CITY OF TWIN FALLS

NOTICE OF SPECIAL MEETING

Canyon Springs Road Project Ad Hoc Committee Meeting

November 17,2016

LOCATION: 305 3RD AVENUE EAST
CITY COUNCIL CHAMBERS

Lori Williamson
Administrative Assistant
208-735-7248

NOTICE OF AGENDA
PUBLIC MEETING
Canyon Springs Road Project
Ad Hoc Committee
Thursday, November 17, 2016 11:30AM
City Council Chambers
305 3rd Avenue East Twin Falls, ID 83301

Canyon Springs Road Project
Ad Hoc Committee Members:
Katie Breckenridge John Lezamiz Tony Mannen Dave McCullom Rick Novacek Jim Olson Linda Roberts
Todd Schwarz Jaime Tigue
Facilitator: Phil Kushlan
Staff: Troy Vitek, Lori Williamson
Council Liaison: Mayor Shawn Barigar

I. CALL MEETING TO ORDER:
1. Confirmation of quorum
2. Introduction of staff

II. CONSENT CALENDAR:
1. Approval of Minutes from the following meeting(s): September 22, 2016

III. ITEMS OF DISCUSSION:
Committee will meet at the Council Chambers at 11:30am

1. Draft Report from JUB.
2. Consideration of a Recommended Preferred Alternative.
3. Discussion of expanded community involvement efforts.
4. Discussion of financing methods.

IV. PUBLIC INPUT AND/OR ITEMS FROM THE COMMISSION/THE PUBLIC/CITY STAFF

V. UPCOMING MEETINGS:
Next public meeting to be scheduled for Thursday December 22, 2016

VI. ADJOURN MEETING:

Si desea esta información en español, llame Leila Sanches al (208) 735-7287
Any person(s) needing special accommodations to participate in the above noticed meeting should contact Lori Williamson at (208) 735-7248 at least two (2) working days before the meeting.

NOTICE OF AGENDA
PUBLIC MEETING
Canyon Springs Road Project
Ad Hoc Committee
Thursday, September 22, 2016 11:30AM
City Council Chambers
305 3rd Avenue East Twin Falls, ID 83301

Canyon Springs Road Project
Ad Hoc Committee Members:
Katie Breckenridge John Lezamiz Tony Mannen Dave McCullum Rick Novacek Jim Olson Linda Roberts
Todd Schwarz Jaime Tigue
Facilitator: Phil Kushlan
Staff: Troy Vitek, Lori Williamson
Council Liaison: Mayor Barigar

Member Attendance: Breckenridge, Lezamiz, Mannen, Novacek, Olson, Roberts, Tigue
Facilitator: Kushlan, JUB: Smith
Staff: Vitek, Williamson, Humble
City Council Liaison: Mayor Barigar

DRAFT

I. CALL MEETING TO ORDER:
1. Confirmation of quorum
2. Introduction of staff

II. CONSENT CALENDAR:
1. Approval of Minutes from the following meeting(s): August 25, 2016

III. ITEMS OF DISCUSSION:
Committee will meet at the Council Chambers at 11:30am

1. Committee Recommendation for the Preferred Alternative for presentation to the Twin Falls City Council. See attached Alternatives Summary Sheet.
2. Discussion Regarding additional community outreach efforts

A motion was made to approve the meeting minutes from August 25, 2016. Unanimously approved by the committee.

Summary of meeting:
Mics were not on for the 1st part of the meeting so it is hard to here part of the discussion.

The committee discussed the recommendation for the alternatives that were presented by Brian from JUB. Brian had a presentation of alternatives and costs. There was discussion again about the stability of the wall, Katie had concerns about the sink hole on her property and the fact that they will not be addressing these. Brian stated that isn't the focus, because they feel this is a lower risk area. Brain pointed out the area that the cost would cover, and explained that the cost addresses the higher risk areas
Katie stated the she is disappointed with this and that she feels strongly about the stability of the Canyon wall because of the sink hole. Brian put together a risk matrix of 0-5 with 0 being low probability of a rock fall event. 4-5 areas are the higher risk areas. The 4-5 areas have been the focus. There was some more discussion back and forth about the canyon grade, the wall and the safety because of potential rock fall.

In review, through the discussion it appears we are concentrating on Alternative #6 with potentially looking at the rock fall areas. The committee is wonder about additional costs. Virgin-Roberts asked if there would be an ongoing evaluation? Perhaps yearly? Vitek answered not at this time. Novacek stated that in his opinion there is need to address the risk factor down to the 3's. Suggesting that the upper level is not as risky as the lower level, also asked about the cost, before commitment. Virgin-Roberts wanted some clarity about bringing down to level 3 with alternative #6. Kushlan said yes the attention is the rock fall expansion. Lezamiz then made a motion to vote for alternative #6, Novacek 2nd the motion. A roll call was done. Alternative #6 was approved 4-2.

IV. PUBLIC INPUT AND/OR ITEMS FROM THE COMMISSION/THE PUBLIC/CITY STAFF

V. UPCOMING MEETINGS:

Next public meeting to be scheduled for November 17, 2016

VI. ADJOURN MEETING:

~~**Si desea esta información en español, llame Leila Sanches al (208) 735-7287**~~

Any person(s) needing special accommodations to participate in the above noticed meeting should contact Lori Williamson at (208) 735-7248 at least two (2) working days before the meeting.

DRAFT

ALTERNATIVES SUMMARY W/COSTS

Alternative	Description	Estimated Cost
1	Rock Fall Ditches Along Canyon Springs Road	$29M - $39M
1A	Pathway Construction along Northern Edge of Breckenridge Property with Rock Fall Catch Ditches	$50M - $66M
2	Grade Separated Path with Rockfall Mitigation (paved with maximum 10% grade)	$5M - $6M
3	Grade Separated Path with Rockfall Mitigation (unpaved "natural" with maximum 20% grade)	$4.5M - $5M
4	Canyon Springs Roadway Reconstruction and Rockfall Mitigation Only (no pedestrian improvements)	$1.4M - $1.7M
5	Pathway Location West of Gun Club	$9.5 - $11.4M
6	At Grade Pathway along Canyon Springs Roadway with Roadway Reconstruction and Rockfall Mitigation	$4.5M - $5.5M

CANYON SPRINGS ROAD PROJECT UPDATE

DRAFT

November 2016

City of Twin Falls, Idaho

J·U·B ENGINEERS, INC.

115 Northstar Avenue
Twin Falls, ID 83301-3366

TABLE OF CONTENTS

INTRODUCTION 1

BACKGROUND AND DISCUSSION 2

Vehicular / Pedestrian Traffic Counts 2

Property Ownership 2

Rock Fall History and Previous Rock Fall Evaluations 2

Table 1 3

IMPROVEMENT ALTERNATIVES DEVELOPMENT 3

Alternative 1 – Install Rock Fall Ditches Along the Canyon Wall with Roadway Widening / Sidewalks 4

Figure 1 – Alternative 1 - Proposed Typical Section 5

Alternative 1A – Pathway Construction Along Northern Edge of Breckenridge Property with Rock Fall Catch Ditches 6

Figure 2 – Alternative 1A - Proposed Typical Section 6

Figure 3 – Alternative 1A - Plan View 7

Alternative 2 – Grade Separated Paved Path with Rock Fall Mitigation 9

Figure 4 – Typical Section – Alternative 2 - Upper Roadway Section Above Upper Hairpin Curve 9

Figure 5 –Typical Section – Alternative 2 - Lower Roadway Section – Below Upper Hairpin Curve . 10

Figure 6 – Upper Roadway Section Pathway Rendering 10

Alternative 3 – Install “Natural” Surface Grade Separated Pedestrian Nature Trail Improvements 12

Alternative 4 – Canyon Springs Roadway Reconstruction and Rock Fall Mitigation Only (No Pedestrian Improvements) 13

Figure 7 – Alternative 4 - Roadway Typical Section 13

Alternative 5 – Pathway Location West of Twin Falls Road and Gun Club 14

Figure 8 – Alternative 5 - Proposed Location 14

Figure 9 – Alternative 5 - View From Canyon Springs Road 14

Figure 10 – Alternative 5 - Plan View 15

Figure 11 – Typical Section – Alternative 5 - Upper Pathway Rock Cut 16

Figure 12 – Typical Section – Alternative 5 - Lower Pathway Fill Section with Gabion Retaining Walls 17

Figure 13 – Example Gabion Retaining Wall 17

Alternative 6 – At Grade Pathway along Canyon Springs Roadway with Roadway Reconstruction and Rock fall Mitigation 18

Figure 14 – Typical Section – Alternative 6 - Upper Roadway 18

Figure 15 – Typical Section – Alternative 6 - Lower Roadway 18
Alternative 7 – Install Signing to Prohibit Pedestrian Use of Canyon Springs Grade 19
Alternative 8 – Install Traffic Signal at Top and Bottom of Grade 20
IMPROVEMENT ALTERNATIVES SUMMARY 21
Figure 16 – Improvement Alternative Summary 21

INTRODUCTION

The City of Twin Falls (City) developed the "Canyon Springs Road Project Citizen Involvement Ad Hoc Committee Charter" on September 14, 2015 with the intent of "providing an effective mechanism to access community input on the identification, design, and construction of potential improvements" to Canyon Springs Road.

