

During a capacity closure, a turnaround in advance of the entrance station could be used to more easily clear a queue on Morrison Road or along the site access. A large part of the congestion issue that occurs during a closure is from vehicles stuck in the queue, not accepting that the park is close or trying to enter the park to pick up a visitor that was dropped off earlier. A turnaround allows park rangers or other traffic control staff to direct the vehicles to the turnaround and keep the queue moving.

The available space for a turnaround is limited by Bear Creek and its riparian/wetlands area to the south and CDOT right-of-way for State Highway 8 to the north. A conceptual layout should be completed to verify there is adequate space to create a turnaround in this area.

Conclusion

During my traffic observations, there were not any traffic issues occurring at the Bear Creek Lake Park. However, traffic queuing issues at the park entrance do occur and were relayed through discussions with park staff and rangers. These occur on holidays, Sundays and some Saturdays during the summer when the park usage is at its highest. Queuing issues can be a result of a high rate of ingress vehicles at the entrance station, but are more common during closures of the park due to capacity being reached at the swim beach.

Several mitigation options are presented within this document, which have been discussed with City and park staff and should be considered for inclusion in the master plan for the park. Each of these options should be evaluated for rough order cost and geometric feasibility. At a minimum, widening the entrance roadway to extend the two dedicated lanes another 300'+ and implementation of a reservation system should be considered as a short-term infrastructure improvement to address the queuing and capacity closure traffic impacts.

Should you have any questions regarding this document or the information contained herein, please do not hesitate to contact me at (303) 653-9200 or via email at craig@civtrans.com. Capacity evaluation reports, traffic counts, and videos from observations are available upon request.

Sincerely,

Craig A. MacPhee, PE, PTOE

Appendix H - Road and Utility Exhibits

EXTEND DUAL ENTRY LANES INTO PARK STARTING FROM MORRISON ROAD. MAY REQUIRE ACCESS PERMIT THROUGH CDOT

DASHED LINE REFLECTS ANTICIPATED MORRISON ROAD TRAIL EXTENSION BY OTHERS, SEE NOTE 4

MORRISON ROAD

R30.00'

8.07'

R30.00'

R64.00'

IMPROVEMENTS WITHIN CDOT RIGHT-OF-WAY, MAY REQUIRE ACCESS EASEMENT OR RIGHT-OF-WAY VACATION

AUTOMATED GATE FOR ANNUAL PASSHOLDER LANE

CONNECT WASTE LINE FROM SINK TO WASTEWATER VAULT BELOW RESTROOM

NEW VAULT TOILET BUILDING RE: ARCH

1-1/2" HDPE WATER LINE BETWEEN STORAGE TANK, BFP, PRESSURE TANK, AND SINK

100 GALLON ABOVE GROUND WATER TANK, FOR TRUCKED IN POTABLE WATER STORAGE

PROJECT BOUNDARY

REMOVE AND RELOCATE BOULDERS ALONG NEW EDGE OF ASPHALT

APPROXIMATE END OF ROAD WIDENING

EXTEND GRAVEL ROAD TO NEW EDGE OF ASPHALT ROADWAY

KUMPFMILLER DRIVE

APPROXIMATELY 320 LF OF ADDITIONAL QUEUING SPACE ADDED

HOLD GRADES AND PAVEMENT EXTENTS AT EXISTING SOUTHERN EDGE OF ROADWAY

RE-STRIPE PAVEMENT MARKINGS FOR 10-FT WIDE BIKE LANE ON SOUTH SIDE OF ROAD. BOTH DIRECTIONS OF TRAVEL TO USE THIS BIKE LANE

GATE HOUSE

TRANSITION TO 10-FT WIDE BIKE PATH DETACHED FROM ROAD

EXISTING TURNAROUND TO REMAIN

GAS EASEMENT

RE-STRIPE STOP BARS TO ALLOW FOR BIKE CROSSING PAVEMENT MARKINGS

1 2

1 W11-15 30 X 30

2 W16-7pL 24 X 12

LEGEND

- PARK BOUNDARY
- EASEMENT
- FLOOD ZONE
- WETLAND
- CREEK

NOTES:

1. EXISTING EASEMENTS AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
3. LOCATIONS OF EXISTING UTILITIES WERE MAPPED INTO CAD BASED ON SITE OBSERVATIONS AND FROM EXISTING PLANS PROVIDED BY CITY OF LAKEWOOD IN JULY, 2023.
4. RECOMMEND THAT A PEDESTRIAN, BICYCLE, AND VEHICULAR INTERACTION STUDY BE COMPLETED AT THE START OF DESIGN PHASE FOR GATEHOUSE IMPROVEMENTS.

