Staff Presentation Outline

- Project Summary
- Staff Responses to Board Feedback
- Open Space Resources at Risk
- Analysis of Concepts
- Staff Recommendation
Currently approximately 3,500 people live within the 100-year floodplain north of US36 (600 Structures and over 1,600 dwelling units).
Background

- Flood Mapping Study
- Mitigation Master Plan
- Boulder Valley Comprehensive Plan
- Concept Evaluation
Concepts Developed and Evaluated

- Master Plan
- Variant 1
- Variant 2
Master Plan Concept Rendering – 100 yr

South Boulder Creek

Floodwall

Earthen Dam
Variant 1 Rendering – 100 year with CU Levee

- Floodwall
- Earthen Dam
Variant 2 Rendering – 100 year

Floodwall

Earthen Dam
Concept Evaluation

- Greatest flood benefits from 500-year concepts
- Master Plan highest cost concepts
- Variant 2 easiest to modify, operate and maintain
- Variant 2 may have greater environmental impacts
- Concept without CU levee best for riparian connectivity
Follow Up Issues

- Variant 2 need for flow restriction at US36
- Potential for debris blockage
- Potential for increased sedimentation
- Groundwater mitigation design
Follow Up Issues

- Variant 2 need for flow restriction at US36
- Potential for debris blockage
- Potential for increased sedimentation
- Groundwater mitigation design
Variant 2 Concept- Need for Flow Restriction

- Remove Existing CU Levee
- Reserve Area for Inflow and Restoration
- Proposed Dam
- Floodwall/spillway
- Prebles mouse critical habitat
- Approx. limits of 100-year flood storage
- Approx. post project 100-yr floodplain
- Approx. post project 500-yr floodplain

US36 Flow restriction
Existing 100-Year Floodplain

Map showing floodplains in the area with labels for locations such as Hwy 93, CU South, South Boulder Creek, Cherryvale, Arapahoe, and 55th.
Existing 100-Year Floodplain
Existing 100-Year Floodplain
Need for Variant 2 Flow Restriction

Existing US36 Bridge Opening
Need for Variant 2 Flow Restriction

100-year existing flow under US36 ~4,000 cfs
Need for Variant 2 Flow Restriction

Deeper ponding with detention
Need for Variant 2 Flow Restriction

Deeper ponding with detention

100-year flow under US36 ~5,000 cfs if no restriction
Need for Variant 2 Flow Restriction

- Larger downstream floodplain
- 100-year flow under US36 ~5,000 cfs if no restriction
- Deeper ponding with detention
Need for Variant 2 Flow Restriction
Follow Up Issues

- Variant 2 need for flow restriction at US36
- Potential for debris blockage
- Potential for increased sedimentation
- Groundwater mitigation design
Potential for Debris Blockage

Variant 2 Flow Restriction Concept
Follow Up Issues

- Variant 2 need for flow restriction at US36
- Potential for debris blockage
  - Potential for increased sedimentation
- Groundwater mitigation design
Additional Flooding: Master Plan Concept 100-Year

- Removes Existing CU Levee
- Proposed Dam
- Syphon
- Outlet Tunnel
- Floodwall/spillway
- Approximately 5.8 acres of additional ponding over existing floodplain limits

Legend:
- Blue: Approx. limits of 100-year ponding
- Green: Prebles mouse critical habitat
- Light blue: 100-yr floodplain
- Light Grey: 500-yr floodplain
Additional Flooding: Master Plan Concept-500 year

- Additional ponding over existing floodplain limits
- Remove Existing CU Levee
- CU South
- OSMP
- Outlet Tunnel
- Floodwall/spillway
- Proposed Dam
- Syphon

11.4 acres of additional ponding over existing floodplain limits

Approx. limits of 100-year ponding
Prebles mouse critical habitat
100-yr floodplain
500-yr floodplain

Hwy 93
Foothills Pkwy

South Boulder Creek
Additional Flooding: Variant 1 Concept- 100 year

- Remove Existing CU Levee
- Realigned Portion of Proposed Dam
- Outlet Tunnel
- Floodwall/spillway

- 5.8 acres of additional ponding over existing floodplain limits

- Approx. limits of 100-year ponding
- Prebles mouse critical habitat
- 100-yr floodplain
- 500-yr floodplain
Additional Flooding: Variant 1 Concept- 500 year

- Remove Existing CU Levee
- Realigned Portion of Proposed Dam
- Outlet Tunnel
- Floodwall/spillway