The purpose of this report is to provide an update of the findings from the Ad Hoc Committee public involvement process including advisory recommendations from the Committee to the City Council.

As outlined in the charter the role of the Ad Hoc Committee included:

1. Develop design concepts regarding the roadway and associated pedestrian and cyclist access
2. Review design data regarding the design and construction of improvements
3. Review and recommend funding options
4. Take public comment
5. Review alternatives
6. Deliberate
7. Make presentations to community and interest groups
8. Make recommendations to the City Council

The following committee members were appointed by the City Council and agreed to participate in this process:

- Katie Breckenridge, Adjacent Property Owner
- Tony Mannen, Retired Professor College of Southern Idaho
- Jim Olson, Business Owner, Member of Twin Falls Rural Fire Protection District
- Todd Schwarz, College of Southern Idaho
- John Lezamiz, Adjacent Property Owner
- Linda Roberts, Realtor
- Rick Novacek, Director Twin Falls County Parks and Waterways
- Jamie Tigue, Magic Valley Trail Enhancement Committee
- Dave McCollum, Adjacent Property Owner, Co-Owner Canyon Springs Golf Course

City of Twin Falls Staff:	Troy Vitek, P.E., Assistant City Engineer Lori Williamson, City Communication Liaison
Project Facilitator:	Phil Kushlan – Kushlan Associates
Consulting Engineers:	Brian D. Smith, P.E. - J-U-B ENGINEERS, Inc. Mike Woodworth, P.E. / Kent Magleby, P.E. - STRATA, Inc.

The initial committee meeting was held on January 21, 2016 and the committee has met a total of (7) times to date to review previously completed studies and discuss and develop a wide range of potential alternatives.

BACKGROUND AND DISCUSSION

Canyon Springs Road provides the only direct access for pedestrians, bicyclists, and vehicular traffic for existing City facilities, parks, and other recreational opportunities on the south side of the Snake River, west of the Perrine Bridge. The existing roadway averages approximately 10% in grade from the top of the canyon to the bottom "flat" area and includes (2) 180 degree "switchback" horizontal curves. The roadway width ranges from approximately 22' to 26' and there are no existing pedestrian facilities (i.e. sidewalks), which forces pedestrians to use one of the vehicular travel lanes.

Access to the canyon from this road has increased over the last several years prompting concerns from the City, adjacent property owners, and roadway users over potential safety and functional concerns with the roadway as well as potential rock fall issues from the adjacent canyon rock wall.

In addition, the City's sanitary sewer trunk line runs down Canyon Springs Road and has limited cover over the top of the pipeline necessitating that any of the proposed improvements for this project take into consideration potential impacts to this vital infrastructure component during construction.

Vehicular / Pedestrian Traffic Counts

City provided traffic counts estimate an average daily vehicular count of 1,343 vehicles. In addition, the City conducted pedestrian counts in July 2016 which showed an average pedestrian use of approximately xxx trips per day on the roadway. Many pedestrians park at existing gravel lots located at either the top or bottom of the grade and then walk the roadway.

Property Ownership

Canyon Springs Road is not dedicated right of way and the majority of the roadway is constructed within an existing City owned parcel located in Twin Falls County. Adjacent to the canyon wall, recorded surveys show that the city owned parcel line along the south side of the roadway is delineated by the top of the canyon rim.

The section of Canyon Springs Road near the top of the rim (approximately 1,000 linear feet in length) is located on a privately owned parcel of land and is used by the public and maintained by the City through prescriptive rights across this property.

Rock Fall History and Previous Rock Fall Evaluations

As reported by City maintenance crews, minor rockfall events requiring maintenance and clean up occur on a period basis along the section of Canyon Springs Road (particularly during spring and winter months) adjacent to the canyon wall. A significant rock fall event occurred in 2003 that resulted in a temporary road closure although no additional property damage or injuries were reported as a result of that event. City personnel and members of the advisory committee indicated that to their knowledge there have been no previous injuries and only (1) incident of damage to a vehicle from rock fall events.

In 2009, the City commissioned a study by STRATA Geotechnical Engineers (STRATA) to review the geologic conditions of the canyon wall along the upper 2,200 foot long section of Canyon Springs Road and to provide recommendations to help mitigate future rock fall events. A detailed field visual evaluation of the canyon wall was completed as a part of this effort in addition to a review of the area geology and potential contributing factors to rock fall.

A site specific data base identifying a total of 44 potential rock fall areas along the canyon wall was prepared to evaluate potential rockfall failure mechanisms, likelihood of failure, and risk to the public associated with the failure. Field observations and consultation with the City led to the development of an inventory of risk factors associated with potential rockfall events to identify potential hazardous areas which appeared to pose the most substantial risk to the public and property.

The risk factors ranged from 0 to 5, with 5 being the highest risk. A summary of the description of each risk factor as well as the number of locations identified along the canyon wall for each of these factors is shown below in **Table 1.**

TABLE 1

Risk Factors	Risk Factor Description	Number of Identified Locations Along Canyon Wall
0 – 1	Smaller cobbles and/or boulders with a low likelihood of reaching the roadway.	5
2 – 3	Larger boulders that would have enough momentum to roll into the roadway and potentially cause minor damage to the roadway and any passing vehicles.	35
4 - 5	Larger boulders / wedge failure locations that will likely reach the pavement and have the potential to cause significant damage to the pavement surface as well as significant / catastrophic damage to a passing vehicle.	5

According to the STRATA report, the City's "preliminary" goal of this effort was to "reduce the existing rockfall hazard by implementing remediation efforts in areas which present the greatest overall risk to public safety and/or existing infrastructure." Based on this criteria, mitigation recommendations were developed for the 4 locations that were classified as risk factors 4 -5.

Rockfall mitigation strategies for these 4 high risk areas included high scaling, rock anchors, and steel wire mesh netting. The estimated rock fall mitigation costs for these (4) "higher risk" areas was **$475,000 - $520,000**. A detailed summary of this previous rock fall history as well as the geotechnical engineering rock fall evaluation report and recommendations was reviewed with the Ad Hoc committee members at the February 18, 2016 meeting.

Following the September 21, 2016 advisory committee meeting, the committee asked the consultant design team to provide additional estimated rockfall mitigation costs for areas identified as risk factor 3. These mitigation strategies would primarily include additional rock bolting as well as installation of steel wire mesh netting and would result in an additional estimated construction cost of **$530,000 - $575,000**.

IMPROVEMENT ALTERNATIVES DEVELOPMENT

In conjunction with the technical information provided by the City staff and consulting engineering team members, the Advisory Committee reviewed / developed a total of 9 alternatives for potential improvements to address the objectives outlined in the project charter. The alternatives ranged in cost from $15,000 to more than $66 million and varied significantly in the degree that each alternative met

the overall goals and objectives of this project. The pages that follow provide additional description of each of the improvement alternatives including conceptual details and drawings.

Alternative 1 – Install Rock Fall Ditches Along the Canyon Wall with Roadway Widening / Sidewalks

Following the review of the previously completed STRATA Rock Fall Evaluation Report, some concern was expressed by the committee that the recommended rock fall mitigation measures were limited to only the highest risk areas along the canyon wall (risk factors 4 – 5), comprising only 4 of the identified 44 rock fall hazard delineated locations.

