

2.0 ALTERNATIVES

This chapter describes the process used to identify, evaluate, and screen alternatives for the proposed SH 82 Grand Avenue Bridge project. This process was developed to meet National Environmental Policy Act (NEPA) requirements and be consistent with the Colorado Department of Transportation's (CDOT) I-70 Mountain Corridor Context Sensitive Solutions (CSS) process. A comprehensive description of the alternatives analysis is included in Appendix A *The Process, Identification, and Evaluation of Alternatives*.

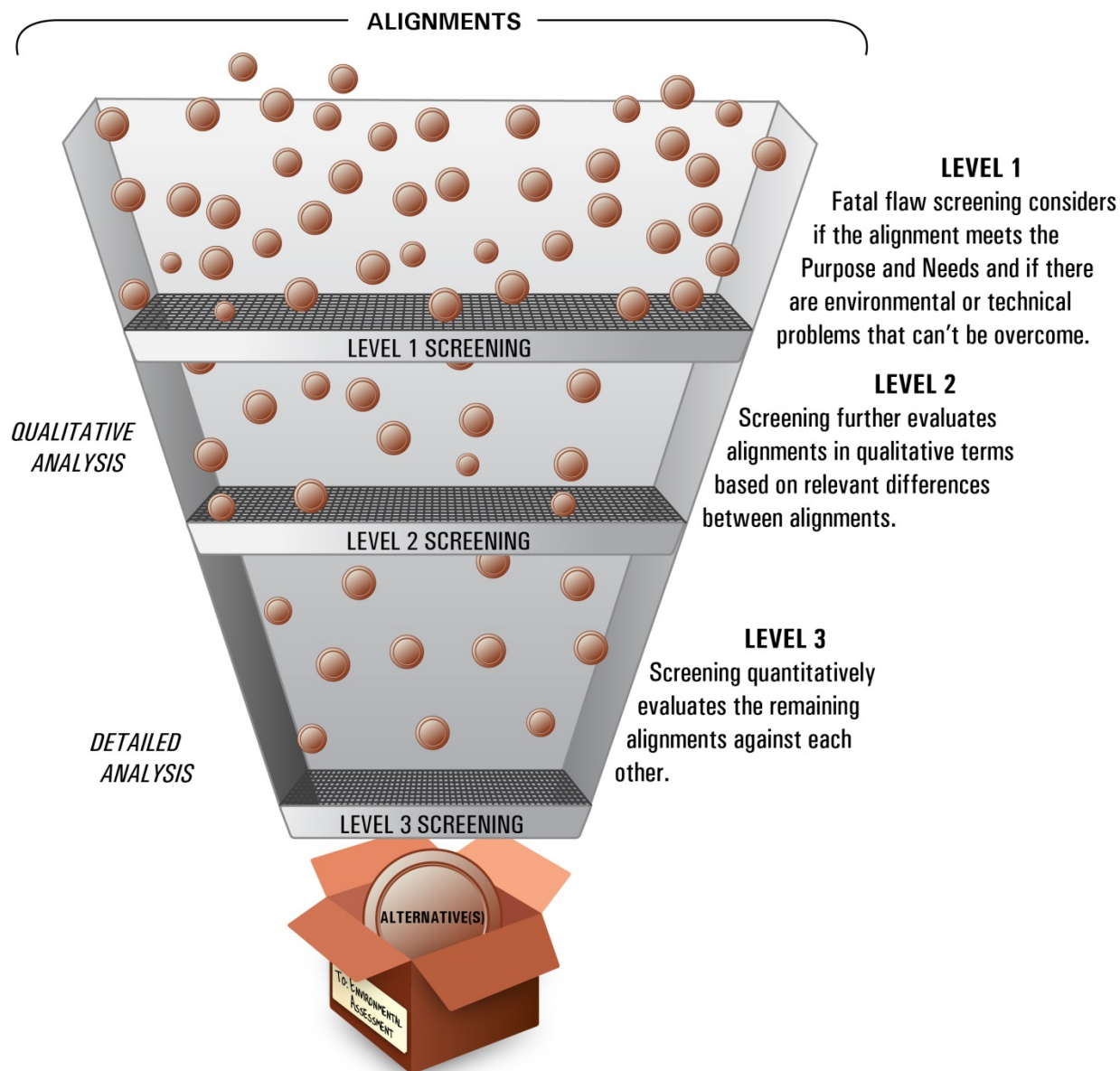
2.1 Decision-Making Process

Three project groups helped guide and provide input into this study: the Project Working Group (PWG), Project Leadership Team (PLT) and the Stakeholder Working Group (SWG). Each group had a specific objective and was made up of team members best qualified to help meet that objective. The PWG was a technical team of agency representatives from CDOT, Federal Highway Administration (FHWA), City of Glenwood Springs (City), and the consultant team. The PLT was comprised of various stakeholders and formed by CDOT to make sure the study team followed a CSS process to complete the study. The SWG, a larger stakeholder group, provided feedback to the PWG on the various issues. More information about these groups and their roles can be found in Chapter 5.0 *Public and Agency Coordination and Public Involvement*.

The alternatives evaluation, or screening process used to develop, evaluate, eliminate, and refine alternatives, involved the four steps below, also shown in Figure 2-1. At each step, stakeholders provided input to the study team that helped shape the alternatives and the results of the evaluations.

1. Identify alternatives based on an assessment of the existing conditions in the study area, project Purpose and Need, and public and agency input. Alternatives were identified from:
 - Ideas from the scoping and visioning process.
 - Ideas generated by the SWG and PWG.
 - Concepts initiated by the project team that responded to the project Purpose and Need, Project Goals, and community values.
 - Concepts generated during an Independent Peer Review.
2. Conduct Level 1 Fatal Flaw screening and eliminate those alternatives that could not meet the Purpose and Need or were not constructible.
3. Conduct Level 2 screening, an initial qualitative comparison of the remaining alternatives to identify those that were most practical or feasible from a technical, economic, and environmental standpoint.
4. Conduct Level 3 screening, a more detailed comparative and quantitative evaluation of the remaining alternatives.

FIGURE 2-1. ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS



The study team applied the screening process to all of the alternatives, regardless of which stage of the process the alternative was developed. For example, during Level 2 screening, several alternatives were proposed by stakeholders that had not yet been considered. Each of them underwent the screening process, starting with a Level 1 Fatal Flaw analysis, and continuing until they were eliminated from consideration or became part of the Build Alternative.

2.1.1 Project Goals and Evaluation Criteria

Project Goals were used in alternatives evaluation to supplement the project Purpose and Need. These goals helped the study team identify and evaluate differences between the various alternatives and options proposed to meet the transportation needs. While the needs must be addressed by the project, the goals provide a framework by which the proposed improvements can exceed those requirements. The Project Goals are:

- ❖ Meet design standards as practical to improve connectivity between the south side of the Colorado River (downtown Glenwood Springs) and the north side of the river (historic Glenwood Hot Springs area and I-70).
- ❖ Maintain consistency with City planning regarding transportation and land use.
- ❖ Accommodate multimodal transportation, including buses, pedestrians, and bicycles.
- ❖ Meet transportation safety needs of all users – auto, truck, bus, pedestrian, and bicycle.
- ❖ Reduce and minimize construction impacts to businesses, transportation users, and visitors.
- ❖ Provide effective access for existing and future economic activity.
- ❖ Avoid and minimize environmental impacts to scenic, aesthetic, historic, and natural resources.
- ❖ Provide practical and financially realistic transportation improvements for the 2035 planning horizon and a structure that will be sound for a minimum of 30 years.
- ❖ Maintain or improve transportation (traffic and pedestrian/bicycle) operations in the project area.
- ❖ Incorporate sustainable elements into the design. Sustainable design elements are those viewed as better for society, the environment, and the economy in the long term and for future generations.
- ❖ Provide an aesthetically appropriate solution that is in harmony with the context of the natural and built environment.
- ❖ Avoid or minimize proximity, economic, and right-of-way impacts and relocations to adjacent properties.
- ❖ Incorporate CSS into the planning and design, including such community-based issues as urban design and aesthetics.

To evaluate alternatives, evaluation criteria were developed from the Purpose and Need and Project Goals. For each criterion, the PWG developed Measures of Effectiveness (MOEs) to compare alternatives at each level of screening.

Lists of evaluation criteria and MOEs are in Appendix A.

2.2 Alternatives Development and Evaluation Results

The alternatives evaluation process included three levels of screening that culminated in the identification of a Build Alternative for evaluation in this EA. Level 1 screening primarily focused on selection of an alignment for the Build Alternative based on fatal flaw analysis. Subsequent screening levels became more focused, and evaluated the following components:

- ❖ Alignments.
- ❖ Cross-sections.
- ❖ Intersections.

In addition, a separate screening process was performed to evaluate pedestrian and bicycle connectivity, using the same Purpose and Need and Project Goals. As a result of the screening processes, the combination of elements deemed best became the Build Alternative.

2.2.1 Level 1 Screening

Level 1 screening identified alignments and evaluated them based on Fatal Flaws – basically, would they address the Purpose and Need and could they be built? Level 1 screening evaluated whether the proposed alignment would:

- ❖ Meet the Purpose and Need.
- ❖ Not have irresolvable environmental impacts.
- ❖ Not have exorbitant (excessive or unreasonable) costs.
- ❖ Not use unproven technology.
- ❖ Be constructible.

Proposed alignments and the results of Level 1 screening are detailed in Appendix A.

Several alignments proposed by stakeholders were considered under Level 1 screening, including a “SH 82 bypass” (described in more detail below). Alignments that did not address the Purpose and Need and/or could not be built were eliminated from consideration, or “screened out,” including alignments that would:

- ❖ Not connect to existing streets in downtown and, therefore, not meet the project Purpose to provide a connection from downtown Glenwood Springs to the historic Glenwood Hot Springs area.
- ❖ Be located east of Cooper Avenue and, therefore, east of downtown Glenwood Springs, which would not meet the project Purpose. Alignments east of Cooper Avenue would also result in considerable impacts to residential areas.

