



Comprehensive
Flood and
Stormwater
Master Plan



Comprehensive Flood & Stormwater Master Plan Update

Goose/Two-mile/Elmer's Creek Meeting
October 21, 2021

10/21/2021

A group of approximately 15 people are sitting on a large, green grassy field, having a picnic. They are dressed in casual summer attire. In the background, there are large, leafy trees and a range of mountains under a cloudy sky. The scene is captured in a slightly desaturated, dark tone.

Welcome

Poll Questions:

- How long have you lived in Boulder?
- What was your experience with flooding in 2013?

Agenda

- Master Plan Overview
- Creek Overview
- Discussions on Equity
- Project Prioritization Framework
 - Overview
 - Breakout polling and discussions
- Wrap Up and Next Steps
- Comment Form

CFS Master Plan Update



Key Tasks

- Review policies
- Evaluate progress
- Develop program and process recommendations
- Provide a framework for evaluating priorities and projects

PURPOSE STATEMENT

The purpose of the plan is to improve the management of stormwater to help protect people, places, property, and ecosystems in the City of Boulder in a way that builds resilience and is consistent with community values.



Completed Community Engagement

- January: Formation of CWG
- January - March: Be Heard Boulder Launch
- July 21st: Boulder Shelter for the Homeless Visit
- August 3rd: National Night Out
- August 29th: Duck Race
- September 4th: Hometown Festival
- September 22nd & October 16th: Farmer's Market
- Oct / Nov: Virtual Community Meetings



How to Participate

Regional Meetings

Future engagement opportunities

Fall Outreach Schedule

Creek Meetings (all meetings 5:30-7:30 p.m.):

Wednesday, Oct. 20 | Fourmile & Wonderland

Thursday, Oct. 21 | Goose, Twomile & Elmer's Twomile

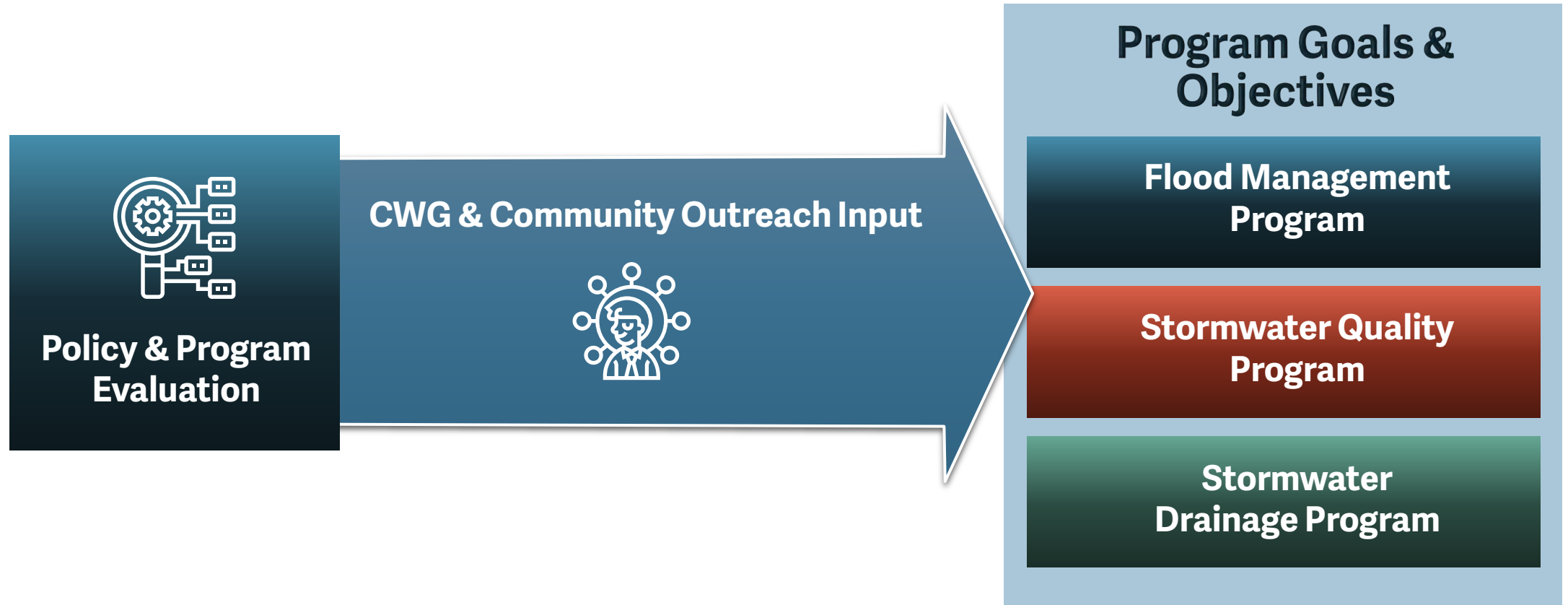
Monday, Oct. 25 | Boulder Creek/Boulder Slough, Sunshine & Gregory

Thursday, Oct. 28 | Spanish Language Meeting

Monday, Nov. 1 | Skunk, Bluebell & King's Gulch

Wednesday, Nov. 3 | S. Boulder Creek, Bear, Viele & Dry Creek Ditch #2

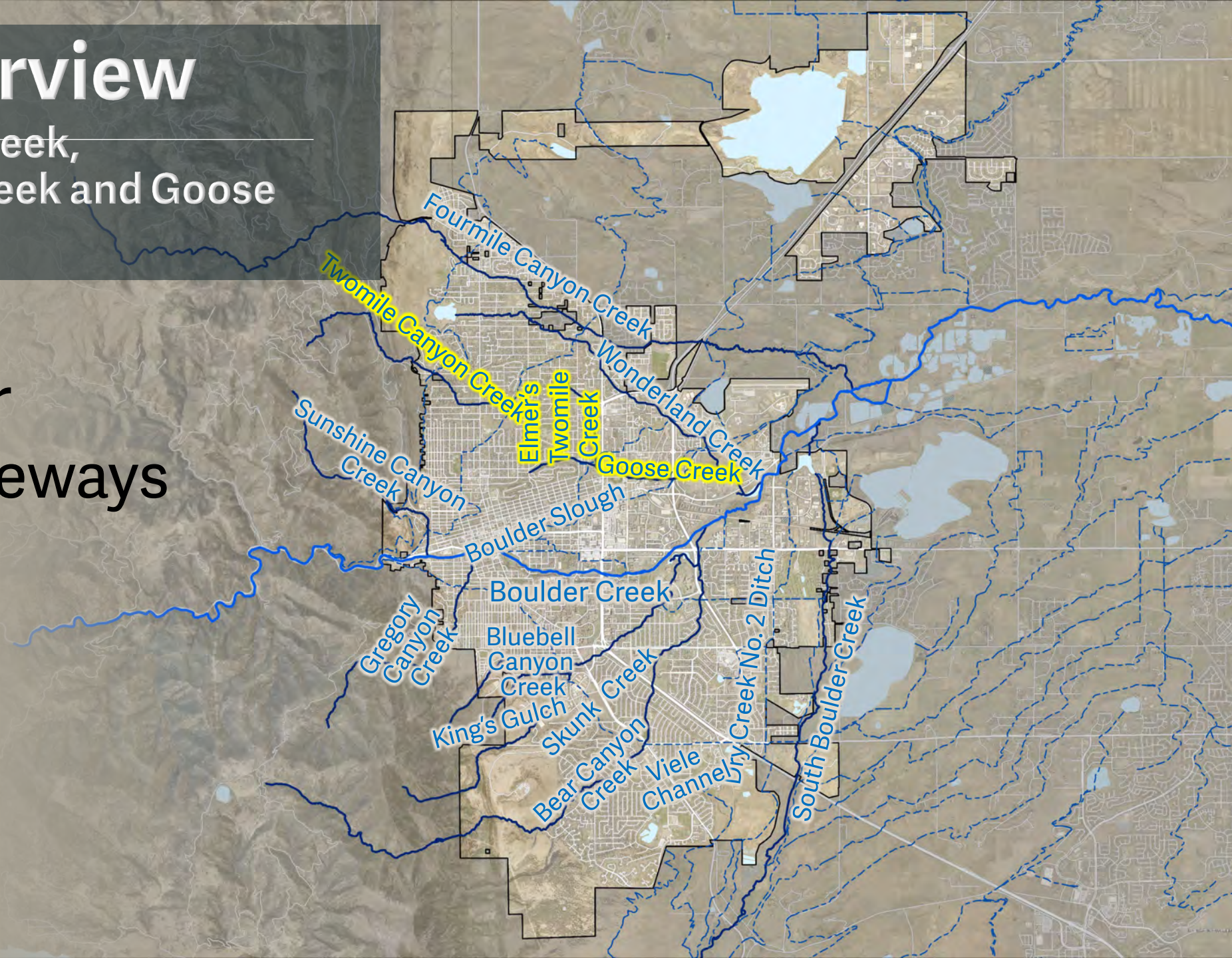
Master Plan Content Informed by Public Outreach



Creek Overview

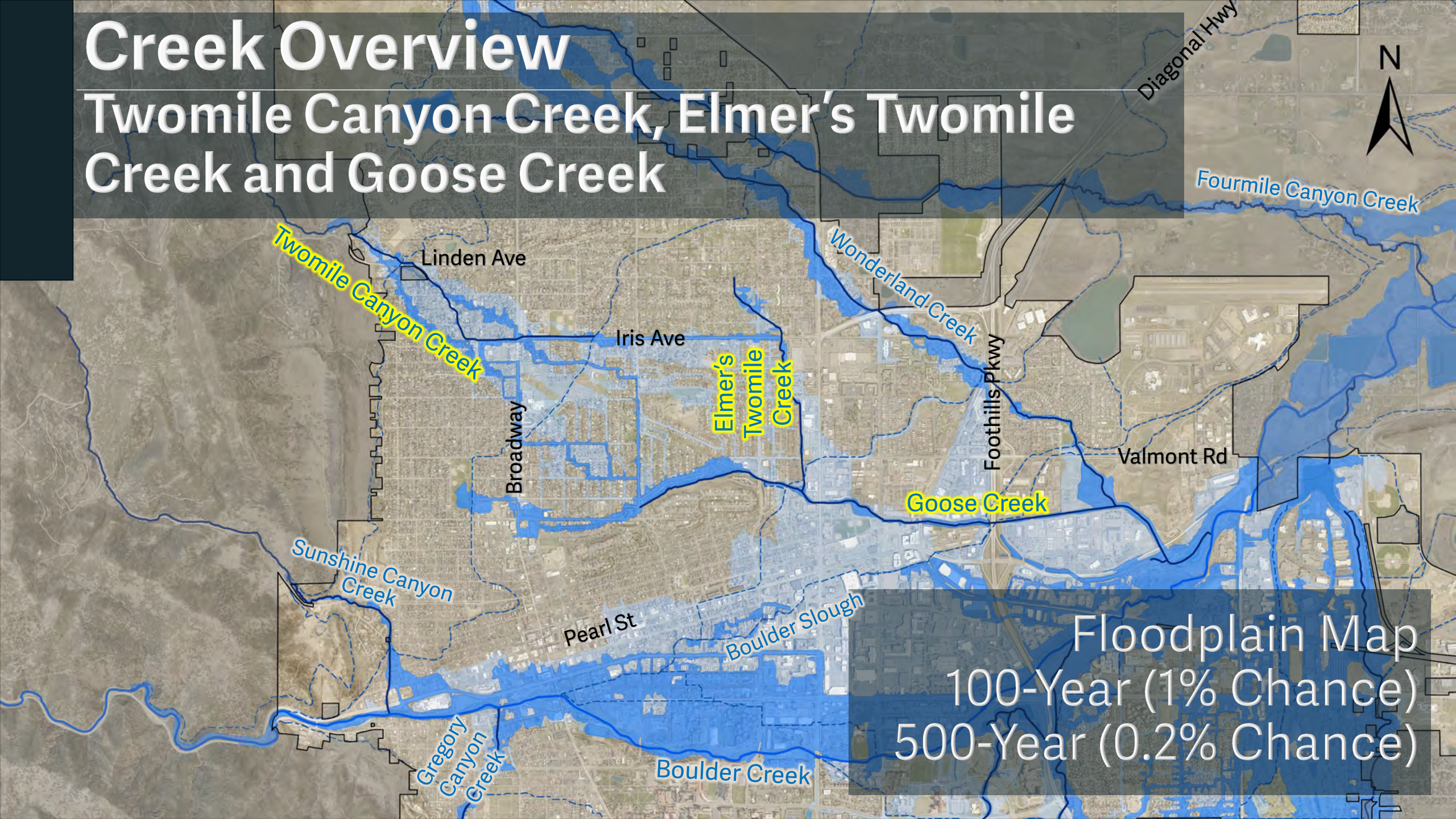
Twomile Canyon Creek,
Elmer's Twomile Creek and Goose
Creek

16 Major
Drainageways



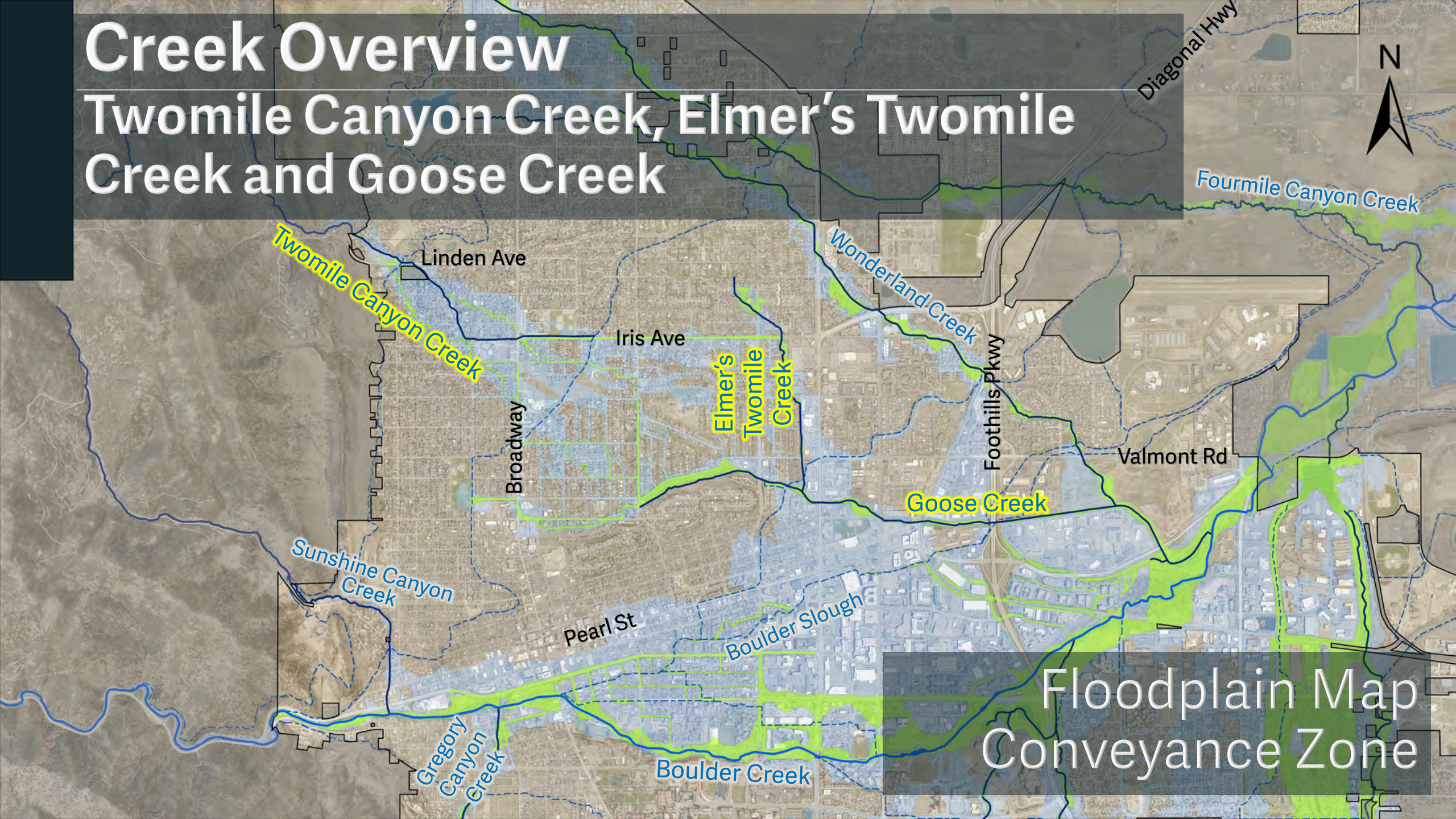
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



