

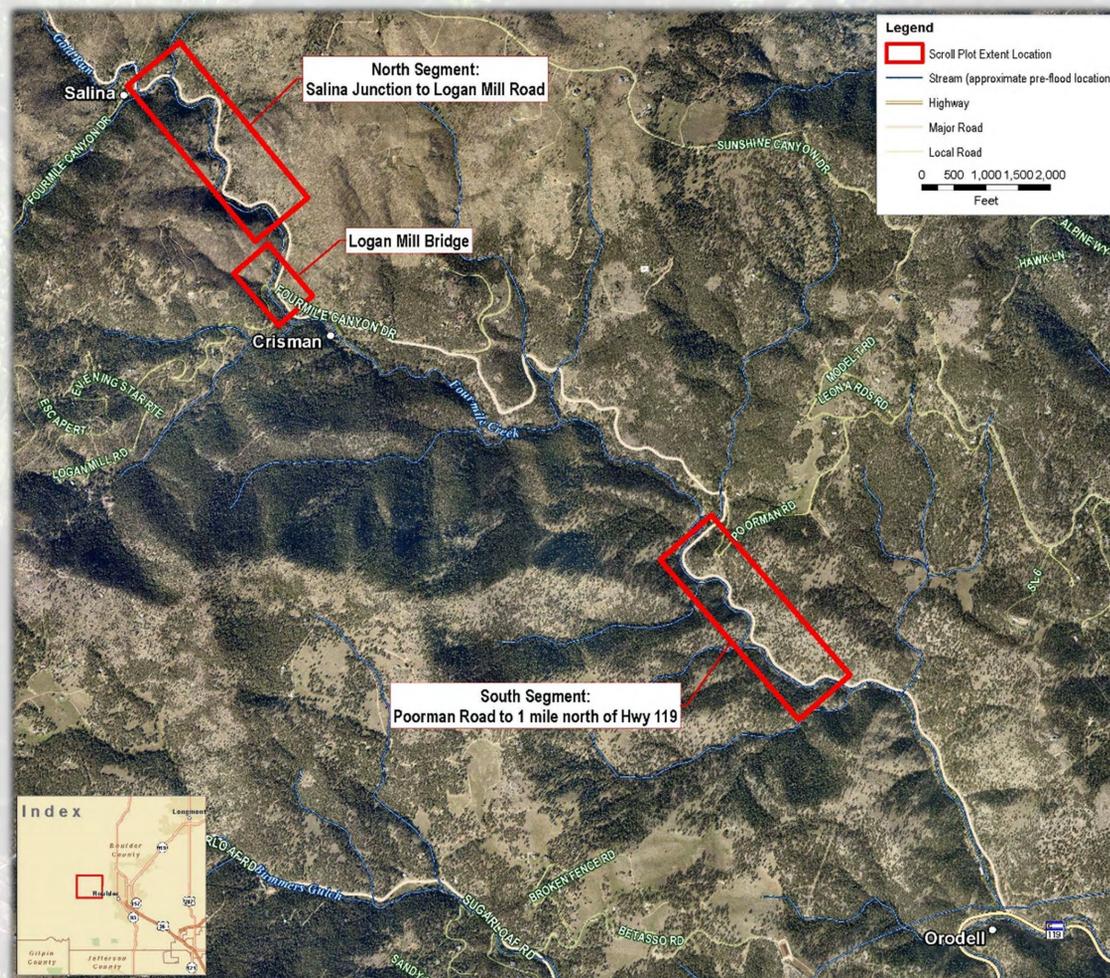
Project Background – Basic Overview

Overview:

- Permanent repairs to Fourmile Canyon Drive Damaged in 2013 Flood (Between Boulder Canyon Rd and Salina Junction)
- Two Segments (1.5 miles total project length):

North Segment

Approx. 0.3 miles north of Logan Mill Rd. to Salina Junction



South Segment

Approx. 1 mile north of Highway 119 to Poorman Rd.