- ❖ Cross below the railroad and, therefore, would not provide a practical and financially realistic alternative, which is an evaluation criterion (see Table 2 in Appendix A).
- ❖ Cross the railroad at grade and, therefore, impede traffic flow and not improve public safety (including emergency service response) or reliability as a critical transportation route. These are evaluation criteria for addressing Purpose and Need elements (see Table 2 in Appendix A).

One of the alignments that would not meet the criteria listed above was a “SH 82 bypass,” which had been proposed by various stakeholders. This alignment was eliminated during Level 1 screening for the following reasons:

- ❖ A SH 82 bypass would not improve connectivity from downtown Glenwood Springs with the historic Hot Springs pool area and I-70 or fix the functional and structural deficiencies of the bridge and, therefore, would not meet the project Purpose and Need.
- ❖ Relocation of SH 82 is related to mobility, whereas the Grand Avenue Bridge project is needed to address safety and operational problems of the bridge. Therefore, a bypass would not address the bridge’s functional and structural deficiencies or improve public safety (including emergency service response), as defined by the project Needs and MOEs.
- ❖ Even with a SH 82 bypass, the Grand Avenue Bridge would need to carry four lanes of traffic, as indicated in the 2010 *SH 82 Corridor Optimization Plan*.
- ❖ Relocating SH 82 would cost five to ten times as much as the available funding for the Grand Avenue Bridge project, which is funded through the Colorado Bridge Enterprise (CBE). Currently, no funding has been identified to reroute SH 82. Therefore, it would not be a practical and financially realistic alternative, as defined by the project MOEs.

The Grand Avenue Bridge project would not preclude consideration of a SH 82 relocation as part of another future study. Indeed, the *Glenwood Springs Comprehensive Plan* (City of Glenwood Springs, 2011) calls for the continued pursuit of both the replacement of the Grand Avenue Bridge and planning for a SH 82 relocation.

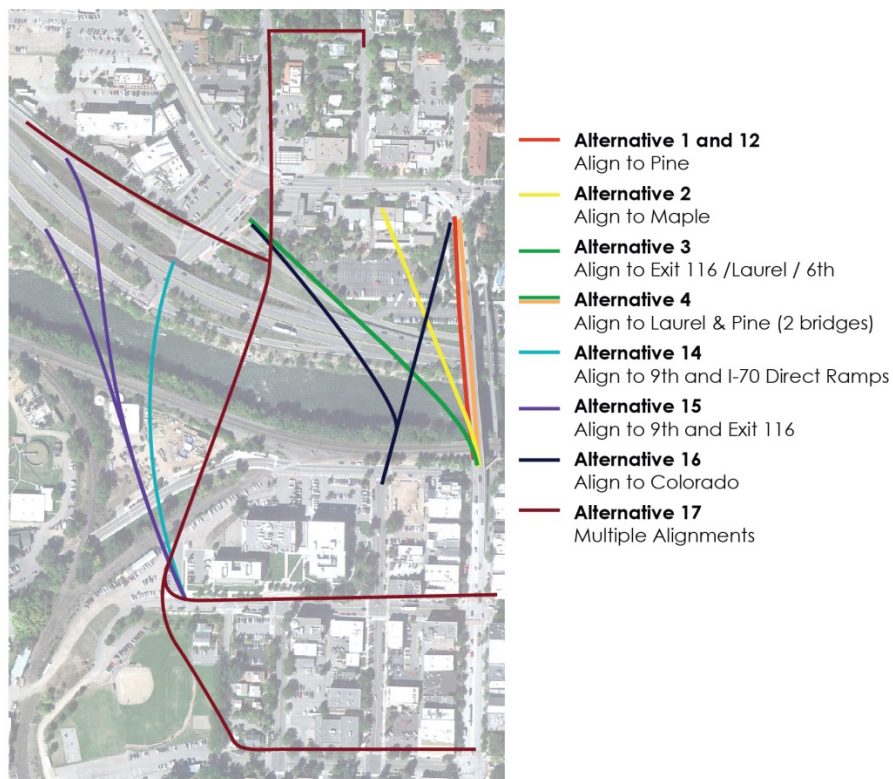
Results of Level 1 Screening

Based on Level 1 evaluation, 17 alignments were carried forward into Level 2. These alignments fell into two general categories – two-way bridges for north- and southbound traffic on adjacent lanes, and north- and southbound traffic on separate one-way bridges (one-way couplets).

SH 82 GRAND AVENUE BRIDGE

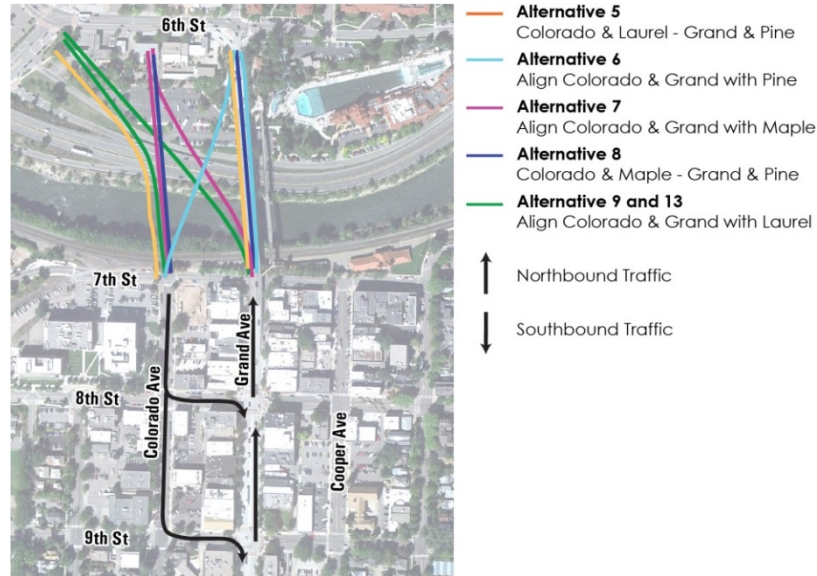
Figure 2-2 shows two-way traffic alignments that were evaluated. Figure 2-3 shows one-way couplet (paired) alignments using Grand Avenue and Colorado Avenue. Figure 2-4 shows one-way couplet (paired) alignments using Cooper Avenue and Grand Avenue. In addition, a Rehabilitation Alternative (Alternative 12) was considered that would fix the existing bridge (described in more detail under Level 2 screening) and address alternatives suggested by the public.

FIGURE 2-2. TWO-WAY ALIGNMENTS CARRIED FORWARD TO LEVEL 2 SCREENING



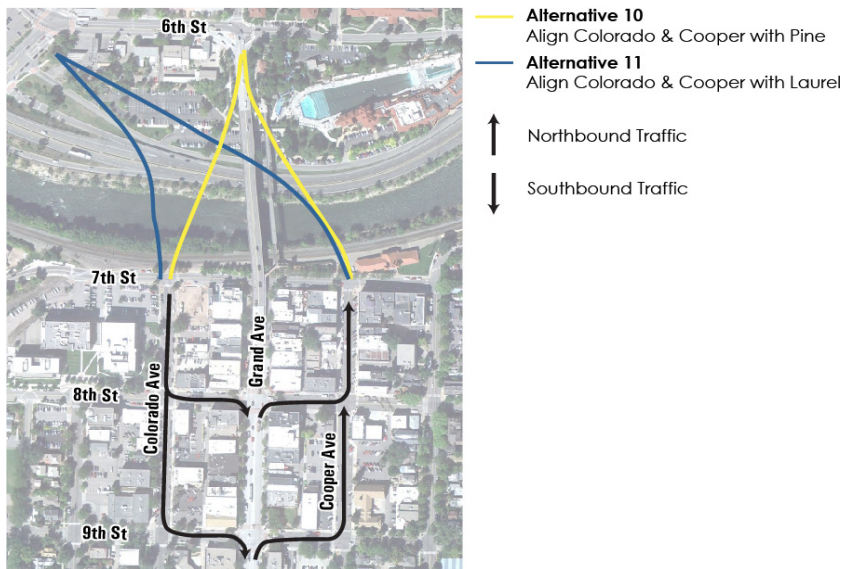
In these two-way traffic alignments, north- and southbound traffic would travel on single bridges with parallel, adjacent lanes.

FIGURE 2-3. ONE-WAY COUPLET ALIGNMENTS CARRIED FORWARD TO LEVEL 2 SCREENING: GRAND AVENUE AND COLORADO AVENUE



In these one-way couplet (paired) alignments, north- and southbound traffic would travel on separate one-way bridges. Northbound traffic would use Grand Avenue to access the bridge. Southbound traffic would touch down at Colorado Avenue upon crossing the river, accessing Grand Avenue using either 8th Street or 9th Street.

FIGURE 2-4. ONE-WAY COUPLET ALIGNMENTS CARRIED FORWARD TO LEVEL 2 SCREENING: COOPER AVENUE AND COLORADO AVENUE



In these one-way couplet (paired) alignments, north- and southbound traffic would travel on separate one-way bridges. Northbound traffic would use Cooper Avenue to access the bridge. Southbound traffic would touch down at Colorado Avenue and access Grand Avenue.

2.2.2 Level 2 Screening

Level 2 screening involved a more detailed, qualitative comparison of the alternatives from Level 1 screening. In addition to alignments, Level 2 screening also evaluated various cross-sections and intersections. The analysis rated each alternative based on the MOEs, which revealed differences between alternatives based on current information.

Appendix A provides Level 2 screening details.

Level 2: Alignments

Figure 2-5 shows the results of the alignment evaluation. In general, during Level 2 screening, alternatives that did not compare as favorably to other build alternatives at meeting the project Purpose and Need and other project criteria (specifically, the evaluation criteria and MOEs included in Appendix A) were screened out.

Discriminating factors in Level 2 included the alternatives' relative impacts (both during construction and after), ability to improve traffic and pedestrian flow through the area, cost, and public support.

Rehabilitation Alternative (Alternative 12). Members of the public showed a strong desire to rehabilitate the existing bridge. For this and other reasons, an alternative to rehabilitate the existing bridge was evaluated in considerable detail in the Level 2 screening. This became the Rehabilitation Alternative, which would fix the existing bridge by repairing or replacing many of the known functional and structural deficiencies. However, some deficiencies could not be fixed without rebuilding large parts or all of the bridge. Further, rehabilitation of the bridge might not save money. Because so much of the bridge needs work, rehabilitation would be a massive undertaking, requiring extensive analysis, design, and major reconstruction. Rehabilitation would likely uncover other needs, making the costs highly variable.