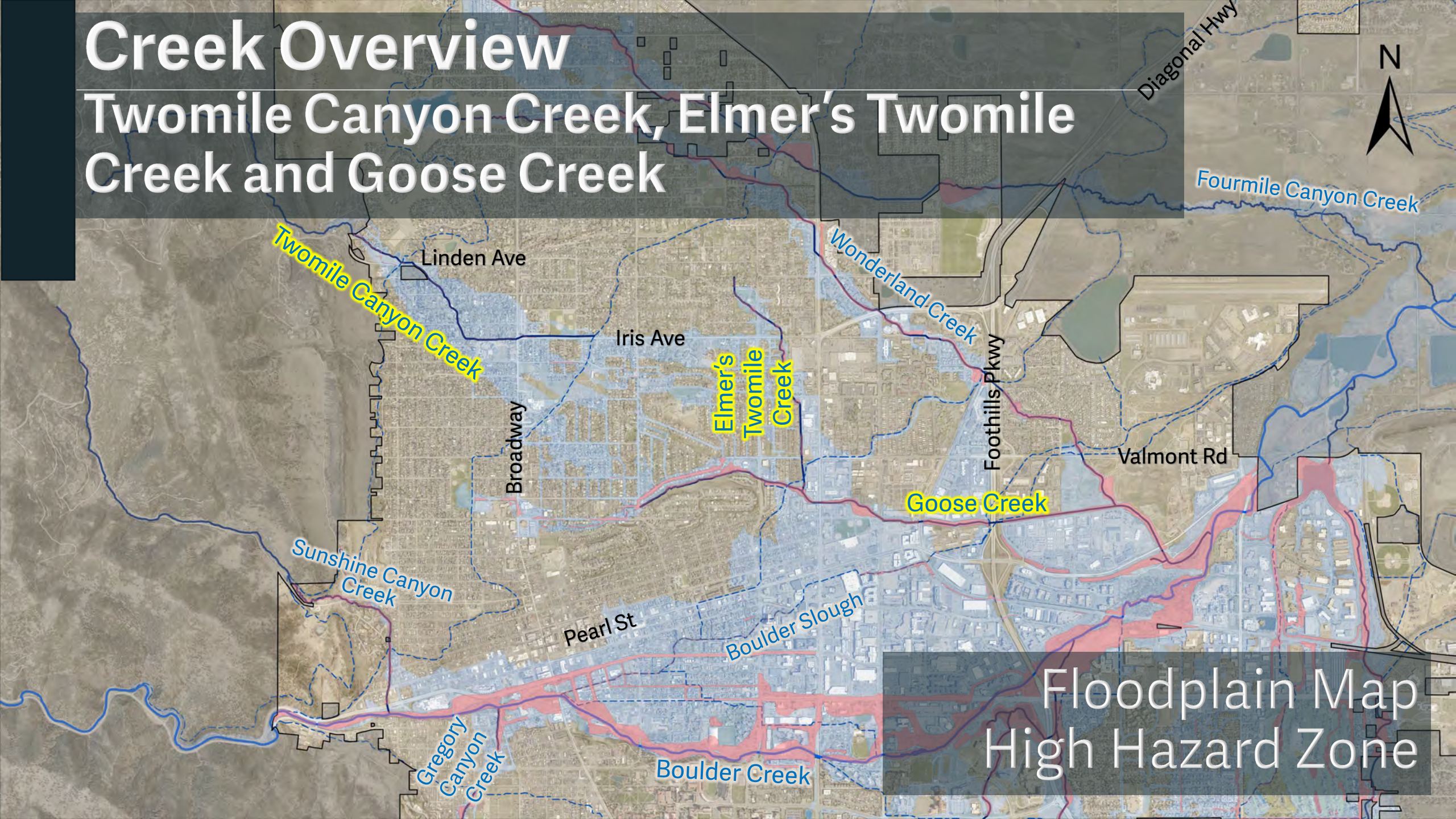
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



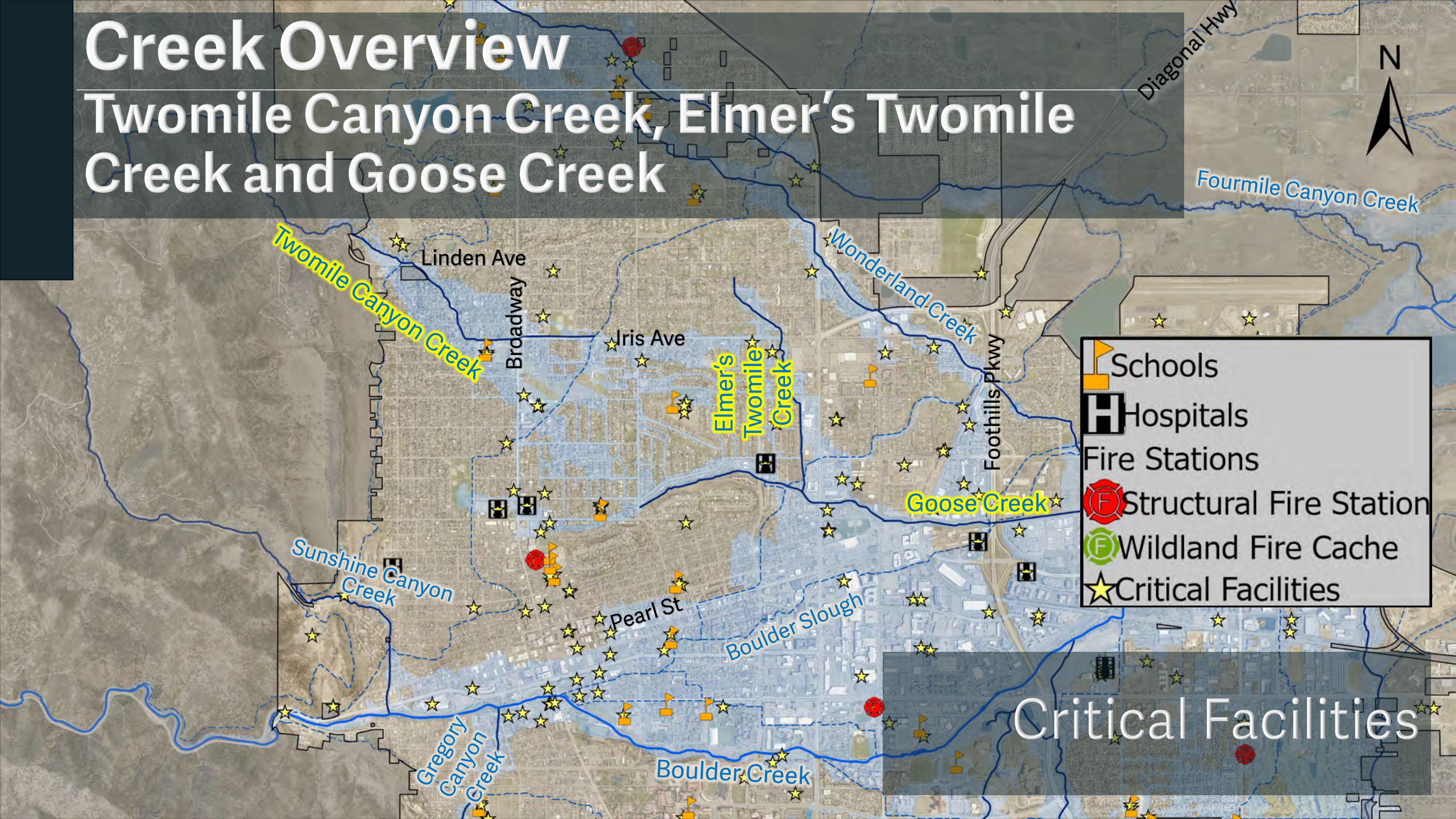
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



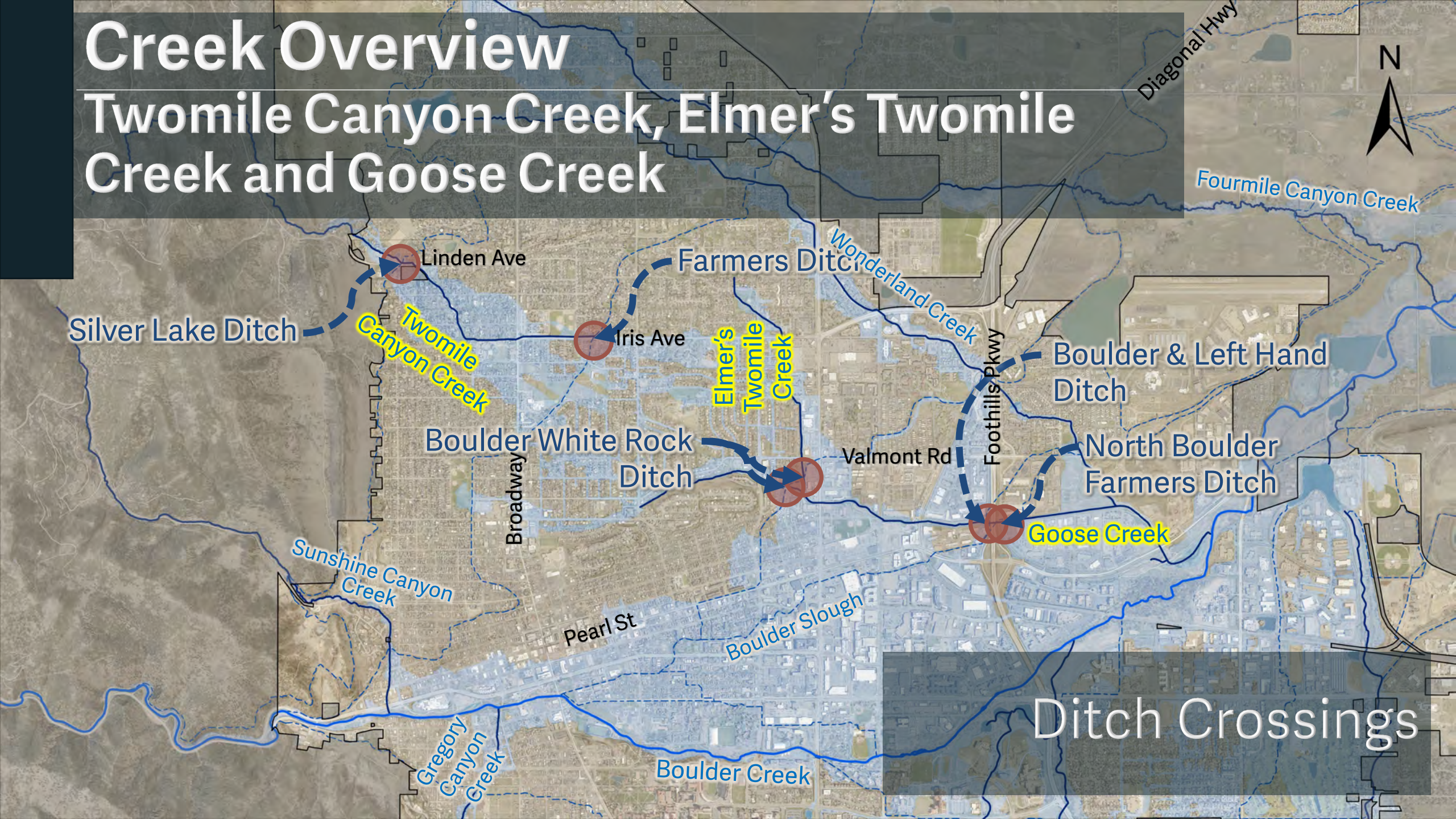
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



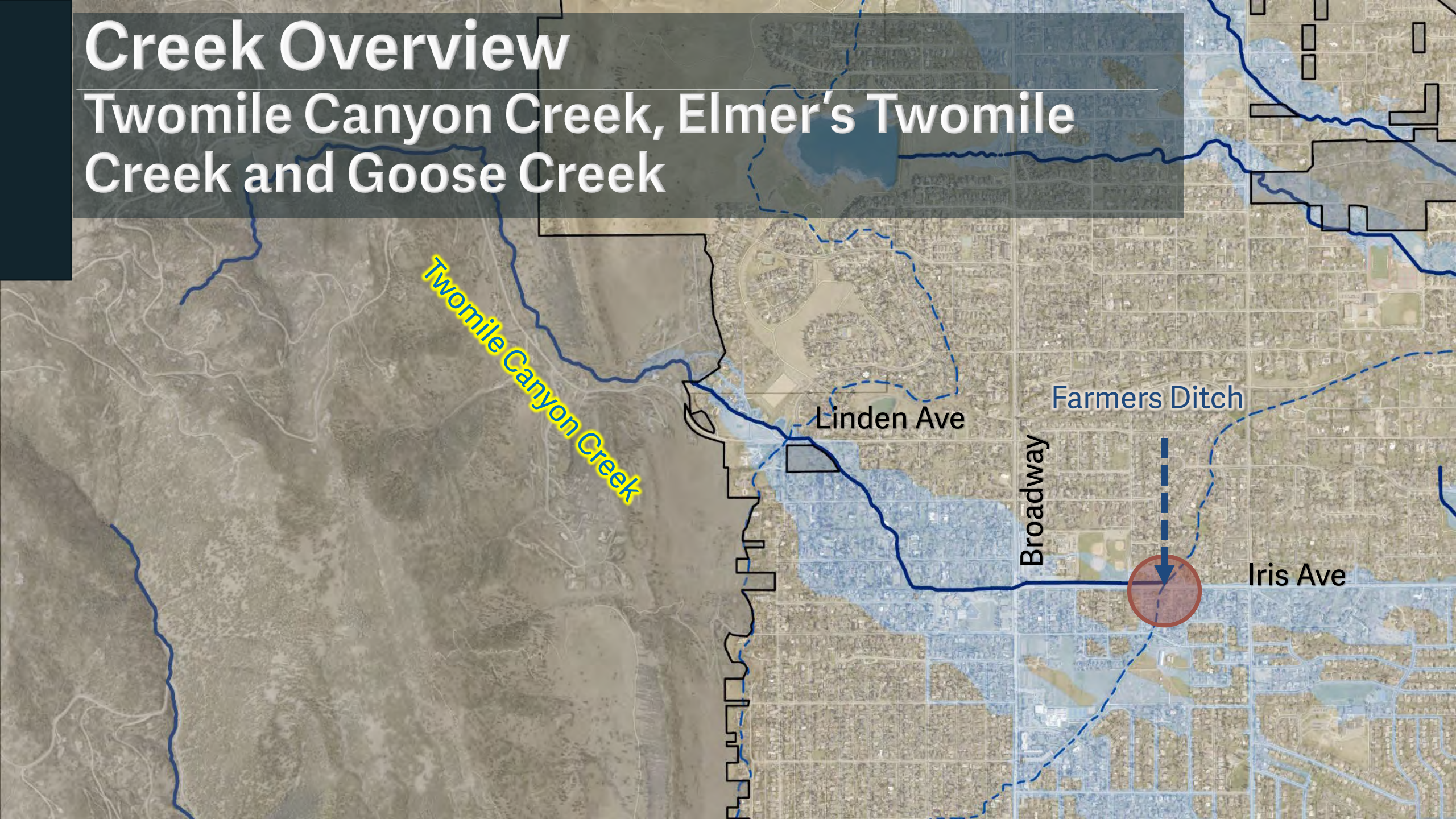
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



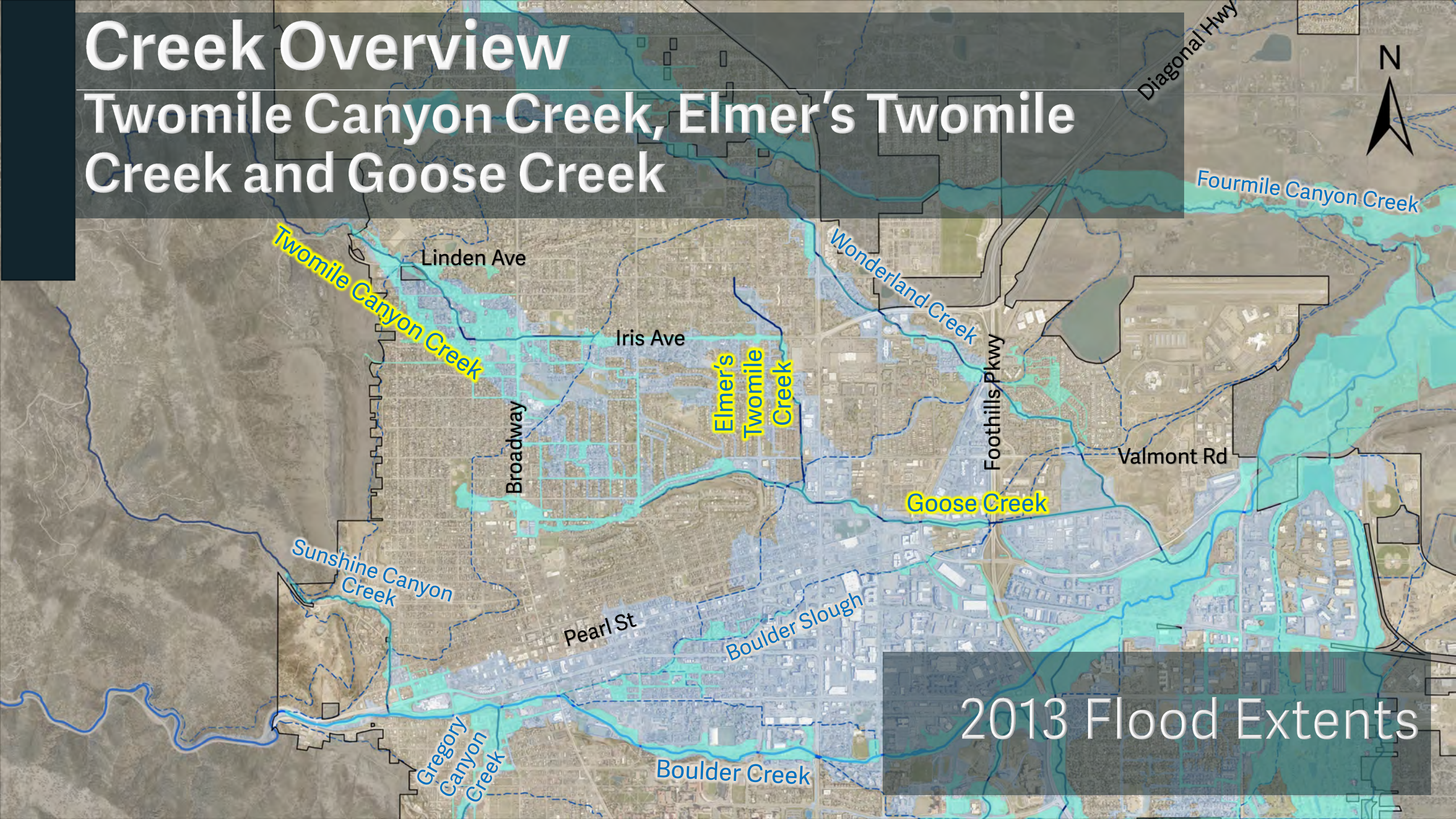
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