- Current Status – 30% (Basic configuration, geometry, alignment, and overall features complete. Next steps: design details, final grading, and specific impacts)

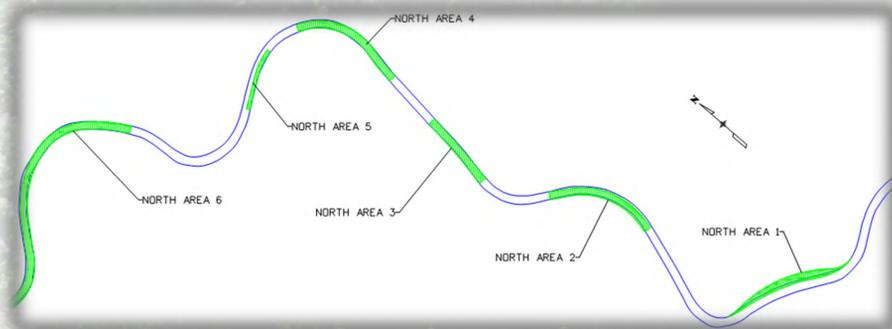
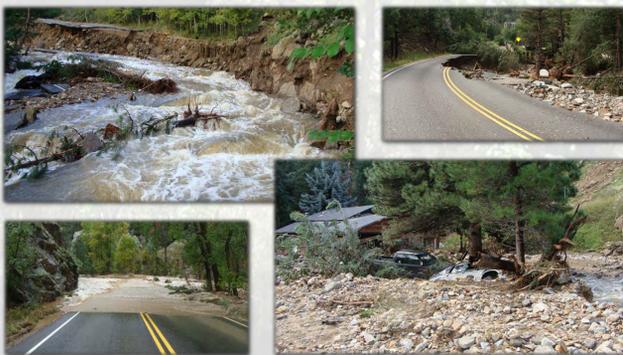
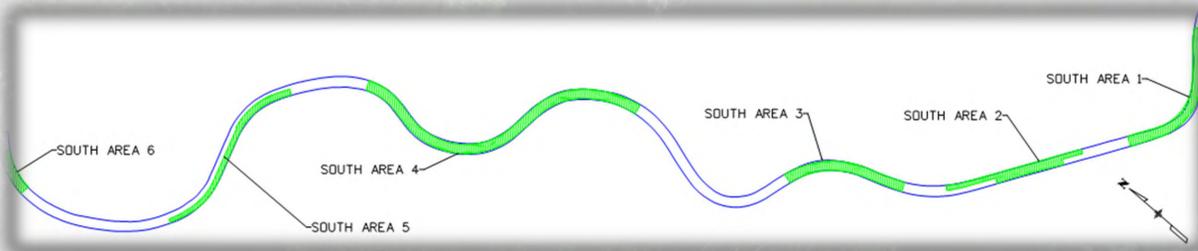
Project Features & Highlights:

- Reconstruction of the damaged roadway segments and uphill safety shoulder
- Restoration of the adjacent Fourmile Creek channel
- Drainage improvements
- Repair and stabilization of embankment slopes
- Refined design to minimize impacts (rocks, trees, ROW, etc.)

Project Background – Why Is It Needed?

Flood Damage:

- Flood damage occurred in two distinct areas



Why Re-Build?:

- Durability: the repairs to-date have been emergency repairs (already failing)
- Safety: there are many areas that were never repaired and are safety hazards
- Resiliency: its critical to improve local drainage and restore the stability, ecology, and biology of the stream in order to protect the roadway

Other Key Tenets:

- Work with individual property owners to understand & address their concerns
- Meet all regulatory requirements
- Match alignment to existing roadway & minimize impacts as much as possible
- Provide an uphill shoulder in accordance with the Boulder County Transportation Master Plan (2012)

