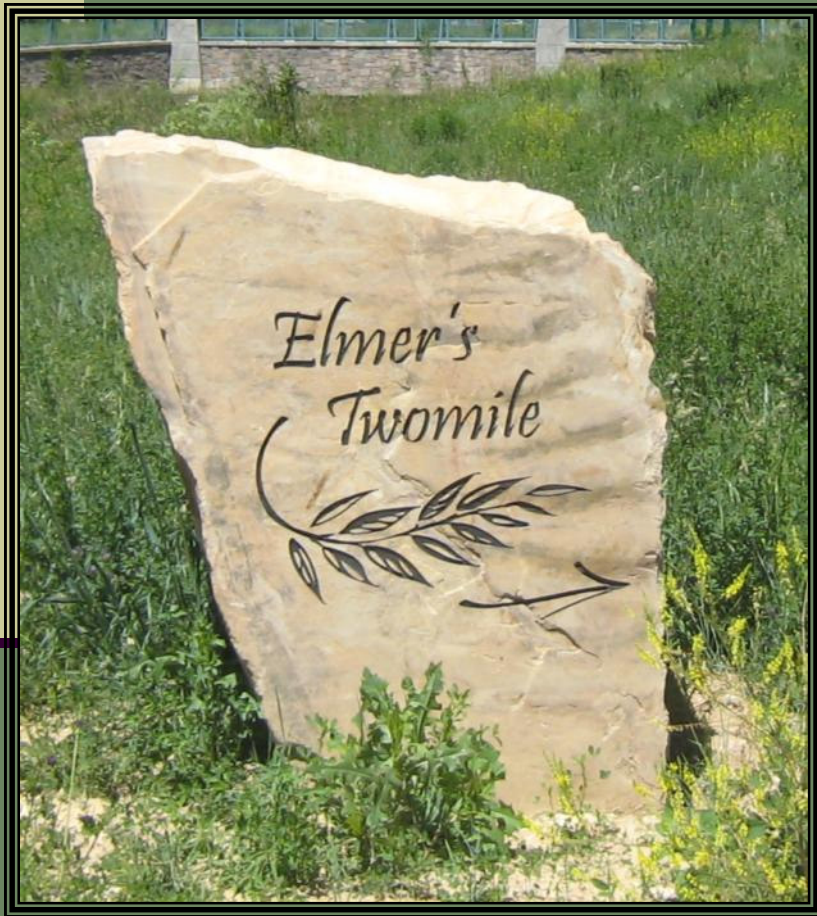


Elmer's Twomile Creek Drainageway Improvements



September 22, 2010

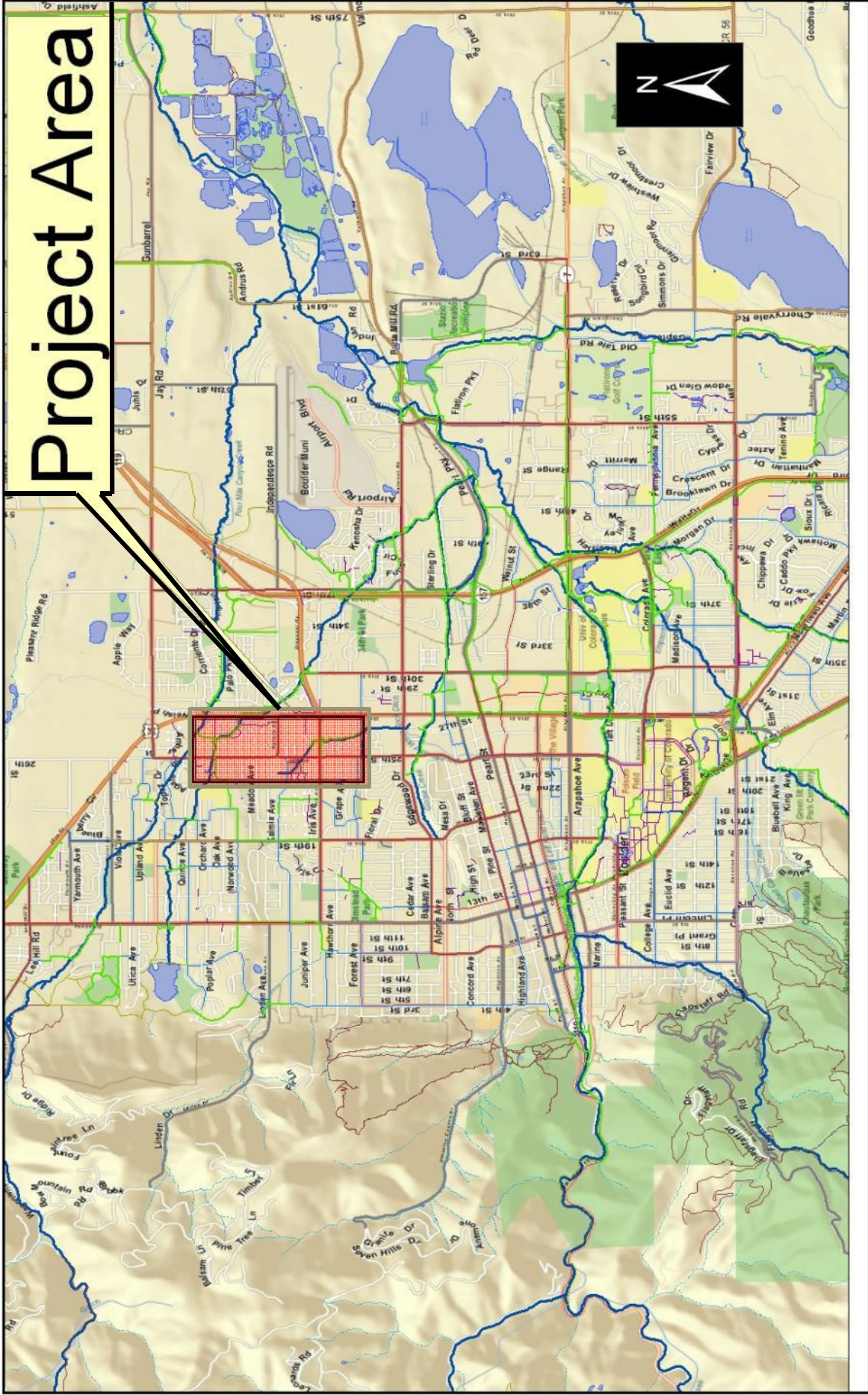
CASFM 2010 Conference

Co-Presenters:

Annie Noble, Mark Post, Mike Galuzzi



Project Area

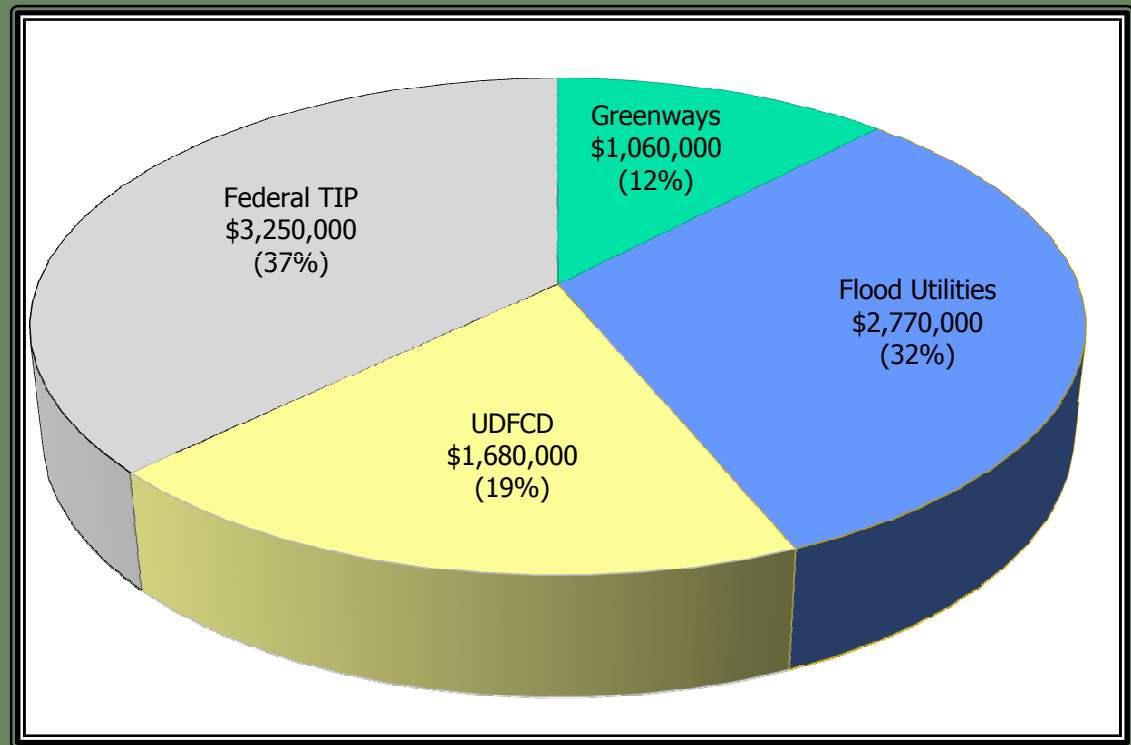


Funding & Partnerships

■ Project cost \$8.76 million

Costs Include:

- Planning
- Property Acquisition
- Design
- Construction
- Letter of Map Revision



Greenways

Purpose Statement

The purpose of the Greenways Program is to extend the stewardship of the city of Boulder to the important riparian areas along the tributaries of Boulder Creek.