11.7 acres of additional ponding over existing floodplain limits

- Approx. limits of 100-year ponding
- Prebles mouse critical habitat
- 100-yr floodplain
- 500-yr floodplain
Additional Flooding: Variant 2 Concept-100 year

- Remove Existing CU Levee
- Reserve Area for Inflow and Restoration
- 15.5 acres of additional ponding over existing floodplain limits
- Proposed Dam
- Floodwall/spillway
- US36 Flow restriction

- Approx. limits of 100-year ponding
- Prebles mouse critical habitat
- 100-yr floodplain
- 500-yr floodplain
Additional Flooding: Variant 2 Concept-500 year

- Remove Existing CU Levee
- Reserve Area for Inflow and Restoration
- Proposed Dam
- Floodwall/spillway
- 17.9 acres of additional ponding over existing floodplain limits
- Approx. limits of 100-year ponding
- Prebles mouse critical habitat
- 100-yr floodplain
- 500-yr floodplain
Variant 2 Concept - Smaller Storm Flooding on OSMP Land
Follow Up Issues

- Variant 2 need for flow restriction at US36
- Potential for debris blockage
- Potential for increased sedimentation
- Groundwater mitigation design
Groundwater
Groundwater Conveyance System Design

- Monitoring wells
- Additional data for design
- System adaptability
Analyzing Concepts from an Open Space Perspective – Key Factors

- Degree of *uncertainty* around impacts
- Relative *significance* of the potentially impacted resources
- *Frequency* of impacts
- Potential for Open Space benefits
Categories of Flood Mitigation Concepts

- Master Plan and Variant 1
  - Viele Channel on OSMP
- Variant 2
  - South Boulder Creek Channel and riparian area
Master Plan Concept-100 year with CU Levee

- CU South
- Area of Fill
- OSMP
- Outlet Tunnel
- Viele Channel located on OSMP land

Hwy 93
Foothills Pkwy
South Boulder Creek

0 500 1,000 Feet
Variant 2 Concept-100 year without CU Levee

US36 Flow restriction at South Boulder Creek
Significance of Potentially Impacted Resources and Frequency – Master Plan and Variant 1

- **Significance of Resources**
  - wetlands (low)
  - Ute ladies’ - tresses orchid habitat (high)
  - Plains topminnow (moderate to high)

- **Frequency of Impacts**
  - wetlands (low to moderate)
  - Ute ladies’ - tresses orchid habitat (low)
  - Plains topminnow (low)
Significance of Potentially Impacted Resources and Frequency – Variant 2

- **Significance of Resources**
  - Wildlife movement corridors (high)
  - South Boulder Creek Geomorphology (high)
  - South Boulder Creek riparian habitat (high)

- **Frequency of Impacts**
  - Wildlife movement corridors (high)
  - South Boulder Creek Geomorphology (moderate)
  - South Boulder Creek riparian habitat (moderate)
Potential for Open Space Benefits

- Remove CU levee
- Permanently protect OS-O on CU South
- Restore OS-O on CU South
- Secure water rights and realign Dry Creek #2 Ditch
- Ensure adequate wildlife passage under US36
- Construct/manage trails to maximize habitat block size
- Modify or realign the sewer line along South Boulder Creek
- Implement long-term monitoring and maintenance agreement
Recommendations

1. The Open Space Board of Trustees recommends that City Council accept and advance any of the South Boulder Creek Flood Mitigation concepts forward to preliminary design conditioned on the terms as shown in Attachment A: Recommended Concept Advancement Terms.
Attachment A Terms Common to all Concepts

1. Remove CU levee
2. Staff collaborate to avoid and minimize impacts
3. Staff develop additional info to identify mitigation measures
4. Staff review design plans, return to OSBT for input
5. Acquire OS-O on CU South and water rights in Dry Creek #2 Ditch
6. Provide restoration on acquired CU South parcel
7. Implement long-term monitoring and maintenance agreement
Additional Recommendations for Variant 2

- Provide additional acquisition of CU South parcel in lieu of restoration
- Modify or realign the sewer line
- Ensure adequate wildlife passage under US36
2. The Open Space Board of Trustees has a significant interest in the future of the OS-O portion of the CU South property and how this area may impact existing city open space and how this acreage may further city open space purposes and services. Therefore, OSBT requests that City Council seek OSBT input, at such a time deemed appropriate during annexation negotiations with CU, regarding decisions affecting the future of any of the land on CU South property with OS-O land use designation.
QUESTIONS / DISCUSSION