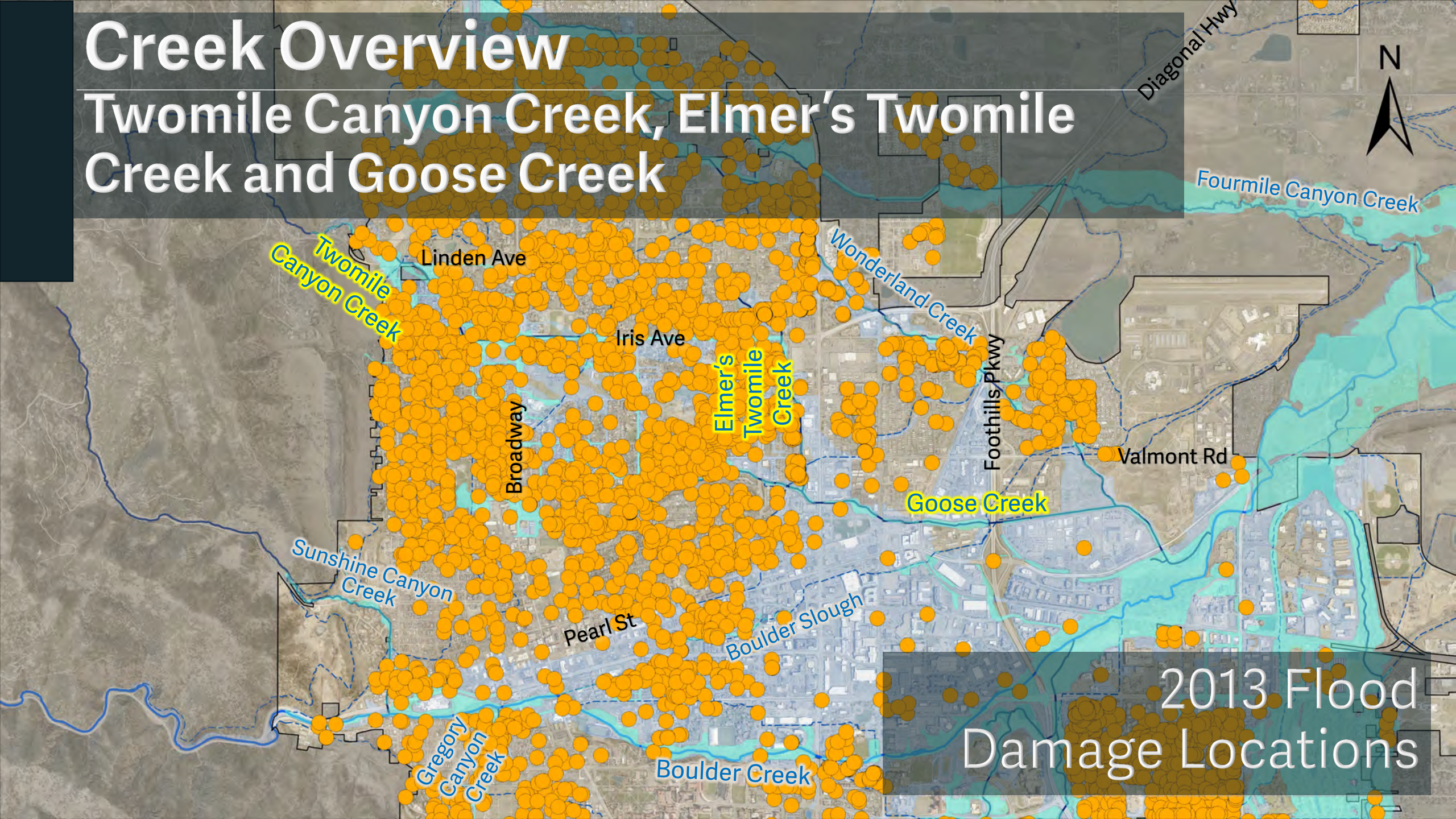
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



2013 Flood
Damage Locations

Creek Overview | 2013 Flood



**Twomile Canyon
Creek**
Linden Ave

Creek Overview | 2013 Flood



**Twomile Canyon
Creek**
Linden Ave

Creek Overview | 2013 Flood

Twomile Canyon Creek Spring Valley Rd & Juniper Ave



Creek Overview | 2013 Flood



**Twomile Canyon
Creek**
Broadway & Iris Ave

Creek Overview | 2013 Flood



Goose Creek
9th Street & Balsam Ave

Creek Overview | 2013 Flood

Goose Creek Greenway Trail Flooding



Creek Overview | 2013 Flood

Elmer's Twomile Creek at Glenwood Dr & Twomile Park

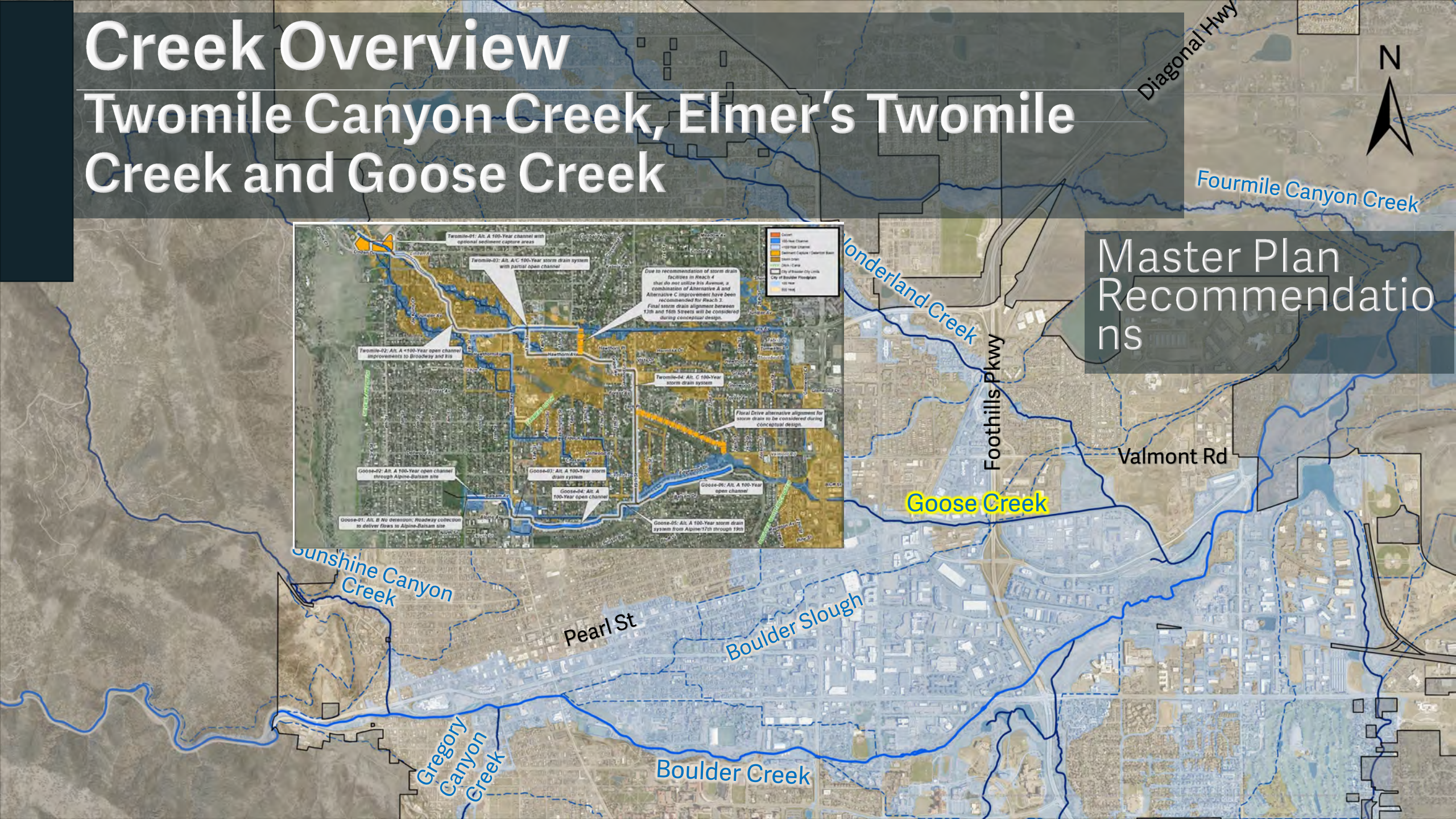


Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



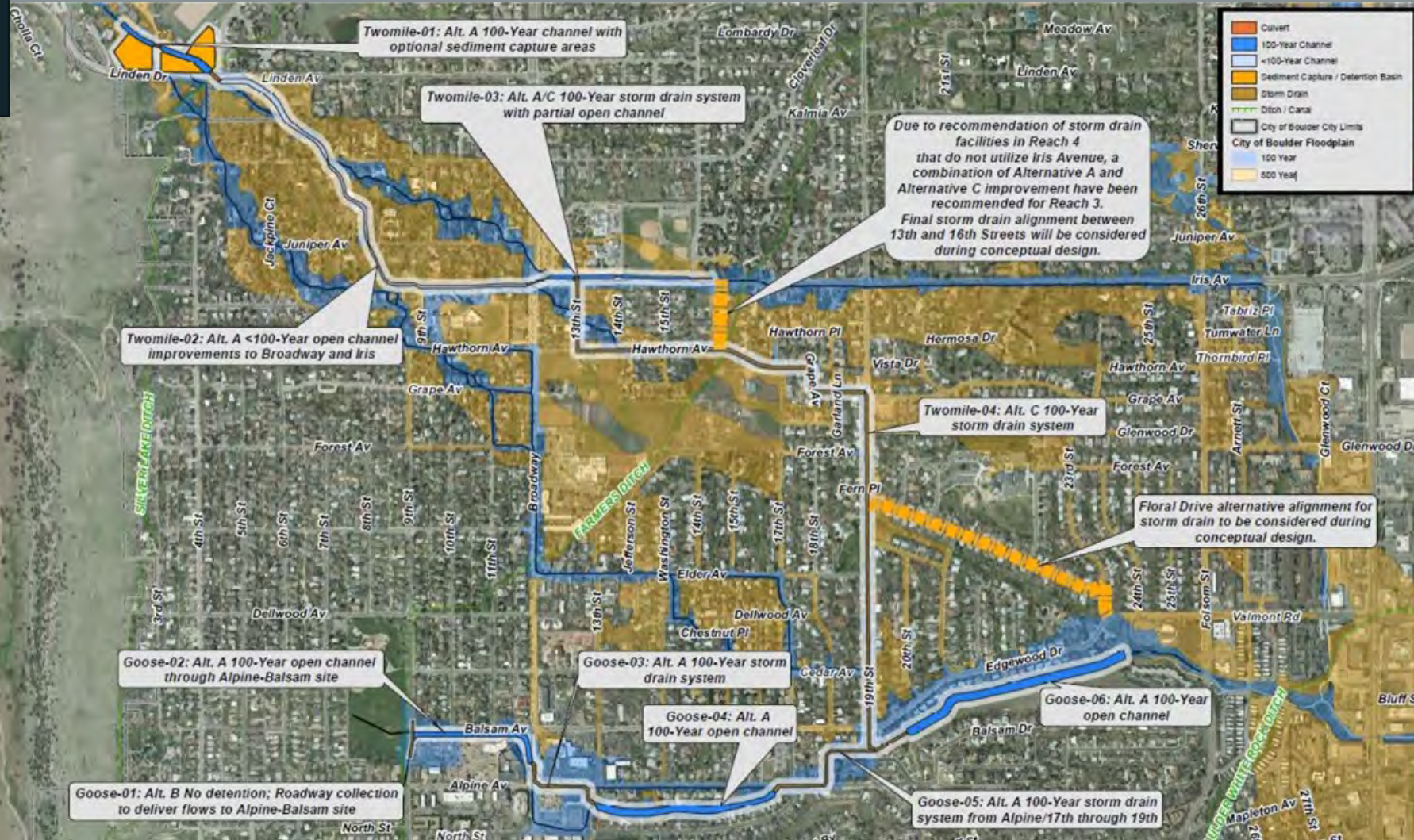
Master Plan
Recommendations



Creek Overview

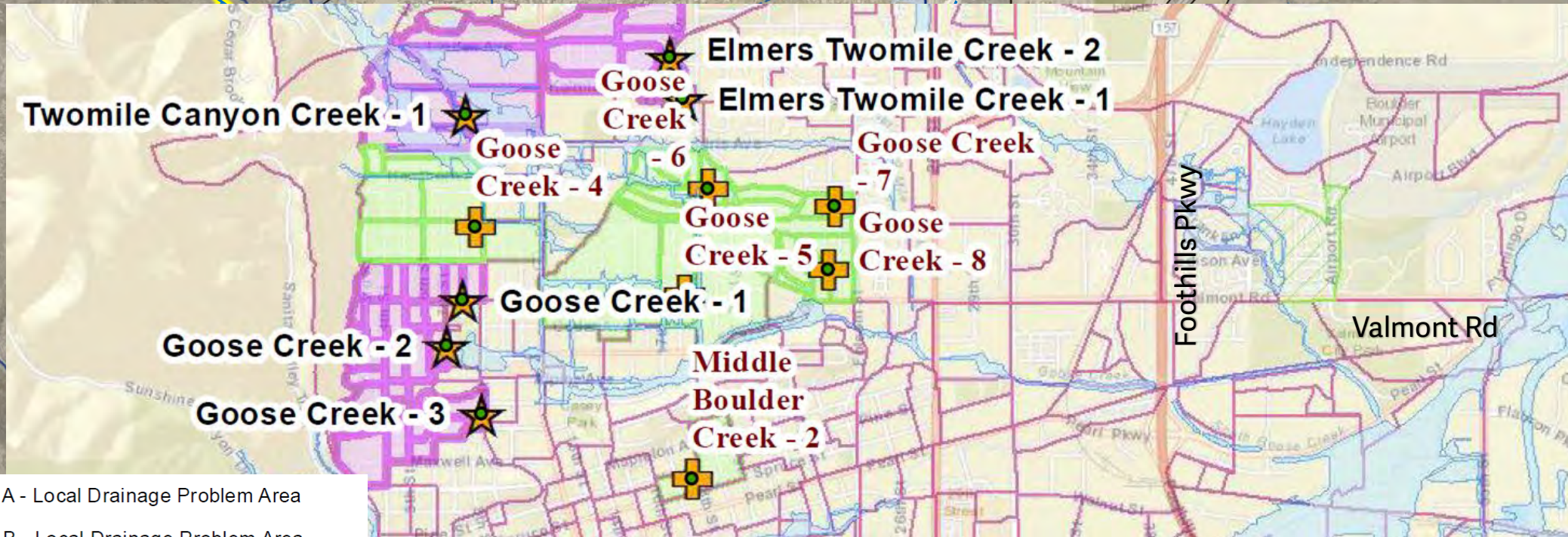
Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek

