

2nd Avenue Bridge Alternatives Analysis

Presented by
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& Dave Skuodas

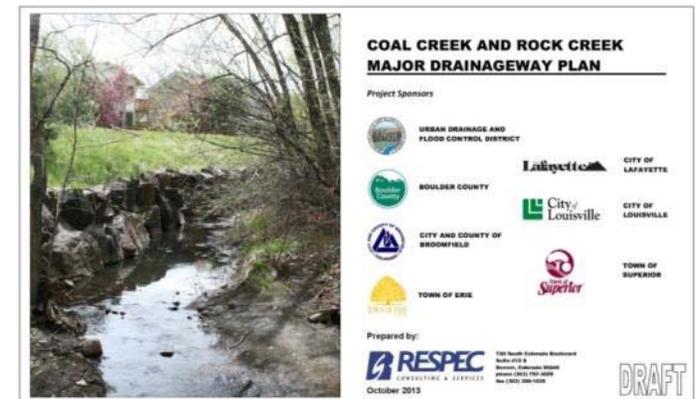
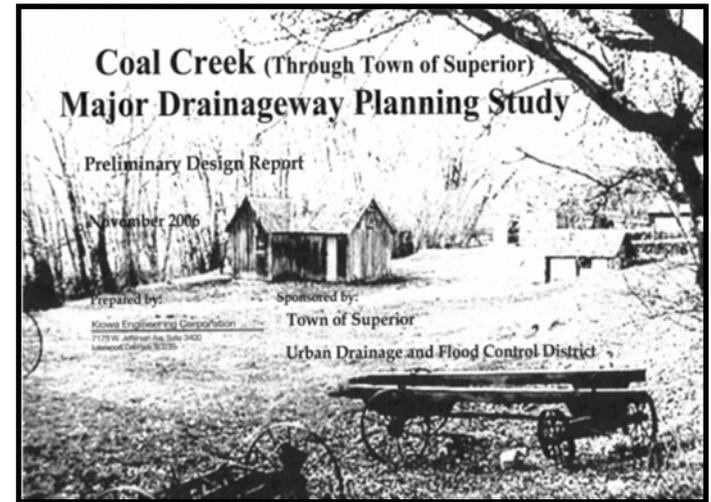


February 10, 2014
Town Board Meeting



Coal Creek Floodplain Background

- ◆ FEMA floodplain study developed 100-year floodplain
- ◆ Coal Creek Master Plan (updated in 2006) reevaluated developed 100-year floodplain
- ◆ 2010-2011 Coal Creek Upstream of McCaslin Boulevard Flood Mitigation Alternatives Analysis
- ◆ 2012-13 Coal Creek/Rock Creek Master Drainageway Study will be the basis of revised floodplain



Coal Creek Upstream of McCaslin Milestones

Milestone	Date
Project initiated between Town of Superior & Urban Drainage & Flood Control District	2011 - 2012
Town Board gives approval to focus on 2 nd Avenue bridge replacement first. 3 rd Avenue bridge replacement could be budgeted in the future.	February 11, 2013
Community Meeting 1 held at Town Hall	April 4, 2013
Town Board gives approval to move project into preliminary design.	April 22, 2013
Town Board approves additional funding for preliminary design.	August 26, 2013
Community Meeting 2 held at Town Hall. Focused on September flood event.	October 1, 2013
Presentation of 2 nd Avenue Bridge replacement alternatives analysis.	February 10, 2014



September, 2013 Flood Event



Estimates put the creek flow around 6,000 cubic feet per second, which is between the 100 and 500 year flood event.