The Greenways Program will manage these areas so as to integrate the following objectives:



to protect and restore riparian, floodplain, & wetland habitat



to enhance water quality



to facilitate storm drainage & mitigate floods



to provide alternative transportation routes or trails for pedestrians & bicyclists



to provide recreation opportunities

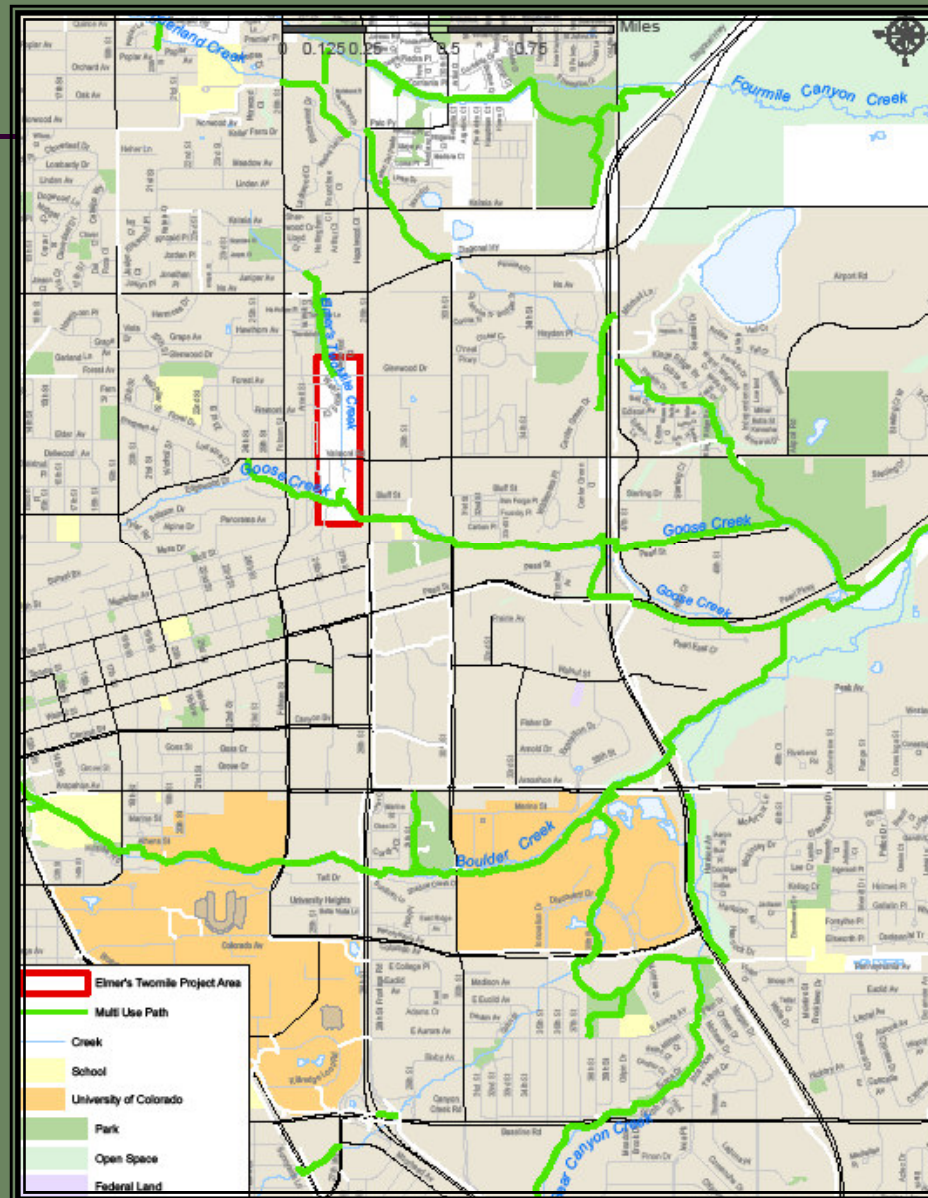


to protect cultural resources

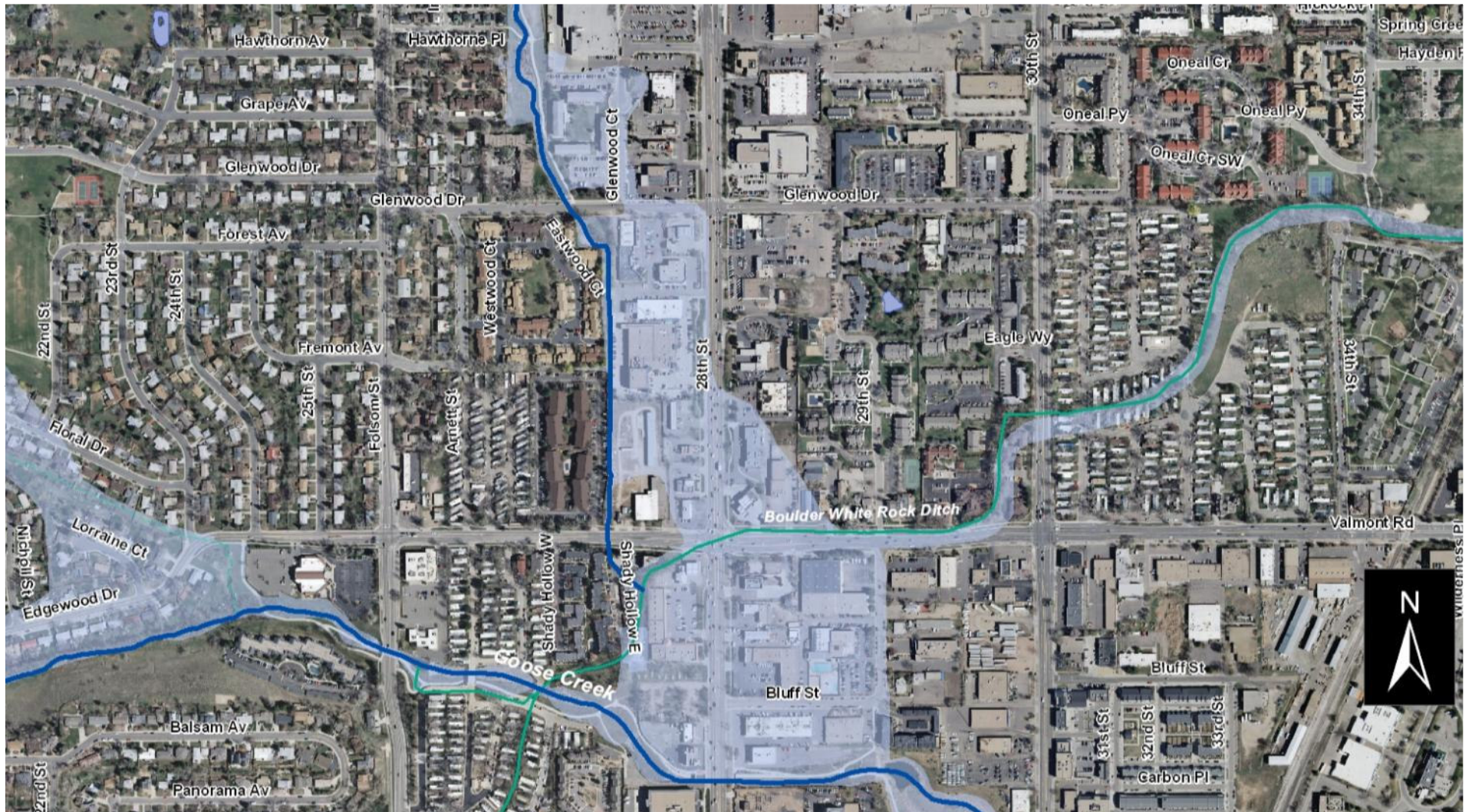
Project Goals

- 100-year flood containment
- Off-street path connections with grade separated crossing at Valmont Rd.
- Separate creek from ditch
- Enhance wetlands and water quality
- Preserve historic resources (Boulder & White Rock ditch)

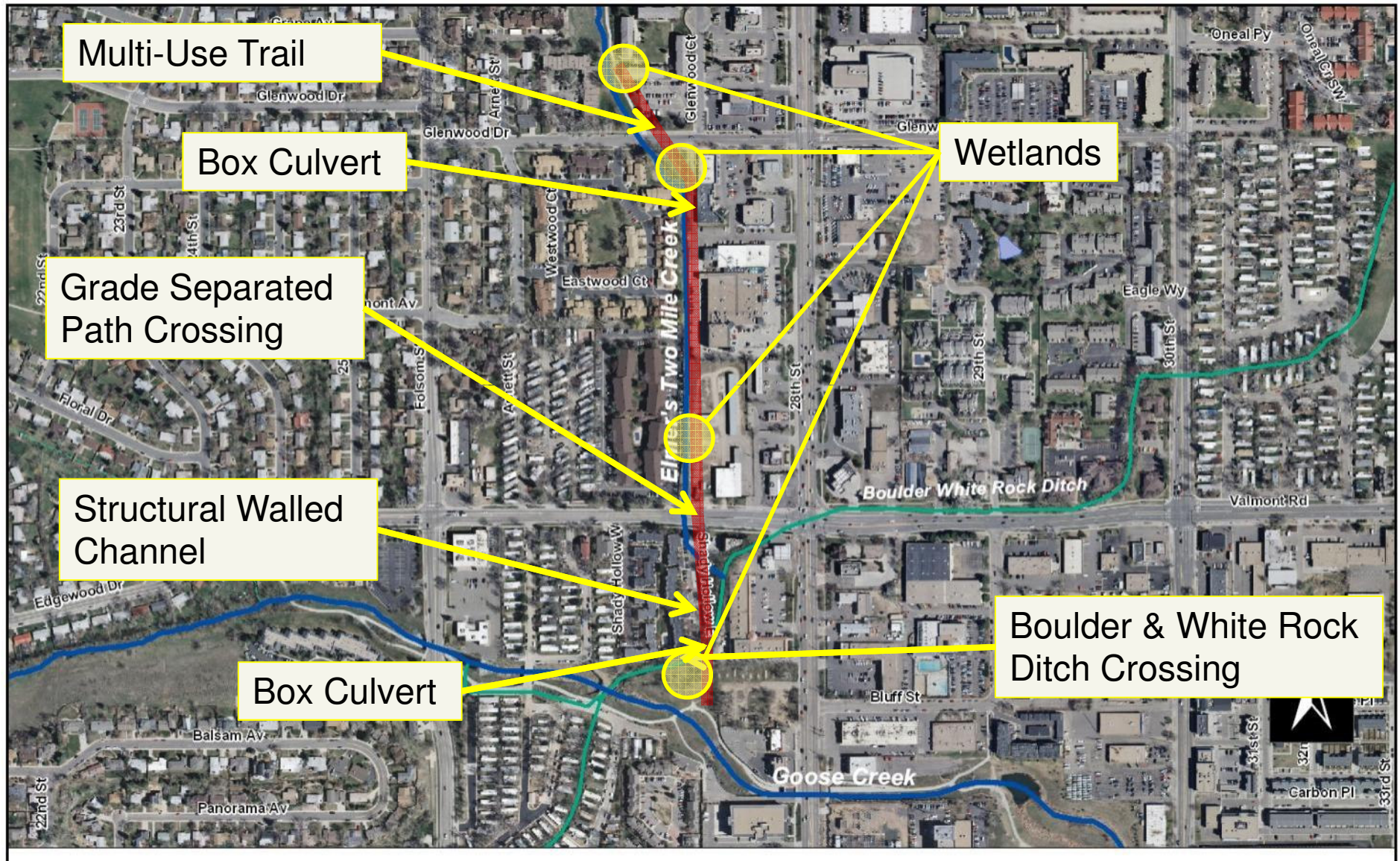
Greenways System



Existing 100-Year Floodplain



Major Project Components



Project Challenges

- Property Acquisition
- Business Interests
- Boulder & White Rock Ditch
- Wetland Mitigation
- State Historic Preservation Office
- Space Limitations
- Utilities