To address this concern, the committee requested the design team prepare a conceptual design for installing rock fall catch ditches along the full length of the canyon wall. The catch ditches would range in width from 10' – 20' depending on the height of existing rock wall above the ditches. The rock excavation would remove existing high risk rockfall locations. In addition, the constructed rock catch ditches would provide a higher degree of rock fall protection for the entire length of roadway adjacent to the canyon wall for any potential future rockfall events, as opposed to installing mitigation in only the higher risk areas.

In addition to construction of the rock catch ditches, this alternative would include reconstruction of the roadway in accordance with City standards to provide (2) 12' wide lanes with 2' shoulders (28' total width). Concrete curb, gutter and sidewalk would be constructed on the "downhill" side of the roadway to accommodate pedestrian access.

A typical section of the proposed improvements is shown in **Figure 1.**

Construction of this alternative would require approximately 180,000 cubic yards of rock blasting and removal of the rock canyon wall. The estimated construction cost for this alternative was between **$29 million - $39 million** and would require acquisition of approximately 1.4 acres of private property to accommodate the rock face excavation. In order to accommodate the width for the rockfall catch ditches, the top of the canyon rim would need to be excavated to less than 20' from some of the existing homes within Breckenridge Estates providing significantly less than the 100' minimum recommended separation from blasting operations to existing structures which in addition to the significant construction cost appears to make this alternative unrealistic.

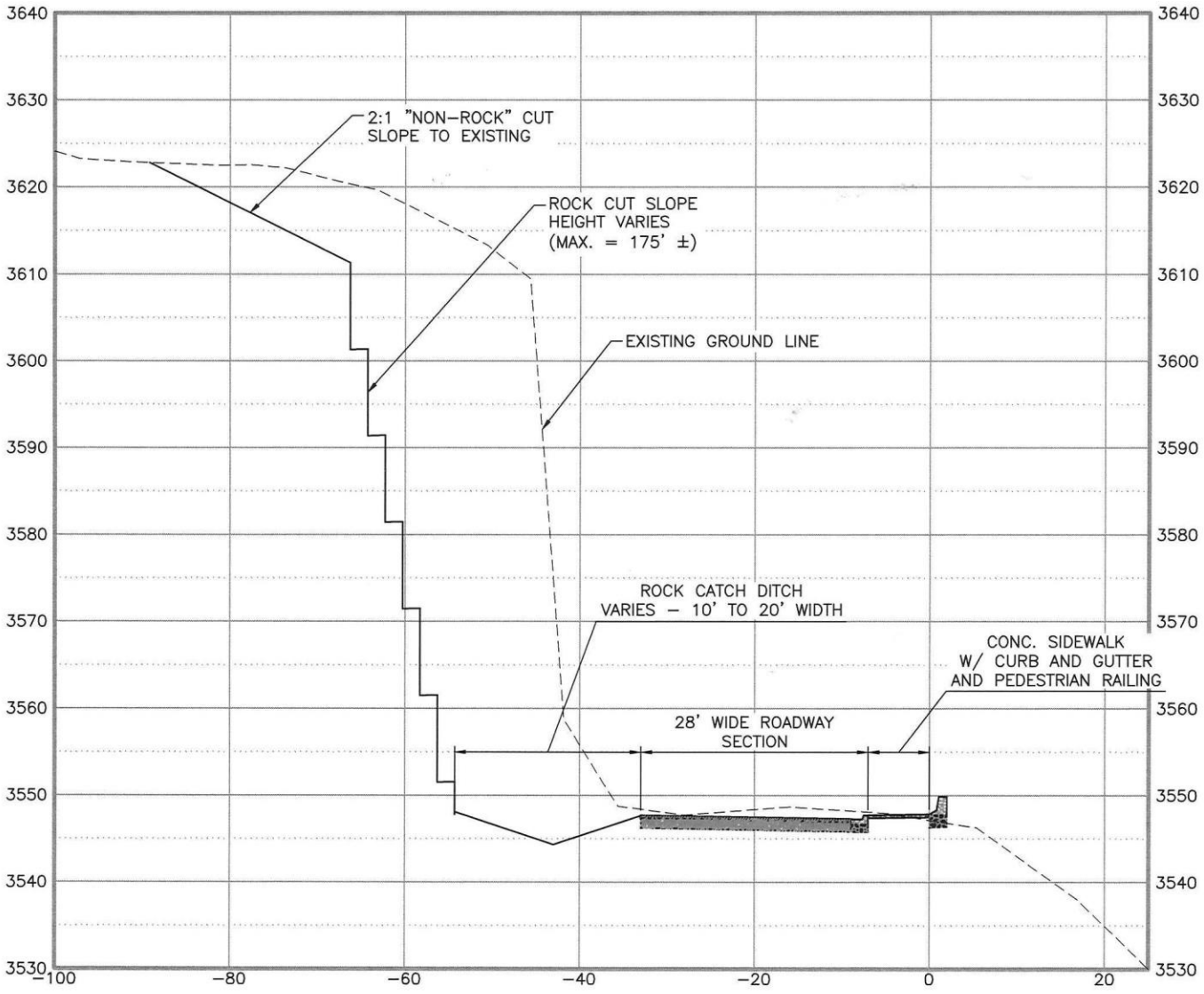
The advantages of this alternative include:

- Meeting project goals for additional rock fall protection and safety
- Dedicated pedestrian facilities along Canyon Springs Road
- Reconstructed and widened roadway

The disadvantages of this alternative include:

- Significant cost
- Extensive blasting and excavation in close proximity to existing houses
- Risk of damaging / closing Canyon Springs Road during construction
- Risk from subsurface groundwater / springs behind the canyon wall during construction
- Risk to damaging City's sewer trunk line (shallow bury depth) during construction