0 50 100

SCALE: 1"=100'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

N

DHM DESIGN
900 S. Broadway
Suite 300
Denver, CO 80209
303.892.5566
www.dhmdesign.com

BEAR CREEK LAKE PARK

15600 W MORRISON RD
LAKEWOOD, COLORADO 80228

Bottom Project Name

PROJECT NUMBER: 23.0459
DATE: 07/24/24
DESIGNED: JKN/TFS
DRAWN: PLS
CHECKED: PJS
REVISIONS:
JOB DESCRIPTION: PRE-DESIGN
SHEET TITLE: GATEHOUSE ROADWAY AND UTILITY IMPROVEMENTS
SHEET NUMBER: C-101
SHEET__OF__

IMAGES
..\IMAGES\Aerial Map East.jpg
..\IMAGES\Aerial Map NorthEast.jpg
..\IMAGES\Aerial Map NorthWest.jpg
..\IMAGES\Aerial Map West.jpg
..\SENT\2024.07.11 CAD to DHM\2024.07.11_BCLP_Civil Base Files\Aerial Map W

XREFS
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V-TOPO [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-TOPO.dwg]
bclptopo [I:\..\BASE\bclptopo.dwg]
C-UTIL [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\C-UTIL.dwg]
L-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\L-SITE.dwg]
11 X 17 TB [G:\SULLIVAN\23.0459-Bear Creek Lake Park\PLANS\SHEET SET\11 X 17 TB.dwg]

FILE NAME
C:\Users\tscurlock\appdata\local\temp\AcPublish_6944\PROPOSED CONCEPTS.dwg
PLOT DATE: Jul 23, 2024 - 5:19pm

LEGEND

- PARK BOUNDARY
- EASEMENT
- FLOOD ZONE
- WETLAND
- CREEK

NOTES:

1. EXISTING EASEMENTS AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
3. LOCATIONS OF EXISTING UTILITIES WERE MAPPED INTO CAD BASED ON SITE OBSERVATIONS AND FROM EXISTING PLANS PROVIDED BY CITY OF LAKEWOOD IN JULY, 2023.

0 30 60

SCALE: 1"=60'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

N

DHM DESIGN
900 S. Broadway
Suite 300
Denver, CO 80209
303.892.5566
www.dhmdesign.com

BEAR CREEK LAKE PARK

15600 W MORRISON RD
LAKEWOOD, COLORADO 80228

Bottom Project Name

PROJECT NUMBER: 23.0459
DATE: 07/24/24
DESIGNED: JKN/TFS
DRAWN: PLS
CHECKED: PJS
REVISIONS:

JOB DESCRIPTION: PRE-DESIGN

SHEET TITLE: VISITOR CENTER UTILITY IMPROVEMENTS

SHEET NUMBER: C-102

SHEET__OF__

XREFS
V-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-SITE.dwg]
V-TOPO [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-TOPO.dwg]
bcltopo [I:\..\BASE\bcltopo.dwg]
C-UTIL [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\C-UTIL.dwg]
L-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\L-SITE.dwg]
11 X 17 TB [G:\SULLIVAN\23.0459-Bear Creek Lake Park\PLANS\SHEET SET\11 X 17 TB.dwg]

IMAGES
..\IMAGES\Aerial Map East.jpg
..\IMAGES\Aerial Map NorthEast.jpg
..\IMAGES\Aerial Map NorthWest.jpg
..\IMAGES\Aerial Map West.jpg
..\SENT\2024.07.11 CAD to DHM\2024.07.11_BCLP_Civil Base Files\Aerial Map West.jpg

