

Chapter 2.0: Alternatives

2.1 Introduction

The National Environmental Policy Act (NEPA) requires that reasonable alternatives, including a No-Action Alternative, be presented and evaluated in a NEPA document. This chapter describes the process used to identify the alternatives that are fully assessed in this Environmental Assessment (EA). Engineering plan sheets depicting the preliminary Preferred Alternative are included in **Appendix B**.

The EA process began with scoping to identify issues and concerns related to SH 7 and its potential improvement. These issues and concerns were used to:

- Develop the Purpose and Need for the project.
- Identify screening criteria to apply to the alternatives development.
- Develop a range of alternatives to evaluate.
- Identify reasonable alternatives to retain for further study.

2.2 Description of Preliminary Alternatives

Section 2.2.1 contains a list of alternatives from which a preliminary screening was conducted. They are categorized as Roadway Build Alternatives and a Congestion Management Alternative. In addition, three Burlington Northern Santa Fe (BNSF) railroad alignment alternatives were evaluated as part of this study, since the roadway build alternatives require reconstruction of the BNSF bridge overpass.

In addition to the alternatives considered, numerous options that could be included as part of the build alternatives were evaluated. These options included the following: Multimodal Enhancement Options and Intersection Enhancement Options. Also, refinements to the build alternatives were considered and evaluated as modifications to the build options to address impacts to environmental resources.

All alternatives were designed to meet applicable design criteria. The criteria were based upon American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*, the Colorado Department of Transportation *Design Guide*, the City of Boulder *Design and Construction Standards* and the Boulder County *Road Standards and Specifications*. Auxiliary lanes will be provided where warranted by CDOT's *State Highway Access Code* (2003) and designed per *A Policy on Geometric Design of Highways and Streets*. The access category is Non-Rural Arterial (NR-B) between Cherryvale Road and 63rd Street, Non-Rural Principal Highway (NR-A) between 63rd Street and Westview Drive, and Rural Highway (R-A) between Westview Drive and 75th Street. The design speed between

Cherryvale Road and Westview Drive is designated as 45 mph and the design speed between Westview Drive and 75th Street is designated as 55 mph.

The No-Action Alternative assumed that no system improvements, other than those identified below, are made within the study area to meet the project goals. Common to all of the alternatives, including the No-Action Alternative, is the reconstruction of the SH 7 and 75th Street intersection by Colorado Department of Transportation (CDOT) as a separate, previously identified and designed improvement. In addition, the No-Action Alternative includes intersection improvements for transit operations funded by the City of Boulder. Finally, the No-Action Alternative includes any improvements that would occur as a result of the ongoing US 36 EIS.

2.2.1 Roadway Build Alternatives

Initially, build alternatives were identified and developed that addressed the western and eastern extents of the study area separately (reflecting the urbanized and rural segments). These preliminary alternatives are shown in Appendix A. The western extents, from Cherryvale Road to Westview Drive, is designated as an urban arterial roadway, has an urban character, and is mostly located in the City of Boulder urbanized area with adjacent land use categorized as urban commercial, industrial and institutional (Boulder Valley School District facilities). The eastern extents, from Westview Drive to 75th Street, is designated as a rural arterial roadway, with undeveloped City of Boulder Open Space, a Boulder County rural park, and undeveloped agricultural land scattered with some concentrated commercial and industrial development. Roadway Build Alternatives were categorized as W-1 to W-5 for the western extents and as E-1 to E-5 for the eastern extents as follows:

Western Extent Alternatives—Cherryvale Road to Westview Drive

- **W-1 – No-Action Alternative:** The No-Action Alternative assumes programmed improvements at the intersection of SH 7 and 75th Street, intersection improvements for transit operations from Cherryvale Road to east of 63rd Street and possible commuter rail and park-n-Ride facilities associated with the ongoing US 36 Environmental Impact Statement (EIS).
- **W-2 – Two-Lane Urban Section with Enhanced Turn Lanes:** This alternative would include one through lane in each direction with curb and gutter (rather than roadside ditches). Warranted turn lanes for left- and right-turning vehicles were incorporated.
- **W-3 – Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd), Transitioning to Two-Lane Section East of VoTec:** The four-lane urban section would include curb and gutter with two lanes in

each direction and warranted auxiliary lanes for left- and right-turning vehicles. This alternative would transition to a two-lane section east of the VoTec signal. This alternative would be consistent with Eastern Extent alternatives that include one lane in each direction (Alternatives E-2 and E-3).

- **W-4 – Four-Lane Urban Section:** Throughout the entire western extents of the project, four lanes would be constructed with warranted auxiliary lanes. This alternative would be consistent with Eastern Extent alternatives that include two lanes in each direction (Alternatives E-4 and E-5).
- **W-5 – Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd):** This alternative would be similar to Alternative W-4, with the additional inclusion of a continuous auxiliary lane from Cherryvale Road through the 63rd Street intersection in each direction. Although this additional lane would be an auxiliary lane, it would provide a continuous third lane along that portion of the segment. The remainder of the alternative would be the same as Alternative W-4.

Eastern Extent Alternatives—Westview Drive to 75th Street

- **E-1 – No-Action:** The No-Action Alternative assumes programmed improvements at the intersection of SH 7 and 75th Street, intersection improvements for transit operations from Cherryvale Road to east of 63rd Street and possible commuter rail and park-n-Ride facilities associated with the ongoing US 36 EIS.
- **E-2 – Intersection Safety Improvements at Valtec and Westview Drive:** This alternative would address safety concerns at Valtec and Westview Drive by providing auxiliary lanes for left- and right-turning vehicles.
- **E-3 – Two-Lane Rural Section:** This alternative would include a two-lane roadway section (one in each direction) with a continuous center two-way left-turn lane, widened shoulders to accommodate design standards and bicycles, improved vertical geometry to accommodate vertical sight distance and vertical grade deficiencies, clear roadsides to enhance safety and roadside drainage ditches.
- **E-4 – Four-Lane Rural Section:** This alternative would be very similar to Alternative E-3, with the exception that two through lanes of travel would be provided in each direction. The designation as a rural section generally implies that shoulders and roadside ditches are utilized as opposed to bike lanes, curb and gutter and a storm sewer system typical of an urban section.

- **E-5 – Four-Lane Urban Section with Sidewalks.** Alternative E-5 would provide a four-lane urban type section. In this roadway section, curb and gutter with a subsurface storm sewer system would be provided, along with adjacent sidewalks.

2.2.2 Congestion Management Alternative

In addition to build alternatives, a non-build alternative was considered. The congestion management alternative considered the following strategies:

- Encourage carpools and promote the Denver Regional Council of Governments (DRCOG) vanpool program.
- Increase the frequency of bus service and encourage additional bus ridership.
- Encourage telecommuting and flex hours.

