

A grayscale photograph of two construction workers in hard hats and safety vests standing on a construction site. They are looking at a large pipe that is being installed in a trench. The site is filled with construction materials, including concrete blocks, rebar, and a traffic cone. The background shows more of the construction area with various equipment and materials.

Denver – Nutrients MS4 Program

2022 Confluence at the Confluence
October 6, 2022

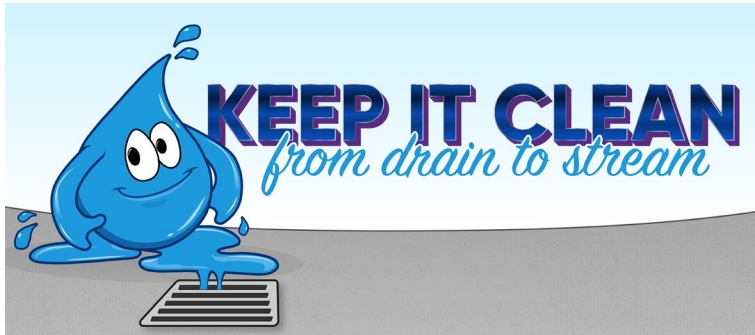


DENVER
TRANSPORTATION &
INFRASTRUCTURE

CONNECT WITH US [311](#) | [POCKETGOV](#) | [DENVERGOV.ORG](#) | [DENVER 8 TV](#)

MS4 Requirements

- MS4 Permit recently renewed
 - Effective April 1, 2021
- Reg 85 requirements now incorporated
 - Education and Outreach
 - Target sources and outreach
 - Municipal Operations
 - Identify operations or facilities contributing
 - Prevent or reduce in stormwater runoff



$$\begin{array}{c}
 \text{:O:} \\
 \parallel \\
 \text{:O-P-O:} \\
 | \\
 \text{:O:}
 \end{array}
 \quad
 \begin{array}{c}
 \text{:O:} \\
 | \\
 \text{:O-N=O}
 \end{array}$$

Dog waste contains 10% phosphates and 2% nitrates.

In Denver alone, that's 4.4 million pounds of phosphates and 881K of nitrogen generated by dog poop every year.

PICK UP LITTER AFTER YOUR CRITTER

161,000
Denver now has more dogs than kids under 18 - 181,000 to 154,000

12 oz.
Each dog generates about this amount of waste per day.

That's **274 lbs.** per year.

Equalling a Denver total of **44M** pounds per year
...equivalent to **1,574** dump trucks worth!

Not picked up, that's 44 million pounds of poop that can wash into your waterways every year!

Why Does It Matter?

Rain and snowmelt washes dog waste into our storm drains that connect to rivers and lakes without treatment.

Dog waste contains 10% phosphates and 2% nitrates.

In Denver alone, that's 4.4 million pounds of phosphates and 881K of nitrogen generated by dog poop every year.

These nutrients contribute to algae growth that can kill fish and other aquatic life.

Waste makes our water murky, green, smelly and unhealthy.

What You Can Do

Dog waste can spread pathogens that can be transmitted from pets to humans, including salmonella, giardia, E. coli, among others.

Pick It Up
Carry pet waste bags on every walk.

Pitch It
Make sure to put the bags in a garbage can.

Your Own Yard, Too
Scoop the poop everywhere, even your own property.

Phosphorus Free Fertilizers

Phosphorus-Free Lawn Fertilizer Initiative Supported by:

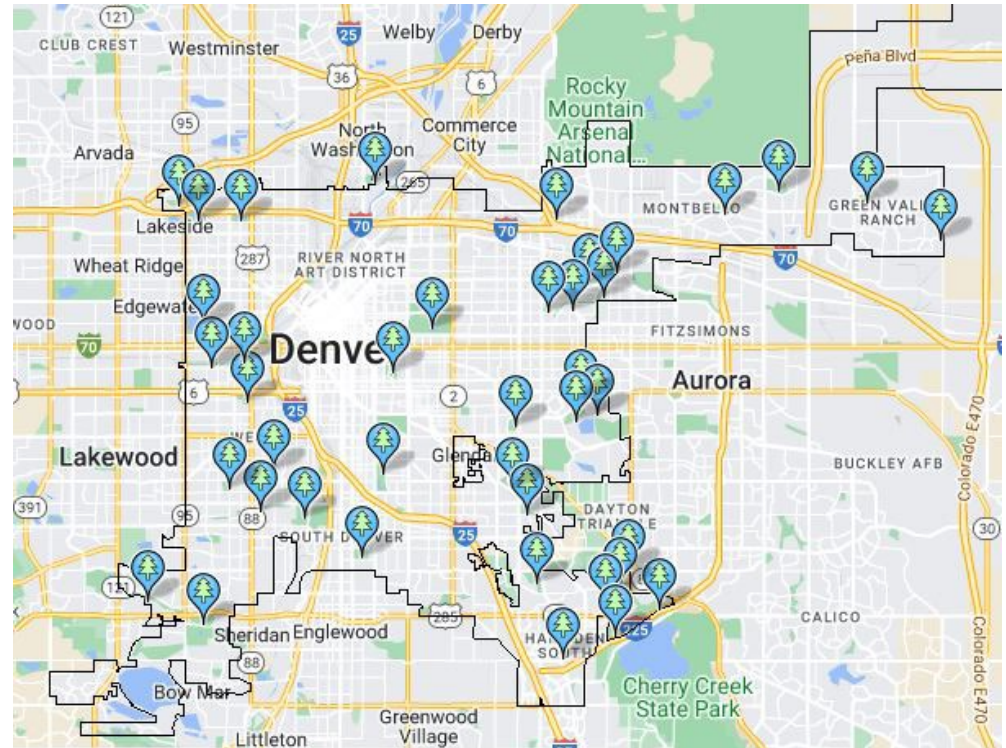


Colorado Lake & Reservoir Management Association



Denver Parks

- 2018 went P-free
- ~6,500 acres parkland
- ~3,900 acres turf



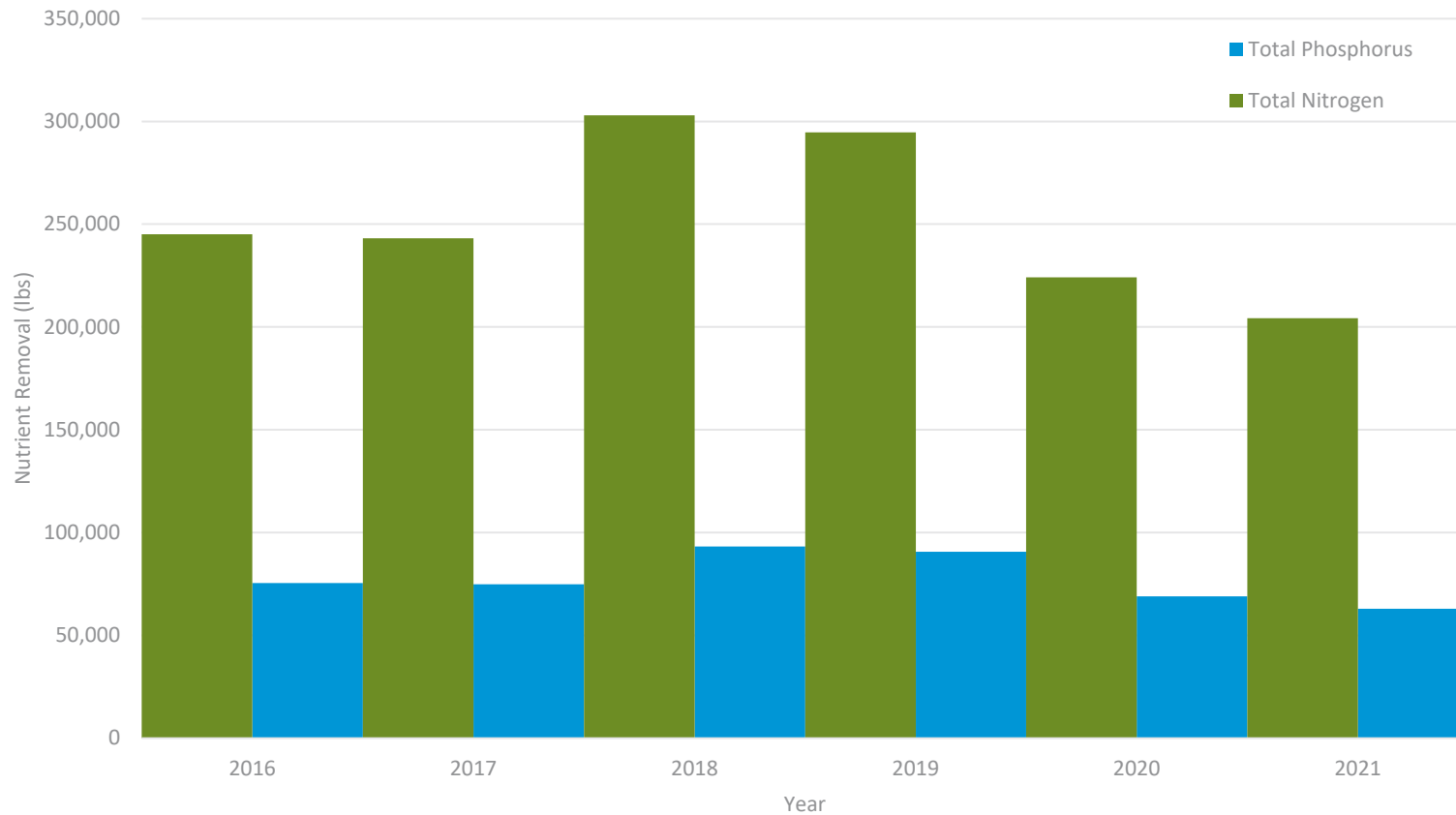
Street Sweeping

- April – November with post snow efforts
- Estimated pollutant tracking since 2012
- Average 48,690 Tons/yrs. solids collected
- 95 tons TN
- 29 tons TP



Street Sweeping

Estimated Average Annual N & TP Removal by Street Sweeping



LeafDrop Program

~800 tons annually



DENVER
TRANSPORTATION &
INFRASTRUCTURE

CONNECT WITH

Wet-Weather Monitoring Trends

Water Quality	SPRU	SPRD	TGC6	SCRM	SPRH
Suspended Solids, Total (mg/L)	X	X	X	▼	▼
Specific Conductance (μS/cm)	▲	X	▲	▲	X
Nitrogen, Total (mg/L)	X	X	X	X	▼
Phosphorus, Total (mg/L)	X	▼	X	X	▼
Discharge	SPRU	SPRD	TGC6	SCRM	SPRH
Discharge (cfs)	X	X	X	▼	X
Loads	SPRU	SPRD	TGC6	SCRM	SPRH
Suspended Solids, Total (#/day)	X	X	X	▼	X
Nitrogen, Total (#/day)	X	X	X	X	X
Phosphorus, Total (#/day)	X	X	X	▼	X

- ▼ Significant decreasing trend
- ▲ Significant increasing trend
- X No trend

- 1998-2018 trends

South Platte River & Tributaries

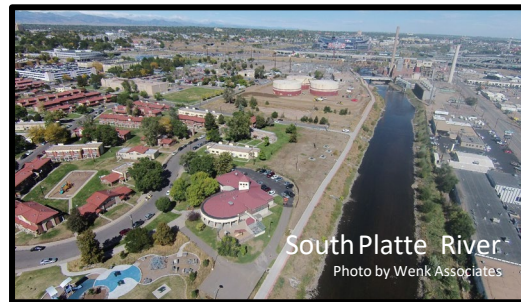
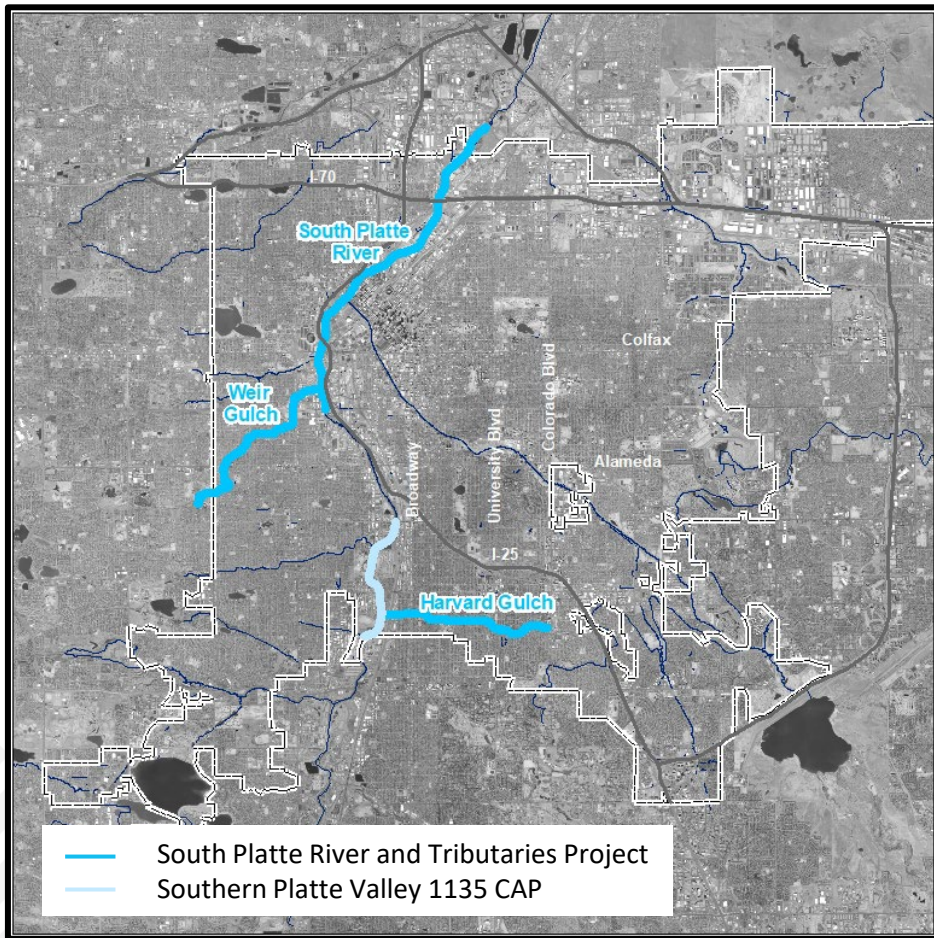
Confluence at the Confluence