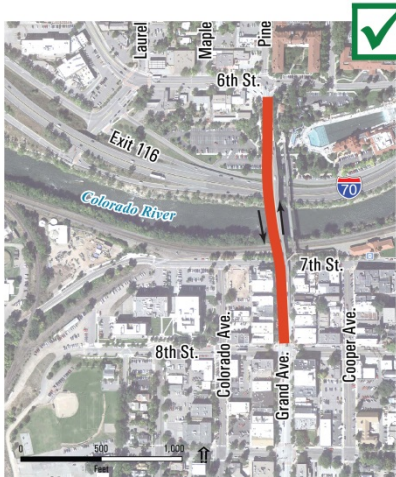
The Rehabilitation Alternative would have similar disruptive traffic impacts during construction as the other proposed alternatives, requiring long-term lane closures or even full bridge closures when replacing critical structural elements. Under the Rehabilitation Alternative, the bridge would still stand on its original piers and foundations. Therefore, it would have a shorter design life (approximately 30 years) than a new bridge, which would have a design life of 75 years.

For these reasons, the Rehabilitation Alternative did not compare favorably to other alternatives and was screened out.

An Independent Peer Review workshop was held at the end of Level 2 screening. The participants included seven professionals with expertise in roadway, structural, traffic, bridge aesthetics, construction methods, and local issues who had not been involved in developing the alternatives. The participants reviewed the alternatives considered, suggested refinements, and suggested one new alternative, which underwent Level 1

and Level 2 screening as Alternative 16. As a result of screening, two alignments were advanced to Level 3 for consideration as the Build Alternative: Alternative 1 and Alternative 3.

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



CARRIED FORWARD

Alternative 1: Replace bridge on existing alignment; land at Grand Avenue on south and Pine Street on north. **Least amount of right-of-way and physical and economic impacts to private property; least amount of environmental impact; better aesthetics than two bridge (couplet) alternatives.**



SCREENED OUT

Alternative 2: Replace bridge with single bridge; land at Grand Avenue on south and Maple Street on north. **More right-of-way impacts than Alternative 1, resulting in more physical and economic impacts to private property; no improvement in traffic flow and transportation operations.**

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



CARRIED FORWARD

Alternative 3: Replace bridge with single bridge; land at Grand Avenue on south and 6th/Laurel on north. Improved traffic flow and transportation operations near Exit 116; improved 6th Street multimodal connections; most of bridge can be built off site, improving ability to construct and minimizing costs and construction impacts to businesses, pedestrians and cyclists, and visitors.



SCREENED OUT

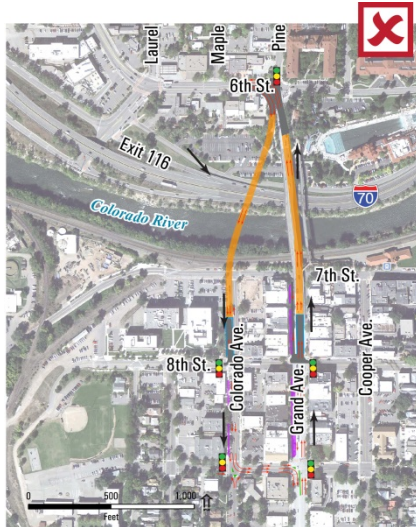
Alternative 4: Replace bridge with two one-way bridges; land at Grand Avenue on south and Pine Street and 6th/Laurel on north. No improved connection to I-70 (project purpose to provide connectivity from the Roaring Fork Valley to Glenwood Hot Springs area); right-of-way impact to Shell station, resulting in more physical and economic impacts on private property.



SCREENED OUT

Alternative 5: Replace bridge with two one-way bridges; land at 6th/Laurel and Pine Street on north and Colorado and Grand on south. Steep climbing grade is difficult to construct and design to standards; partial right-of-way impact to Shell station resulting in more physical and economic impacts on private property; more environmental impacts; more transportation operations impacts.

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



SCREENED OUT

Alternative 6: Replace bridge with two one-way bridges; land at Pine Street on north and Colorado and Grand Avenues on south. **Worse traffic flow with more transportation operations impacts; increased traffic in residential areas on Colorado Avenue, resulting in increased environmental (historic, scenic, noise) impacts.**

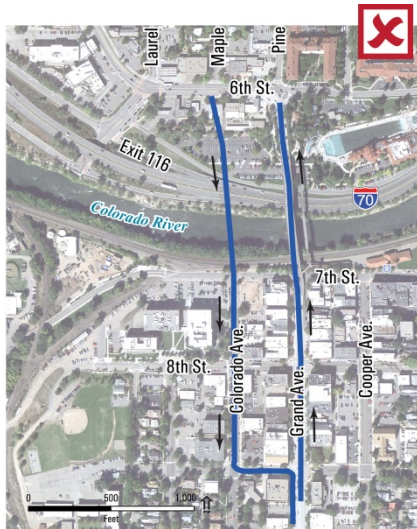


SCREENED OUT

Alternative 7: Replace bridge with two one-way bridges; land at Maple Street on north and Colorado and Grand on south. **Increased traffic in residential areas on Colorado Avenue resulting in increased environmental (historic, scenic, noise) impacts and greater transportation operations impacts, such as increased congestion on Colorado Avenue and 9th Street.**

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



SCREENED OUT

Alternative 8: Replace bridge with two one-way bridges; land at Maple and Pine on north and Colorado and Grand Avenues on south. **Screened out for the same reasons as Alternative 7.**



SCREENED OUT

Alternative 9: Replace bridge with two one-way bridges; land at 6th/Laurel on north and Colorado and Grand Avenues on south. **Steep grades are difficult to construct and design to standards; similar impacts to Colorado Avenue as Alternatives 6-8; second highest cost.**

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



SCREENED OUT

Alternative 10: Replace bridge with two one-way bridges; land at Pine Street on north and Colorado and Cooper Avenues on south. **Worst traffic flow and transportation operations impacts; increased traffic in residential areas on Cooper Avenue resulting in substantial environmental impacts to neighborhood; no separate pedestrian bridge resulting in no improvement to multimodal connections.**

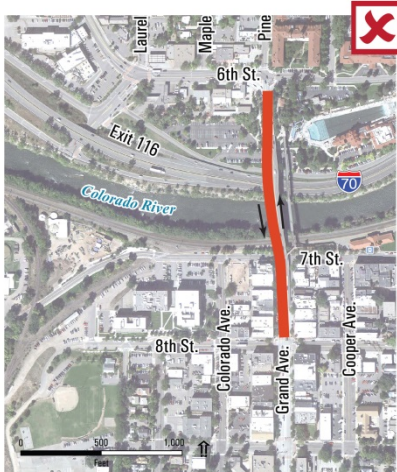


SCREENED OUT

Alternative 11: Replace bridge with two one-way bridges; land at 6th/Laurel on north and Colorado and Cooper Avenues on south. **Screened out for same reasons as Alternative 10 plus steep grade and highest cost.**

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



SCREENED OUT

Alternative 12: Renamed "Rehabilitate Grand Avenue Bridge." Large bridge sections to be rebuilt, resulting in major reconstruction costs; long-term lane or full bridge closures with construction impacts to businesses, visitors, and pedestrians and cyclists; shortest design life due to reusing components of existing structure; potential for higher maintenance costs than a new bridge.



SCREENED OUT

Alternative 13: Very similar to Alternative 9 with minor differences. Steep grades are difficult to construct and design to standards; high cost; more physical and economic impacts to private property.



SCREENED OUT

Alternative 14: Connect to I-70 interchange on north and at 9th Street downtown. Higher costs, greater impacts to downtown properties; potential impacts to historic and park resources; does not address project Purpose to provide connectivity from downtown Glenwood Springs to Glenwood Hot Springs area as well as Alternative 1 and 3.

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



SCREENED OUT

Alternative 15: Connect to downtown to and from I-70 to the west via one or two bridges connecting to 9th Street. Does not address Grand Avenue Bridge issues and project Purpose to provide connectivity from downtown Glenwood Springs to Glenwood Hot Springs area; still requires replacing Grand Avenue Bridge.

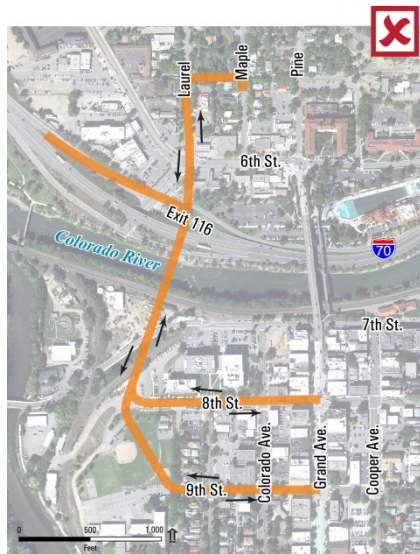


SCREENED OUT

Alternative 16: Use Colorado Avenue alignment on south side for two-way traffic. Higher costs; more community and historic impacts along Colorado Avenue (similar to Alternatives 6-8), does not address Purpose and Need because the Grand Avenue bridge would remain in place, and, therefore, the existing bridge issues would not be addressed.

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-5. RESULTS OF LEVEL 2 ALIGNMENT SCREENING



SCREENED OUT

Alternative 17: Use four overlapping movements; requires bridges and connections that do not exist. Same as Alternative 16 plus more elevated structure through residential areas; more aesthetic impacts; more right-of-way required; very circuitous traffic routes that would impact transportation operations; removes access from several properties; does not address project Purpose to provide connectivity from downtown Glenwood Springs to Glenwood Hot Springs area.

Level 2: Cross-Sections

After the two alignments were identified (Alternatives 1 and 3), several options for cross-sections that could be used with these alignments were evaluated. The options and the results of the evaluation are shown in Figure 2-6.