September, 2013 Flood Event



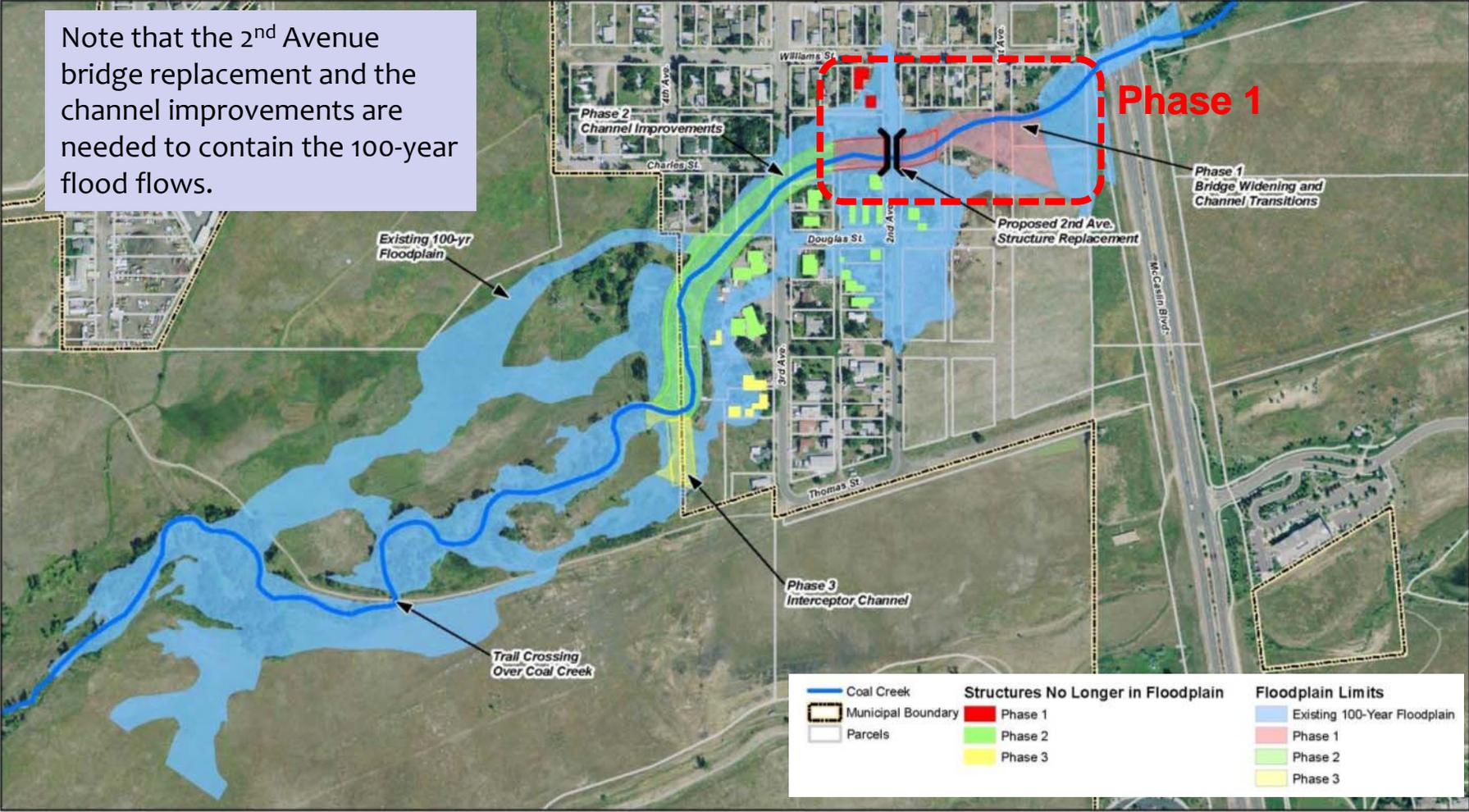
McCaslin Bridge

Grasso Park



Project Area Overview

Note that the 2nd Avenue bridge replacement and the channel improvements are needed to contain the 100-year flood flows.

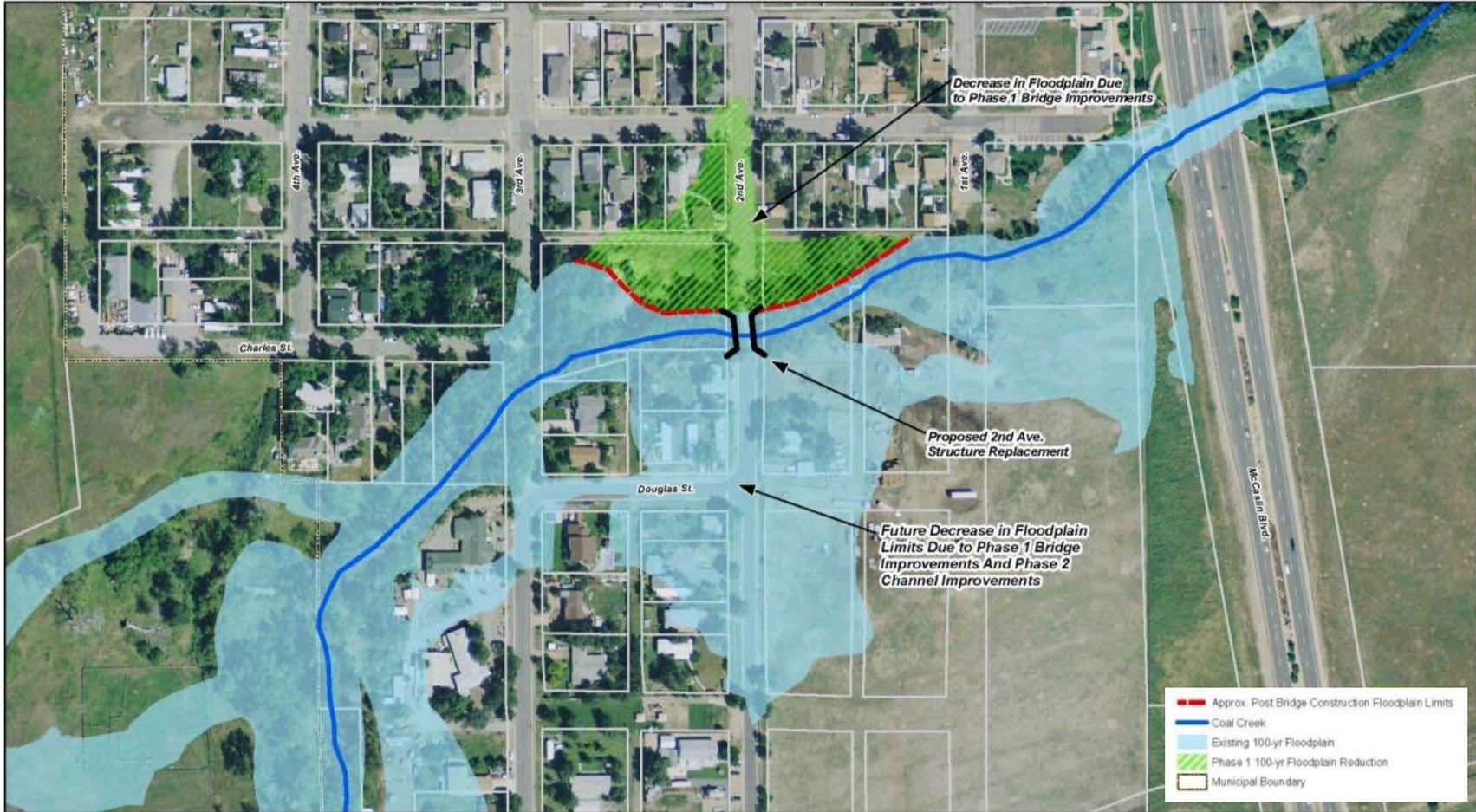


Phase 1 Project Scope

- ◆ Removal of the existing bridge structure
- ◆ 2nd Avenue Bridge structure replacement (including headwalls, wingwalls, toewalls, and guardrail)
- ◆ Channel regrading for the bridge replacement
- ◆ Utility relocation (sanitary sewer, domestic water)
- ◆ Erosion control & landscape restoration
- ◆ 2nd Avenue roadway modifications (slight realignment & raising of section north of bridge)



Project Impacts



September, 2013 Flood Event



Estimates put the creek flow around 6,000 cubic feet per second, which is between the 100 and 500 year flood event.



