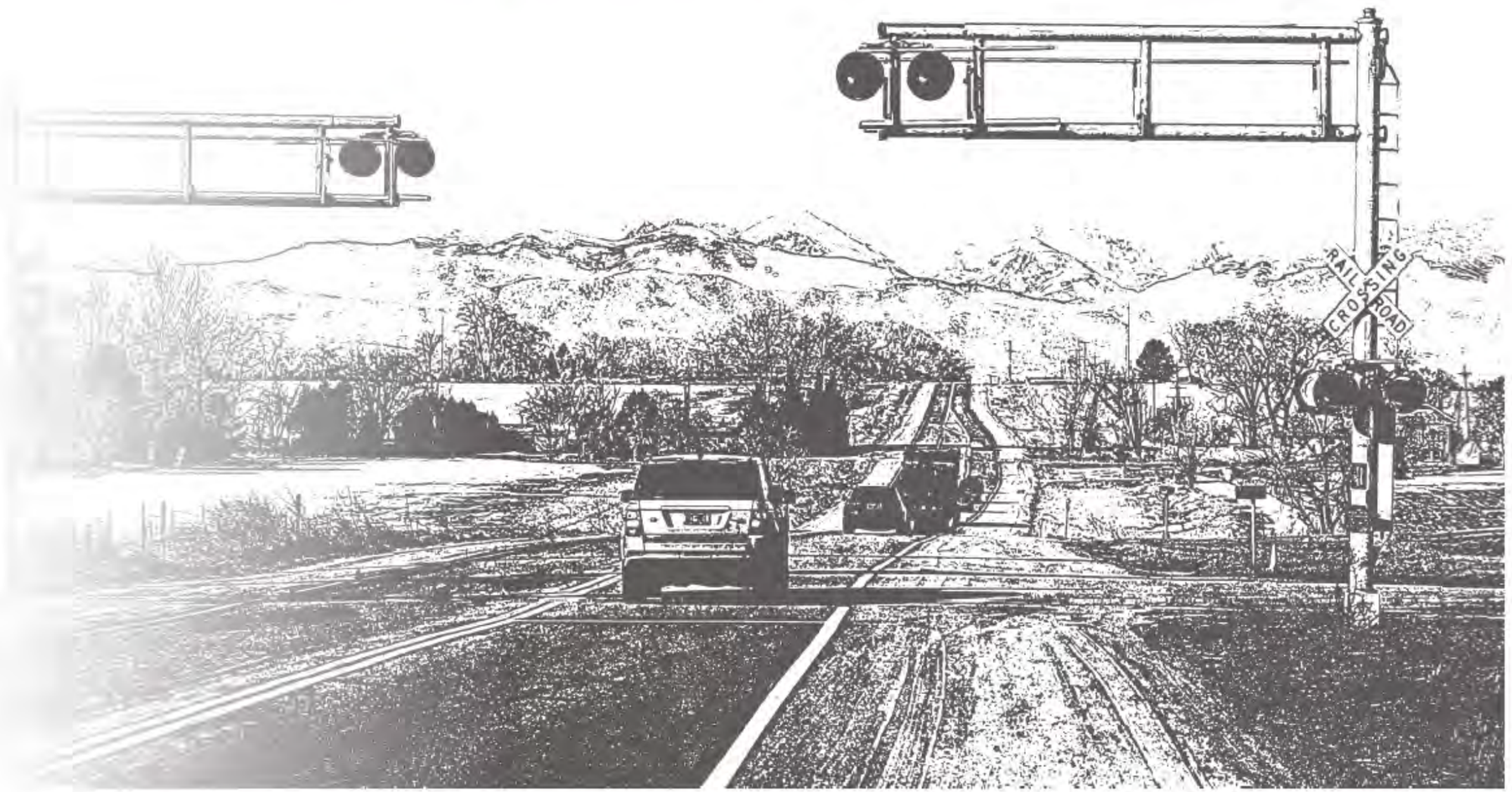
SH 66 Planning and Environmental Linkages Study | Report

March 2020



COLORADO
Department of Transportation

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State Highway 66 Planning and Environmental Linkages Study Report

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FHU Reference No. 115255-01
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SH 66 Planning and Environmental Linkages Study

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List of Abbreviations and Acronyms

ACP	Access Control Plan
ARWAS	access road with advisory shoulders
AST	above ground storage tank
BRT	bus rapid transit
CAP-X	Capacity Analysis for Planning of Junctions
CatEx	Categorical Exclusion
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CPW	Colorado Parks and Wildlife
CV/AV	connected vehicle and automated vehicle
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EC	Executive Committee
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
IGA	intergovernmental agreement
LOS	level of service
LUST	leaking underground storage tank
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PEL	Planning and Environmental Linkages
RIRO	right in/right out
ROW	right of way
RTD	Regional Transportation District
SEMS	Superfund Enterprise Management System
SH 66	State Highway 66
SHPO	State Historic Preservation Office
SPUI	single point urban interchange
TAC	Technical Advisory Committee
TAZ	traffic analysis zone
T&E	threatened and endangered
TIP	Transportation Improvement Program
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
UST	underground storage tank
WCR	Weld County Road

SH 66 Planning and Environmental Linkages Study

Instructions for Reviewing This PEL Report

This Planning and Environmental Linkages (PEL) Report was completed with the goal of highlighting key information in a concise and useful manner. As such, this report follows a planning document format. Each section includes key background and findings from the State Highway 66 (SH 66) PEL process. The appendices include detailed content for further examination. Some graphical icons are included to show a preview of the respective appendix.

Study Report Summary and PEL Questionnaire Highlights

Federal Highway Administration (FHWA) developed a PEL questionnaire, which is intended to summarize the planning process and ease the transition from this planning study to National Environmental Policy Act (NEPA) analysis. This questionnaire is consistent with 23 Code of Federal Regulations (CFR) 450 (planning regulations) and other FHWA policy on the PEL process. The Colorado Department of Transportation (CDOT) has incorporated key components of the PEL questionnaire as an introductory summary of the SH 66 PEL. The complete questionnaire is available in **Appendix B**.

SH 66 PEL Background

- What is the name of the PEL document and other identifying project information?
  - SH 66 Planning and Environmental Linkages Study Report
  - CDOT Project No: STA 0661-014
  - CDOT Project Code: 21003
- Who is the lead agency for the study?
  - CDOT
- Who was the sponsor of the PEL study?
  - CDOT, with funding support from Denver Regional Council of Governments (DRCOG)
- Provide a description of the existing transportation corridor (**Chapter 1**):
  - **Project limits** – McConnell Drive in Lyons to Weld County Road (WCR) 19
  - **Length of study corridor** – 20 miles
  - **Modes** – Includes vehicular, bicycle, pedestrian, bus transit, and freight rail facilities
  - **# Lanes** – Generally two lanes (undeveloped areas); four to five lanes near Interstate 25 (I-25), United States Highway 287 (US 287), and United States Highway 36 (US 36)
  - **Shoulders** – Widths vary widely; depending on classification, between 4 to 12 feet.
  - **Access control** – Not currently a limited access highway. Includes many uncontrolled accesses. An Access Control Plan (ACP) has been developed in parallel with this PEL study.
  - **Surrounding environment** – Includes a mix of suburban development and open space in Boulder County (western limits) and a mix of suburban development and agricultural uses in Weld County (eastern limits).

SH 66 PEL Process Overview

- Did the Study follow the FHWA PEL Process?
  - Yes, this PEL study followed FHWA's process, according to *CDOT's PEL Handbook* (2016).
- Provide a brief chronology of the planning activities (PEL study) including the year(s) the studies were conducted.
  - Study began – October 2016
  - Purpose and Need – January 2017 through September 2017
  - Public Open House Series #1 – April 2017
  - Final Corridor Conditions Report – September 2017
  - Developed Risk and Resiliency (R&R) PEL Process – August 2017 through July 2018
  - Public Open House Series #2 – April 2019
  - Draft Access Control Plan (ACP) Public Open House – July 2019
  - Public Open House Series #3 – September 2019
  - Alternatives Development and Screening complete – September 2019
  - Draft PEL and ACP Reports available – October 2019
  - Final ACP Report available – November 2019
  - Final PEL Report available – November 2019
  - Study concluded – November 2019
- What was the scope of the PEL study and the reason for doing it (**Chapter 1**)?
  - To address and prioritize safety, mobility, and access needs
  - To promote efficient and cost-effective solutions and reduce delays in project implementation
  - To understand community context, where sensitive environmental resources are located, and how to make SH 66 more resilient
- What types of alternatives were evaluated during the SH 66 PEL (**Chapter 2**)?
  - Roadway options that would improve safety, mobility, and access, such as highway classification and capacity and intersection improvements
  - Bicycle, pedestrian, and transit options that would improve safety and mobility
- Which alternatives were recommended (**Chapter 3**)?
  - This report summarizes and prioritizes safety, mobility, and access options carried forward to establish a right of way (ROW) preservation footprint.
  - The ROW preservation footprint is considered the collective footprint of all PEL proposed options that are recommended to be carried forward.
  - This footprint is intended to inform decision-making at the state and local levels in terms of preserving land and making decisions that do not preclude future transportation improvements identified in this PEL study.
- What are the environmental issues that need to be considered during NEPA (**Chapter 4**)?
  - **Likely resources:** Floodplains and floodways; wetlands and other waters of the US; threatened and endangered (T&E) species, species of special concern, migratory birds and Eagles; park/trail/open space resources and wildlife/waterfowl refuges; utilities; traffic noise; hazardous materials; environmental justice; visual resources; and historic resources
  - **Other possibilities:** Paleontology, archaeology, farmlands, and air quality

SH 66 Study Team

- Who was included on the study team?
  - **FHWA**: Tricia Sergeson *(Transportation Specialist)*; Brian Dobling *(Region 4 (R4) Area Engineer/ROW Program Manager)*
  - **CDOT Project Management Team (PMT)**: James Zufall *(Project Manager)*; Abra Geissler and Brian Varrella *(Resident Engineers)*; Jim Eussen *(R4 Planning and Environmental Manager)*; Karen Schneiders *(Local Agency Environmental and Planning Manager)*; Lindsay Edgar and Sean Brewer *(Statewide PEL Managers)*; Tim Bilobran *(R4 Permits Manager)*
  - **Consultant Team**: Felsburg Holt & Ullevig (FHU), Atkins, Goodbee & Associates, and All Traffic Data
  - **Technical Advisory Committee (TAC)**: CDOT PMT Members; FHWA; Joe Kubala (Town of Lyons); Paul Glasgow (Town of Lyons); George Gerstle (Boulder County); Jeffery Maxwell (Boulder County); Scott McCarey (Boulder County); Phil Greenwald (City of Longmont); Tyler Stamey (City of Longmont); Jim Angstadt (City of Longmont); Jim Flesher (Weld County); Dawn Anderson (Weld County); Everett Bacon (Weld County); Helen Migchelbrink (Town of Mead); Erika Rasmussen (Town of Mead); Dawn Adams (Town of Mead); Chris Kennedy (Town of Mead); Julie Pasillas (City of Firestone); David Lindsay (City of Firestone); Paula Mehle (City of Firestone); Steve Cook (DRCOG); Nataly Handlos (RTD); Consultant Team.
  - **Executive Committee (EC)**: CDOT PMT Members; FHWA; Heather Paddock (CDOT R4); Johnny Olson (CDOT R4); Keith Sheaffer (CDOT R4); Connie Sullivan (Town of Lyons); Victoria Simonsen (Town of Lyons); Deb Gardner (Boulder County); Jeff Moore and Tim Waters (City of Longmont); Scott James (Weld County); Elizabeth Relford (Weld County); Julie Cozad (Weld County); George Heath (Town of Firestone); Colleen Whitlow (Town of Mead); Judy Lubow (RTD); Consultant Team.
- How did the Study meet each of the PEL Coordination Points identified in 23 USC 168?
  - FHWA points are summarized below.
    - March 16, 2017 – **Coordination Point # 1:** Reason for the Study and Desired Outcomes Meeting
    - June 19, 2017 – **Coordination Point # 2**: Purpose and Need, Goals and Objectives plus Corridor Conditions Report approval by email
    - December 12, 2018 – **Coordination Point #3**: Alternatives Development and Screening Review email coordination from FHWA for Level 2/Level 3
    - May 30, 2019 – **Coordination Points #3 and #4**: Alternatives Development and Screening Outcomes and PEL Documentation Next Steps Meeting
    - July 26, 2019, and August 16, 2019 – **Coordination Points #3 and #4**: Alternatives Development and Screening Outcomes and PEL Documentation Next Steps Correspondence by email
  - Further FHWA and agency coordination details are included in **Chapter 6 and Appendix B**.

1. Introduction, Purpose, and Need

CDOT has conducted a PEL study and has developed an ACP for SH 66.

What is a PEL study?

PEL studies represent an approach to transportation decision-making that considers environmental, community, and economic goals during early planning stages. PELs minimize duplication of effort, promote cost-effective solutions, encourage environmental stewardship, and reduce project implementation delays.

What is an ACP?

In parallel with the PEL and using consistent study limits, CDOT developed a SH 66 ACP (**Chapter 2**) to identify location, type, and basic design elements of future access points. Without better access control, the number of conflicts, amount of delay, and level of congestion would increase on SH 66.

SH 66 PEL Study Outcomes

- Identifies a strategic vision and purpose for SH 66 that addresses safety, mobility, and access needs
- Accounts for environmental resources, community context, and risk/resiliency
- Details the alternatives development and screening process
- Identifies and prioritizes short-term and long-term improvements developed through a collaborative stakeholder and public process

Supporting Documentation

- **Appendix A** FHWA Acceptance Letter: Obtained to document FHWA's involvement and acceptance of the PEL study
- **Appendix B** FHWA PEL Questionnaire: Consistent with 23 CFR 450 and FHWA policies, serves as a guide for conducting a PEL study, and summarizes the process
- **Appendix C** Corridor Conditions Report: Documents current and anticipated future corridor conditions regarding planning and land use, the transportation system, and environmental resources; served as the basis for developing and evaluating possible transportation improvements in the corridor; involved agency coordination at the local, state, regional, and federal levels

Other appendices are available and will be referenced in subsequent sections.

SH 66 Study Location

- Situated north of the Denver metropolitan area (**Figure 1**)
- Includes approximately 20 miles (**Figure 2**) of SH 66 between US 36 in the Town of Lyons and Weld County Road (WCR) 19 in unincorporated Weld County. Also includes US 36/McConnell Drive to US 36/SH 66.
- Intersects US 36, US 287, and I-25

Figure 1. Study Corridor Location

What is a purpose and need?

According to FHWA, a study's "purpose and need" provides justification for the project and drives the development and screening of alternatives. CDOT and the PEL Study Team worked in collaboration with FHWA and corridor stakeholders (**Chapter 6**) to establish a purpose and need for guiding the SH 66 PEL process. **Appendix D** includes detailed purpose and need documentation for the SH 66 PEL study.

How is purpose and need different from goals and objectives?

Goals and objectives carry less emphasis in a PEL, but they serve as differentiators during alternative screening when purpose and need considerations do not distinguish an alternative. They also help define context sensitivity. **Appendix D** highlights CDOT's goals and objectives for the SH 66 PEL study.

SH 66 PEL Purpose Statement

SH 66 transportation improvements are to increase safety; reduce traffic congestion; provide managed access for existing and future development; and improve multi-modal mobility of people, goods, and services. The improvements should be resilient, accommodate developing technologies, and strive to complement adjacent community context.

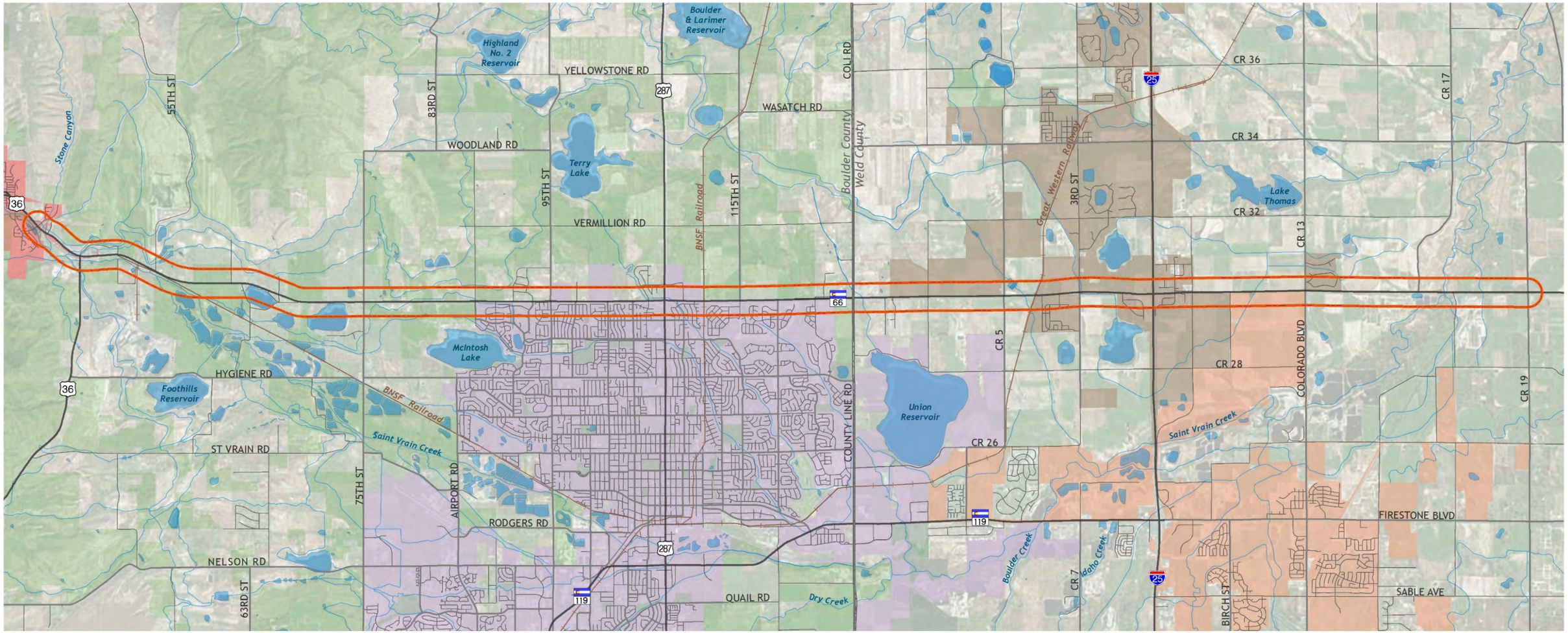
SH 66 PEL Summary of Needs

- **Safety:** The corridor has higher than expected safety concerns.
  - *Vehicular* — Several intersection and mainline locations have a high number of crashes and fatalities.
  - *Bicycle* — Areas in the corridor exhibit bicycle safety concerns.
  - *Pedestrian* — Many pedestrian destinations do not have sidewalk connections.
- **Mobility**: The movement of people, goods, and services along the corridor has resulted in mobility challenges that can impede people commuting, recreating, and conducting business along SH 66.
  - *Vehicular* — Traffic congestion, inadequate intersections and highway design, and unreliable travel times currently; conditions are expected to worsen with population and employment growth.
  - *Bicycle* — Heavy SH 66 bicycle use (recreational, commuter, and events); insufficient shoulders; high level of traffic stress for cyclists; insufficient future bicycle connections.
  - *Pedestrian* — Many pedestrian destinations do not have sidewalk connections; no grade-separated pedestrian crossings currently.
  - *Transit* — High vehicle speeds and lack of pedestrian infrastructure for transit stops; Regional Transportation District's (RTD) current service boundaries do not include Weld County; expected increase in future demand.
- **Access:** Operational and safety deficiencies due to a high number of uncontrolled public and private access points with inconsistent spacing; access issues expected to worsen in future as traffic volumes and development increase.

SH 66 PEL Summary of Goals and Objectives

- **Community Context:** Maintain community context (such as rural character) and enhance the community's exposure along the corridor (through gateways)
- **Environment:** Protect and accommodate natural and cultural resources along the corridor (such as floodplains, open space areas) and minimize environmental impacts (e.g., wildlife crossings, traffic noise concerns)
- **Risk and Resiliency:** Understand physical threats (such as natural hazards) and operational threats (unanticipated traffic increases resulting from unplanned land development); collaborate with communities to establish partnerships; and enhance SH 66 as an evacuation route

Figure 2. PEL Study Area



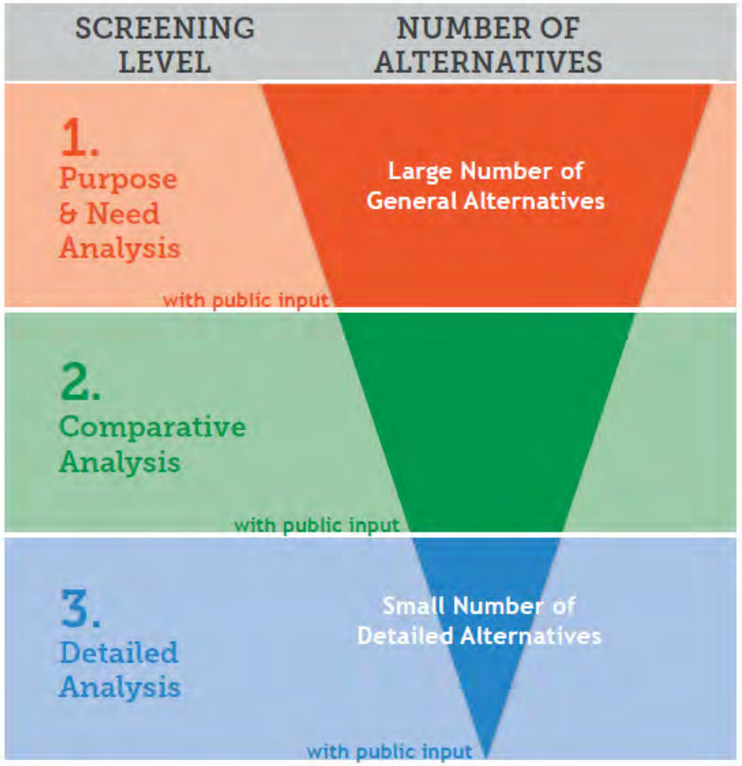
2. Alternatives Development and Screening and ACP Development

Chapter 2 documents methods used to develop and screen alternatives along the SH 66 PEL study corridor. The alternatives produced and evaluated include a wide range of potential solutions encompassing roadways, intersections, access points, bicycle and pedestrian facilities, and transit. Development, screening, and refinement of alternatives focused on identifying alternatives that meet purpose and need for the corridor and that match corridor context.

How were alternatives developed?

Alternatives were produced through a multi-level iterative process. The process began with a large number of alternatives that led to a smaller number of more detailed alternatives, following a focused screening effort (**Figure 3**). Agency coordination and public involvement (**Chapter 6**) played a major role in the alternative development process. **Figure 4** summarizes the alternatives development and screening process for the SH 66 PEL study.