Level 2: Intersections

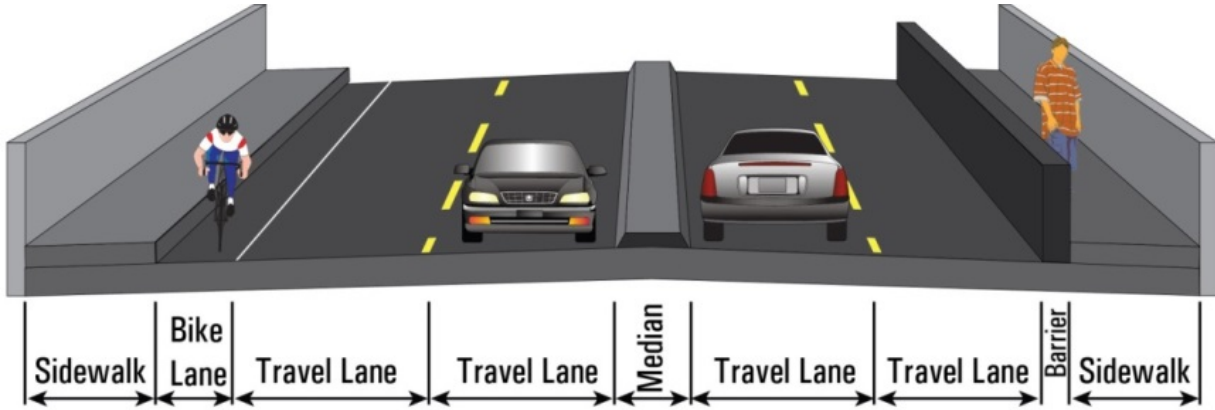
Level 2 screening then focused on types of intersections to include in the Build Alternative. Alternatives 1 and 3 would touch down in different locations on the north side, which, in turn, led to different options for improving or reconfiguring intersections. For Alternative 1, which would replace the existing bridge at its current location, only minor modifications to the existing 6th Street and Pine Street intersection were considered. For Alternative 3, three intersection options were considered for the 6th and Laurel intersection. These intersection options are shown in Figure 2-7 as Options A, B, and C.

2.2.3 Level 3 Screening

Level 3 screening involved more detailed evaluation of the remaining alignments and intersections, as well as pedestrian and bicycle options. As with Level 2, this step eliminated alternatives that did not meet the project Needs and Goals, as well as other additional criteria developed for Level 2.

Appendix A includes Level 3 screening details.

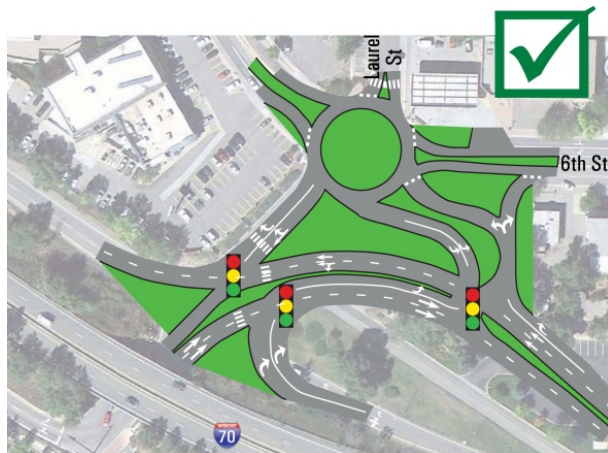
FIGURE 2-6. GRAND AVENUE BRIDGE CROSS-SECTIONS EVALUATED IN LEVEL 2



Cross-Section Element	Screened Out <input checked="" type="checkbox"/>	Carried Forward <input checked="" type="checkbox"/>
Number of Travel Lanes	Two lanes – would not improve connectivity Six lanes – no plans to widen Grand Avenue on either end of the bridge	Four lanes
Lane Width	10-foot lanes – would not meet design criteria, too narrow	11-foot 12-foot
Median	Barriers – inconsistent with the context and would create sight distance issues	Striped (painted) Raised
Sidewalks	Both sides – additional width, additional impacts downtown; notably, narrower sidewalks along storefronts, and visual impacts	No attached sidewalk One side
Special Lanes	Bike, Reversible, Transit, Emergency – none existing or planned in study area, meaning lanes on the bridge would be isolated	None

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-7. 6TH AND LAUREL INTERSECTION OPTIONS A, B, AND C



Option A would carry SH 82 traffic directly from the I-70 interchange to the bridge; would include local circulation via two signals and a roundabout at 6th and Laurel. Option A was **CARRIED FORWARD** with Alternative 3 because it:

- ❖ Provides better traffic efficiency than Option B.
- ❖ Moves all SH 82 traffic away from 6th Street and the pedestrian corridor.
- ❖ Has fewer impacts/detours during construction compared to Option B.
- ❖ Allows for variations that could further improve pedestrian and vehicle access and operations.



Option B would create a larger roundabout to accommodate SH 82 traffic. Option B was **SCREENED OUT** because:

- ❖ Three lanes would be required to route all traffic through the roundabout, and heavy SH 82 traffic would make the entire roundabout inefficient.
- ❖ The public stated concerns about pedestrian traffic at large roundabouts.
- ❖ Pedestrian signals and metering signals would be required on most roundabout legs.
- ❖ It would require more difficult and impactful construction phasing and detours than Option A.



Option C would provide an overpass ramp for Grand Avenue to I-70 westbound traffic, and provide a roundabout for other movements. Option C was **SCREENED OUT** because:

- ❖ It is likely the most expensive option.
- ❖ Public input was negative about using a two-level interchange with flyover.
- ❖ Although Option C would offer a traffic flow benefit, Option A best meets traffic flow needs.

Results of Level 2 Screening

As a result of Level 2 screening, two alignments (Alternatives 1 and 3), several cross-section elements, and one intersection (Option A), were advanced to Level 3 screening.

Level 3: Alignments

After developing Alternatives 1 and 3 to greater detail, the study team conducted outreach to identify the public’s preferences on these bridge alignments and design options. Chapter 5.0 *Agency Coordination and Public Involvement* has details on public input.

The Alternative 3 alignment was compared against project criteria and recommended to be further developed and evaluated through the process because it would have better traffic operations and fewer construction impacts to traffic and businesses. Table 3 in Appendix A has additional details.

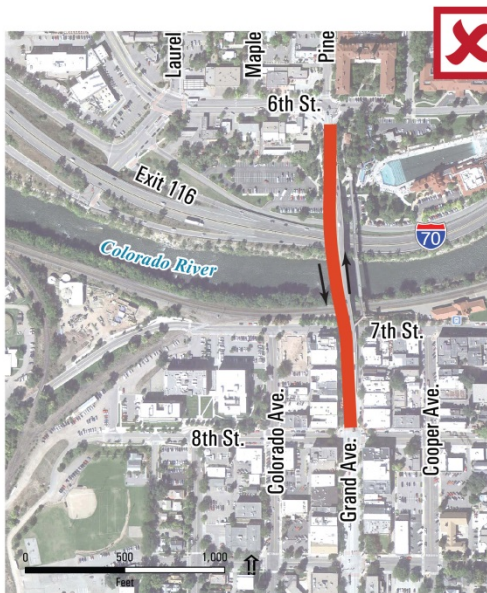
PUBLIC INPUT

When asked how Alternatives 1 and 3 compared for various criteria, attendees at a Public Open House overwhelmingly favored Alternative 3.

FIGURE 2-8. RESULTS OF LEVEL 3 SCREENING

Alternative 1: Single bridge at existing location aligned to Pine Street. **SCREENED OUT**

Alternative 3: Single bridge aligned to Exit 116/6th/Laurel **CARRIED FORWARD**



As shown in Figure 2-8, Alternative 3 would touch down on the north side of the river near the 6th and Laurel intersection. It would provide a direct connection to I-70 at Exit 116 and would remove SH 82 traffic from 6th Street and provide a new connection to W. 6th Street. Alternative 3 would have fewer construction impacts because much of the bridge could be constructed while keeping all four lanes open on SH 82 until just before the full closure. Conversely, Alternative 1 would require closing two lanes on SH 82 for longer periods of time. Therefore, Alternative 1 was eliminated because it would have more construction impacts, more traffic delay, more impacts to historic properties, and fewer benefits related to bike and pedestrian connections compared to Alternative 3. The Alternative 3 alignment was selected as the alignment for the Build Alternative.

Level 3: Intersections

6th/Laurel Intersection Options. During Level 3 screening, the study team refined and expanded upon intersection options at 6th and Laurel associated with Alternative 3. In addition to Option A, which was carried forward from Level 2, four additional options (D, E, F, and G) were developed to reduce impacts or provide better operations, connectivity, or access, described in Appendix A. These options are shown in Figure 2-9. This process resulted in the selection of Option A as part of the Build Alternative.

FIGURE 2-9. 6TH AND LAUREL INTERSECTION OPTIONS

CARRIED FORWARD



Option A – Roundabout at 6th/Laurel, signal at Laurel extension and Grand Avenue Bridge. Reduced right-of-way acquisition, reduced noise and air impacts, enhanced aesthetics, reduced maintenance costs, increased vehicle safety, safe bike and pedestrian use, shorter trail underpass.

SCREENED OUT



Option D – Signal at 6th/Laurel, T-intersection on the bridge near existing bridge alignment to provide access to 6th Street. Higher costs, more visual impacts, more out-of-direction travel, more traffic adjacent to pedestrians and bicycles, less stakeholder support than Option A, inconsistent with community character.

SCREENED OUT



Option E – Signal at 6th/Laurel, signal at Laurel extension and Grand Avenue Bridge. Additional right-of-way required, higher cost, longer pedestrian crossing times, more maintenance.

FIGURE 2-9. 6TH AND LAUREL INTERSECTION OPTIONS**SCREENED OUT**

Option F – Roundabout at 6th/Laurel with “1/2” roundabout for local access east of Laurel. Potential directional confusion with two adjacent roundabouts; operations no better than Option A.

SCREENED OUT

Option G - Diverging Diamond style intersection for movements to/from I-70. Potential wrong-way traffic movements; poor traffic flow and capacity.