Structure Flow Capacity

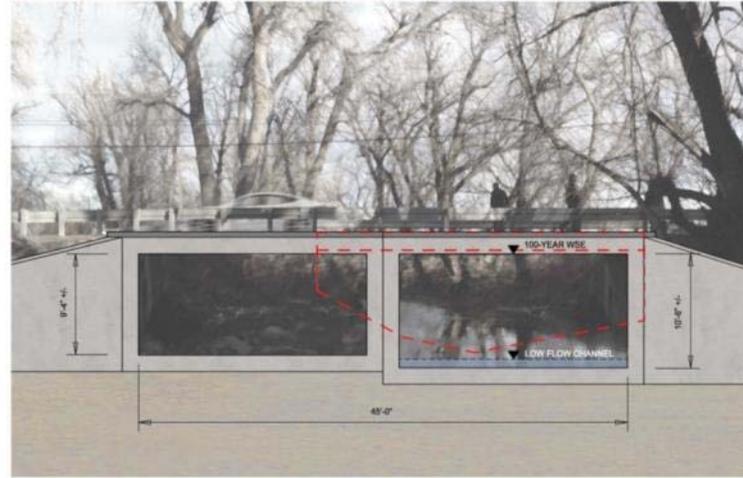
- ◆ Estimated Flow in Coal Creek during September 2013 Floods
 - 6,000 cubic feet per second
- ◆ Current Hydrologic Calculated Flow
 - 100 year: 3,827 cubic feet per second
 - 500 year: 7,340 cubic feet per second (per 2013 Master Plan)
- ◆ 2nd Avenue Structure is proposed to pass the 100-year flood event
 - Local road
 - Second access point will be provided elsewhere