FIGURE 1 – ALTERNATIVE 1 - PROPOSED TYPICAL SECTION

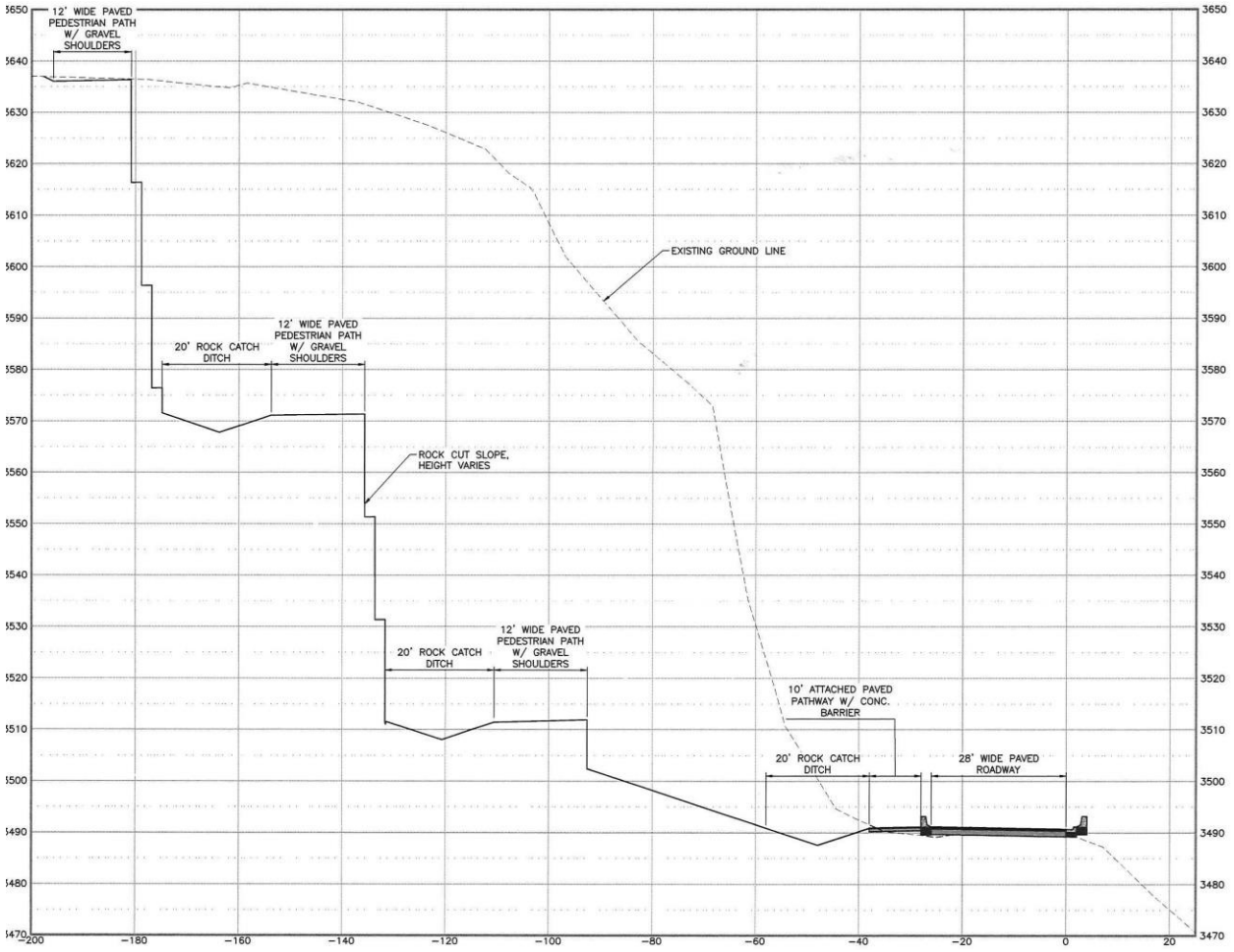


Alternative 1A – Pathway Construction Along Northern Edge of Breckenridge Property with Rock Fall Catch Ditches

Similar to Alternative 1, this option would install rock fall catch ditches along the roadway from a location near the north east corner of the Breckenridge property extending west along the canyon wall. This option would also include construction of a new pedestrian pathway that connected the existing paved pathway on the canyon rim at the eastern Breckenridge property line down into the canyon to match the existing roadway grade near the upper hairpin turn. The proposed pathway would include several hairpin turns to maintain a maximum 10% grade from the canyon rim to the roadway.

A typical section of the proposed improvements for Alternative 1A is shown below. A proposed plan view of the pathway and roadway improvements is included on the following page.

Figure 2 – Alternative 1A - Proposed Typical Section



Construction of this project would provide pedestrian connectivity to the previously constructed pathways along the canyon rim east and west of the Breckenridge property. Excavation / blasting of the canyon wall would begin a minimum of 100’ west of the Breckenridge Estates houses to minimize potential impacts to those structures. Additional rockfall mitigation measures (rock scaling, bolting, mesh) would be required for approximately 300’ east of the pathway construction to address those areas of concern.

FIGURE 3 – ALTERNATIVE 1A - PLAN VIEW

The roadway would be reconstructed to a minimum 28’ width and a separated pedestrian path would be constructed from the first Canyon Springs Road hairpin turn down to the “flat” area at the base of the grade.

Construction of this alternative would require approximately 320,000 cubic yards of blasting and rock removal of the existing wall at an estimated construction cost of **$50 million - $60 million.**

The advantages of this alternative include:

- Meeting project goals for additional rock fall protection and safety
- Pedestrian connectivity to existing pathways along the canyon rim
- Dedicated pedestrian facilities along Canyon Springs Road
- Reconstructed and widened roadway

The disadvantages of this alternative include:

- Significant cost
- Extensive blasting and excavation
- Risk of damaging / closing Canyon Springs Road during construction
- Risk from subsurface groundwater / springs behind the canyon wall during construction
- Risk to damaging City’s sewer trunk line (shallow bury depth) during construction

Alternative 2 – Grade Separated Paved Path with Rock Fall Mitigation

This alternative involves constructing a 12-foot-wide grade separated pathway for pedestrian use from the top of the grade to the lower "flat" area near the lower hairpin curve. Due to the steepness of the existing grade downhill of the upper section of roadway, the pathway would be "benched" to include an 8-foot-wide paved walking surface installed at a maximum 10% running grade to generally match the adjacent roadway slope.

The bench would be installed in a "cut" section adjacent to the upper roadway section extending from the canyon rim parking lot and the first switchback curve and would be located up to 15' vertically below the adjacent roadway surface to accommodate the 10% maximum grade requirements. The roadway would be widened to the north and west below the upper switchback curve by creating a "fill" section with mechanically stabilized earth (MSE) retaining walls on the downhill side of the roadway. The MSE walls would utilized rock filled gabion baskets to provide a more natural look to the fill areas by using existing rock excavation from the site. Typical sections and a rendering showing the proposed roadway improvement are shown below.

