

# Upper Goose and Twomile Canyon Creek Flood Mitigation Workshop

## Upper Goose and Twomile Canyon Creek Drainageways Watershed Information

The Twomile Canyon Creek drainage basin originates in the mountains west of Boulder near Pine Brook Hill Fire Station. The upper portion of the drainage basin is narrow, steep and rocky with a well-defined channel. The creek enters the City of Boulder and flows through a residential area near Spring Valley Road. Under normal flows, water is diverted into the Silver Lake ditch near the Linden Ave. and Wonderland Hill Ave. intersection. The South Juniper Lateral returns water into the creek near Foothills Elementary School. The rocky creek bed is approximately three to four feet wide, and ends on the west side of the intersection of Broadway and Iris. East of this intersection, water flows through a small ditch that runs along the north side of Iris and into a storm sewer. The storm sewer discharges into Elmer's Two Mile Park, which flows into Goose Creek, just south of Valmont Road.

The Upper Goose Creek drainage basin is primarily composed of residential and commercial development, and is located just south of Twomile Canyon Creek. During minor storm events, runoff is collected in storm sewers and conveyed to a concrete lined channel at 19<sup>th</sup> St. and Tyler Rd. During major storm events, water naturally drains to the east side of North Boulder Park located on 9<sup>th</sup> St. From here to 19<sup>th</sup> St., floodwaters head east, along Balsam Ave., Alpine Ave. and through backyard areas, because there is no defined stream channel within this portion of the drainage basin. The concrete lined channel starts at 19<sup>th</sup> St. and continues for approximately 270 feet before becoming a more natural, vegetated channel. The stream channel runs south of and parallel to Edgewood Dr. which also carries flood waters. From approximately 600 feet upstream (west) of Folsom, Goose Creek has been improved to convey the 100-year storm event. The width of the channel is as large as 25 feet with 6 to 15-foot high channel walls.

Much of the development within the watershed occurred prior to the first floodplain mapping and did not consider the impacts from major or minor storm events. Therefore, in many area the existing channels and drainage systems can only accommodate low flows.

## Objective

The purpose of this workshop is to engage the community to identify preferred flood mitigation strategies along Upper Goose and Twomile Canyon Creek. City staff requests the community to consider the following questions during your tabletop discussions:

- During storm events, what do you think is currently working well?
- What is not working well with storm drainage in your watershed?
- Which of the flood and greenways objectives are most important to you?
- What is/are your preferred method(s) for conveying storm water flows and flood flows through your neighborhood?
- What are the biggest challenges you can identify for drainageway improvements through your neighborhood?

## The Process

- You have been asked to join a table with other individuals to work on a few brainstorming exercises. The assigned seating is to promote diversity within your discussions. Having a diverse table of residents sit together whom reside along the same drainageway, but are not necessarily immediate neighbors, can create a broader perspective discussion. You may learn something you didn't know about how water flows behave to someone further downstream or upstream of you.
- Each table will be asked to draw observations (i.e. short duration, high intensity storms and/or 2013 flood) of flow paths on the map provided at your table, and identify preferred mitigation strategy(ies) along the drainageway (color-coded for each mitigation strategy)
- There will be four table-top exercises you will be asked to participate in.

## Working Together

Please remember the following during your table-top discussions:

- Make room for all table members to participate. All input is valuable.
- Step Up / Step Down! Ensure it is clear to all that one or a few members of the table should not be the only ones offering input.
- Avoid making assumptions about another individual's thinking. Ask clarifying questions to better understand other's interests and perspectives.
- Try to get a "rough consensus" on how the team moves ahead but stay open to changes. This is a process of sharing and discovery!
- Be respectful of the time commitment each of you have made by being here tonight. Avoid side conversations, talking over one another, cell phones, etc.

## Materials

- Workshop Agenda
- 36" x 48" Drainageway Base Map
- Post-it notes
- Pens and Markers
- Stickers

## Supporting Documentation

The attached documents are supplemental and are included to guide you through your table-top discussions.

- Flood Mitigation Planning Process
- Maps of Drainageways/Floodplains
- Summary of Mitigation Strategies – (Environmental, Social, and Economic Matrix)
- Criteria for Ranking Greenway Projects by Objectives (excerpt from the Greenways Master Plan)
- Workshop Exercise Sheets\* **(please ensure all sheets have been returned to a city staff member prior to your departure from the workshop!)**

