

COMMUNITY AND ENVIRONMENTAL ASSESSMENT PROCESS

Elmer's Twomile Creek Greenway Improvements Goose Creek to Glenwood Drive

March 27, 2004

1. Description and location of the project:

The Elmer's Twomile Creek Greenway improvement project involves the construction of a multi-use path and flood mitigation improvements along Elmer's Twomile Creek from Goose Creek to Glenwood Drive. Water quality enhancements are also being proposed at the confluence of Elmer's Twomile Creek and Goose Creek. Water quality "best management practices" will also be implemented to treat parking lot run off where possible. The Elmer's Twomile project includes an off street path, a proposed underpass or enhanced crosswalk at Valmont Rd., and flood mitigation improvements. An underpass at Glenwood Drive was also evaluated.

The Elmer's Twomile Greenway is located between Folsom and 28th Streets, north of Goose Creek. The CEAP for this project has been divided into three phases. Phase I includes the area from Goose Creek to north of Valmont Road. Phase II includes the area north from Valmont Road to Glenwood Drive and Phase III evaluates an underpass at Glenwood Drive.

(See vicinity map for location – **Attachment A**)

2. Background, purpose and need for the project:

This project has been identified in the Greenways Master Plan (GMP), the Transportation Master Plan (TMP), and the Comprehensive Drainage Utility Master Plan (CDUMP). The Greenways Program manages streams for multiple objectives, therefore the project meets multiple city goals as described below.

Transportation

The Elmer's Twomile project from Goose Creek to Glenwood Drive will complete an important off-street trail connection. It will connect to the Goose Creek path, which is an existing grade separated system that connects to the Boulder Creek path and the rest of the Boulder bikeways system. This link will provide a continuous trail segment along Elmer's Twomile Creek allowing users to avoid traveling on 28th Street or Folsom Street. This connection will facilitate pedestrian and bicycle travel between several high density residential neighborhoods and various commercial areas along 28th Street, as well as create a north-south connection to Boulder's bikeways system.

Flood Mitigation:

This project would contain the 100 year flood within Elmer's Twomile to the confluence of Goose Creek, therefore removing many properties from the floodplain. The 100 year floodplain

is not currently contained within the Elmer's Twomile channel. (See **Attachments A and N** for current 100 year flood mapping). South of Glenwood Drive, flood waters spill east and south toward Goose Creek, flooding properties along the west and east sides of 28th Street.

Habitat Improvements:

The existing riparian and aquatic habitat in the project area is highly impacted by channelization and the surrounding urbanized environment. The proposed project will impact sections of the existing stream channel but will include habitat enhancements to improve the functions and values of the stream corridor beyond its current condition. In addition, impacts to regulatory wetland areas will be mitigated as required by wetlands regulations.

Water Quality:

Enhancements for water quality will include a proposed wetland at the confluence of Elmer's Twomile and Goose Creeks, as well as planting of riparian vegetation north of Valmont Road and treatment of parking lot runoff where possible.

Recreation: The multi-use path will be available for a variety of recreational activities, including bicycling, rollerblading, running, walking, hiking, and passive recreation. The Greenways trail system serves as a recreational facility in addition to an alternative transportation corridor.

3. Description of project alternatives and summary of major issues:

The following alternatives were evaluated:

Phase I – Goose Creek to north of Valmont Road

- Alternative 1 - Combined Creek and Trail Underpass
- Alternative 2 - Separated Creek and Trail Underpass
- Alternative 3 - Open Channel Creek and At-Grade Trail Crossing

Phase II – Valmont Road to Glenwood Drive

- Alternative 1 - Narrow Channel
- Alternative 2 - Wider Channel

Phase III – Glenwood Drive Underpass

- Alternative 1 - Combined Creek and Trail Underpass
- Alternative 2 - Separated Creek and Trail Underpass

Comparison of Alternatives

Phase I Goose Creek to north of Valmont Road

ALTERNATIVES	Alt 1	Alt 2	Alt 3
	Staff Recommended		
Cost	\$2.75 million	\$2.46 million	\$2.46 million
GREENWAYS OBJECTIVES			
Flood			
Carries 100 yr Flood	+	+	+
Transportation			
Provides Trail Connection	+	+	+
Provides Grade Separated Crossing at Valmont	+	+	0
Water Quality & Habitat			
Wetland at Confluence with Goose	+	+	+
Additional Water Quality Treatment	0	0	+
Safety of Valmont Crossing	+	+	-
Wider Trail Underpass at Valmont	+	0	0
Impact to Parking	-	-	0
Trail Flooding During Major Storms	-	0	0
Impact to Shady Hollow During Construction	-	----	-
Removes mature trees	-	-	----
Elmer's is in open channel	0	0	+
Structural Walls	0	0	-
Easement Acquisition	0	0	0

- negative impact
- + positive impact
- 0 no impact

Phase I - Goose Creek to north of Valmont Road

Each of the Phase I alternatives provide a concrete trail connection from the existing Goose Creek trail to Valmont Road (approx. 700 feet) and provide flood mitigation to contain the 100 year flood within the Elmer's Twomile Creek corridor. All three Phase I alternatives provide a separation of all stormwater flows from the Boulder Whiterock ditch (BWR). Water rights considerations may make it desirable to divert "low flows" to the BWR. To divert low stormwater flows (up to about 14 cfs) to the BWR would increase project costs by approximately \$140,000. The cost of diverting these flows will depend on the alternative selected and the amount of flow diverted.