FILE NAME
C:\Users\scurlock\appdata\local\temp\AcPublish_6944\PROPOSED CONCEPTS.dwg
PLOT DATE: Jul 23, 2024 - 5:19pm

LEGEND

- PARK BOUNDARY
- EASEMENT
- FLOOD ZONE
- WETLAND
- CREEK

NOTES:

1. EXISTING EASEMENTS AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
3. LOCATIONS OF EXISTING UTILITIES WERE MAPPED INTO CAD BASED ON SITE OBSERVATIONS AND FROM EXISTING PLANS PROVIDED BY CITY OF LAKEWOOD IN JULY, 2023.

0 40 80

SCALE: 1"=80'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

N

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BEAR CREEK LAKE PARK

15600 W MORRISON RD
LAKEWOOD, COLORADO 80228

Bottom Project Name

PROJECT NUMBER: 23.0459
DATE: 07/24/24
DESIGNED: JKN/TFS
DRAWN: PLS
CHECKED: PJS

REVISIONS:

JOB DESCRIPTION: PRE-DESIGN

SHEET TITLE: SWIM BEACH & MARINA UTILITY IMPROVEMENTS

SHEET NUMBER: C-103

SHEET__OF__

IMAGES
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XREFS
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V-TOPO [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-TOPO.dwg]
bclptopo [..\..\BASE\bclptopo.dwg]
C-UTIL [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\C-UTIL.dwg]
L-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\L-SITE.dwg]
11 X 17 TB [G:\SULLIVAN\23.0459-Bear Creek Lake Park\PLANS\SHEET SET\11 X 17 TB.dwg]

FILE NAME
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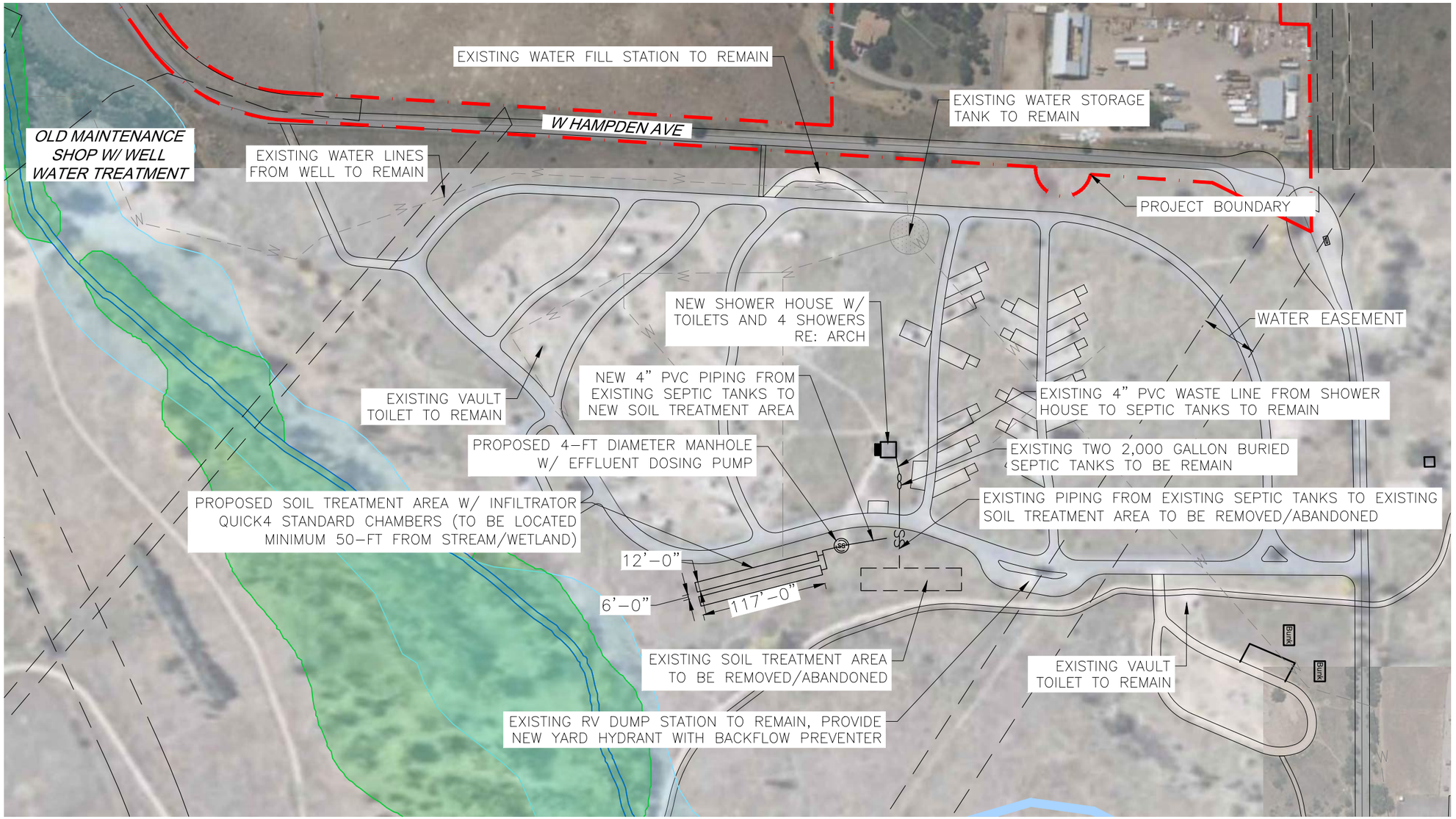
PLOT DATE: Jul 23, 2024 - 5:19pm