October 2022



Background

SPR & Tributaries



2014 – 2018

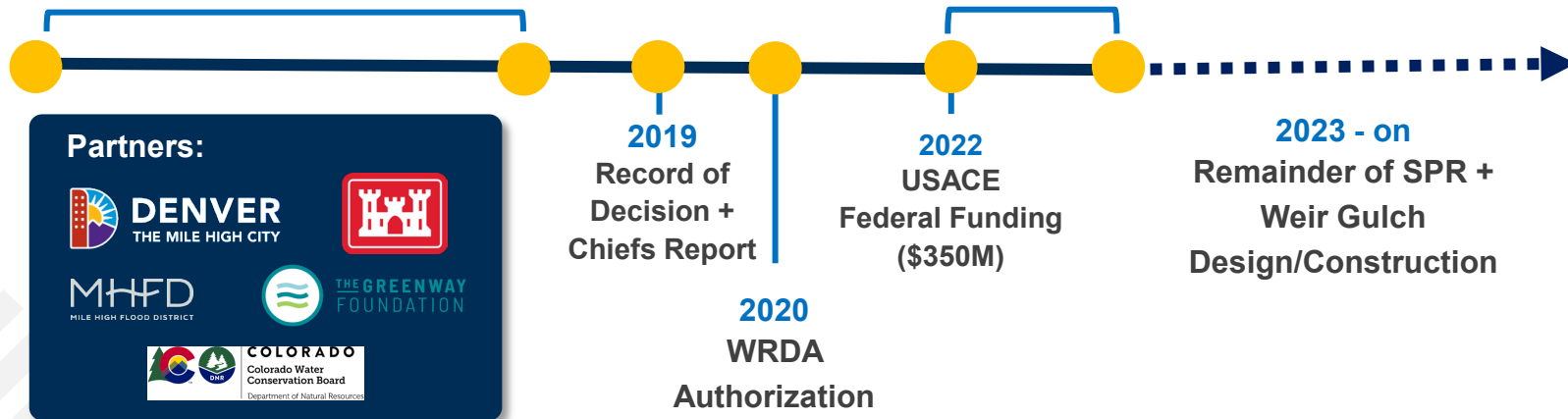
Integrated Feasibility Report
and Environmental Impact Statement (FEIS):

Defined project goals,
scope, etc.

2022 – 2023

Program and Project Initiation

- USACE/CCD Agreements
- Program/project planning

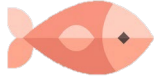


160 acres



Riparian corridor
& wetland habitat

100 acres



Aquatic
habitat

190 acres

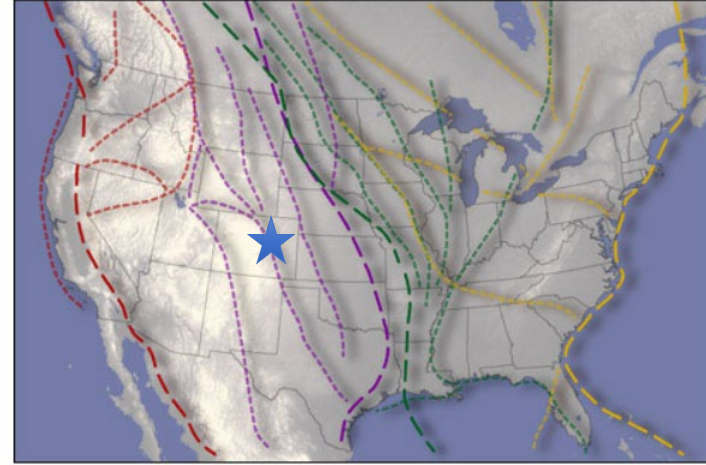


Reconnected
existing habitat

Will provide

- A remedy to degradation due to the USACE Tri-Lakes Project;
- An Integral connection in the **Central Flyway**;
- Mitigation in an area that has seen a 66% decline in waterfowl numbers over last 28 years;
- Improved habitat, potentially benefiting:
 - 3 endangered species,
 - 12 state listed bird species, and
 - 14 bird species listed on the national birds of conservation list;
- Benefit to 80% of Colorado wildlife which use wetland and riparian habitats;
- An antidote to the > 50% decrease in wetland acreage since pre-urbanization; and
- An increase in vegetated wetland from 0.7% to 6.5% of land mass within the City boundaries.