Figure 3. Alternatives Evaluation Process



How were the alternatives screened?

Evaluation criteria were developed for each screening level and were used to assess alternatives relative to the purpose and need. Goals and objectives were considered in the process. Alternatives were evaluated based on whether they met purpose and need and were advanced to subsequent screening levels, as appropriate. The following language was used to document findings:

- **Eliminated:** Removed an alternative from consideration for not meeting purpose and need in the current planning horizon (2020 to 2040); used only during the Level 1 process selectively; and would allow an alternative to be considered again after the 20-year planning horizon ends
- **Not Recommended:** Would allow the alternative to be revisited during NEPA and project development but was not recommended at the current time and was not advanced to subsequent screening levels
- **Carried Forward:** Recommended for further consideration in subsequent screening levels

Alternatives development and screening outcomes were evaluated in substantial detail and documented in color-coded screening matrices (**Appendix E**).

CONCEPTS	SAFETY Does the alternative improve existing and future conditions with respect to: • Vehicle crashes/fatalities • Bicycle accidents and unsafe facilities • Pedestrian safety and missing sidewalks?			MOBILITY Does the alternative improve the current and future ability to move people, goods, and services along and across SH 66 to: • Automobiles • Bicycles • Pedestrians • Transit			ACCESS Does the alternative improve access to decrease congestion in the corridor?	SUMMARY OF RESULTS	JUSTIFICATION/ADDITIONAL COMMENTS
	Vehicle	Bicycle	Pedestrian	Vehicle	Bicycle	Pedestrian			
No Action	No	No	No	No	No	No	No	Retained	Retained to evaluate as baseline condition.
Functional Class									
Freeway (F-W)	Yes	No	No	Yes	No	No	Yes	Retained	Yes for vehicles/No for other modes.
Enhanced Expressway (E-X)	Yes	No	No		Yes		Yes	Retained	Yes for vehicles/No for other modes.
Standard Expressway (R-A or R-B)		No			No		No	Retained	This is No Action for various sections of the corridor.
Enhanced Arterial (NR-A)		No			No		No	Retained	This is No Action for various sections of the corridor.
Arterial Roadway (NR-B)	No	Yes	Yes	No	Yes	Yes	No	Retained	No for vehicles/Yes for other modes.
Main Street (NR-C)	No	Yes	Yes	No	Yes	Yes	No	Retained	No for vehicles/Yes for other modes.
Highway Capacity									
HOV Lanes		No		Yes	No	No	No	Retained	Yes for vehicles/No for other modes.
Toll Lanes		No		Yes	No	No	No	Retained	Yes for vehicles/No for other modes.
HOT Lanes		No		Yes	No	No	No	Retained	Yes for vehicles/No for other modes.
Additional General Purpose Lanes		No		Yes	No	No	No	Retained	Yes for vehicles/No for other modes.
Intersections Modifications									
Close Access		Yes			Yes		Yes	Retained	
Partial Closure		Yes			Yes		Yes	Retained	
Intersection Reconfiguration		Yes			Yes		Yes	Retained	
Turn Lane Additions/Extended Storage	Yes	No	No	Yes	No	No	Yes	Retained	Yes for vehicles/No for other modes.
Signalization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Retained	May increase vehicle accidents due to the addition of a traffic signal. Additional signals may add additional delay and reduce vehicle mobility.
Grade-Separated Crossing (No Access)	Yes	No	No	Yes	No	No	Yes	Retained	May make mobility worse due to the need for out-of-direction travel to reach destinations.
Multi-modal Intersection Improvements	Yes	Yes	Yes	No	Yes	Yes	No	Retained	Some multi-modal intersection improvements can benefit vehicles by helping drivers see and avoid non-vehicular users.
Intersection Capacity Improvements		Yes		Yes	Yes	Yes	Yes	Retained	Some design features could provide safety benefit to all modes of travel. As concepts are developed in this study, intersection capacity improvements will be paired with

Appendix E-1 includes the Level 1 screening table and evaluation criteria, as illustrated in this image

Stakeholder Involvement Overview

- A Technical Advisory Committee (TAC) and an Executive Committee (EC) were formed to maintain stakeholder involvement throughout the PEL study. Heavy stakeholder involvement occurred during alternatives development and screening to ensure needs and concerns of affected agencies and communities would be heard and considered in the process.
  - TAC members, including agency or community planners or engineers, were involved in each level of the evaluation process and during alternatives development, refinement, and screening.
  - EC members, including elected officials and agency or community executive leadership, were involved at key milestones and decision points.
- Alternatives development and screening analysis findings were shared with the public in April and September 2019 during two public open houses, and analysis refinements were made to address public input.

Supporting Documentation

- **Appendix E** Alternative Development and Screening Documentation: Presents technical detail associated with Level 1, Level 2, and Level 3 alternatives development and screening, including evaluation criteria and screening matrices
- **Appendix F** Agency Coordination Summary: Documents the SH 66 PEL process of agency coordination and engagement
- **Appendix G** Public Involvement Summary: Documents the SH 66 PEL process of public outreach and involvement
- **Appendix H** Access Control Plan Documentation: Documents development of ACP and maps ACP recommendations

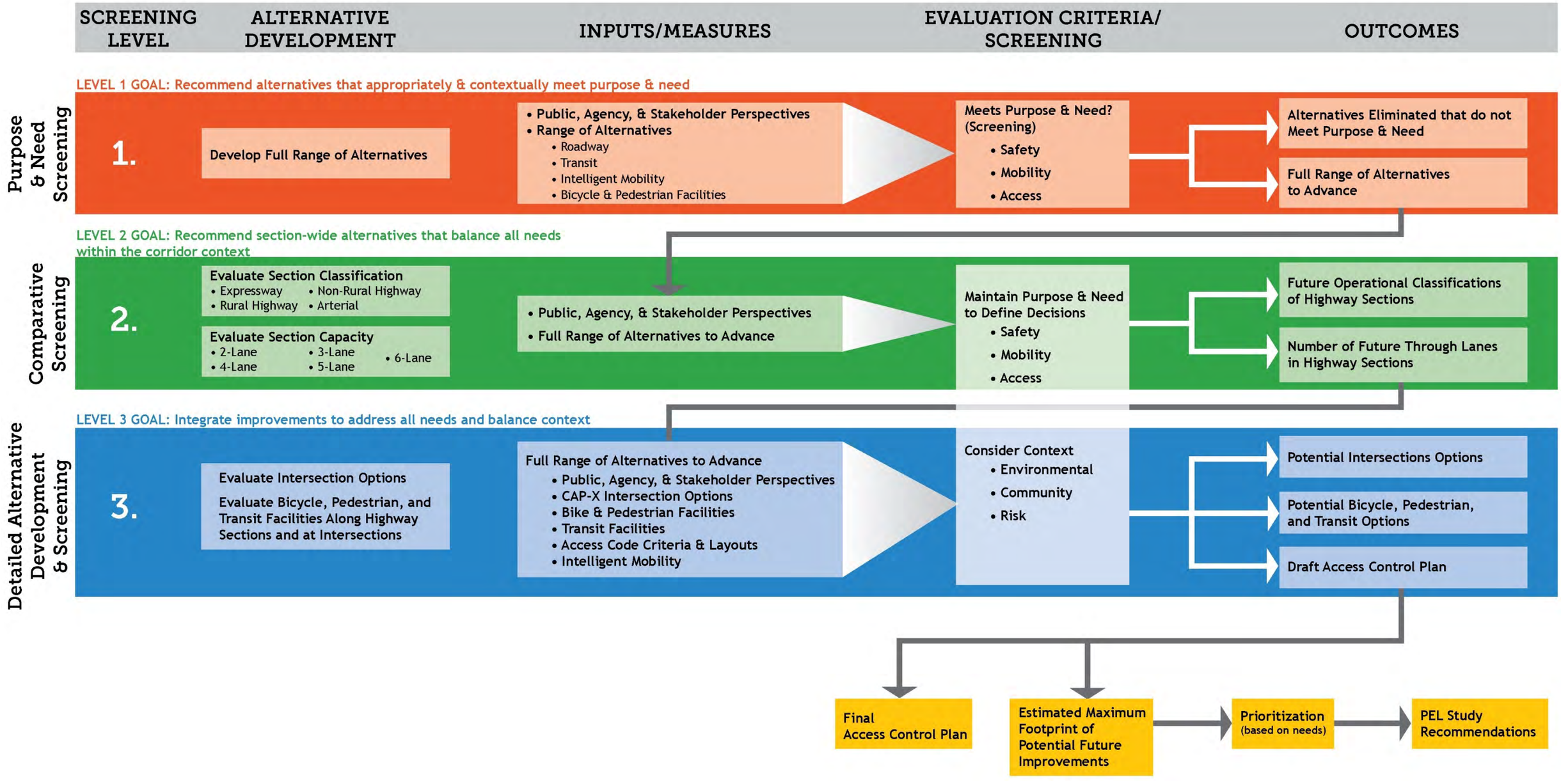
Level 1 Overview: Purpose and Need Screening

- **Goal:** Evaluate a full range of alternatives based on corridor conditions (**Appendix C**) to assess whether alternatives would meet purpose and need appropriately and contextually
- **Considerations:** Evaluated roadway, transit, intelligent mobility, and bike and pedestrian facilities alternatives
- **Recommendations:** Identified which alternatives to eliminate, eliminate in planning horizon, or advance for further evaluation in Level 2

Level 1 Process

- More than 70 generalized alternatives were reviewed along sections of the corridor, including a No Action Alternative. The No Action Alternative represents a baseline option to consider the corridor in its current or existing state with no improvements or modifications beyond those identified as fiscally constrained. The No Action Alternative is described further on **Page 14** of this PEL Report.
- Alternatives that were retained include various functional classes of highway, highway capacity options, intersection modifications, safety-specific improvements, interchange configurations, intersection configurations, highway alignments, transit service and infrastructure options, bicycle and pedestrian options, and concepts contributing to system/program alternatives.
- Most alternatives were retained for further consideration in Level 2.
- Five alternatives were either eliminated or eliminated in the 2020 to 2040 planning horizon:
  - Realigning SH 66 southward (west of I-25) was not retained because the current alignment is the northern edge of Longmont. Movement southward would place SH 66 within Longmont, which would degrade safety, mobility, and access conditions and create other issues for the City's transportation system.
  - Commuter rail, light rail, bus rapid transit (BRT), and separate transit guideway were eliminated through 2040 because anticipated ridership does not match the need for these modes. Dedicating a separate transit guideway was also eliminated through 2040 because anticipated transit demand is not viable at this time.

Figure 4. Alternative Development and Screening Process



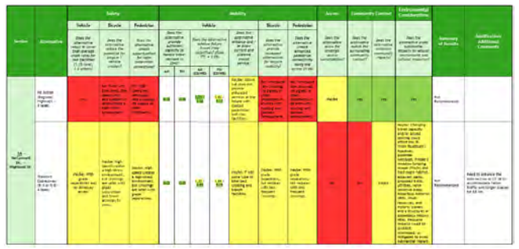
SH 66 Planning and Environmental Linkages Study

Level 2 Overview: Comparative Screening

- **Goal:** Complete screening to recommend section-wide alternatives that balance all needs in the context of environment, community, and risk
- **Technical Considerations:** Evaluated data and stakeholder input to recommend future characteristics for each highway section
  - Corridor conditions (**Appendix C**) in terms of:
    - Existing highway classifications and number of travel lanes
    - Existing traffic volumes
    - Future (seasonally-adjusted) traffic volumes to account for stakeholder identified issues of developing typical peak recreational season volumes. Volumes represent peak weekday volumes.
  - Select link analysis from the DRCOG traffic model. Select link analysis provided a more detailed understanding of SH 66 travel characteristics to inform the process
  - Stakeholder input (**Chapter 6**)
- **Findings**: Recommended future operational classifications of highway sections, future number of through lanes in highway sections, and basic cross-sections for inclusion of medians or two way left turn lanes

Level 2 Process

- For each corridor section (**Figure 5**), a range of classification options and number of travel lanes were evaluated. **Figure 6** illustrates the general operational classifications and associated transportation characteristics considered, such as travel speed, traffic volumes, and desired access spacing.
- Considerations also were made regarding the number of travel lanes that would address purpose and need most effectively, while taking into consideration corridor context and stakeholder input.
- About 50 alternatives, including the No Action Alternative, were reviewed across all corridor sections. For each section, one option was *recommended* for further evaluation in Level 3, which included classification and capacity. Remaining options were *not recommended*. **Figure 7** illustrates corridor-wide illustrations of existing and proposed future highway capacity (number of lanes) and classification. **Figure 8** includes existing and future visualizations of the highway corridor developed as part of the Level 2 Screening Process.
- Following Level 2, these PEL Proposed Options were carried forward into assessing the collective footprint of all proposed options. **Chapter 3** further describes the ROW preservation footprint.



Appendix E-2 includes the Level 2 screening tables and evaluation criteria, as illustrated in this image

Figure 5. SH 66 PEL Corridor Sections

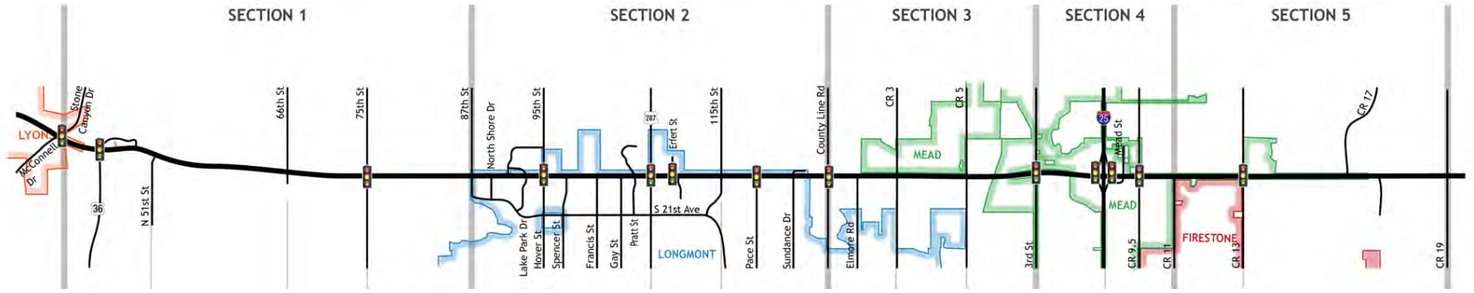


Figure 6. Operational Classifications Overview

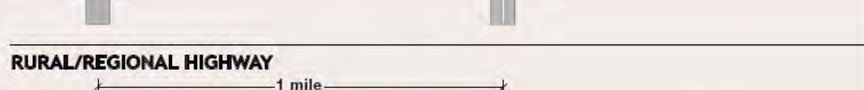
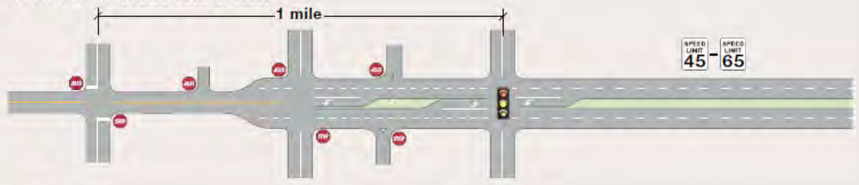
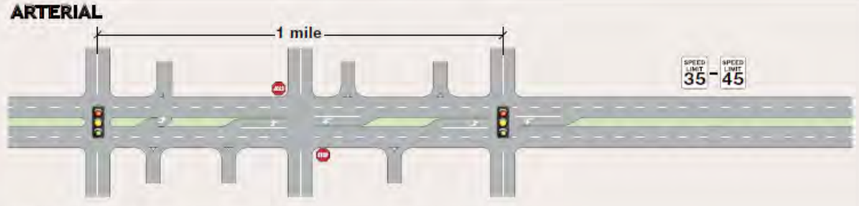
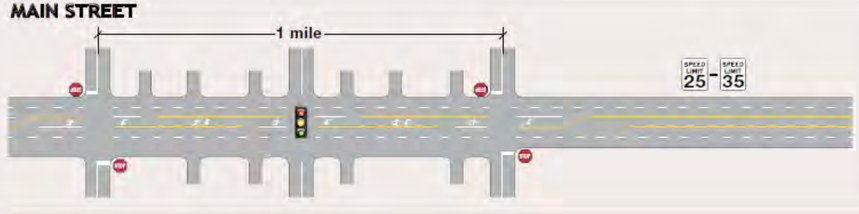
	Description	Access Spacing
EXPRESSWAY 	Moderately high speeds and traffic volumes with limited access, multiple lanes in each direction and separated directional travel	1 mile + for full movement, with possible RIRO at half mile
RURAL/REGIONAL HIGHWAY 	Moderate to high speeds with moderate to low traffic volumes	1/2 mile + for full movement intersections with public roadways, maximum of one access per parcel (depending on other roadways that could preclude access) with shared access preferable
ARTERIAL 	Moderate to low travel speeds and traffic volumes with moderate access	1/2 mile for full movement intersections, with possible 3/4 movement at quarter miles, and RIRO access for each parcel (should share access if possible)
MAIN STREET 	Low travel speeds and traffic volumes with significant roadside development and access needs	One access per parcel (should share access if possible)

Figure 7. Existing Conditions and Level 2 Screening Recommendations

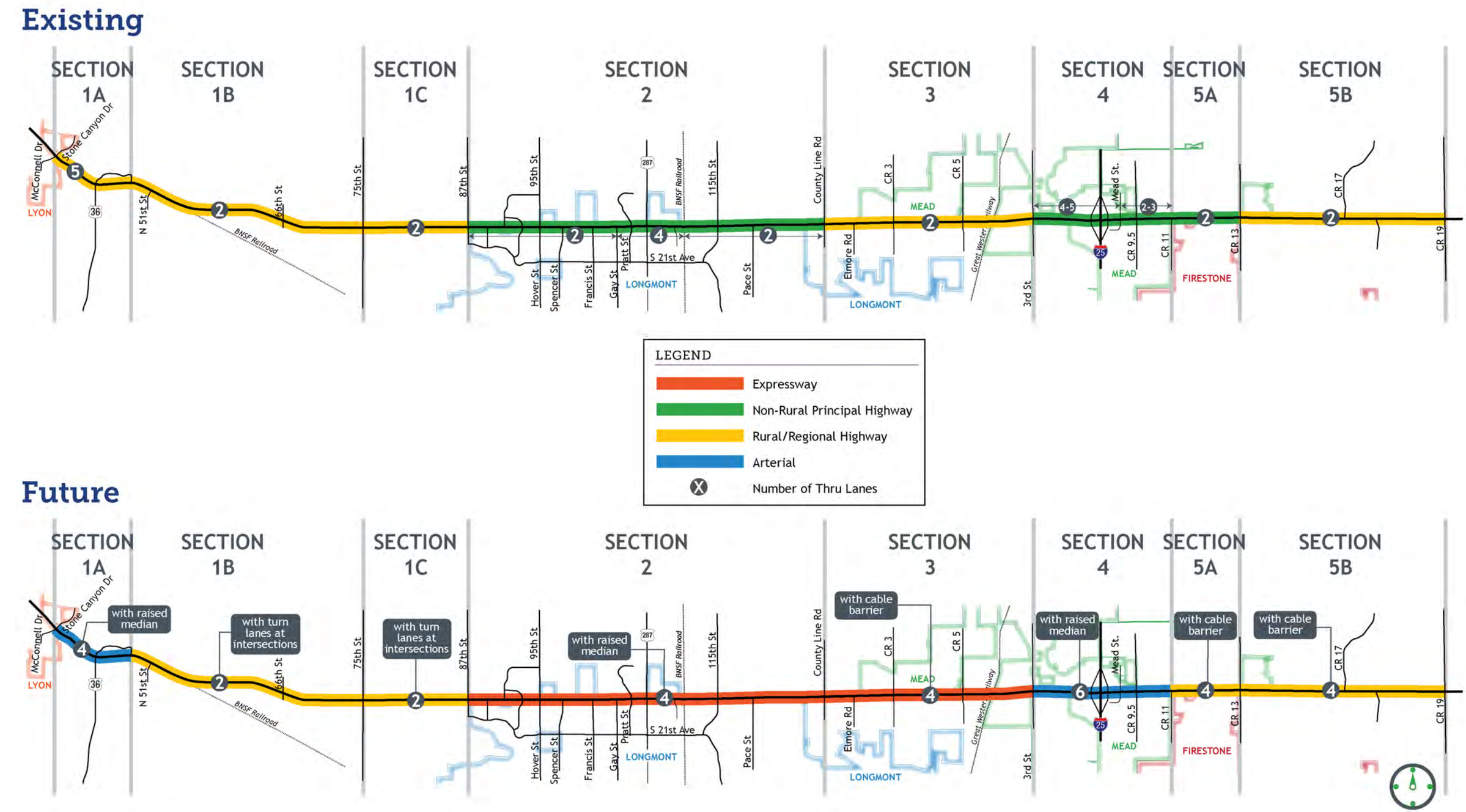


Figure 8. Existing Conditions and Level 2 Screening Corridor Visualizations

Section 1A

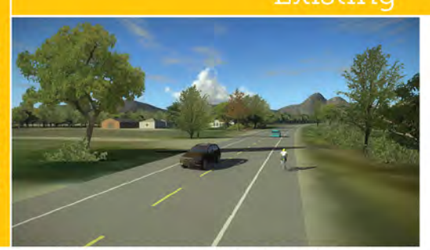
Existing | Proposed

Center left turn lane

Raised median with left turn lanes and bike lanes

Section 1B

Existing | Proposed



No median separation and minimal turn lanes

Two through lanes, wide shoulders, and access road with advisory shoulders; with turn lanes at intersections

Section 1C

Existing | Proposed

No median separation and minimal turn lanes

Two through lanes, wide shoulders, and side path; with turn lanes at intersections

Section 2

Existing | Proposed

No median separation and minimal turn lanes

Raised median with side path

Section 3

Existing | Proposed

No median separation and minimal turn lanes

Cable barrier/grassy median with side path

Section 4

Existing | Proposed

Striped median separation

Raised medians with side paths

Section 5A

Existing | Proposed

No median separation and minimal turn lanes

Cable barrier/grassy median with side path

Section 5B

Existing | Proposed

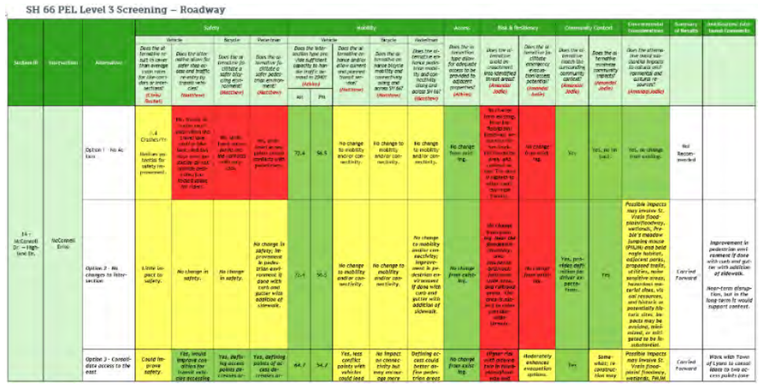
No median separation and minimal turn lanes

Cable barrier/grassy median with side path

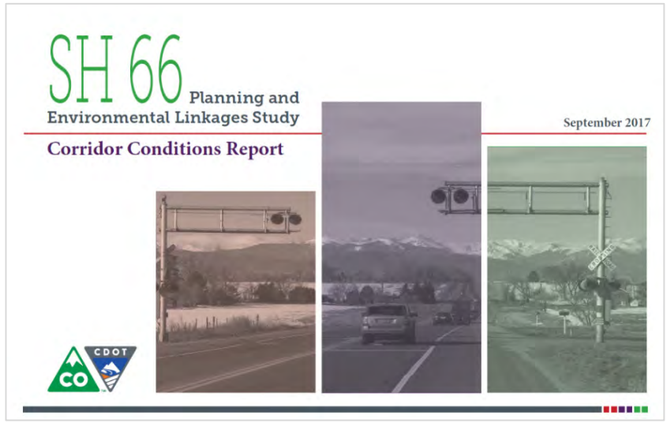
SH 66 Planning and Environmental Linkages Study

Level 3 Overview: Detailed Alternative Development and Screening

- **Goal:** Complete screening to integrate SH 66 corridor improvements that address all needs and balance context
- **Evaluated:**
  - Range of alternatives at SH 66 intersections, which were refined during ACP development
  - Range of alternatives for providing adequate bicycle and pedestrian facilities
  - Transit alternatives, including sidewalk connections and pedestrian accommodations at bus stops
- **Recommendations:**
  - Identified intersection improvements (**Figure 13** at the end of this chapter) that address safety, mobility, and access needs
  - Integrated bicycle, pedestrian, and transit improvements (**Figure 12**) that address safety, mobility, and access needs
  - Integrated ACP considerations for access management, consolidation, closures, and recommendations



Appendix E-3 includes the Level 3 screening tables and evaluation criteria for roadways, bicycles, pedestrians, and transit, as illustrated in this image



For baseline transportation information, view the SH 66 PEL Corridor Conditions Report (**Appendix C**)

Roadway Level 3 Alternatives Development

- Intersections along the corridor (**Figure 13** at the end of this chapter) were initially evaluated based on purpose and need and study goals. Synchro was used to evaluate intersection and corridor-wide levels of service (LOS) and traffic delays.
- FHWA's Capacity Analysis for Planning of Junctions (CAP-X) Tool was used to evaluate the range of feasible alternative intersection options where a traditional signalized intersection was not appropriate.
- Approximately 180 alternatives/options, including the No Action Alternative, were reviewed across all corridor sections. For each section, one or more options have been identified as "PEL Proposed Option(s)."
- A reversible lanes concept (**Figure 9**) was evaluated in Section 1 between SH 66/E Highland Drive and SH 66/87th Street. It did not receive much stakeholder or public support and was found infeasible from an operation or a constructability standpoint.
- Options were further refined during the ACP process and based on input from the public at the Open Houses in April 2019.
- Following Level 3, these PEL Proposed Options were carried forward into assessing the collective footprint of all proposed options. **Chapter 3** further describes the ROW preservation footprint.