Easement Acquisition



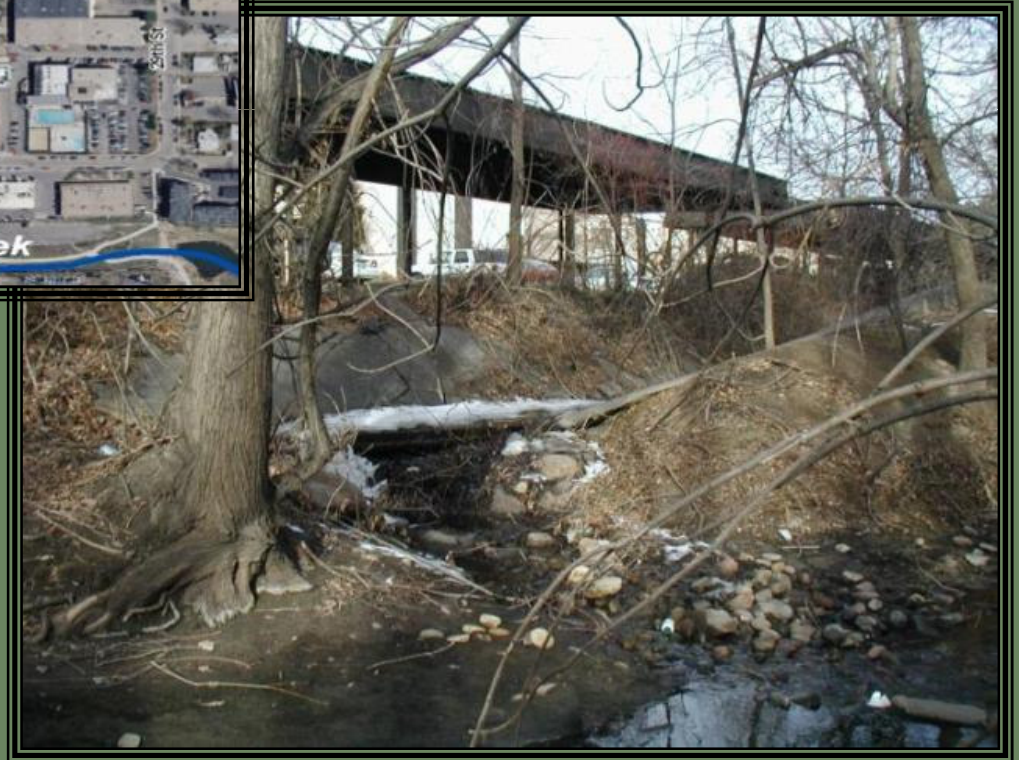
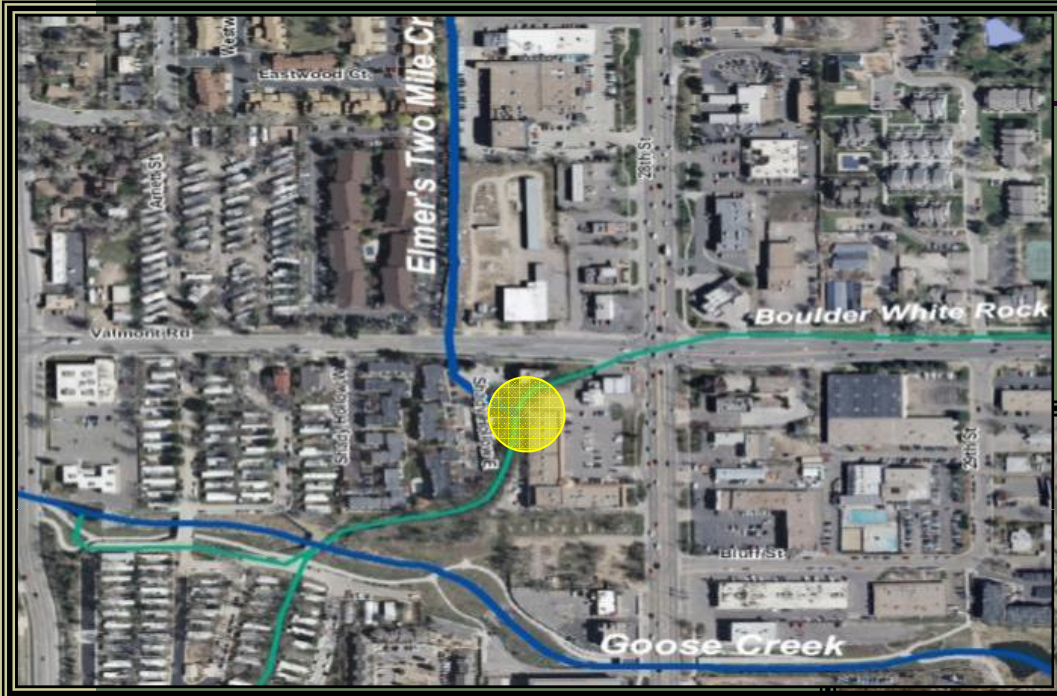
- 22 Easements on 9 properties

1	EWM	6	Eden East HOA
2	Palmos	7	Tebo
3	J&C Leasing	8	Willow Brook HOA
4	Shady Hollow HOA	9	Roosevelt
5	Rayback		

Business Interests



Boulder & White Rock Ditch



Wetlands Impacts

- USACE 404 Permit requirements
- City requirements
- Water rights (ditch diversion)



Wetlands Mitigation



Historic & Cultural Resources



2727 Valmont Road

This house, built in 1920, was once situated here on Valmont Road.

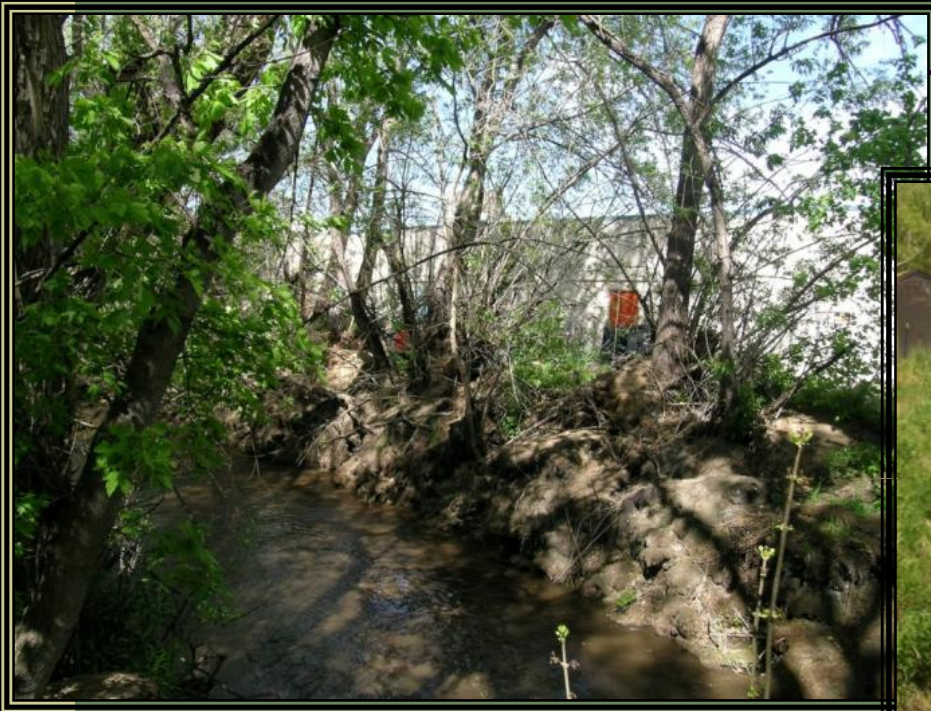
It was representative of vernacular frame construction.

Over the years, the condition of the house deteriorated and, as Boulder grew, the surroundings changed dramatically.

The house was removed in 2008 to make way for the new Elmers Two Mile multi-use path.



Historic & Cultural Resources



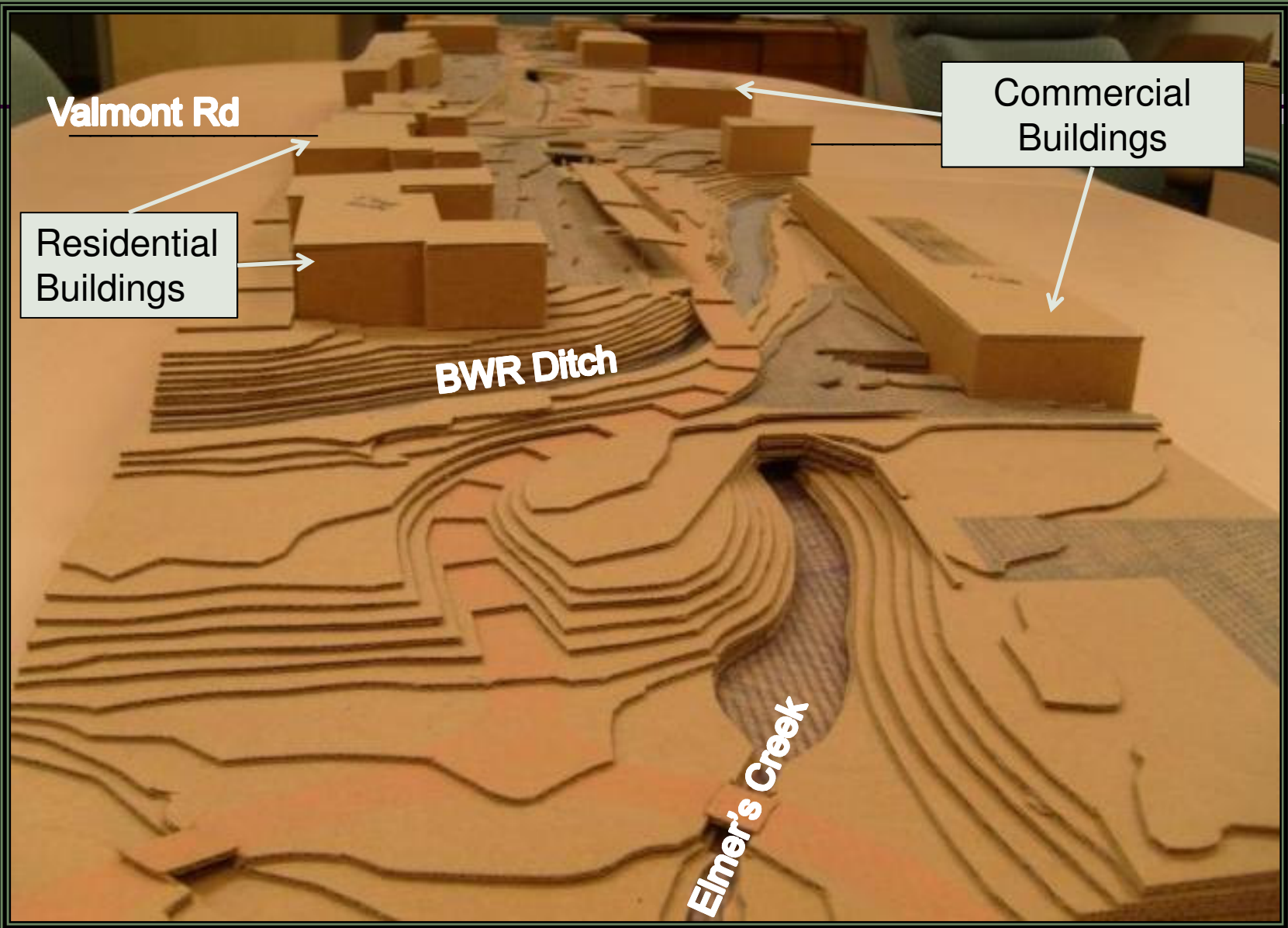
(Before)