Downtown Boulder is already using many creative ways to bring commuter benefits to the community. The City offers the EcoPass, an unlimited regional transit pass for bus and light rail, free of charge to the employees of all downtown businesses. In addition, the City provides a wide range of commuter benefits including bike parking throughout the downtown area, electric bikes, and a full-service Transportation Resource Center.

2.2.3 BNSF Railroad Alignment Alternatives

A subset of alternatives with regard to the BNSF railroad alignment was also evaluated, since roadway build alternatives would require the reconstruction of the BNSF railroad bridge over SH 7. The following railroad alignment alternatives were considered:

- **R-1 – No-Action**
- **R-2 – Reconstruct with Alignment in Existing Location:** This alternative would require the construction of a temporary railroad alignment and bridge over SH 7 to allow the construction of a new bridge along the existing railroad alignment over SH 7.
- **R-3 – Realign to the East in Existing Right-of-Way:** This alternative would realign approximately 4,000 feet of the existing railroad approximately 25 feet east of the existing alignment. This alignment shift would remain within the existing railroad right-of-way. The offset alignment would transition back to the existing alignment through the horizontal curves north and south of the offset alignment.

- **R-4 – Realign to the West in Existing Right-of-Way:** This alternative would realign approximately 4,000 feet of the existing railroad approximately 25 feet west of the existing alignment. This alignment shift would remain within the existing railroad right-of-way. The offset alignment would transition back to the existing alignment through the horizontal curves north and south of the offset alignment.

2.2.4 Multimodal Enhancement Options

Multimodal build enhancement options were evaluated for inclusion into the build alternatives. These enhancements were identified to address bicycle, pedestrian and transit accessibility issues and were outlined as follows:

- **Continuous On-Street Bicycle Lanes / Shoulders:** Bicycle facilities in the form of bike lanes or shoulders were included in all build alternatives except Alternative E-2, which is an intersection safety improvement only. The City of Boulder, Boulder County and local stakeholders have all expressed the need for bicycle facilities.
- **Sidewalks:** Sidewalks (either attached or detached) were considered as options for all build alternatives. Various locations were evaluated.
- **Multi-Use Trails:** Multi-use trails (typically wider than sidewalks) were considered at various locations to provide multimodal access to adjacent land uses and along the length of the project.

Many of these multimodal options were included in the roadway build alternatives in various forms.

2.2.5 Intersection Enhancement Options

Intersection operations could be enhanced by providing separate lanes for turning or waiting vehicles and by providing buses with the ability to “jump” queued vehicles at signalized intersections. Intersection enhancement options were evaluated for inclusion into build alternatives. They are:

- **Turn Lanes and Deceleration and Acceleration Lanes:** Auxiliary lanes, which include left- and right-turn lanes along with acceleration lanes and deceleration lanes, are an important safety and capacity element of a roadway transportation system. Both local and state criteria dictate where lanes are warranted. Their inclusion allows for safe and efficient vehicle maneuvers at intersections.

- **Transit Queue Jump Lanes:** Transit queue jump lanes use the right-turn acceleration and deceleration lanes as an option for the bus to bypass any queue. This requires modifying the right-turn islands at an intersection to allow a “bus-only” through movement. This option does not require special signal timing.
- **Transit Signal Priority Lanes:** Transit signal priority lanes allow a bus to bypass vehicles queued in the through lanes. This requires special signal phases for buses that could occur every phase or be triggered by the presence of a bus.

2.2.6 Environmental Resource Avoidance Variations

The presence of National Register of Historic Places (NRHP)-eligible resources, low-income and minority populations, and the presence of mature vegetation at the Boulder County Legion Park and the City of Boulder Open Space presented the need to evaluate avoidance or minimally impactful variations of the build alternatives. The following variations were considered and evaluated:

- Roadway alignment shifts were evaluated to minimize impacts to historic resources, including the historic gas station on the northeast corner of 63rd Street, the Harburg property and the Tenenbaum property.
- Roadway alignment shifts were evaluated to minimize impacts to low-income and minority populations in the study area. In particular, the SH 7 alignment and typical section were evaluated at the 63rd Street intersection to assess the avoidance of impacts to the mobile home park on the southwest corner of the 63rd Street intersection.
- Mature vegetation exists at the Boulder County Legion Park and the City of Boulder Open Space near the high point along the project. The construction of build alternatives would require lowering the highpoint along the roadway in this area, resulting in the need to transition back to existing ground level with graded side slopes or with retaining walls. These two options were evaluated for these build alternatives.

2.3 Preliminary Alternatives Evaluation

A two-step process was used to evaluate the alternatives. The Preliminary Alternatives Evaluation assessed the initial alternatives against a wide range of parameters, including transportation, community, environmental and construction issues. Members of the project team developed the evaluation parameters. The parameters were based on input from Boulder County, City of Boulder, Federal Highway Administration (FHWA), resources agencies and the issues as identified from public meetings. The preliminary alternatives evaluated were broken out into the following categories:

1. No-Action
2. Congestion Management
3. Improvement Alternatives – Cherryvale Road to Westview Drive
4. Improvement Alternatives – Westview Drive to 75th Street

In the preliminary evaluation, a relative scale was used to rate the alternatives. The project team (design and environmental specialists) evaluated the effectiveness of the alternatives against the evaluation criteria. This preliminary screening gained concurrence from the project team and the City of Boulder and Boulder County.

Multimodal enhancements and intersection enhancements were not considered as individual stand-alone build alternatives, since they do not address the full spectrum of the identified Purpose and Need for the project. Based upon public feedback, community planning and compatibility with local design standards, some elements of the typical section were included for all the build alternatives carried forward. These included bicycle lanes, sidewalks and multi-use trails as well as auxiliary lanes and queue jump/bus priority lanes.

2.4 Preliminary Screening Summary

Based on the results of the Preliminary Alternatives Evaluation, the following alternatives did not sufficiently address the Purpose and Need, and were not carried forward for more detailed evaluation. The primary reasons for eliminating each alternative are outlined below:

- **Congestion Management:** Although the strategies listed on page 2-4 will encourage some additional use of the JUMP system, these strategies by themselves do not fulfill the project Purpose and Need, specifically improving safety, upgrading outdated transportation facilities and providing bicycle facilities.
- **Alternative W-2: Two-Lane Urban Section with Enhanced Turn Lanes:** Although this alternative would have improved traffic operations over the No-Action Alternative, it still resulted in a poor traffic operating condition and was not compatible with local planning efforts [the Boulder County Regional Transportation Task Force (RTTF) and the City of Boulder East Arapahoe Transportation Network Plan].
- **Alternatives W-4: Four-Lane Urban Section and W-5: Four-Lane Urban Section with Additional Continuous Transit/Auxiliary Lanes (Cherryvale to 63rd) -** During the Preliminary Alternatives Evaluation, it was decided that the

remaining alternatives should be refined to address public feedback and project constraints. It was determined that continuous acceleration/deceleration lanes in both directions from Cherryvale Road through the 63rd Street intersection should be considered based upon criteria and need. These auxiliary lanes would also serve as transit lanes identified by the City of Boulder as a desirable enhancement. Therefore, Alternatives W-3 and W-4 would be sufficiently similar to be combined into one alternative. Similarly, Alternative W-5 was no longer sufficiently different to warrant its continuance as an independent alternative. Alternative W-5 served as an avoidance alternative for the gas station (NRHP-eligible property) on the northeast quadrant of the 63rd Street intersection. Avoidance alternatives were further defined in the description of the Preferred Alternative.