Project Timeline

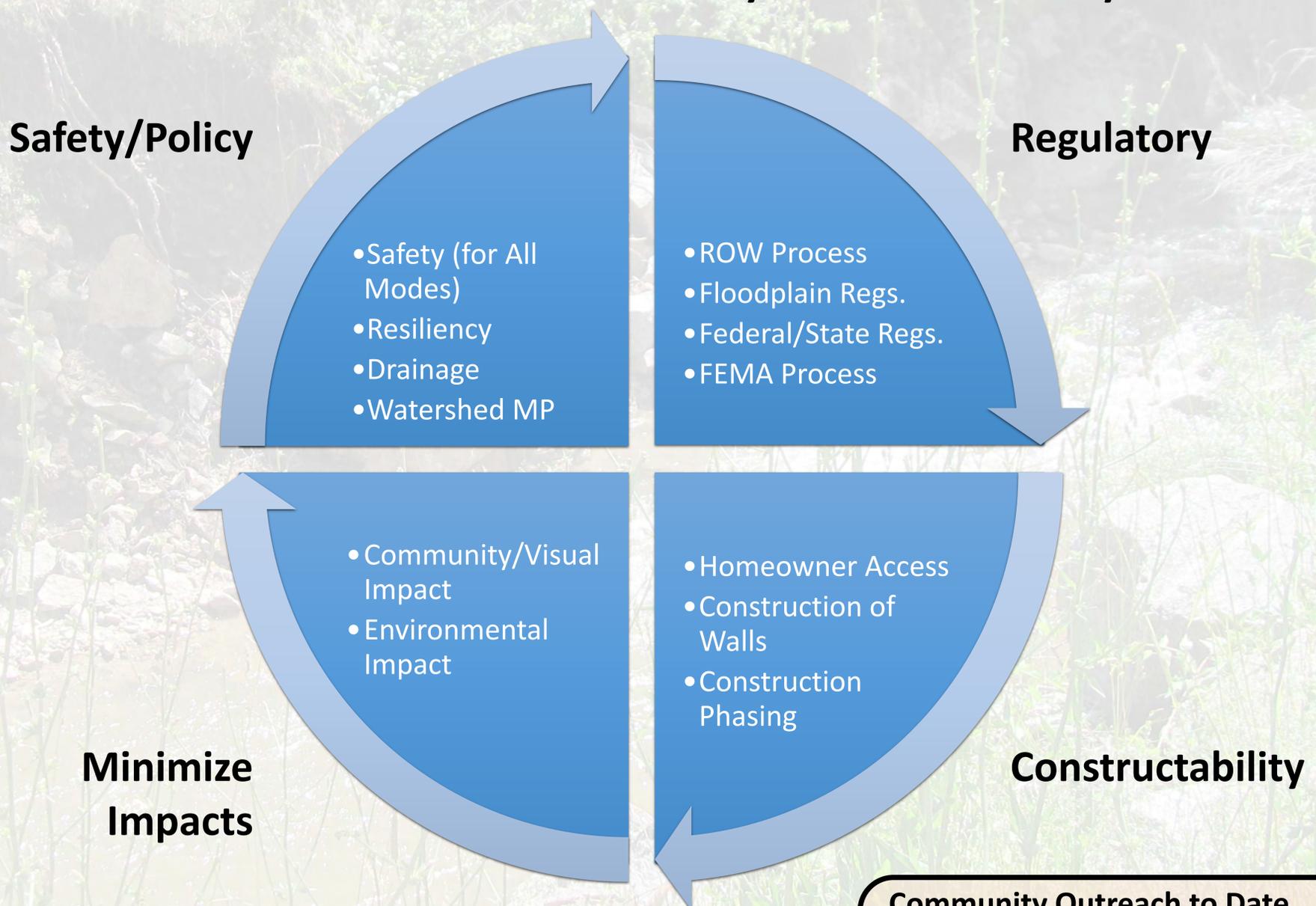


Design Process

How the design arrived to this point:

- A comprehensive engineering analysis established critical design features based upon the project goals and constraints
- Significant community and individual property owner input helped to identify priorities and highlight concerns
- The design was re-evaluated several times using an iterative process; each time decisions were re-evaluated using outlined criteria and constraints

Boulder County is working hard to find the right balance in order to reach the best roadway solutions for everyone

