

Camp Creek Drainage Improvement Project

Common Implications of Concepts

All Concepts Would...

- Reduce the area of Pleasant Valley that is at risk of flooding during large flood events
- Remove 224 residential properties 13 commercial lots from the 100-year floodplain
- Reduce the amount of water flowing on 31st Street roadway during large flood events
- Provide sediment collection improvements at north end of Garden of the Gods. Removal of sediment from this area will need to be performed on an as-needed basis
- Improve pedestrian and traffic safety by providing barrier walls, guardrails, increasing the distance between the road and the channel, and/or covering the channel
- Improve emergency access by reducing the potential for water on roadways during larger flood events
- Not impact existing on-street parking
- Not require residential property acquisition
- Reduce risk that Gateway Road would be over-topped by water during large storm runoff events
- Manage erosion of the natural channel in the Garden of the Gods
- Have an option to realign the Camp Creek near the confluence with Fountain Creek in conjunction with adjacent projects

Concepts Summary

Concept	Hydraulic Approach	Unique Features	Unique Implications
<p style="text-align: center; color: #0070c0; font-weight: bold;">A</p> <p>Channel Reconstruction Creek Stabilization</p>	<ul style="list-style-type: none"> • No upstream detention • Full 100-year Camp Creek flow contained in the 31st Street channel 	<ul style="list-style-type: none"> • Enlarges the 31st Street channel by making it deeper to achieve increased capacity • Replaces existing culverts and bridges with larger bridges to minimize restrictions in the 31st Street Channel • Channel lining similar to existing lining with rock bottom. May support some grass vegetation on bottom (similar to existing) • Includes walls along the outside edges of the channel for traffic safety and to achieve required channel depth without widening the top width of the channel • Has an option to raise Gateway Road and increase the size of its bridge to improve safe public access during storm runoff events 	<ul style="list-style-type: none"> • 100-year floodplain contained in channel through Pleasant Valley neighborhood • No change to existing bike lanes • No change to outside edges of street • Provides improved emergency access to Pleasant Valley neighborhood during a 100-year rainfall event • Requires less construction in Gardens of the Gods and Rock Ledge Ranch Historic Site than Concepts B, C, and E
<p style="text-align: center; color: #ff9900; font-weight: bold;">B</p> <p>Channel Reconstruction Creek Stabilization Detention</p>	<ul style="list-style-type: none"> • Upstream detention • Most of the detained 100-year Camp Creek flow contained in the 31st Street channel • Some 100-year Camp Creek flow conveyed on east side of 31st Street 	<ul style="list-style-type: none"> • Reconstructs the 31st Street channel section and lining to be similar to the existing channel section and lining with rock bottom. May support some grass vegetation on bottom (similar to existing) • Replaces culverts and bridges with larger bridges to minimize restrictions in the 31st Street Channel • Includes a wall along the west side of the channel for 100-year flood conveyance and traffic safety • Includes a landscape strip along the east edge of the channel for flood conveyance, traffic safety and beautification • Moves street closer to sidewalk on east side to accommodate landscape strip along channel • Includes landscaped earthen detention basins in Garden of the Gods through raising Gateway Road to an elevation similar to adjacent 30th Street as it spans the Camp Creek Valley (16-foot maximum raise), and within Rock Ledge Ranch Historic Site by adding 11-foot high berms within existing parking lot area. 	<ul style="list-style-type: none"> • 100-year floodplain contained in channel and streets through Pleasant Valley neighborhood • Improves emergency access during large flow events over the existing condition but does not provide flood-free vehicular and pedestrian access to all portions of Pleasant Valley neighborhood during a 100-year flood event • No change to existing bike lanes • Requires more construction in Garden of the Gods and Rock Ledge Ranch Historic Site than Concepts A & D • Moves east side of 31st Street closer to sidewalk • Conveying a portion of the Camp Creek flow in the street during large storm events presents potential hazards to pedestrians and motorists along 31st Street