Roadway Level 3 Recommendations

- PEL Proposed Options are consistent with recommendations of the ACP. Several locations along the corridor were projected to have unacceptable operations as a traditional signalized intersection with capacity improvements alone. Additionally, stakeholders desired to preserve a larger footprint to accommodate major north-south arterials at WCR 9.5 and WCR 13 in Weld County.
- Various intersection types and innovations developed during Level 3 were determined to be able to accommodate future traffic conditions. The following options were considered feasible, along with the Proposed Options to carry forward:
  - *SH 66 and Hover/95th Street* — Partial displaced left turn (for westbound to southbound left); fully displaced left turn; grade-separation, such as echelon, single point urban interchange (SPUI), or diamond interchange; junior interchange in the northeast quadrant.

    Carried Forward: Partial displaced left turn as it best meets corridor needs with the smallest footprint
  - *SH 66 and US 287* — Fully displaced left turn; grade-separation, such as echelon, SPUI, or diamond interchange; split intersection for westbound/diamond interchange for eastbound.

    Carried Forward: Fully displaced left turn as it best meets corridor needs with the smallest footprint
  - *SH 66 and County Line Road* — Capacity improvements to add turn lanes and acceleration lanes; fully displaced left turn; or grade-separation, such as echelon, SPUI, or diamond interchange.

    Carried Forward: Added turn lanes at the intersection as it best meets corridor needs with the smallest footprint
  - *SH 66 and WCR 9.5* — Hybrid option of split intersection for westbound/diamond interchange for eastbound; partial or fully displaced left turn; or grade-separation, such as echelon, SPUI, or diamond interchange.

    Carried Forward: Hybrid option of a split intersection/diamond interchange as it best meets SH 66 corridors needs and WCR 9.5 arterial needs (**Figure 10**)
  - *SH 66 and WCR 13/Colorado Blvd* — Split intersection for westbound/diamond interchange for eastbound; partial or fully displaced left turn; or grade-separation, such as echelon, SPUI, or diamond interchange.

    Next Steps: This intersection will need to be analyzed in more detail in the future. Based on current traffic projections, a grade-separated interchange is not warranted. However, based on stakeholder input and planned arterial networks, WCR 13 is anticipated to be a major north-south regional route. Therefore, the same ROW footprint for WCR 9.5 was set aside for WCR 13. Local agencies will be responsible for ensuring that development setbacks meet the needs to accommodate future potential ROW needs.
- Operational functionality and cost considerations of various intersections can be balanced during NEPA and project decision-making.

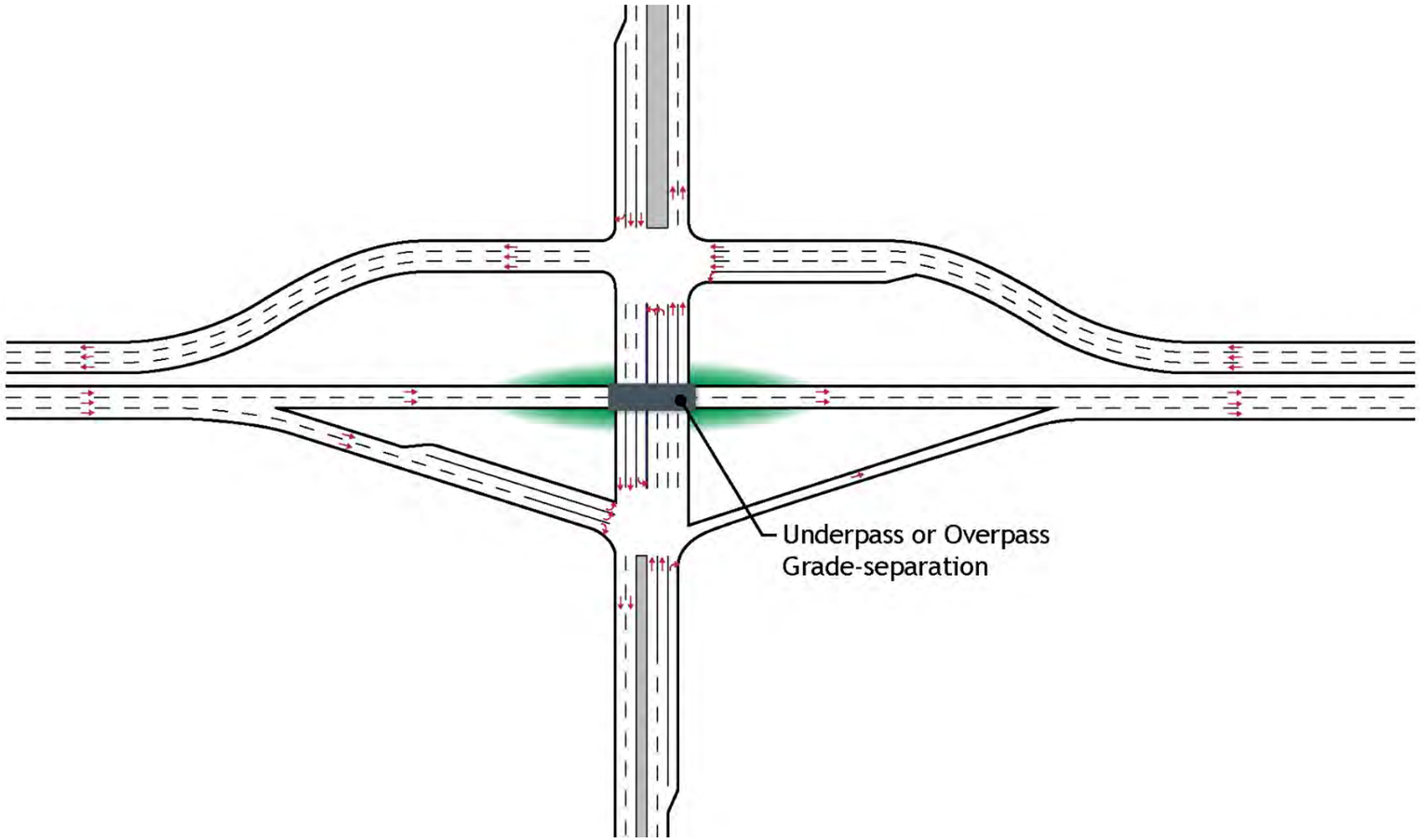
Figure 9. Reversible Lane Concept Between SH 66/Hover and SH 66/US 287 – Not Carried Forward

Morning Configuration Concept, with two lanes of travel westbound and one lane of travel eastbound

Intersection Concept Configuration

The reversible lane concept was deemed infeasible and did not have much stakeholder or public support.

Figure 10. Hybrid Option Concept of a Split Intersection/Diamond Interchange at SH 66/WCR 9.5 – PEL Proposed Option



This concept includes a compressed footprint and is a hybrid option, with the westbound direction being a split intersection and the eastbound direction being a partial diamond interchange. This option has been carried forward as it works operationally and would have the smallest implementation footprint.

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SH 66 Planning and Environmental Linkages Study

How did this PEL incorporate bicycle, pedestrian, and transit facility considerations?

The SH 66 PEL has emphasized the importance of safely and comfortably serving all modes along SH 66. The SH 66 PEL purpose and need (**Chapter 1**) and Level 3 alternatives development and screening process include bicycle, pedestrian, and transit considerations.

Bicycle, Pedestrian, and Transit Level 3 Alternatives Development

- During Level 3, a range of alternatives for providing adequate facilities for bicyclists and pedestrians (active transportation users) were evaluated:
  - *Multi-use Trails* —Allows two-way, off-street pedestrian, bicycle, and non-motorized vehicle use
  - *Side Paths* —A bi-directional shared use path located immediately adjacent and parallel to a roadway that accommodates all ages and abilities, allows reduced roadway crossing distances, and maintains rural community character
  - *Sidewalks* —A paved path for pedestrians at the side of a road
  - *Bike Lanes* —A division of a road marked off with painted lines, for use by cyclists
  - *Access Road with Advisory Shoulders (ARWAS)* —A shared access road that accommodates both non-motorized travelers and low volumes of vehicles.
  - *Wide Shoulders (bigger than 5 feet)* —Accommodates vehicles and non-motorized travelers along the roadway
- Transit alternatives include sidewalk connections and pedestrian accommodations at bus stops. Transit considerations during Level 3 primarily centered on accessibility and efficiency.
- Alternatives were developed through a process of reviewing previous relevant plans from local jurisdictions and incorporating their recommendations, as appropriate, identifying and addressing any remaining infrastructure gaps, and collaborating with the public and key stakeholders to ensure a consistent and compatible vision.

Bicycle, Pedestrian, and Transit Level 3 Alternatives Screening

- Street crossings are often the most stressful component of a bicycle or pedestrian trip. Appropriate intersection treatments are crucial for supporting these modes. Intersection operations are also a critical determinant to the efficiency and effectiveness of transit service. As such, each intersection alternative was evaluated in the context of bicycles, pedestrians, and transit:
  - How intersection options would affect vehicular safety and mobility (including transit vehicles), and bicyclist and pedestrian safety and mobility
  - How bicycle, pedestrian, and transit options would benefit or impair vehicular safety and mobility (both personal and transit vehicles), bicyclist safety and mobility, pedestrian safety and mobility, risk and resiliency, community context, and environmental considerations

Bicycle, Pedestrian, and Transit Level 3 Recommendations

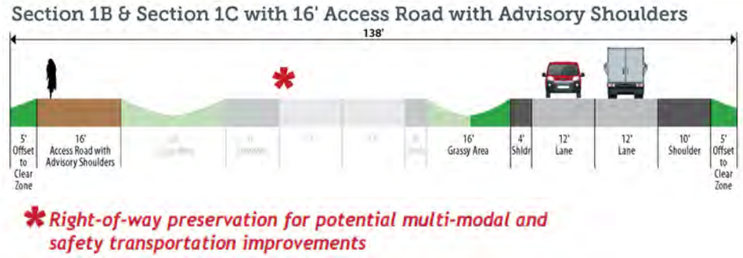
- Below is a summary of bicycle and pedestrian recommendations:
  - *Section 1B* — Wide shoulders along both sides of SH 66 and the ARWAS/bike and pedestrian path along the north side of SH 66
  - *Section 1C* —Wide shoulders along both sides of SH 66 and the ARWAS/bike and pedestrian path along the south side of SH 66
  - *Section 2* — Wide shoulders along both sides of SH 66, a bike and pedestrian path along the entire south side, and a bike and pedestrian path along the north side between 95th Street and the BNSF Railroad
  - *Section 3* — Wide shoulders along both sides of SH 66, a bike and pedestrian path along the south side of SH 66
  - *Section 4* — Wide shoulders along both sides of SH 66, a bike and pedestrian path along the entire south side, a bike and pedestrian path along the north side between WCR 7 and I-25, and a sidewalk along the north side between I-25 and WCR 9.5
  - *Section 5* — Wide shoulders along both sides of SH 66 and a bike and pedestrian path along the south side of SH 66
- Transit recommendations include:
  - Improvements to the existing bus stops along SH 66 between McConnell Dr and US 36, including sidewalk/trail connections and concrete platforms
  - A transit station at the intersection of SH 66 and US 287 that will serve the planned SH 119 BRT line and potential future transit service along SH 66
  - Continued coordination between CDOT, RTD, local jurisdictions, and railroad officials regarding the potential for future transit service along SH 66 and rail service along I-25
- **Figure 12** illustrates Level 3 bicycle, pedestrian, and transit recommendations.

Appendix E-3 includes the Level 3 screening tables and evaluation criteria for roadways, bicycles, pedestrians, and transit

Unique Bicycle and Pedestrian Recommendation: Access Road with Advisory Shoulders

- The ARWAS (**Figures 11 and 12**) balances needs to maintain SH 66 access for residents between 51st Street and 87th Street with needs to provide a safe and comfortable active facility in a popular area for recreational bicyclists.
- The access roads with advisory shoulders are envisioned as 16' wide facilities that provide low-speed motor vehicle access from individual residences to streets that intersect SH 66. These roads include striped advisory shoulders on each side as a space for active users.

Figure 11. Access Road with Advisory Shoulders Cross Section

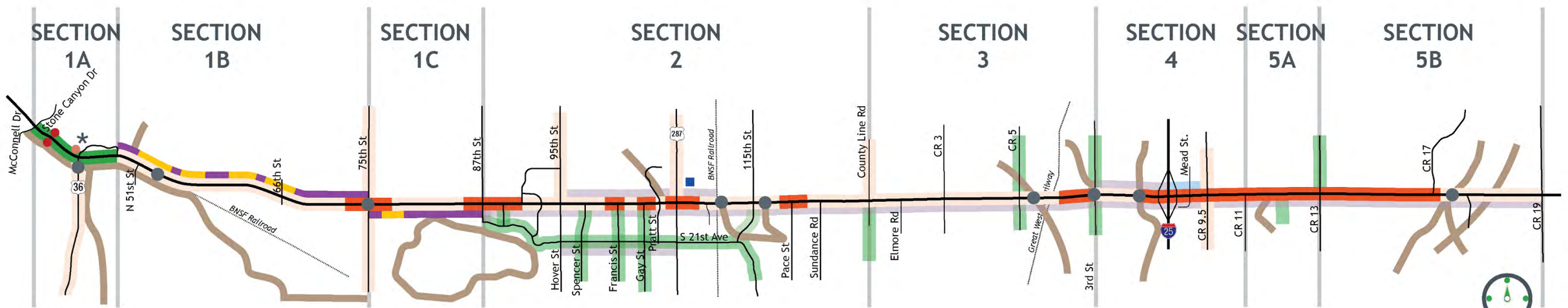


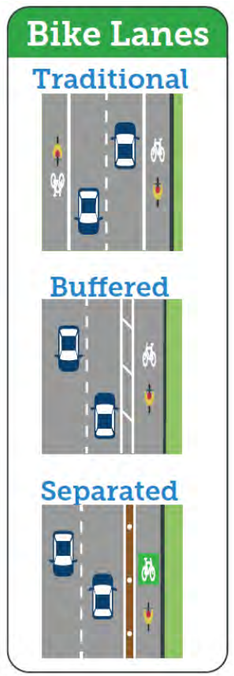
- In order to prevent vehicles using the facility as an alternate route to SH 66, the ARWAS would transition to side paths where vehicular access is not needed.
- With only a handful of residents fronting each proposed section of ARWAS, motor vehicle volumes would be low.
- If land uses adjacent to the ARWAS are redeveloped in the future, additional intersections with SH 66 may become necessary, and the ARWAS would not be appropriate (given higher volumes of traffic). In that case, the ARWAS would be converted to side paths. The potential for the ARWAS to become side paths eventually is why a wider facility is not recommended at this time.

Bicycle, Pedestrian, and Transit Next Steps

- As intersection and highway improvements are considered in NEPA and design, consideration should be made toward providing multi-modal functionality, such as:
  - interchange designs should include side path connections,
  - roundabouts should include proper signing and striping to facilitate active crossings, and
  - grade-separated bicycle and pedestrian crossings (**Figure 11**) should be explored.
- The ARWAS option is not an approved treatment in the Manual on Uniform Traffic Control Devices and would require a "request for experiment" from FHWA to implement.
- A high-quality transit corridor needs to provide convenient access to stops, a safe and comfortable environment for users to wait for buses, and a system that facilitates efficient movement of buses. As intersection and highway improvements are considered in NEPA and design, consideration should be made toward providing:
  - efficient merges at transit stop locations
  - providing opportunities for buses to bypass congestion at busy intersections
  - minimizing the number of turning movements conflicting with the bus

Figure 12. Level 3 Screening Bicycle, Pedestrian, and Transit Recommendations





Section 1B: In this access road with advisory shoulders concept, motorists, bicyclists, and pedestrians share travel space in CDOT's ROW, north of SH 66. Communities could connect the access road locations with trail segments to expand regional bicycle and pedestrian mobility along SH 66.

Section 1B and 1C: The access road with advisory shoulders would connect to streets that intersect with SH 66 to provide motorists access to and from SH 66.

LEGEND

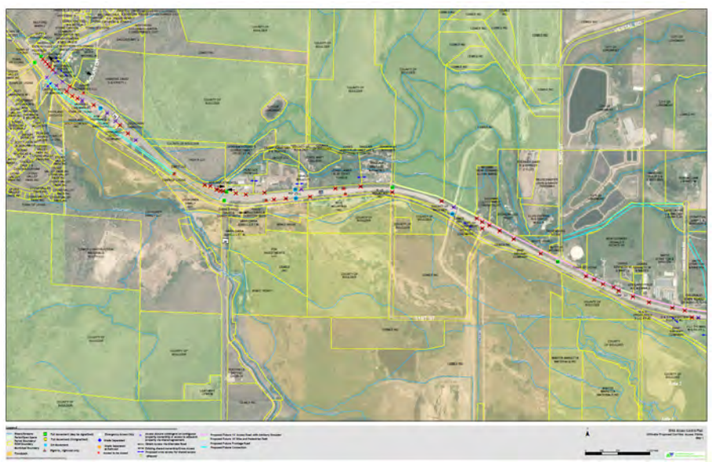
PEL Proposed	Existing/Previously Planned	
		Multi-Use Trail
		Sidepath
		Sidewalk
		Bike Lanes
		Access Road with Advisory Shoulders
		Wide Shoulders (5+Feet)

- Bus Stop Improvements
- Existing Bus Stops
- Transit Station
- Proposed Grade-Separated Crossing to Bike/Pedestrian Facilites or Open Space

* Includes traditional bike lanes and buffered bike lanes as short-term options and separated bike lanes as the long-term option from McConnell Dr. to Highland Dr.

SH 66 Access Control Plan Development

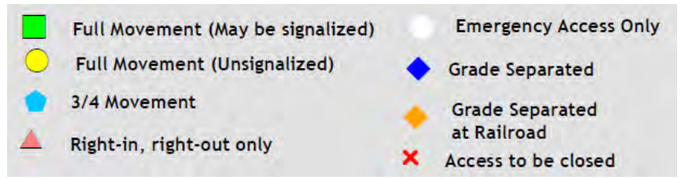
- The alternatives development and screening process and ACP development were conducted in parallel for SH 66. For the ACP, considerations were made to:
  - Reduce the number of conflict points where a crash may occur on the highway, which is applicable for vehicles and also for pedestrians and cyclists who must cross multiple driveways on the corridor.
  - Create fewer locations for vehicles to brake or turn onto or off the highway, resulting in more efficient travel for through traffic.
  - Make the corridor more visually appealing to drivers and visitors by reducing the number of driveways.
- Development of the SH 66 ACP included the following goals:
  - Identifying improvements to the local transportation network that promote safety and provide appropriate level of access to properties along SH 66.
  - Blending the corridor vision from the PEL with requirements of CDOT's State Highway Access Code.
  - Assisting future development and redevelopment along SH 66 by identifying locations and types of accesses.
  - Providing efficient movement for all transportation modes along SH 66.
- Reasonable access has been provided to properties adjacent to the highway while maintaining safe and efficient movement of vehicles, bicyclists, and pedestrians along and adjacent to SH 66.
- The ACP is intended to represent a long-range plan for the study roadway. Implementation of the full plan will occur over the long term as a phased approach over time based on:
  - When a safety need is identified
  - During the land development or redevelopment process
  - When funding for improvements is available
  - When traffic needs arise



Appendix H includes the ACP Report and supporting documentation

SH 66 Access Control Plan Options

- The SH 66 corridor has more than 370 existing access points within the PEL and ACP Study Area **(Appendix H)**.
- Options mapped in the Recommended ACP include:



A small portion of the corridor is illustrated in this image, showing an area of access points along SH 66.

What is a No Action Alternative?