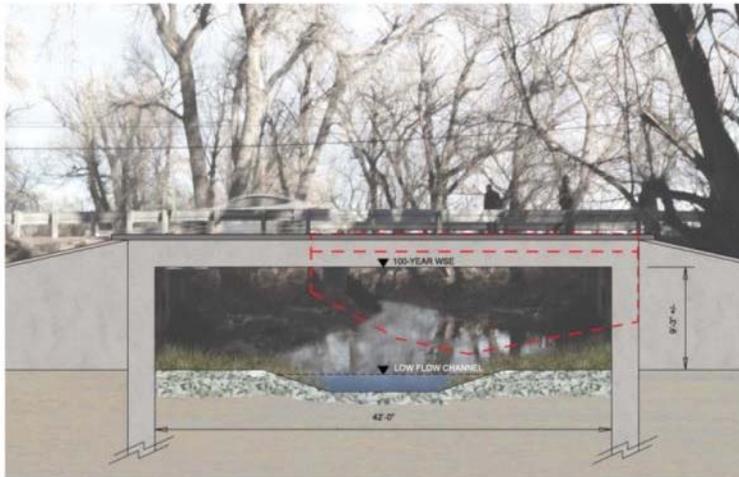
2nd Avenue Structure Options Overview



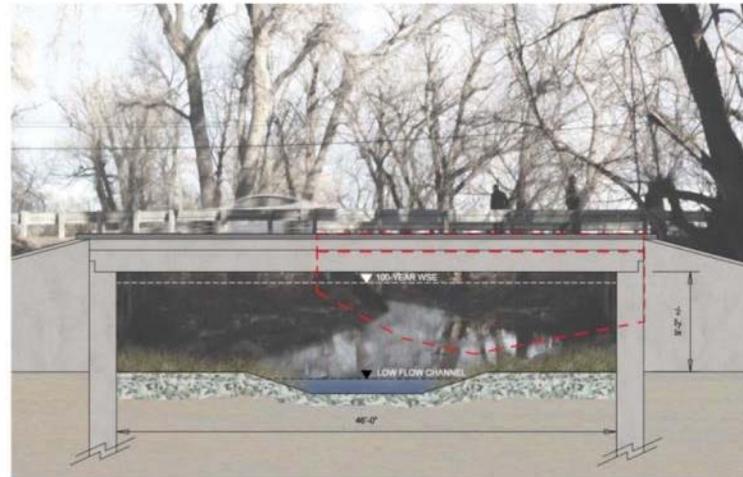
EXISTING STRUCTURE CROSS SECTION



MULTI-CELL BOX CULVERT CROSS SECTION



3-SIDED SUPERBOX CROSS SECTION

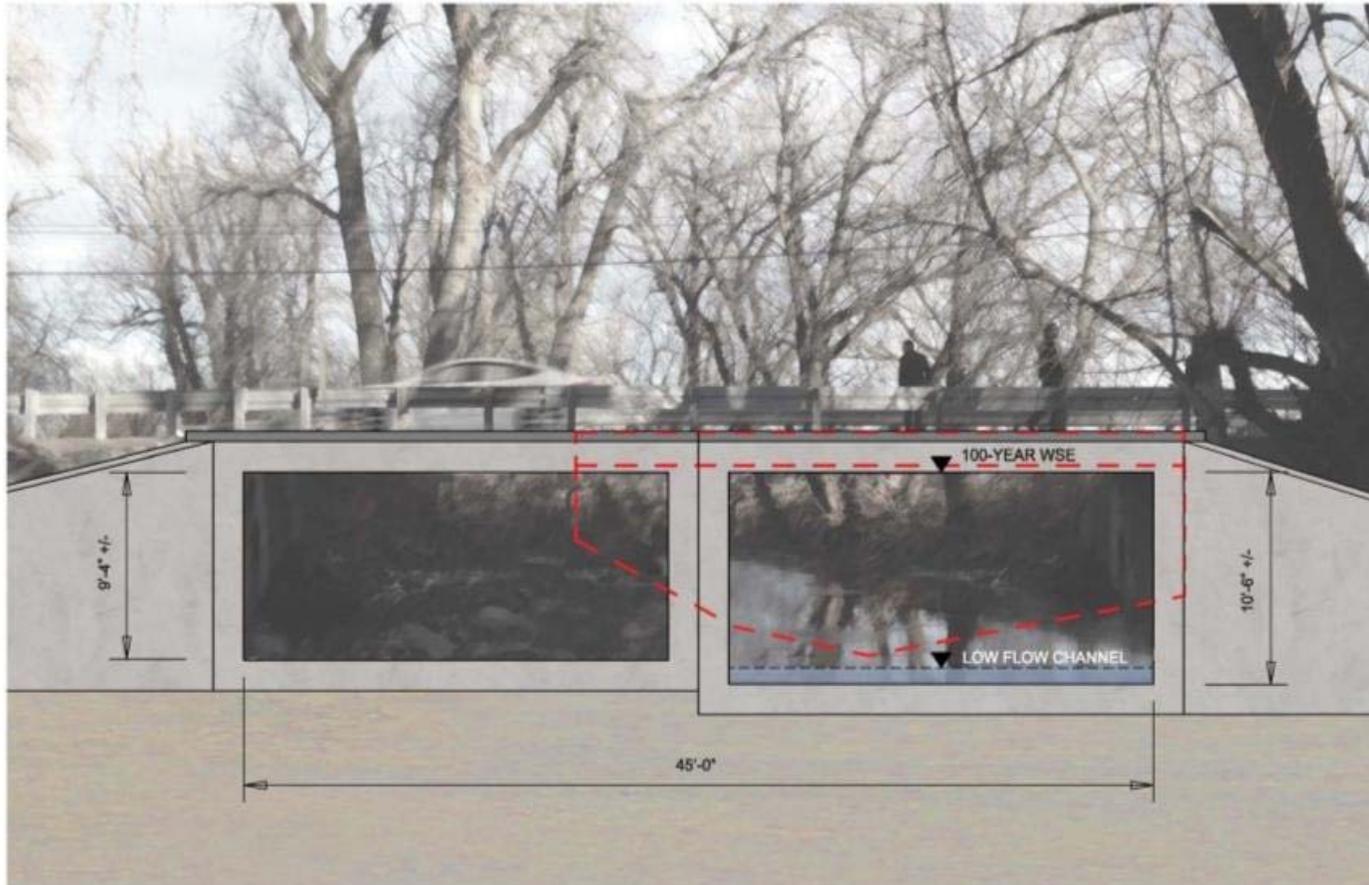


BRIDGE CROSS SECTION



2nd Avenue Structure Options

Multi-Cell Box Culvert

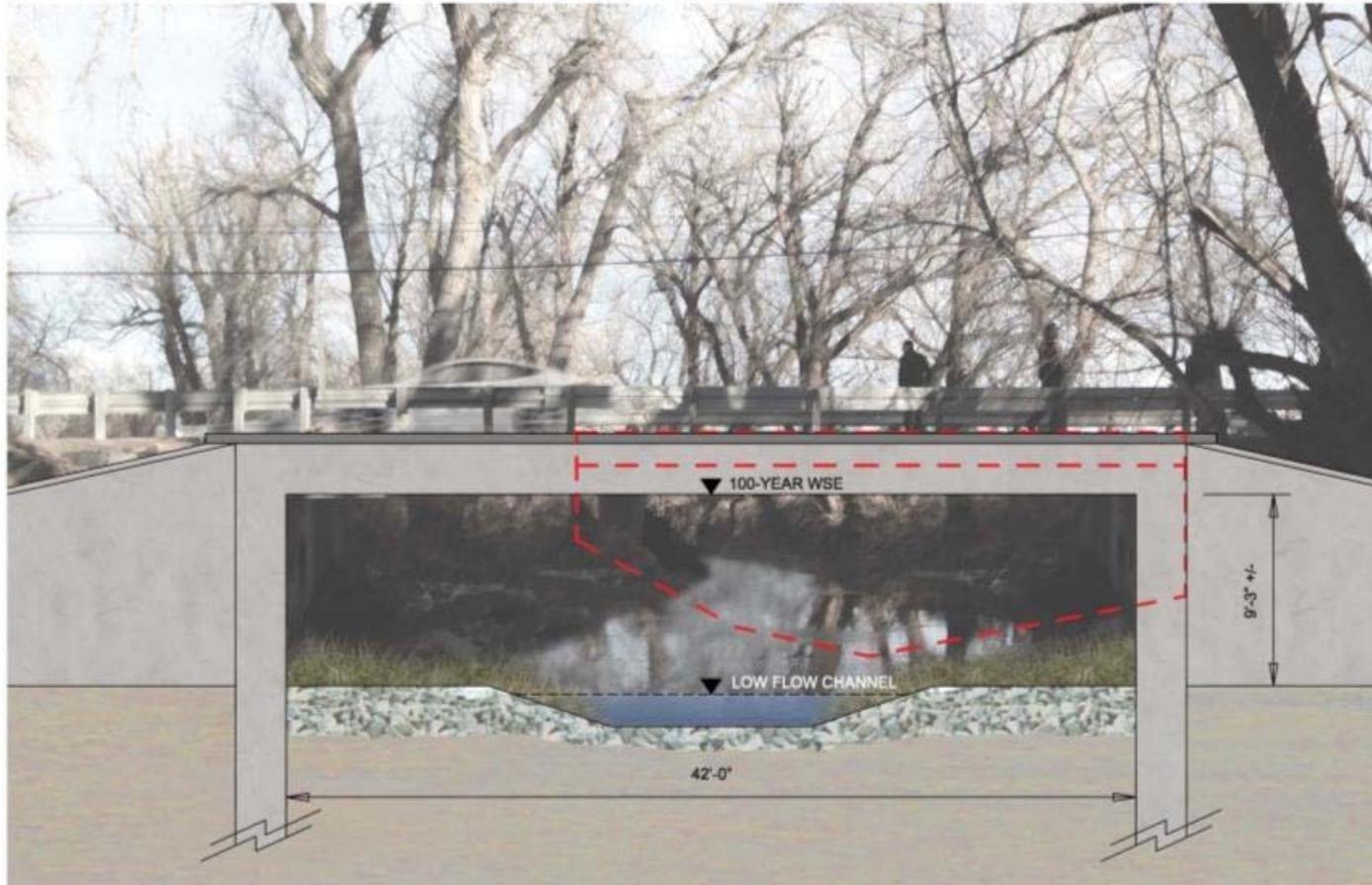


MULTI-CELL BOX CULVERT CROSS SECTION



2nd Avenue Structure Options

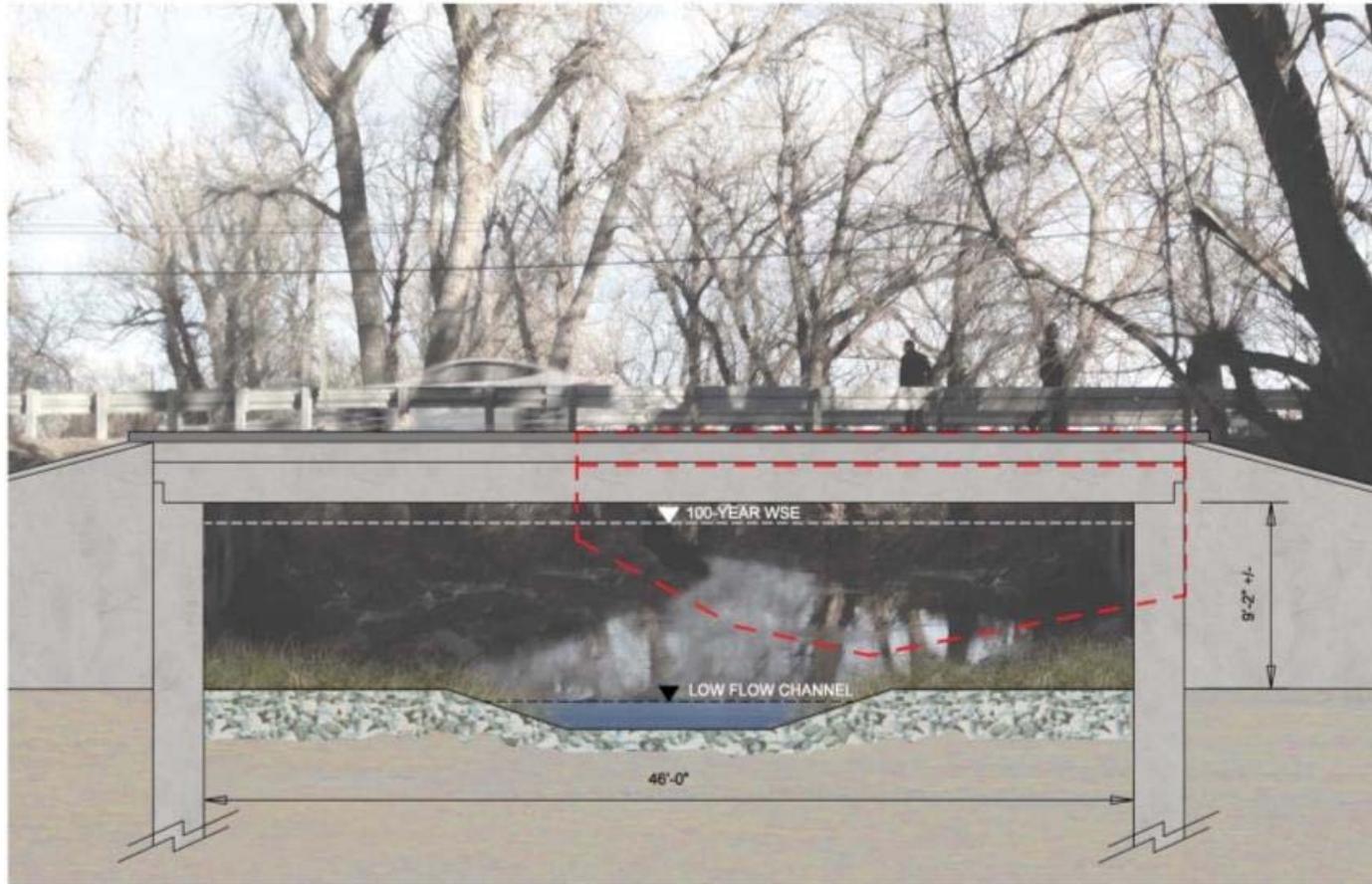
3-Sided Super Box Culvert



3-SIDED SUPERBOX CROSS SECTION