Alternative 1 – Combined Creek and Trail Underpass (Attachments B & G)

Estimated Cost: \$2.75 million

The advantages and disadvantages of Phase I Alternative 1 are summarized in the table above.

This alternative combines the trail underpass and the conveyance of storm flows under Valmont Road into one structure. Elmer's Two Mile Creek 100-year flows (790 cfs) will be conveyed to Goose Creek through a box culvert under Valmont Road and under the BWR. The trail will cross under Valmont Road through the same structure provided for storm flows. Storm flows greater than the 5-year event (20% annual probability of exceedance) will flood lower sections of the trail where it passes under Valmont Road.

The Greenways staff group recommended looking at reducing the underpass width to allow path flooding at the 2 year flood level to see if this would significantly reduce the cost of the underpass. If the low flow channel capacity is reduced from the 5 year flow (200 cfs) to the 2 year flow (120 cfs) the cost savings is minimal. Depending on how the channel depth is adjusted, the cost savings could range from \$10,000 to \$45,000 for a structure that would have a total cost of at least \$300,000. These costs also include reductions to improvements downstream of the underpass. If the low flow channel depth is reduced to 2.5 feet instead of 4 feet, as currently planned, the underpass width is only reduced by 1 foot (approximate cost savings \$10,000). If the low flow channel depth is maintained at 4 feet, the underpass width is reduced by 4 feet (approximate cost savings \$45,000). The staff recommendation is to maintain the original low flow channel configuration.

The trail will also connect to the existing sidewalk on the south side of Valmont Road. Originally the at-grade connection on the south side of Valmont was shown adjacent to the BWR ditch. Based on public input, the proposed Alternative 1 now includes an at-grade connection to Valmont adjacent to the underpass instead of the path connection along the BWR. This change was made to reduce the impact to mature trees along the ditch. The alternate route for the at-grade connection will encroach into the parking lot of the office building because the underpass cannot be moved further west without restricting access to Shady Hollow. This will require the removal of two parking spaces for the office building east of Shady Hollow. A trail bridge will cross over the BWR and the ditch will be lined with concrete under the bridge and above the box culvert to ensure that the ditch banks remain stable. A bridge will also be required to maintain access to the parking lot of the adjacent office building.

Retaining walls will be required to make up elevation differences between the proposed trail alignment and adjacent properties. Retaining walls will be required behind the Villa Shopping Center, behind the Shady Hollow car ports and adjacent to the Shady Hollow driveway and office building parking lot. Shady Hollow residents requested a path connection from their parking lot to the new trail. This path connection is being proposed to be located between the Shady Hollow carports.

The Shady Hollow driveway will be relocated to the west to accommodate the combined underpass structure. The driveway relocation is not expected to reduce the number of parking spaces for Shady Hollow. The underpass structure in Valmont Road will cross the alignment of an existing sanitary sewer line and a water line. The sanitary sewer line will be re-routed to the

south through the Shady Hollow parking lot, under the BRW and then east to connect to the sanitary sewer line in 28th Street. The water line will be relocated to pass under the combined underpass structure at Valmont Road.

A limited opportunity for wetlands and stormwater quality treatment is available just prior to the confluence of Elmer's Two Mile and Goose Creek. Project improvements are expected to disturb or destroy some mature trees along the BWR. The project includes re-vegetation of disturbed areas and replanting of some trees.

This alternative can be completed within existing easements and by the acquisition of additional easements. The acquisition of land through purchasing is not anticipated.

Alternative 2 – Separated Creek and Trail Underpass (Attachments C & H)

Estimated Cost: \$2.46 million

The advantages and disadvantages of Phase I Alternative 2 are summarized in the table above.

This alternative considers the effects of separating the trail underpass and the conveyance of storm flows under Valmont. Elmer's Two Mile Creek 100-year flows (790 cfs) will be conveyed to Goose Creek through a continuous box culvert under Valmont Road and under the BWR. The trail will cross under Valmont Rd. through a separate structure. Creek flows will be completely separated from the trail.

The at-grade trail connection to the south side of Valmont will be adjacent to the underpass as was described in Alternative 1. This will require the removal of two parking spaces for the office building east of Shady Hollow. A trail bridge will cross over the BWR and the ditch will be lined with concrete under the bridge and above the box culvert to ensure that the ditch banks remain stable. A bridge will also be required to maintain access to the parking lot of the adjacent office building.