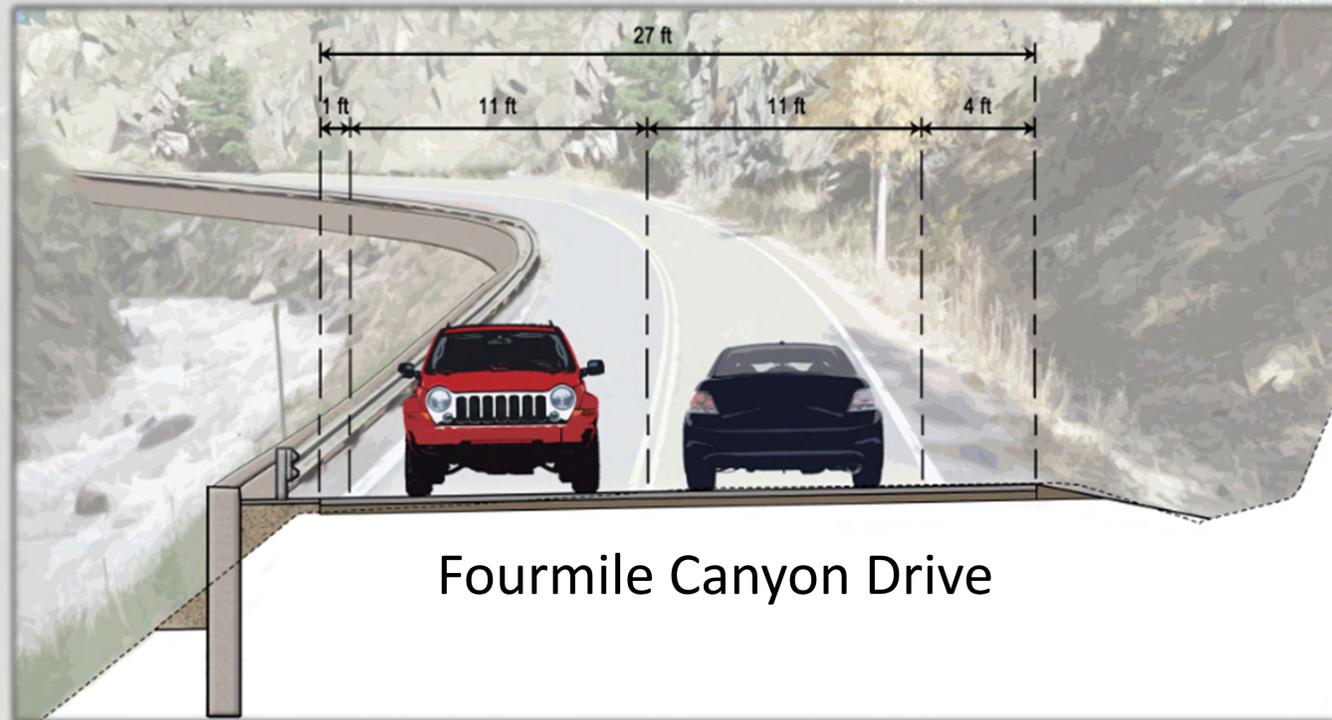


Community Outreach to Date

- 5 public meetings
- 50+ individual meetings
- Hundreds of phone calls & emails

Roadway Section

Future Roadway Section at Reconstruction Areas



- 11' travel lanes
- 4' uphill shoulder
- Uphill drainage ditches increased for 5-yr flood min.
- Clear zones improved on both shoulders
- Increased to accommodate rockfall catchment area
- Walls & guardrail when needed to minimize impacts
- Consistency with the Watershed Master Plan

This design leads to:

- **Enhanced safety for all users** (uphill shoulder, pedestrian refuge, clear zones, rockfall catchment)
- **Improved resiliency** (system-wide drainage upgrade, stream restoration, slope stabilization)
- **Minimal impacts** (rock outcrops avoided, tree protection, floodplains maintained, creek/road blended)

Retaining Wall Aesthetics

Photo Simulations – Before & After



Environmental Planning and Historic Preservation (EHP) Process

This project is federally funded – resource evaluations and permitting follows National Environmental Policy Act (NEPA)

Waters of the U.S., including Wetlands

- Permits to work within Fourmile Creek will be obtained through the U.S. Army Corps of Engineers (USACE) under provisions of Section 404 of the Clean Water Act
- Permitting to be completed under a Nationwide Permit (NWP) 14 for roadway improvements and NWP 27 or 37 for stream improvements

Work within the floodplain

- Floodplain Development Permit through Boulder County

Riparian and Tree Impacts, Senate Bill 40 (SB 40)

- Certification through Colorado Parks and Wildlife (CPW)

Wildlife and Migratory Birds

- Project coordinated with CPW to identify concerns regarding use of walls and guardrail
- CPW has stated there are no CPW designated migration corridors or patterns within the project and they have no concerns for impacts to wildlife
- Nesting survey to be performed prior to construction for verification of no impacts