FIGURE 4 – TYPICAL SECTION – ALTERNATIVE 2 - UPPER ROADWAY SECTION ABOVE UPPER HAIRPIN CURVE

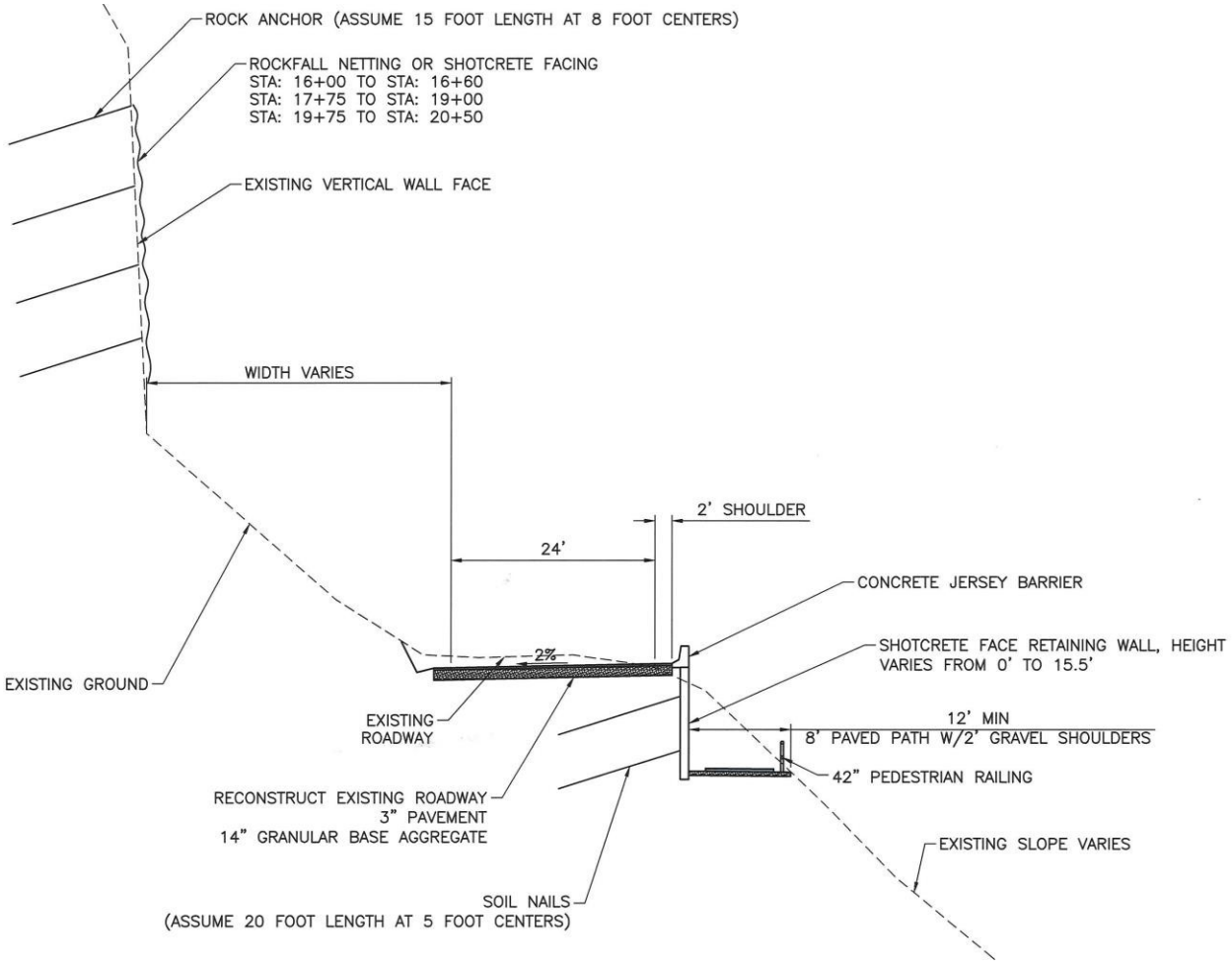


FIGURE 5 –TYPICAL SECTION – ALTERNATIVE 2 - LOWER ROADWAY SECTION – BELOW UPPER HAIRPIN CURVE

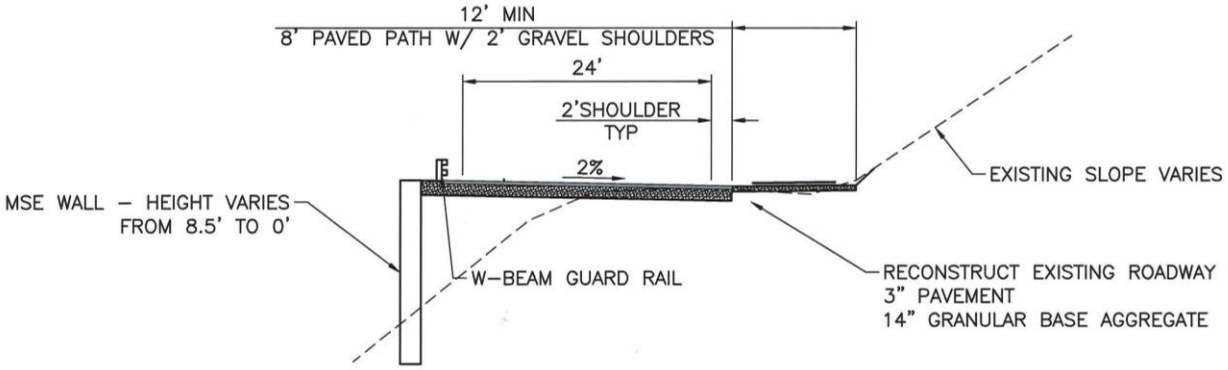


FIGURE 6 – UPPER ROADWAY SECTION PATHWAY RENDERING

The primary advantage of this alternative is that "top down" construction could be used for the upper pathway section to potentially reduce traffic control impacts to the adjacent roadway. It is anticipated that one lane of traffic could be maintained during construction with intermittent closures. This alternative also does not require filling on top of the existing steep and potentially unstable downhill slope (east of the upper hairpin curve).

In existing rock cut areas, a vertical shotcrete wall fascia would be installed between the upper roadway and the path. In areas of soil / boulder excavation, soil nailing would be used to stabilize the soil beneath the roadway in conjunction with the shotcrete fascia wall.

The roadway width would be improved and revised from a "crown" to a "shed" section with storm water runoff diverted to a new drainage ditch adjacent to the roadway. Concrete catch basins would be installed at intermediate points along the length of the roadway and then piped to rock lined outfall locations. Seepage from the canyon wall would be collected in a similar manner.

Costs for this alternative include rock fall mitigation (rock bolting, scaling, and netting / shotcrete facing) in accordance with recommendations from the 2010 STRATA geotechnical report for the higher rockfall risk areas (risk factors 4 – 5).

Committee members expressed concern over potential safety issues with the path being 10'-15' below the adjacent roadway due to lack of lighting and line of sight. During winter months, the lowered section of the pathway would see limited sunlight and potentially freeze causing additional potential safety issues. In addition, city personnel expressed concern over long term maintenance and potential for falling debris from the roadway above.

The estimated construction cost for this alternative is **$5 million - $6 million**.

The advantages of this alternative include:

- Separation of pedestrians from vehicular traffic
- Separation of pedestrians away from potential rock fall events on the upper section of the roadway
- Rock fall mitigation for vehicular traffic at higher risk portions of the canyon wall
- Reconstructed and widened roadway with drainage improvements

The disadvantages of this alternative include:

- Pathway would not be ADA compliant
- Bicycles would not be allowed on the pathway due to steepness of grade and horizontal curvature at upper hairpin curve
- Possible freezing concerns for separated path below north side of roadway
- Lighting / Safety concerns for separated path below roadway due to lack of visual sight lines
- Potential maintenance concerns from city staff for separated pathway
- Alternative does not address lower rockfall "risk categories" (0-3) along Canyon Wall as identified in the previously completed STRATA Geotechnical report

Alternative 3 – Install "Natural" Surface Grade Separated Pedestrian Nature Trail Improvements

This alternative is similar to Alternative 2 and involves constructing a 12' wide grade separated bench for pedestrian use. The bench would include an 8' wide natural or gravel walking surface with a grade that more closely matched the existing topography instead of attempting to match the maximum 10% grade of the adjacent roadway.

The trail would have an overall "average" slope from top to bottom of 10%, however, there would be several sections within the trail with grades of approximately 20%. This design approach is consistent with Federal Highways Administration (FHWA) recommendations for rural recreational trails in mountainous areas.

The advantage of this alternative is that the increased steepness for areas of the pathway would significantly reduce excavation and rock removal quantities and costs for the pathway construction, particularly on the section between the canyon rim and the first switchback curve. The pathway would still be grade separated but not to the extent of Alternative 2 with a maximum wall height of approximately 7'. Costs for pathway paving would also be eliminated.

Improvements for the lower section of pathway, roadway reconstruction, drainage, and rock fall protection outlined in Alternative 2 would be the same for this alternative. As a result of the reduced rock removal, excavation, and paving, the estimated construction cost for Alternative 3 is **$4.5 million – 5.0 million**.

The advantages of this alternative include:

- Separation of pedestrians from vehicular traffic
- Separation of pedestrians away from potential rock fall events on the upper section of the roadway
- Rock fall mitigation for vehicular traffic at higher risk portions of the canyon wall
- Reconstructed and widened roadway with drainage improvements

The disadvantages of this alternative include:

- Pathway would not be ADA compliant and would have an approximate 20% grade in locations
- Pathway is not paved which would likely require additional long term maintenance
- Bicycles would not be allowed on the pathway due to steepness of grade and horizontal curvature at upper hairpin curve
- Possible freezing concerns for separated path below north side of roadway
- Lighting / Safety concerns for separated path below roadway due to lack of visual sight lines
- Potential maintenance concerns from city staff for separated pathway
- Alternative does not address lower rockfall "risk categories" (0-3) along Canyon Wall as identified in the previously completed STRATA Geotechnical report

Alternative 4 – Canyon Springs Roadway Reconstruction and Rock Fall Mitigation Only (No Pedestrian Improvements)

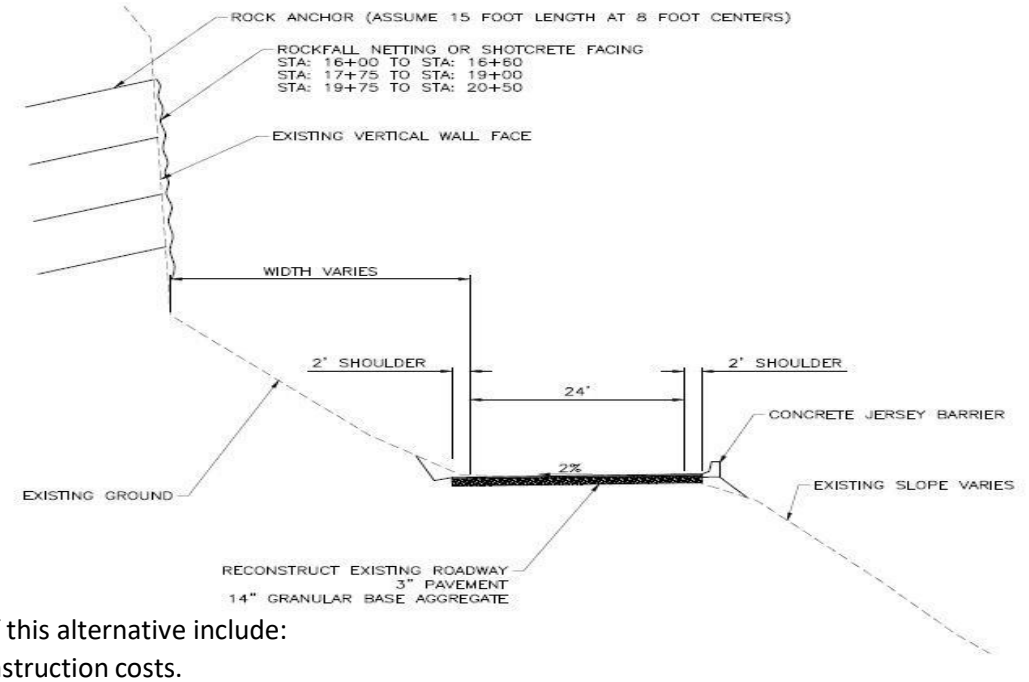
Alternative 4 would include a full reconstruction of Canyon Springs Road from the upper gravel parking area to the lower hairpin curve. The roadway would be constructed to a uniform 28' width to provide (2) – 12' travel lanes with 2' paved shoulders on each side.