The No Action Alternative assumes no improvements would be made to the corridor and the surrounding transportation network, except those already committed by a government or an agency or those with identified funds for construction, meaning the No Action transportation network is "fiscally constrained." The No Action Alternative assists the study in determining transportation needs along the corridor if no new improvements beyond those in the fiscally-constrained plan are implemented. It serves as a base against which to compare impacts of suggested alternatives.

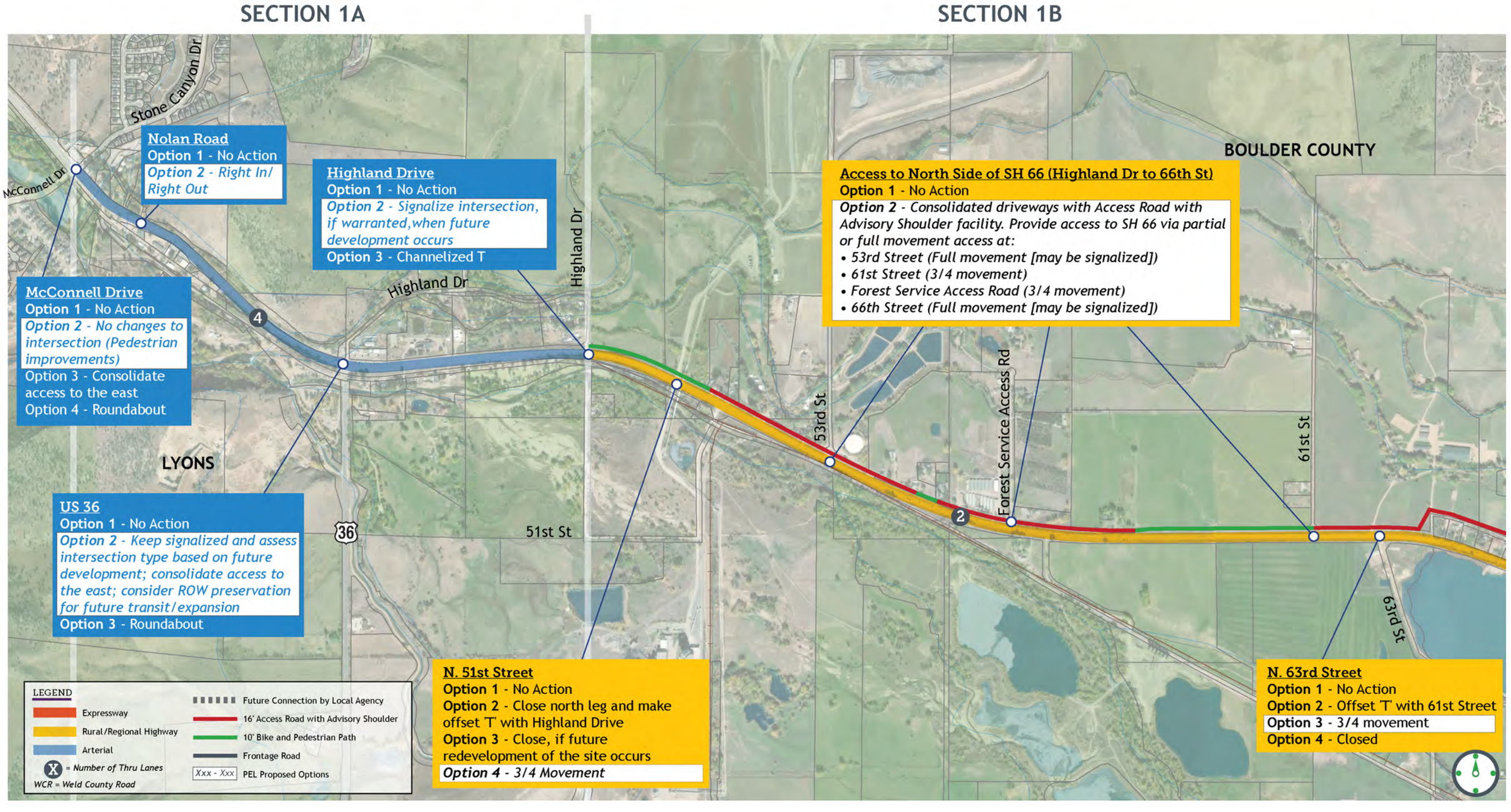
No Action Alternative Overview

- **Table 1** provides information on 2040 fiscally-constrained projects that might have an impact on the study area.
- Projects include road widening (including SH 66 to four lanes from Hover Street to US 287), managed lanes (on I-25), and transit projects that will be constructed regardless of improvements identified by the SH 66 PEL.
- Section 3.1.3 of the Corridor Conditions Report (**Appendix C**) includes more information about the No Action Alternative and the travel demand model.

Table 1. 2040 No Action Fiscally-Constrained Projects Impacting SH 66

Facility	To/From	Location	Improvement
Roadway Projects			
SH 66	Hover Street to US 287	Longmont	Widen to 4 lanes
I-25	SH 66 to WCR 38	North I-25	New managed lane, each direction
17th Avenue	Alpine Street to Ute Creek Drive	Longmont	Widen to 4 lanes
East County Line Road	9th Avenue to SH 66	Longmont	Widen to 4 lanes
Nelson Road	75th Street to Affolter Drive	Longmont	Widen to 4 lanes
Pace Street	5th Avenue to SH 66	Longmont	Widen to 4 lanes
Transit Projects			
SH 119	Foothills Parkway to US 287	Boulder / Longmont	New BRT route
Parking	SH 66 & US 287	Longmont	Relocated Park-n-Ride (150 spots)
Station / Parking	SH 119 & US 287	Longmont	New BRT station (439 spots)

Figure 13. Level 3 Screening Roadway Maps



SECTION 1B

SECTION 1C

SECTION 2

BOULDER COUNTY

N. 66th Street
Option 1 - No Action
Option 2 *- Full movement; signalized intersection, if warranted, when future development occurs*

McCall Drive
Option 1 - No Action
Option 2 - Right in/Right Out
Option 3 *- Right out only*
Option 4 - Close

N.75th Street
Option 1 - No Action
Option 2 - Provide two EB through lanes
Option 3 *- Capacity improvements*

Table Mountain Road
Option 1 - No Action
Option 2 *- Right In/Right Out with possible new connection to Unnamed Road on north side*

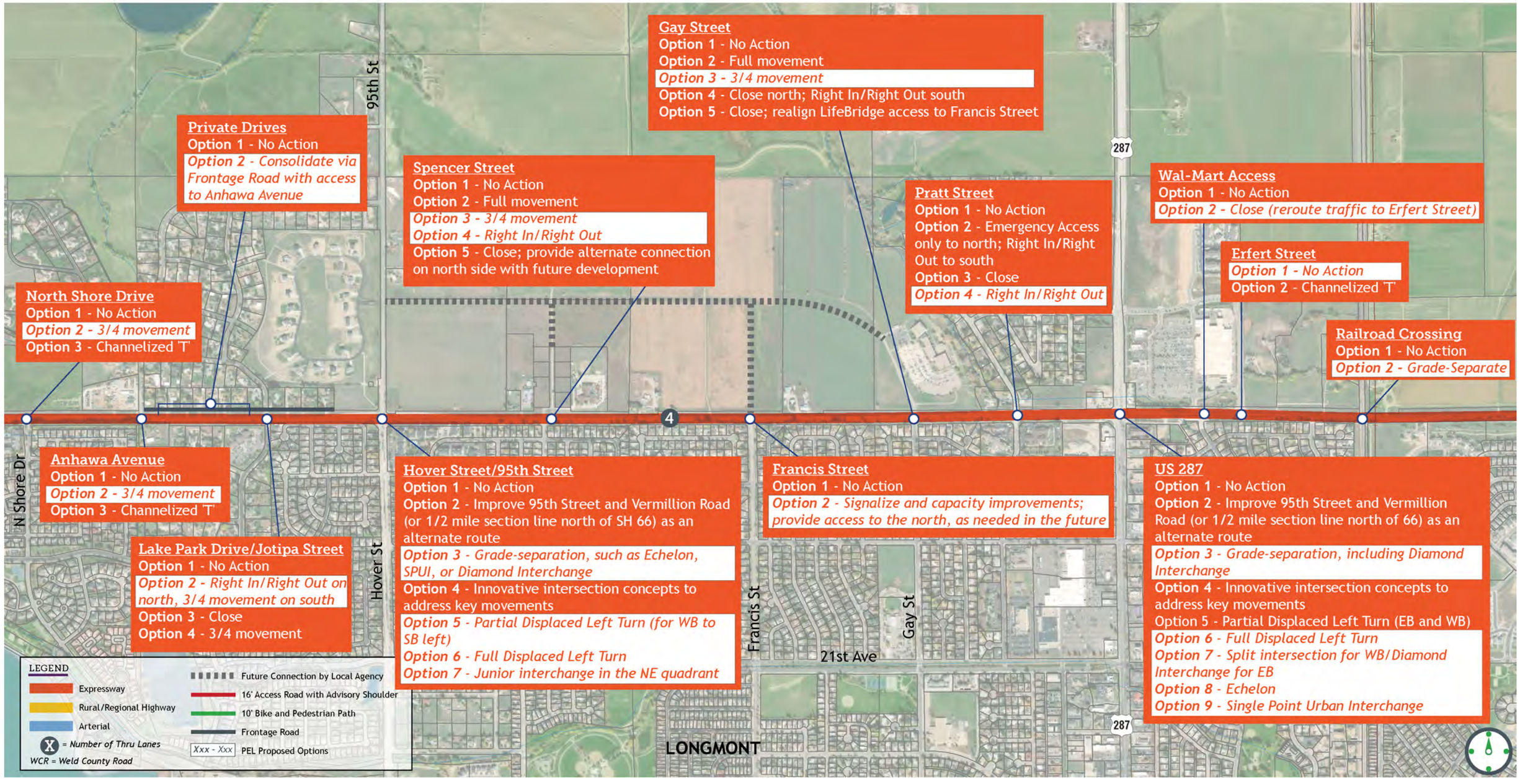
Unnamed Road
Option 1 - No Action
Option 2 *- 3/4 movement access point for consolidated access on south via Access Road with Advisory Shoulder facility on south side of SH 66*
Option 3 - Consolidate access on north and south to one Right In/Right Out

N. 87th Street
Option 1 - No Action
Option 2 *- Signalize and capacity improvements. Eastbound 4-lane section should begin at intersection approach*

N 66th St
N 75th St
Table Mountain Rd
Unnamed Rd
N 87th St
Airport Rd
Horizon
Rozena Dr

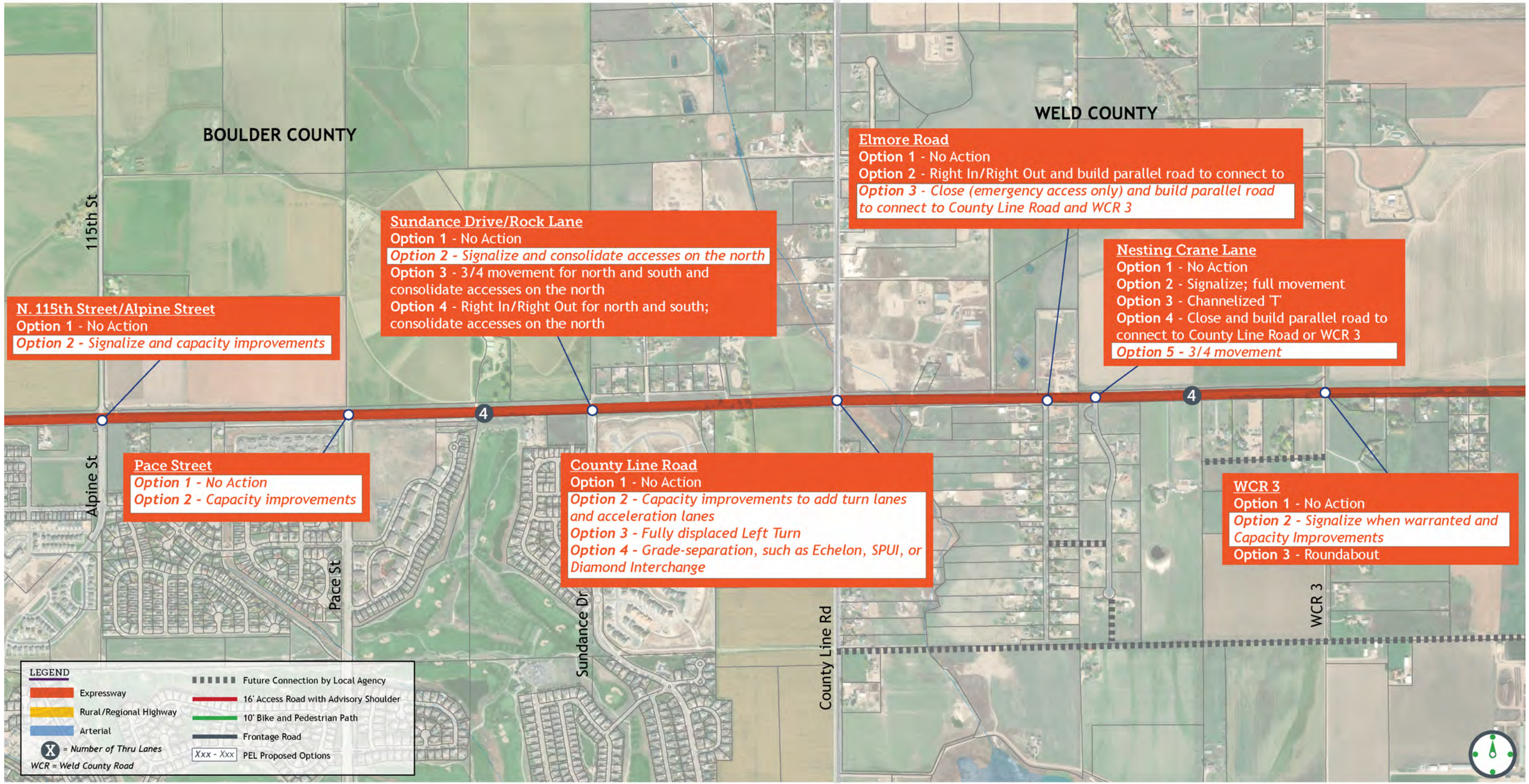
LEGEND
Expressway
Rural/Regional Highway
Arterial
X = *Number of Thru Lanes*
WCR = Weld County Road
Future Connection by Local Agency
16' Access Road with Advisory Shoulder
10' Bike and Pedestrian Path
Frontage Road
Xxx - Xxx PEL Proposed Options

SECTION 2


Gay Street
Option 1 - No Action
Option 2 - Full movement
Option 3 - 3/4 movement
Option 4 - Close north; Right In/Right Out south
Option 5 - Close; realign LifeBridge access to Francis Street
95th St
Private Drives
Option 1 - No Action
Option 2 - Consolidate via Frontage Road with access to Anhawa Avenue
Spencer Street
Option 1 - No Action
Option 2 - Full movement
Option 3 - 3/4 movement
Option 4 - Right In/Right Out
Option 5 - Close; provide alternate connection on north side with future development
287
Pratt Street
Option 1 - No Action
Option 2 - Emergency Access only to north; Right In/Right Out to south
Option 3 - Close
Option 4 - Right In/Right Out
Wal-Mart Access
Option 1 - No Action
Option 2 - Close (reroute traffic to Erfert Street)
Erfert Street
Option 1 - No Action
Option 2 - Channelized 'T'
North Shore Drive
Option 1 - No Action
Option 2 - 3/4 movement
Option 3 - Channelized 'T'
Railroad Crossing
Option 1 - No Action
Option 2 - Grade-Separate
4
N Shore Dr
Anhawa Avenue
Option 1 - No Action
Option 2 - 3/4 movement
Option 3 - Channelized 'T'
Lake Park Drive/Jotipa Street
Option 1 - No Action
Option 2 - Right In/Right Out on north, 3/4 movement on south
Option 3 - Close
Option 4 - 3/4 movement
Hover St
Hover Street/95th Street
Option 1 - No Action
Option 2 - Improve 95th Street and Vermillion Road (or 1/2 mile section line north of SH 66) as an alternate route
Option 3 - Grade-separation, such as Echelon, SPUI, or Diamond Interchange
Option 4 - Innovative intersection concepts to address key movements
Option 5 - Partial Displaced Left Turn (for WB to SB left)
Option 6 - Full Displaced Left Turn
Option 7 - Junior interchange in the NE quadrant
Francis Street
Option 1 - No Action
Option 2 - Signalize and capacity improvements; provide access to the north, as needed in the future
Francis St
Gay St
21st Ave
US 287
Option 1 - No Action
Option 2 - Improve 95th Street and Vermillion Road (or 1/2 mile section line north of 66) as an alternate route
Option 3 - Grade-separation, including Diamond Interchange
Option 4 - Innovative intersection concepts to address key movements
Option 5 - Partial Displaced Left Turn (EB and WB)
Option 6 - Full Displaced Left Turn
Option 7 - Split intersection for WB/Diamond Interchange for EB
Option 8 - Echelon
Option 9 - Single Point Urban Interchange
287
LONGMONT
LEGEND
Expressway
Rural/Regional Highway
Arterial
X = Number of Thru Lanes
WCR = Weld County Road
Future Connection by Local Agency
16' Access Road with Advisory Shoulder
10' Bike and Pedestrian Path
Frontage Road
Xxx - Xxx PEL Proposed Options