Retaining walls will be required to make up elevation differences between the proposed trail alignment and adjacent properties. Retaining walls will be required behind the Villa Shopping Center, behind the Shady Hollow car ports and adjacent to the Shady Hollow driveway and office building parking lot.

The Shady Hollow Townhouses driveway will be relocated to the west to accommodate the trail underpass structure, but to a lesser extent than Alternative 1. The driveway relocation is not expected to reduce the number of parking spaces for Shady Hollow. The stormwater culvert and trail underpass structure in Valmont Road will cross the alignment of an existing sanitary sewer line and a water line. The sanitary sewer line will be re-routed to the south through the Shady Hollow parking lot, under the BRW and then east to connect to the sanitary sewer in 28th Street. The water line will be relocated to pass under the culvert and underpass structures in Valmont Road.

A limited opportunity for wetlands and stormwater quality treatment is available just prior to the

confluence of Elmer's Two Mile with Goose Creek. Project improvements are expected to disturb or destroy some mature trees along the BWR. The project includes re-vegetation of disturbed areas and replanting of some trees.

This alternative can be completed within existing easements and by the acquisition of additional easements. The acquisition of land through purchasing is not anticipated.

Alternative 3 – Open Channel Creek and Trail At-grade Crossing (Attachments D & I)

Estimated Cost: \$2.46 million

The advantages and disadvantages of Phase I Alternative 3 are summarized in the table above.

This alternative was proposed in an attempt to maximize opportunities for open channel and stormwater quality treatment along the trail. However, this alternative has the greatest disturbance of mature trees and only a short section of Elmer's would not be contained in a culvert. Elmer's Two Mile Creek 100-year flows (790 cfs) will be conveyed to Goose Creek through a culvert under Valmont Road to a section of open channel before being conveyed under the BWR in a second culvert. The trail will cross Valmont Road at street level and will include an enhanced crosswalk treatment. A trail bridge will cross over the BWR and the ditch will be lined with concrete under the bridge and above the box culvert to ensure that the ditch banks remain stable. Storm flows up to the 100-year event will be completely separated from the trail.

Retaining walls will be required to make up elevation differences between the proposed trail alignment and adjacent properties and between the open channel and the trail. Retaining walls will be required behind the Villa Shopping Center, behind the Shady Hollow car ports and adjacent to the trail and open channel between the two Elmer's Two Mile Creek culverts. The open channel section between the two culverts will be completely surrounded by retaining walls with a nominal depth of six feet to the channel invert.

A less significant relocation of the Shady Hollow Townhouses driveway will be required to accommodate the trail as it connects to Valmont Road. The driveway relocation is not expected to reduce the number of parking spaces for Shady Hollow or for the office building to the east. The stormwater culvert structure in Valmont Road will cross the alignment of an existing sanitary sewer line and a water line. The sanitary sewer line will be re-routed to the south through the Shady Hollow Townhouses parking lot, under the BRW and then east to connect to the sanitary sewer in 28th Street. The water line will be relocated to pass under the culvert structure in Valmont Road.

An additional opportunity for wetlands and stormwater quality treatment is available in the open channel section between the two Elmer's Two Mile Creek culverts. This alternative also includes a limited opportunity for wetlands and stormwater quality treatment upstream of the confluence with Goose Creek. Project improvements are expected to disturb or destroy some mature trees along the BWR. The project includes re-vegetation of disturbed areas and replanting of some trees.

This alternative can be completed within existing easements and by the acquisition of additional easements. The acquisition of land through purchasing is not anticipated.

Phase II Valmont Road to Glenwood Drive

ALTERNATIVES	Alt 1	Alt 2
		Staff Recommended
Cost	\$3.16 million	\$3.22 million
GREENWAYS OBJECTIVES		
Flood		
Carries 100 yr Flood	+	+
Transportation		
Provides Trail Connection	+	+
Water Quality & Habitat		
Maintains Wetlands downstream of Glenwood	+	+
Additional Water Quality Treatment	0	+
Easement Acquisition	0	-
Impact to Parking	0	-
Trail Flooding	-	0
Removes mature trees	-	0
Structural Walls	-	0

- negative impact
- + positive impact
- 0 no impact

Phase II - Valmont Road to Glenwood Drive

Both of the Phase II alternatives provide a concrete trail connection from Valmont Road to Glenwood Drive (approximately 1300 feet) and provide conveyance of Elmer’s Two Mile Creek 100-year flood flows (790 cfs) in an open channel. Alternative 1 proposes a narrower channel corridor that requires more structural retaining walls than Alternative 2. Alternative 2 requires more property acquisition.

Alternative 1 – Narrower Channel (Attachments E & J)

Estimated Cost: \$3.16 million

The advantages and disadvantages of Phase II Alternative 1 are summarized in the table above.

A trail connection will be made to the sidewalk at Glenwood Drive and at Valmont Road. Storm flows greater than the 2-year event (50% annual probability of exceedance) will flood the trail along most of its length.