2nd Avenue Structure Options Bridge



BRIDGE CROSS SECTION



2nd Avenue Structure Comparison

Structure Type	Approx. Cost	Flow Capacity	Pros	Cons
Multi-cell box culvert	\$960,000	4,150 cfs *	<ul style="list-style-type: none"> • Fastest construction time (pre-cast) 	<ul style="list-style-type: none"> • Center support • Concrete bottom
3-sided super box culvert	\$920,000	5,100 cfs *	<ul style="list-style-type: none"> • Least expensive • No center support • Natural stream bottom 	<ul style="list-style-type: none"> • Cast-in-place concrete will take longer
Bridge	\$1,050,000	5,750 cfs **	<ul style="list-style-type: none"> • No center support • Natural stream bottom 	<ul style="list-style-type: none"> • Most expensive • Design criteria requires freeboard

* Structure flow capacity prior to road overtopping in cubic feet per second.

** Bridge flow capacity is with freeboard set to 0 feet in cubic feet per second.



2nd Avenue Bridge – Current Conditions



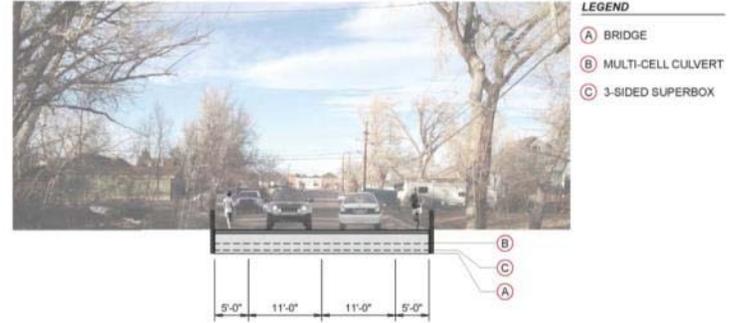
2nd Avenue Bridge – Looking North
There is a centerline jog through the bridge