8th Street and Grand Avenue Intersection Options. On the south side of the river, two options for the Grand Avenue and 8th Street intersection were developed to best meet the Purpose and Need while minimizing impacts to downtown properties (presented in Figure 2-10). The Right-In-Right-Out option would result in restricted movements at the 8th Street intersection, which was identified as a key concern by stake-holders. The Signal option would best address the key issues for stakeholders, including providing for all movements at the intersection. This option is also consistent with CDOT’s SH 82 Access Control Plan and was therefore included with the Build Alternative.

2.2.4 Pedestrian and Bicycle Options

Because the Purpose and Need for the project includes the need to improve multimodal connectivity, several bicycle and pedestrian options were considered for inclusion with the Build Alternative to improve pedestrian and bicycle connectivity from downtown Glenwood Springs to the Glenwood Hot Springs area. Evaluation of these options underwent a separate screening process, described below.

FIGURE 2-10. SOUTH SIDE OPTIONS

SCREENED OUT



Right-In-Right-Out, no left turns, no signal. Would result in restricted movements at the 8th Street intersection, which was identified as a concern by stakeholders.

CARRIED FORWARD



Signal with full movements. Would best address the key stakeholder issues, including providing for all movements at the intersection. Is also consistent with the SH 82 Access Control Plan.

Location

Options considered for improving connectivity between downtown Glenwood Springs and the area north of the river included placing a pedestrian and bicycle facility on or adjacent to the Grand Avenue Bridge, as follows:

- ❖ **Attached sidewalks along the Grand Avenue Bridge. Screened Out.** The PWG eliminated this from consideration because of the additional impacts to downtown businesses from the required bridge width, as well as impacts to safety and the user experience of the bicyclists and pedestrians.
- ❖ **Using the existing pedestrian bridge. Screened Out.** The PWG eliminated this from consideration because a new bridge would better address the Purpose and Need and evaluation criteria (included in Appendix A) by providing greater connectivity and reducing impacts. A new bridge would also reduce and minimize utility relocation costs.
- ❖ **A new pedestrian bridge (that would accommodate bicycles) in the same location as the existing bridge. Carried Forward.** A new pedestrian bridge would be most effective for relocating utilities, improving connections, improving I-70 clearances, improving the grade, improving aesthetics, and addressing CDOT's bike and pedestrian policy. A new pedestrian bridge was also deemed more favorable because it would allow improvements to merging distance onto I-70 eastbound to meet design standards.

Type

Once it was determined to replace the existing pedestrian bridge, various pedestrian bridge types for the new bridge were considered and presented to the public. These are described in Appendix A. After stakeholder input and alternative refinement, the pedestrian bridge type selected for the Build Alternative would have constant depth girders and architectural treatments consistent with the historic character of Glenwood Springs. This bridge would be less vertically imposing than other bridge types considered and would complement the new roadway bridge better than the other options.

Connections

From new pedestrian bridge to 7th Street. Because the new highway bridge would not have a sidewalk, Americans with Disabilities Act (ADA) access from the new pedestrian bridge to 7th Street on the south side of the river would need to be provided by another means. Three options were considered for ADA access – all with stairs to the new pedestrian bridge:

- ❖ **Attached sidewalk on the bridge between 7th and 8th Streets. Screened Out.** Considerable feedback from the public indicated the added width of the structure for the sidewalk combined with the left turn lane at 8th Street would negatively impact area businesses. Also, emergency service providers were concerned that the wider structure would impair their access to businesses in this area. For these reasons, this option was screened out.
- ❖ **A new ADA ramp system between 7th Street and the railroad. Screened Out.** Stakeholder input indicated the ramp would block the views from the businesses across the Colorado River and negatively impact pedestrian space along the north side of 7th Street. The Build Alternative would not preclude construction of an ADA ramp if needed in the future.
- ❖ **One or two elevators between 7th Street and the railroad. Carried Forward.** Elevators received the greatest amount of City and stakeholder support throughout the process, which is particularly important because the City would have to maintain the elevators. An elevator system was deemed to have the fewest visual impacts. For this option, CDOT and the City will develop an intergovernmental agreement (IGA) that outlines the City's responsibilities to operate and maintain the elevators and comply with ADA requirements, including a contingency plan for ADA compliance.

From new pedestrian bridge to 6th Street. The new pedestrian bridge would land on the north side of the Colorado River at an elevation higher than the existing pedestrian bridge, at nearly the elevation of the existing roadway. Because the existing SH 82 roadway would ultimately be vacated, a portion of this vacated roadway area would be used to complete the connection from the new pedestrian bridge to 6th Street. A sidewalk connection would continue north to the intersection of 6th Street and Pine

Street, and the existing stairway would provide a direct connection to the Glenwood Hot Springs.

From new pedestrian bridge to existing Two Rivers Park trail system at Exit 116.

Several options were developed and evaluated with stakeholder input, and are described below:

- ❖ **Keep existing bicycle/pedestrian connections. Screened out.** The existing connection includes a grade-separated trail under the existing bridge and at-grade crossings of Exit 116 on and off ramps. The new Grand Avenue Bridge alignment would remove the existing connections, requiring a new connection to be constructed.
- ❖ **New ramp and stairs from pedestrian bridge to Glenwood Hot Springs parking lot. Screened out.** Because of the large elevation difference between the pedestrian bridge and the parking lot, the ramp would require additional right-of-way and would split existing parcels owned by the Glenwood Hot Springs. It also would route public trail traffic through a private parking lot.
- ❖ **New stairs from pedestrian bridge down to Glenwood Hot Springs parking lot and ramp to Two Rivers Park Trail. Screened out.** This option also would split existing parcels owned by the Glenwood Hot Springs and result in additional right-of-way.
- ❖ **Underpass under the new Grand Avenue Bridge north abutment in the Hot Springs parking lot connecting existing Two Rivers Park Trail and 6th Street. Screened out.** This option would require raising the sidewalk 8 feet above the Hot Springs parking lot. To achieve required grades and vertical clearance above the parking lot, the path would have had sharp corners, limiting sight-distance and thereby reducing safety. The path would have steeper grades and increased potential for icing during winter months. Further, the Grand Avenue vehicle bridge would need to be lengthened, adding costs.
- ❖ **New at-grade trail connection on west side of SH 82 at Exit 116 and a new at-grade crossing of US 6 at the new intersection with SH 82. Screened out.** This option would result in worse connectivity for multimodal connections and, therefore, did not meet the project's Purpose and Need. This connection would require two new at-grade crossings on the west side of the Exit 116 underpass, which has higher traffic volumes than the existing at-grade crossings. It also would require a new at-grade crossing of US 6—a wider intersection than now exists, thereby increasing potential for conflicts with vehicles. Stopping traffic to allow pedestrians to cross this intersection also would worsen traffic operations. For these and other reasons (see Appendix A), this option was strongly discouraged by the City's Transportation Commission, the City's River Commission, and City staff.

- ❖ **Underpass under the new Grand Avenue Bridge** north of the I-70 off ramp. **Carried forward.** This option would create a more direct trail path and would result in moderate ADA grades to create a grade separation and path direction. The new grade-separated connection would provide safety and mobility benefits similar to the existing grade-separated connection under the existing Grand Avenue Bridge.

2.3 Alternatives Evaluated in This EA

As a result of the evaluation process, a Build Alternative was identified, comprised of the components described above, for comparison to the No Action Alternative in this EA. These alternatives are described below.

2.3.1 No Action Alternative

The No Action Alternative would not implement any projects beyond safety and operational improvements to keep SH 82 open and previously programmed projects. Neither CDOT nor the City currently has programmed projects in the study area.

The No Action Alternative does not meet the Purpose and Need, but is fully evaluated and serves as a baseline for comparison for environmental analysis purposes.

2.3.2 Build Alternative

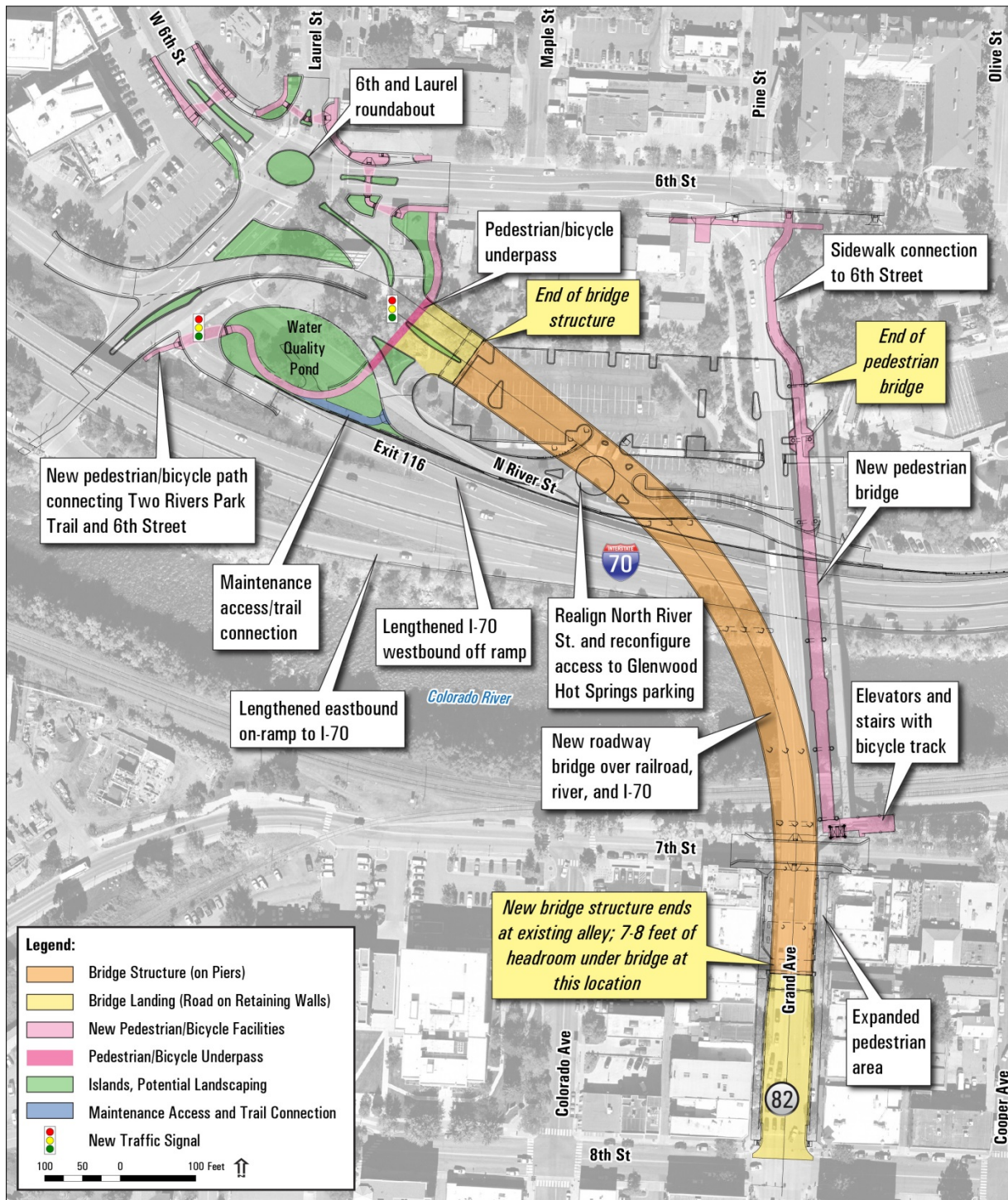
FHWA and CDOT have identified the Build Alternative as the Proposed Action. The Build Alternative would consist of the elements described below and depicted in Figure 2-11.