Retaining walls will be required to make up elevation differences between the proposed trail

alignment and adjacent properties. Nearly the entire length of the project will be walled and narrow except as it approaches Glenwood Drive. However, most of the existing grass-lined channel just downstream of Glenwood Drive will be preserved.

Retaining walls will cross the alignment of an existing sanitary sewer line between the Willow Brook and Eden East developments. This sanitary sewer line will be re-routed south through the Eden East parking lot to connect to the sanitary sewer in Valmont Road.

There are no additional opportunities for wetlands and stormwater quality treatment in this alternative. Project improvements are expected to disturb or destroy some mature trees in the open area just downstream of Glenwood Drive. The project includes re-vegetation of disturbed areas and replanting of some trees.

This alternative can be completed within existing easements and by the acquisition of additional easements. The acquisition of land through purchasing is not anticipated.

Alternative 2 – Wider Channel (Attachments F & K)

Estimated Cost: \$3.22 million

The advantages and disadvantages of Phase II Alternative 2 are summarized in the table above.

This alternative was proposed to improve the experience of trail users by widening the channel section and to provide additional opportunities for planting vegetation. The wider corridor will allow for habitat and water quality enhancement.

A trail connection will be made to sidewalk at Glenwood Drive and at Valmont Road. The walled channel section will be widened to the east (about 10 feet) to provide opportunities for more vegetation on the channel banks and improve the experience of trail users. Storm flows greater than the 5-year event (20% annual probability of exceedance) will flood the trail along most of its length.

Retaining walls will be required to make up elevation differences between the proposed trail alignment and adjacent properties. About 60 percent of the length of the project reach will be walled (approx. 800 feet). A widened grass-lined channel will be provided for about 480 feet north of Valmont Road and most of the existing grass-lined channel just downstream of Glenwood Drive will be preserved.

Retaining walls will cross the alignment of an existing sanitary sewer line between the Willow Brook and Eden East developments and the channel widening to the east will encroach into an existing sanitary sewer. Both of these sanitary sewer lines will be re-routed parallel to the improved channel to connect to the sanitary sewer in Valmont Road.

There may be somewhat more opportunities for wetlands and stormwater quality treatment in this alternative if the low flow portion of the channel is modified to accommodate wetlands. This alternative provides opportunities for planting trees and grasses along the channel. Project

improvements are expected to disturb or destroy some mature trees in the open area just downstream of Glenwood Drive. The project includes re-vegetation of disturbed areas and replanting of some trees.

This alternative requires the acquisition of additional easements behind commercial properties along 28th Street and the purchasing of nearly one acre of land east of the channel just north of Valmont Road (a portion of the Rayback property).

Phase III – Glenwood Drive Underpass

As proposed, the northern end of Phase II improvements terminates on the southern side of Glenwood Drive with a trail connection to existing sidewalk and channel improvements transitioning to the existing culvert under Glenwood Drive. This provides an at-grade connection to the existing trail that continues north of Glenwood Drive and limits disturbance of the area due to channel improvements. Traffic volumes on Glenwood Drive do not warrant a grade-separated trail crossing at this time, but one may be desirable in the future. Therefore, two possibilities for providing an underpass at Glenwood Drive were considered; 1) a combined trail and drainage underpass with a low flow channel similar to that proposed for Phase I - Alternative 1 at Valmont Road and 2) a separated trail underpass using the existing culvert for passing storm flows. Each of these possibilities includes the proposed at-grade trail connection to the south side of Glenwood Drive.

Constructing a combined trail and drainage underpass at Glenwood Drive increases the depth of excavation and amount of disturbance in the area south of Glenwood Drive and would likely require the removal of mature trees. This approach requires removal of the existing double 10' x 4.75' box culvert and realignment of the low flow channel. This approach would preserve the alignment of the existing trail north of Glenwood Drive, along the eastern bank of the creek with a retaining wall having a maximum height of 11 feet. A series of three drop structures would be needed to raise the improved channel to match the existing channel north of Glenwood Drive about 200 feet north of Glenwood Drive. A 5-year flow was assumed for the low flow channel capacity, similar to the Valmont Road crossing.

Constructing a separate trail underpass at Glenwood Drive would require less excavation and cause less disturbance of the area, but would still likely cause the removal of mature trees. Due to the proximity of a Willow Brook building southwest of the existing culvert crossing, constructing a trail underpass east of the existing culvert is most feasible. This approach would not require the removal of the existing culvert and storm flows would continue to pass under Glenwood Drive through this structure. The construction of the trail underpass would require relocation of the existing trail north of Glenwood Drive; either to the east into private property or to the west side of the creek by way of a low flow crossing or bridge. Relocation to the east would encroach into the corner of a parking lot. Relocation to the west could disturb mature trees.