Flyways of North America



Pacific — Central — Mississippi — Atlantic —



Prioritizing and Reducing Life Safety Risk



Weir Gulch

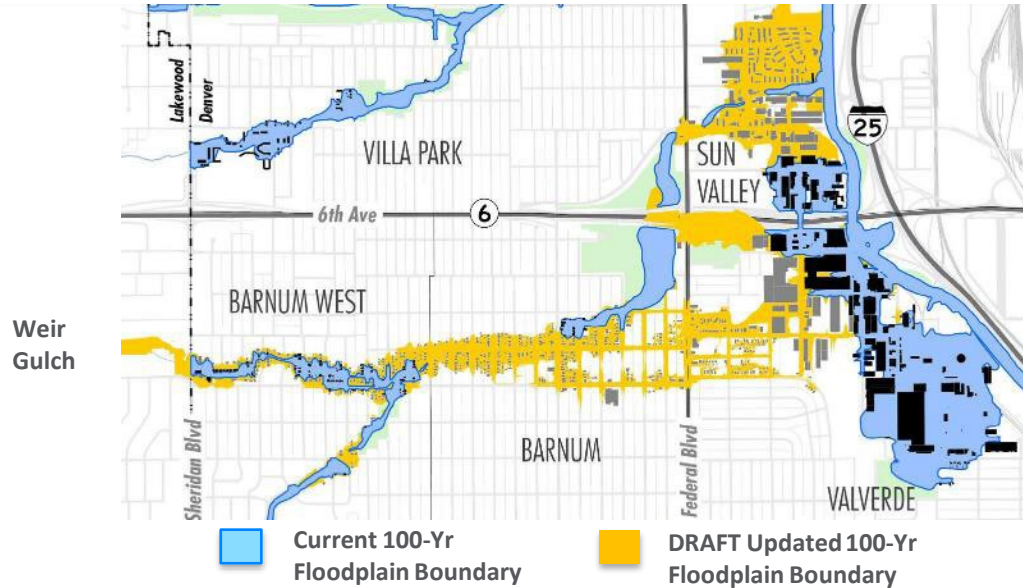
- Vulnerable neighborhood
- 360 structures removed from floodplain designation
- Improves neighborhood connectivity
- Creates a more resilient environment for both stormwater and wildlife

Harvard Gulch

- Non-structural plan; voluntary
- 176 structures to be modified:
 - 77 Commercial
 - 99 Residential

South Platte River

- Incidental flood risk benefit for 100 structures

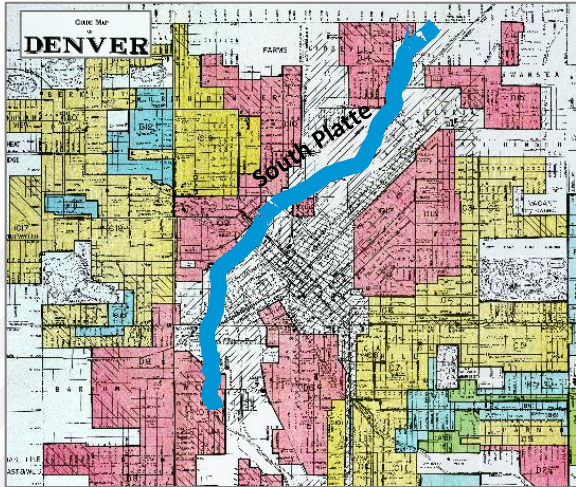


Weir Gulch Undergrounded and Inaccessible Concrete Channel – an Opportunity for Environmental Justice

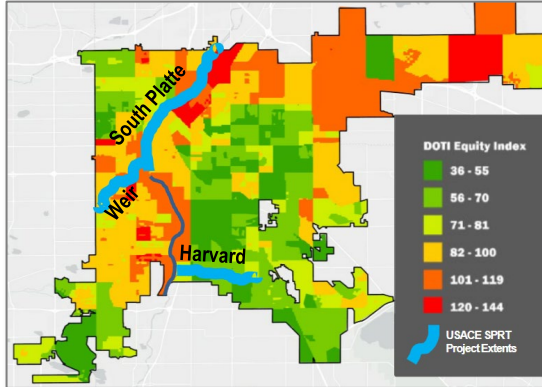
Along the South Platte River:

- Diverse, culturally vibrant neighborhoods
- History of economic inequities and environmental injustices

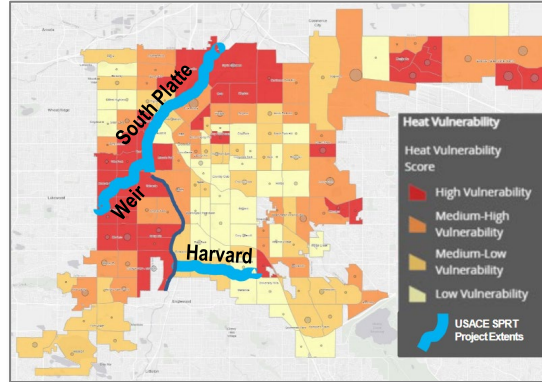
Residential Security Map (1938)



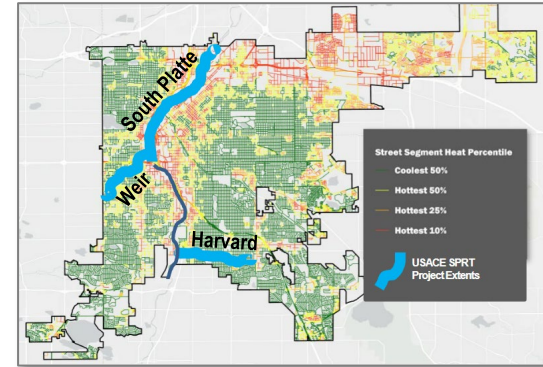
Denver's Dept. of Transportation and Infrastructure Equity Index



Denver's heat vulnerability map



Denver streets segments coded by relative heat class



Benefits beyond the EIS:

- Economic Justice
- Environmental Justice
- Economic Recovery
- Infrastructure Equity
- Environmental Sustainability:
 - Drought Tolerance
 - Climate Resiliency
 - Carbon Sequestration
 - Ground level ozone reduction
 - Stream temperature reduction
 - Heat island reduction