Master Plan Recommendations



Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



★ Type A - Local Drainage Problem Area

✚ Type B - Local Drainage Problem Area

2013 Flood Extents

Subcatchment

Type A Priority Subbasin

Type B Priority Subbasin

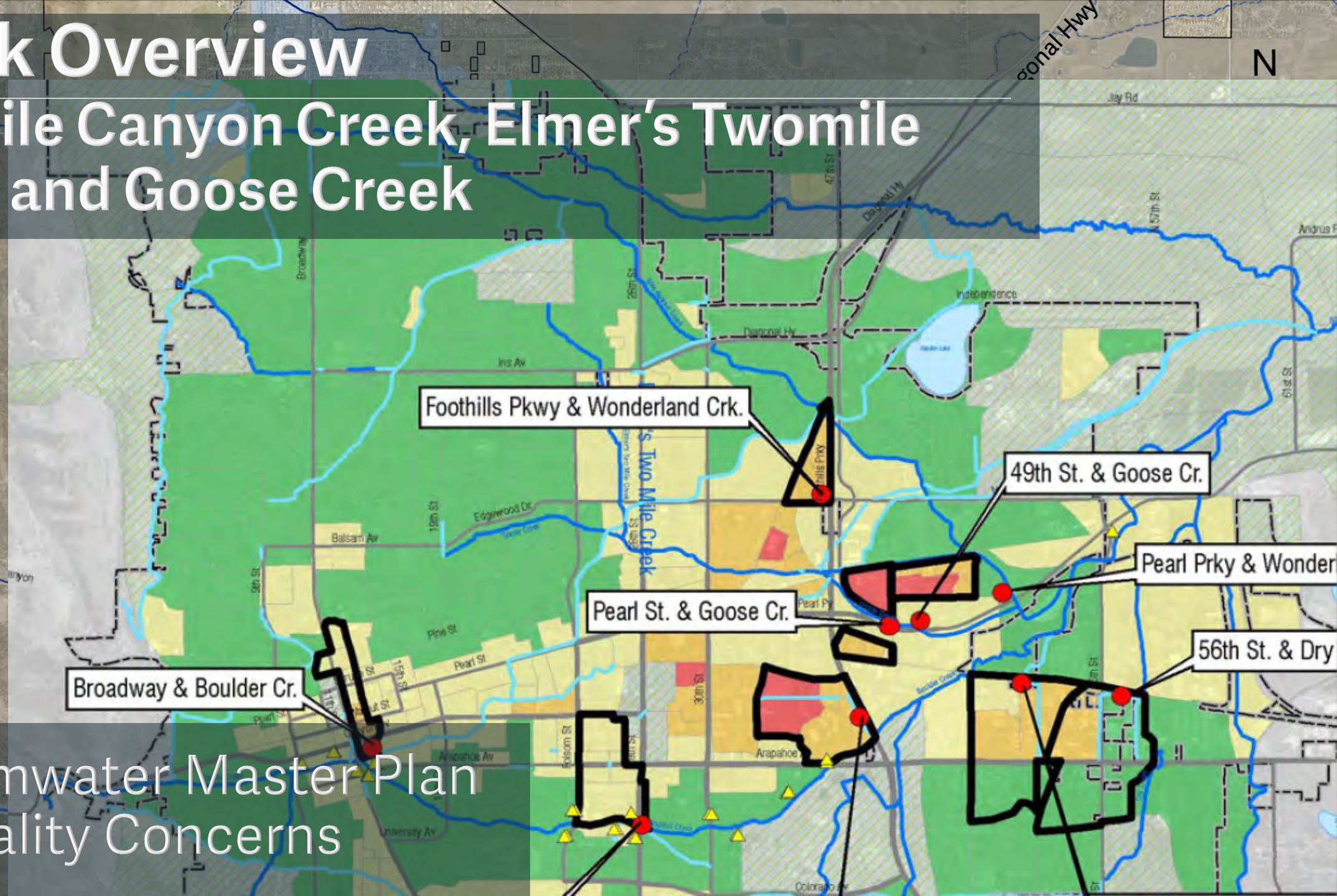
Type B Override

2016 Stormwater Master Plan Storm Drainage Problem Areas

Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek

2016 Stormwater Master Plan
Water Quality Concerns



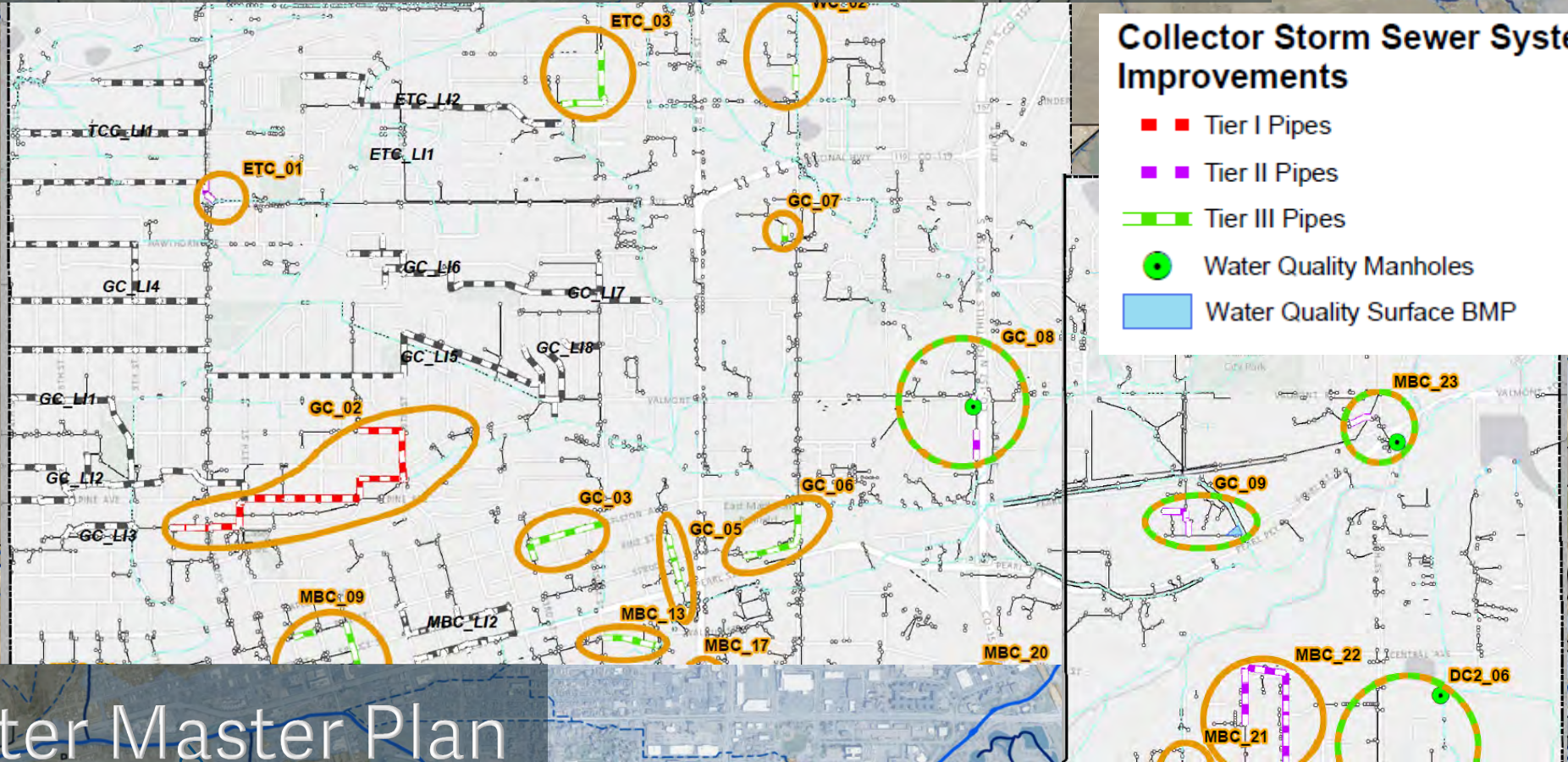
Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek

Collector Storm Sewer System Improvements

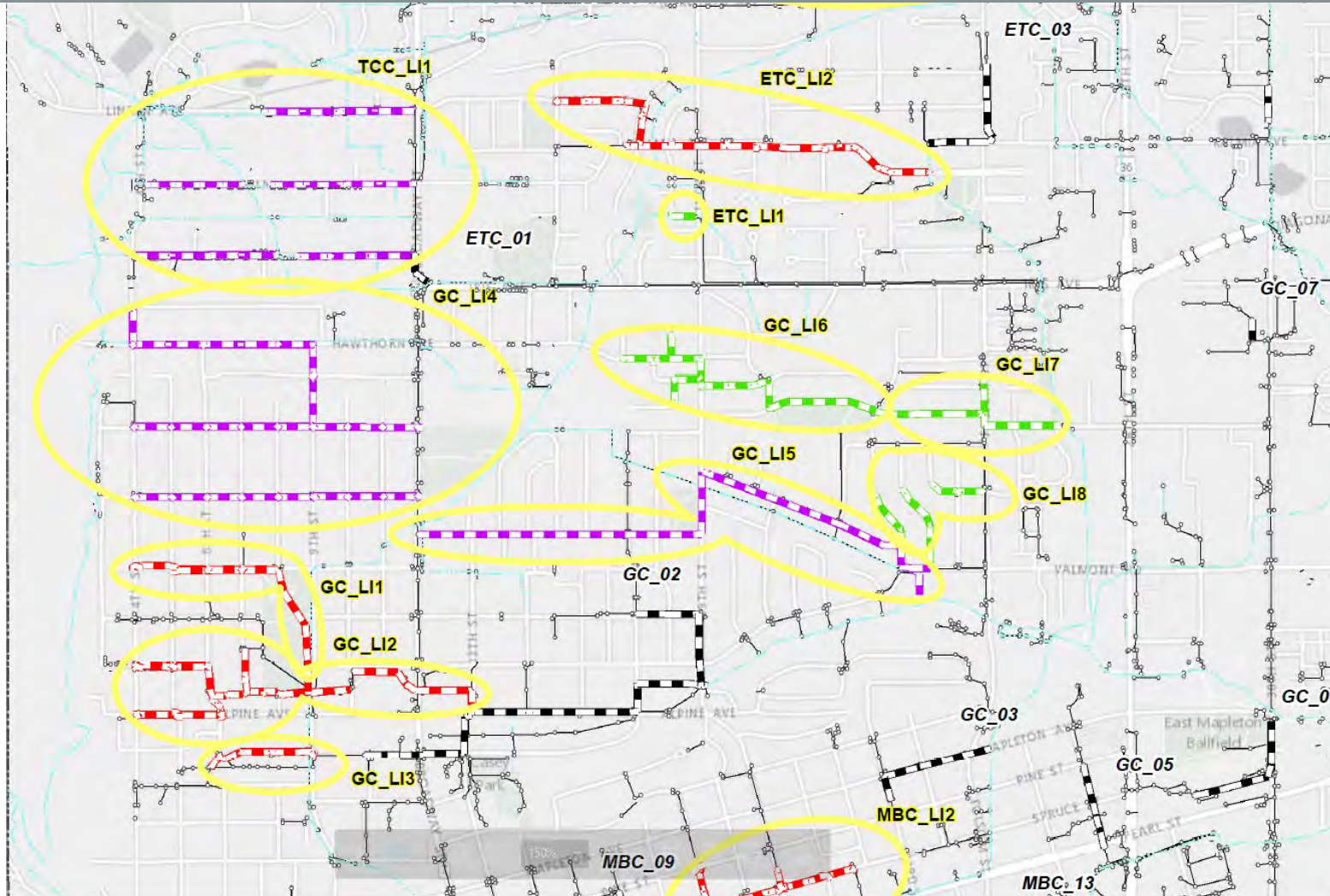
- Tier I Pipes
- Tier II Pipes
- Tier III Pipes
- Water Quality Manholes
- Water Quality Surface BMP

2016 Stormwater Master Plan
Recommendations



Creek Overview

Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



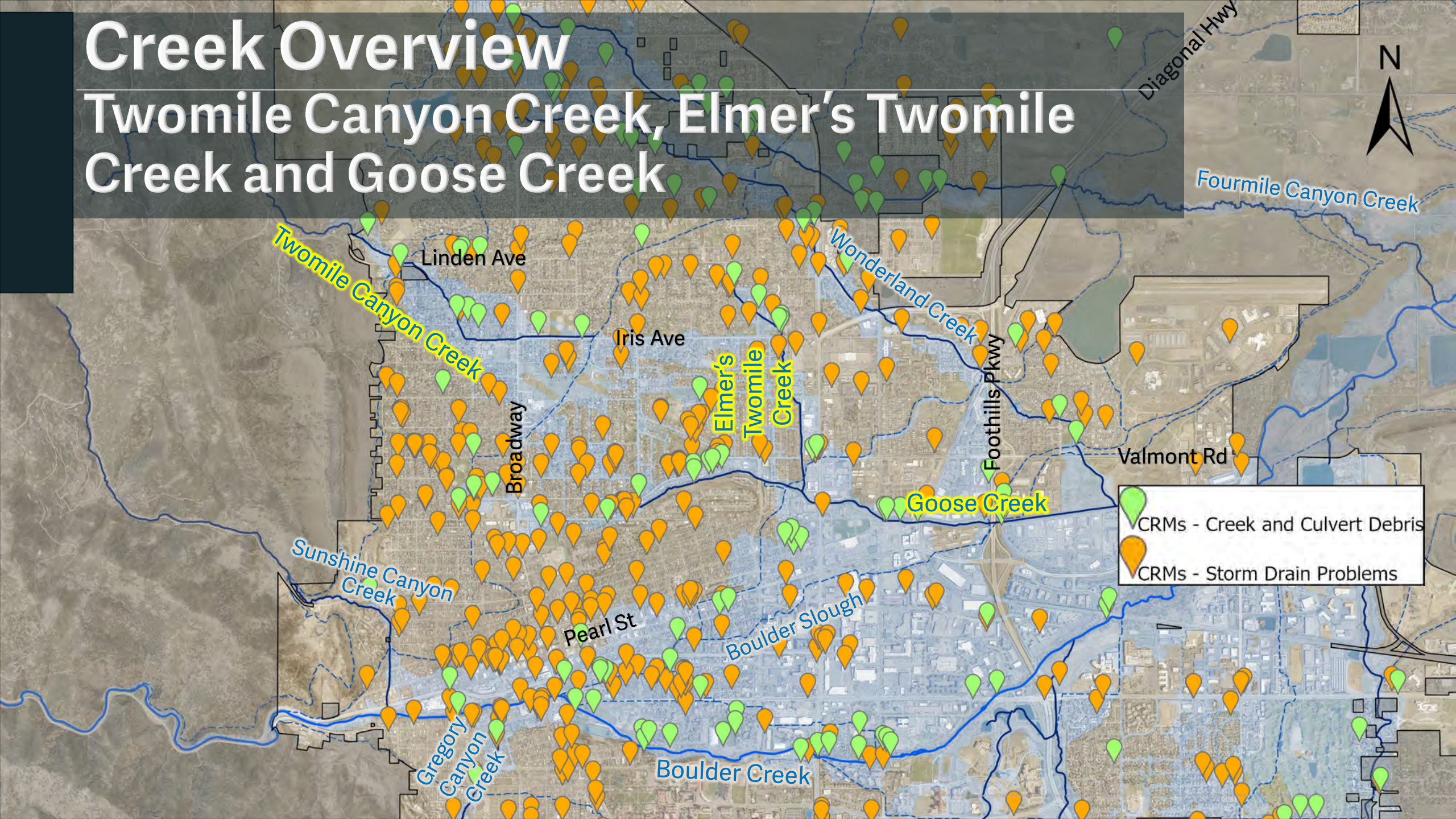
Local System Improvements

- Tier I Pipes
- Tier II Pipes
- Tier III Pipes

2016 Stormwater
Master Plan
Recommendations

Creek Overview

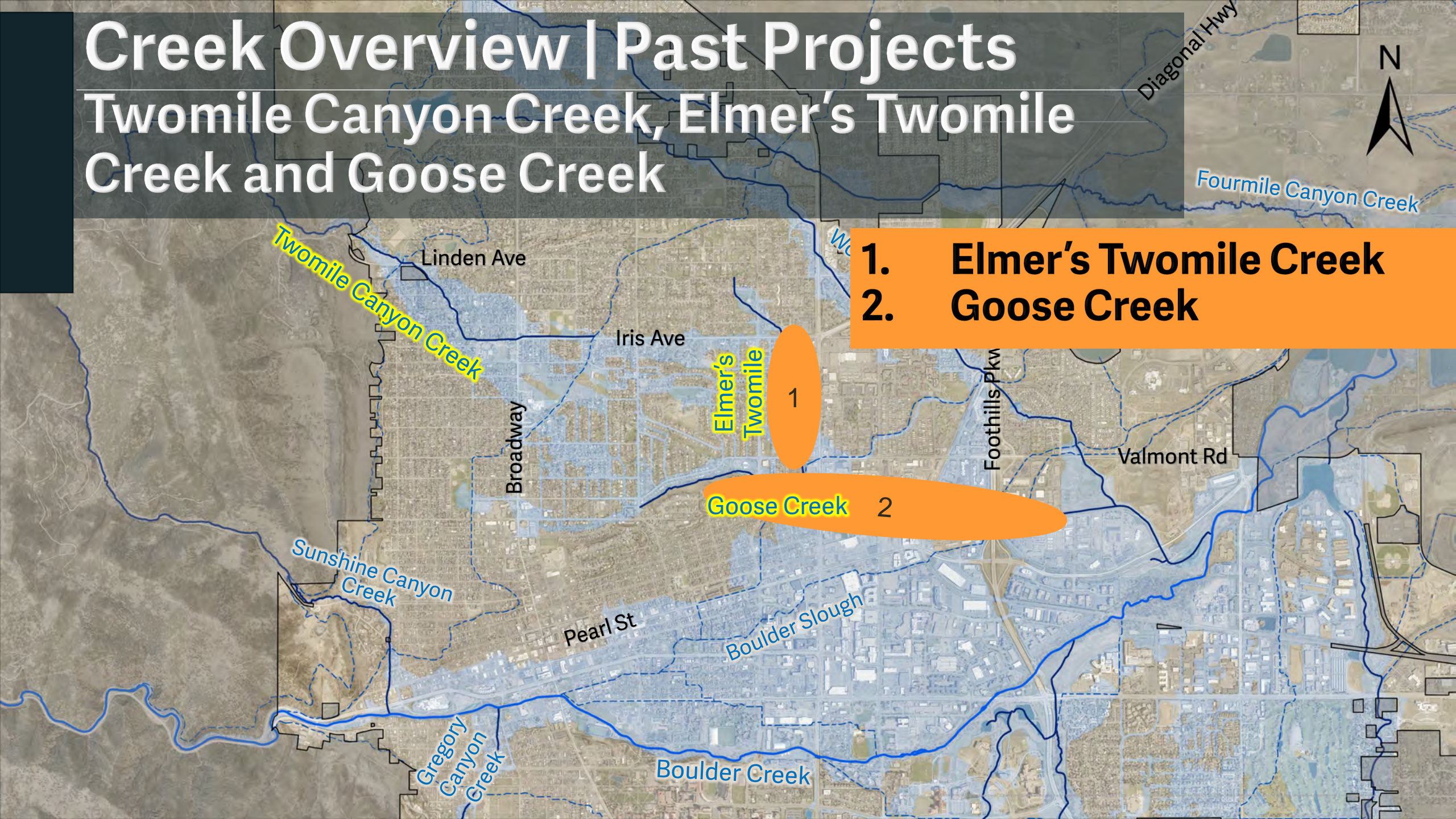
Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek



Creek Overview | Past Projects

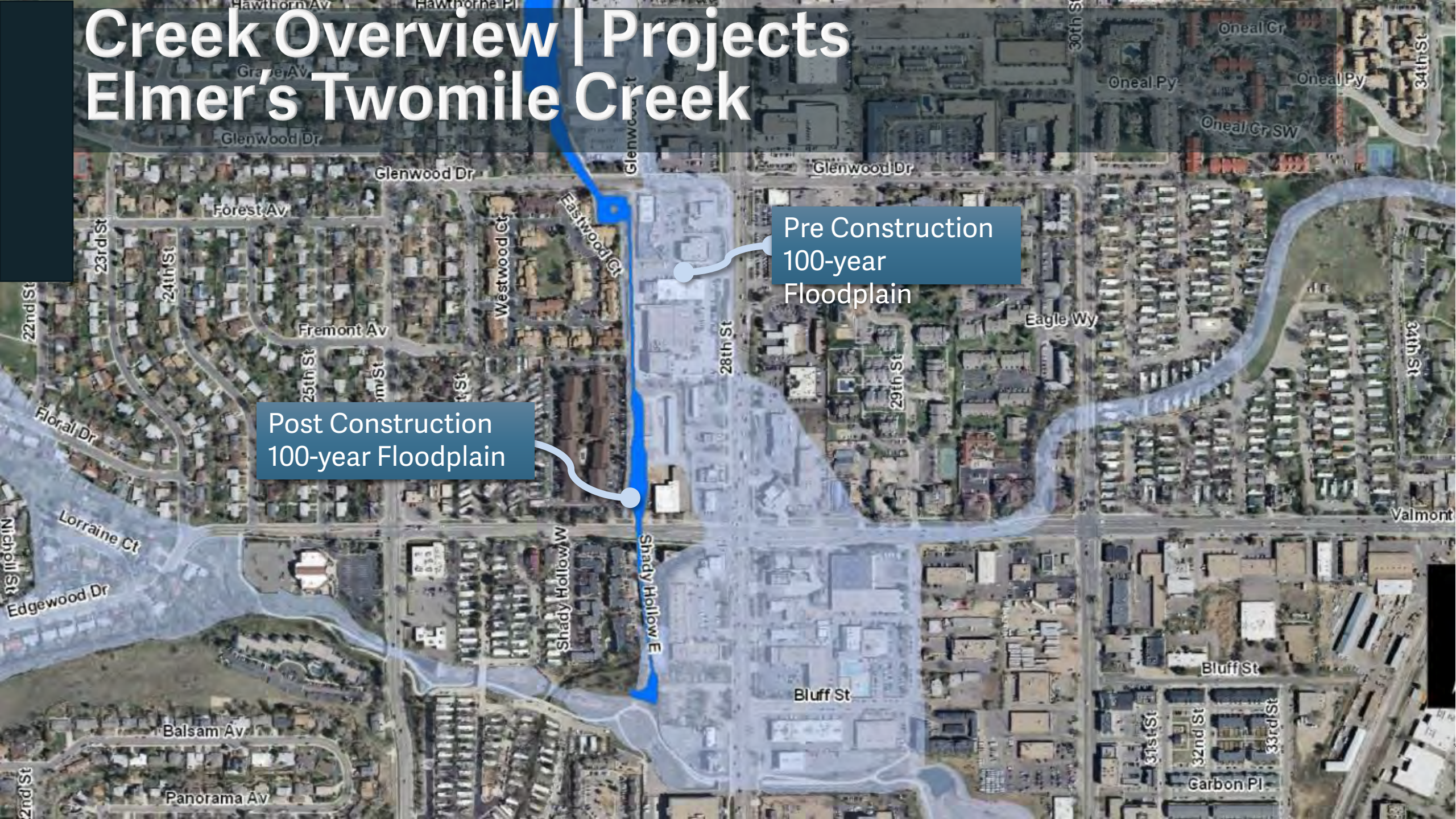
Twomile Canyon Creek, Elmer's Twomile Creek and Goose Creek

1. Elmer's Twomile Creek
2. Goose Creek



Creek Overview | Projects

Elmer's Twomile Creek



Pre Construction
100-year
Floodplain

Post Construction
100-year Floodplain

Creek Overview | Projects

Elmer's Twomile Creek



North of Valmont
Before & After

Creek Overview | Projects

Goose Creek



**Folsom Ave View (looking West)
Before & After**

Creek Overview | Projects

Goose Creek



**Boulder White Rock Ditch
Before & After**

Creek Overview | Projects

Goose Creek



**Mapleton Mobile Home Park
Before & After**

**Policy &
Program
Evaluation** + **Community
Input** + **Existing
Creek
Plans**



**Inform Policy
Recommendations**

**Develop Project
Prioritization
Framework**

Project Prioritization Criteria

Life Safety

Ability to
Implement

Efficiency & Cost

**Social Impact,
Equity & Fairness**

Protect Property

Cultural
Resources

Environmental
Resources

Infrastructure
Resiliency

Protect Critical
Facilities

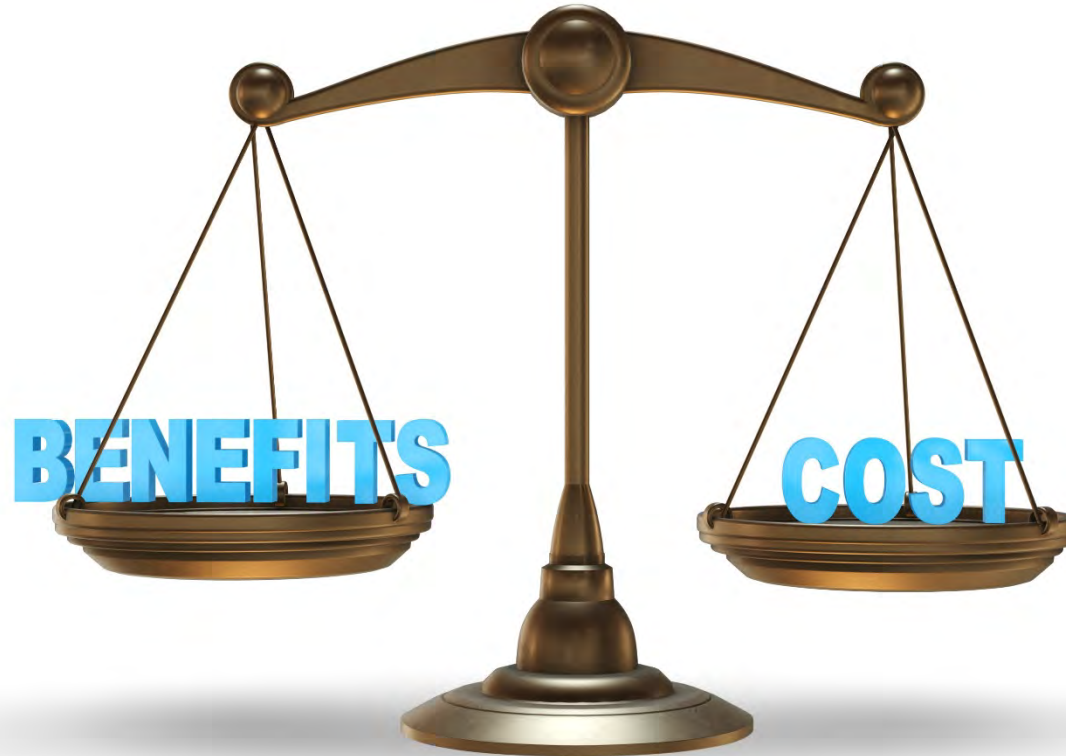
Equity



When one's identity cannot predict the outcome.

Source: OEHR.

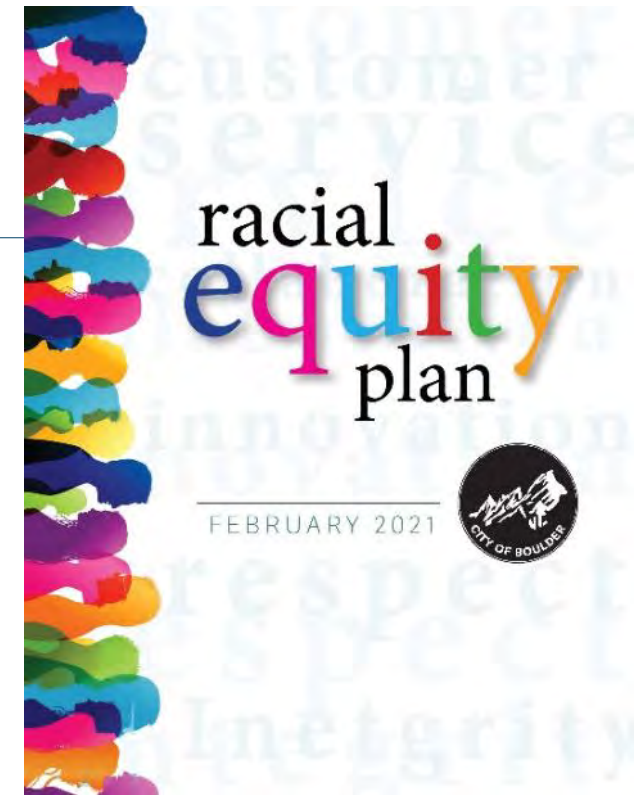
Project Prioritization Criteria



Racial Equity

When race does not determine or predict the distribution of resources, economic/political/social opportunities, and burdens for group members in society.

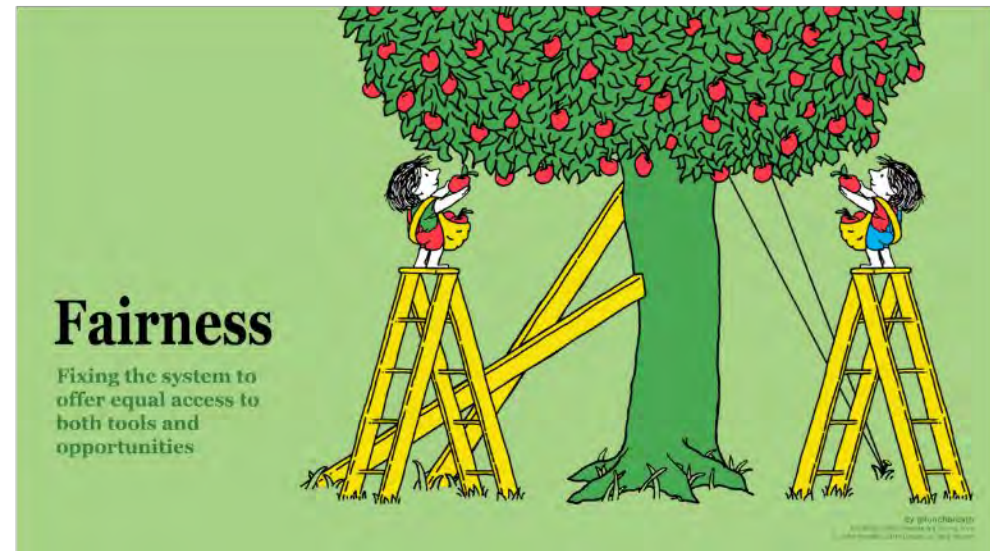
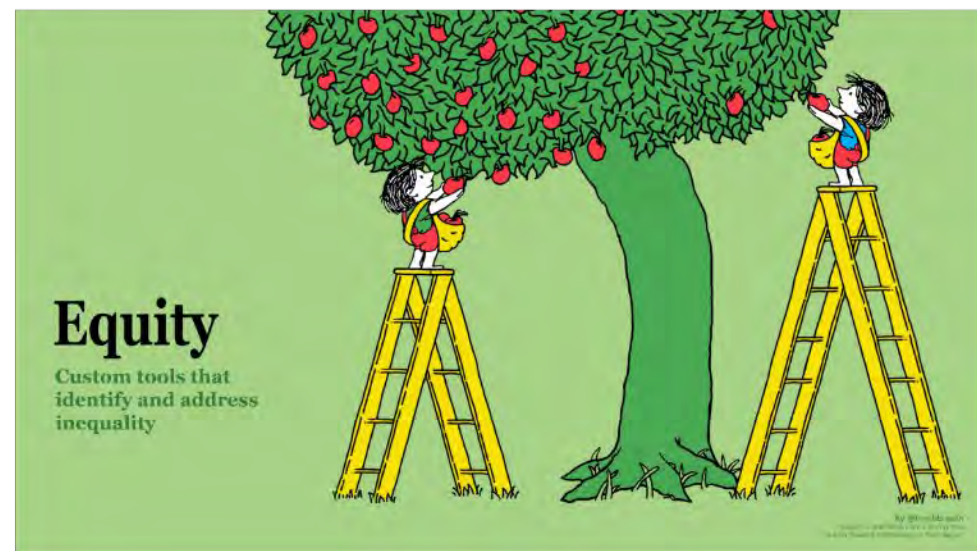
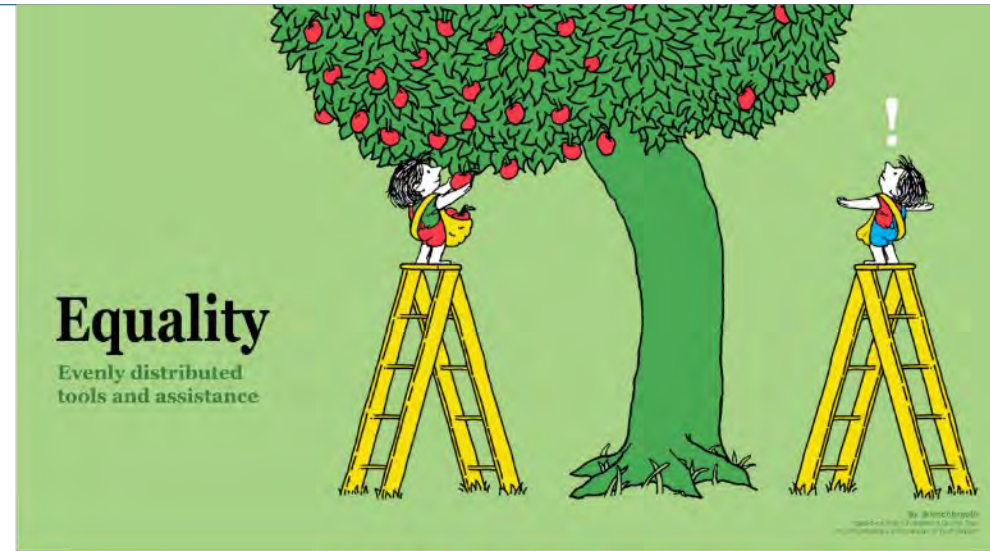
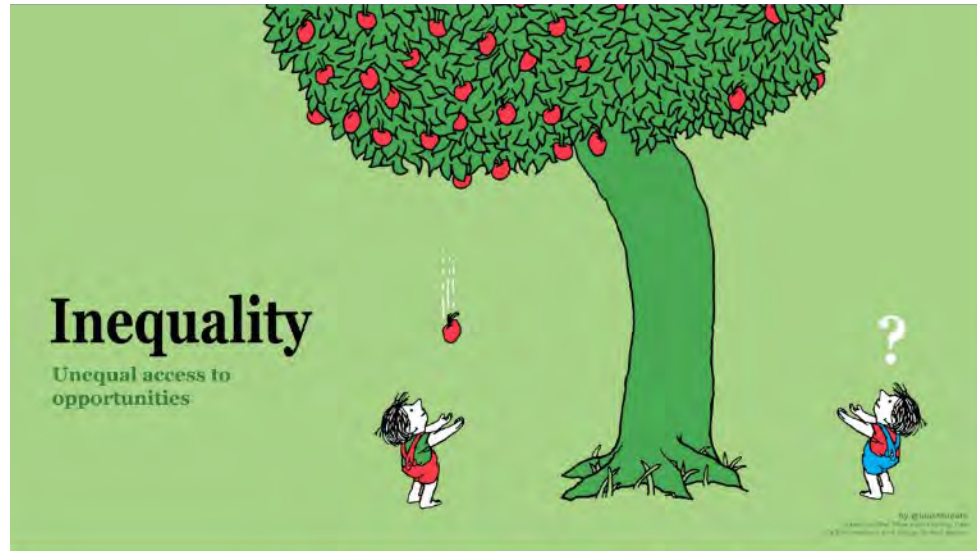
Source: OEHR and Seattle RSJI.