The roadway would be improved and revised from a "crown" to a "shed" section with storm water runoff diverted to a new drainage ditch adjacent to the roadway. Concrete catch basins would be installed at intermediate points along the length of the roadway and then piped to rock lined outfall locations. Seepage from the canyon wall would be collected in a similar manner.

Costs for this alternative include rock fall mitigation (rock bolting, scaling, and netting / shotcrete facing) in accordance with recommendations from the 2010 STRATA geotechnical report for the higher rockfall risk areas (risk factors 4 – 5).

The reconstructed roadway would be wider in most locations than the current roadway configuration, however, no additional pedestrian improvements would be included as a part of this alternative. A typical section showing Alternative 4 is shown below. The estimated construction cost for Alternative 4 is **$1.4 million – $1.7 million**.

Figure 7 – Alternative 4 - Roadway Typical Section



The advantages of this alternative include:

- Lower construction costs.
- Rock fall mitigation for the higher risk portions of the canyon wall.
- Reconstructed and widened roadway with drainage improvements.

The disadvantages of this alternative include:

- No additional pedestrian improvements are included for the roadway as a part of this alternative.
- Alternative does not address rockfall "risk categories" (0-3) along Canyon Wall as identified in the previously completed STRATA Geotechnical report

Alternative 5 – Pathway Location West of Twin Falls Road and Gun Club

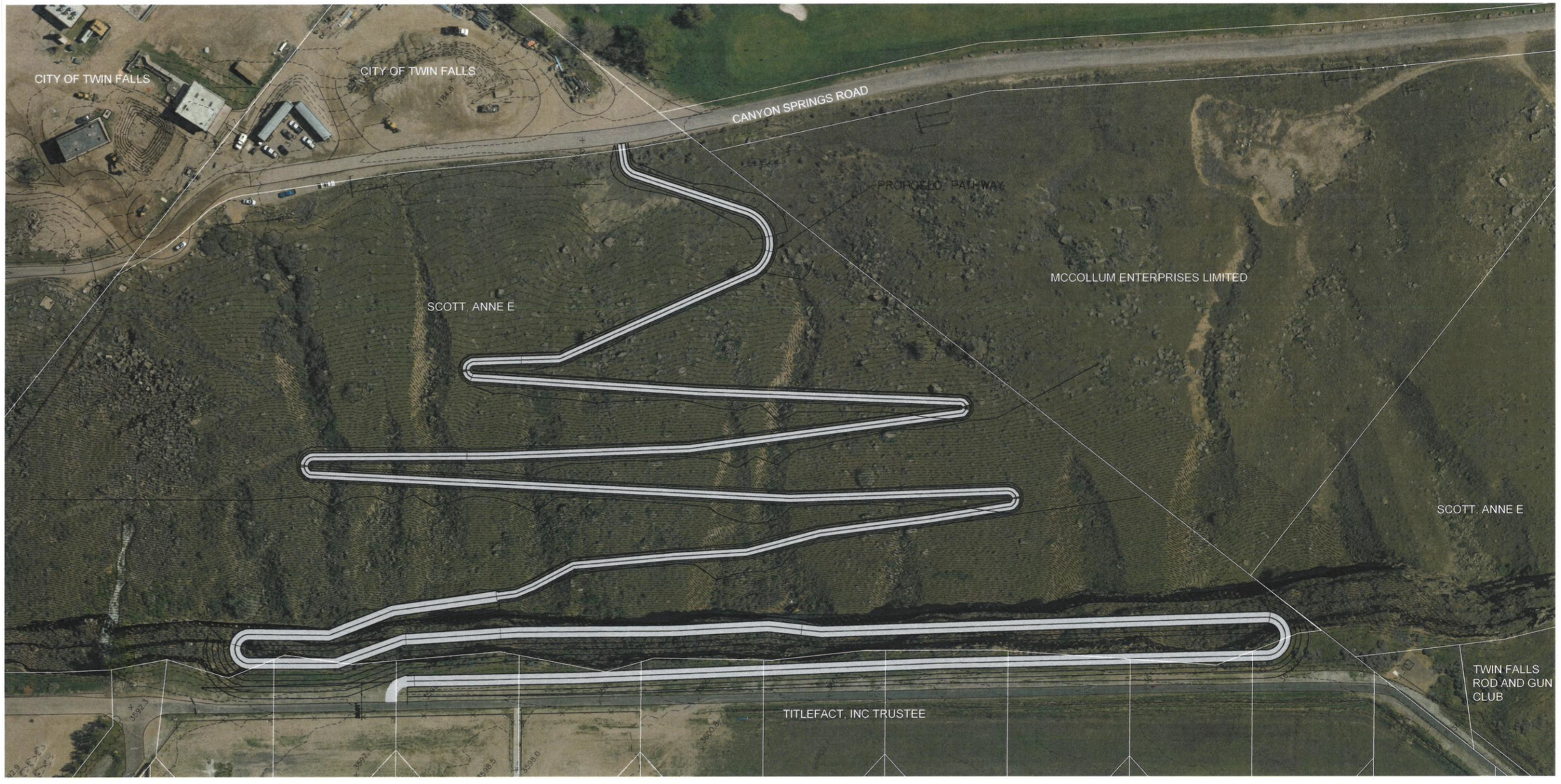
Alternative 5 involves constructing a pathway immediately west of the Twin Falls Rod and Gun Club from the existing rim path down to the canyon floor. The pathway would terminate at Canyon Springs Road near the City's wastewater treatment plant. An aerial location of the proposed improvements and a photograph of the existing slope in this location are shown below. **Figure 8** shows a plan view of the proposed pathway alignment.

FIGURE 8 – ALTERNATIVE 5 - PROPOSED LOCATION

FIGURE 9 – ALTERNATIVE 5 - VIEW FROM CANYON SPRINGS ROAD

The upper portion of the pathway would involve significant rock excavation of the existing canyon wall and would include rock fall ditches along the pathway length to mitigate against potential rock fall events.

FIGURE 10 – ALTERNATIVE 5 - PLAN VIEW



The existing steep 'talus' slope beneath the canyon rock wall would require the pathway to be constructed on fill sections supported by gabion basket MSE retaining walls. The gabion baskets would be filled with portions of the blasted canyon wall to provide a more natural look while also minimizing the need to import fill material. Cross sections of the proposed pathway in the canyon wall excavation and talus fill portions are shown below.