Concept	Hydraulic Approach	Unique Features	Unique Implications
C Grass-Lined Channel Creek Stabilization Detention	<ul style="list-style-type: none"> Upstream detention All of the detained 100-year Camp Creek flow contained in the 31st Street channel and street 	<ul style="list-style-type: none"> Reconstructs the 31st Street channel section to be wider and have flatter side slopes than the existing channel Replaces culverts and bridges with larger bridges to minimize restrictions in the 31st Street channel Replaces the existing on-street bike lanes with a paved trail within the channel section Channel side slopes lined with native grasses Channel bottom lined with rock which may support some vegetation (similar to existing) Includes walls along the outside edges of the channel for traffic and pedestrian safety and additional walls to achieve required channel depth and capacity. Includes landscaped earthen detention basins in Garden of the Gods through raising Gateway Road to an elevation similar to adjacent 30th Street as it spans the Camp Creek Valley (16-foot maximum raise), and within Rock Ledge Ranch Historic Site by adding 11-foot high berms within existing parking lot area.” 	<ul style="list-style-type: none"> 100-year floodplain contained in channel and streets through Pleasant Valley neighborhood More natural appearance for 31st Street channel than Concepts A and B On-street bike lanes replaced by trail within channel section. Trail to be constructed with walls above the expected level of flow during a 2-year flood event Requires more construction in Garden of the Gods and Rock Ledge Ranch Historic Site than Concepts A & D Provides improved emergency access to Pleasant Valley neighborhood during 100-year flood event May require moving street closer to sidewalks to implement Trail in channel crosses streets at street level at bridges Conveying a portion of the Camp Creek flow in the street during large storm events presents potential hazards to pedestrians and motorists along 31st Street
D Box Culvert Creek Stabilization	<ul style="list-style-type: none"> No upstream detention Full 100-year Camp Creek flow contained in the 31st Street box culvert 	<ul style="list-style-type: none"> Replaces the 31st Street open channel with extensive underground box culverts Includes a trail and native landscaping in the 31st Street median area over the box culverts Eliminates the on-street bike lanes along 31st Street Has an option to raise Gateway Road and increase the size of its bridge to improve safe public access during storm runoff events 	<ul style="list-style-type: none"> 100-year floodplain eliminated throughout Pleasant Valley neighborhood No on-street bike lanes Provides a trail connection between Garden of the Gods and Fountain Creek No change to outside edges of street Provides emergency access to Pleasant Valley neighborhood during 100-year flood event Requires less construction in Garden of the Gods and Rock Ledge Ranch Historic Site than Concepts B, C, and E Requires more extensive construction in Pleasant Valley neighborhood than Concepts A, B, C, and E More natural median area appearance than Concepts A, B, and C Eliminates open channel safety risk along 31st Street
E Box Culvert Creek Stabilization Detention	<ul style="list-style-type: none"> Upstream detention All of the detained 100-Year Camp Creek flow contained in the 31st Street Box Culvert 	<ul style="list-style-type: none"> Replaces the 31st Street open channel with underground box culverts Includes a trail and native landscaping in the 31st Street median area over the box culverts Eliminates the bike lanes along 31st Street Includes landscaped earthen detention basins in Garden of the Gods through raising Gateway Road to an elevation similar to adjacent 30th Street as it spans the Camp Creek Valley (16-foot maximum raise) and constructing an 19-foot high earthen landscaped dam in the northern end of the park 	<ul style="list-style-type: none"> 100-year floodplain eliminated throughout Pleasant Valley neighborhood On-street bike lanes replaced by trail within native landscaped median area Provides a trail connection between Garden of the Gods and Fountain Creek No change to outside edges of street Provides emergency access to Pleasant Valley neighborhood during 100-year flood event Requires more construction in Garden of the Gods than Concepts B, C, and E More natural median area appearance than Concepts A, B, and C Eliminates open channel safety risk along 31st Street

Notes regarding Concepts:

1. These Concepts were developed for the purpose of soliciting public input on the various elements included in the Concepts and to demonstrate some of the ways that the elements can be linked together in the design of project improvements.
2. These Concepts do not necessarily represent specific design alternatives that will be carried through to final design of improvements.
3. Comments received on the various Concept elements will help guide development of specific design alternatives which will be reviewed with the community in January.

December 12, 2013