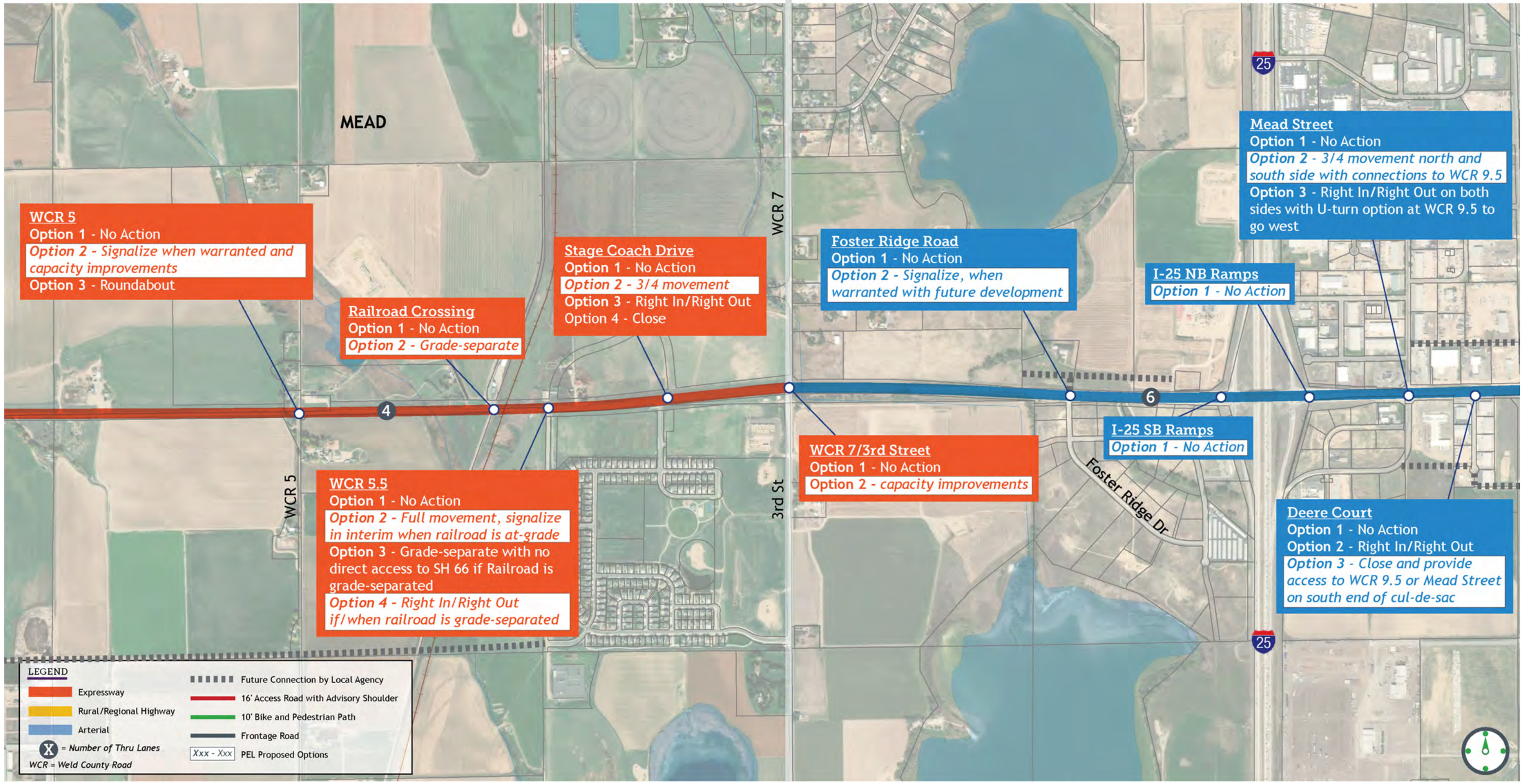
SECTION 2

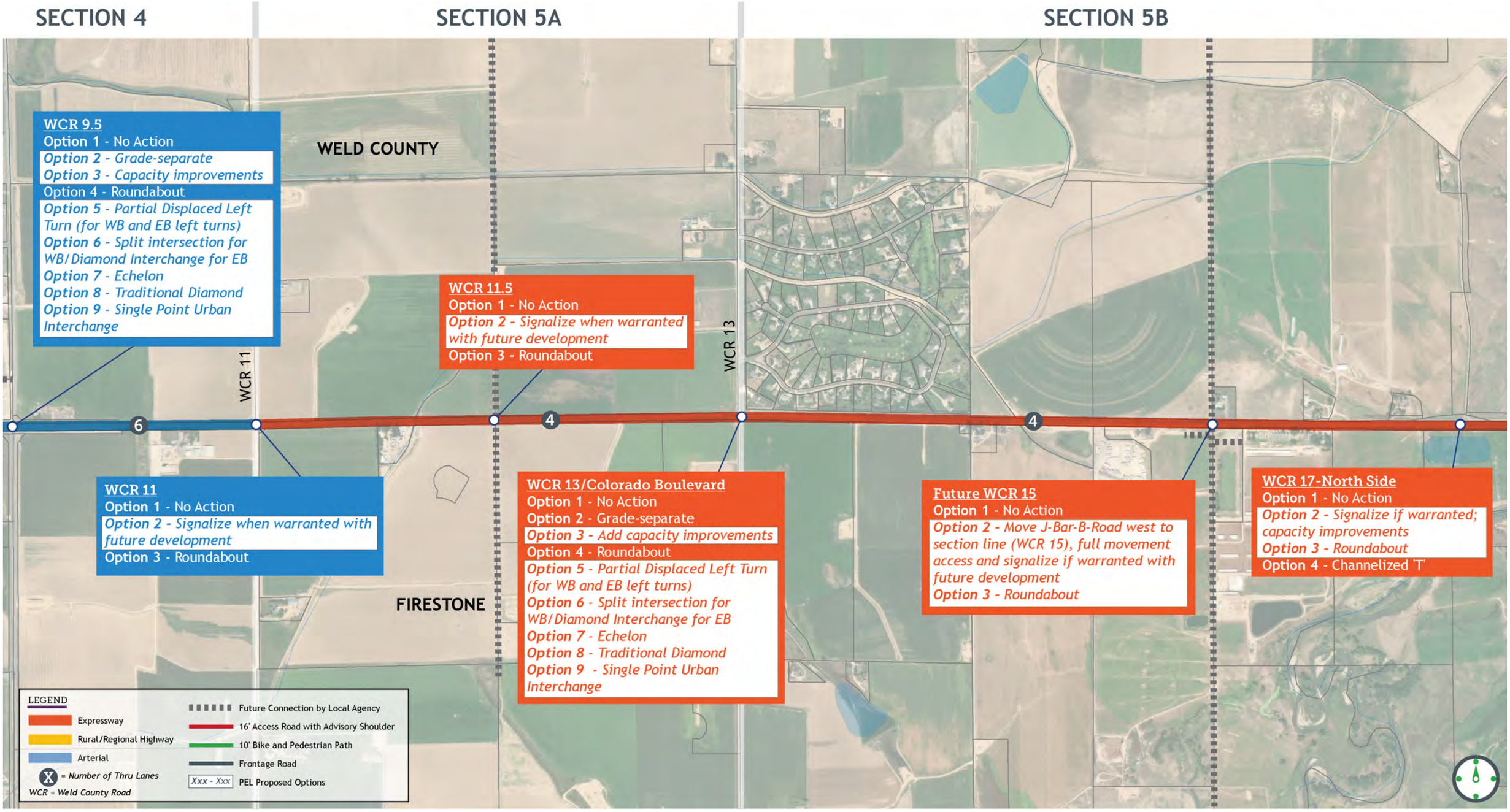
SECTION 3



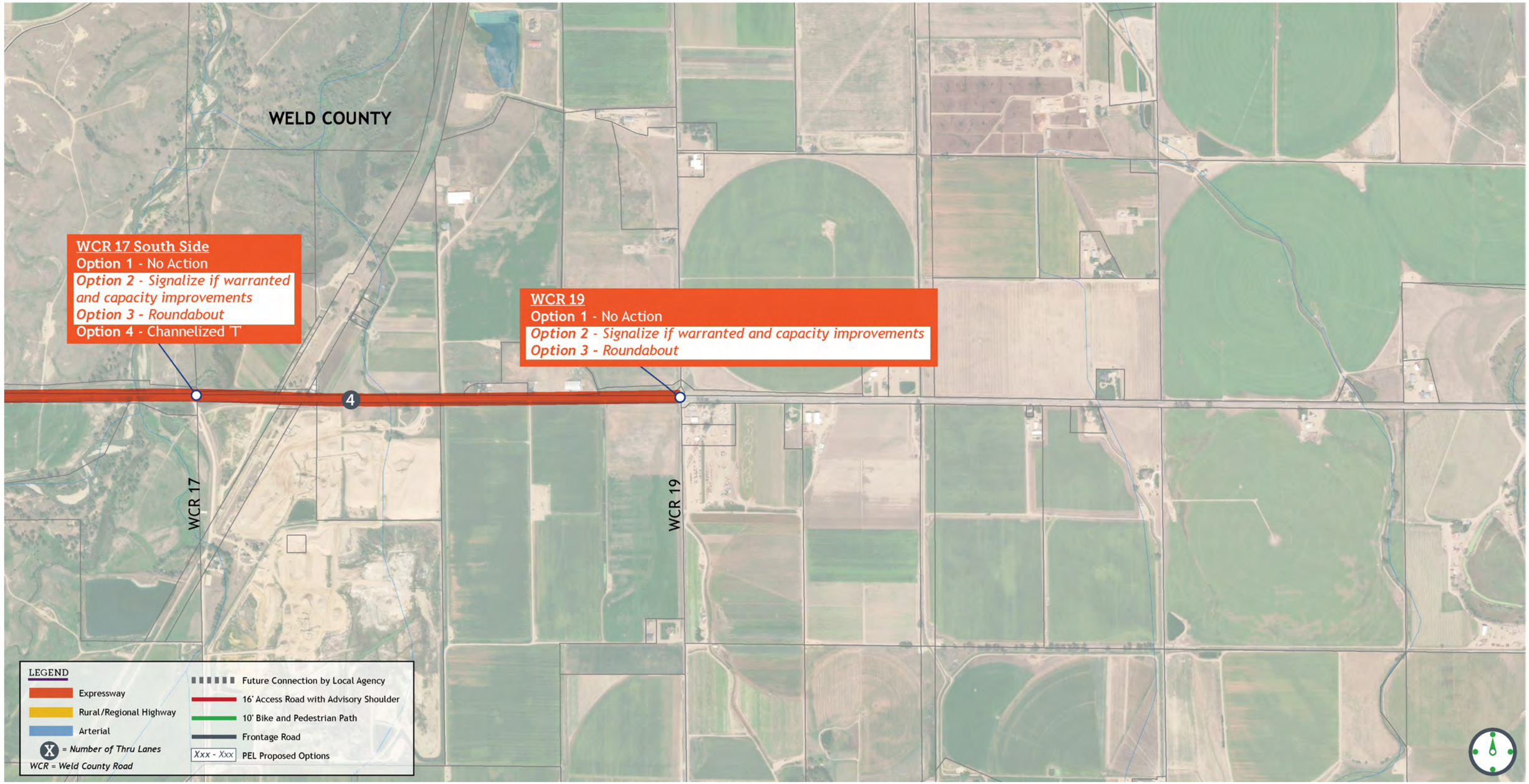
SECTION 3

SECTION 4




SECTION 4
SECTION 5A
SECTION 5B
WELD COUNTY
FIRESTONE
WCR 11
WCR 13
WCR 9.5
Option 1 - No Action
Option 2 - Grade-separate
Option 3 - Capacity improvements
Option 4 - Roundabout
Option 5 - Partial Displaced Left Turn (for WB and EB left turns)
Option 6 - Split intersection for WB/Diamond Interchange for EB
Option 7 - Echelon
Option 8 - Traditional Diamond
Option 9 - Single Point Urban Interchange
WCR 11.5
Option 1 - No Action
Option 2 - Signalize when warranted with future development
Option 3 - Roundabout
6
4
4
WCR 11
Option 1 - No Action
Option 2 - Signalize when warranted with future development
Option 3 - Roundabout
WCR 13/Colorado Boulevard
Option 1 - No Action
Option 2 - Grade-separate
Option 3 - Add capacity improvements
Option 4 - Roundabout
Option 5 - Partial Displaced Left Turn (for WB and EB left turns)
Option 6 - Split intersection for WB/Diamond Interchange for EB
Option 7 - Echelon
Option 8 - Traditional Diamond
Option 9 - Single Point Urban Interchange
Future WCR 15
Option 1 - No Action
Option 2 - Move J-Bar-B-Road west to section line (WCR 15), full movement access and signalize if warranted with future development
Option 3 - Roundabout
WCR 17-North Side
Option 1 - No Action
Option 2 - Signalize if warranted; capacity improvements
Option 3 - Roundabout
Option 4 - Channelized 'T'
LEGEND
Expressway
Rural/Regional Highway
Arterial
X = Number of Thru Lanes
WCR = Weld County Road
Future Connection by Local Agency
16' Access Road with Advisory Shoulder
10' Bike and Pedestrian Path
Frontage Road
Xxx - Xxx PEL Proposed Options

SECTION 5B


WELD COUNTY
WCR 17 South Side
Option 1 - No Action
Option 2 - Signalize if warranted and capacity improvements
Option 3 - Roundabout
Option 4 - Channelized 'T'
WCR 19
Option 1 - No Action
Option 2 - Signalize if warranted and capacity improvements
Option 3 - Roundabout
4
WCR 17
WCR 19
LEGEND
Expressway
Rural/Regional Highway
Arterial
X = Number of Thru Lanes
WCR = Weld County Road
Future Connection by Local Agency
16' Access Road with Advisory Shoulder
10' Bike and Pedestrian Path
Frontage Road
Xxx - Xxx PEL Proposed Options

3. PEL Recommendations, Right of Way Preservation, and Prioritization of Improvements

Chapter 3 includes detailed two-page plans for each section of the SH 66 corridor. These plans are intended to provide substantive information about PEL findings and recommendations in a meaningful and easy to process manner.

Plan-on-a-Page Content

The plans document the following information for each section:

- Overview of section context and recommendations
- Summary of local agency planning efforts from **Appendix C**
- Existing and proposed roadway classification graphical definitions
- Recommended future corridor cross sections
- An overview of the recommended ROW preservation footprint
- Existing and proposed corridor visualizations
- Planned improvements, phasing, and prioritization covering roadway, bicycle, pedestrian, and transit options

PEL Recommendations and Right of Way Preservation

- This PEL recommendation ultimately includes a ROW preservation footprint (**Figure 14**).
- This footprint is considered the collective footprint of all options that have been carried forward as PEL Proposed Options. This common footprint of alternatives represents ROW that would be necessary to accommodate the aggregate of:
  - Ultimate roadway laneage
  - Intersection configurations
  - Bicycle, pedestrian, and transit facilities along SH 66
- This footprint is intended to inform decision-making at the state and local level in terms of preserving land and making land use decisions to not preclude future transportation improvements that have been identified in this PEL study.
- The footprint width for each section generally corresponds with cross-section widths from each plan, but expansion of the footprint occurs around intersections.
- **Appendix I** provides a detailed mapbook of the footprint, along with parcel information. **Appendix I** also includes a package of digital files that allow communities, developers, and stakeholders to view the ROW preservation footprint interactively. File formats include:
  - DWG – Computer aided design and drafting file
  - KML – Google Earth® file
  - Shapefile package – Geographic Information Systems package

Prioritization of Potential Improvements

- An important component of a PEL is prioritizing projects. Prioritization aids decision-makers in evaluating when and how to implement potential improvements. These potential improvements were prioritized based on when safety and operational needs likely will warrant recommended changes.
- PELs are long-term planning documents. As a result, prioritizations for SH 66 are shown in the context of:
  - Near-term as 0-10 years
  - Mid-term as 5-15 years
  - Long-term as 10-20 years
  - Beyond the planning horizon as more than 20 years
- The prioritization terms intentionally overlap because of uncertain funding availability and because of how rapidly corridor growth and development will occur. These terms are intended to be flexible prioritizations that accommodate future conditions.
- The prioritization of improvements also includes a preliminary opinion of potential costs, which is based on a planning level evaluation. These potential costs may serve as a placeholder for funding but have not been developed from engineered plans. This preliminary opinion of potential costs should not be programmed for future transportation improvements until further engineering analysis is completed for the improvement(s). These ranges are based on 2019 dollars and do not include potential right of way, environmental, utility, topography, and stakeholder considerations. Potential costs were developed through a high level consideration of major cost elements only (**Appendix L**).
- In terms of next steps, CDOT and local agencies will continue collaborating to identify funding sources and funding partnerships. SH 66 improvements may be implemented as smaller projects or in phases.
- If corridor conditions change beyond the land use, travel demand, and community priorities identified in this PEL, this prioritization may be subject to change. One example of potential change is addressed in **Chapter 5**, in terms of operational threats.

Figure 14. ROW Preservation Footprint Overview

This PEL ROW preservation footprint represents the collective footprint of all options that have been carried forward as PEL proposed options. Appendix I includes a detailed mapbook showing this footprint relative to parcel boundaries

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Section 1: McConnell Drive to 87th Street

Overview & Recommendations

- ☐ **Local agencies:** Town of Lyons and Unincorporated Boulder County
- ☐ **Known transportation problems:** Vehicular access, mobility, and safety; bicycle and pedestrian connections and safety, bicycle crossings
- ☐ **Existing roadway classification and laneage:** Rural/Regional Highway with two to five lanes
- ☐ **Recommended roadway classification:**
  - Arterial roadway from McConnell Drive to Highland Drive (Section 1A)
  - Rural/Regional Highway from Highland Drive through 75th Street (Section 1B) and 75th Street through 87th Street (Section 1C)
- ☐ **Total recommended cross section width:** 101 feet to 138 feet
- ☐ **Total right of way preservation acreage:** 99.6 acres
- ☐ **Recommended cross sections include:**
  - Four 12-foot travel lanes with a raised 16-foot median and curb and gutter (Section 1A)
  - Two 12-foot travel lanes with turn lanes at intersections and right-ofway preservation for potential multimodal and safety transportation improvements (Sections 1B and 1C)
  - Curb and gutter and bike lanes along SH 66 (Section 1A)
  - Either a 10-foot bike and pedestrian path or a 16-foot access road with advisory shoulders along SH 66 (Section 1B and 1C)
  - A five-foot offset to clear zone (a clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway) in areas that are not curb & gutter

Recommended Roadway Classification

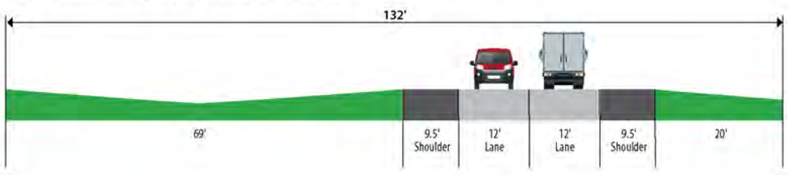
	DESCRIPTION	ACCESS SPACING
ARTERIAL 	Moderate to low travel speeds and traffic volumes with moderate access	1/2 mile for full movement intersections, with possible 3/4 movement at quarter miles, and RIRO access for each parcel (should share access if possible)
RURAL/REGIONAL HIGHWAY 	Moderate to high speeds with moderate to low traffic volumes	1/2 mile + for full movement intersections with public roadways, maximum of one access per parcel (depending on other roadways that could preclude access) with shared access preferable

Recommended Right-of-Way Preservation Footprint

Expansion of intersections throughout Section 1 should consider the potential for any future expansion of the roadway and should fit appropriately in the right-of-way. Additionally, the construction of the Access Road with Advisory Shoulders and Bike Only Path should be placed in the right-of-way such that if future roadway expansion occurs, the bicycle and pedestrian facilities would not require replacement.

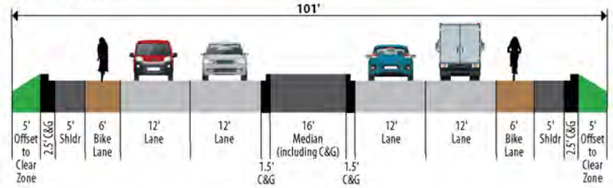
Section 1B & Section 1C Existing Conditions

(exact dimensions vary slightly throughout the section)

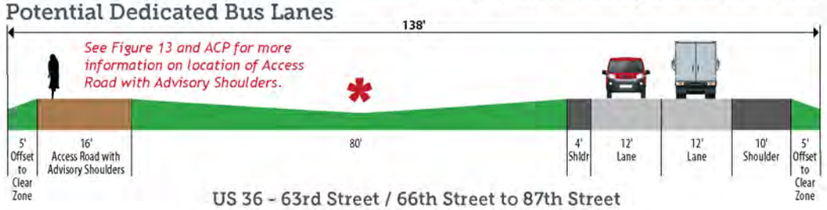


Recommended Cross Sections (facing east)

Section 1A with Curb & Gutter

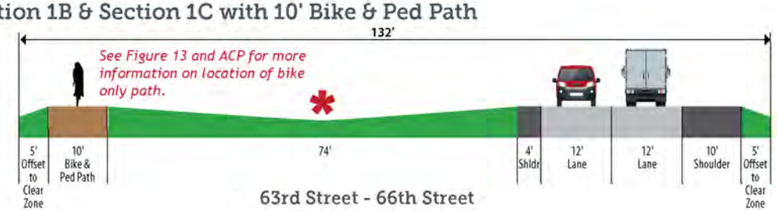


Section 1B & Section 1C with 16' Access Road with Advisory Shoulders with Potential Dedicated Bus Lanes



US 36 - 63rd Street / 66th Street to 87th Street

Section 1B & Section 1C with 10' Bike & Ped Path



63rd Street - 66th Street

** Right-of-way preservation for operational resiliency*

Existing & Proposed Visualizations (facing west)

Section 1A

Center left turn lane

Raised median with left turn lanes and bike lanes

Section 1B

No median separation and minimal turn lanes

Two through lanes, wide shoulders, and access road with advisory shoulders; with turn lanes at intersections

Section 1C

No median separation and minimal turn lanes

Two through lanes, wide shoulders and side path; with turn lanes at intersections

Improvements & Preliminary Opinion of Potential Costs

TRANSPORTATION CONSIDERATIONS:

The access road with advisory shoulders option is not an approved treatment in the Manual on Uniform Traffic Control Devices and would require a 'request for experiment' to implement. The proposed bicycle and pedestrian path and access road with advisory shoulders must be accommodated with safety in mind within the highway clear zone and at all intersection crossings along the corridor.

ENVIRONMENTAL CONSIDERATIONS:

Resources include floodplains and floodway, potential wetlands, Preble's Meadow Jumping Mouse habitat, potential bald eagle nest sites, parks and open space, proposed trails, utilities, noise sensitive areas, hazardous materials sites, visual resources, and potential historic sites.

Near-Term 0-10 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
1A	Section-wide	High rate of access-related crashes; high-use bike corridor with limited shoulders	Construct four-lane cross-section with curb and gutter where missing, install bike lanes and raised median, and consolidate accesses	$3.1 Mil - $4.2 Mil
1A	US 36	Conflicts between vehicles and cyclists/ pedestrians crossing SH 66	Construct grade-separated underpass for cyclists and pedestrians	$550,000 - $750,000
1B	Section-wide	High rate of run-off-road crashes	Install rumble strips	<$100,000
1B	West of 75th St	High rate of run-off-road crashes	Widen shoulders along SH 66 at 75th St and westward	<$150,000
1B	Section-wide	Safety concerns and delays for vehicles entering and exiting the highway from driveways and low-volume roads	Install access road with advisory shoulders to consolidate accesses to SH 66, construct deceleration and acceleration lanes on SH 66 at those intersections	$4.7 Mil - $6.2 Mil
1C	75th St	High rate of intersection-related crashes and conflicts between vehicles/cyclists	Re-assess signal timing and/or consider protected only left turns. Construct grade-separated underpass for cyclists and pedestrians	$550,000 - $750,000
1C	Section-wide	High rate of run-off-road crashes	Install rumble strips Widen shoulders along SH 66 at 75th St and eastward plus at 87th St and westward	<$100,000 $200,000 - $300,000
1C	Section-wide	Safety concerns and delays for vehicles entering and exiting the highway from driveways and low-volume roads	Install access road with advisory shoulders to consolidate accesses to SH 66, construct deceleration and acceleration lanes on SH 66 at those intersections	$1.3 Mil - $1.8 Mil

Mid-Term 5-15 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
1B	Section-wide	Lacks regional bicycle and pedestrian mobility options	Construct bike/pedestrian only connections between segments of the access road with advisory shoulders. Construct trail along BNSF (planned by local agencies; not included in costs)	$550,000 - $700,000
1B	Section-wide	High delay on side streets as development occurs and regional volumes increase	If warranted, install signals as allowed in the ACP (potential considerations: E Highland Dr, 53rd St, and 66th St)	$350,000 - $400,000 per intersection
1C	Section-wide	Lacks regional bicycle and pedestrian mobility options	Construct bike/pedestrian only connections between segments of the access road with advisory shoulders	$500,000 - $650,000

Long-Term 10-20 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
1B	53rd St	Conflicts between vehicles and cyclists/pedestrians crossing SH 66	Construct grade-separated underpass for cyclists and pedestrians	$550,000 - $750,000

Beyond Horizon Year +20 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
1B	Section-wide	Multi-modal and vehicular transportation concerns	Multi-modal and safety transportation improvements	Not calculated; beyond planning horizon
1C	Section-wide	Multi-modal and vehicular transportation concerns	Multi-modal and safety transportation improvements	Not calculated; beyond planning horizon

Disclaimer: *This preliminary opinion of potential costs is based on a planning level evaluation. These potential costs may serve as a placeholder for funding but have not been developed based on engineered plans. This preliminary opinion of potential costs should not be programmed for future transportation improvements until further engineering analysis is completed for the improvement(s). These ranges are based on 2019 dollars and do not include potential right of way, environmental, utility, topography, and stakeholder considerations. Potential costs were developed through a high level consideration of major cost elements only. Additional information is provided in Appendix L.*

Local Agency Planning Efforts

Lyons vision for:

- Business district along SH 66
- US 36/SH 66 roundabout
- Gateway features at US 36/SH 66 and east of US 36 along SH 66

Boulder County vision for:

- Improve bus service and stops, park and ride capacity, and local transit connections; add queue jump lanes
- Incorporate bikeable shoulders and key grade separated crossings
- Enhance intersections to improve safety and convenience for all modes and to reduce congestion

For more information, please view the SH 66 PEL Corridor Conditions Report (Appendix C).

Section 2: 87th Street to County Line Road

Overview & Recommendations

- ☐ **Local agencies:** City of Longmont and Unincorporated Boulder County
- ☐ **Known transportation problems:** Vehicular access, mobility, and safety; bicycle and pedestrian mobility and safety; transit access
- ☐ **Existing roadway classification and laneage:** Non-rural principal highway with two to four lanes
- ☐ **Recommended roadway classification:** Expressway
- ☐ **Total recommended cross section width:** 109 feet to 145 feet
- ☐ **Total right of way preservation acreage:** 82.8 acres
- ☐ **Recommended cross sections include:**
  - Four travel lanes (two 12-foot lanes in each direction)
  - A 16-foot wide median (raised with curb and gutter)
  - Five-foot outside shoulders
  - A 10-foot bike and pedestrian path on one or both sides of the road
  - A 16-foot frontage road along SH 66 in select locations
  - A five-foot offset to clear zone (a clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway)
  - Addition of turn lanes at intersections

Local Agency Planning Efforts

Longmont vision for:

- Side path from 87th Street to County Line Road
- Two underpasses at SH 66/US 287 and SH 66/Pace Street
- Tie bike lanes into north-south routes along SH 66
- SH 66/US 287 Park-n-Ride
- Active participation with CDOT for multi-modal plan

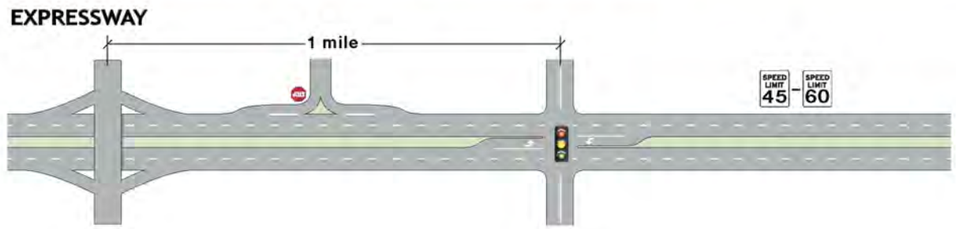
Boulder County vision for:

- Improve bus service and stops, park and ride capacity, and local transit connections; add queue jump lanes
- Incorporate bikeable shoulders and key grade separated crossings
- Enhance intersections to improve safety and convenience for all modes and to reduce congestion

For more information, please view the SH 66 PEL Corridor Conditions Report (Appendix C).