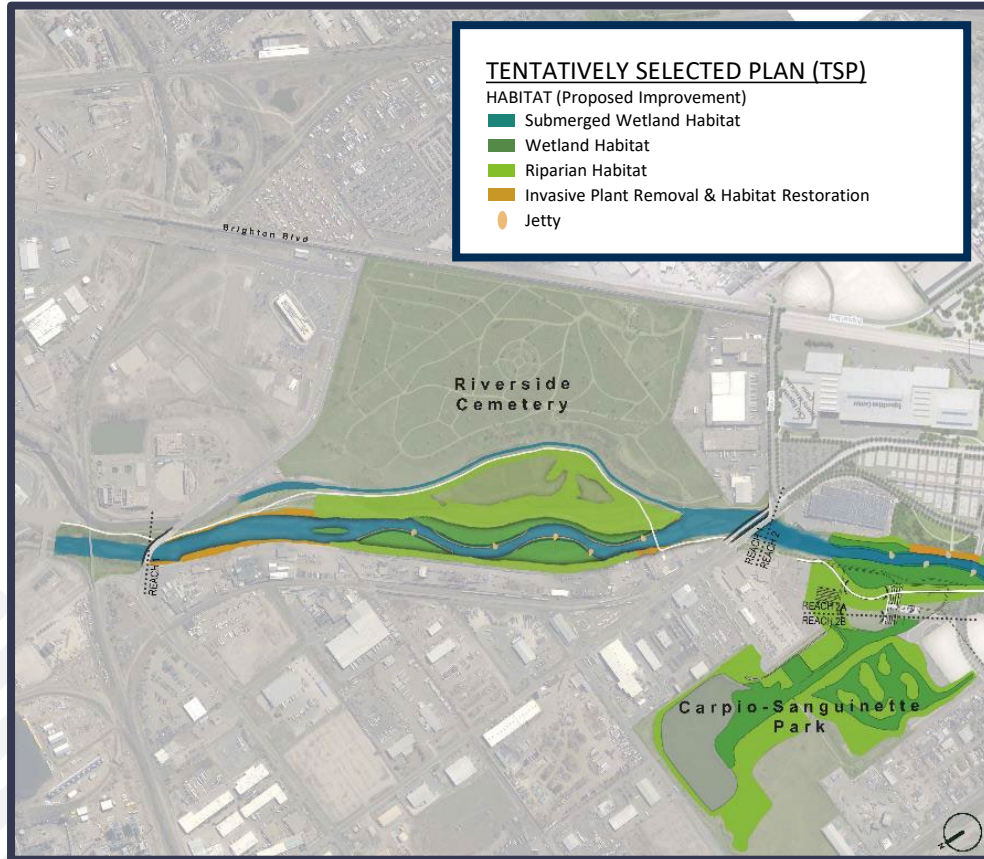


Project Scope

South Platte River



South Platte River – Reach 1



Project Improvements

- Relocate canal to reconnect wetland/riparian
- Large in-stream benches
- Regrade west bank
- Install jetties
- Remove invasives, replace with native species
- Reduction in spill on west bank

Major Infrastructure Changes

- Relocation of Burlington Canal
- Relocation of MWR Interceptor

Recreation Improvements

- No additional improvements

South Platte River – Reach 2



Project Improvements

- Widen east bank to increase riparian/wetland
- In-stream benches
- Install jetties
- Regrade steep banks for stabilization
- Remove invasives, replace with native species
- Regrade/vegetate 28 acres in Carpio Sanguinette/Heron Pond, also restore 10 acres of upland

Major Infrastructure Changes

- Relocation of MWR interceptor
- Raising railroad bridge

Recreation Improvements

- Educational opportunities integrated with trails
- River corridor overlooks & viewing areas
- Improved all-ages fishing access

Complementary Projects

National Western

- Riverfront Construction: 2022/2023
- Collaboration with multiple founding partners funded by a ballot measure.
- Includes relocating twin sanitary interceptors and a heat exchange program to reduce the temperature of the South Platte River.

Carpio-Sanguinette Park

- Phase I Construction: 2022
- Natural refuge restoring ecologies of the place and a connection to the South Platte River.

Globeville Stormwater Systems

- Phase I Levee Construction: 2022/2023
- Phase I 48th Ave Outfall Construction: 2022/2023
- Goals include alleviate local flooding, reduce riverine flooding, and improve water quality.

South Platte River – Reach 3



Project Improvements

- Stabilize banks with vegetated slopes
- 4' Retaining wall along the east bank
- Wetland benches
- Install jetties
- Convert riparian to wetland
- Remove invasives, plant native species

Major Infrastructure Changes

- Replace Globeville Landing pedestrian bridge

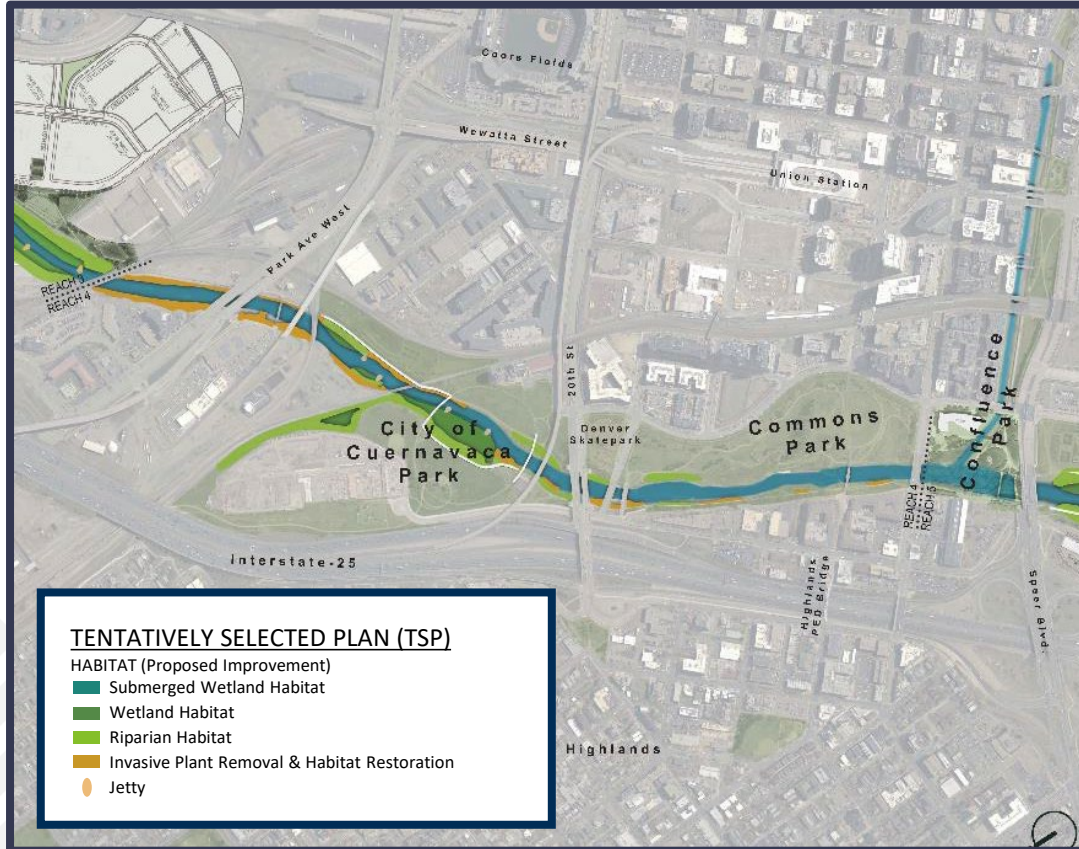
Recreation Improvements

- Improved river access
- Maintains the recreational trail
- Improved fishing

Complementary Redevelopment

- Pepsi Bottling Plant
- Arkins Promenade Development
- Ringsby Court Developments (including Taxi)
- Denargo Market