- **Alternative E-2: Intersection Safety Improvements at Valtec and Westview Drive:** This alternative was developed to address safety concerns identified as part of the *Safety Assessment Report* conducted by CDOT. While the alternative would provide improved safety at the intersecting street locations of Westview Drive and Valtec Lane, it did not sufficiently address the other elements of the Purpose and Need for the project; specifically, improving safety along the other sections of SH 7, upgrading outdated transportation facilities and providing bicycle facilities. The safety improvements specific to Alternative E-2 were incorporated into the Preferred Alternative.
- **Alternative E-4: Four-Lane Rural Section:** For the eastern extent of the project, Alternatives E-3 and E-5 would be advanced for further consideration. Alternative E-5 is a variation of E-4 (E-5 is an urban section and E-4 is a rural section) and is not sufficiently different to carry both E-4 and E-5 forward.

Based upon this preliminary screening, the combined alternatives of Alternative W-3 with Alternative E-3 and Alternative W-3 with Alternative E-5, along with the No-Action Alternative, were further considered and designated as follows:

- **Alternative 1:** No-Action
- **Alternative 2: Combined W-3 and E-3:** Four-Lane Urban Section (curb and gutter) with Additional Continuous Transit/ Auxiliary Lanes (Cherryvale to 63rd), Transitioning to Two-Lane Rural Section (shoulders) East of VoTec to the 75th Street Intersection.
- **Alternative 3: Combined W-3 and E-5:** Four-Lane Urban Section with Additional Continuous Transit/ Auxiliary Lanes (Cherryvale to 63rd), Transitioning to a Four-Lane Rural Section East of Westview Drive to the 75th Street Intersection.

In addition to the described enhancements, both build alternatives incorporate continuous bicycle lanes. Also, a multi-use path is included on the north side of SH 7 between Cherryvale Road and 75th Street, and a sidewalk is included on the south side of SH 7 between Cherryvale Road and Westview Drive. Auxiliary lanes and either transit queue jump lanes or transit signal priority lanes were incorporated.

Since both build alternatives include the requirement to replace the BNSF railroad bridge, an evaluation of railroad alternatives was also conducted as part of the Short-Listed Alternatives Evaluation.

2.5 Railroad Alternatives Evaluation

A BNSF railway line crosses SH 7 between 63rd Street and 75th Street and currently conveys about six trains per day. The existing railroad overpass structure is designated DOT 244809X and is located in the BNSF Front Range Subdivision at BNSF milepost 24.04 in Boulder County, Colorado.

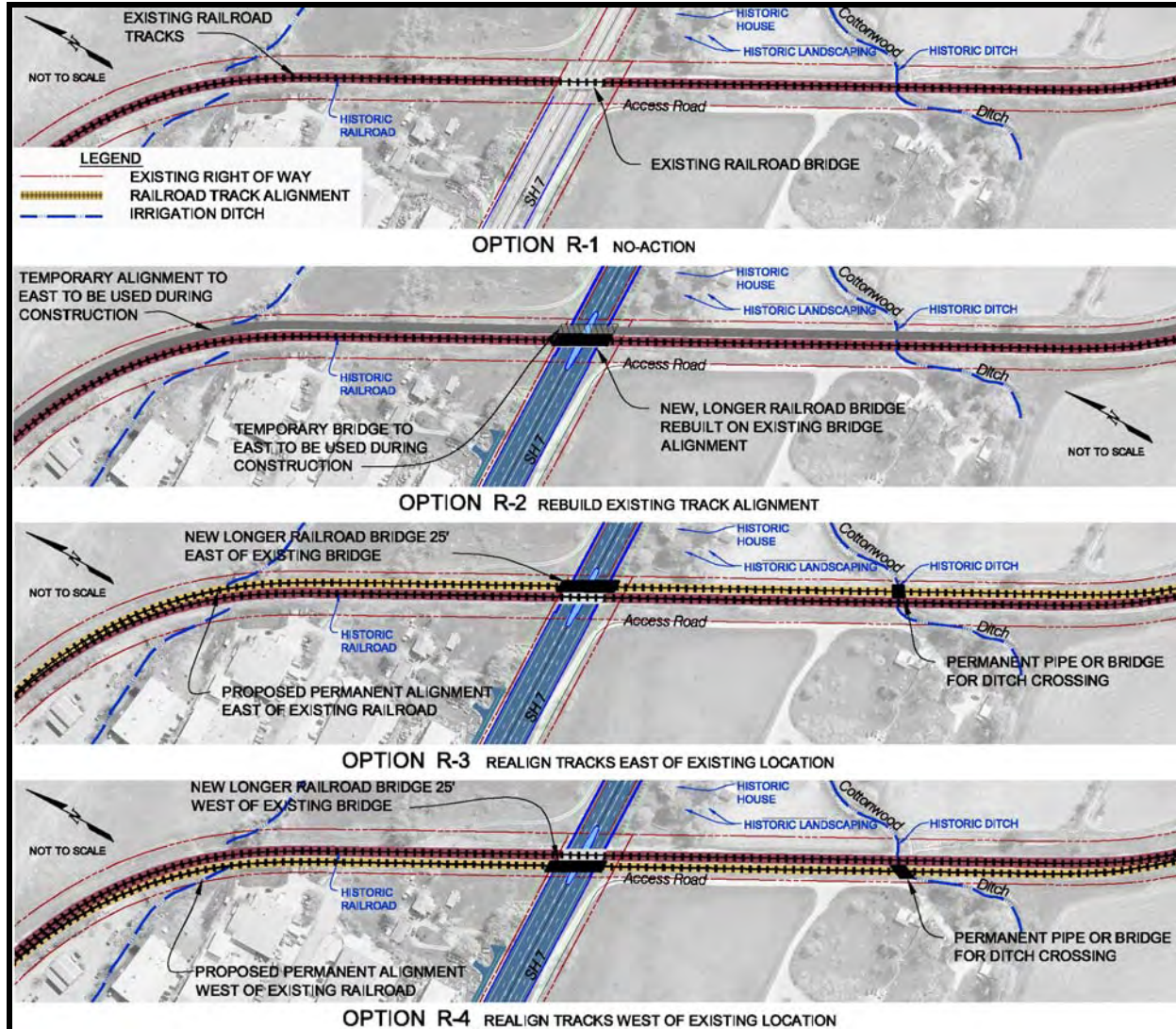
The existing bridge was built in 1931 and consists of three simple spans with a ballast covered concrete deck. The substructure consists of concrete stub abutments and concrete wall piers.