Recommended Right-of-Way Preservation Footprint

Recommended Roadway Classification



DESCRIPTION

Moderately high speeds and traffic volumes with limited access, multiple lanes in each direction and separated directional travel

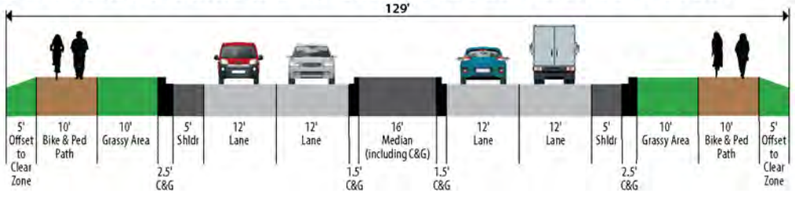
ACCESS SPACING

1 mile + for full movement, with possible RIRO at half mile

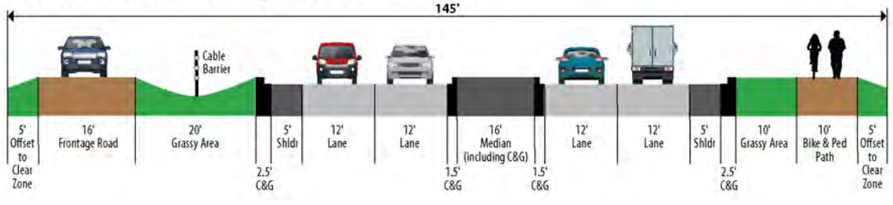
Recommended Cross Sections (facing east)

Section 2 with Curb & Gutter and 10' Bike & Ped Path

Section 2 with Curb & Gutter and 10' Bike & Ped Path on North & South



Section 2 with Frontage Road



Existing & Proposed Visualizations (facing west)

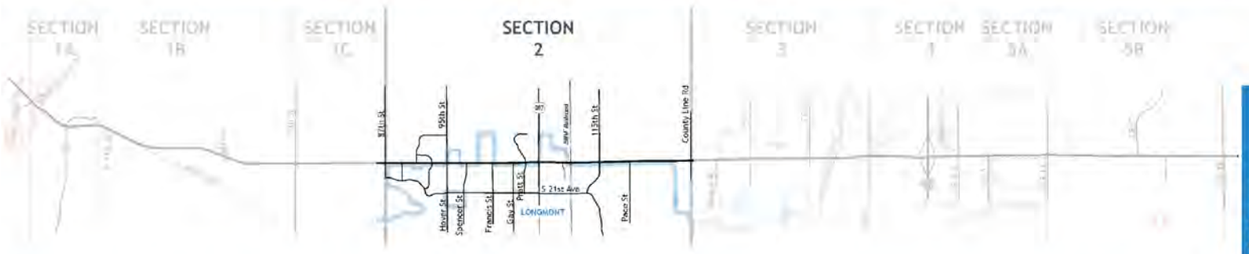
Section 2

Existing | Proposed

No median separation and minimal turn lanes

Raised median with side path

Improvements & Preliminary Opinion of Potential Costs



Near-Term 0-10 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
2	Section-wide	High delay at stop-controlled intersections	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted install signals as allowed in the ACP (potential considerations: 87th St/Airport Rd, Francis St, Alpine St, Pace St, Sundance Dr)	$350,000 - $400,000 per intersection
2	East of 87th St	High rate of run-off-road crashes	Widen shoulders along SH 66 at 87th St and eastward	$250,000 - $400,000
2	87th St/Airport Rd to 95th St/Hover St	Lacks regional bicycle and pedestrian mobility options; densely spaced driveways with direct access to SH 66 near Anhawa St	Construct side path along southern side of SH 66; construct a Frontage Road between Anhawa St and west of Hover St	$700,000 - $1 Mil
2	95th St/Hover St to Erfert St	Failing intersection LOS and long queues approaching Hover St and US 287; lacks regional bicycle and pedestrian mobility options	Construct four-lane cross-section including auxiliary lanes, median, side paths along north and south sides of SH 66 and implement access control recommendations. Add auxiliary lanes and increase capacity at Hover St intersection	$9.6 Mil - $13 Mil
2	US 287	Failing intersection LOS and high rate of intersection-related crashes; multiple public comments/concerns received	Improve intersection; recommend carrying forward displaced left turn or other alternative intersection option	$5.4 Mil - $7.1 Mil
2	Erfert St to Alpine St	Lacks regional bicycle and pedestrian mobility options	Construct side path along southern side of SH 66	$650,000 - $850,000
2	Alpine St to County Line Rd	Failing intersection LOS at County Line Rd, high rate of intersection-related, head-on, and run-off-road crashes through this segment; lacks regional bicycle and pedestrian mobility options	Construct four-lane cross-section including auxiliary lanes, median, side path along south side of SH 66, and implement access control recommendations. Add auxiliary lanes and increase capacity at County Line Rd intersection	$7.5 Mil - $10 Mil

TRANSPORTATION CONSIDERATIONS:

The proposed bicycle and pedestrian paths must be accommodated with safety in mind within the highway clear zone and by providing clearly marked crosswalks at intersections. A variety of intersection types and innovations developed during Level 3 could accommodate future traffic conditions, including:

- SH 66 and Hover/95th Street: Partial displaced left turn (for westbound to southbound left); fully displaced left turn; grade-separation, such as echelon, single point urban interchange, or diamond interchange; junior interchange in the northeast quadrant.
- SH 66 and US 287: fully displaced left turn; grade-separation, such as echelon, single point urban interchange, or diamond interchange; split intersection for westbound/diamond interchange for eastbound.

ENVIRONMENTAL CONSIDERATIONS:

Resources include floodplains and floodway, potential wetlands, Preble's Meadow Jumping Mouse habitat, potential bald eagle nest sites, parks and open space, proposed trails, utilities, noise sensitive areas, hazardous materials sites, visual resources, and potential historic sites.

Mid-Term 5-15 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
2	Section-wide	High delay on stop-controlled intersections	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted, install signals as allowed in the ACP (potential considerations: 87th St/Airport Rd, Francis St, Alpine St, Sundance Dr)	$350,000 - $400,000 per intersection
2	Erfert St to Alpine St	Over capacity as a two-lane highway	Construct four-lane cross-section including auxiliary lanes, median, and implementing access control recommendations. Grade-separate SH 66 over the BNSF railroad	$8.3 Mil - $11 Mil

Long-Term 10-20 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
2	Section-wide	High delay on stop-controlled intersections	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted, install signals as allowed in the ACP (potential considerations: 87th St/Airport Rd, Francis St, Alpine St, Sundance Dr)	$350,000 - $400,000 per intersection
2	87th St/Airport Rd to 95th St/Hover St	Over capacity as a two-lane highway	Construct four-lane cross-section including auxiliary lanes, median, and implementing access control recommendations	$4.5 Mil - $6 Mil
2	95th St/Hover St	Failing intersection LOS	Improve intersection; recommend carrying forward Partial Displaced Left Turn or other alternative intersection option	$2.8 Mil - $4 Mil
2	Pace St	Lacks safe facility/crossing for bicyclists and pedestrians	Install bicycle and pedestrian grade-separated crossing	$750,000 - $1 Mil

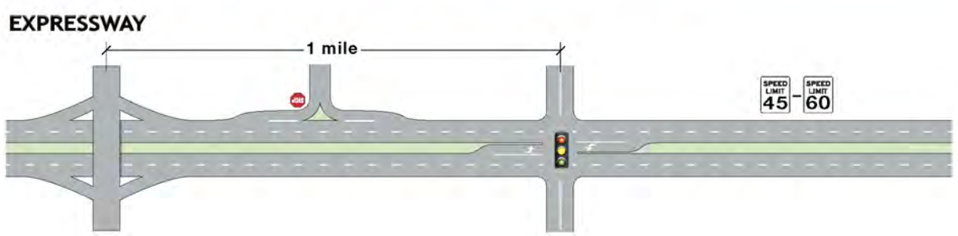
Disclaimer: *This preliminary opinion of potential costs is based on a planning level evaluation. These potential costs may serve as a placeholder for funding but have not been developed based on engineered plans. This preliminary opinion of potential costs should not be programmed for future transportation improvements until further engineering analysis is completed for the improvement(s). These ranges are based on 2019 dollars and do not include potential right of way, environmental, utility, topography, and stakeholder considerations. Potential costs were developed through a high level consideration of major cost elements only. Additional information is provided in Appendix L.*

Section 3: County Line Road to 3rd Street (WCR 7)

Overview & Recommendations

- ☐ **Local agencies:** City of Longmont, Town of Mead, and Unincorporated Weld County
- ☐ **Known transportation problems:** Vehicular access, mobility, and safety; bicycle connections and safety
- ☐ **Existing roadway classification and laneage:** Rural/regional highway with two lanes
- ☐ **Recommended roadway classification:** Expressway
- ☐ **Total recommended cross section width:** 122 feet
- ☐ **Total right of way preservation acreage:** 45.3 acres
- ☐ **Recommended cross section includes:**
  - Four travel lanes (two 12-foot lanes in each direction)
  - A 16-foot wide grassy median with cable barrier
  - A 10-foot bike and pedestrian path along SH 66
  - 10-foot shoulders
  - A five-foot offset to clear zone (a clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway)
  - Addition of turn lanes at intersections

Recommended Roadway Classification



DESCRIPTION	ACCESS SPACING
Moderately high speeds and traffic volumes with limited access, multiple lanes in each direction and separated directional travel	1 mile + for full movement, with possible RIRO at half mile

Local Agency Planning Efforts

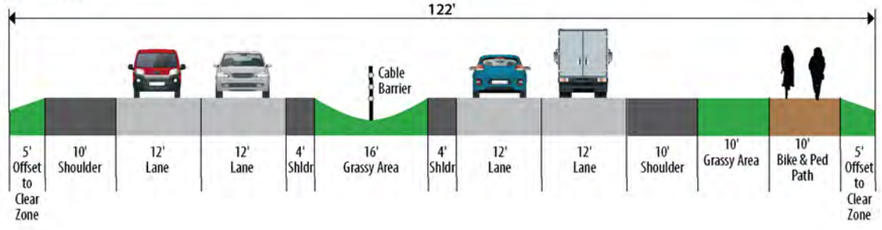
Longmont vision for:
- Tie bike lanes into north-south routes along SH 66
- Active participation with CDOT for multi-modal plan

Mead vision for:
- Gateways at SH 66/WCR 1 (County Line Road) and SH 66/WCR 7 (3rd Street)
- SH 66/3rd Street intersection improvements and signalization
- Widen SH 66
- Proposed trail

Weld County vision for:
- Trail connections
- Access control
- Intersection improvement partnership SH 66/WCR 7 (3rd Street)

Recommended Cross Section (facing east)

Section 3



For more information, please view the SH 66 PEL Corridor Conditions Report (Appendix C).

Recommended Right-of-Way Preservation Footprint

Existing & Proposed Visualizations (facing west)

Section 3

Existing	Proposed
	
No median separation and minimal turn lanes	Cable barrier/grassy median with side path

Improvements & Preliminary Opinion of Potential Costs

TRANSPORTATION CONSIDERATIONS:

The proposed bicycle and pedestrian path must be accommodated with safety in mind within the highway clear zone and by providing clearly marked crosswalks at intersections. A variety of intersection types and innovations developed during Level 3 could accommodate future traffic conditions at SH 66 and County Line Road, including capacity improvements to add turn lanes and acceleration lanes; fully displaced left turn; or grade-separation, such as echelon, single point urban interchange, or diamond interchange.

ENVIRONMENTAL CONSIDERATIONS:

Resources include potential wetlands, proposed trails, utilities (including oil/gas production facilities), noise sensitive areas, hazardous material sites, visual resources, and potential historic resources.

Near-Term 0-10 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
3	Section-wide	High rate of run-off-road and access-related crashes	Install rumble strips along corridor; add auxiliary lanes where warranted at intersections	<$100,000 $3 Mil -$4 Mil (unless mainline widening occurs first)
3	Section-wide	High delay on stop-controlled intersections	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted, install signals as allowed in the ACP (potential considerations: WCR 3, WCR 5, WCR 5.5 (interim condition only))	$350,000 - $400,000 per intersection

Mid-Term 5-15 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
3	Section-wide	Over capacity as a two-lane highway and lacks regional bicycle and pedestrian mobility options	Construct four-lane cross-section including auxiliary lanes, median, side path along south side of SH 66, and implement access control recommendations. Grade-separate SH 66 over the Great Western railroad	$16.3 Mil - $22 Mil
3	High delay on stop-controlled intersections	Over capacity as a two-lane highway	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted, install signals as allowed in the ACP (potential considerations: WCR 3, WCR 5, WCR 5.5 (interim condition only))	$350,000 - $400,000 per intersection

Long-Term 10-20 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
3	East of WCR 5	Conflicts with planned regional trail between vehicles and cyclists/pedestrians crossing SH 66	Construct grade-separated underpass for cyclists and pedestrians if it is not feasible to utilize SH 66 grade-separation over Great Western railroad	$750,000 - $1 Mil
3	Section-wide	High delay on stop-controlled intersections	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted, install signals as allowed in the ACP (potential considerations: WCR 3, WCR 5, WCR 5.5 (interim condition only))	$350,000 - $400,000 per intersection

Disclaimer: *This preliminary opinion of potential costs is based on a planning level evaluation. These potential costs may serve as a placeholder for funding but have not been developed based on engineered plans. This preliminary opinion of potential costs should not be programmed for future transportation improvements until further engineering analysis is completed for the improvement(s). These ranges are based on 2019 dollars and do not include potential right of way, environmental, utility, topography, and stakeholder considerations. Potential costs were developed through a high level consideration of major cost elements only. Additional information is provided in Appendix L.*

Section 4: 3rd Street (WCR 7) to Weld County Road 11

Overview & Recommendations

- ☐ **Local agencies:** Town of Mead and Unincorporated Weld County
- ☐ **Known transportation problems:** Access, mobility, and safety concerns for vehicles, bicycles, pedestrians, and transit
- ☐ **Existing roadway classification and laneage:** Non-rural Principal Highway with two to three lanes east of I-25; four to five lanes west of I-25
- ☐ **Recommended roadway classification:** Arterial roadway
- ☐ **Total recommended cross section width:** 133 feet to 143 feet
- ☐ **Total right of way preservation acreage:** 45.2 acres
- ☐ **Recommended cross sections include:**
  - Six travels lanes (three 12-foot lanes in each direction) and five-foot outside shoulders
  - A raised 16-foot wide median
  - Curb and gutter along SH 66
  - A 10-foot bike and pedestrian path along SH 66 setback 5 feet from SH 66 on both sides of SH 66 at select locations
  - A 5-foot offset to clear zone (a clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway)
  - Addition of turn lanes at intersections

Local Agency Planning Efforts

Mead vision for:

- Gateways at I-25/SH 66, and SH 66/WCR 7 (3rd Street)
- SH 66/3rd Street intersection improvements and signalization
- Widen SH 66
- Proposed trail connections

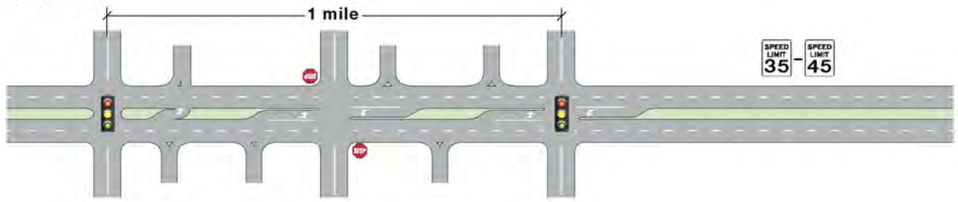
Weld County vision for:

- Trail connections
- Access control
- Intersection improvement partnership at SH 66/WCR 7 (3rd Street)

For more information, please view the SH 66 PEL Corridor Conditions Report (Appendix C).

Recommended Roadway Classification

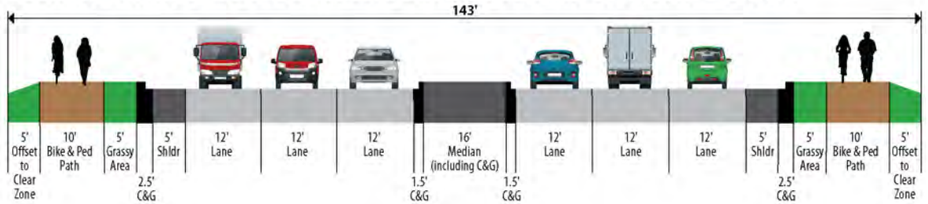
ARTERIAL



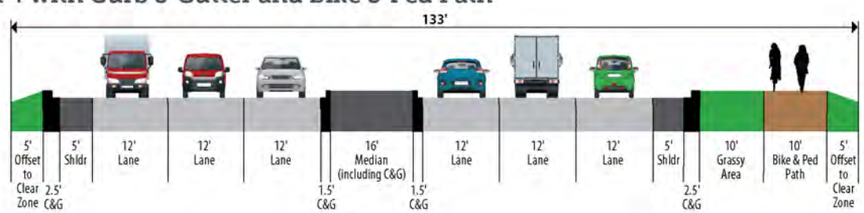
DESCRIPTION	ACCESS SPACING
Moderate to low travel speeds and traffic volumes with moderate access	1/2 mile for full movement intersections, with possible 3/4 movement at quarter miles, and RIRO access for each parcel (should share access if possible)

Recommended Cross Sections (facing east)

Section 4 with Curb & Gutter and Bike & Ped Path on North & South



Section 4 with Curb & Gutter and Bike & Ped Path



Recommended Right-of-Way Preservation Footprint

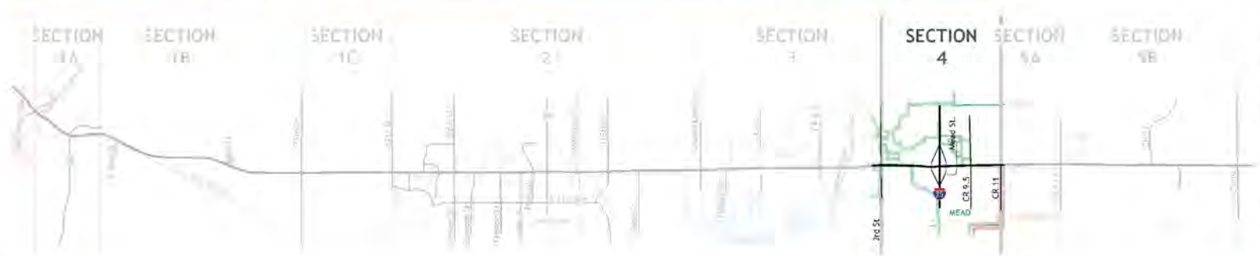
Existing & Proposed Visualizations (facing west)

Section 4

Striped median separation

Raised medians with side paths

Improvements & Preliminary Opinion of Potential Costs



TRANSPORTATION CONSIDERATIONS:

The proposed bicycle and pedestrian path must be accommodated with safety in mind within the highway clear zone and by providing clearly marked crosswalks at intersections. A variety of intersection types and innovations developed during Level 3 could accommodate future traffic conditions at SH 66 and WCR 9.5, including split intersection for westbound/diamond interchange for eastbound; partial or fully displaced left turn; or grade-separation, such as echelon, single point urban interchange, or diamond interchange.

ENVIRONMENTAL CONSIDERATIONS:

Resources include potential wetlands, proposed trails, utilities (including oil/gas production facilities), noise sensitive areas, hazardous material sites, visual resources, and potential historic resources.