Endangered Species, Endangered Species Act

- Coordination to obtain clearance with U.S. Fish & Wildlife Service (USFWS) for potential impacts to suitable habitat for the Preble's meadow jumping mouse, Colorado butterfly plant, and Ute ladies'-tresses
- Findings – not likely to adversely affect

Historic Resources, National Historic Preservation Act

- Coordination with Colorado State Historic Preservation Office (SHPO) on archaeological and historical findings
- No impacts were found

Hazardous Materials

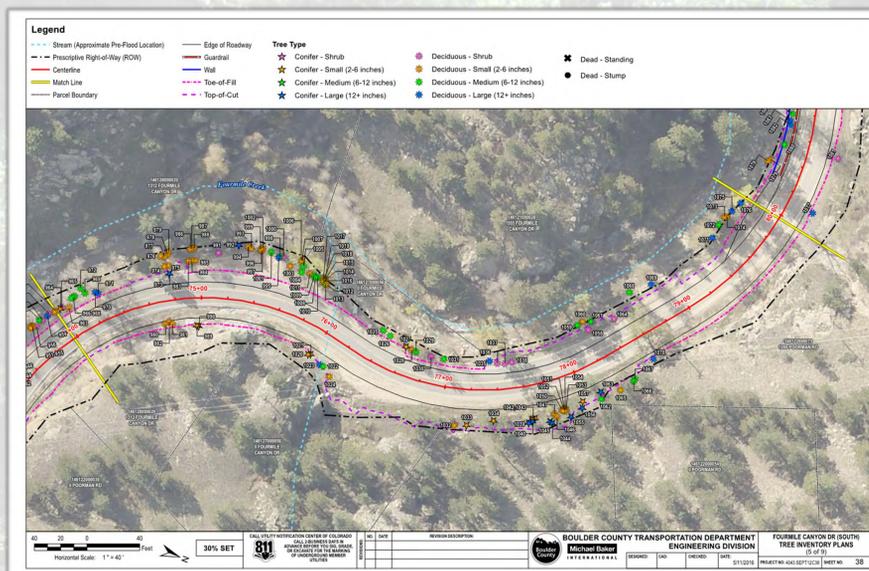
- There is a legacy of mining in the general vicinity of this project
- No potential sources of hazardous materials were observed during field visits
- Significant processing or occurrences of mine wastes are not expected



Protection of Trees and Vegetation

Plan to Avoid/Minimize Tree & Vegetation Impacts:

- Detailed tree inventory, impacts considered for each tree
- Project will direct contractors to minimize impacts
- Property owners provide input for protecting important trees