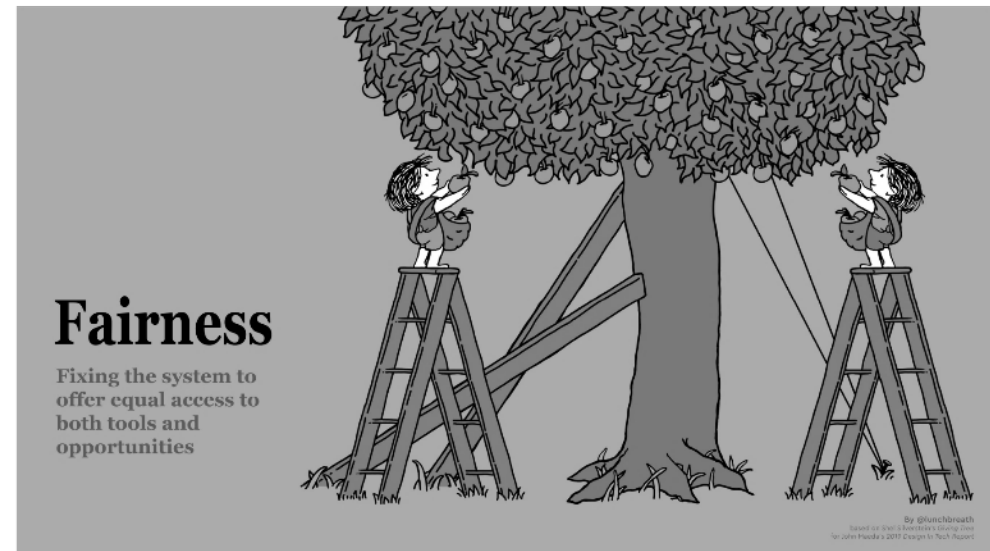
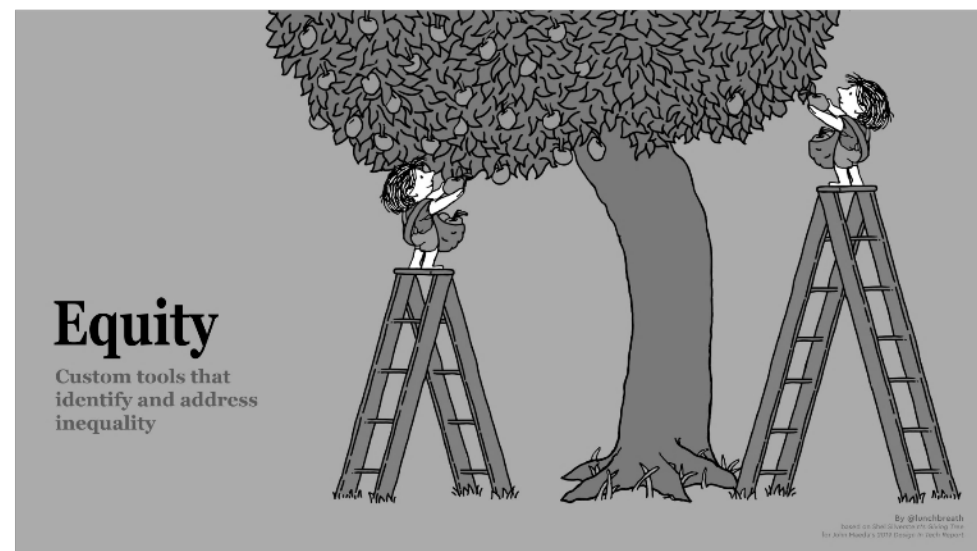
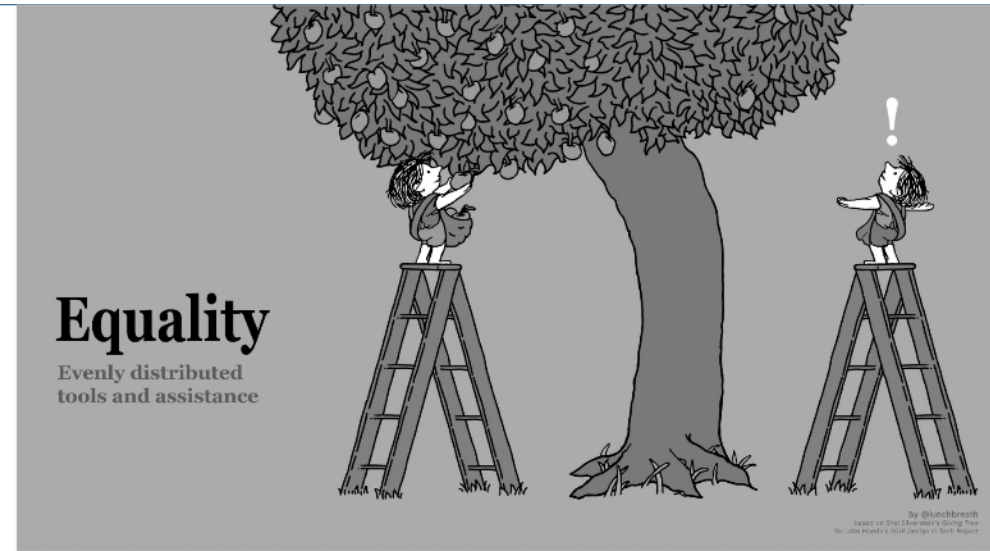
City of Boulder Racial Equity Plan, 2021



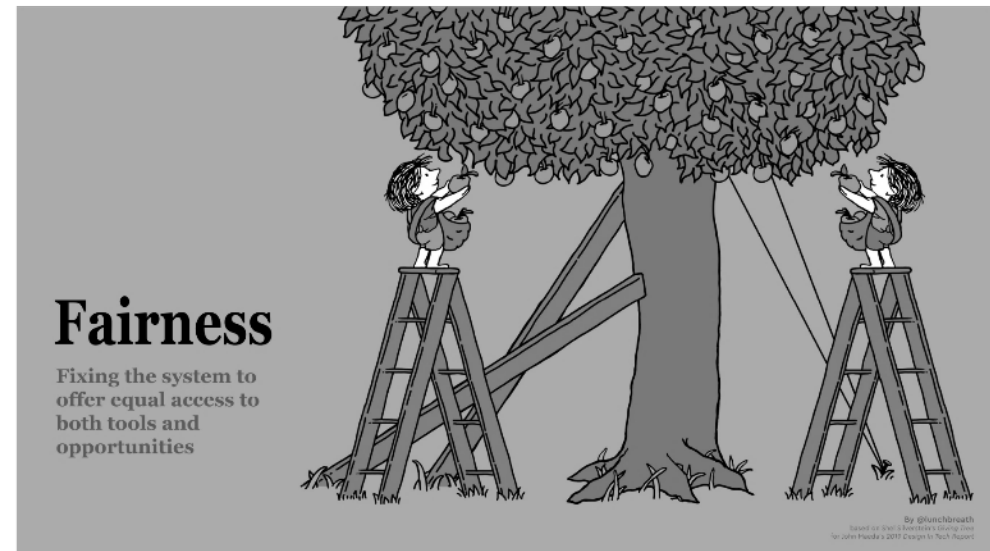
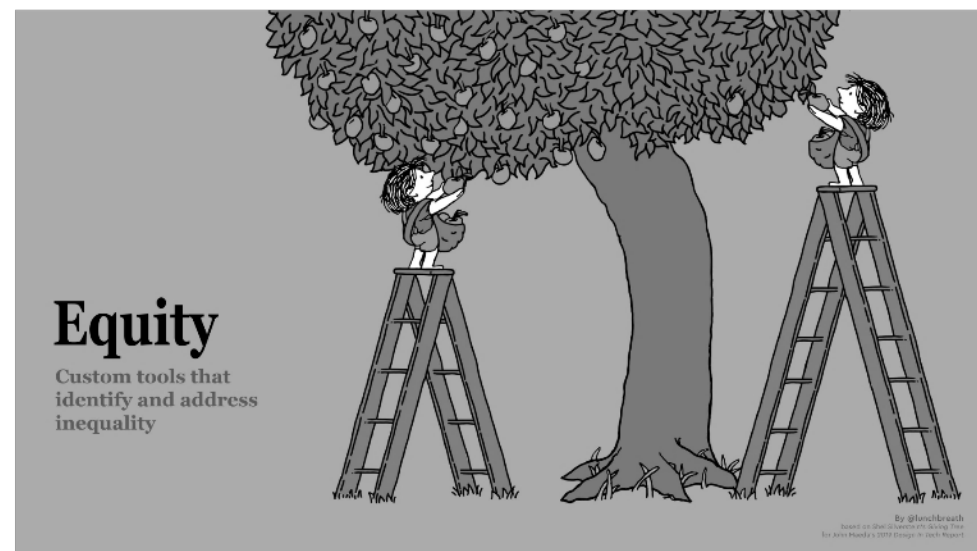
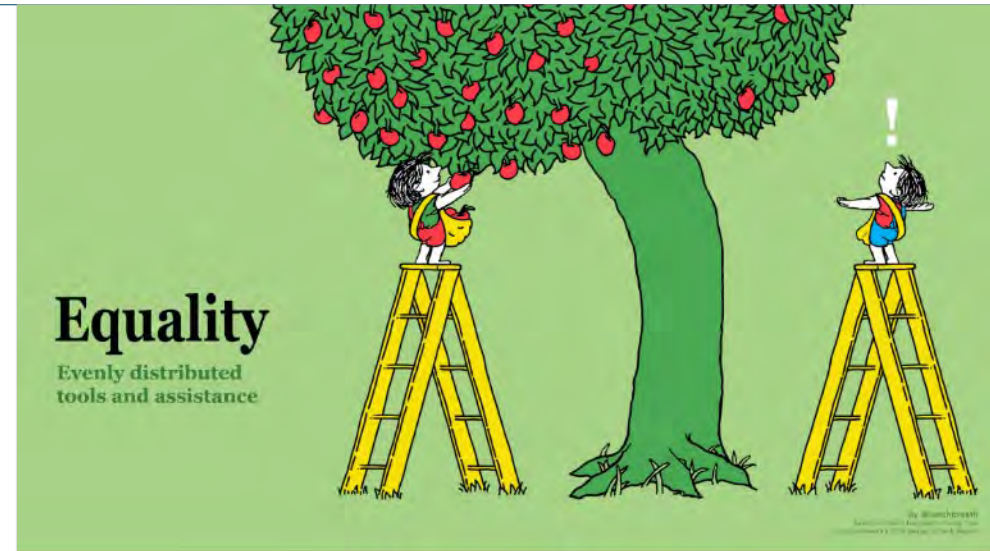
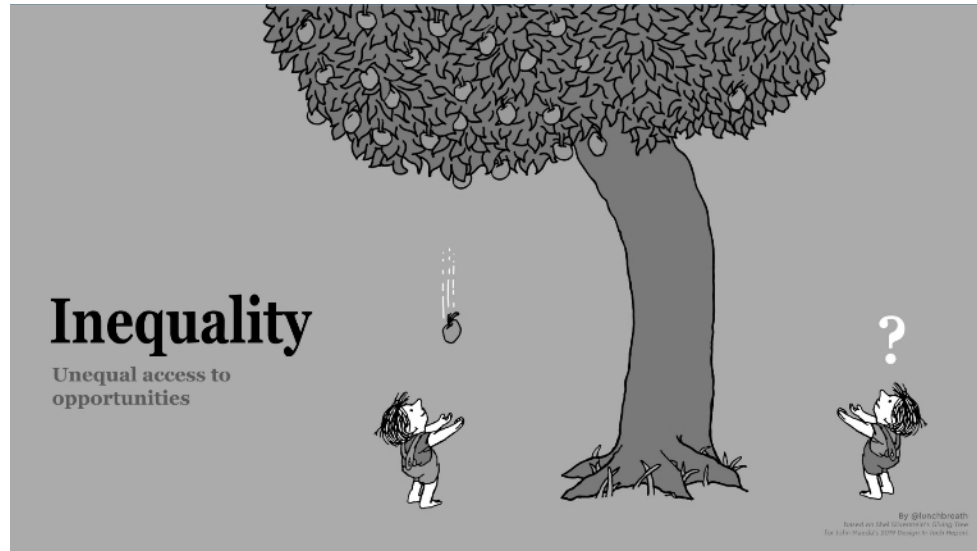
What does *Equity* mean?