South Platte River – Reach 4



Project Improvements

- Widen into Cuernavaca Park to increase wetland/riparian habitat
- Modify storm outfall to support new wetland bench at Cuernavaca
- Wetland benches
- Install jetties
- Convert riparian to wetland
- Remove invasives, plant native species

Major Infrastructure Changes

- Remove drop structure d/s of 16th St / Highlands Bridge and lower channel invert

Recreation Improvements

- Improved river access
- Maintains the recreational trail
- Improved fishing

South Platte River – Reach 5

TENTATIVELY SELECTED PLAN (TSP)

HABITAT (Proposed Improvement)

- Submerged Wetland Habitat
- Wetland Habitat
- Riparian Habitat
- Invasive Plant Removal & Habitat Restoration
- Jetty



Project Improvements

- Widen Fishback & Crescent Parks to increase wetland/riparian habitat
- Excavate & regrade channel
- Vegetate sandbars
- Address sedimentation
- Remove invasives, plant native species
- Riffles upstream of Colfax
- Retaining walls under I-25

Major Infrastructure Changes

- Relocation of trolley tracks
- Replacement of Confluence dam

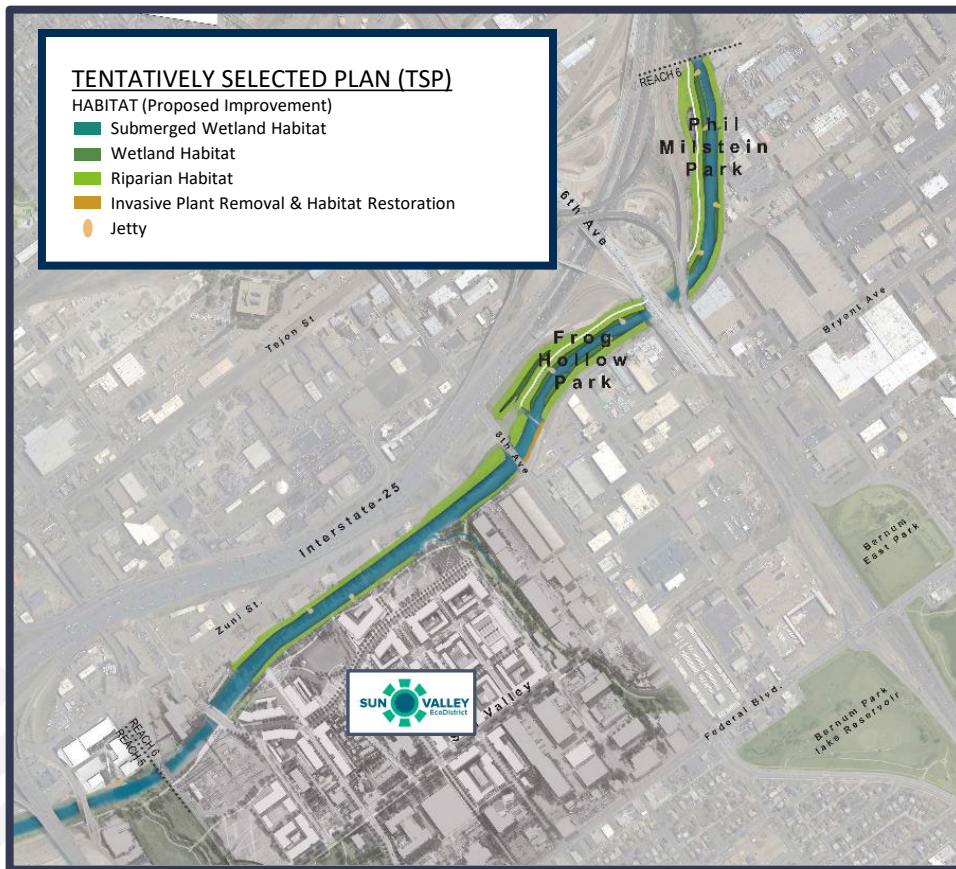
Recreation Improvements

- Improved river access
- Maintains the recreational trail
- Improved fishing

Complementary Redevelopment



SPR-Reach 6



Project Improvements

- Revegetate existing banks with native riparian along Sun Valley & Zuni
- Widen east bank at Frog Hollow to create wetland/riparian area
- Vegetate existing sandbar to increase wetland
- Lower bench & regrade at Phil Milstein
- Wetland benches
- Install jetties
- Convert riparian to wetland
- Remove invasives, plant native species