Near-Term 0-10 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
4	WCR 7 to I-25	Lacks regional bicycle and pedestrian mobility options	Construct side path along northern side of SH 66	$650,000 - $850,000
4	WCR 7	Failing intersection LOS	Improve intersection by adding auxiliary lanes and increasing capacity (design currently underway by CDOT/nearby developers)	Not calculated; design currently underway
4	Mead Street	High delay on stop-controlled intersections	Monitor intersection operations and restrict left turns out if a documented safety need is shown	Minimal

Mid-Term 5-15 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
4	WCR 7 to Foster Ridge Dr	Over capacity as a two-lane highway and lacks regional bicycle and pedestrian mobility options	Improve highway to a four-lane cross-section including auxiliary lanes, median, side path along south side of SH 66, and implement access control recommendations. Signalize Foster Ridge Dr when warranted	$2.4 Mil - $3.1 Mil
4	Section-wide	High delay on stop-controlled intersections	Restrict left turns out where identified in the ACP and a documented safety need is shown. Monitor and if warranted, install signals as allowed in the ACP	$350,000 - $400,000 per intersection
4	WCR 9.5 to WCR 11	Over capacity as a two-lane highway and lacks regional bicycle and pedestrian mobility options	Improve highway to a four-lane cross-section including auxiliary lanes, median, side path along south side of SH 66, and implement access control recommendations	$2.6 Mil - $3.4 Mil
4	Mead Street	High delay at stop-controlled intersection and high crash rate	Monitor intersection operations and restrict left turns out if a documented safety need is shown	Minimal
4	WCR 9.5	Failing intersection LOS	Add auxiliary lanes and increase capacity	$370,000 - $500,000

Long-Term 10-20 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
4	Section-wide	Over capacity as a four-lane highway	Improve highway from a four-lane to the ultimate six-lane cross-section	$2.3 Mil - $3 Mil
4	East of WCR 7	Conflicts with planned regional trail between vehicles and cyclists/ pedestrians crossing SH 66	Construct grade-separated underpass for cyclists and pedestrians	$550,000 - $750,000
4	WCR 9.5	Failing intersection LOS	Grade-separate intersection; recommend carrying forward split intersection/partial interchange or other alternative intersection option	$9.6 Mil - $13 Mil

Disclaimer: *This preliminary opinion of potential costs is based on a planning level evaluation. These potential costs may serve as a placeholder for funding but have not been developed based on engineered plans. This preliminary opinion of potential costs should not be programmed for future transportation improvements until further engineering analysis is completed for the improvement(s). These ranges are based on 2019 dollars and do not include potential right of way, environmental, utility, topography, and stakeholder considerations. Potential costs were developed through a high level consideration of major cost elements only. Additional information is provided in Appendix L.*

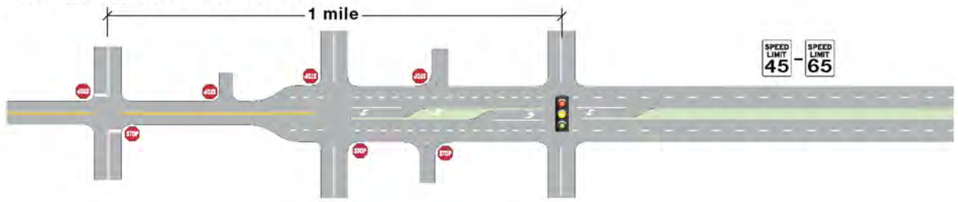
Section 5: Weld County Road 11 to Weld County Road 19

Overview & Recommendations

- ☐ **Local agencies:** Town of Mead and Unincorporated Weld County
- ☐ **Known transportation problems:** Vehicular access, mobility, and safety; bicycle and pedestrian mobility and safety
- ☐ **Existing roadway classification and laneage:** Non-rural Principal Highway and Rural/Regional Highway with two lanes
- ☐ **Recommended roadway classification:** Rural/Regional Highway
- ☐ **Total recommended cross section width:** 122 feet
- ☐ **Total right of way preservation acreage:** 67.9 acres
- ☐ **Recommended cross section includes:**
  - Four travel lanes (two 12-foot lanes in each direction)
  - A 16-foot wide grassy median with cable barrier
  - A 10-foot bike and pedestrian path along SH 66
  - 10-foot shoulders
  - A five-foot offset to clear zone (a clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway)
  - Addition of turn lanes at intersections

Recommended Roadway Classification

RURAL/REGIONAL HIGHWAY

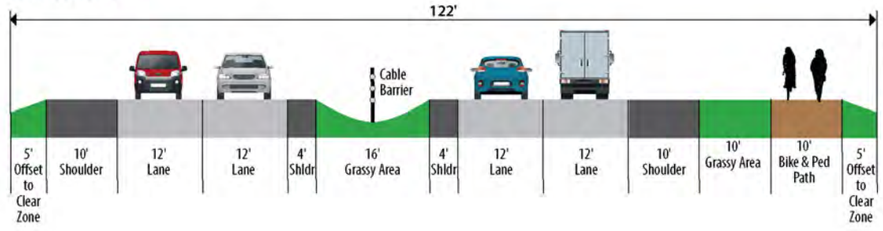


DESCRIPTION
Moderate to high speeds with moderate to low traffic volumes

ACCESS SPACING
1/2 mile + for full movement intersections with public roadways, maximum of one access per parcel (depending on other roadways that could preclude access) with shared access preferable

Recommended Cross Section (facing east)

Section 5



Local Agency Planning Efforts

Mead vision for:
- Widen SH 66
- Proposed trail connections

Weld County vision for:
- Trail connections
- Access control
- Intersection improvement partnerships at SH 66/ WCR 13

Firestone vision for:
- Trail connections
- Trail crossing

For more information, please view the SH 66 PEL Corridor Conditions Report (Appendix C).

Recommended Right-of-Way Preservation Footprint

Existing & Proposed Visualizations (facing west)

Section 5A


Existing

No median separation and minimal turn lanes


Proposed

Cable barrier/grassy median with side path

Section 5B


Existing

No median separation and minimal turn lanes


Proposed

Cable barrier/grassy median with side path

Improvements & Preliminary Opinion of Potential Costs

TRANSPORTATION CONSIDERATIONS:

A variety of intersection types and innovations developed during Level 3 could accoommodate future traffic conditions at SH 66 and WCR 13/Colorado Blvd., including split intersection for westbound/diamond interchange for eastbound; partial or fully displaced left turn lane; or grade-separation, such as echelon, single point urban interchange, or diamond interchange.

ENVIRONMENTAL CONSIDERATIONS:

Resources include floodplains and floodway, potential wetlands, Preble's Meadow Jumping Mouse habitat, potential bald eagle nest sites, parks and open space, proposed trails, utilities, noise sensitive areas, hazardous materials sites, areas with higher minority and low-income populations, visual resources, and potential historic sites.

Near-Term 0-10 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
5A	Section-wide	High delay at stop-controlled intersection	Monitor and if warranted, install signals as allowed in the ACP (potential considerations: WCR 11, WCR 11.5 when constructed)	$350,000 - $400,000 per intersection
5A	WCR 11 to WCR 13	High rate of run-off-road and access-related crashes	InInstall rumble strips	<$100,000
5B	WCR 13 to WCR 19	High rate of run-off-road and access-related crashes	Install rumble strips and widen shoulders	$1.4 Mil - $2 Mil
5B	WCR 13	High crash rate at WCR 13	Install eastbound and westbound right turn lanes	$750,000 - $1 Mil

Mid-Term 5-15 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
5A	Section-wide	High delay at stop-controlled intersections	Monitor and if warranted, install signals as allowed in the ACP (potential considerations: WCR 11, WCR 11.5 when constructed)	$350,000 - $400,000 per intersection
5A	WCR 11 to WCR 13	Over capacity as a two-lane highway	Improve highway to a four-lane cross-section including auxiliary lanes, depressed median, side path along south side of SH 66, and implement access control recommendations	$3.9 Mil - $5.1 Mil
5B	Section-wide	High delay at stop-controlled intersections	Monitor and if warranted, install signals as allowed in the ACP (potential considerations: future WCR 15 when constructed, WCR 17N, WCR 17S, WCR 19)	$350,000 - $400,000 per intersection

Long-Term 10-20 years

	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
5A	Section-wide	High delay at stop-controlled intersections	Monitor and if warranted, install signals as allowed in the ACP (potential considerations: WCR 11, WCR 11.5 when constructed)	$350,000 - $400,000 per intersection
5B	Section-wide	High delay at stop-controlled intersections	Monitor and if warranted, install signals as allowed in the ACP (potential considerations: future WCR 15 when constructed, WCR 17N, WCR 17S, WCR 19)	$350,000 - $400,000 per intersection
5B	East of WCR 17N	Conflicts with planned regional trail between vehicles and cyclists/pedestrians crossing SH 66	Construct grade-separated underpass for cyclists and pedestrians	$550,000 - $750,000
5B	Section-wide	Lacks regional bicycle and pedestrian mobility options	Construct side path along southern side of SH 66	$1.7 Mil - $2.3 Mil

Beyond Horizon Year +20 years

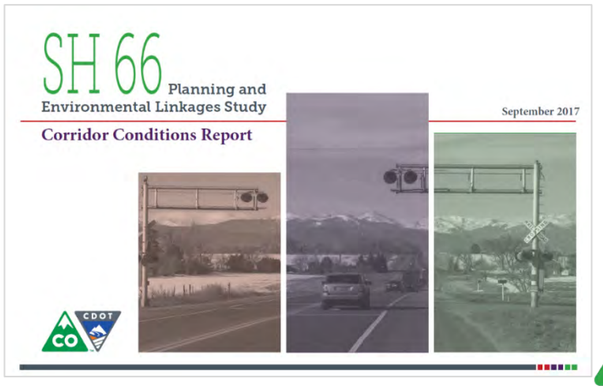
	LOCATION ON SH 66 (intersection or section)	IDENTIFIED PROBLEM	RECOMMENDED IMPROVEMENT	COST OPINION (See disclaimer)
5B	Section-wide	Over capacity as a two-lane highway	Improve highway to a four-lane cross-section including auxiliary lanes, depressed median, and implement access control recommendations	Not calculated; beyond planning horizon
5B	WCR 13	Intersection over capacity	Grade-separate intersection; recommend carrying forward split intersection/partial interchange or other alternative intersection option	Not calculated; beyond planning horizon

Disclaimer: *This preliminary opinion of potential costs is based on a planning level evaluation. These potential costs may serve as a placeholder for funding but have not been developed based on engineered plans. This preliminary opinion of potential costs should not be programmed for future transportation improvements until further engineering analysis is completed for the improvement(s). These ranges are based on 2019 dollars and do not include potential right of way, environmental, utility, topography, and stakeholder considerations. Potential costs were developed through a high level consideration of major cost elements only. Additional information is provided in Appendix L.*

SH 66 Planning and Environmental Linkages Study

4. Affected Environment, Environmental Consequences, and Mitigation Strategies

The *SH 66 PEL Corridor Conditions Report* (**Appendix C**) summarizes environmental resources in the study area. This chapter provides a planning level overview of anticipated impacts associated with the PEL Recommendations. Data used in this assessment were derived from readily available data sources and environmental field visits during development of the *Corridor Conditions Report*.



For more baseline environmental information, view the SH 66 PEL Corridor Conditions Report **(Appendix C).**

How is PEL environmental documentation used?

As funding becomes available for implementation of PEL Recommendations, CDOT will determine the appropriate level of NEPA study that is required as part of project delivery. This PEL information serves to inform that process and provide a baseline understanding for decision makers, stakeholders, and the public about sensitive environmental resources.

Potential NEPA Documentation Next Steps

Based on the level of NEPA study and environmental context of each project, some or all resources identified in this chapter may need to be addressed during project delivery, once funds become available. NEPA involves an assessment of the affected environment (existing conditions), anticipated environmental impacts, and environmental mitigation commitments. Depending on project context and complexity, NEPA involves:

- **Categorical exclusions (CatEx)**: For actions that do not individually or cumulatively result in significant impacts; involves a focused assessment of resources based on scoping coordination with CDOT
- **Environmental assessments (EA):** For actions that may individually or cumulatively result in significant impacts; prepared when there is insufficient information to determine if a project's impacts warrant further study
- **Environmental impact statements (EIS)**: For projects that are anticipated to have significant impacts and/or a high level of controversy

Environmental Impacts Evaluation

- A quantitative evaluation, using GIS spatial analysis, was completed for:
  - Floodplains and Floodways
  - Wetlands and Other Waters of the US
  - T&E Species, Species of Special Concern, Migratory Birds and Eagles
  - Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges
- A qualitative assessment, using professional judgment, was completed for:
  - Utilities
  - Traffic Noise
  - Hazardous Materials
  - Environmental Justice
  - Visual Resources
  - Historic Resources
- Potential impacts are summarized in **Table 2**.

How were environmental impacts analyzed in this PEL Study?

Chapter 3 describes the ROW preservation footprint, which represents the collective area of SH 66 PEL options that were recommended or carried forward as a result of this PEL study. Impact analyses included an evaluation of this footprint relative to mapped environmental resources as shown in **Appendix C**.

Environmental Resource Next Steps

- **Floodplains and Floodways:** Design solutions should minimize impacts to the floodplain and be developed cooperatively with US Army Corps of Engineers (USACE), Federal Emergency Management Agency, and affected communities. If an alternative encroaches on a regulatory floodway/floodplain, an evaluation is necessary to determine if the encroachment would require a revision to the regulatory floodway (impacts to floodplains may require a Conditional Letter of Map Revision). For alternatives with significant impacts, discuss practicable alternatives or mitigation.
- **Wetlands and Other Waters of the US:** When wetland impacts are expected, build adequate time into the design schedule to allow a wetland delineation and consequent permitting.
- **T&E Species, Species of Special Concern, Migratory Birds and Eagles:** When wildlife impacts are expected, build adequate time into the design schedule to consider temporary and permanent impacts and allow time for a biological resources report, Senate Bill 40 reporting, consultation, and consequent permitting. Consider the development of wildlife crossings or fencing with future projects.
- **Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges:** When Section 4(f) and Section 6(f) evaluations are necessary, build adequate time into the design schedule to avoid construction delays. Design modifications and/or mitigation considerations may be necessary in the Section 4(f) process. If a Section 6(f) conversion of land is necessary, CDOT must replace the land. The local agency, Colorado Parks and Wildlife (CPW), and the National Park Service must approve the replacement land. Typically, replacement occurs at a 1:1 ratio.

Environmental Resource Next Steps (Continued)

- **Utilities:** During the design phase, identify and evaluate all utilities (not just major utilities) for impacts from proposed improvements, determine location time requirements and cost responsibility, and obtain the project utility clearance from CDOT. When project-funded relocations are necessary, adequate budget must be made available. Build adequate time and construction phasing into the schedule to allow utility relocations to avoid construction delays. Adherence to the new subsurface utility engineering statute may be necessary. **Appendix J** includes additional information.
- **Traffic Noise:** Conduct a traffic noise impact and abatement analysis for NEPA. If noise abatement appears likely, solicit the Benefited Receptor Preferences Survey after the Final Office Review but during the NEPA process (for projects anticipated to meet CatEx criteria) or during final design for an EA or an EIS. If a simple majority of benefitting receptors favors abatement, then the project becomes committed to constructing and funding the abatement measure(s). Noise walls may cost about $2 million per mile. The likelihood for abatement to be feasible and reasonable increases with a higher density of impacted receptors.
- **Hazardous Materials:** If a Phase II Environmental Site Assessment (ESA) and/or remediation activities are required based on a Modified Environmental Site Assessment (MESA), Initial Site Assessment, or Phase I ESA findings, there may be substantial delays for property acquisition or construction in the vicinity. Also, a Phase II ESA and remedial activities could require additional funding. These activities are associated with the acquisition of properties. Regarding construction phase implications, hazardous materials concerns within the construction area will require the use of CDOT Standard Specification 250: Environmental, Health and Safety Management. A Materials Management Plan should also be used if construction activities are anticipated to encounter hazardous materials.
- **Environmental Justice:** Identify low-income and minority populations early so that these populations can become involved and have a meaningful opportunity to participate during every phase of a project. Specialized outreach may be necessary based on the extent of anticipated impacts and stakeholder concerns. In addition, the Project Team will need to determine whether language assistance measures are needed to ensure meaningful access to the process. Consideration of businesses and community facilities important to low-income, minority, and limited English proficiency populations is also critical.
- **Visual Resources:** The interdisciplinary project team should work with CDOT early (during project scoping) to complete CDOT's visual resources scoping documentation. This scoping process determines the level of visual impact assessment, establishes a study area, identifies visual resource issues and associated regulations, and initiates public contact.
- **Historic Resources:** Design solutions should seek ways to avoid or minimize impacts to historic resources in any way possible. For alternatives with significant impacts, discuss practicable alternatives or mitigation. Evaluate sites identified as potential historic resources for NRHP eligibility to determine historic status.

Other Potential Environmental Resource Next Steps

Additional resource considerations may be warranted during future transportation improvements along SH 66. Scoping should occur in coordination with CDOT staff. NEPA evaluation may be required for future SH 66 projects in compliance with applicable regulations. Other resources to consider include the following.

- **Paleontology:** Before any construction activity, complete a desktop literature review and museum record search to identify geological formations within the corridor that are likely to contain fossils. If the desktop review reveals sensitive areas in the corridor, surveying and potential construction monitoring may be necessary. Clearance from CDOT may be required.
- **Archaeology:** Conduct a file search through the Office of Archaeology and Historic Preservation's online Compass database to identify all previously recorded sites and surveys within 0.5 mile of the corridor. If the desktop review reveals sensitive areas in the corridor, surveying and potential construction monitoring may be necessary. Clearance from the State Historic Preservation Office (SHPO) may be required.
- **Farmlands:** If farmland of importance or prime farmland is found within the corridor, consider and take care to minimize overall impacts to prime farmland during design and construction. Clearance from the U.S. Department of Agriculture – Natural Resources Conservation Service may be necessary.
- **Air Quality:** The entire study area is included in the Denver Ozone Nonattainment Area, portions of the study area are in the Denver Particulate Matter 10 Attainment/Maintenance Areas, and portions of the study area are in the Longmont Carbon Monoxide (CO) Attainment/Maintenance Area. Project level conformity analyses (40 CFR 93) will be required for those areas from a regional and/or local perspective. Additional air quality analysis (mobile source air toxics and greenhouse gases) applies statewide to projects (primarily if the project is at the EA or EIS level). Clearance from the Colorado Department of Public Health and Environment's Air Pollution Control Division may be required.

Environmental Resource Agency Coordination

- During the PEL process, CDOT consulted with environmental resource agencies, including:
  - Colorado Department of Public Health and Environment (CDPHE)
  - CPW
  - Environmental Protection Agency (EPA)
  - SHPO
  - USACE
  - US Fish & Wildlife Service (USFWS)
- These agencies reviewed the *Corridor Conditions Report* during summer 2017 and were given an opportunity to provide comments. Agency comments were addressed and incorporated in the final *Corridor Conditions Report* (**Appendix C**). Agency correspondence is included in **Appendix F-1**.

Additional NEPA and Environmental Requirements

- Individual projects must be evaluated under NEPA (most likely as a CatEx or EA) and should contribute to meeting purpose and need for SH 66.
- Resultant mitigation commitments must be implemented during the phase/project in which impacts occur.
- Fiscal constraint requirements must be satisfied for FHWA and CDOT to approve further NEPA documentation, which involves project inclusion in the fiscally constrained Regional Transportation Plan and fiscally constrained Transportation Improvement Program (TIP).
- In cases where corridor improvements are implemented in more than one phase/project, care must be taken to ensure that the transportation system operates acceptably at the conclusion of each phase/project (i.e., the project must demonstrate independent utility).

How are cumulative impacts included in PELs?

Cumulative impacts are combined, incremental effects of human activity. They may be insignificant by themselves, but cumulative impacts accumulate over time, from one or more sources, and can result in degradation of important resources. The goal of considering cumulative impacts in a PEL study is to look broadly at future land use, development, population increases, and other growth factors.

Cumulative Impacts Next Steps

As projects are implemented, this information can aid in assessing cumulative effects.

- **Geographic context for future analysis:** The boundary for traffic assessments (e.g., the extent of traffic analysis zones) may be a reasonable study boundary for future SH 66 projects, given the influence of land use and development near SH 66.
- **Actions that may contribute to cumulative effects:** Past, present, and reasonably foreseeable future actions should be assessed. Population increases and land development are considerations for cumulative impact analysis, given the increasing and projected growth trends in northern Colorado along the Front Range.
- **Resources sensitive to cumulative impacts:** Project teams should coordinate with CDOT to confirm scope. Resources that may be vulnerable to cumulative impacts could include floodplains, wetlands, traffic noise, and historic resources.

Cumulative Impacts Resource Considerations

- **Floodplains and Floodways:** St. Vrain Creek is the major watershed along SH 66. Cumulative impacts to the floodplain primarily would result from alterations to the floodplain caused by development already planned in the study area. Future project improvements should consider potential cumulative impacts to floodplains and floodways.
- **Wetlands and Other Waters of the US:** Agricultural practices and land development in the SH 66 PEL study area have increased over time. Activities causing soil erosion and changes to the water table lead to cumulative impacts to wetlands and waters of the US. Future project improvements should consider potential cumulative impacts to wetlands and other waters of the US.
- **T&E Species, Species of Special Concern, Migratory Birds and Eagles:** Agriculture and urbanization activities along the SH 66 corridor have impacted wildlife corridors, movement, and distribution of sensitive threatened and endangered species in the past. Future land use changes and alteration to natural vegetation and open space proximity may lead to cumulative impacts to wildlife species. When project improvements are implemented, consideration should be given for potential cumulative impacts to threatened and endangered species, species of special concern, migratory birds and Eagles.
- **Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges:** Recreation and open space resources are dedicated and preserved in Boulder County. Weld County also has resources that may have recreational and open space values. Surrounding land use changes could affect the character of parks and open space. These resources should be evaluated during NEPA to identify potential cumulative impacts.
- **Traffic Noise:** Noise levels along SH 66 continue to increase with changing land use and as urbanization spreads from Longmont and Lyons. Vehicular traffic increases, oil and gas development, and farming activities also continue to shape noise levels in the study area. Future project improvements should consider potential cumulative impacts from traffic noise levels.
- **Hazardous Materials:** Past development and urbanization are expected to continue along the SH 66 corridor. These changes in land use may include facilities with hazardous materials. If contaminated areas are acquired for transportation purposes, CDOT policies and mandates for remediation may contribute to restoring past damages to the environment. Future project improvements should consider hazardous materials cumulative impacts.
- **Environmental Justice:** Areas adjacent to Longmont were identified as having the greatest potential for impacts to low-income and minority populations. When project-specific roadway improvements move forward in the future, consideration should be given for potential cumulative impacts to low-income and minority populations.
- **Visual Resources:** Urbanization has increased along the SH 66 PEL study area over time, changing the visual setting of the corridor. As future project-specific roadway improvements are planned and implemented, consideration should be made regarding potential cumulative impacts to the visual character of the area.
- **Historic Resources:** Residential and commercial development continue to expand along SH 66, particularly adjacent to Longmont. In combination, future project improvements may have the potential for cumulative impacts on historic properties. Additional review will be required through NEPA.