Inequity



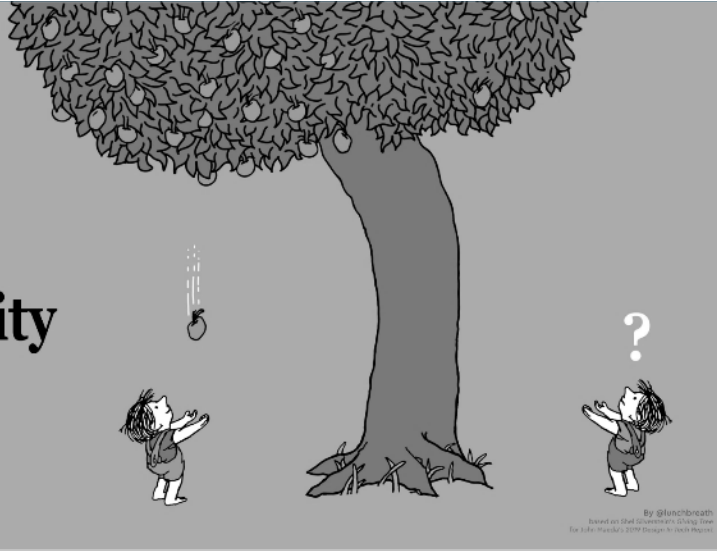
Equality



Equity

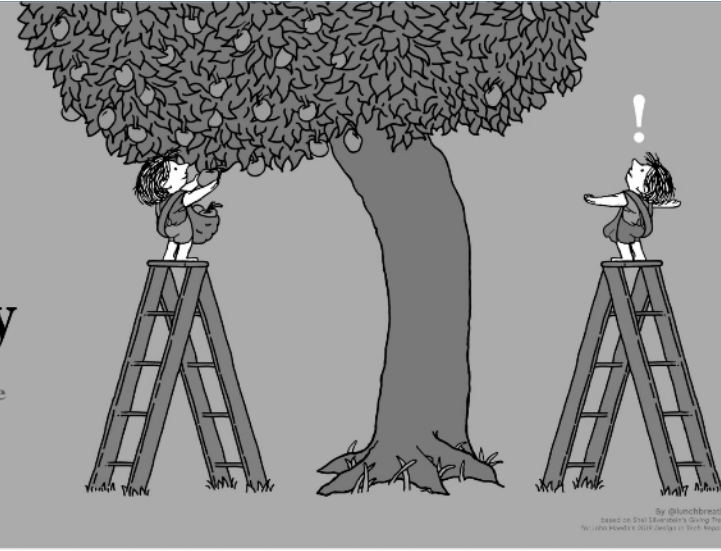
Inequality

Unequal access to opportunities



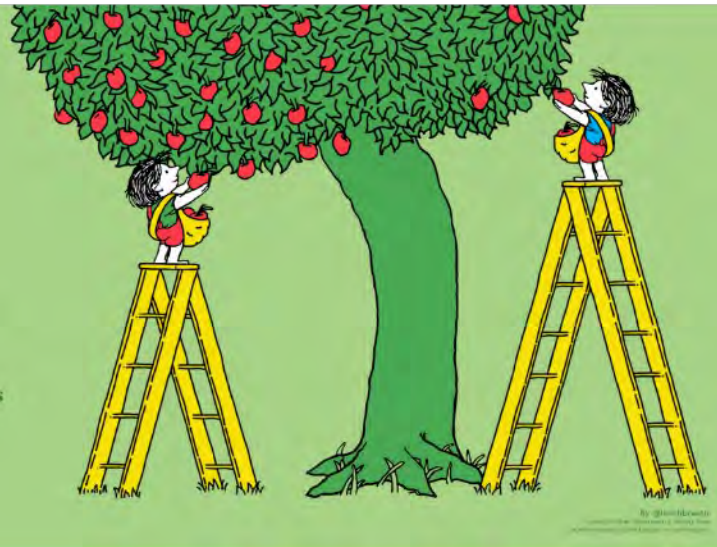
Equality

Evenly distributed tools and assistance



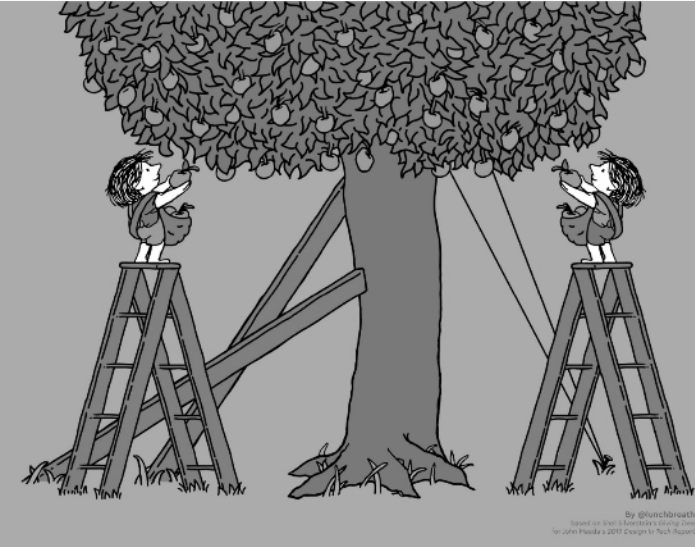
Equity

Custom tools that identify and address inequality

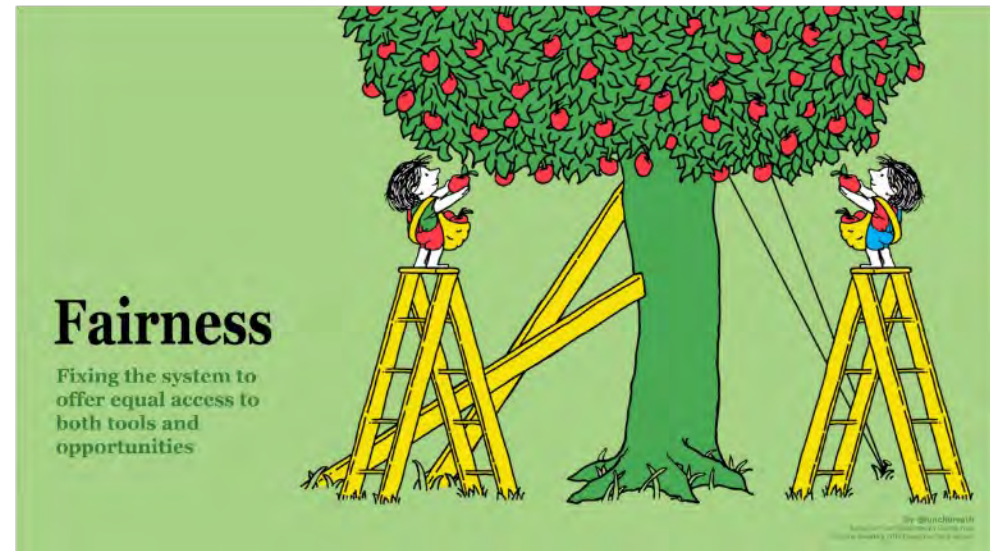
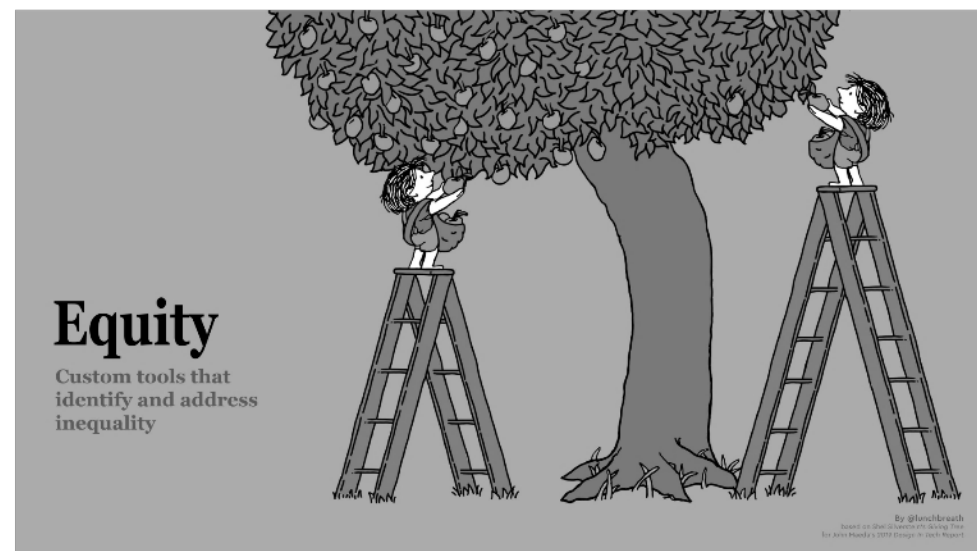
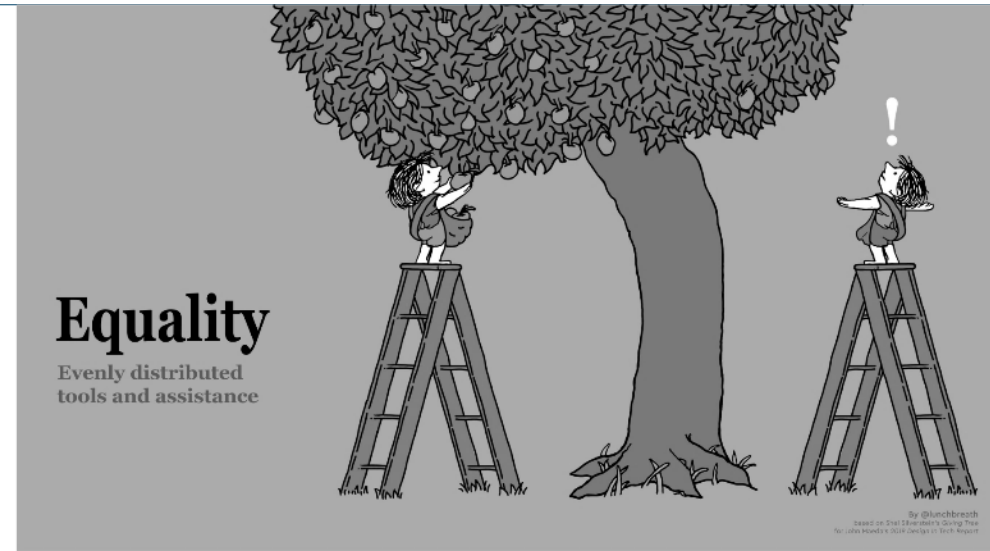
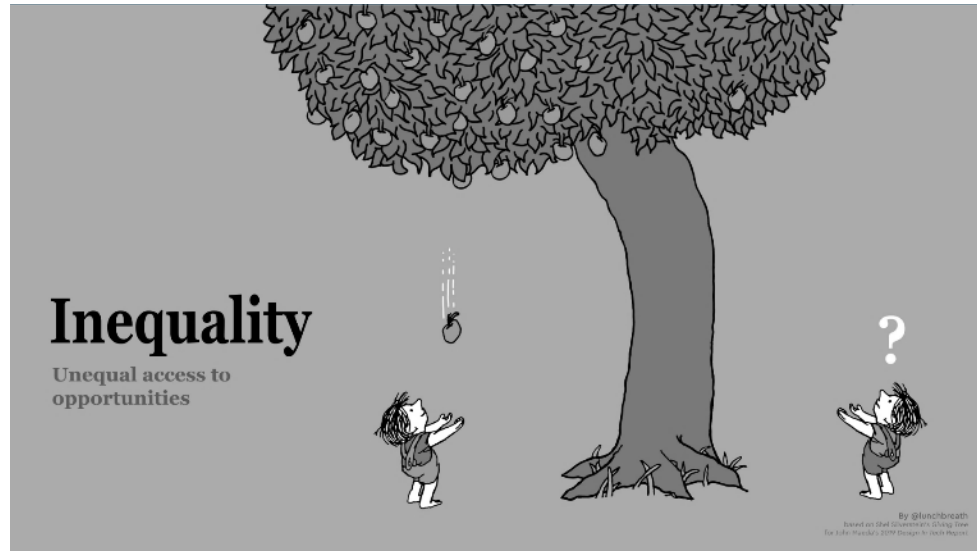


Fairness

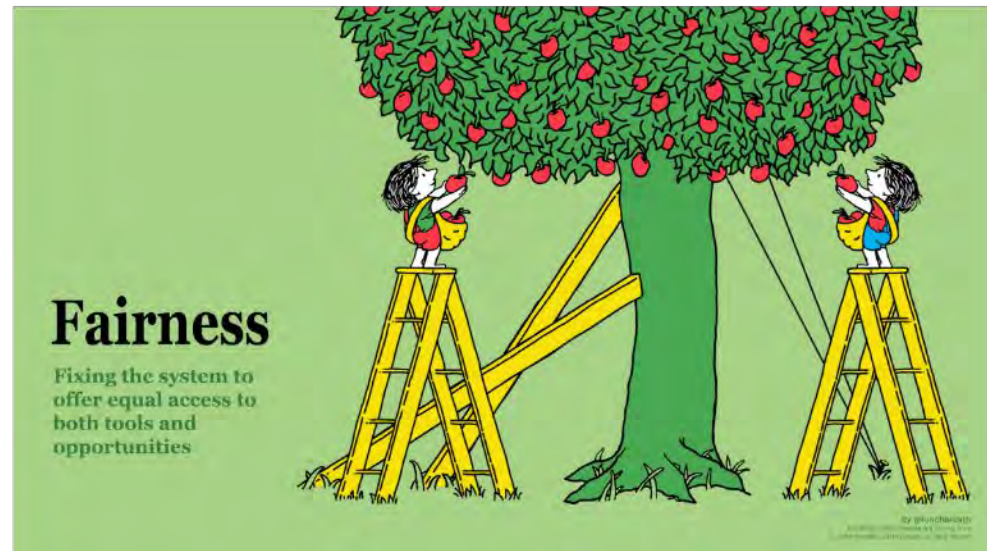
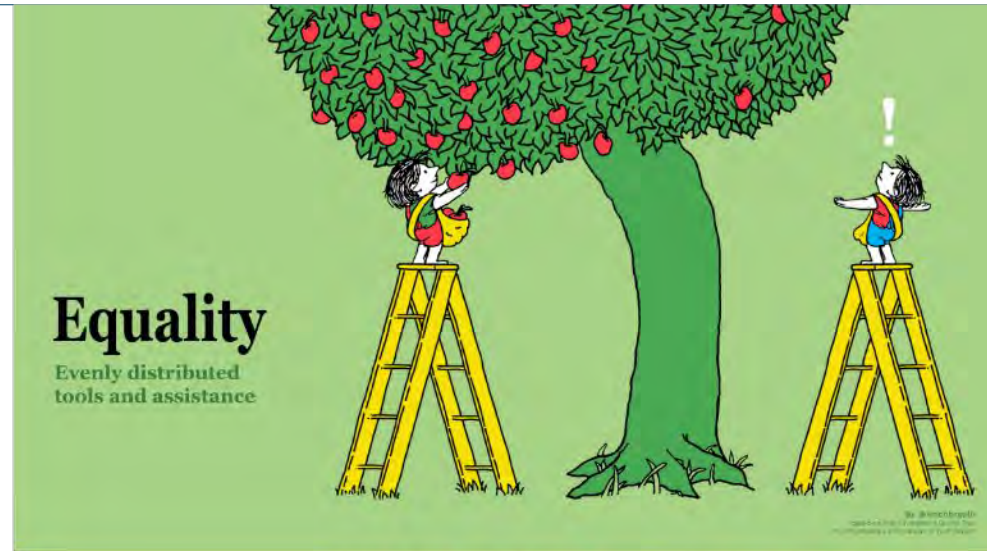
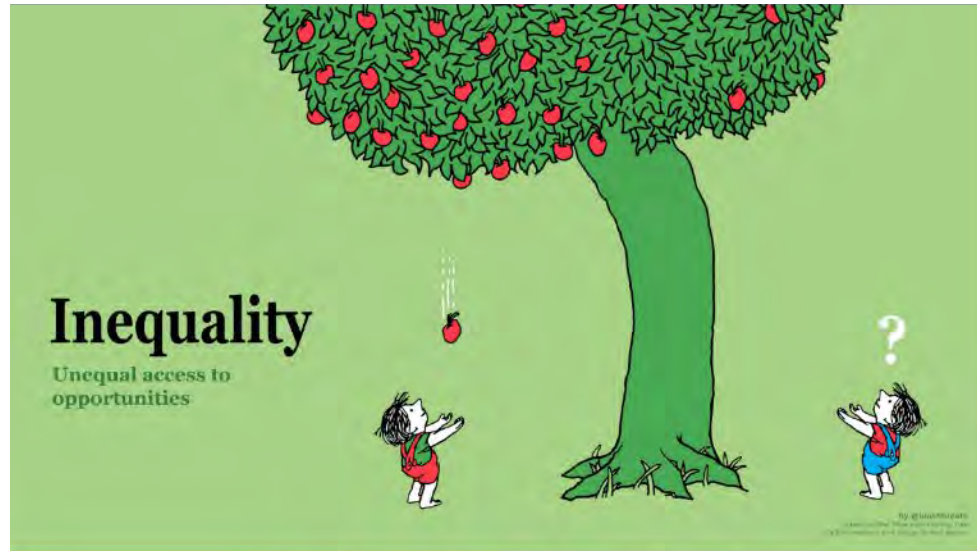
Fixing the system to offer equal access to both tools and opportunities



Fairness



Equity and Fairness

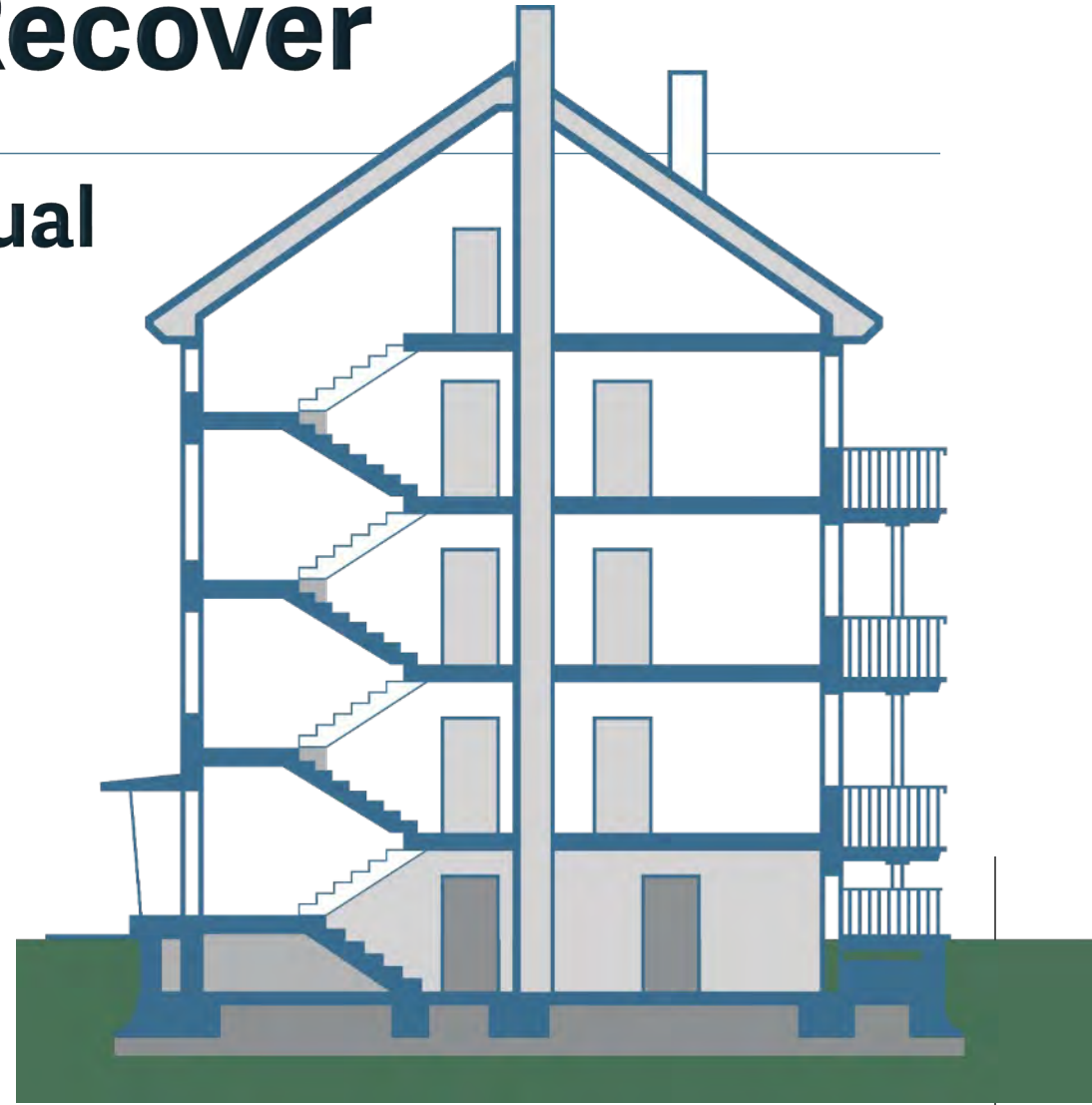
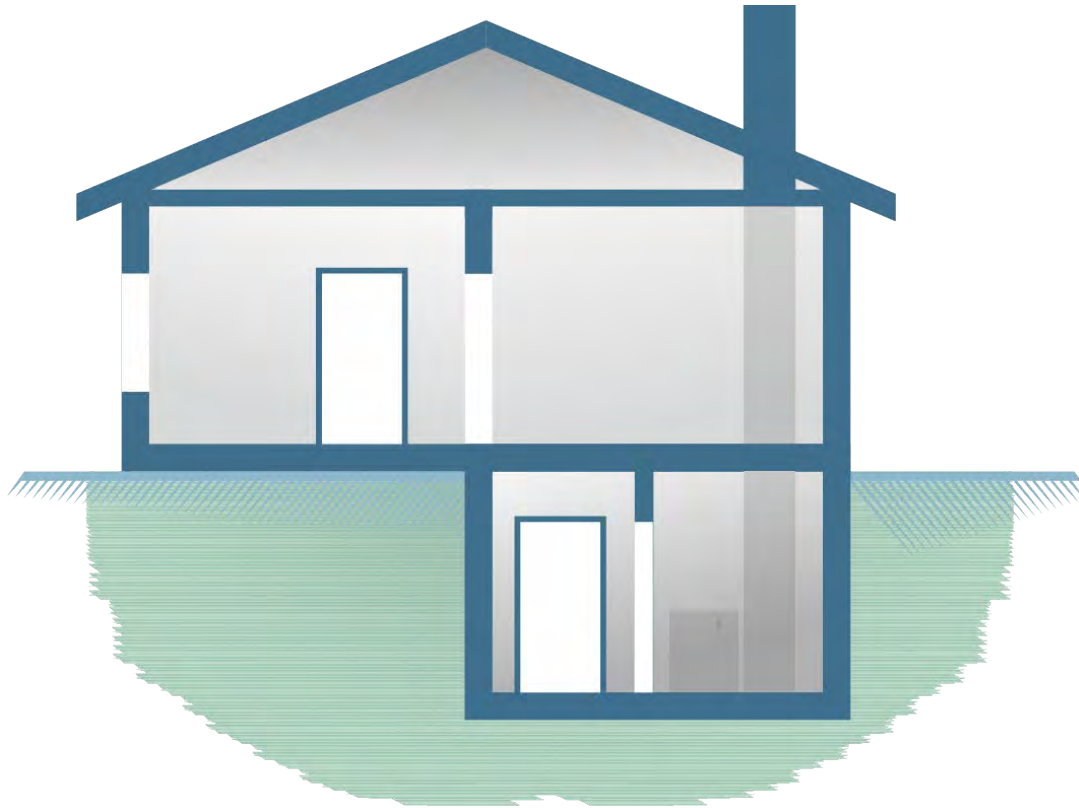