Under Alternative 2 or 3, the 40-foot existing center span and end span configuration would not accommodate the proposed roadway safety and capacity improvements with bikeways and sidewalks. Therefore, railroad alternatives to accommodate the replacement of the existing bridge were developed and evaluated as part of a build alternative. The railroad structure in all the alternatives would accommodate a four-lane principal arterial typical section, regardless of which roadway alternative is built.

2.5.1 Description of Railroad Alternatives

It has been determined that rerouting train traffic during construction to an alternate route is not practical; therefore, either a temporary bridge and temporary alignment or a permanent offset alignment would be required. The existing BNSF right-of-way is 100 feet wide with the existing track centered in the railroad right-of-way. The alternatives evaluated are shown in **Figure 2-1**. Coordination with BNSF has occurred to ensure that the alternatives are acceptable. Coordination has also occurred with Regional Transportation District's (RTD's) US 36 EIS project team, which, at the time this report was written, is analyzing the BNSF rail corridor as a commuter rail corridor. The railroad alternatives considered in this EA do not preclude the build options in the US 36 EIS. The following is a description of railroad alternatives evaluated:

Figure 2-1
Railroad Alternatives



- **Railroad Alternative 1: No-Action:** The No-Action Alternative assumed no improvements are made and the existing bridge would remain in place.
- **Railroad Alternative 2: Rebuild on Existing Alignment:** This alternative would require the construction of a temporary bridge and temporary alignment offset 25 feet to the east of the existing alignment. This temporary alignment would be required so that the new, longer bridge over SH 7 could be constructed in the existing bridge location while train operations continue on the temporary alignment. The temporary offset alignment would be approximately 4,000 feet in total length. The ultimate railroad alignment would follow the existing railroad

alignment. The temporary railroad alignment and temporary bridge would be removed once the new railroad facilities are completed.

For this alternative, a temporary pipe or bridge to carry the temporary railroad alignment over the Cottonwood Ditch # 2 would also be required. This temporary pipe or bridge would be removed following the need for the temporary alignment.

- **Railroad Alternative 3: Realign Tracks East:** This alternative would require the construction of a permanent alignment offset 25 feet to the east of the existing alignment. This permanent alignment would include a longer bridge over SH 7 to accommodate the widening of the highway. The vertical alignment of this alternative would match the existing vertical alignment. SH 7 is on a downgrade to the east; therefore, offsetting the railroad alignment to the east would result in the roadway not requiring further lowering to achieve clearance under the ultimate railroad bridge. The offset alignment would be approximately 4,000 feet in total length. The existing railroad alignment would be used for train traffic while the new alignment and bridge are constructed.

For this alternative, a permanent pipe or bridge to carry the railroad alignment over the Cottonwood Ditch would be required.

- **Railroad Alternative 4: Realign Tracks West:** This alternative would require the construction of a permanent alignment offset 25 feet to the west of the existing alignment. This permanent alignment would include a longer bridge over SH 7 to accommodate the widening of the highway. The vertical alignment of this alternative would match the existing vertical alignment. SH 7 is on a downgrade to the east; therefore, offsetting the railroad alignment to the west would result in the roadway requiring further lowering to achieve clearance under the ultimate railroad bridge. The offset alignment would be approximately 4,000 feet in total length. The existing railroad alignment would be used for train traffic while the new alignment and bridge are constructed.

For this alternative, a permanent pipe or bridge to carry railroad alignment over the Cottonwood Ditch would be required, and approximately 100 feet of the Cottonwood Ditch would have to be realigned or placed in a pipe.

2.5.2 Railroad Alternative Evaluation

The Alternatives Evaluation assessed the four railroad alternatives against parameters including community, environmental, and construction issues. The project team developed evaluation parameters. The railroad evaluation matrix is shown in **Table 2-1**.

Both Alternative 3 and 4 result in an offset alignment for the ultimate configuration of the railroad alignment resulting in greater impacts to the Colorado and Southern Railway and to the Cottonwood Ditch, both historic and 4(f) resources, than Alternative 2. In order to minimize impact to these historic and 4(f) resources, Railroad Alternative 2, Rebuild on Existing Alignment, was identified as the preferred railroad alternative.

**Table 2-1
Railroad Evaluation Matrix**

Issues	Railroad Alternatives			
	Alt. 1	Alt. 2	Alt. 3	Alt. 4
	No Action	Re-build on Existing Alignment	Realign Tracks East	Realign Tracks West
Community Issues				
Right-of-Way Impacts	●	●	◐	◑
Compatible with RTD and US 36 EIS	○	●	●	◑
Environmental Issues				
Wetlands	●	◐	◐	◑
Noise	◐	◐	◐	◑
Historic Resources	●	◐	◐	◑
Section 4(f)	●	◐	◐	◑
Endangered Species	●	◐	◐	◑
Wildlife	●	◐	◐	◑
Construction Issues				
Cost	\$0 M ●	\$2.8 M ◐	\$2.1 M ◐	\$2.1 M ◑
Constructability	●	◐	◐	◑
RELATIVE IMPACT SCALE BEST ● ◐ ◑ ○ WORST				

2.6 Short-Listed Alternatives Evaluation

Based on the preliminary screening of alternatives, feedback from the general public and public agencies, and refinement by the project team, the evaluation criteria were further refined for the screening of short-listed alternatives. The short-listed alternatives evaluation matrix is presented in **Table 2-2**.

As a result of the alternative evaluation and refinement process, the No-Action and Alternative 2 were advanced for further analysis in this EA. Additionally, rebuilding the railroad on the existing alignment (Railroad Alternative 2) was analyzed