LEGEND

- PARK BOUNDARY
- EASEMENT
- FLOOD ZONE
- WETLAND
- CREEK

NOTES:

1. EXISTING EASEMENTS,AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
3. LOCATIONS OF EXISTING UTILITIES WERE MAPPED INTO CAD BASED ON SITE OBSERVATIONS AND FROM EXISTING PLANS PROVIDED BY CITY OF LAKEWOOD IN JULY, 2023.

N

0 100 200

SCALE: 1"=200'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

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BEAR CREEK LAKE PARK
15600 W MORRISON RD
LAKEWOOD, COLORADO 80228
Bottom Project Name

PROJECT NUMBER: 23.0459
DATE: 07/24/24
DESIGNED: JKN/TFS
DRAWN: PLS
CHECKED: PJS
REVISIONS:
JOB DESCRIPTION: PRE-DESIGN
SHEET TITLE: CAMPGROUND UTILITY IMPROVEMENTS
SHEET NUMBER: C-104
SHEET__OF__

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XREFS
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V-TOPO [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-TOPO.dwg]
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C-UTIL [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\C-UTIL.dwg]
L-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\L-SITE.dwg]
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FILE NAME C:\Users\tsullock\appdata\local\Temp\AcPublish_6944\PROPOSED CONCEPTS.dwg
PLOT DATE: Jul 23, 2024 - 5:19pm

LEGEND

- PARK BOUNDARY
- EASEMENT
- FLOOD ZONE
- WETLAND
- CREEK

NOTES:

1. EXISTING EASEMENTS AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
3. LOCATIONS EXISTING UTILITIES WERE MAPPED INTO CAD BASED ON SITE OBSERVATIONS AND FROM EXISTING PLANS PROVIDED BY CITY OF LAKEWOOD IN JULY, 2023.

0 20 40

SCALE: 1"=40'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

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BEAR CREEK LAKE PARK

15600 W MORRISON RD
LAKEWOOD, COLORADO 80228

Bottom Project Name

PROJECT NUMBER: 23.0459
DATE: 07/24/24
DESIGNED: JKN/TFS
DRAWN: PLS
CHECKED: PJS
REVISIONS:

JOB DESCRIPTION: PRE-DESIGN

SHEET TITLE: LITTLE SODA LAKE UTILITY IMPROVEMENTS

SHEET NUMBER: C-105

SHEET__OF__

XREFS
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V-TOPO [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-TOPO.dwg]
bclptopo [..\..\BASE\bclptopo.dwg]
C-UTIL [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\C-UTIL.dwg]
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11 X 17 TB [G:\SULLIVAN\23.0459-Bear Creek Lake Park\PLANS\SHEET SET\11 X 17 TB.dwg]

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FILE NAME
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PLOT DATE: Jul 23, 2024 - 5:19pm

NOTES:

1. EXISTING EASEMENTS AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
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0 20 40

SCALE: 1"=40'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

N

1 W11-2 30 X 30

2 W16-7pL 24 X 12

LEGEND

- PARK BOUNDARY
- EASEMENT
- FLOOD ZONE
- WETLAND
- CREEK

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BEAR CREEK LAKE PARK

15600 W MORRISON RD
LAKEWOOD, COLORADO 80228

Bottom Project Name

PROJECT NUMBER: 23.0459
DATE: 07/24/24
DESIGNED: JKN/TFS
DRAWN: PLS
CHECKED: PJS
REVISIONS:
JOB DESCRIPTION: PRE-DESIGN
SHEET TITLE: STABLES UTILITY IMPROVEMENTS
SHEET NUMBER: C-106
SHEET__OF__

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XREFS
V-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-SITE.dwg]
V-TOPO [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\V-TOPO.dwg]
bclptopo [..\..\BASE\bclptopo.dwg]
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L-SITE [G:\SULLIVAN\23.0459-Bear Creek Lake Park\BASE\L-SITE.dwg]
11 X 17 TB [G:\SULLIVAN\23.0459-Bear Creek Lake Park\PLANS\SHEET SET\11 X 17 TB.dwg]

FILE NAME
C:\Users\tscurlock\appdata\local\temp\AcPublish_6944\PROPOSED CONCEPTS.dwg
PLOT DATE: Jul 23, 2024 - 5:19pm

CONNECTION TO EXISTING SANITARY SYSTEM WEST OF MORRISON WASTEWATER TREATMENT PLANT

LIFT STATION 3 DISCHARGE TO GRAVITY MANHOLE

3" HDPE SANITARY FORCE MAIN

LIFT STATION 3 TWO 6-FT DIAMETER MANHOLES

8" PVC GRAVITY SANITARY LINE

LIFT STATION 2 DISCHARGE TO GRAVITY MANHOLE

CONNECT BCLP WATER SYSTEM TO EXISTING 12" PVC WATER MAIN AT MCINTYRE ROAD

MCINTYRE ROAD

CONNECT BCLP WATER SYSTEM TO EXISTING 12" PVC WATER MAIN AT ROONEY ROAD

ROONEY ROAD

MORRISON ROAD

NEW GATEHOUSE CONNECTED TO NEW WATER AND SANITARY MAINS

GATE HOUSE

BOAT RAMP (NO MUNICIPAL CONNECTIONS)

BEAR CREEK RESERVOIR

W.L. 5558.3

TWO PARALLEL 8" PVC WATER MAINS FROM PARK ENTRANCE TO MARINA

MAINTENANCE SHOP

GAS EASEMENT

NEW VISITOR CENTER CONNECTED TO NEW WATER AND SANITARY MAINS

LOOKOUT WATERTON 230KV TRANSMISSION LINE EASEMENT

PELICAN POINT (NO MUNICIPAL CONNECTIONS)

LITTLE SODA LAKE (NO MUNICIPAL CONNECTIONS)

VISITOR CENTER

3" HDPE SANITARY FORCE MAIN

LIFT STATION 2 TWO 6-FT DIAMETER MANHOLES

TWO PARALLEL 6" PVC WATER MAINS FROM MARINA TO CAMPGROUND

8" PVC GRAVITY SANITARY LINE

LIFT STATION 1 DISCHARGE TO GRAVITY MANHOLE

3" HDPE SANITARY FORCE MAIN

LIFT STATION 1 TWO 6-FT DIAMETER MANHOLES

STABLES (NO MUNICIPAL CONNECTIONS)