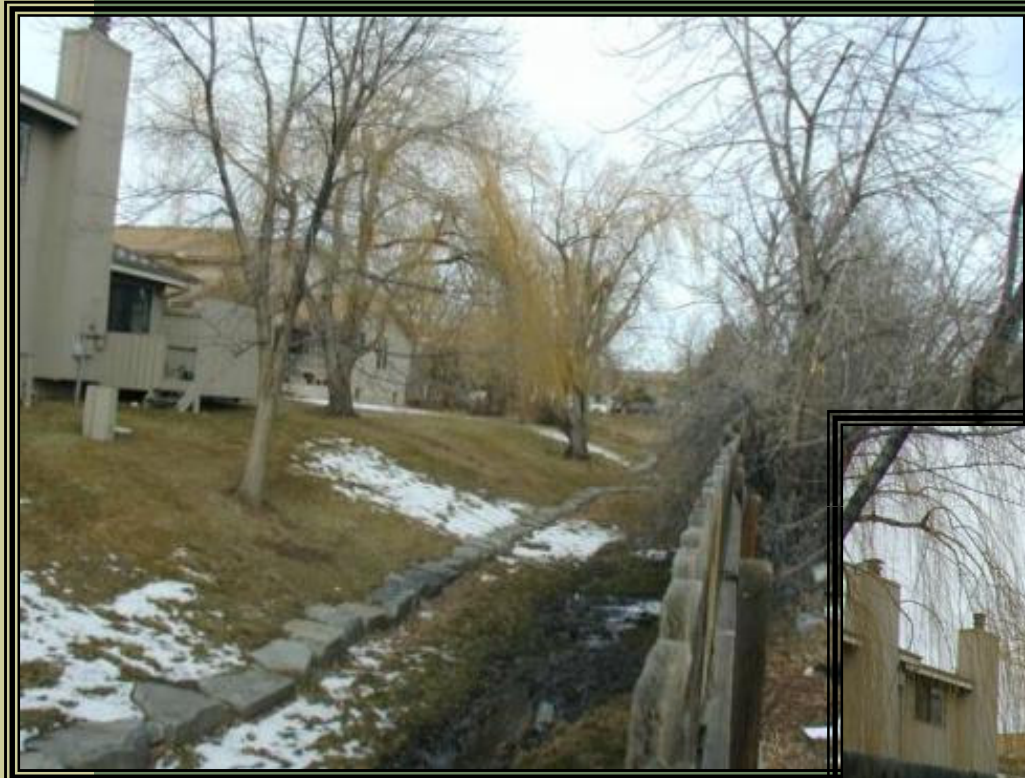
(After)

Boulder & White Rock Ditch

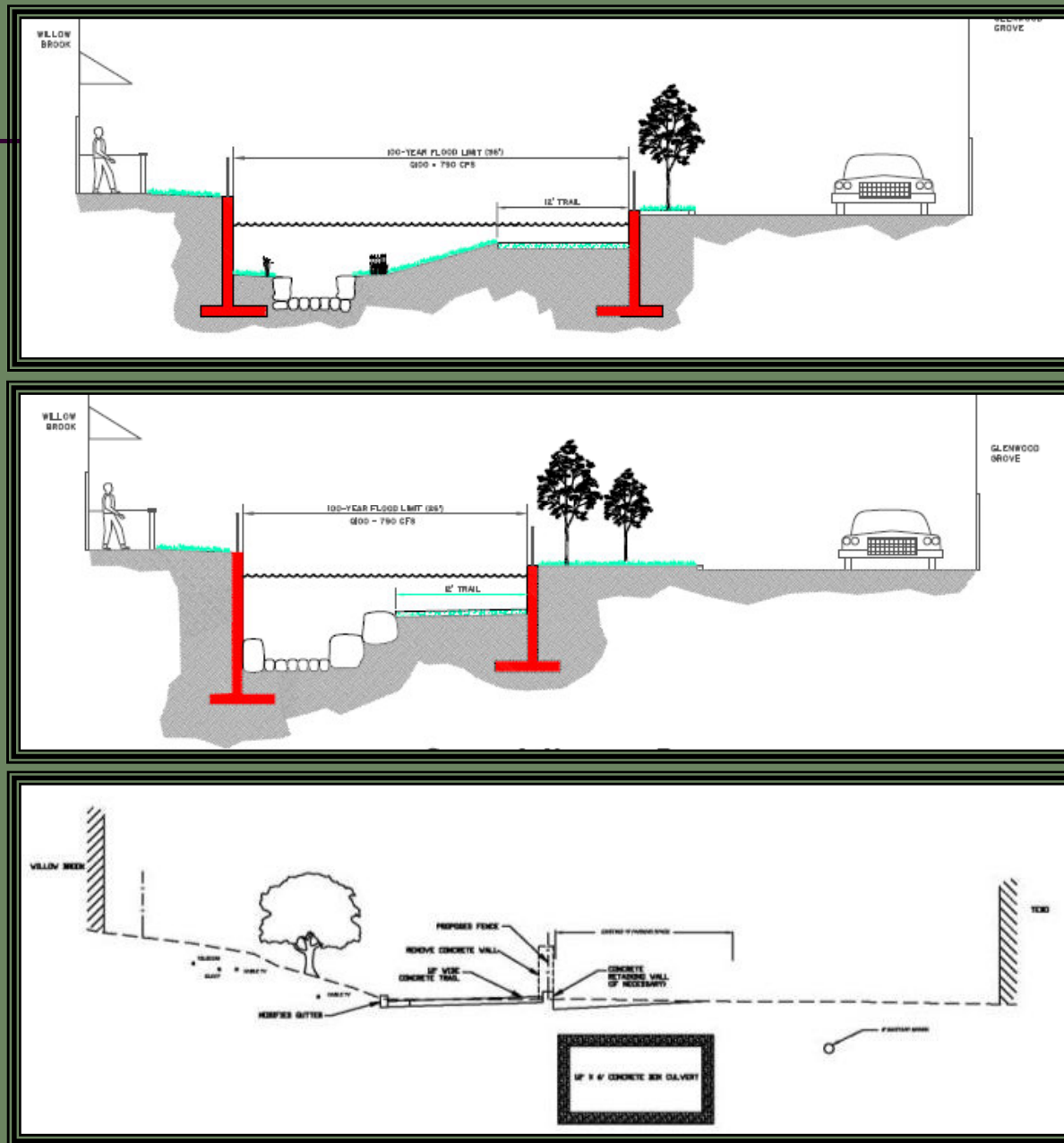
Space Limitations



Space Limitations



Space Limitations



Space Limitations



Space Limitations



Utilities

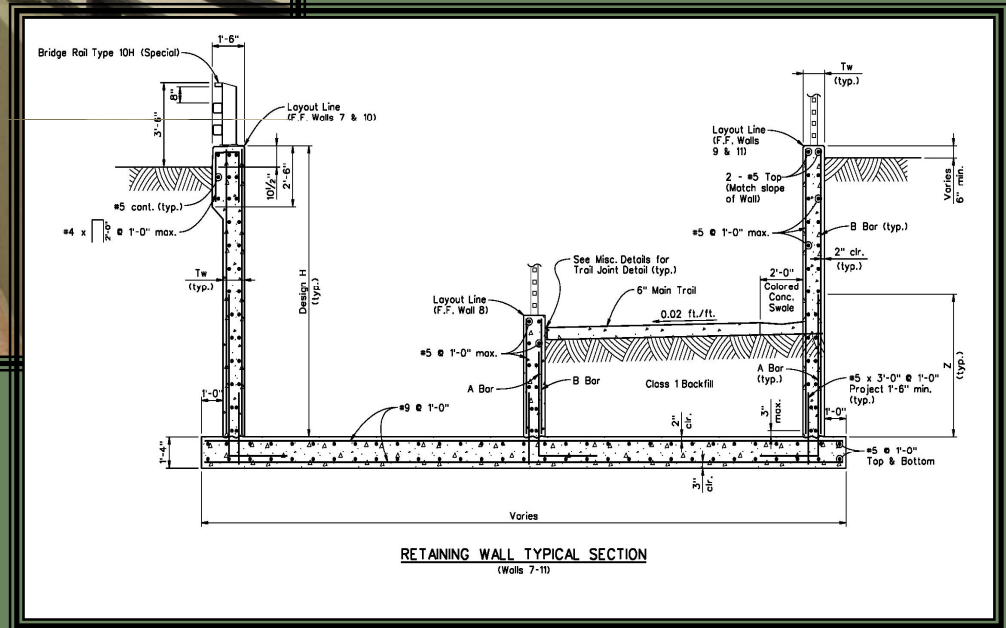
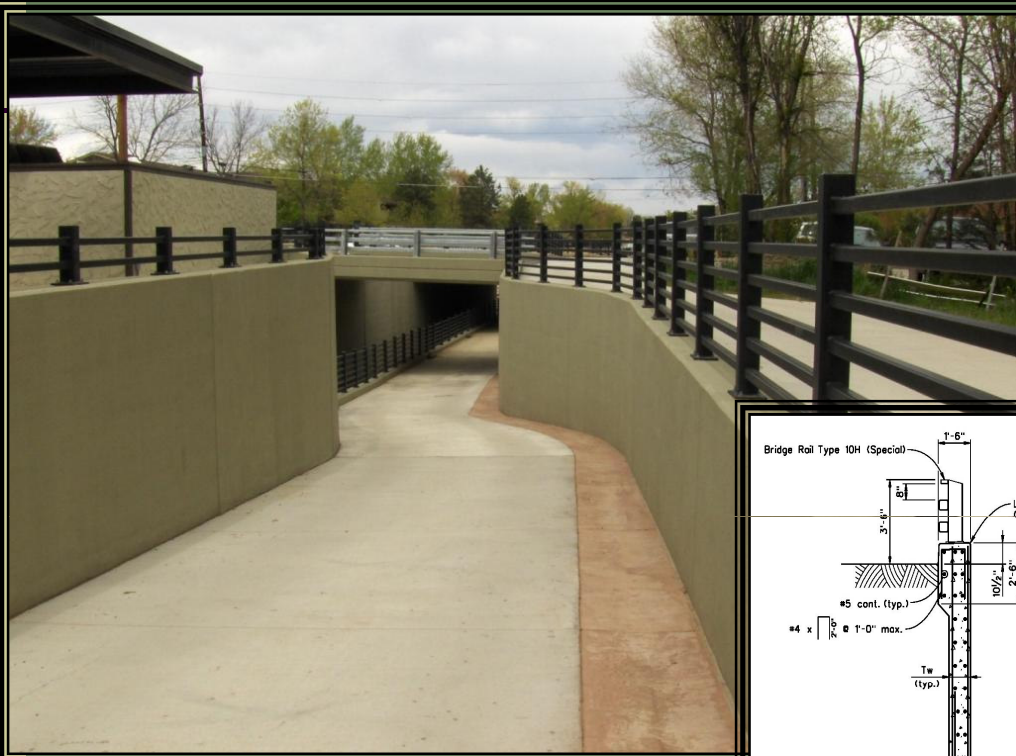