**Table 2-2
Final Evaluation Matrix**

Issues	Improvement Alternatives		
	Alt. 1	Alt. 2	Alt. 3
	No Action	Four-Lane Urban with Transit Lanes West of 63rd, 4-Lane Urban to Votec, 2-Lane Rural to 75th Improvements	Four-Lane Section with Transit Lanes West of 63rd, Urban West of Westview, Rural East of Westview.
Transportation Issues			
Traffic Operations (AM Peak / PM Peak) 63rd Intersection (Signalized Intersection-LOS) BVSD Intersection (Signalized Intersection-LOS) Road Segment BVSD to 75th (LOS) Travel Time 75th to Cherryvale	E / D D / D E / E 8 min.	B / B B / B E / E 5 min.	B / B B / B C / C 5 min.
Safety	Substandard Shoulders, Sight Distance, Acceleration and Deceleration lanes	Improved Geometry, Sight Distance and Access Management	Improved Geometry, Sight Distance and Access Management
Pedestrian and Bicycle Enhancements	None	Add Sidewalks Add Bike Lanes Yes	Add Sidewalks Add Bike Lanes Yes
Transit Enhancements	No	Improved Stops and Accessibility, Bus Priority Features Incorporated	Improved Stops and Accessibility, Bus Priority Features Incorporated
Community Issues			
Owner / Business Relocations	0 Residential 0 Business	1 Residential Mobile Home 3 Business	1 Residential Mobile Home 3 Business
Right-of-Way Impacts	0 Buildings 0 Parcels	4 Buildings 27 Parcels	4 Buildings 29 Parcels
Impact to Low Income or Minority Populations	None	One mobile home taken, some loss to community property, and change in access to property	One mobile home taken, some loss to community property, and change in access to property
Access from Adjacent Properties	Poor	Good All Warranted Auxiliary Lanes Incorporated	Good All Warranted Auxiliary Lanes Incorporated
Compatible with Local Planning (RTTF and East Arapahoe Transportation Network Plan)	No	Yes	Partial
Compatible with Regional Planning (DRCOG)	No	Yes	Partial
Public Support	Generally Unsupported	Generally Favored Over No Action	Generally Preferred
Environmental Issues			
Wetlands	0 Acres	0.013 Acres Jurisd. 0.308 Acres Non-Jurisd.	0.013 Acres Jurisd. 0.308 Acres Non-Jurisd.
Noise	0 Receptors Impacted	2 Receptors Impacted	2 Receptors Impacted
Air Quality	No Improvement	Some Improvement	Some Improvement
Historic Resources	0 Properties Adversely Impacted	2 Properties Adversely Impacted	2 Properties Adversely Impacted
Section 4 (f)	0 Properties Adversely Impacted	2 Properties Adversely Impacted	2 Properties Adversely Impacted
Endangered Species	None	None	None
Wildlife	None	Minimal	Minimal
Visual Impacts	None	Potential 20' Walls Over Hill or Slope Impacts w/Removal of Trees 60' Pvmnt. Width Over Hill	Potential 23' Walls Over Hill or Slope Impacts w/Removal of Trees 84' Pvmnt. Width Over Hill
Implementation Issues			
Cost	\$0 M	\$22.6 M*	\$23.8 M*
Maintenance	Poor	Good	Good
Ease of Construction	No Construction	Constructable	Constructable
Overall Rating		Preferred	Good

* Preliminary Estimates (For Comparative Purposes)

(Includes Preferred BNSF RR Alternative 2)

in detail as part of the roadway build alternative.

Both short-listed alternatives address the purpose and need and result in similar projected traffic operations. Although Alternative 3 results in slightly better LOS for the road segment over the Hoover Hill (between Westview Drive and the BNSF RR overpass), the travel times for both alternatives are anticipated to be almost identical. Acknowledging that both build alternatives are relatively similar in terms of addressing the purpose and need, Alternative 2 was identified as the Preferred Alternative based upon the following differentiators from Alternative 3:

- Less Right of Way Required
- Less Vegetation Impact in Vicinity of Hoover Hill (Legion Park and Boulder Open Space)
- Less Impervious Surface Area Resulting in Less Water Quality Impact and Reduced Need for Mitigation
- Less Temporary Grading Impact to Legion Park
- Less Visual Impact Due to Narrower Roadway Section Over Hoover Hill
- Less Prime Farmland Impact
- Lower Construction Cost
- Higher Agency Support Due to Consistency with Prior Local Planning

CDOT is committed to coordinating directly with the local public agencies to develop a consensus on the specific phasing of improvements identified in the Preferred Alternative and to develop the anticipated schedule and operational thresholds that will precipitate the completion of the phases of improvements. This approach will leave options open for decision makers to address specific operational issues in a phased manner. Initial phases of construction will be designed to accommodate major investments in bridge and retaining wall structures and ultimate right-of-way needs in consideration toward the full completion of the Preferred Alternative.

2.7 Alternatives Advanced

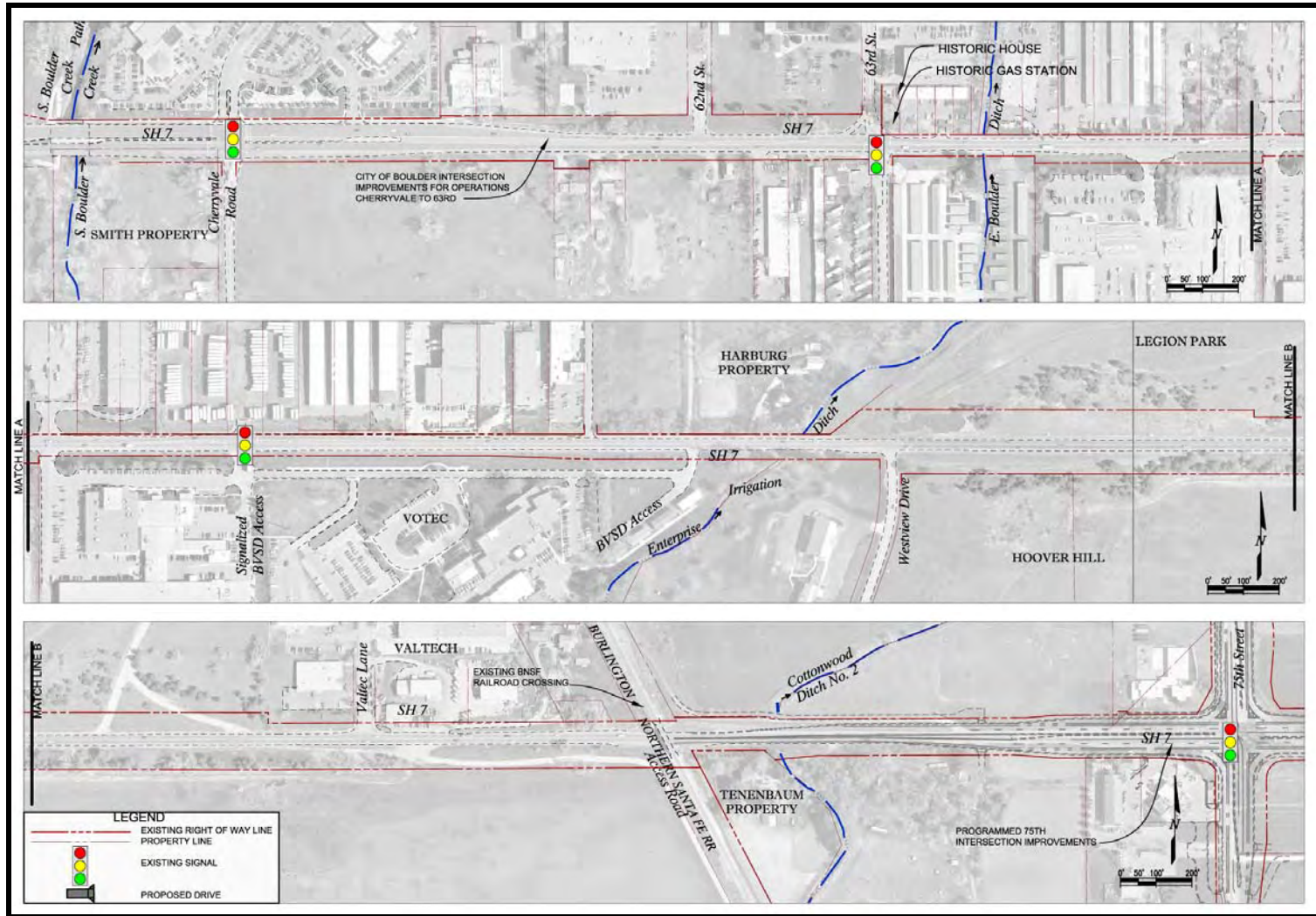
The alternatives described in this section were developed to a conceptual level only. Specific details may change during the final design process. The No-Action Alternative and the Preferred Alternative are described in this section and are fully evaluated in Chapter 3 of this EA.