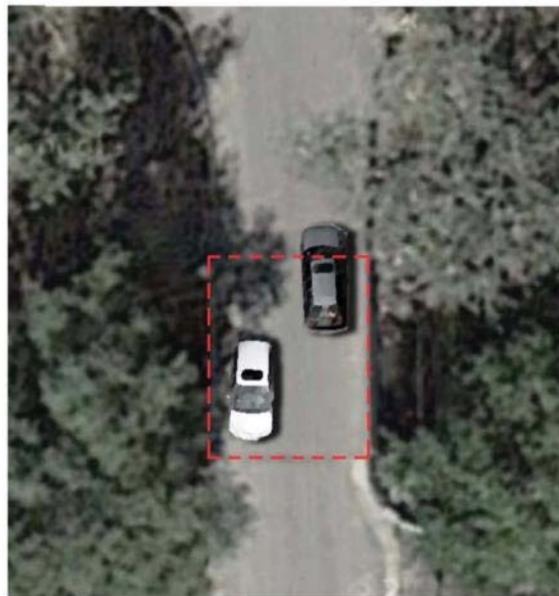
2nd Avenue Structure Layout



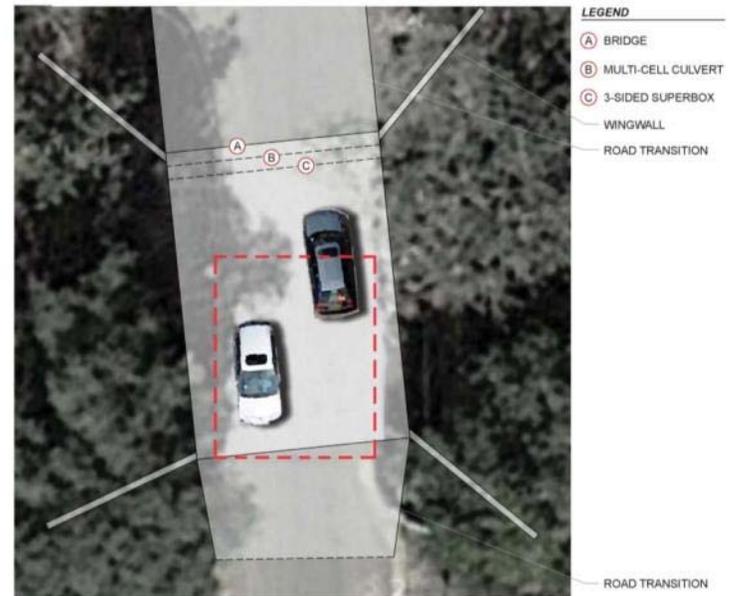
EXISTING ROADWAY CROSS SECTION



PROPOSED ROADWAY CROSS SECTION



EXISTING PLAN VIEW



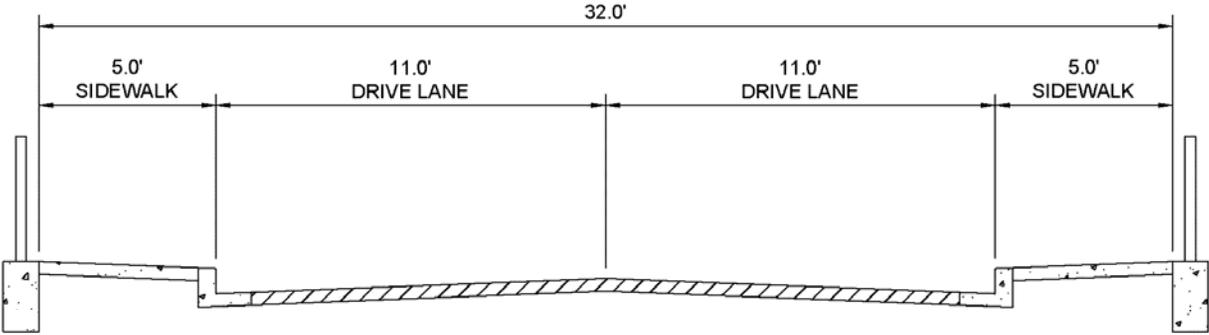
PROPOSED PLAN VIEW



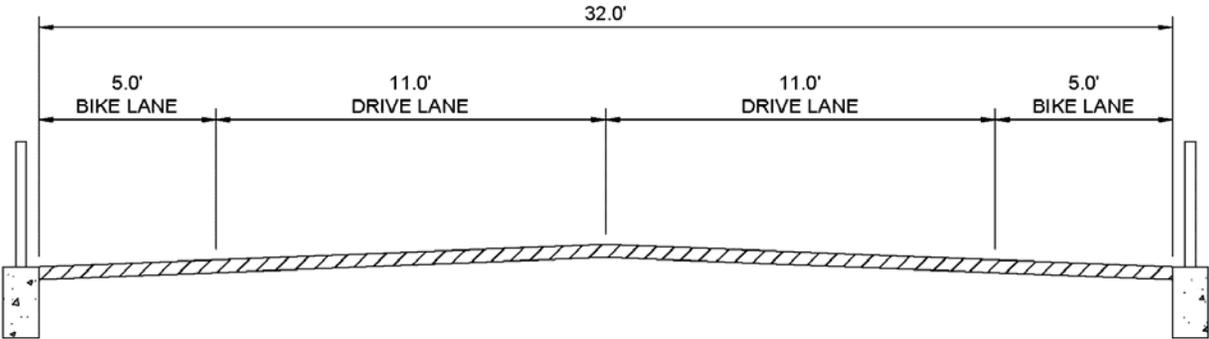
2nd Avenue Structure Layout



2nd Ave Structure Section Options



SIDEWALK OPTION



BIKE LANE OPTION



Sidewalks vs Bike lanes

◆ Bike lanes

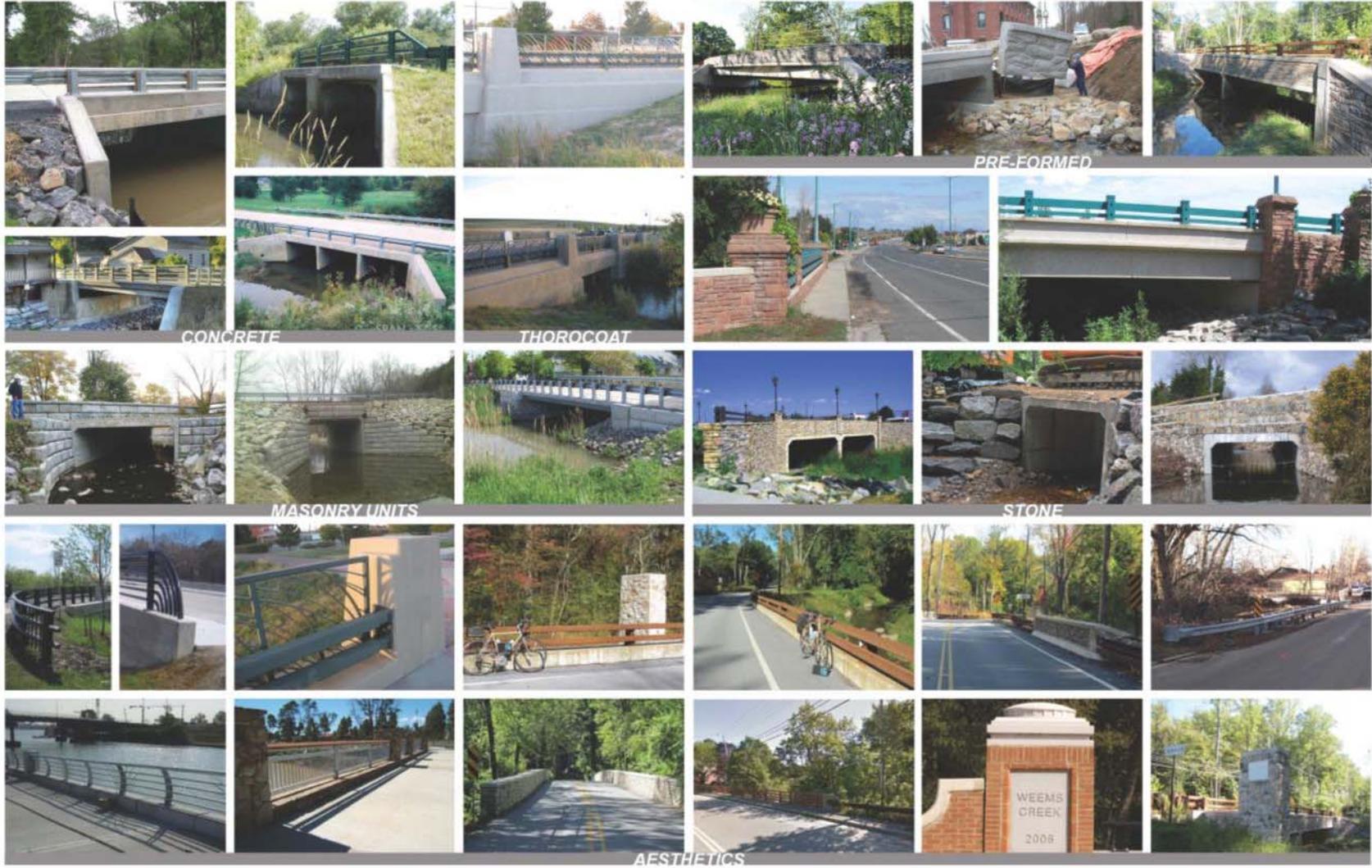
- 32 ft. Pavement width matches width on north side
- Similar to street character on north side
- Pedestrians do not have protection across bridge