Creative Design Solutions



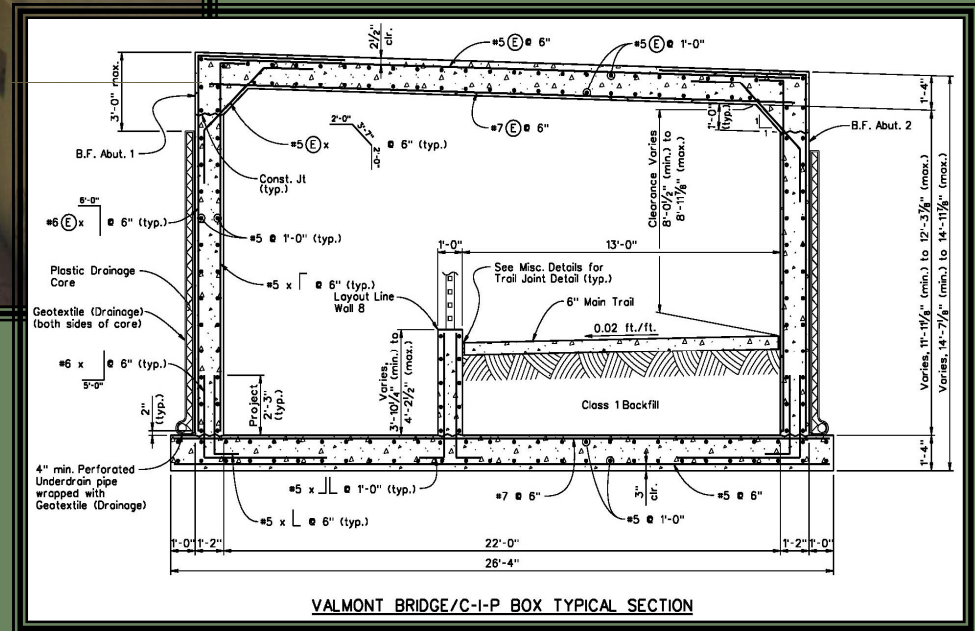
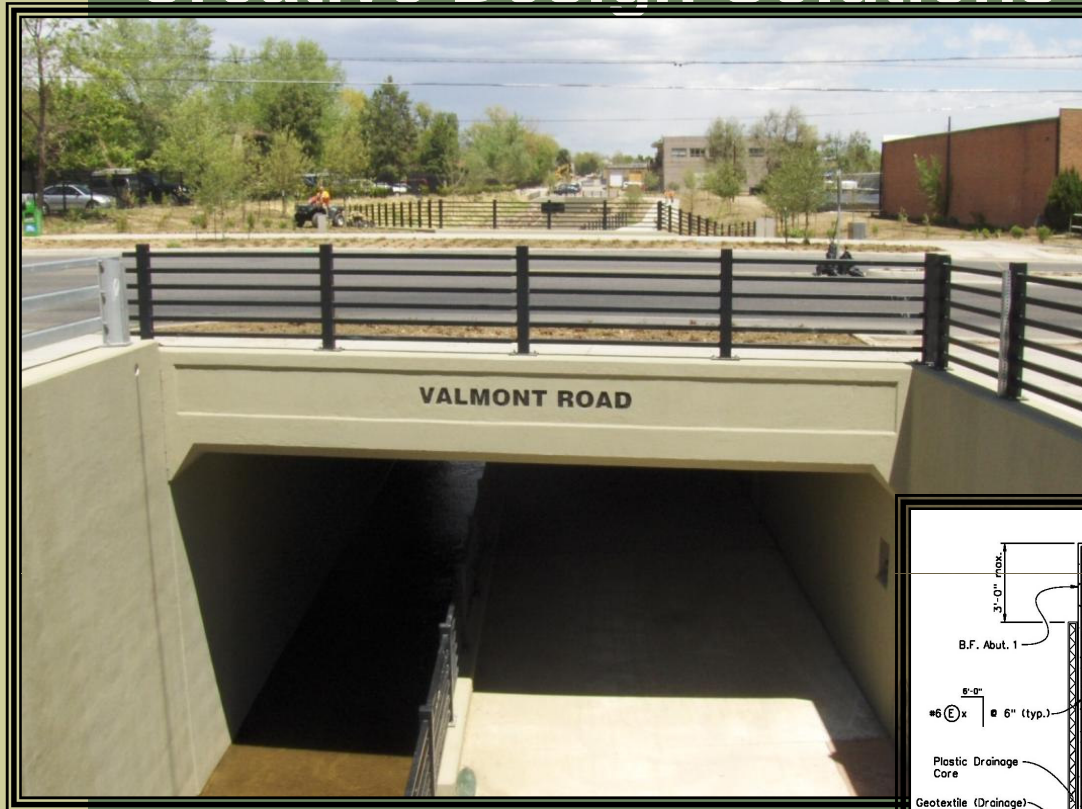
Narrow Right-of-Way for Construction