2.7.1 No-Action Alternative

The No-Action Alternative (shown in **Figure 2-2**) would include no transportation improvements but does account for the recently completed SH 7 and 75th intersection improvements. This intersection project includes four through lanes of traffic along SH 7 with on-street bike lanes and sidewalks. The build alternative would tie to the western extents of the intersection project.

In addition, the City of Boulder has funding for intersection improvements for transit operations along SH 7 from Cherryvale Road to east of 63rd Street. These improvements include queue jump lanes, sidewalks and connections to transit stops.

Figure 2-2
No-Action Alternative – Plan View



The RTD and the U.S. Army Corps of Engineers have initiated a NEPA study along the BNSF corridor. As part of this study, improvements, including commuter rail, are being considered along the existing BNSF railroad corridor that crosses SH 7. In addition to possible commuter rail service, a potential park-n-Ride is being considered in the vicinity of the SH 7 and 63rd Street intersection.

There is no cost beyond routine maintenance associated with the No-Action Alternative.

2.7.2 Preferred Alternative

A preliminary Preferred Alternative has been designated in this document. No decision has been made, however, and no decision will be made until full public and agency review of this document has occurred. A plan view of the Preferred Alternative is shown in **Figure 2-3**.

2.7.2.1 Typical Section

The typical sections for the Preferred Alternative are shown in **Figure 2-4** and **Figure 2-5**. The Preferred Alternative has two through lanes in each direction from Cherryvale Road to the BVSD entrance. At Cherryvale Road, curb and gutter is added to the existing right-turn deceleration lane for eastbound traffic. At 63rd Street, in the westbound direction, there is a continuous right-turn acceleration/deceleration lane that also functions as a bus bypass lane from east of 63rd Street to Cherryvale Road. In the eastbound direction, there is a continuous right-turn acceleration/deceleration lane between the business access west of the BVSD to east of the BVSD signal. From the BVSD signal to Westview Drive there is one through lane westbound and two through lanes eastbound. The second eastbound through lane is dropped as a right-turn lane at Westview Drive. There is a right-turn lane in the westbound direction at Valtec Lane.

The two-lane section (one lane in each direction) continues past the BNSF railroad overpass where the roadway section widens to two lanes in each direction at the 75th Street intersection improvements.

The roadway is an urban section with curb and gutter between Cherryvale Road and Westview Drive. Between Westview Drive and the BNSF railroad overpass, the Preferred Alternative is a rural section with ten-foot shoulders. Between the railroad overpass and 75th Street, SH 7 is an urban section with curb and gutter.

The Preferred Alternative features a raised median with left-turn lanes between Cherryvale Road and 63rd Street. East of 63rd Street to the 75th Street improvements is a continuous sixteen-foot two-way left-turn lane.