## Criteria for Ranking Greenway Projects by Objective

Program Area	Ranking Criteria
<b>Habitat</b>	<p><b>High</b></p> <ul style="list-style-type: none"> <li>Highest ranked reaches in Riparian Habitat Assessment for vegetative structure, native vegetation and bird habitat</li> <li>Reaches with species of concern</li> <li>Reaches with irreplaceable complexity and structure</li> </ul> <p><b>Medium</b></p> <ul style="list-style-type: none"> <li>Average ranked reaches in Riparian Habitat Assessment</li> <li>Somewhat replaceable vegetation (good native but poor structure)</li> </ul> <p><b>Low</b></p> <ul style="list-style-type: none"> <li>Low ranking reaches in Riparian Habitat Assessment</li> <li>Areas suitable for restoration</li> </ul>
<b>Water Quality</b>	<p><b>High</b></p> <ul style="list-style-type: none"> <li>Highest ranked reaches in Aquatic Habitat Assessment</li> <li>High quality aquatic habitat coincident with high quality terrestrial habitat</li> <li>Fair aquatic habitat adjacent or between high ranked aquatic habitat</li> </ul> <p><b>Medium</b></p> <ul style="list-style-type: none"> <li>Fair aquatic habitat</li> <li>Confluences with Boulder Creek</li> <li>Riparian or aquatic habitat good over majority of stream length but not necessarily overlapping</li> </ul> <p><b>Low</b></p> <ul style="list-style-type: none"> <li>Poor aquatic habitat</li> </ul>
<b>Flood</b>	<p><b>Criteria are listed in order of importance</b></p> <ul style="list-style-type: none"> <li>Removes property from the high hazard zone or conveyance zone</li> <li>Removes property from the floodplain</li> <li>Reduces storm drainage problems</li> </ul>
<b>Transportation</b>	<p><b>Criteria are listed in order of importance</b></p> <ul style="list-style-type: none"> <li>Relationship to major destinations such as parks and employment centers</li> <li>Population density served, particularly relative to major destinations</li> <li>Lack of good alternative routes, particularly the inability to stay off busy streets</li> <li>Amount of connectivity to the system added by segment</li> <li>Amount of the corridor already completed</li> </ul>
<b>Recreation</b>	<p><b>High</b></p> <ul style="list-style-type: none"> <li>Critical trail component is planned to connect or is within a current or future park, recreation area or community or citywide facility</li> </ul> <p><b>Medium</b></p> <ul style="list-style-type: none"> <li>Proposed improvement in this Greenways reach may impact the connectivity between park and recreation areas</li> </ul> <p><b>Low</b></p> <ul style="list-style-type: none"> <li>Proposed improvement in this Greenways reach is not located near and will not impact the connectivity to current or future park or recreation area</li> </ul>
<b>Cultural Resources</b>	<ul style="list-style-type: none"> <li>Presence of cultural site(s) which are listed or eligible for listing on: <ul style="list-style-type: none"> <li>National Register of Historic Places</li> <li>State Register of Historic Properties</li> </ul> </li> <li>Are Historic Landmarks</li> <li>Are eligible for land marking</li> </ul>

# Greenways

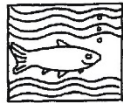
## Purpose Statement

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:



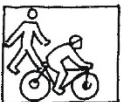
to protect and restore riparian, floodplain, & wetland habitat



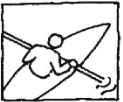
to enhance water quality



to facilitate storm drainage & mitigate floods



to provide alternative transportation routes or trails for pedestrians & bicyclists



to provide recreation opportunities



to protect cultural resources

## Ranking of Greenways Objectives by Reach

REACH	LOCATION	HABITAT	WATER QUALITY	TRANSPORTATION <sup>1</sup>	RECREATION	FLOOD MITIGATION	CULTURAL RESOURCES	PARK SITE	Managed by OPEN SPACE	CONFLICT
<b>Goose Creek</b>										
GC 1 North Goose	Pearl Pkwy to Foothills Pkwy	L	L	N/A	H	L				
GC 2 South Goose	Pearl Pkwy to Foothills Pkwy.	L	M	N/A	L	L				
GC 3	Foothills Pkwy to RR	H	L	N/A	N/A	L	√			
GC 4	RR to 28 <sup>th</sup> St.	L	L	N/A	L	L	√			
GC 5	28 <sup>th</sup> St. to Folsom	L	L	N/A	M	L	√			
GC 6	Folsom to 13 <sup>th</sup> St.	L	L	N/A	N/A	H				
<b>Twomile Canyon Creek</b>										
TMC1	15 <sup>th</sup> St to city limits	H	L	L	N/A	M+			√	

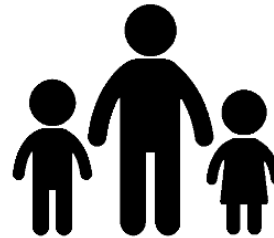
## Storm Water and Flood Management Guiding Principles



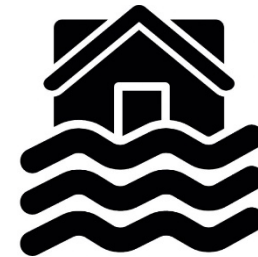
Life Safety



Flood Emergency  
Response Capability

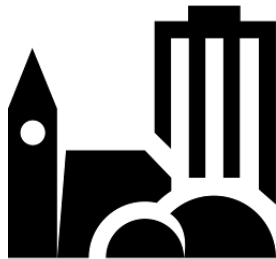


Critical Facilities Hazard  
Mitigation (Vulnerable  
Population)



Property Damage  
Mitigation

Accommodating  
New Growth and  
Development



Collaboration with  
other Greenways  
Program Objectives



Potential for Operation and  
Maintenance Cost Savings

Opportunities to Leverage  
Outside Funding