◆ Sidewalks

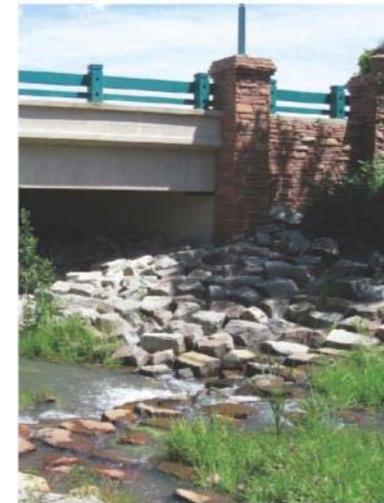
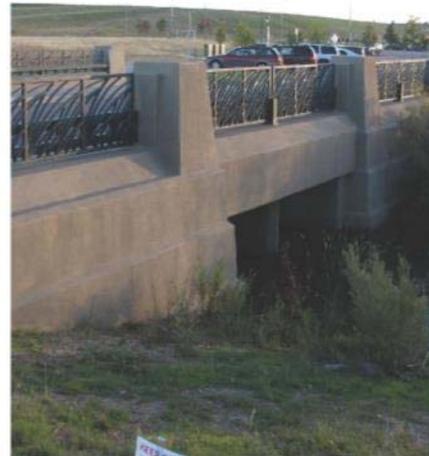
- Sidewalks will connect to asphalt walks north of bridge
- If Rogers property develops, there will most likely be sidewalks on east side on 2nd Ave.
- Provides secondary barrier for bridge protection from vehicle damage.



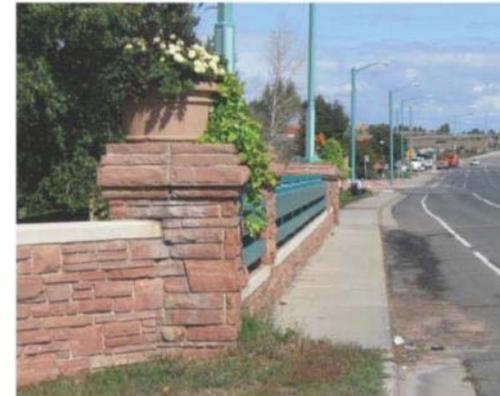
2nd Avenue Structure Aesthetics



2nd Avenue Structure Aesthetics – Creek View



2nd Avenue Structure Aesthetics – Road View



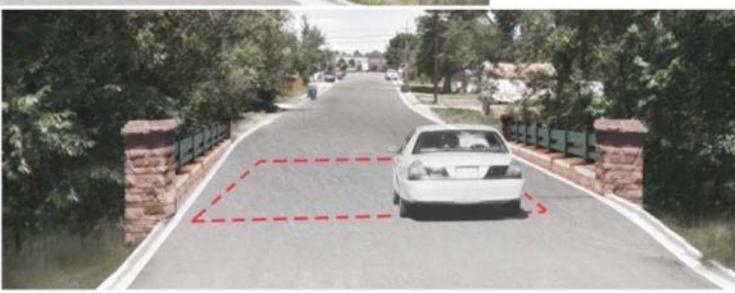
2nd Avenue Structure Aesthetics Rendering



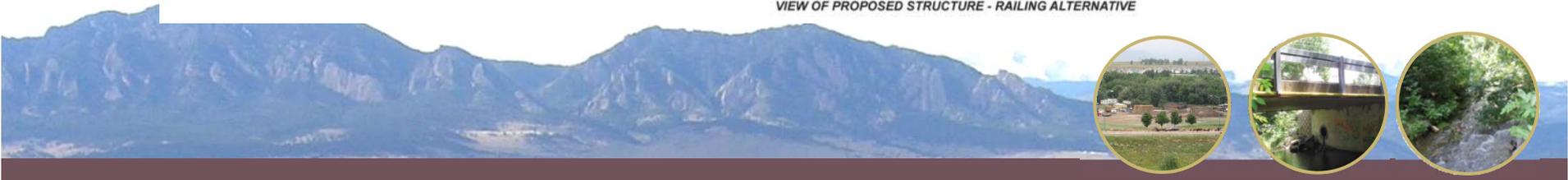
VIEW OF PROPOSED STRUCTURE FROM SECOND AVENUE LOOKING NORTH



EXISTING STRUCTURE



VIEW OF PROPOSED STRUCTURE - RAILING ALTERNATIVE



Discussion Items

- ◆ Structure flow capacity
 - 100 year vs. 500 year flood
- ◆ Type of Structure
 - Multi-cell Box Culvert
 - 3-Sided Super Box Culvert
 - Bridge
- ◆ Street Section Options
 - Drive Lane Width
 - Sidewalks vs Bike lanes
- ◆ Wall/Bridge Rail Aesthetic Treatments



Next Steps

- ◆ **Meet with Individual Property Owners, Refine Channel Improvements Concepts**
 - **February and March**
- ◆ **Complete Preliminary Design For All Phases**
 - **February through June**
- ◆ **Final Design/Environmental Clearance**
 - **June through November**
- ◆ **Town Board Approval of 2nd Avenue Structure Bids**
 - **December**
- ◆ **Construction**
 - **January to May, 2015**