Figure 2-3
Preferred Alternative – Plan View

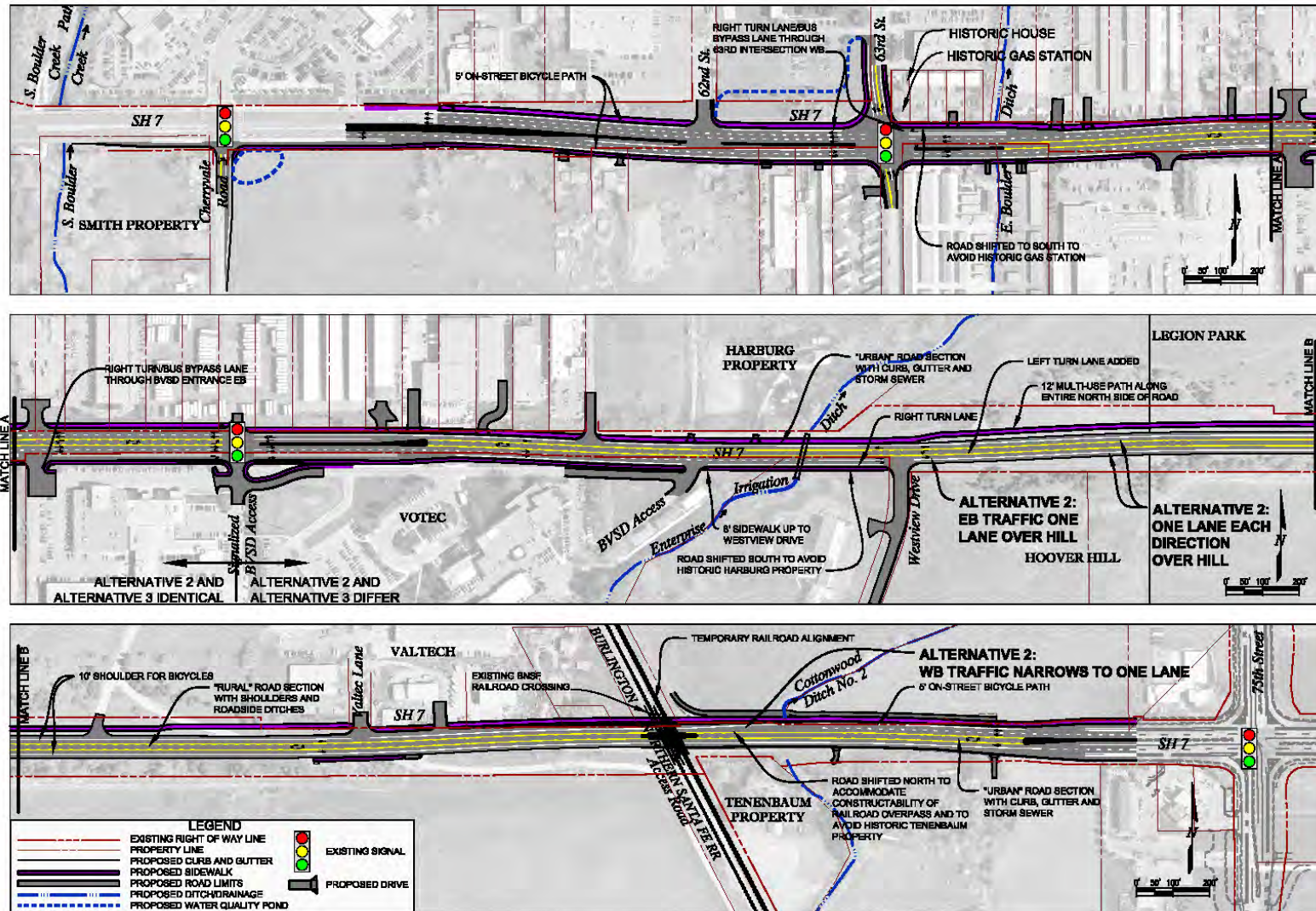


Figure 2-4
Preferred Alternative Typical Sections

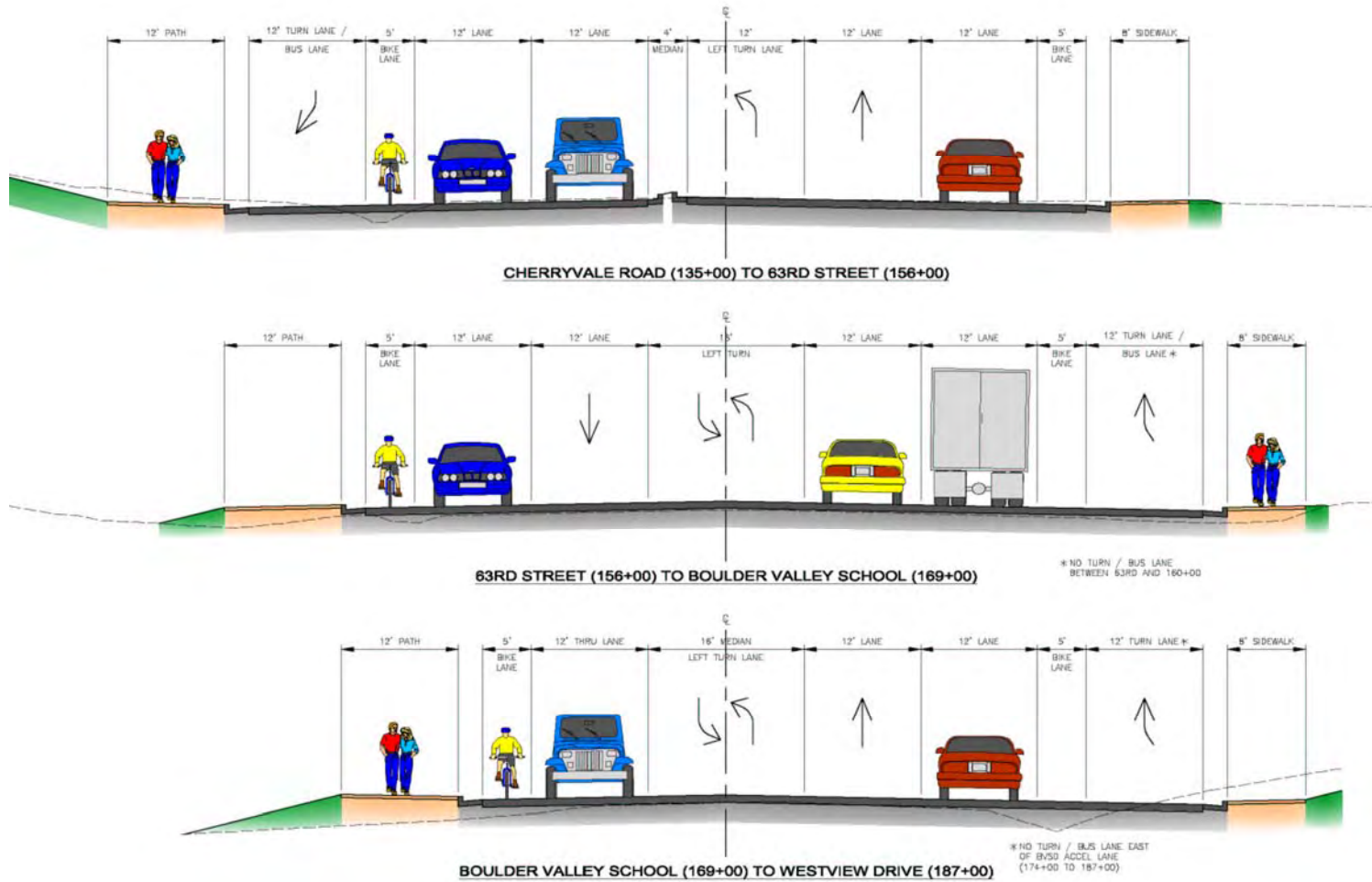
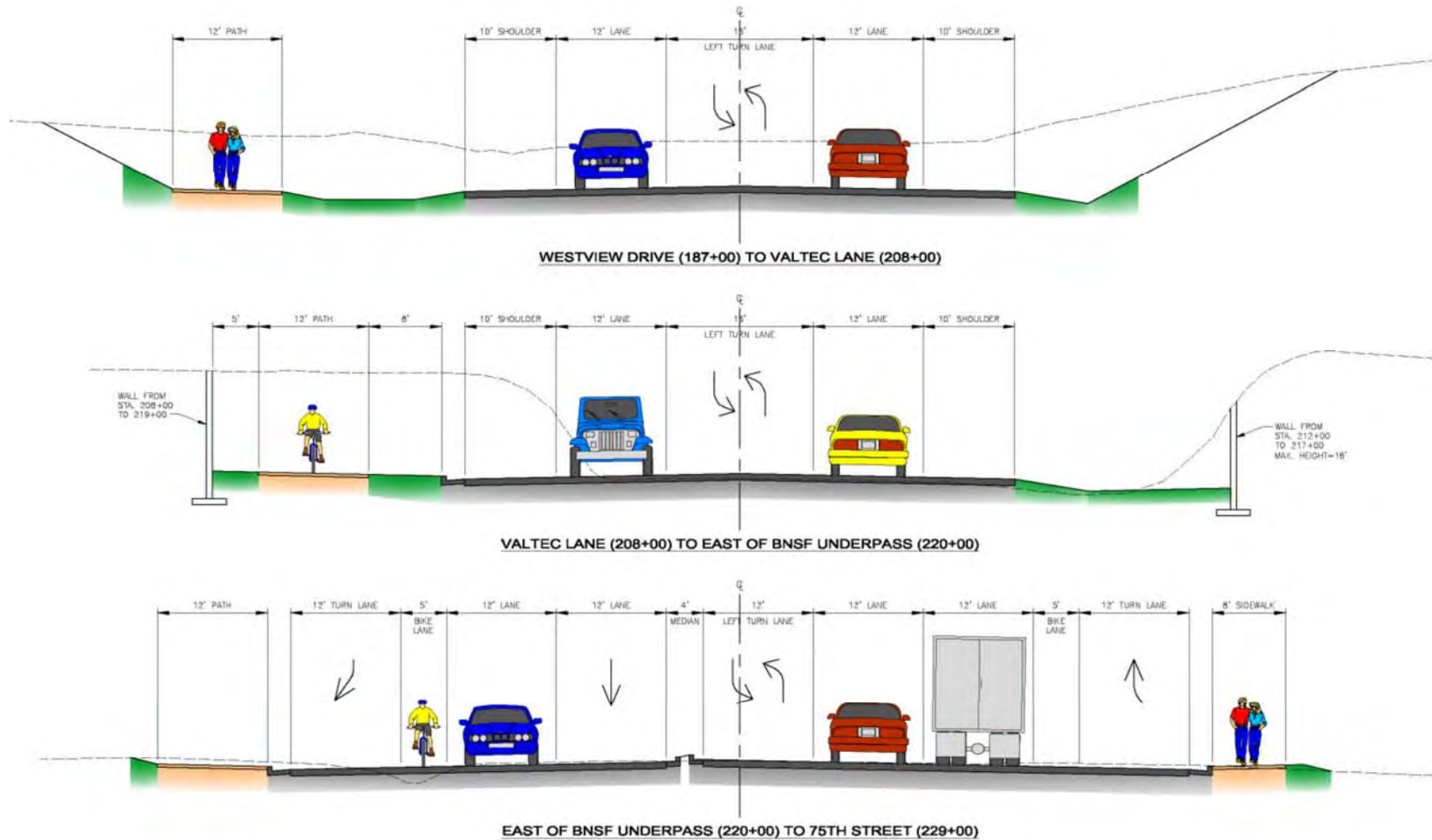