How do we prioritize projects with equity and fairness in mind?



Resiliency & Ability to Recover

Impacts from flooding are not equal



Equity, Fairness and Resiliency

Variation in creeks and drainage areas



Boulder Creek



Gregory Canyon Creek



Bluebell Canyon Creek



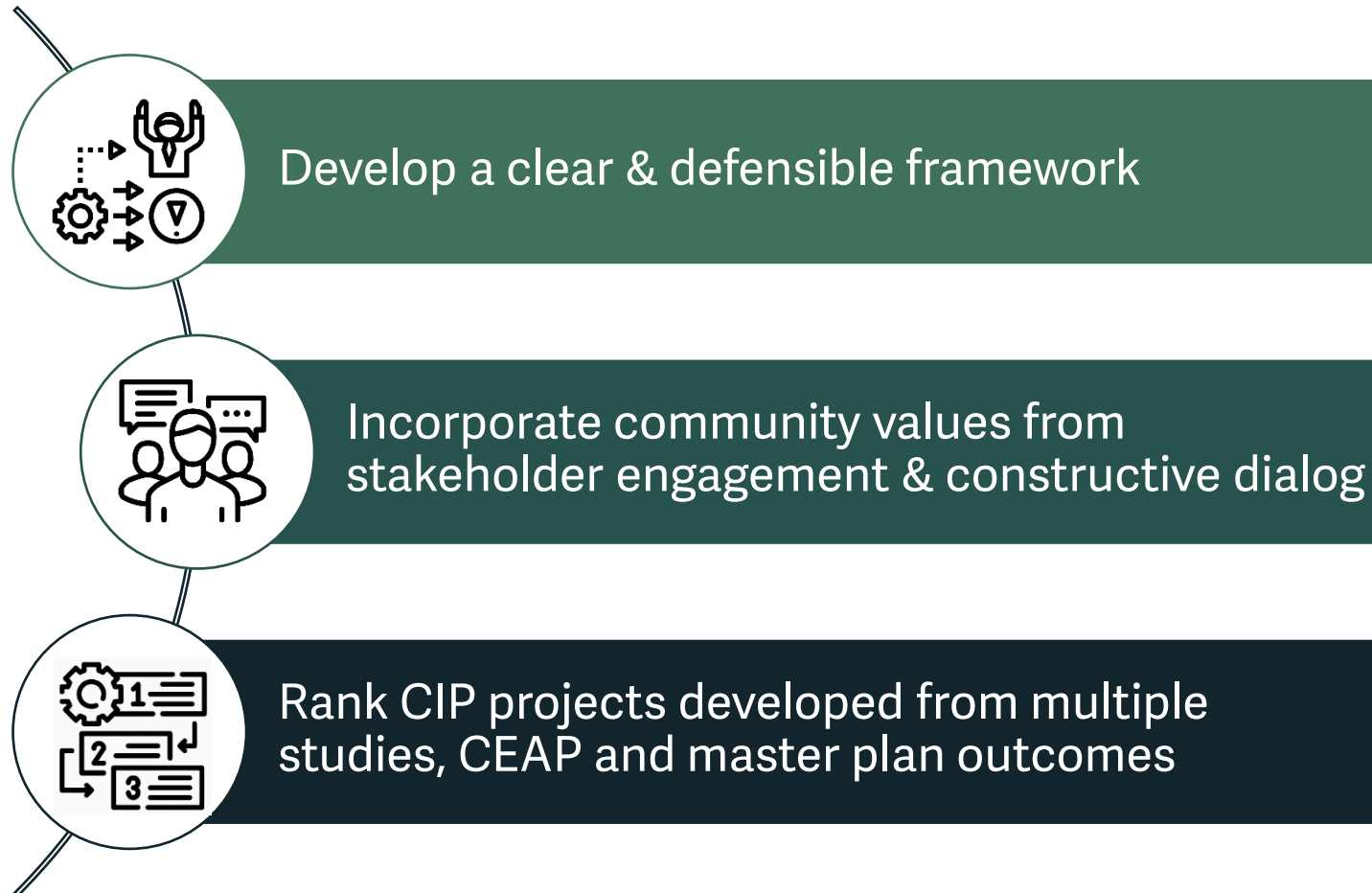
Project Prioritization Framework to Aid Good Decision Making

Building projects that align with community values & meet the Utility's goals and objectives



Project Prioritization Framework to Aid Good Decision Making

Building projects that align with community values & meet the Utility's goals and objectives



CIP Project Prioritization | Background

Historic Criteria Sets Used in Boulder

- Stormwater and Flood Management CIP Prioritization Guiding Principles
- Mitigation Planning Evaluation of Alternatives
- Community & Environmental Assessment Process (CEAP) Criteria



Other County & City CIP Prioritization Criteria

Stormwater and Flood Management Project Prioritization Goals

Stormwater and flood management projects should...

- *Protect people from harm, educate the community, reduce risks, and...*
- *Preserve, protect, and restore the natural resources associated with creeks and wetlands for the multiple benefits they provide to support a resilient community*
- *Provide resilient infrastructure that addresses uncertainty, including climate change considerations*
- *Provide access for emergency response and recovery efforts*
- *Minimize property damage*
- *Provide efficient and cost-effective solutions*

... in ways that are mindful and equitable to our entire community.

As we evaluate flood mitigation projects and approaches, we are committed to mutually respectful conversations about these issues in a way that is productive and safe for all involved.

Project Prioritization Criteria

Life Safety

Ability to
Implement

Efficiency & Cost

Social Impact,
Equity & Fairness

Protect Property

Cultural
Resources

Environmental
Resources

Infrastructure
Resiliency

Protect Critical
Facilities

LIFE SAFETY

- Consequence of Failure
- Reduce/Eliminate High Hazard Zone Areas or Residential Structures
- Maintain Emergency Access for First Responders



ABILITY TO IMPLEMENT

The background of the slide features a close-up, warm-toned photograph of several hands working together to assemble a wooden jigsaw puzzle on a rustic wooden table. The puzzle pieces are light-colored wood, and some are already in place, while others are being held or moved by the hands. The lighting is soft and directional, creating a sense of focus and teamwork.

- Minimal Constraints:
Institutional, Legal, Land ownership, etc.
- Community Acceptance/Support
- Project Readiness
- Ease of Construction

EFFICIENCY AND COST

- Capital Cost
- Operations and Maintenance Cost
- Ability to Leverage Funding



Social Impact, Equity and Fairness

Overall Vulnerability	Socioeconomic Status	Below Poverty
		Unemployed
		Income
		No High School Diploma
	Household Composition & Disability	Aged 65 or Older
		Aged 17 or Younger
		Civilian with a Disability
		Single-Parent Households
	Minority Status & Language	Minority
		Aged 5 or Older who Speaks English "Less than Well"
	Housing Type & Transportation	Multi-Unit Structures
		Mobile Homes
		Crowding
		No Vehicle
		Group Quarters

PROTECT PROPERTY

- Protect from Physical Damage
- Reduce Economic Loss



CULTURAL RESOURCES

- Protect Historic Structures
- Protect/Provide Community Amenities



ENVIRONMENTAL RESOURCES


- Protect/Restore Floodplains and Wetlands
- Protect/Improve Water Quality
- Increase Habitat Connectivity

INFRASTRUCTURE RESILIENCY

- Reduce Damage to Existing Infrastructure: Roadways, Water & Sewer Lines, Utility Services, etc.
- Increase Infrastructure Capacity
- Reduce/Mitigate Channel Migration and Erosion
- Disconnect Storm Flows from Irrigation Ditches

PROTECT CRITICAL FACILITIES

- Schools, Daycares, Hospitals, Senior Living Facilities, etc.
- Essential Services: Fire, Police, Water Treatment, etc.
- Hazardous Materials Facilities



Breakout Discussion

Criteria Weighting Exercise

CIP Project Prioritization Tool | Criteria Voting

Step 1: Enter your name

Step 2: Click "Join"

The image shows a mobile application interface for a project prioritization tool. At the top, there is a text input field labeled 'Enter your name to participate' with a yellow 'Join' button to its right. Below this is a yellow 'Chat' header with a speech bubble icon. Under the chat header is a large white text area for messages. At the bottom, there is a 'Participants' section with a list of names, currently showing 'Laurel Olsen'.

Enter your name to participate

Join

Chat

Participants 1

Laurel Olsen

CIP Project Prioritization Tool | Criteria Voting

Click light grey dots to vote

16 votes available
Private Voting

Enabled ☐

Infrastructure Resiliency

- Reduce Damage to Existing Infrastructure: roadways, water & sewer lines, utility services, etc.
- Increase Infrastructure Capacity
- Reduce/Mitigate Channel Migration and Erosion
- Disconnect Storm Flows from Irrigation Ditches

4



Environmental Resources

- Protect/Restore Floodplains and Wetlands
- Protect/Improve Water Quality
- Increase Habitat Connectivity



Cultural Resources

- Protect Historic Structures
- Protect/Provide Community Amenities



Efficiency & Cost

- Capital Cost
- Operations & Maintenance Cost
- Ability to Leverage Funding



Red dots tally your total votes for the card

Click yellow dots to remove a vote

Click here for more information on the card

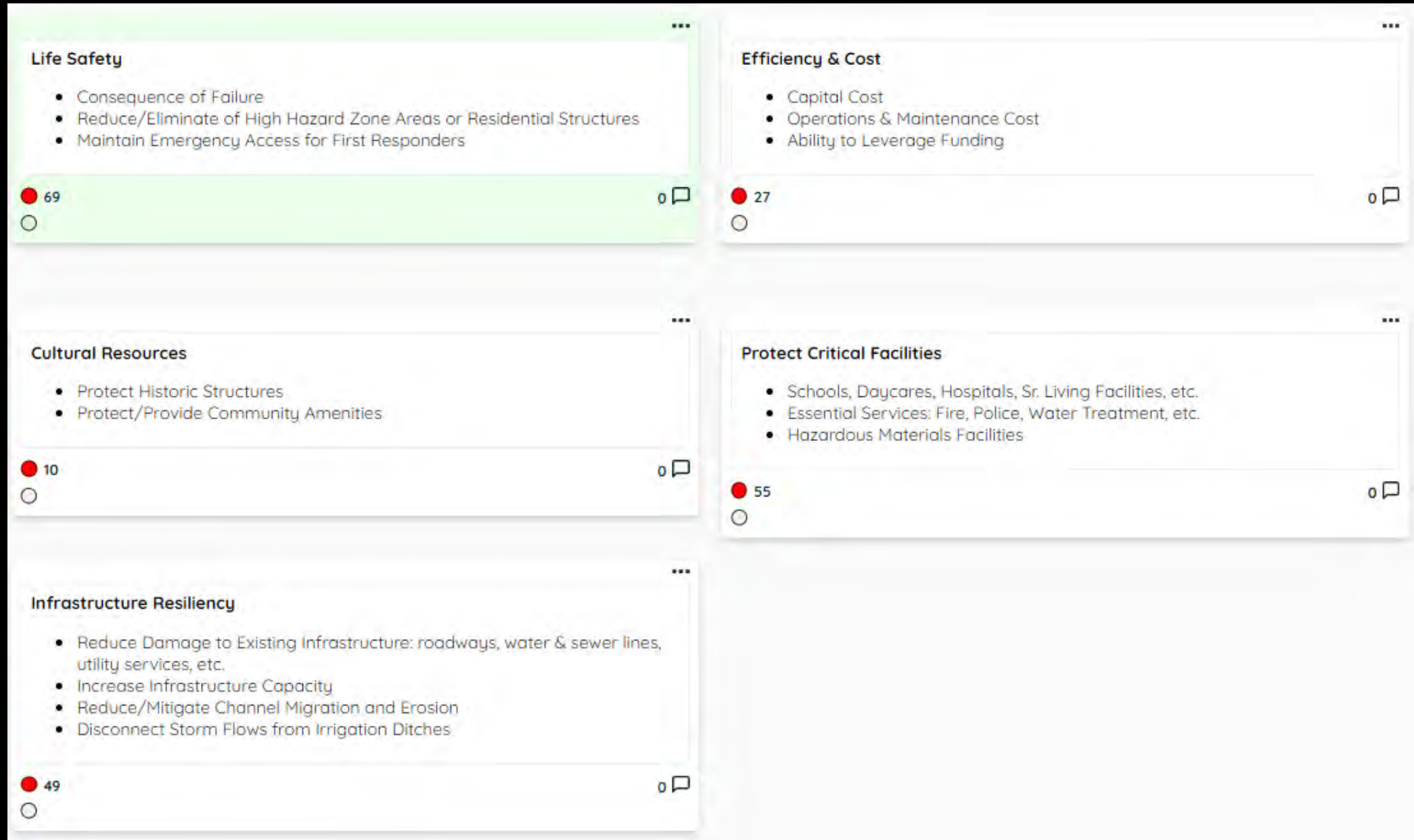
You're done when all 20 votes have been applied (0 votes available)

A diverse group of people, including men and women of various ethnicities, are seated in a classroom or lecture hall. In the foreground, a woman with curly hair is raising her right hand. To her left, a man is smiling. Other people in the background are looking towards the front of the room. The image has a dark, semi-transparent overlay.

Poll Question

Did your thinking evolve over the course of the discussions and activities?

Dotstorming Results



Dotstorming Results

Ability to Implement

- Minimal Constraints: Institutional, Legal, Landownership, etc.
- Community Acceptance / Support
- Project Readiness
- Ease of Construction

● 32
○

0

Social Impact, Equity & Fairness

- Socioeconomic Status: Income, Employment, Education
- Household Composition: Youth, Elderly, Disability, Single Parent
- Racial Equity and Language
- Housing Type and Transportation: Multi-unit, Manufactured Homes, Dorms and Lack of Vehicle Access

● 42
○

0

Protect Property

- Protect from Physical Damage
- Reduce Economic Loss

● 52
○

0

Environmental Resources

- Protect/Restore Floodplains and Wetlands
- Protect/Improve Water Quality
- Increase Habitat Connectivity

● 44
○

1



Comprehensive
**Flood and
Stormwater**
Master Plan



Wrap Up

Comment Form link in chat

Questions? Email: cfsinfo@bouldercolorado.gov



Comprehensive Flood and Stormwater Master Plan





Comprehensive Flood and Stormwater Master Plan





Breakout Discussion

How do we best protect our community so that all of us recover from flooding?

Given the examples provided, what is the city's role and what is the community's role?

Prepare to share one surprising/important thing that was discussed.