FIGURE 11 – TYPICAL SECTION – ALTERNATIVE 5 - UPPER PATHWAY ROCK CUT

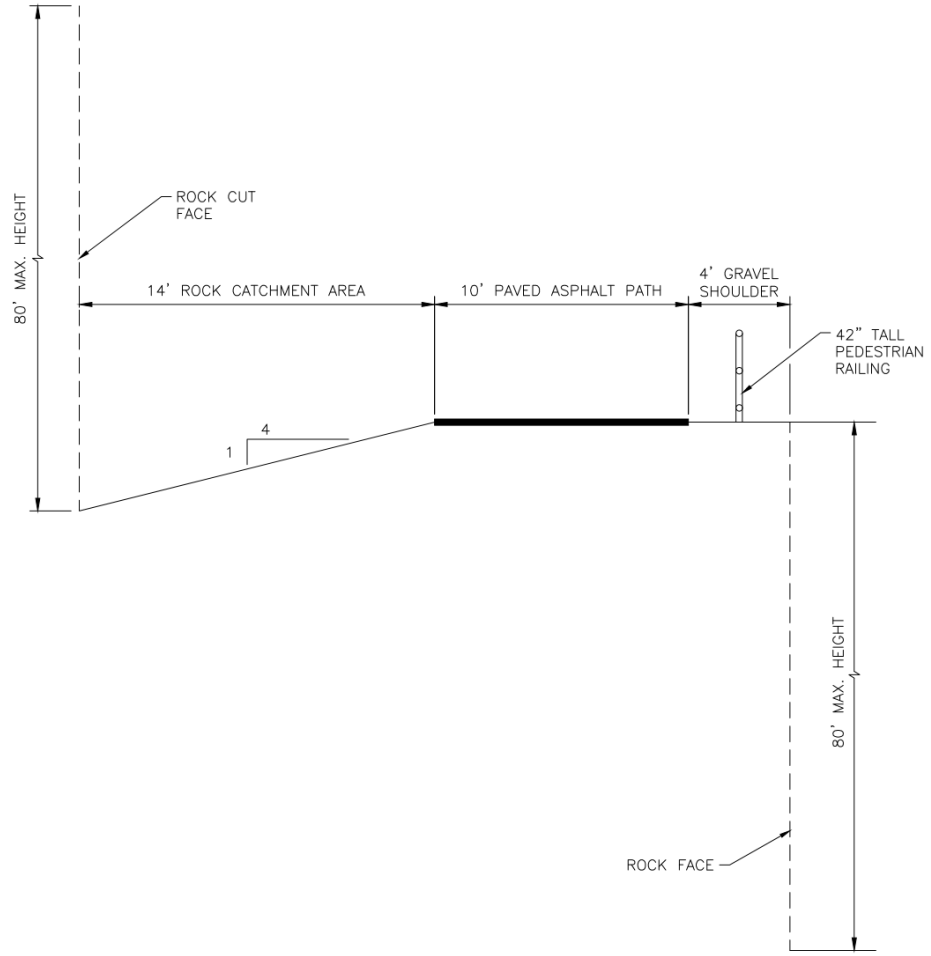


FIGURE 12 – TYPICAL SECTION – ALTERNATIVE 5 - LOWER PATHWAY FILL SECTION WITH GABION RETAINING WALLS

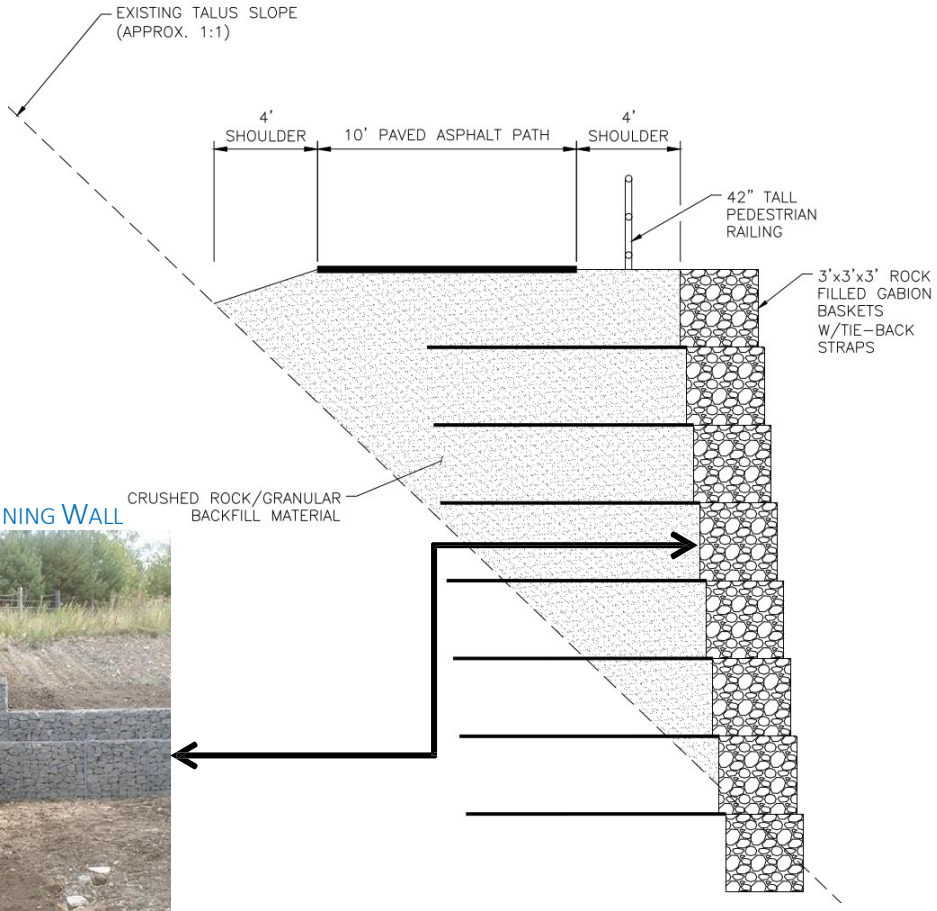


FIGURE 13 – EXAMPLE GABION RETAINING WALL

The estimated construction cost for implementing this alternative is **$9.5 million - $11.4 million**. Costs associated with this improvement are limited to construction of the new pathway only and do not include additional costs for roadway improvements and rock fall mitigation to the Canyon Spring Road grade (See Alternative No. 4).

The advantages of this alternative include:

- Separation of pedestrians from vehicular traffic and connectivity to an existing pedestrian trail along the canyon rim
- Closer pedestrian connectivity to Auger Falls Park
- Implementation of this alternative would likely reduce the number of pedestrians currently using Canyon Springs Road grade
- Parking is limited at the top of the canyon rim near the gun club. The closest parking is near Washington Avenue, east of the gun club

The disadvantages of this alternative include:

- Pathway would not be ADA compliant and would have a maximum 9%-10% grade in locations
- Bicycles would not be allowed on the pathway due to steepness of grade and horizontal curvature at pathway hairpin curves
- Costs for improvements to Canyon Springs Road are not included in this alternative

Alternative 6 – At Grade Pathway along Canyon Springs Roadway with Roadway Reconstruction and Rock fall Mitigation

Alternative 6 proposed to construct an "at grade" pathway along the downhill side of Canyon Springs Road using gabion basket retaining walls to bring the pathway to grade. Construction sequencing of the pathway would be similar to what was proposed for alternatives 2 and 3 and would require "top down" excavation adjacent to the roadway to reach competent base material with adequate width to support the pathway. The excavated area would then be backfilled and retained with gabion basket walls to provide a stable support for the new path location. Typical sections of this proposed alternative (along both the upper and lower limits of Canyon Springs Road grade) are shown below.