Figure 2-5
Preferred Alternative Typical Sections



2.7.2.2 Pedestrian/Bicycle Facilities

The Preferred Alternative includes bicycle lanes and shoulders along the entire length. The roadway section includes a five-foot bicycle lane in each direction in the urban sections, adjacent to the curb and gutter. Bicycle lanes would extend through intersections as exclusive lanes. In the rural section, the ten-foot shoulder would also function as a bicycle lane. Flattening the side slopes adjacent to the paved roadway and removing obstructions would provide a safer roadside by providing an unobstructed uniform clear zone adjacent to the roadway.

A continuous twelve-foot multi-use path on the north side of SH 7 is intended for both pedestrian and bicycle traffic. An eight-foot sidewalk is incorporated along the south side of SH 7 between Cherryvale Road and Westview Drive. Pedestrian and handicap access to transit facilities would be provided at intersections with 63rd Street, the BVSD access and at Valtec Lane. Handicap ramps would be provided at all intersections. Traffic signals would be enhanced to include pedestrian phases.

2.7.2.3 Alignment

The horizontal alignment is shifted from the existing roadway centerline and section line to avoid the NRHP-eligible properties along the corridor. The proposed roadway centerline is shifted 37 feet south of the existing centerline adjacent to the historic gas station on the northeast corner of the 63rd Street intersection. The alignment is also shifted 29.5 feet south adjacent to the Harburg property. Finally, the roadway centerline is shifted 24.5 feet north adjacent to the Tenenbaum property and Cottonwood Ditch.

The vertical alignment would generally follow the existing alignment. The exception is at the existing hill east of Westview Drive. To achieve a design speed of 55 mph and provide the required minimum stopping sight distance between Westview Drive and 75th Street, the existing hill east of Westview Drive would be lowered approximately 13 feet. The alignment is also slightly lowered below the BNSF railroad bridge to obtain the 16'-6" required clearance.

2.7.2.4 Access Management

All state highways in Colorado are limited access highways. CDOT is authorized to regulate vehicular access to or from any state highway under its jurisdiction from or to property adjoining that highway to protect the public health, safety and welfare; to maintain smooth traffic flow, to maintain highway right-of-way drainage; and to protect the functional level of the highway. Because of the high volume of traffic and in order to maintain the safe operation of traffic at intersections and in the vicinity of intersections, access control has been incorporated into portions of the Preferred Alternative. From Cherryvale Road, through the 63rd Street intersection, auxiliary lane

delineation and required intersection storage lengths create the need to control mid-block access.

In most cases, access locations and configurations are perpetuated along the corridor. In a few locations, for safety reasons, access control is incorporated into the Preferred Alternative. Access control includes restricting left-in and left-out maneuvers through the use of raised medians at the following locations:

- South Side SH 7
 - 6160 (Cherryvale Commons) 6180 (Cherryvale Commons)
 - 6234 (Cherryvale Commons) 6270 (5 String Partnership)
 - 6254 (William Robert Eason) 6338 (Securcare Boulder Group)

- North Side SH 7
 - 6123 (White Wave) 6301 (A. B. Tuorah)
 - 6325-6333 (David Salzman)

In addition, the access just east of Valtec Lane, which currently accesses SH 7 along the entire property frontage, would be consolidated to one access point to improve the safety of the intersection.

Auxiliary lanes, where warranted by the CDOT *State Highway Access Code*, have been incorporated into the design.

2.7.2.5 Railroad

For the Preferred Alternative, reconstruction of the BNSF railroad bridge is required. Railroad Alternative 2, which reconstructs the railroad bridge over SH 7 along the existing railroad alignment, is the preferred alternative. It has been determined that rerouting rail traffic is not practical, so a temporary bridge and offset rail alignment 25 feet east of the current location is required. The existing vertical alignment includes positive grades that are near the maximum allowed for the current track design speed of 30 mph. Therefore, the temporary vertical alignment of the offset alignment would be essentially the same as the existing alignment. The temporary alignment would require a temporary bridge or culvert for the Cottonwood Ditch #2 crossing. It is anticipated that the temporary embankment and track would be contained within the existing 100-foot-wide BNSF right-of-way limits.

The typical section for the new bridge accommodates a single track with walkways and handrails provided on both sides in accordance with BNSF design criteria. It is anticipated that an I-girder bridge with a center pier would be utilized. The bridge would require a total superstructure depth of approximately five feet. The bridge would consist of two 59-foot spans. SH 7 is realigned to the north in this location;

therefore, the center railroad bridge pier can be constructed while still maintaining two lanes of traffic. The vertical alignment for SH 7 is lowered to provide 16'-6" of clearance with the new railroad bridge. Retaining wall abutments are required to minimize impacts to existing residences, businesses, frontage roads, and adjacent City of Boulder Open Space.

2.7.2.6 Cost

Construction costs were identified for the Preferred Alternative based on an initial opinion of probable construction costs, including contingencies, right-of-way (not including structures) design and construction engineering. The total conceptual-level estimated cost for the Preferred Alternative is approximately \$23 million.

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