According to the Flood Hazard Area Delineation study completed for Elmer's Two Mile Creek in 1986 by Geenhorne and O'mara, the existing culvert at Glenwood Drive passes 100-year flood

flows (640 cfs) without overtopping Glenwood Drive. This same study shows that 100-year flood flows leave the main channel about 500 feet north of Glenwood Drive and cause shallow flooding of two apartment buildings east of the creek. This flooding is due to backwater conditions caused by a detention pond on the creek. Flood flows that overtop the pond outlet structure (approx. 300 feet north of Glenwood Drive) are not adequately contained along the eastern bank of the creek. Removal of this outlet structure or raising the bank of the creek could provide adequate flood protection. However, removal of the pond outlet structure could have downstream consequences by increasing flows during more frequent flood events (e.g. 2-year and 5-year storms).

Either of the two possibilities considered could be constructed without addressing flooding along the eastern bank of the creek. However, by extending improvements 200 to 300 feet to the north flooding issues could also be addressed. The current CEAP is not recommending that a trail underpass be constructed at Glenwood Drive at this time, however, should an underpass be considered in the future, the issues of increased disturbance and flood containment should be addressed.

4. Preferred project alternative:

Based on the comments received from the public meeting and the staff meeting held on March 11, 2004, the staff recommendation is to construct the project with a combined creek and trail underpass at Valmont Road with a relocated at-grade trail connection to Valmont located further away from the Boulder and Whiterock Ditch as shown in Phase I - Alternative 1 and construct a wider channel as shown in Phase II – Alternative 2, with the understanding that the width of the channel and the transition from the south section to the north section needs to be flexible to take into account the affect on adjacent properties and the city's ability to negotiate easements with adjacent property owners. Staff does not recommend a grade separated crossing at Glenwood Drive at this time.

5. Public input to date:

There has been public comment on the Transportation Master Plan, the Greenways Master Plan, CDUMP, and the Greenways CIP. In addition, a public open house was held on March 8, 2004 to solicit comments on this project. Twenty one people attended the open house. Three alternatives were presented for phase I and two alternatives were presented for phase II of the project. The underpass at Glenwood Drive was not presented at the open house. Comments from this public meeting are attached (**Attachment L**). Several Greenways core group staff meetings were held to discuss project alternatives in order to solicit input from representatives from various departments that have an interest in the Greenways Program. Comments from the final staff meeting on March 11, 2004 are also attached (**Attachment L**).

6. Staff project manager:

The Greenways Engineering Project Manager for this project is Anne Noble.

7. Other consultants or relevant contacts:

McLaughlin Water Engineers

Goals Assessment:

1. Using the BVCP, describe the primary city goals that the project will help to achieve:

General

The project will help to achieve multiple objectives and city goals by combining transportation, recreation, flood control, water quality, and aesthetic improvements to the Elmer's Twomile Creek corridor in the project area.

Community Design

The Greenways system is an example of a positive community design feature. This project contributes to the Greenways program and meets multiple objectives for stream management.

Facilities and Services

The proposed project includes transportation, flood improvements, and environmental facilities.

Environment

The project will enhance the environment of the Elmer's Twomile Creek corridor in the project area. Specific improvements include removing noxious weeds, planting native vegetation, increased buffer vegetation along parking lots to reduce pollutant loading to the stream, cleanup of the trash and debris, and possibly widening of the creek corridor.

Economy

The project will increase alternative transportation access between the commercial areas along 28th Street and high density residential areas to the west.

Transportation

The Elmer's Twomile project from Goose Creek to Glenwood Drive will complete an important off-street trail north-south connection to Goose Creek and the Boulder bikeways system. This link will provide a continuous trail along Elmer's Twomile Creek allowing users to avoid traveling along Folsom or 28th Streets.

Housing

The trail will be adjacent several high density residential areas and will facilitate alternative transportation to these areas, as well as to the areas north and south of the project.

Social Concerns and Human Services

The area along Elmer's Twomile Creek is currently a dumping ground for trash and refuse. Once the path and creek improvements are completed, the area will be better maintained.

2. What are the trade-offs in terms of city policies and goals?

All of the alternatives proposed will require the removal of mature trees. Every attempt will be made to preserve as many trees as possible.

While it would be desirable to have Elmer's Twomile drainage be in an open channel, given the constraints of urban development adjacent to the drainage between Goose Creek and Valmont Road and the desire for the drainage to contain the 100 year flood, this is not possible.

3. Is this project referenced in a master plan? If so, what is the context in terms of goals, objectives, larger system plans, etc.? If not, why not?

This project is referenced in the Greenways Master Plan, the Transportation Master Plan, and the Comprehensive Drainage Utility Master Plan. In terms of larger system plans, this project completes an important alternative transportation connection linking the north part of Boulder with the Goose Creek path and entire Boulder bikeways system. Flood improvements will remove several properties along 28th Street from the 100 year floodplain. Replacing the concrete lined channel with a rock lined channel, providing opportunities for treatment of parking lot runoff prior to discharge to Elmer's Twomile Creek and developing wetland and water quality improvements at the confluence of Elmer's Two and Goose Creeks will meet the habitat and water quality enhancement objectives of the Greenways Master plan. However, due to the urban environment and the predominant use by resistant urban-tolerant wildlife, it is doubtful that riparian habitat improvements will increase the value of the larger system as a wildlife movement corridor or to support more ecologically important or rare species.