Creative Design Solutions



Walled Channel Sections

Creative Design Solutions



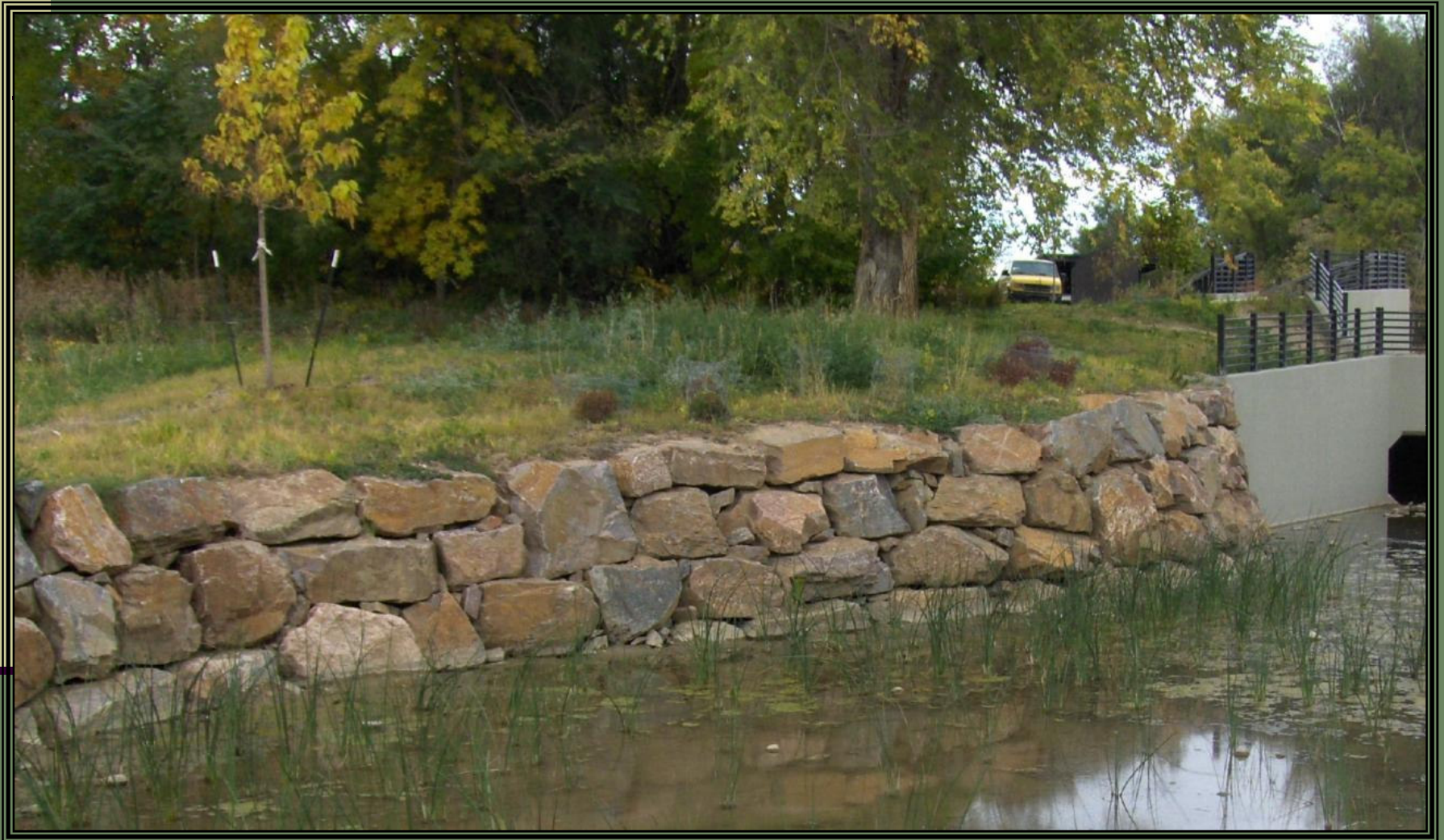
Bridge & Pedestrian Underpass

Creative Design Solutions



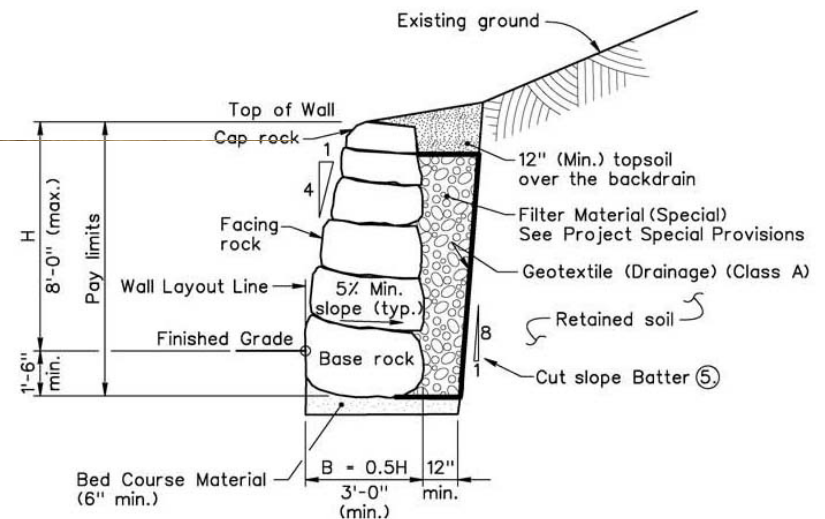
Space Limitations – Parking, Carport, Box Culvert, Bridge

Creative Design Solutions



Use of Boulder Walls to Minimize Concrete

Creative Design Solutions



**BOULDER WALL
TYPICAL SECTION**

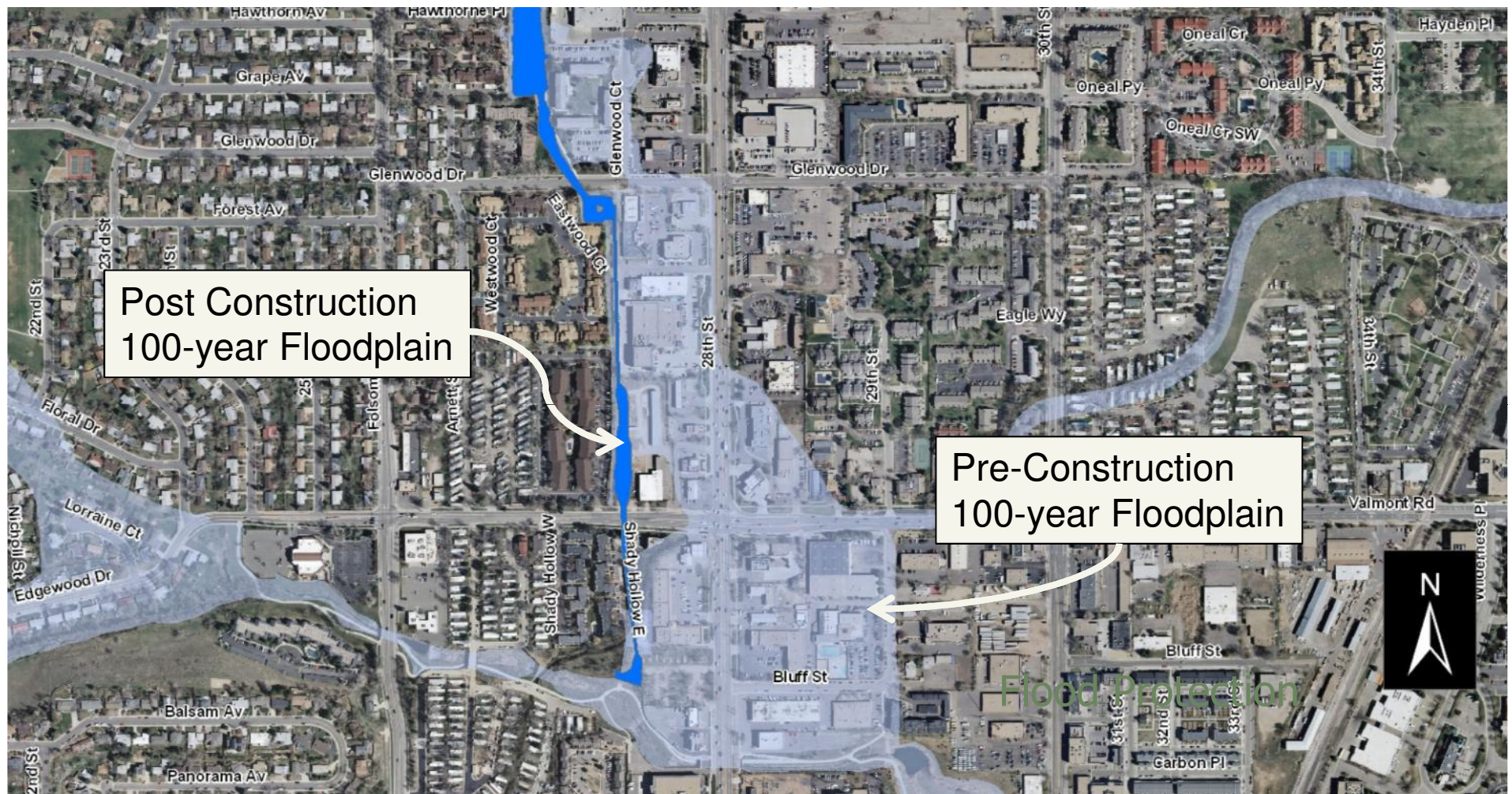
Construction of Boulder Walls

Multiple Objectives and Benefits

- The project provides:
 - Flood Protection
 - Separation of Elmer's Creek from BWR Ditch
 - Enhanced Wetlands and Water Quality
 - Off-street Path System
 - Neighborhood Enhancements
 - Local Drainage Improvements

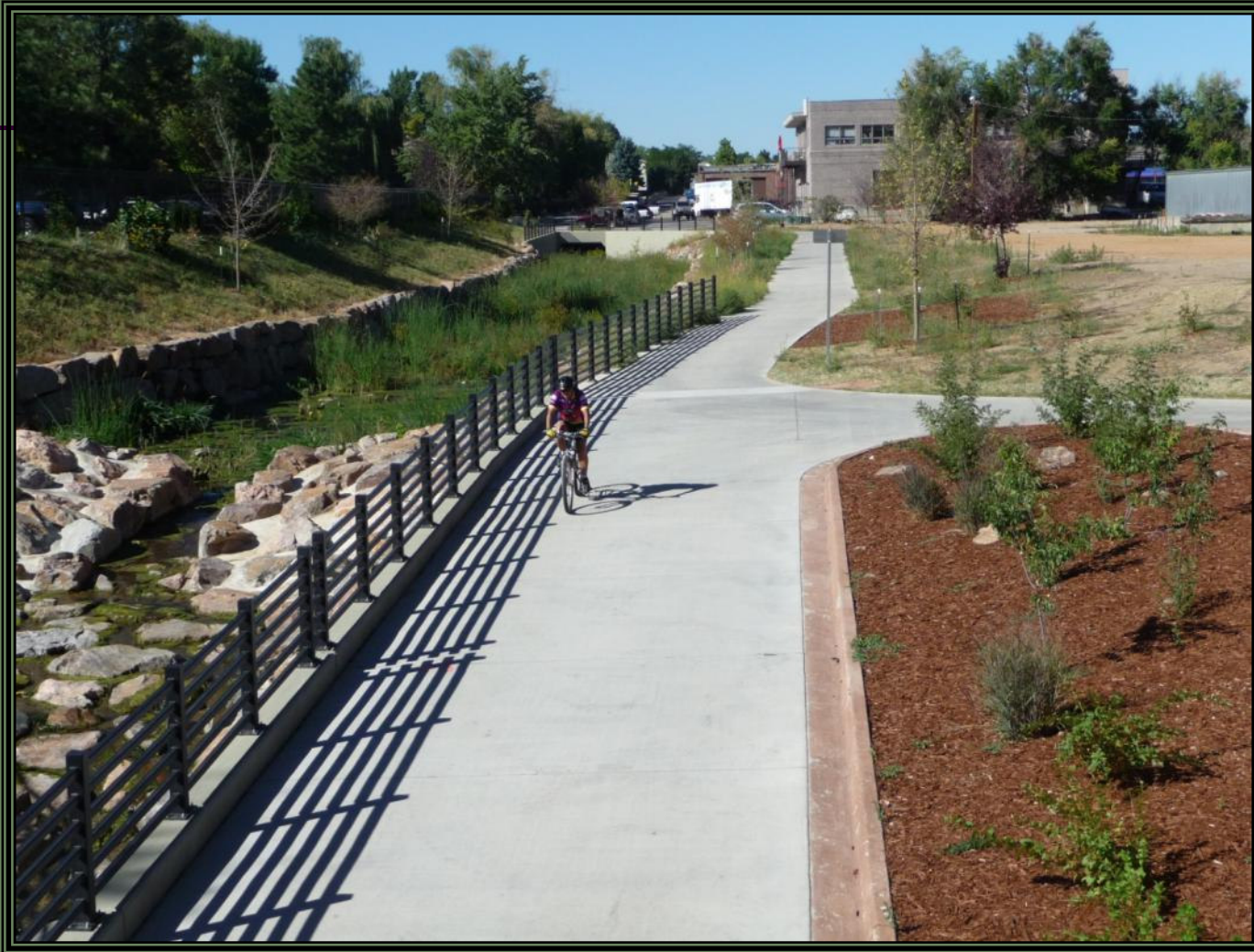


Enhancement of Public Health, Safety & Welfare



Flood Protection – removed over 50 structures from floodplain.

Enhancement of Public Health, Safety & Welfare



100-year Capacity Channel

Enhancement of Public Health, Safety & Welfare



Boulder & White Rock Ditch Crossing – Addresses Localized Flooding

Enhancement of Surrounding Environment



Created Wetlands/Riparian Habitat – North of Glenwood Dr.