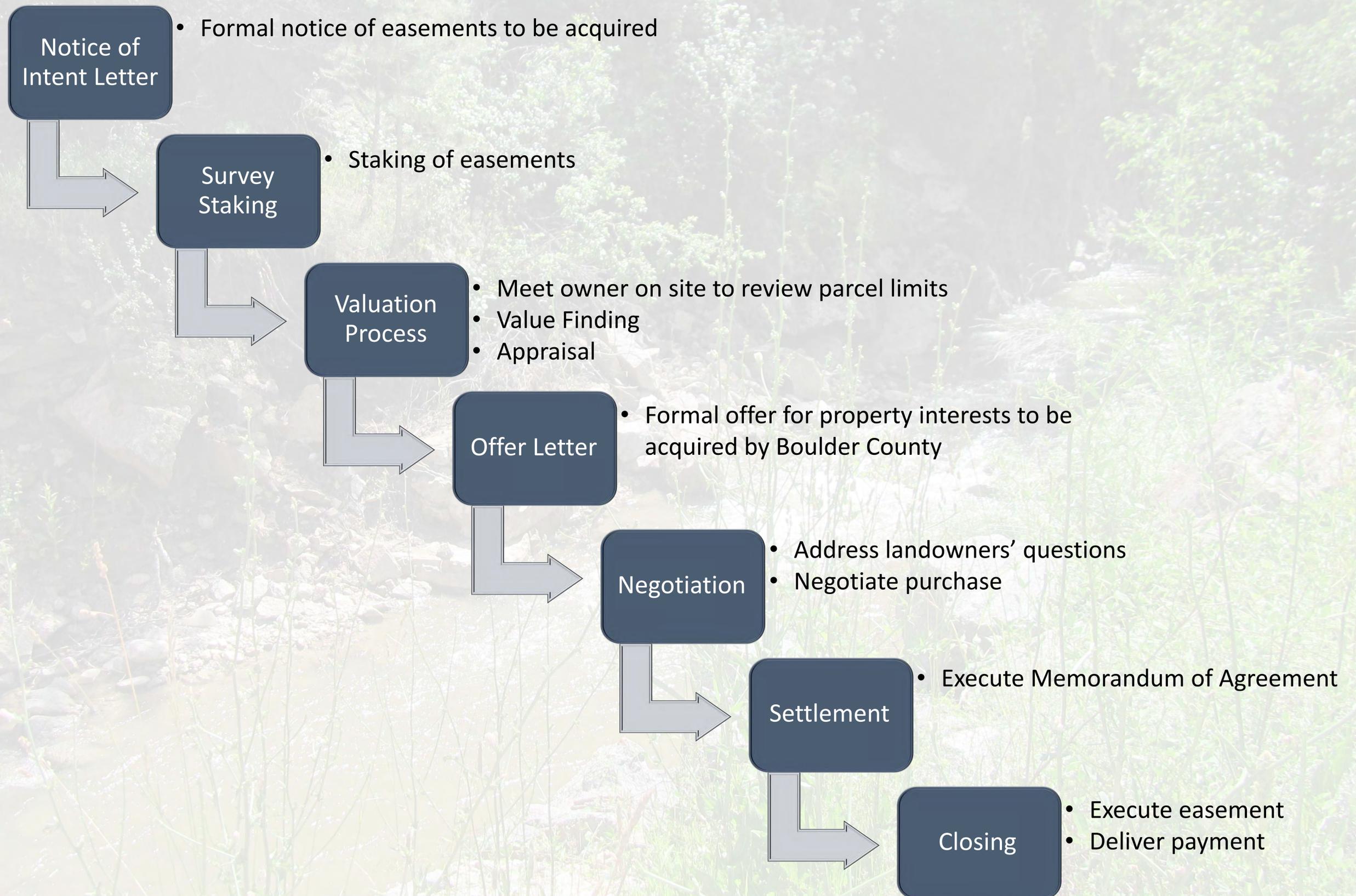


Map ID	Type	Size	Easting	Northing	ROW	Riparian	Removal	Potential Removal	Protect in Place
1001	Deciduous	Small	4819.82	25402.38	Inside				
1002	Deciduous	Small	4819.83	25402.86	Inside				
1003	Deciduous	Small	4819.50	25402.21	Inside				
1004	Deciduous	Small	4819.29	25402.21	Inside				
1005	Conifer	Large	4819.92	25402.24	Inside				
1006	Conifer	Large	4819.80	25402.21	Inside				
1007	Conifer	Small	4819.60	25402.21	Inside				
1008	Shrub - Deciduous	0'	4819.76	25402.25	Inside				
1009	Deciduous	Medium	4819.21	25402.08	Outside				
1010	Deciduous	Small	4818.37	25402.88	Outside				
1011	Deciduous	Medium	4818.03	25402.77	Inside				
1012	Deciduous	Medium	4818.36	25403.81	Inside				
1013	Conifer	Large	4818.32	25404.58	Inside				
1014	Shrub - Deciduous	0'	4818.33	25402.58	Inside				
1015	Deciduous	Small	4818.87	25404.83	Outside				
1016	Deciduous	Medium	4817.71	25402.82	Outside				
1017	Deciduous	Medium	4817.32	25402.45	Outside				
1018	Deciduous	Medium	4815.15	25403.49	Outside				
1019	Deciduous	Large	4810.21	25408.79	Outside				
1020	Deciduous	Large	4810.56	25408.89	Inside				
1021	Deciduous	Large	4810.45	25408.15	Outside				
1022	Deciduous	Medium	4812.32	25408.31	Outside				
1023	Deciduous	Small	4812.89	25403.40	Outside				
1024	Deciduous	Small	4812.78	25403.89	Outside				
1025	Deciduous	Small	4812.50	25407.09	Outside				
1026	Deciduous	Large	4812.40	25402.32	Inside				
1027	Deciduous	Large	4812.39	25418.17	Inside				
1028	Deciduous	Small	4810.89	25408.67	Outside				
1029	Deciduous	Small	4810.80	25407.05	Inside				
1030	Deciduous	Medium	4810.47	25407.25	Inside				
1031	Shrub - Deciduous	0'	4810.20	25418.41	Inside				
1032	Deciduous	Large	4810.82	25408.39	Inside				
1033	Deciduous	Large	4810.78	25408.87	Inside				
1034	Deciduous	Medium	4810.41	25404.77	Inside				
1035	Deciduous	Medium	4810.41	25402.22	Outside				
1036	Deciduous	Small	4812.20	25412.33	Inside				
1037	Deciduous	Small	4810.21	25411.57	Inside				
1038	Dead - Standing	0'	4812.20	25408.82	Outside				
1039	Deciduous	Medium	4810.31	25403.03	Outside				
1040	Deciduous	Medium	4810.27	25401.06	Outside				
1041	Deciduous	Medium	4811.09	25405.20	Inside				
1042	Deciduous	Medium	4811.74	25405.80	Inside				
1043	Shrub - Deciduous	0'	4810.78	25408.48	Outside				
1044	Deciduous	Medium	4810.88	25406.85	Inside				
1045	Shrub - Deciduous	0'	4810.87	25408.17	Inside				
1046	Deciduous	Large	4812.21	25406.01	Inside				
1047	Deciduous	Small	4810.42	25404.15	Inside				
1048	Deciduous	Small	4810.44	25402.42	Inside				
1049	Deciduous	Small	4810.38	25402.21	Inside				
1050	Deciduous	Small	4810.31	25402.29	Inside				