Alignment

The existing four-lane SH 82/Grand Avenue highway bridge would be replaced with a new four-lane bridge on a modified alignment. The new bridge would start just north of the intersection of 8th Street and Grand Avenue, and continue on the existing SH 82/Grand Avenue alignment to 7th Street. At 7th Street, the alignment would begin a curve to the west as it crosses the Union Pacific Railroad (UPRR) and the Colorado River. It would touch down north of the river on the west side of the Glenwood Hot Springs parking lot and southeast of the existing 6th and Laurel intersection. From the touchdown point, the alignment would curve southwest to the existing Exit 116 and access to I-70, and would connect to a new 6th and Laurel intersection just northeast of Exit 116 for local access. Bridge height clearances would meet current federal and American Railway Engineering and Maintenance of Way Association (AREMA) standards for road and railroad crossings. The crossing over the UPRR would have a minimum clearance of 23 feet 4 inches, which would meet these requirements as well as UPRR minimum guidelines.

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-11. BUILD ALTERNATIVE



Source: Jacobs, 2014.

Cross-sections

The new bridge would include four 12-foot-wide travel lanes, consistent with AASHTO standards, to improve safety and mobility. A striped median was selected for the bridge because it would be more cost-effective and would better accommodate larger vehicles, thereby being practical and financially realistic, as required by the MOEs. The bridge would have two-foot shoulders on the east side and a four-foot shoulder on the west, with the additional width needed because of the bridge curvature and sight difference requirements. The southbound left turn lane to 8th Street would be lengthened. Lane widths would taper to 11 feet wide between 7th and 8th Streets into downtown to tie into the existing 11-foot lanes in downtown and minimize impacts in that area. No sidewalks or special lanes would be provided on the bridge.

Intersections

6th/Laurel Intersection. A new one-lane five-leg roundabout at the 6th and Laurel intersection would help distribute traffic between I-70/ SH 82 and hotels west along W. 6th Street, the Hotel Colorado, and Glenwood Hot Springs along 6th Street, and local businesses and residences along Laurel Street. The fifth leg would be a one-way southbound lane to the Exit 116 interchange using the existing SH 82 alignment. The major movements for this intersection are shown in Figure 2-12.

8th and Grand Avenue Intersection. A traffic signal would provide for all movements at the 8th Street and Grand Avenue intersection.

Pedestrian/Bicycle Facilities

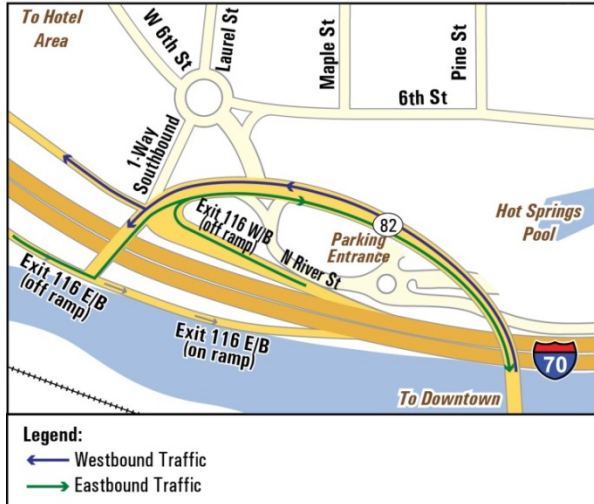
New Pedestrian Bridge. The Build Alternative would replace the existing pedestrian bridge immediately east of the highway bridge with a new pedestrian bridge that would also carry utility lines across the Colorado River. The following facilities would be built in conjunction with this bridge and other elements of the Build Alternative described above.

- ❖ *Connection to 7th Street.* A wider staircase with a bicycle track would take pedestrians and bicyclists to and from the south end of the new pedestrian bridge to 7th Street and downtown Glenwood Springs. In addition, to meet ADA requirements, the Build Alternative would include two elevators for redundancy and a back-up generator in case of an electrical power outage. CDOT and the City will develop an IGA that outlines the City's responsibilities to operate and maintain the elevators and comply with ADA requirements, including a contingency plan for ADA compliance if the elevators are not operational. The Build Alternative would not preclude an ADA ramp if needed in the future.
- ❖ *Expanded Pedestrian Plaza Under Bridge near 7th Street.* The bridge design would allow for an expanded open area under the new Grand Avenue Bridge south of 7th Street.

SH 82 GRAND AVENUE BRIDGE

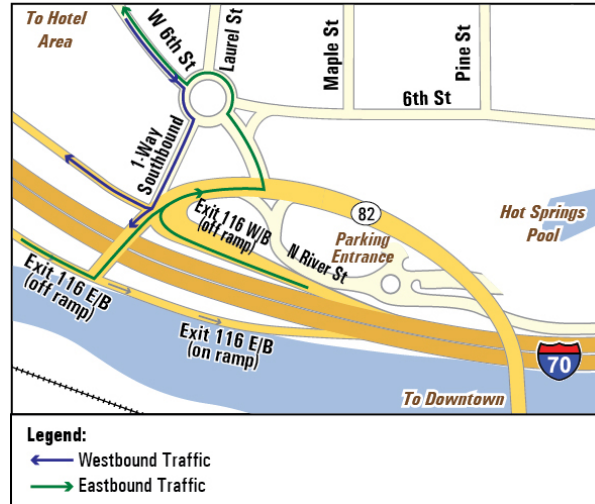
FIGURE 2-12. 6TH AND LAUREL MAJOR TRAFFIC MOVEMENTS

I-70 to and from SH 82 and downtown



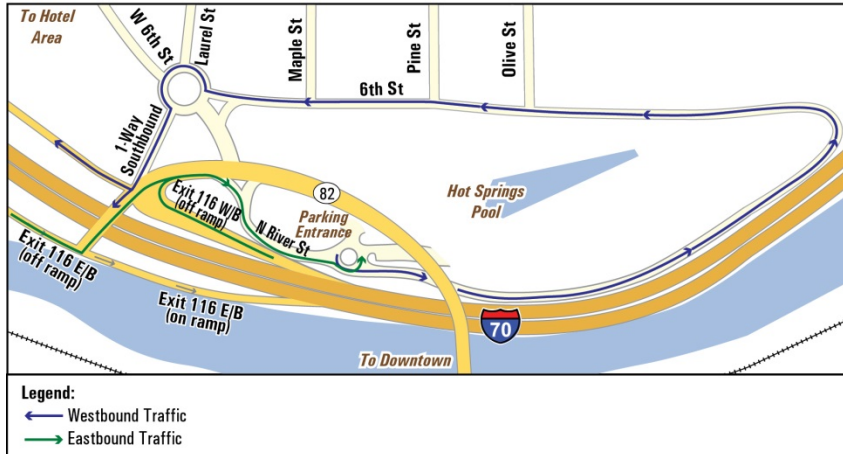
The same general movement as the existing intersection would be retained for regional traffic.

I-70 to and from W. 6th Street hotel area



From I-70, the travel pattern for regional traffic would be very similar to existing conditions.

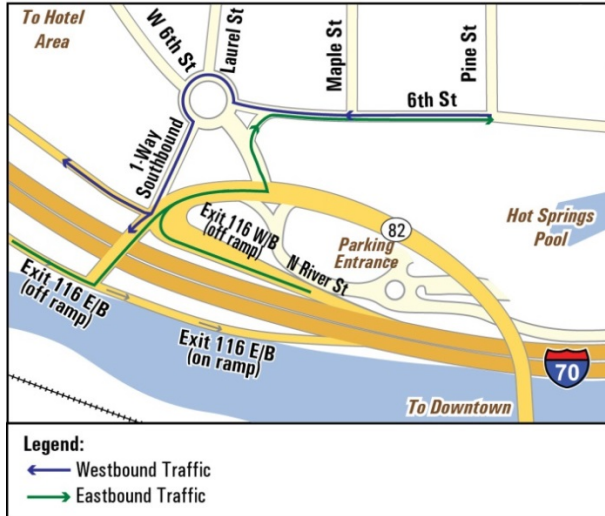
I-70 to and from Glenwood Hot Springs



The Build Alternative would maintain the same general movement for westbound I-70 motorists after they exit I-70. The same two right turns would be made in succession. Eastbound I-70 motorists would cross under I-70 and take the first right onto North River Street. Signs would direct motorists leaving the Glenwood Hot Springs large parking lot east to where the intersection with 6th Street.