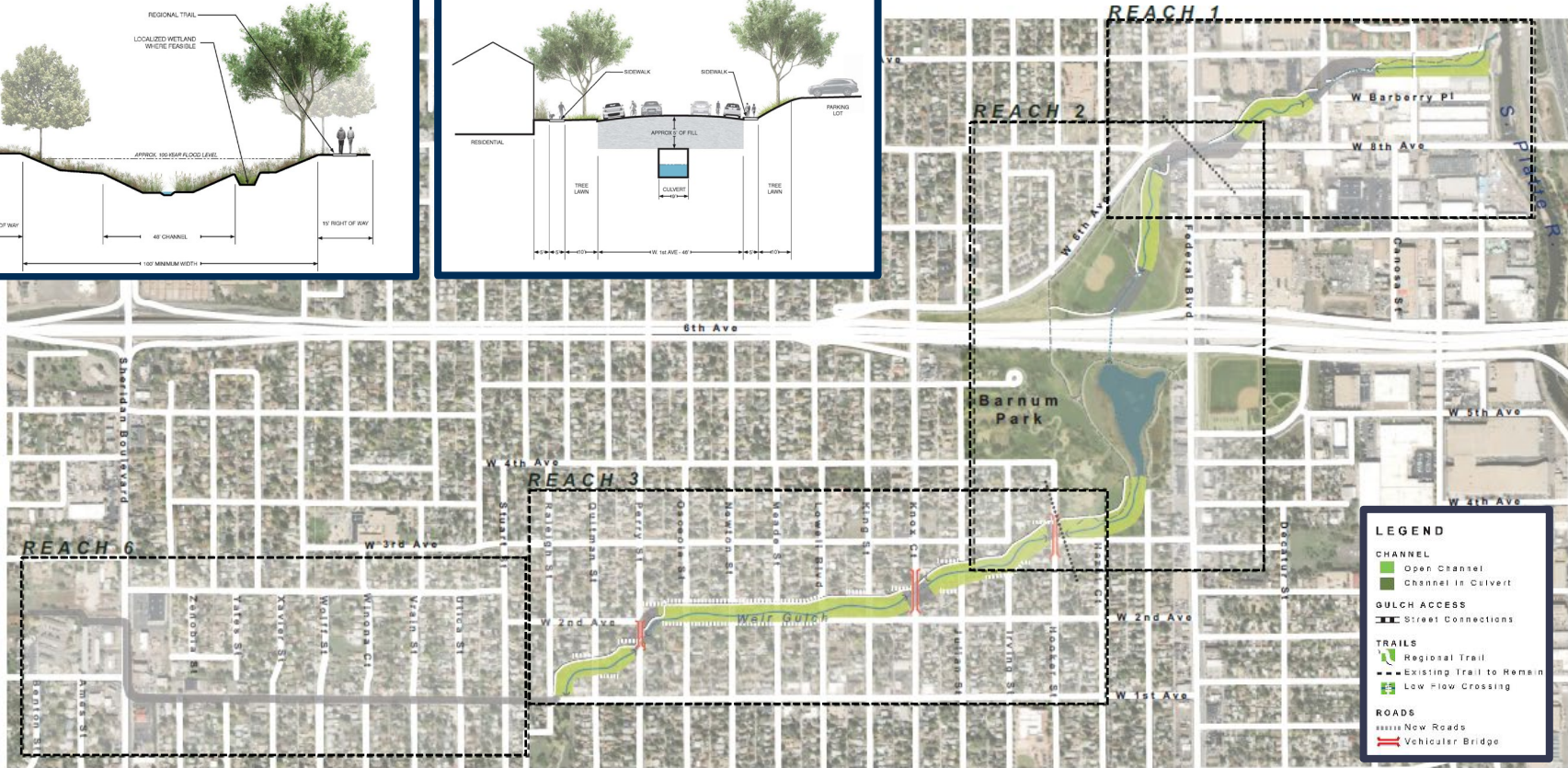
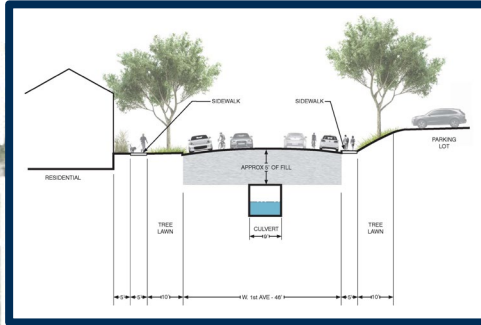
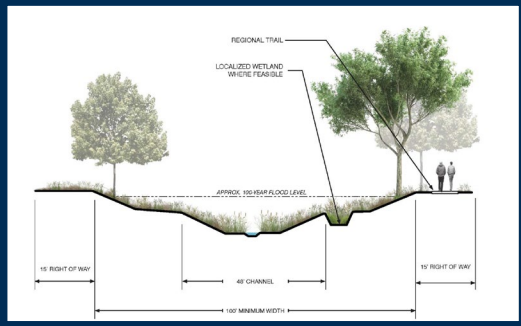
Recreation Improvements

- Regrading to improve pedestrian access
- Improved fishing, flatwater paddling, wildlife viewing

Complementary Projects



Weir Gulch





Project Progress

A. Carpio-Sanguinette Park

- Natural refuge restoring ecologies of the area and connection to the South Platte River.

B. Globeville Stormwater Systems

- Globeville Levee will prevent more than 700 structures from being remapped into the floodplain
- Goals include alleviate local flooding, reduce riverine flooding, and improve water quality.

C. National Western

- Collaboration to re-envision the campus with multiple founding partners funded by a ballot measure.
- Includes relocating twin sanitary interceptors and a heat exchange program to reduce the temperature of the South Platte River.

D. Complementary Developments

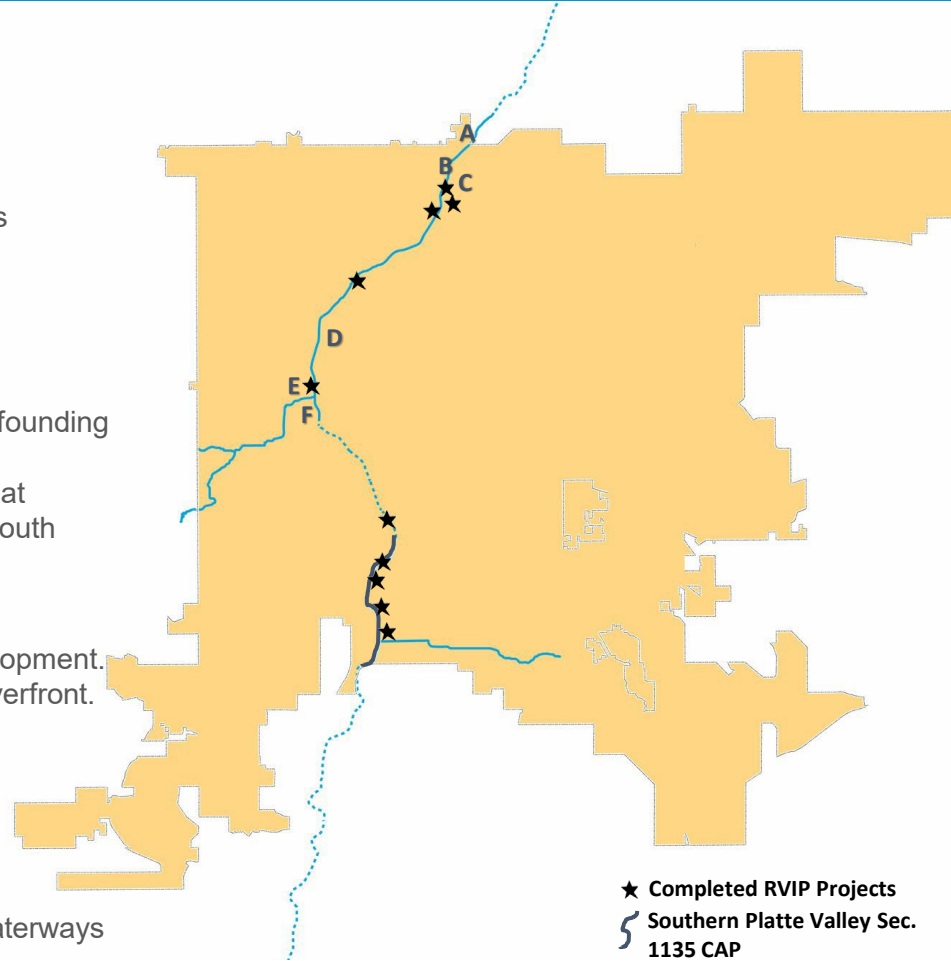
- Local investment has increased complementary development.
- River Mile is one such development along 1 mile of riverfront.