4. How will the project exceed city, state, or federal standards and regulations?

The project will be designed to achieve the lowest feasible slope and to meet ADA requirements as much as possible. The project will meet the requirements for wetland mitigation for unavoidable impacts from the culvert installation, underpass and trail construction. All necessary permits including floodplain and wetland permits will be obtained for the project.

Impact Assessment

1. Using the attached checklist, identify the potential impacts of the proposed project or (if applicable) the project alternatives: See Attachment M CEAP Checklist

COMMUNITY AND ENVIRONMENTAL ASSESSMENT PROCESS - CHECKLIST

Elmer's Twomile Creek Greenway Improvements

Goose Creek to Glenwood Drive

Note: The following questions are a supplement to the CEAP checklist. Only those questions indicated on the checklist are answered in full.

A. Natural Areas

1. Describe the potential for disturbance to or loss of significant: species, plant communities, wildlife habitats, or ecosystems via any of the activities listed below. (Significant species include any species listed or proposed to be listed as rare, threatened or endangered on federal, state, county lists.) – **SEE BELOW**
 - a. construction activities
 - b. vegetation removal
 - c. human or domestic animal encroachment
 - d. chemical pollutants (including fertilizers, pesticides, herbicides)
 - e. behavioral displacement of wildlife species (due to noise from use activities)
 - f. introduction of non-native plant species in the site landscaping
 - g. hydrologic alteration (groundwater, surface runoff)
 - h. increased sedimentation in any body of water
 - i. wind erosion

2. Loss of Mature Trees and significant plants

If potential impacts have been identified, please provide the following:

- A description of how the proposed project would avoid, minimize, or mitigate identified impacts. – **SEE BELOW**
- A habitat assessment of the site, including: 1. a list of plant and animal species and plant communities of special concern found on the site; 2. a wildlife habitat evaluation of the site. – **SEE BELOW**
- Maps of the site showing the location of any Boulder Valley Natural Ecosystem, Boulder County Environmental Conservation Area, or critical wildlife habitat. – **NOT APPLICABLE**

A comprehensive Greenways Riparian Habitat Assessment was completed in October, 1999 as part of the Greenways Master Plan, December 2001. The riparian habitat was evaluated based on the quality of the vegetation (native or non-native), the vegetative structure and the quality of the habitat based on the presence of bird species. Each

stream reach was rated for each of these three criteria, with a rating of very poor, poor, good, very good and excellent. Elmer's Twomile Creek received the following ratings:

- Vegetation Structure Very Poor to Good
- Native Plants Very Poor to Good
- Bird Habitat Very Poor to Poor

The aquatic habitat within the Greenways System was evaluated in a separate study and was rated on a scale of poor, fair, good to excellent. Elmer's Twomile rated poor to fair. This information is contained in the Greenways Master Plan Reach Inventory.

The Greenways Master Plan also ranked each of the six Greenways objectives for each stream reach for the purpose of balancing conflicting interests at the time a project is being undertaken. Each objective was given a low, medium or high rank based on specific criteria outlined in the Master Plan. Elmer's Twomile Creek received the following rankings:

- Habitat Low
- Water Quality Low
- Transportation High
- Recreation High
- Flood High

Given the relatively poor quality of the existing habitat, the limited amount of space available and the high rankings of the Transportation, Recreation and Flood objectives in this area, this project primarily focuses on containing the 100 year flood and providing a path connection between Goose Creek and Glenwood Drive.

- a. The project involves construction activities in and around the Elmer's Twomile Creek stream channel. The construction crew will use Best Management Practices as described in the Wetlands Mitigation Guidelines, however some impacts to vegetation and stream morphology will be unavoidable. The project includes environmental enhancements for habitat and water quality.
- b. There are many mature trees in the project area, which are primarily supported by water in the Boulder and Whiterock Ditch. While mature trees will be removed, the preferred alternative minimizes the impacts on trees by having a trail alignment as far away from the Ditch as possible and by relocating the at-grade path connection to Valmont Road away from the Ditch. Site landscaping will be in accordance with the Revegetation Rules.
- c. Because the project area is already highly urbanized, it is not expected that disturbance from humans and domestic animals will impact the wildlife that currently inhabit the area.
- d. Chemical pollutants will not be part of the project. Maintenance of the vegetation after project completion will be performed by selective mechanical removal of noxious weed species, with limited use of herbicides. If herbicides are selected for control, only chemicals certified for use near streams will be used.