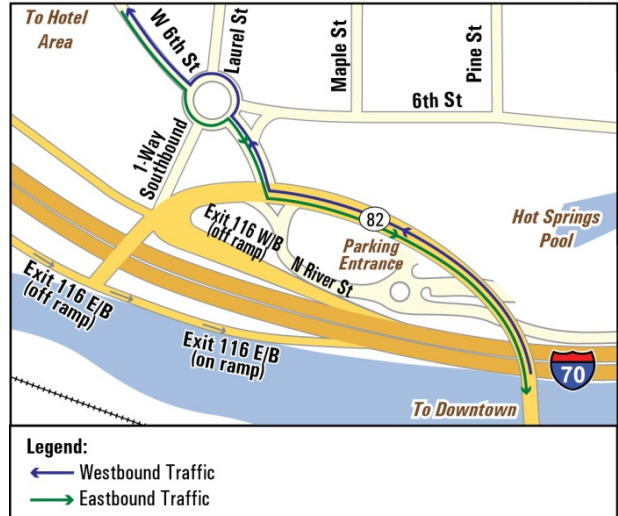
FIGURE 2-12. 6TH AND LAUREL MAJOR TRAFFIC MOVEMENTS

I-70 to and from 6th Street hotel area (Hotel Colorado)



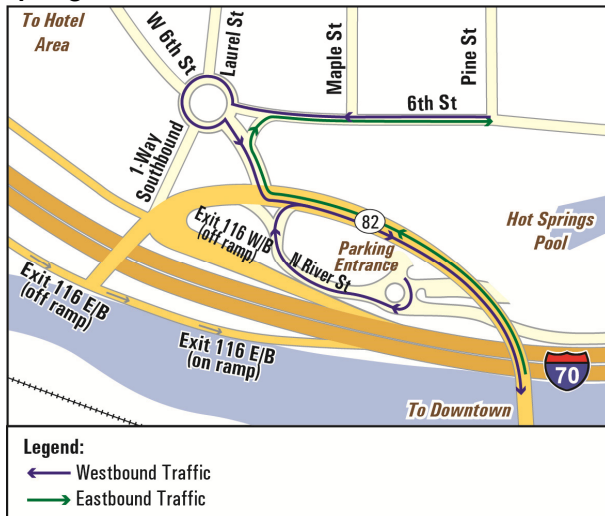
The travel pattern for regional traffic would change as shown above.

W. 6th Street hotel area to and from SH 82 and downtown



The travel pattern for local and regional traffic would change as shown above.

SH 82 and downtown to and from Glenwood Hot Springs



The travel pattern for local and regional traffic would change as shown above.

- ❖ *Connection to 6th Street.* The north end of the new pedestrian bridge would land adjacent to the existing SH 82 bridge landings. A sidewalk connection would continue north to the intersection of 6th Street and Pine Street, and the existing stairway would provide a direct connection to the Glenwood Hot Springs.

6th and Laurel Intersection. New sidewalks and crossings would be installed.

Pedestrian/Bicycle Path Connecting the Existing Two Rivers Park Trail and 6th Street.

This new grade-separated path would replace the existing connection affected by the new SH 82 alignment. It would start at the existing Two Rivers Park Trail just north of the I-70 underpass at Exit 116, cross the improved westbound I-70 off ramp, and continue north using an underpass/tunnel of the new SH 82/Grand Avenue Bridge alignment just west of the new bridge.

A new maintenance access and trail connection would link the new trail north of the I-70 off ramp to the on-road bicycle route on North River Street. This trail would be open to the public.

Shielding

The Build Alternative would include shielding on the Grand Avenue Bridge extending from just north of the railroad tracks to the intersection of Grand Avenue and 7th Street. The shielding would be used to prevent splash back from the bridge, with the added benefit of providing a noise reduction. The shielding would be approximately seven feet tall over the railroad tracks to meet railroad requirements. For the remaining south section, shielding would be located along the bridge near businesses. The exact shielding locations and dimensions to prevent splash back would be determined during final design with stakeholder input. Chapter 3 provides further discussion of the noise benefits provided by the shielding.

Additional Roadway Improvements

The Build Alternative would make improvements to existing facilities that would stay in place for the long term. These improvements were evaluated under this EA.

North River Street. The west end of North River Street would be raised to match the new SH 82 elevation and realigned slightly to avoid the new piers. The intersection with SH 82/Grand Avenue would be moved to the east and become a right-in/right-out intersection.

A small roundabout would be built on North River Street at the entrance to the Glenwood Hot Springs parking lot. This roundabout would enable motorists heading west on North River Street to make a U-turn to access 6th Street, which would be required to access I-70. This would be particularly beneficial for larger vehicles, such as recreational vehicles. It would also provide good traffic control at the Glenwood Hot

Springs parking lot entrance. Drivers continuing west past this roundabout would turn right at SH 82 and go south over the Grand Avenue Bridge.

Exit 116 On and Off Ramps. The I-70 eastbound on ramp and westbound off ramp at Exit 116 would be lengthened to meet current design standards after the existing Grand Avenue Bridge piers adjacent to them are removed. These improvements would be funded separately from the bridge project through Funding Advancements for Surface Transportation and Economic Recovery (FASTER) funds, but are planned to be constructed concurrently for cost and construction efficiency.

2.4 Construction

Construction could begin as early as spring 2015 and is anticipated to last approximately 18 to 24 months, including an approximately 90-day full bridge closure during the last 9 months. Construction would involve:

- ❖ Construction of a highway and a pedestrian bridge with piers, retaining walls, road pavement, storm sewers, curb and gutter, sidewalks, and paths; and installation of traffic signals and other overhead traffic control, wayfinding and traffic signs, and landscaping.
- ❖ Demolition, which is the process of wrecking or tearing down an existing facility or structure by various methods, such as use of bulldozers or wrecking ball. The project would involve demolition of existing structures, such as the Grand Avenue Bridge, pedestrian bridge, and buildings acquired for right-of-way.
- ❖ Excavation, which is the process of removing soil, rock, or other material from a site, typically with use of heavy earthmoving equipment such as excavators and bulldozers. Excavation would be necessary for construction of bridge supports and storm sewers.
- ❖ Grading, which is the movement and shaping of earth to achieve a desired level or shape using heavy earthmoving equipment, would be required for construction of retaining walls, sidewalks and paths, curb and cutter, intersection improvements, and landscaping.
- ❖ Utility relocations, which involves the identification and relocation of utility facilities that may be in conflict with the proposed bridge project.

2.4.1 Construction Phasing

The study team developed a construction phasing approach to accommodate accelerated bridge construction that would minimize the duration of detours and total closures of the Grand Avenue Bridge, SH 82, and I-70. The approach involves building most bridge elements outside the existing SH 82 route during much of the construction phase, thereby allowing SH 82 to remain open as long as possible.

The construction phasing plan calls for removing the existing Grand Avenue Bridge and installing the new bridge within an approximately 90-day period, during which the Grand Avenue Bridge would be fully closed to traffic. Based on current traffic volumes and concerns voiced by the public, full closure would be scheduled to occur during spring or fall, when traffic volumes and tourism are typically lower. In addition a pedestrian connection would be maintained for access across the Colorado River, I-70, and the railroad at all times.

The main elements of the Grand Avenue Bridge project would be constructed in phases to minimize travel disruptions as much as possible. Specific details of each phase would be identified during project design, but in general, the phases would follow a logical sequence. Early in the project, a five-foot sidewalk with barrier would be built on or adjacent to the existing Grand Avenue Bridge. The existing pedestrian bridge would be removed and the new bridge built adjacent to the existing Grand Avenue Bridge. Concurrently or afterward, causeways for work pads would be built in the river, and the site at the 6th and Laurel intersection would be prepared, including removal of the Shell station. More preparatory work would follow, such as working on bridge piers and utilities and modifying existing streets as necessary. Meanwhile, segments of the new Grand Avenue Bridge would be constructed off site. Before the existing bridge is removed, detours (described below) would be put in place, with changes to I-70 Exit 114, Midland Avenue, and 8th Street. Finally, the Grand Avenue Bridge would be constructed, the 6th and Laurel roundabout would be finished, new pedestrian connections would be finalized, and other associated activities would conclude the construction process.

2.4.2 Detours

Two detour routes are proposed during construction – one for I-70 traffic during short, nighttime closure periods (I-70 Detour), and a second for SH 82 traffic during the full closure of the Grand Avenue Bridge (SH 82 Detour). These detours were evaluated under this EA.

I-70 Detour

Construction of the Grand Avenue Bridge and the pedestrian bridge would require full nighttime closures of I-70 approximately ten times for safety-critical overhead work, such as bridge demolition, construction of bridge components, and concrete installation. This would be planned to occur between the hours of 8:30 p.m. and 5:30 a.m., when current traffic volumes are generally between 50 and 150 vehicles per hour per direction on I-70, according to CDOT data. Detouring I-70 traffic to local streets is proposed to maintain emergency access to and from Glenwood Canyon and because a detour route along state highways would be very long.

Eastbound and westbound I-70 traffic would be rerouted onto 6th Street at a temporary break in the I-70 barrier near the Yampah Vapor Caves, shown in Figure 2-13. The 0.5-mile detour would be repaved to handle the additional traffic. On the east end of the detour, both travel directions would be located on the north side of I-70. There would be two-way traffic on the westbound lanes until just west of No-Name tunnel, where eastbound traffic would cross over to I-70 eastbound lanes.

FIGURE 2-13. I-70 DETOUR



SH 82 Detour

During the approximately 90-day full closure of the Grand Avenue Bridge between 8th Street south of the river and 6th Street north of the river, SH 82 traffic would be rerouted onto the designated SH 82 Detour, shown in Figure 2-14. The temporary route for regional traffic would begin at Exit 114 on I-70 and proceed south on Midland Avenue to 8th Street across the Roaring Fork River, then along a new 8th Street connection into downtown. In the downtown grid, the traffic would be routed through a temporary “square about” for continuation south on SH 82/Grand Avenue to Aspen. This downtown route is depicted in Figure 2-15.

Determination of the detour route and associated improvements included an analysis of the traffic carrying capacities of 8th Street, 9th Street, Colorado Avenue, and Midland Avenue to I-70 Exit 114. The analysis determined that motorists would experience unacceptable delay without some temporary improvements to intersections and roadways along the route, and a voluntary reduction of peak hour trips.

SH 82 GRAND AVENUE BRIDGE

FIGURE 2-14. SH 82 DETOUR ROUTE



FIGURE 2-15. SH 82 DETOUR ROUTE, DOWNTOWN



The components of the SH 82 Detour are described below, including the improvements necessary to accommodate traffic. The study team determined that the temporary improvements described below would only accommodate a portion of the demand for the Grand Avenue Bridge during construction. Further measures to reduce automobile demand are described in Section 3.2 *Transportation*.