FIGURE 14 – TYPICAL SECTION – ALTERNATIVE 6 - UPPER ROADWAY

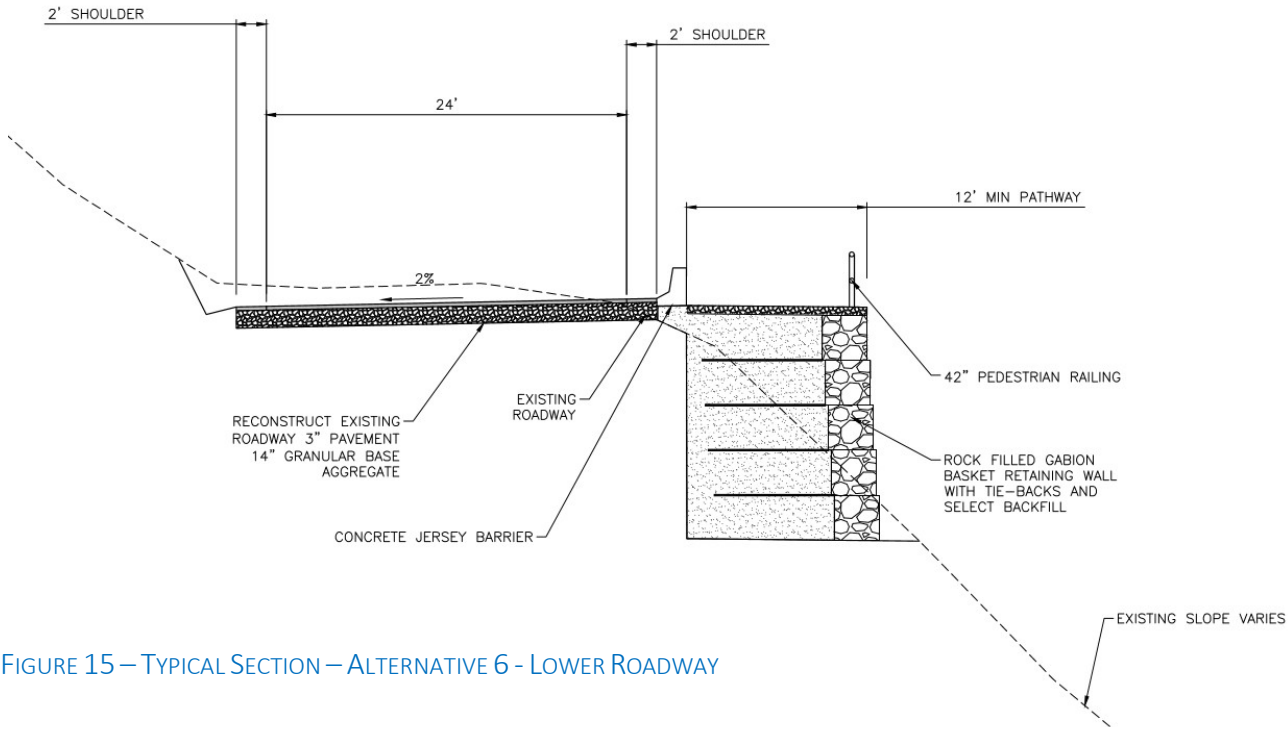
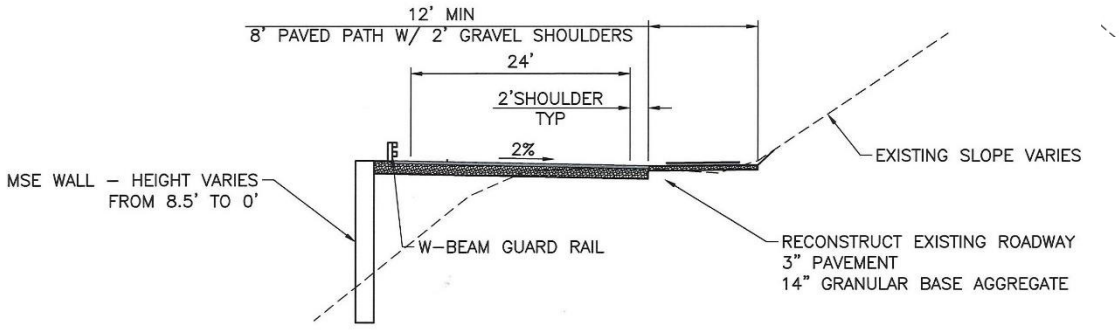


FIGURE 15 – TYPICAL SECTION – ALTERNATIVE 6 - LOWER ROADWAY



Construction of this alternative would address several of the potential safety concerns expressed by both the advisory committee and city staff related to a pathway being below grade adjacent to the

roadway. The pathway would be separated from traffic with a crash rated concrete barrier or similar guard railing.

The roadway would be improved and revised from a "crown" to a "shed" section with storm water runoff diverted to a new drainage ditch adjacent to the roadway for the upper section of the roadway. A concrete pan would be installed between the proposed roadway and pathway for the section of roadway downhill of the first hairpin curve. Concrete catch basins would be installed at intermediate points along the length of the roadway and then piped to rock lined outfall locations. Seepage from the canyon wall would be collected in a similar manner.

Rock fall mitigation would be achieved by rock bolting, scaling, and netting / shotcrete facing in accordance with recommendations from the 2010 STRATA geotechnical report for the higher risk areas.

The estimated construction cost for implementing this alternative is **$4.8 million - $5.8 million**.

The advantages of this alternative include:

- Separation of pedestrians from vehicular traffic
- Separation of pedestrians away from potential rock fall events on the upper section of the roadway
- Pedestrians would be at the same grade as adjacent traffic but separated by a traffic rated barrier
- Rock fall mitigation for vehicular traffic at higher risk portions of the canyon wall
- Reconstructed and widened roadway with drainage improvements

The disadvantages of this alternative include:

- Pathway would not be ADA compliant
- Bicycles would not be allowed on the pathway due to steepness of grade and horizontal curvature at upper hairpin curve
- Alternative does not address lower rockfall "risk categories" (0-3) along Canyon Wall as identified in the previously completed STRATA Geotechnical report

Alternative 7 – Install Signing to Prohibit Pedestrian Use of Canyon Springs Grade

This alternative involves installation of signage along the length of Canyon Springs Grade to prohibit pedestrian use of the roadway. The estimated cost of this alternative is **$15,000 - $20,000**. Enforcement to prohibit pedestrian use would be required from the Twin Falls County Sheriff's department.

The advantages of this alternative include:

- Minimal Cost

The disadvantages of this alternative include:

- Difficult to enforce this alternative and it is anticipated that pedestrians would continue to attempt to use the grade
- This alternative does not address potential rockfall issues along the canyon wall or needed improvements to Canyon Springs Road and would likely need to be installed in conjunction with Alternative 4
- Pedestrian access to canyon amenities would be eliminated potentially impacting tourist /economic development opportunities in the future

Alternative 8 – Install Traffic Signal at Top and Bottom of Grade

This alternative involves installation of a timed traffic signal at the top and bottom of the Canyon Springs Road Grade which would limit vehicular traffic to one way / one lane. The existing roadway width would remain the same but could be striped to provide a pedestrian "path" within the existing roadway prism adjacent to the one-way vehicular traffic.

The traffic signal system would be similar to the vehicular system used to access the Snake River Canyon on the north side of the river near the Blue Lakes Country Club.

The estimated cost for installation of a traffic signal is **$400,000**. This cost does not include additional roadway reconstruction improvements or any rockfall mitigation and would likely need to be constructed in conjunction with and in addition to Alternative 4 to address those issues.

The signal timing would be set to allow for larger trucks and queues of cars to navigate the approximately 3,000 feet of steep and winding roadway from the top of the canyon to the lower "flat" hairpin turn. Traffic queueing computations have not been completed, however it is anticipated that this timing combined with the current traffic volumes would result in significant queues (particularly at the top of the canyon rim). These queues would potentially block existing residential driveways as well as create issues with the Canyon Springs Road / Fillmore intersection.

The advantages of this alternative include:

- Lower cost than most of the other alternatives
- Separate facility for pedestrians / vehicles

The disadvantages of this alternative include:

- Alternative does not address roadway improvement needs for Canyon Springs Road
- Alternative does not address rockfall concerns from the adjacent canyon wall
- Implementation of this alternative would create significant delays to vehicular traffic
- Traffic queues at the top of the grade would have a potential negative impact on adjacent residential driveways and traffic operations at the Fillmore Road intersection

IMPROVEMENT ALTERNATIVES SUMMARY

A summary of the evaluated alternatives that have been developed to date as a part of the Advisory Committee meetings as well as previously completed technical evaluations are presented in the table below.

FIGURE 16 – IMPROVEMENT ALTERNATIVE SUMMARY

ALTERNATIVE	DESCRIPTION	ESTIMATED COST
1	Rock Fall Ditches Along Canyon Springs Road	$29M - $39M
1A	Pathway Construction along Northern Edge of Breckenridge Property with Rock Fall Catch Ditches	$50M - $66M
2	Grade Separated Path with Rockfall Mitigation (paved with maximum 10% grade)	$5M - $6M
3	Grade Separated Path with Rockfall Mitigation (unpaved “natural” with maximum 20% grade)	$4.5M - $5M
4	Canyon Springs Roadway Reconstruction and Rockfall Mitigation Only (no pedestrian improvements)	$1.4M - $1.7M
5	Pathway Location West of Gun Club	$9.5M - $11.4M
6	At Grade Pathway along Canyon Springs Roadway with Roadway Reconstruction and Rockfall Mitigation	$4.5M - $5.5M
7	Signing to Prohibit Pedestrian Use of Canyon Springs Grade	$15,000 - $20,000
8	Install Traffic Signal at Top and Bottom of Grade	$400,000