Enhancement of Surrounding Environment



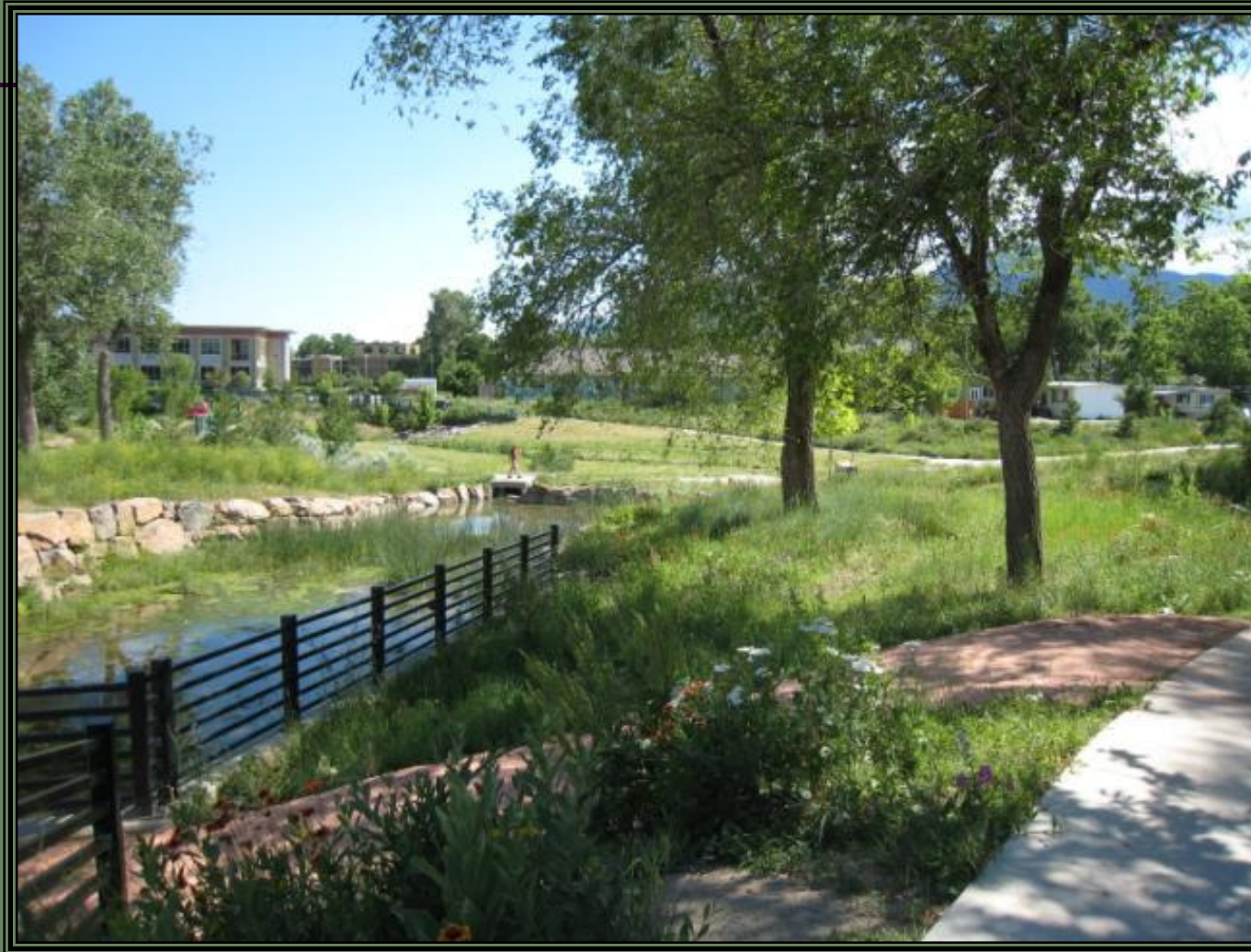
Created Wetlands/Riparian Habitat – South of Glenwood Dr.

Enhancement of Surrounding Environment



Created Wetlands/Riparian Habitat – North of Valmont Rd.

Enhancement of Surrounding Environment



Created Wetlands/Riparian Habitat – At Goose Creek

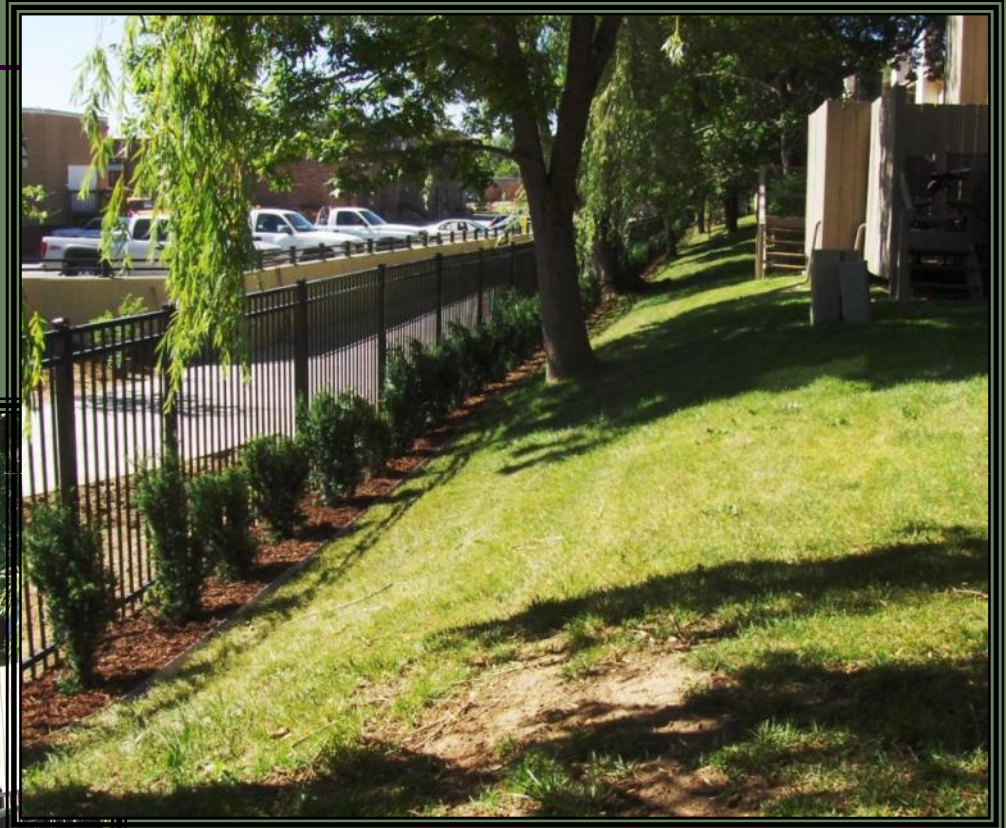
Multi-Use Recreational Trail System



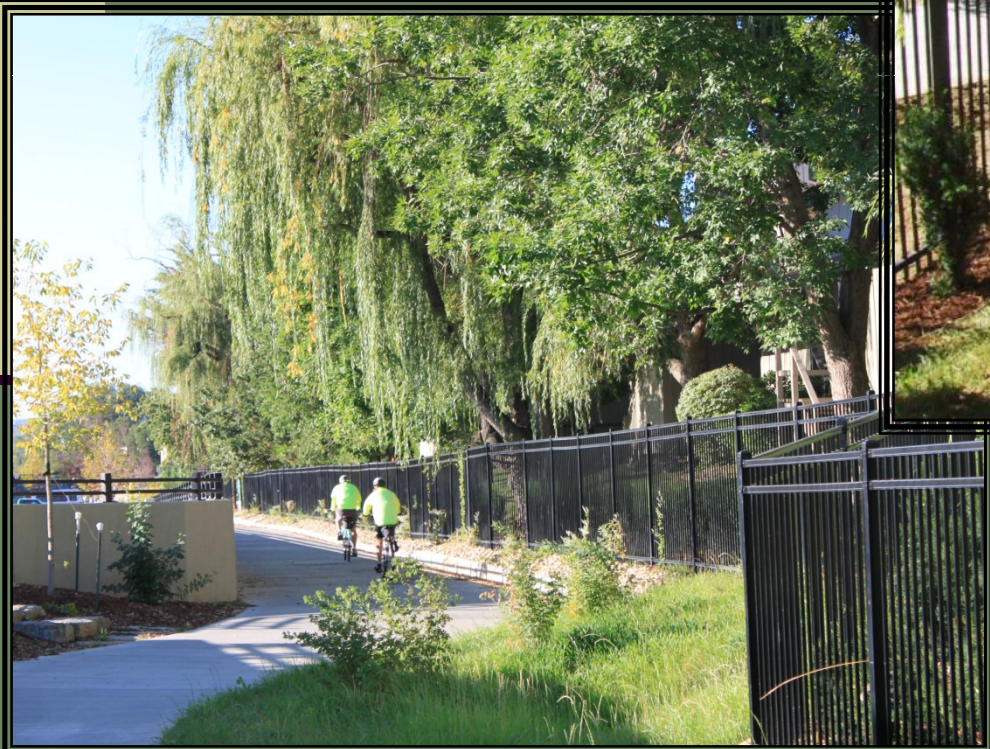
Alternative Modes of
Transportation, Grade Separated
Paths, Promotes Public Health
and Safety