Temporary 8th Street Connection. 8th Street in downtown Glenwood Springs currently terminates just west of School Street. The temporary 8th Street connection would connect the 8th Street Bridge over the Roaring Fork River along a new alignment that would cross land owned primarily by the City of Glenwood Springs and a small portion of land owned by RFTA. This land also contains an active railroad. The UPRR has a permanent exclusive freight rail easement across both properties (see Figure 2-15). CDOT has coordinated with the UPRR on the detour.

The 8th Street connection would require the following elements:

- ❖ Temporary removal of portions of four existing railroad tracks and railbed.
- ❖ Two 12-foot lanes on 8th Street with curb and gutter on both sides.
- ❖ Drainage and water quality infrastructure.
- ❖ Temporary grade modifications on 7th Street and the Vogelaar Park access road.
- ❖ Modifications at 7th Street/8th Street to maintain bicycle access from the Rio Grande Trail along the river to downtown and sidewalk on 7th Street.
- ❖ Increased turn radius at the northeast corner of the 8th Street and Midland Avenue intersection to accommodate larger vehicles. This change would be permanent.

After the new Grand Avenue Bridge is reopened and the SH 82 Detour is no longer needed, CDOT would restore the area to pre-construction conditions and replace the railbed and railroad tracks.

Downtown Grid. A “square about” would consist of a temporary one-way loop on 8th Street, Colorado Avenue, 9th Street, and Grand Avenue (see Figure 2-15). To address higher traffic volumes, the following measures would be put into place:

- ❖ A temporary signal would be installed at the intersection of 8th Street and Colorado Avenue to facilitate pedestrian crossings and higher traffic volumes.
- ❖ A temporary physical barrier would be placed at the intersection of 9th Street and Colorado Avenue to force detour traffic to turn east toward Grand Avenue and keep detour traffic from continuing south on Colorado Avenue.

Exit 114. The improvements described below and shown in Figure 2-16 would be needed at Exit 114 to accommodate SH 82 Detour traffic during full closure of Grand Avenue Bridge, but would remain as permanent improvements.

- ❖ **I-70 eastbound off ramp at Exit 114.** The I-70 deceleration lane would be lengthened by about 800 feet, and the second lane of the two-lane approach to the roundabout would be lengthened by approximately 340 feet.
- ❖ **I-70 westbound on ramp at Exit 114.** The existing I-70 westbound on ramp has a short two-lane segment just past the roundabout. This two lane section would be lengthened about 500 feet to create a more standard two-lane merge onto I-70.
- ❖ **I-70 Exit 114 roundabouts.** Minor changes to the curb and gutter and signing and striping would be made on the two roundabouts at the exit to better accommodate the detour traffic volumes and larger trucks.

2.4.3 Additional Temporary Improvements

Some additional elements would be necessary to support the construction of the Build Alternative. These improvements are evaluated in this EA and would stay in place through the construction phases. They include:

Construction Staging Areas. Construction staging areas where materials and equipment would be located would primarily store construction equipment while not in use.

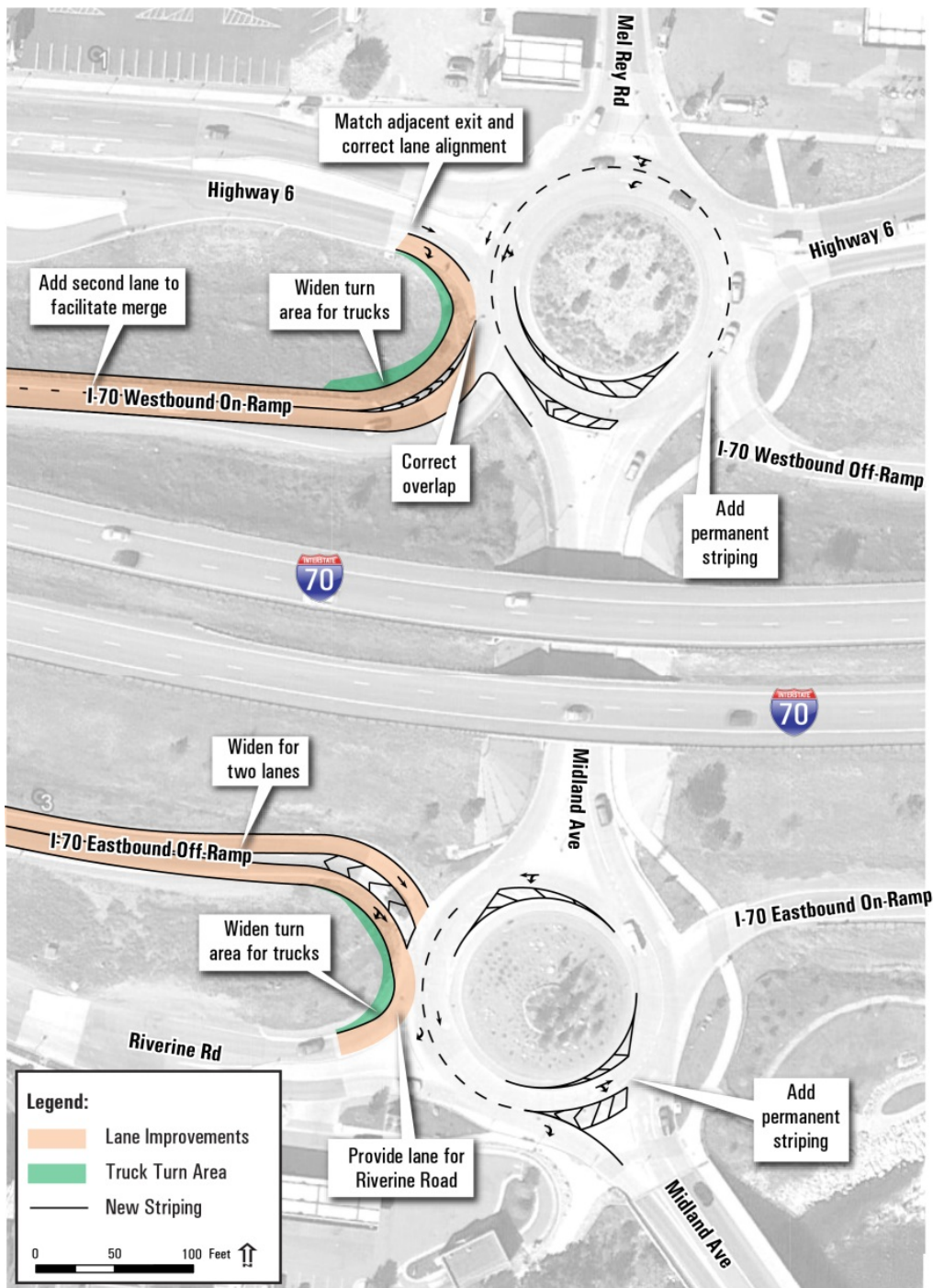
Temporary Causeways in the Colorado River. Bridge construction would require placement of temporary causeways (a raised road or working area built on low or wet ground) on both banks of the Colorado River upstream and downstream of the new bridges.

Construction causeways are temporary, earthen platforms that would serve as a work pad, allowing construction to occur without operating directly in the Colorado River. Causeways would also minimize the construction equipment footprint by confining travel to a small area.



Example of causeways used on both sides of the river at the Dotsero bridge.

FIGURE 2-16. EXIT 114 IMPROVEMENTS



SH 82 GRAND AVENUE BRIDGE

As shown in Figure 2-17, the causeway on the north side of the Colorado River would be approximately 1,600 feet long, and the causeway on the south side would be approximately 600 feet long. Side slopes would be constructed as required for stability. Cofferdams (shoring systems used to create a dry working space below the river's water surface) may also be used on and between the river banks to facilitate bridge pier demolition and construction.

FIGURE 2-17. TEMPORARY CAUSEWAYS AND ACCESS ROADS



Access Roads to the Colorado River. Temporary construction access roads would be built on both the north and south sides of the Colorado River within the construction limits so construction equipment could be positioned to demolish the existing Grand Avenue Bridge and pedestrian bridge, construct the new bridges, and construct and remove cofferdams. These are shown on Figure 2-17.

The temporary access road on the north side of the river would be between I-70 and the river from Exit 116 to a location on I-70 400 feet east of the existing pedestrian bridge. The access road on the south side of the river would be between the UPRR tracks and the river from a location along the UPRR tracks 600 feet west of the existing Grand Avenue Bridge to a point 100 feet east of the existing pedestrian bridge. Part of this access road would require a temporary crossing of the UPRR tracks at grade west of the existing Grand Avenue Bridge. Figure 2-17 shows access road locations.

Upon construction completion, the access roads, causeways, staging areas, and railroad grade crossing would be removed and the areas returned to their pre-construction condition and appearance.

2.5 PROJECT FUNDING

Funding has been identified for this project primarily through CDOT's CBE program, with other funds coming from local sources and other state funds. Ramp improvements will be completed prior to opening of the Grand Avenue Bridge project. CDOT estimates the total construction cost at approximately \$60 million (see Table 2-1).

TABLE 2-1. OPINION OF PROBABLE COST

Item	Opinion of Probable Cost*
Construction	
Grand Avenue Bridge and Approach Roadways	\$40.5 million
Pedestrian Bridge with Elevator	\$9.5 million
Construction Detour	\$5.5 million
Multimodal Connections and Underpass	\$1.5 million
Walls	\$3.0 million
Construction Total	\$60.0 million
Preconstruction	
NEPA and Design, Right-of-way and Utilities	\$25.3 million

*These costs do not include indirect costs associated with CDOT management, administration, etc., or other direct costs associated with procurement and review.

2.5.1 Project Implementation

CDOT will proceed with project development after completion of the NEPA process. Stages of project development include, in order, final design, right-of-way acquisition, and construction. Because of the anticipated complexity of the project's construction and the community's sensitivity to construction impacts, CDOT has engaged a Construction Manager/General Contractor to help strategize phasing and constructability issues during the planning and design process.