Tree Replacement Program (Still Being Refined):

- Any dead trees removed will not be replaced
- Live trees removed from the riparian areas within public or private ROW will be replaced at 1:1, no requirements on location of new tree plantings
- Live trees removed from the non-riparian areas within public ROW will be replaced at 1:1, no requirements on location of new tree plantings
- Live trees removed from the non-riparian areas in private property will be financially reimbursed through the ROW negotiation process
- Any trees to be replaced should be of similar type (i.e. deciduous or coniferous)
- Tree replacements will be small caliper (2"-3" in diameter)

Right-of-Way Process



Federal Acquisition Guidelines (Uniform Act)

Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 (Uniform Act)

What is the Uniform Act?

- It is a Federal law that establishes the minimum standards for federally funded programs and projects that require the acquisition of real property.

The main objectives of the Uniform Act:

- To provide uniform, fair and equitable treatment of persons whose real property is acquired.
- To encourage and expedite acquisition by agreement and without coercion.

Types of property acquisition needed for this project:

- **Temporary Easements (TCE)**

Generally used for construction work for a limited amount of time. Area is rented from property owner to allow access while construction is commenced. Once the construction is finished, the temporary easement will expire.

- **Permanent Easements (PE)**

A nonpossessory interest in another person's land. An interest that allows the holder the right to a specific use to the property that they do not own or possess.

Example reasons for a PE: culvert cleanout, repair of slope-erosion, riprap adjustments, etc.

Creek Restoration

What is Creek Restoration?

- Design of a natural stable channel in current watershed setting
- Self regulating
- Establishes the physical, chemical and biological functions

How do we do Creek Restoration?

- Quantify the degree of impairment
- Formulate design based on scientific methods
- Restore biology/ecology/geomorphology/hydrology/geometry

Design Process and Results

- Identify Constraints
- Layout channel section, alignment and profile
- Modify using design parameters
- Verify with sediment transport & hydraulic modeling

Implementation Process

- Probably design-build construction
- Ideal construction times – fall through spring (if/when funded)
- In context with native stream and watershed setting

Your Input Is Needed

- Identifying location of well heads & septic systems
- Identifying other constraints that we need to consider during design
 - Examples – trees, landscape features, post-flood repair work, etc.



Lower Fourmile Creek Restoration Limits

- Overall creek restoration limits roughly follow road reconstruction limits (north and south segments)
- Funding provided by:
 - National Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) Program
 - Colorado Development Block Grant (CDBG) Disaster Relief (DR) Grant and/or other Funding (TBD)