E. Sun Valley EcoDistrict

- Lowest income neighborhood in Denver
- Received \$30M HUD grant

F. Weir Gulch Channel Improvements

- Includes widening channel and elements of Urban Waterways



11 acres



Riparian
habitat

22 acres



Aquatic
habitat

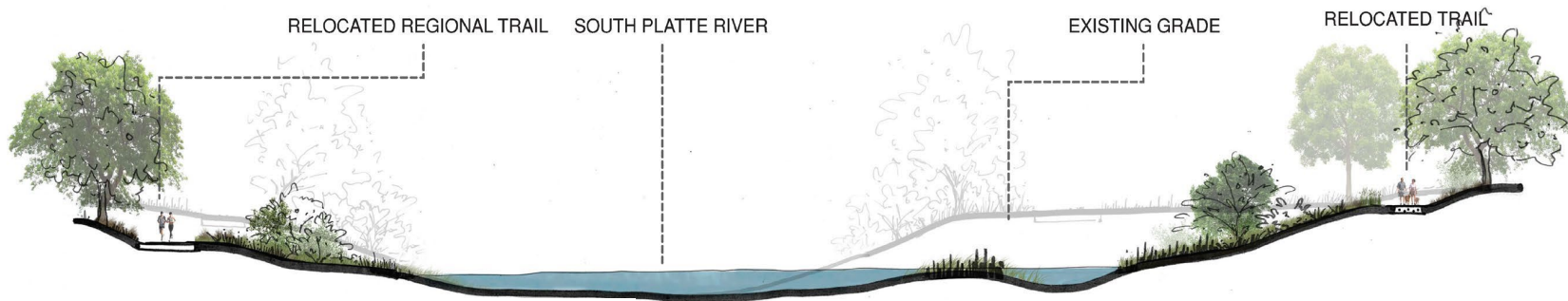
1.5 acres



Palustrine
Emergent scrub/shrub
wetlands

Project Highlights:

- 2.4-mile project
- Connects 3 previous completed River Vision Projects.
- Adjacent to \$20M investment at the outfall of Sanderson Gulch.



Schedule

Design: 2022

Construction: 2023

Carpio Sanguinette / Heron Pond



An 80-acre open space park that connects the community to nature and the South Platte River.

Schedule

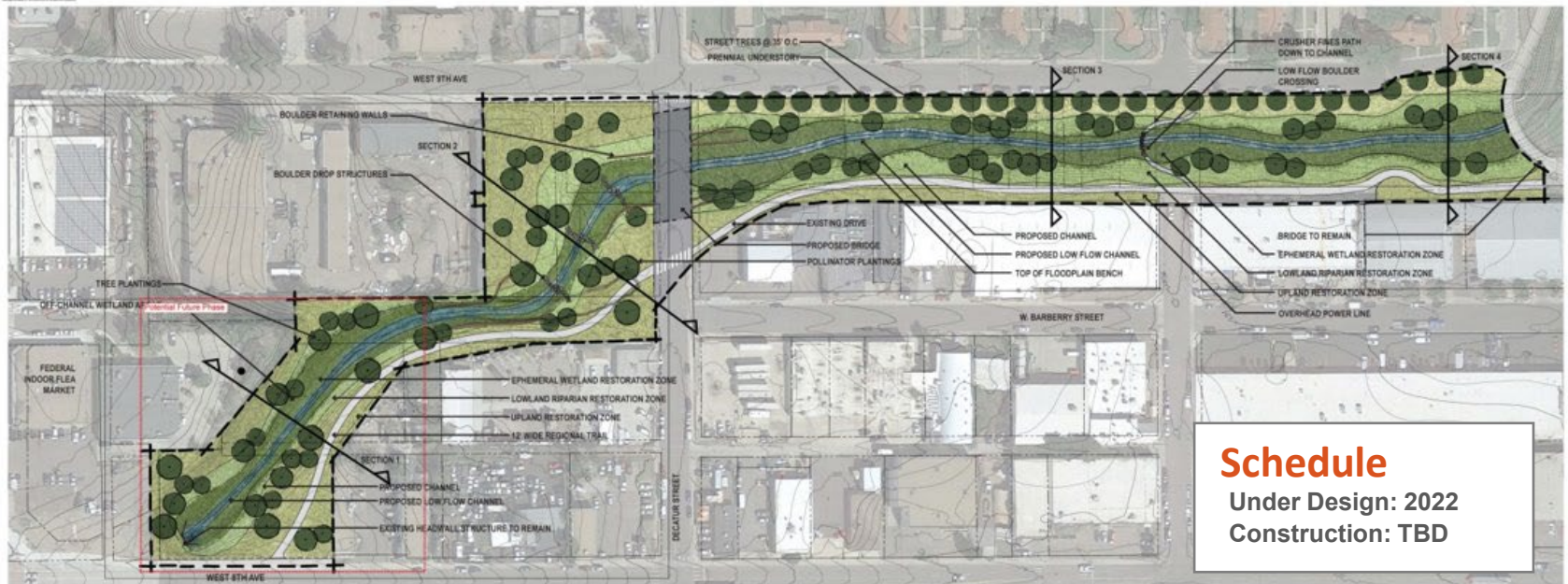
Phase 1A: Complete

Phase 1B: Under construction: 2022-2023

Phase 2: Design 2023



Weir Gulch: Reach 1



WEIR GULCH DECATUR CROSSING - CONCEPT DESIGN
DENVER, COLORADO

NOVEMBER, 2021



Flood mitigation + new open space adjacent to Sun Valley redevelopment

Partnership between MHFD + CCD



Next Steps

USACE's Alternative Delivery Program

Precedent Setting Partnership: City-led Delivery

- City's record of consistent, successful delivery of large-scale infrastructure projects
- 2021 MOU demonstration of leadership support and partnership
- Strong, existing relationships with community
- Ability and desire to overlay a wide range of City goals to optimize project benefits
- Ability to leverage diverse, local funding
- Leverages existing, prioritized investment in underserved neighborhoods in Weir Gulch and Globeville
- Project schedule acceleration and related savings

Denver Priorities

- ✓ Ecosystem Restoration
- ✓ Flood Risk Mitigation
- ✓ Equity
- ✓ Alignment with citywide plans (recreational, mobility, One Water)
- ✓ Implement innovative, cost-saving delivery approach
- ✓ Develop/maintain well-matrixed team
- ✓ Effective communication, public engagement and stakeholder management
- ✓ Establish long term management plan for success

Questions?

SPRT Director, DOTI

Ashlee.grace@denvergov.org