- e. Although construction activities may limit the use of the area by even tolerant species during the work activities, they are expected to return after project completion. It is likely that the resident fauna include tolerant urban generalists which are not sensitive to noise or other human disturbances that may be associated with trail use. The environmental enhancements associated with the project are not likely to draw more ecologically important or sensitive wildlife species to the area due to the surrounding urban uses.
- f. Only native vegetation will be used in site landscaping, in accordance with the Revegetation Rules.
- g. Hydrologic alteration will be part of the project, since the capacity of the stream channel and box culvert structures to convey flood waters will be increased. Water from Elmer's Twomile currently empties into the Boulder and Whiterock Ditch, which is an irrigation ditch. After this project is completed, water from Elmer's Twomile will flow into Goose Creek.
- h. Sedimentation will not be increased. Water quality enhancements such as buffer strips and wetland enhancements at the confluence with Goose Creek will reduce sedimentation downstream.

B. Riparian areas/floodplains

1. Describe the extent to which the project will encroach upon the 100-year, conveyance or high hazard flood zones. – **SEE BELOW**
2. Describe the extent to which the project will encroach upon, disturb, or fragment a riparian corridor. – **SEE ABOVE**

If potential impacts have been identified, please provide the following:

- A description of how the proposed project would avoid, minimize, or mitigate identified impacts. – **SEE BELOW**
- A map showing the location of any streams, ditches and other water bodies on or near the project site. **See Attachment A**
- A map showing the location of the 100-year flood, conveyance, and high hazard flood zones relative to the project site. **See Attachment N**

The proposed project lies within the 100-year, high hazard, and conveyance zones of Elmer's Twomile Creek. One of the purposes of the project is to provide flood mitigation by increasing the capacity of the stream channel and the box culvert structure under Valmont Road.

C. Wetlands

1. Describe any disturbance to or loss of a wetland on site which will result from the project. – **SEE BELOW**

If potential impacts have been identified, please provide the following:

- A description of how the proposed project would avoid, minimize, or mitigate identified impacts. – **SEE BELOW**
- A map showing the location of any wetlands on or near the site. Identify both those wetlands which are jurisdictional under city code (on the wetlands map in our ordinance) and other wetlands pursuant to federal criteria (definitional). **See Attachment O.**

The Elmer's Twomile Creek project will have a temporary impact to regulatory wetlands in the area north of Valmont Road and a permanent impact to regulatory wetlands south of Valmont Road. The area of the mapped regulatory wetland south of Valmont Road is much smaller than the area north of Valmont Road. The quality of the existing wetland areas is low, and is dominated by weed species. The project includes a proposed wetland at the confluence of Elmer's Twomile and Goose Creek, as well as a much wider riparian corridor north of Valmont Road. The proposed wetland area and wider riparian corridor will be more functional and provide better wildlife habitat and improve water quality.

D. Geology and soils

1. Describe any:
 - a. impacts to unique geologic or physical features
 - b. geologic development constraints or effects to earth conditions or landslide, erosion, or subsidence
 - c. substantial changes in topography

which will result from the project. – **NO IMPACTS**

The project will not impact any geologic or physical features.

E. Water Quality

1. Describe potential impacts to groundwater or stormwater quality which may result from the project. – **NO NEGATIVE IMPACTS**
2. Describe potential increases in stormwater discharges which may result from the project. – **NO NEGATIVE IMPACTS**

3. Describe potential water quality impacts to streams, ditches and other water bodies from the project. – **NO NEGATIVE IMPACTS**
4. Is there a likelihood of groundwater contamination from past history on the site or an adjacent site? – **NO IMPACTS**

The completed project will improve water quality by improving the filtering capacity of the buffer at parking lots, and at the confluence with Goose Creek, as well as providing water quality features.

Stormwater conveyance will be improved by the project due to the increased flood capacity of the stream channel and underpass.

Construction activities within and near stream channels have the potential to impact water quality. Best Management Practices (City of Boulder Wetlands Guidelines) will be followed to minimize impacts.

No contaminated groundwater impacts have been identified at the site.

F. Air Quality

1. Describe potential impacts to air quality resulting from this project. Distinguish between impacts from mobile sources (VMT/trips) and stationary sources (APEN, HAPS). – **NO IMPACTS**

The project will not cause air quality impacts, but in fact should improve air quality by encouraging alternative transportation in the form of bicycling on the trail network.

G. Resource Conservation

1. Describe potential changes in water use which may result from the project. – **NO IMPACTS**
 - a. Estimate the indoor, outdoor (irrigation) and total daily water use for the facility.
 - b. Describe plans for minimizing water use on the site.
2. Describe potential increases in energy use which may result from the project. – **NO IMPACTS**
 - a. Describe plans for minimizing energy use on the project or how energy conservation measures will be incorporated into the building design.