NEW RV DUMP STATION

WATER EASEMENT

95 FLOOD POOL ELEV=5587.15

83 FLOOD POOL ELEV=5581

SWIM BEACH

W.L. 5705.8

HIGHWAY C470

MARINA

NEW RESTROOM BUILDING CONNECTED TO WATER AND SANITARY MAINS

RANGER STATION CONNECTED TO WATER AND SANITARY MAINS

CAMPGROUND

8" PVC GRAVITY SANITARY LINE

W.L. 5610.2

WATER STORAGE TANK TO BE ABANDONED

NEW SHOWER HOUSE CONNECTED TO WATER AND SANITARY MAINS

NEW WATER FILL STATION CONNECTED TO NEW WATER MAIN

EXISTING RV DUMP STATION TO CONNECT TO NEW SANITARY MAIN

NEW SWIM BEACH AND MARINA BUILDINGS CONNECTED TO NEW WATER AND SANITARY MAINS

W.L. 5693.2

NEW 36 ACRE PARCEL (NO MUNICIPAL CONNECTIONS)

6" PVC WATER MAIN LOOP AROUND CAMPGROUND

BIG SODA LAKE

20-YEAR FLOOD POOL ELEV=5601

50-YEAR FLOOD POOL ELEV=5613

100-YEAR FLOOD POOL ELEV=5623

NEW RESTROOM BUILDING CONNECTED TO WATER AND SANITARY MAINS

WELL WATER TREATMENT SYSTEM TO BE ABANDONED

GAS EASEMENT

WATER EASEMENT

PARK BOUNDARY

OLD PARK MAINTENANCE SHOP

US HIGHWAY 285

SOUTH WATER SYSTEM-PIPES RANGE IN SIZE FROM 1-1/4" TO 4", TO BE ABANDONED

C470 ROAD EASEMENTS

EXISTING GALLERY WELL TO BE ABANDONED

LEGEND

- 4-FT DIAMETER SANITARY MANHOLE
- WASTEWATER LIFT STATION
- AIR RELEASE VALE
- BLOW OFF VALVE
- FIRE HYDRANT
- GATE VALE
- PROPOSED WATER
- PROPOSED SANITARY
- PARK BOUNDARY
- EASEMENT
- ROAD
- BUILDING
- FLOOD ZONE
- WETLAND
- CREEK
- LAKE
- DIRECTION OF EXISTING TOPOGRAPHY/DRAINAGE

NOTES:
1. TOPOGRAPHY, EXISTING ROADWAYS, EXISTING EASEMENTS, AND EXISTING FLOOD POOL LIMITS SHOWN WERE PROVIDED IN CAD FILES FROM CITY OF LAKEWOOD IN JULY, 2023.
2. EXISTING PARK BOUNDARY AND WETLAND LIMITS WERE PROVIDED IN CAD FILES FROM DHM DESIGN IN AUGUST, 2023.
3. LOCATIONS OF EXISTING BUILDINGS AND EXISTING UTILITIES WERE MAPPED INTO CAD BASED ON SITE OBSERVATIONS AND FROM EXISTING PLANS PROVIDED BY CITY OF LAKEWOOD IN JULY, 2023.

N

400 200 0 400 800
SCALE: 1"=400'
ALL LINEAL DIMENSIONS ARE IN U.S. SURVEY FEET

PLOT DATE: Wednesday, February 14, 2024 7:48 PM LAST SAVED BY: TSCURLOCK
DRAWING LOCATION: G:\SULLIVAN\23.0459-Bear Creek Lake Park\PLANS\EXHIBITS\C-107 MUNICIPAL CONNECTION CONCEPT.dwg

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NOT FOR CONSTRUCTION

BEAR CREEK LAKE PARK

15600 W MORRISON RD
LAKEWOOD, COLORADO 80228

PROJECT NUMBER: 23.0459
DATE: 02/14/2024
DESIGNED: JKN/TFS
DRAWN: AEL
CHECKED: PJS

REVISIONS:

JOB DESCRIPTION:

SHEET TITLE:
MUNICIPAL CONNECTION CONCEPTS

SHEET NUMBER:
C-107

SHEET_____OF_____