Neighborhood Enhancements

Landscaping/Privacy
Fencing for Property
Owners

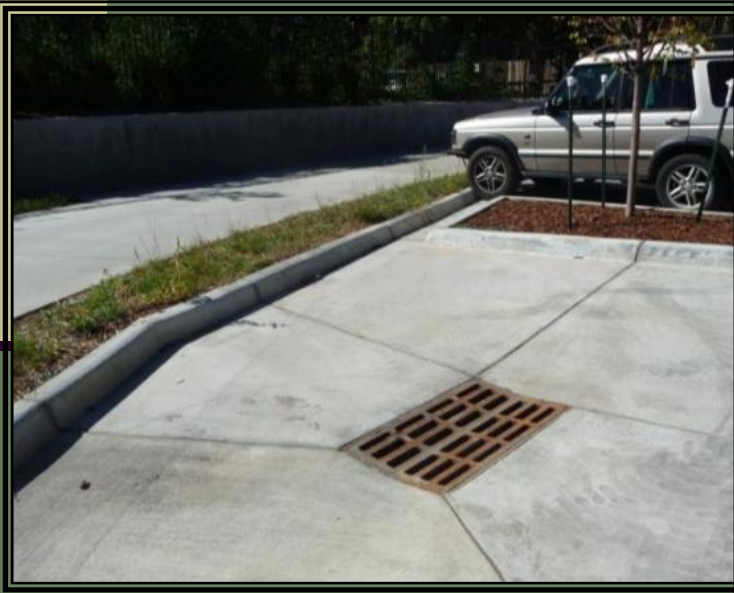
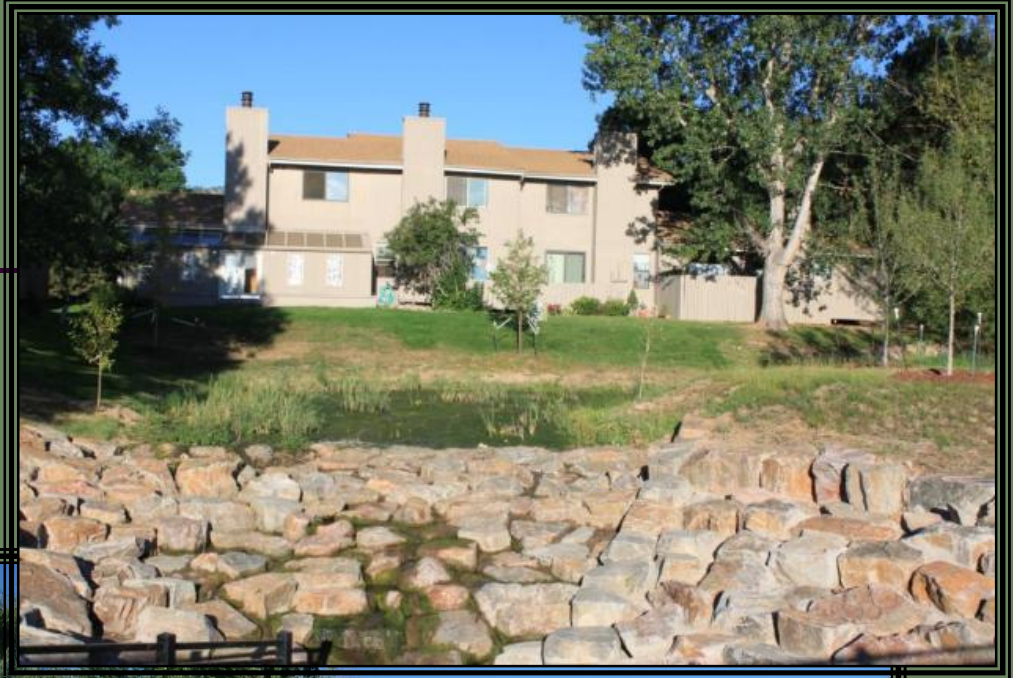


Preservation of Existing
Trees and Landscaping

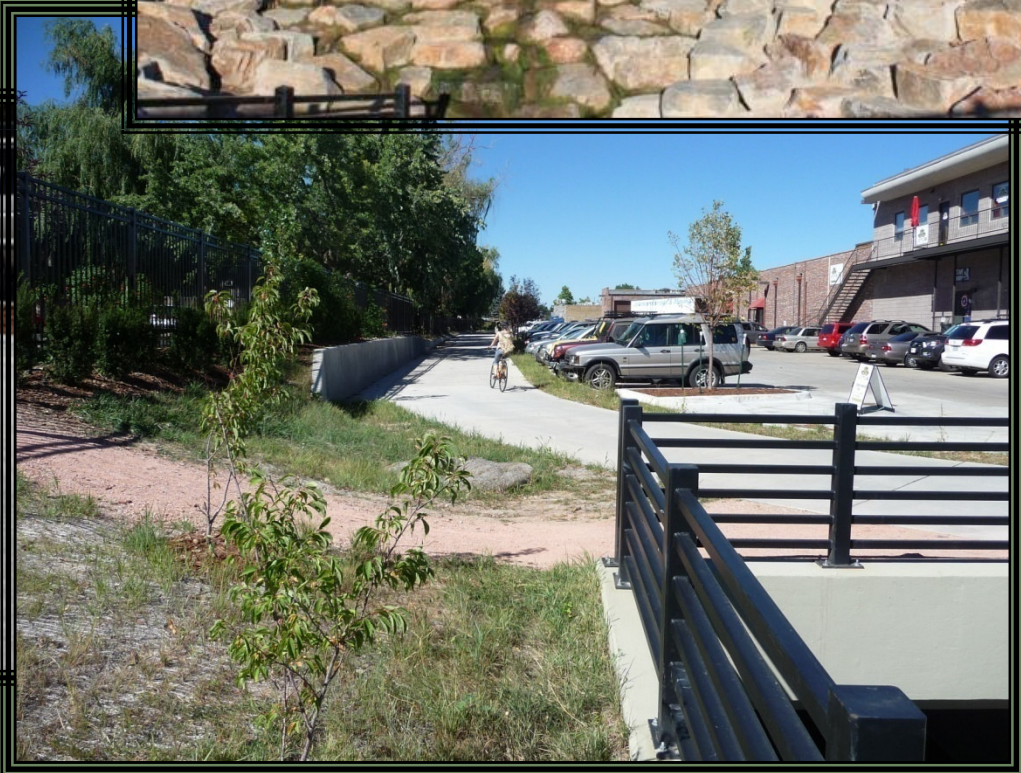


Additional Improvements

Neighborhood
and Parking
Enhancements



Local Drainage
Improvements



Before and After Comparison

(Before)

(After)



Rayback Plumbing

Before and After Comparison

(Before)

(After)

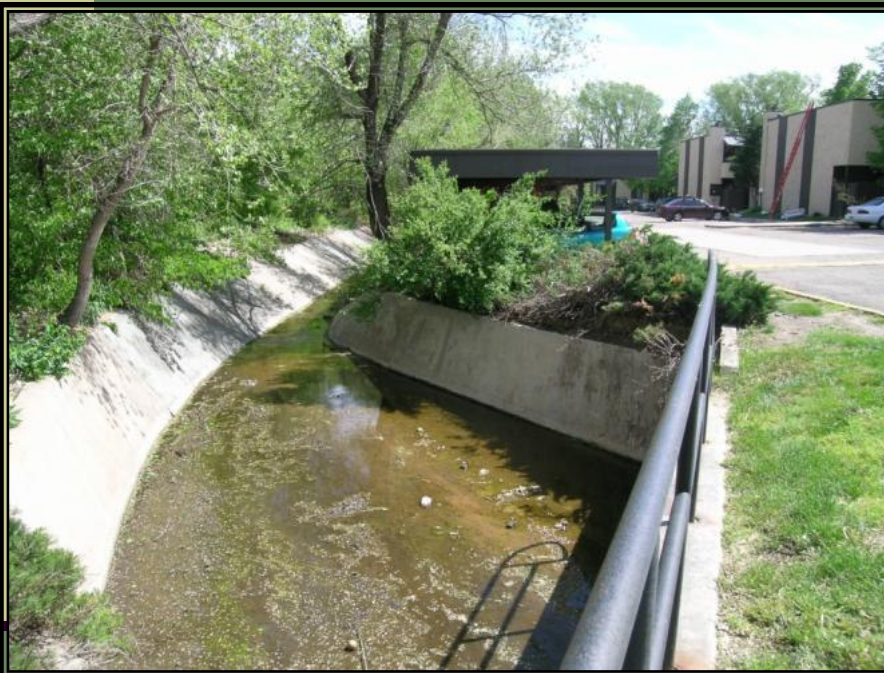


Upstream of Valmont Road

Before and After Comparison

(Before)

(After)



Shady Hollow Parking Lot

Before and After Comparison

(Before)

(After)



Confluence with Goose Creek

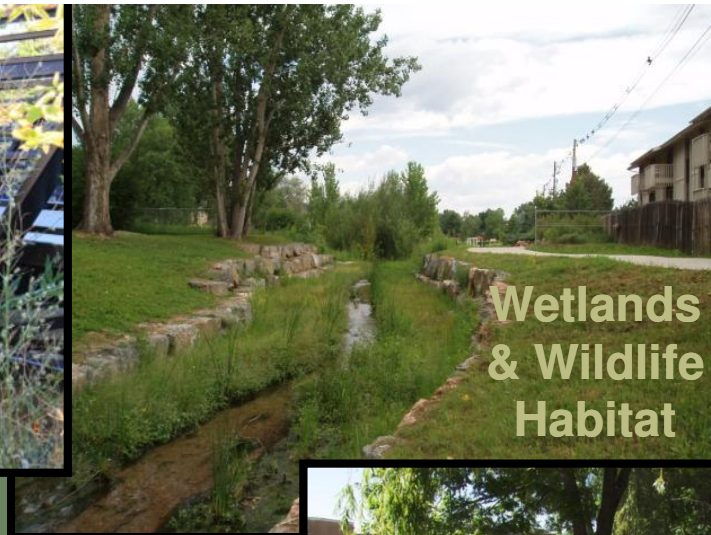
**Improved Access &
Use of Space**



**Preservation of
Cultural Resources**



**Wetlands
& Wildlife
Habitat**



**A Model for Other Communities:
Highly Constrained Urban Area
Multi-use Drainageway**



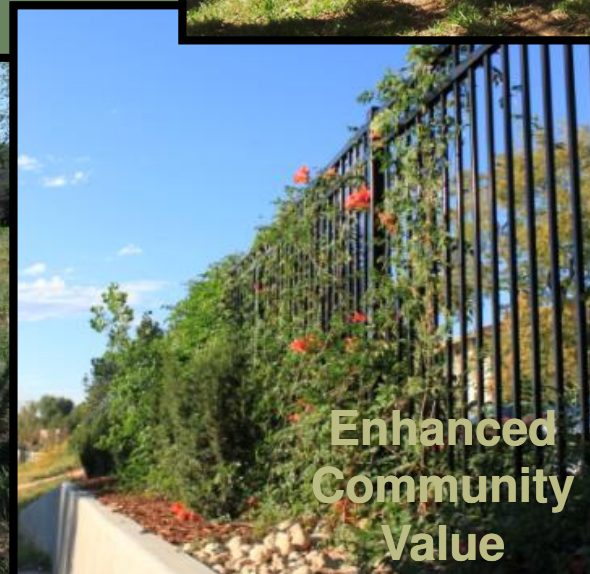
**Multi Use
Trails**



**Flood Protection &
Improved Public
Safety**



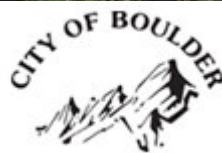
**Enhanced
Community
Value**



Questions & Answers



 **CENTENNIAL**
ENGINEERING, INC.



WHPacific