3. Describe the potential for excess waste generation resulting from the project. Describe plans for recycling and waste minimization (deconstruction, reuse, recycling, green points). – **NO IMPACTS**

The project will not use water or energy, or generate waste. Initially, plantings will need to be watered to ensure establishment and survival. Plantings will be selected and located along the slope of the channel banks based on the water requirements of the plant and the water table associated with the stream.

H. Cultural/Historic Resources

1. Describe any impacts to:
 - a. a prehistoric or historic archaeological site.
 - b. a building or structure over fifty years of age.
 - c. a historic feature of the site such as an irrigation ditch.
 - d. significant agricultural lands.

which may result from the project.

The project will require demolishing a structure on the Rayback property that was built in 1920. During the design phase of the project, the Landmarks Board will review the structure to determine whether it will be eligible for landmark designation. A 1995 historic structure survey found the house to be significant for its representation of early 20th century vernacular construction in Boulder. However, the survey also notes that the structure is in deteriorating condition.

I. Visual Quality

1. Describe any effects on:
 - a. Scenic vistas or views open to the public.
 - b. The aesthetics of a site open to public view.
 - c. View corridors from the site to unique geologic or physical features.

which may result from the project. – **NO IMPACTS**

The project will not increase the heights of the roadway surface, therefore there will be no effects on scenic views, or view corridors. The aesthetics of the site will be improved by removing the trash and debris.

J. Safety

1. Describe any additional health hazards, odors, or exposure of people to radon that may result from the project. – **NO IMPACTS**
2. Describe any additional site hazards that may result from the project. (Including risk of explosion or the release of hazardous substances such as oil, pesticides, chemicals or radiation) – **NO IMPACTS**

The proposed project will improve safety by providing a grade separated path and grade-separated crossing of Valmont Road and increasing the flood capacity of the stream channel and box culverts. Potential site hazards include collisions among users, risk to users during conditions of high water, and other path-related concerns. These hazards will be minimized by posting speed limit signs to reduce the speed of trail users, and by providing adequate sight distances for accommodating multiple users.

K. Physiological Well-being

1. Describe the potential for exposure of people to excessive noise caused by any phase of the project. – **SEE BELOW**
2. Describe any excessive light or glare that may result from the project. – **NO IMPACTS**
3. Describe any increase in vibrations that may result from the project. – **NO IMPACTS**

If potential impacts have been identified, please provide the following:

- A description of how the proposed project would avoid, minimize, or mitigate identified impacts. – **SEE BELOW**

During construction, noise related to heavy equipment operation will be generated during the daytime hours. No other phase of the project will have a negative impact on physiologic well being. The project itself will enhance physiological well being by providing an outdoor recreational opportunity, relieving traffic congestion by providing alternative transportation options, and enhancing the environment in the project area. Lighting in the underpasses will be designed for safety purposes, and will not cause excessive glare.

L. Services

1. Describe any additional need for the following services as a result of the project:
– **NO IMPACTS**
 - a. health care/social services
 - b. water or sanitary sewer services

- c. police services
- d. fire protection
- e. recreation or parks facilities
- f. libraries
- g. transportation improvements/traffic mitigation
- h. parking
- i. affordable housing
- j. open space/urban open land
- k. power or energy use
- l. telecommunications

The proposed project will not increase the need for any of the above services or facilities. The project should reduce the need for several services, including transportation and parking by providing alternative transportation in the form of bicycle commuting. Proper lighting and landscaping will be used to discourage crimes. The project will also contribute to urban open land by preserving and enhancing the Elmer's Twomile Creek corridor.

- 2. Describe any impacts to any of the above existing or planned city services or department master plans as a result of this project. (e.g. budget, available parking, planned use of the site, public access, automobile/pedestrian conflicts, views) – **NO IMPACTS**

There will be no impacts to any of the above existing or planned city services or department master plans as a result of this project.

M. Special Populations

- 1. Describe any effects the project may have on the following special populations:
– **SEE BELOW**
 - a. persons with disabilities
 - b. senior population
 - c. children
 - d. restricted income persons

Due to significant development in the project area and other site constraints there may not be adequate space available to meet ADA slope requirements for the underpass access ramps in all locations. The project will be designed to achieve the lowest feasible slope and to meet ADA requirements as much as possible to ensure adequate use and participation in the trail system by persons with disabilities, seniors, and children.

Attachments:

Attachment A	Project Location Map
Attachment B	Plans for Phase I Alternative 1

Attachment C	Plans for Phase I Alternative 2
Attachment D	Plans for Phase I Alternative 3
Attachment E	Plans for Phase II Alternative 1
Attachment F	Plans for Phase II Alternative 2
Attachment G	Cross Sections for Phase I Alternative 1
Attachment H	Cross Sections for Phase I Alternative 2
Attachment I	Cross Sections for Phase I Alternative 3
Attachment J	Cross Sections for Phase II Alternative 1
Attachment K	Cross Sections for Phase II Alternative 2
Attachment L	Comments from Public and Staff
Attachment M	CEAP Checklist
Attachment N	Flood Map
Attachment O	Wetland Map