Table 2. Potential Environmental Impacts

Resource	Anticipated Impacts
Section 1	
Floodplains and Floodways	▪ 0.07 acre of floodway ▪ 3.6 acres of 100-yr floodplain ▪ 3.9 acres of 500-yr floodplain
Wetlands and Other Waters of the US	▪ 2,022 ft of streams ▪ 1.8 acres of potential wetlands ▪ 0.82 acre of wetlands
T&E Species, Species of Special Concern, Migratory Birds and Eagles	▪ 36.3 acres of Preble's Meadow Jumping Mouse habitat ▪ Intersection with overland habitat connectors, active Bald Eagle nest site area, and undetermined/unknown Bald Eagle nest site area
Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges	▪ 2.51 acres of park and open space ▪ 73.3 feet of existing trail ▪ 470 feet of proposed trail
Utilities	▪ 26 major utilities, including communication, irrigation ditch(es), electric and gas transmission, and water ▪ 13 utility owners
Traffic Noise	▪ Includes noise sensitive areas and individual homes and businesses ▪ Potential impacts at dispersed rural/large lot residences and in medium density residential neighborhoods ▪ Potential impacts at recreational and historic sites
Hazardous Materials	▪ 303(d) rivers/streams, including St. Vrain Creek ▪ 2 LUST sites, 3 industrial sites, 2 water treatment facilities, 5 other sites of concern, including AST/UST, and historic auto sites
Environmental Justice	▪ 11 to 20 percent minority population in Section 1 Census blocks ▪ Between 11 and 40 percent low-income population in Section 1 Census blocks ▪ Lower potential to cause disproportionately high or adverse impacts to low-income and/or minority populations
Visual Resources	▪ Low to moderate potential for visual impacts, depending on potential improvement and location/context ▪ Includes access consolidation and at-grade transportation improvements
Historic Resources	▪ Potential for direct and/or indirect impacts at properties meeting the 45-year threshold for NRHP ▪ NRHP-eligible resources include: ▪ 5BL.241.1 Sites Milkhouse ▪ 5BL.241.15 Montgomery School ▪ 5BL.374 Burlington Northern Railroad ▪ 5BL.3113 Rough and Ready Ditch ▪ 5BL.3114 Highland Ditch ▪ 5BL.3115 Palmerton Ditch ▪ 5BL.4248 Montgomery Farm ▪ 5BL.4476 Longmont Supply Canal ▪ 5BL.4832 Oligarchy Ditch ▪ 5BL.6987 McIntosh/Lohr Farm

Resource	Anticipated Impacts
Section 2	
Floodplains and Floodways	▪ None
Wetlands and Other Waters of the US	▪ 2,251 ft of streams ▪ 0.23 acre of potential wetlands ▪ 0.7 acre of wetlands
T&E Species, Species of Special Concern, Migratory Birds and Eagles	▪ Intersection with active Bald Eagle nest site area
Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges	▪ 0.34 acre of park and open space ▪ No existing or proposed trails
Utilities	▪ 21 major utilities, including communication, irrigation ditch(es), gas transmission, storm sewer, and water ▪ 13 utility owners
Traffic Noise	▪ Includes noise sensitive areas, individual homes and businesses, and individual places of worship ▪ Potential impacts to residential neighborhoods and medium/high density residential neighborhoods ▪ Potential impacts at recreational and historic sites
Hazardous Materials	▪ Ten sites of concern, including SEMS, AST/UST, LUST, Historic Auto, and Industrial sites ▪ Cluster of sites near SH 66/US 287
Environmental Justice	▪ Between 11 and greater than 60 percent minority population in Section 2 Census blocks ▪ Between 11 and 80 percent low-income population in Section 2 Census blocks ▪ Higher potential to impact minority and low-income populations; Make considerations to avoid causing disproportionately high or adverse impacts to low-income and/or minority populations
Visual Resources	▪ Low to moderate or moderate to high potential for visual impacts, depending on potential improvement and location/context ▪ Includes access modifications/consolidations, at grade intersection improvements, and potential grade-separated improvements
Historic Resources	▪ Potential for direct and/or indirect impacts at properties meeting the 45-year threshold for NRHP ▪ NRHP-eligible resources include: ▪ 5BL.3113 Rough and Ready Ditch ▪ 5BL.4476 Longmont Supply Canal ▪ 5BL.6938 Nishida Farms

Resource	Anticipated Impacts
Section 3	
Floodplains and Floodways	▪ None
Wetlands and Other Waters of the US	▪ 514.3 ft of streams ▪ 0.98 acre of potential wetlands ▪ 0.96 acre of wetlands
T&E Species, Species of Special Concern, Migratory Birds and Eagles	▪ Intersection with active Bald Eagle nest site area
Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges	▪ No parks or open space ▪ 243 feet of proposed trail
Utilities	▪ 8 major utilities, including communication, electric transmission, and sanitary sewer ▪ 5 utility owners
Traffic Noise	▪ Includes noise sensitive areas and individual homes and businesses ▪ Potential impacts at dispersed rural/large lot residences and in medium density residential neighborhoods
Hazardous Materials	▪ 3 oil and gas wells ▪ Three 303(d) water bodies and/or rivers/stream ▪ 1 SEMS site
Environmental Justice	▪ 11 to 20 percent minority population in Section 3 Census blocks ▪ 11 to 20 percent low-income population in Section 3 Census blocks ▪ Lower potential to cause disproportionately high or adverse impacts to low-income and/or minority populations
Visual Resources	▪ Low to moderate or moderate to high potential for visual impacts, depending on potential improvement and location/context ▪ Includes access modifications/consolidations, at-grade intersection improvements, and potential grade- separated improvements
Historic Resources	▪ Potential for direct and/or indirect impacts at properties meeting the 45-year threshold for NRHP: ▪ 5WL.841 Great Western Railroad ▪ 5WL.2181 Highland Canal Lateral ▪ 5WL.4300 Pleasant Hill School/Liberty Hall Grange

Notes: LUST = leaking underground storage tank
AST = above ground storage tank
UST = underground storage tank
SEMS = Superfund Enterprise Management System
NRHP = National Register of Historic Places

Table 2. Potential Environmental Impacts (Continued)

Resource	Anticipated Impacts
Section 4	
Floodplains and Floodways	▪ None
Wetlands and Other Waters of the US	▪ 2,427 ft of streams ▪ 1.6 acres of potential wetlands ▪ 0.73 acre of wetlands
T&E Species, Species of Special Concern, Migratory Birds and Eagles	▪ None
Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges	▪ No parks or open space ▪ 310 feet of proposed trail
Utilities	▪ 6 major utilities, including communication, irrigation ditch(es), petroleum/natural gas, and water ▪ 7 utility owners
Traffic Noise	▪ Includes noise sensitive areas and individual homes and businesses ▪ Potential impacts at dispersed rural/large lot residences and at businesses along SH 66
Hazardous Materials	▪ Dispersed oil and gas wells ▪ 7 other sites of concern, including AST/UST, LUST, Historic Auto, and Industrial sites ▪ Cluster of sites near SH 66/Mead Street intersection
Environmental Justice	▪ 11 to 20 percent minority population in Section 4 Census blocks ▪ Between 11 and 40 percent low-income population in Section 4 Census blocks ▪ Lower potential to cause disproportionately high or adverse impacts to low-income and/or minority populations
Visual Resources	▪ Low to moderate or moderate to high potential for visual impacts, depending on potential improvement and location/context ▪ Includes access modifications/consolidations, at-grade intersection improvements, and potential grade-separated improvements
Historic Resources	▪ Potential for direct and/or indirect impacts at properties meeting the 45-year threshold for NRHP: ▪ 5WL.1978 Rademacher-Hilgers Residence

Resource	Anticipated Impacts
Section 5	
Floodplains and Floodways	▪ 11.6 acres of 100-yr floodplain
Wetlands and Other Waters of the US	▪ 726 ft of streams ▪ 2.24 acres of potential wetlands ▪ 1.28 acres of wetlands
T&E Species, Species of Special Concern, Migratory Birds and Eagles	▪ Intersection with active Bald Eagle nest site area
Park/Trail/Open Space Resources and Wildlife/Waterfowl Refuges	▪ No parks or open space ▪ 3,124 feet of proposed trail
Utilities	▪ 11 major utilities, including communication, electric and gas transmission, petroleum/natural gas, sanitary sewer, and water ▪ 7 utility owners
Traffic Noise	▪ Includes noise sensitive areas and individual homes and businesses ▪ Potential impacts at dispersed rural/large lot residences and at businesses along SH 66
Hazardous Materials	▪ Dispersed oil and gas wells ▪ 2 industrial sites ▪ 1 LUST site ▪ Two 303(d) impaired water bodies
Environmental Justice	▪ Between 11 and greater than 60 percent minority population in Section 5 Census blocks ▪ Between 11 and 40 percent low-income population in Section 5 Census blocks ▪ Higher potential to impact minority populations; make considerations to avoid causing disproportionately high or adverse impacts to low-income and/or minority populations
Visual Resources	▪ Low to moderate or moderate to high potential for visual impacts, depending on potential improvement and location/context ▪ Includes access modifications/consolidations, at-grade intersection improvements, and potential grade-separated improvements
Historic Resources	▪ No previously determined NRHP-eligible resources were identified ▪ Several irrigation ditches and old farm complexes line this section of the study area and will require additional survey and evaluation to determine NRHP eligibility

Project teams should coordinate with CDOT and consult CDOT's NEPA Manual for more information about environmental next steps.

5. Risk and Resiliency

Given the increasing prevalence of extreme weather events and risks associated with human activities, planning for resiliency is gaining increasing recognition as an important consideration in infrastructure development and operations. Some transportation officials across the country and internationally have begun to plan and design transportation infrastructure with more focus on risk and resiliency.

These types of considerations are distinct from responding to an emergency event (such as an automobile accident or a medical emergency). CDOT's goal in this assessment is to inform planning decisions and incorporate resiliency considerations where transportation assets may be vulnerable to risk in the context of two distinct considerations: physical threats and operational threats.

What is resiliency?

"Resiliency is the ability of communities to rebound, positively adapt to, or thrive amidst changing conditions or challenges – including disaster and climate change – and maintain quality of life, healthy growth, durable systems, and conservation of resources for present and future generations." – Colorado Resiliency Working Group

What are physical threats?

Physical threats are considered natural hazards or human caused hazards that could shut down a highway for more than four hours (**Figure 15**). Physical threats analyzed as part of this SH 66 process (**Figure 16**) are considered in the context of being location-specific (i.e., the threat may occur at a specific site) or corridor-wide (i.e., the threat may occur anywhere along the corridor).

Summary of Physical Threats Evaluated

Location-specific threats include:

- **Bridge scour from floods**
  erosion of soil supporting a SH 66 bridge structure and causing structural damage
- **Debris flows**
  moving mass of loose mud, sand, soil, rock, and water down a slope toward SH 66
- **Landslides/rockfalls**
  moving mass of earth or rock from a mountain or cliff toward SH 66
- **Bridge strikes**
  truck collision with a SH 66 bridge causing structural damage
- **Railroad proximity**
  train derailment affecting SH 66 or stalled train blocking SH 66 operations

Key:
Natural hazard
Human caused hazard

Corridor-wide threats include:

- **Fires**
  wildfires or range fires burning along or near SH 66
- **Tornadoes/high winds**
  strong gusts/storms causing SH 66 infrastructure damage
- **Utility rupture**
  explosion or sink hole on or along SH 66
- **Visibility**
  intense fog or ground level cloud cover along SH 66
- **Cyber**
  attack on CDOT's intelligent transportation system infrastructure along SH 66
- **Hazardous Materials**
  spill of hazardous materials or waste on or along SH 66

Figure 15. Physical Threat Examples

Supporting Documentation

- **Appendix K** Physical Threats Risk and Resiliency Assessment: Presents technical detail, including cost calculations and detailed maps

Physical Threats Overview and Recommendations

- For location-specific threats, 11 threat areas were evaluated (**Appendix K**) to assess zones of potential floods, debris flow/landslides/rock falls, railroad conflicts, an overhead pipe, bridge strikes, and wildfires.
  - These areas were evaluated in the context of:
    - *Consequence* — Costs for CDOT to replace the asset and time and resources spent on out-of-direction travel for motorists/travelers
    - *Vulnerability* — Probability of the threat occurring should the threat be realized
    - *Risk* — Consideration of threat, consequence, and vulnerability in the context of one another
    - *Criticality* — Relative importance of SH 66 (AEM 2018)
    - *Prioritization* — Documentation that assets and/or areas of SH 66 should receive funding and action in the context of risk and resiliency
    - *Recommendations* — Considerations for CDOT that would build resiliency into SH 66
  - The highest priority threat areas include risk area ID 2 (along the St. Vrain River in Weld County), risk area ID 9 (the overpass structure at SH 66 and I-25), and Risk Area ID 10 (the bridge over the St. Vrain River in Weld County).
  - The lowest priority threat area is risk area ID 5 (the BNSF Railway crossing with SH 66 in Longmont).
  - **Figure 17** includes a map overview of CDOT's threats and assets along SH 66.
- For corridor-wide threats, resiliency recommendations include the following generalized actions:
  - Establish redundant routes to offer additional evacuation potential
  - Establish signage to disseminate information in the event of a hazard
  - Develop an Incident Management Plan for SH 66

Figure 16. SH 66 PEL Risk & Resiliency Physical Assessment Process

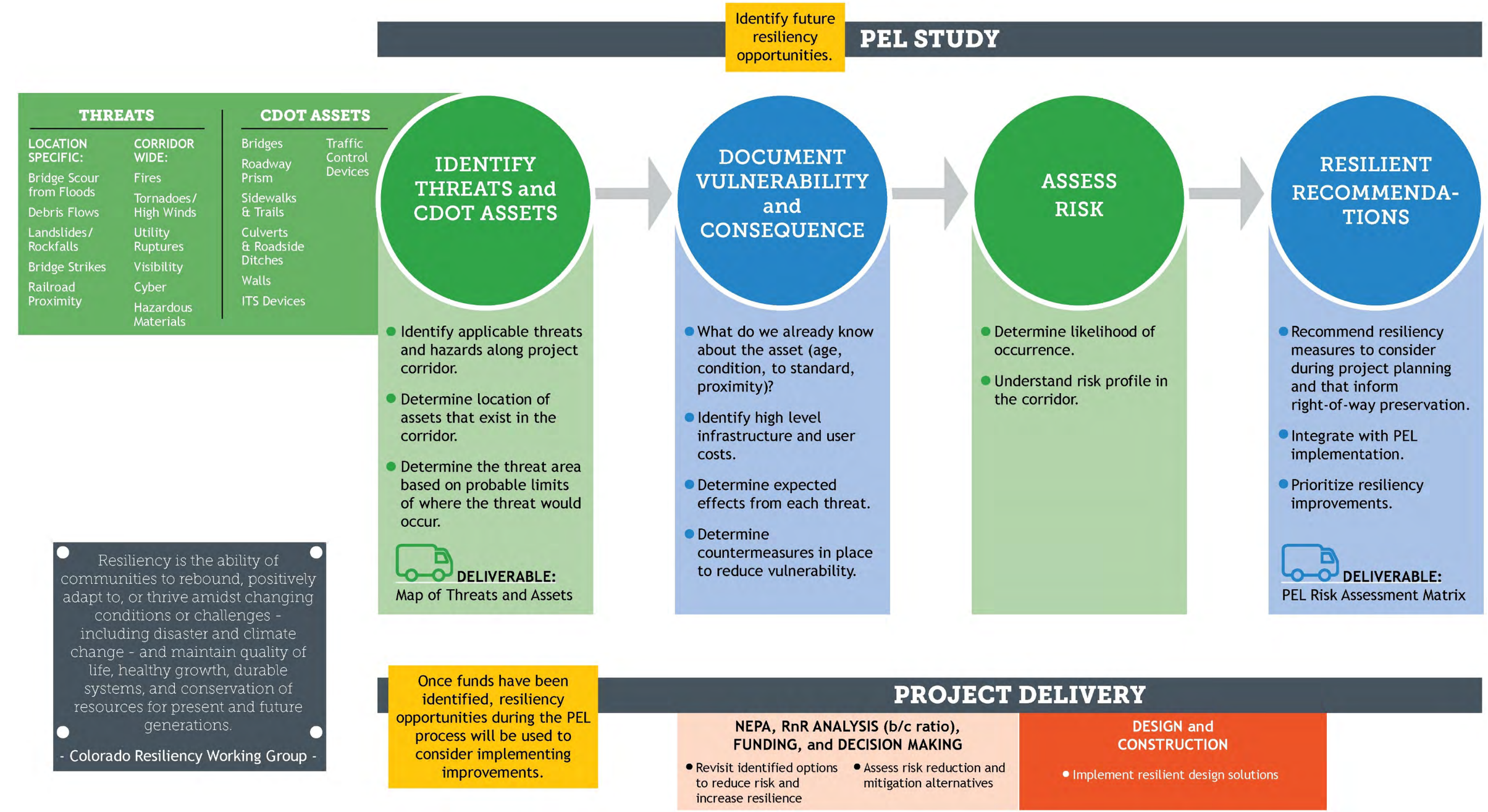
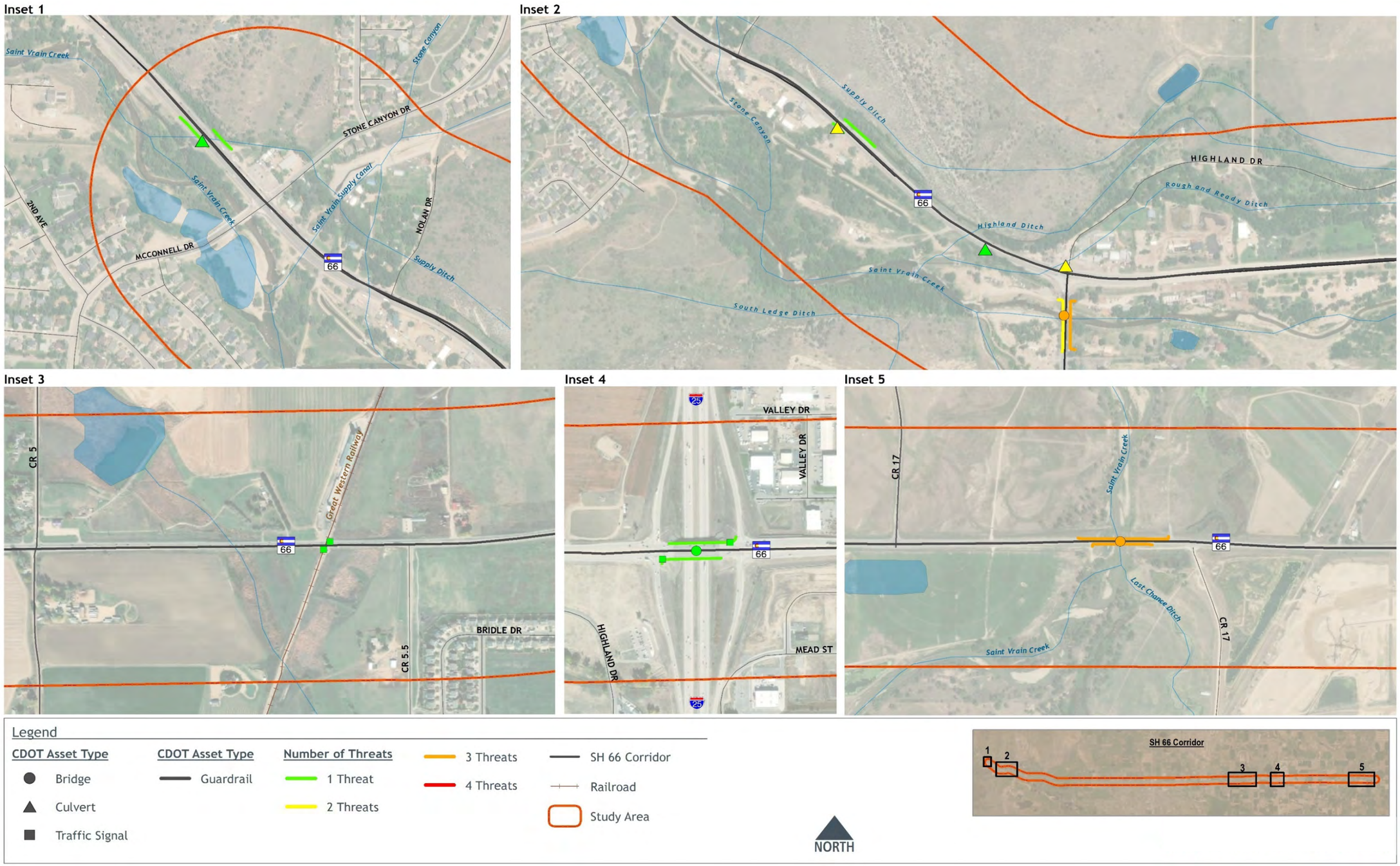


Figure 17. SH 66 Assets and Physical Threats Overview



What are operational threats?

Operational threats (**Figure 18**) occur when unplanned land development has unanticipated highway operation impacts. Occasionally, communities will make land use/land development decisions that are not accounted for in the travel demand model and, therefore, position CDOT and surrounding communities as reactionary. This unplanned land development can generate unanticipated traffic volume increases on Colorado's state highways minimizing previous planning and prioritization efforts. Required funding may not be available to address operational and/or safety concerns sufficiently and the overall transportation network's operational resiliency is compromised.

Figure 18. Operational Threat Factors

Operational Threat Assessment

- CDOT Region 4 staff and leadership, FHWA, and the Project Team developed a three-step assessment to evaluate operational resiliency.
  1. Perform an operational sensitivity at a corridor-level to establish intersections where highway operations may be nearing capacity based on the recommendations made in the PEL.
  2. Focus on these areas by identifying high-risk intersections (i.e., intersections that have failing operations if traffic volumes are higher than projections) to determine whether there is a threat of land use changes that may impact this area.
  3. CDOT and local agencies continue planning efforts to ensure that these locations are monitored after the PEL is completed.
- This assessment was not used to determine the PEL footprint. It was completed after the PEL recommendations were made to establish locations that may be most vulnerable to land use changes on the corridor.
- While small changes in land use may occur throughout the corridor and would be overall inconsequential to operations where intersections have excess capacity, these changes would be more significant if there are several compounded land use changes or if they occur at a location without excess intersection capacity.

Operational Sensitivity

- The PEL used 2040 traffic projections based on available and approved DRCOG data. The operational sensitivity assessment identifies locations that may be nearing capacity after considering the capacity/geometric improvement recommendations from the PEL. It identifies likely traffic analysis zones (TAZ) that could underestimate future development.
- This corridor is near the outer limits of the DRCOG model. When development occurs outside the DRCOG region, it may impact volumes on SH 66 as well.
- To test overall sensitivity of the PEL recommendations, two future traffic volume adjustment scenarios were considered:
  - **Scenario 1** considered the case where unanticipated development results in an additional 10 percent traffic volume above the DRCOG projections.
  - **Scenario 2** considered a case where traffic was 20 percent higher than the DRCOG projections.
- While it is unlikely any uniform growth would occur in this manner on all movements along the corridor, this assessment allows a macro-level assessment to determine where there may be capacity issues on the corridor if the volumes are higher than projections from the regional travel demand model.
- TAZs and their household and employment growth projections were assessed at a high level to determine risks and vulnerabilities for each Section.
- Using operational sensitivity results, a high level assessment was made for locations on SH 66 that may be at risk for operational deficiencies with unanticipated changes in future volumes occurs. This assessment identifies SH 66 locations most sensitive to changes if:
  - background growth projections are higher than anticipated in the model
  - specific developments submit plans with denser land uses than projections
  - land use projections are modified in future transportation plan updates

Results Overview

- In the sensitivity analysis, some intersections have unacceptable operations under Scenario 1, which also means they would have poor operations under Scenario 2.
- Other intersections have enough additional capacity to absorb a 10 percent volume increase but fail in the 20 percent growth scenario.

Section 1 Results

- **Risks:** Land uses in Section 1 have lower risk for unanticipated growth because Boulder County open space surrounds much of the highway. The following locations are considered at a higher risk for poor operations if volumes on the corridor become higher than anticipated:
  - *75th Street* — Incorporating PEL recommendations (addition of turn lanes to the side street approaches) results in operations of a LOS B or C. Adding 10 percent traffic results in the intersection being over capacity (operating at LOS E) during weekday evening peaks and results in long queues for eastbound SH 66. Additional lane construction may be needed to increase intersection throughput.
  - *Low Volume Intersections* — Lower-volume intersections in Section 1, including Highland Drive, 52nd Street, and 66th St, are anticipated to have lower side-street volumes and may not meet warrants for signalization. Drivers wanting to turn left out of the intersection will experience long delays, which will be further compounded with additional traffic on SH 66.
- **Vulnerability:** The DRCOG model projects almost no growth from the western project limits to 75th Street for either households or employment growth and moderate growth between 75th Street and Airport Road. Locations with the greatest vulnerability to development or redevelopment include:
  - *SH 66 Mainline* — The DRCOG model projects approximately 0.8 percent annual growth through Sections 1B and 1C until 2040, compared to a higher growth rate on the remainder of SH 66. If the surrounding growth on these sections of SH 66 are higher than anticipated, there could be long queues at signalized intersections and long delays near East Highland Drive and/or 87th Street.
  - *US 36/SH 66* — TAZs surrounding the SH 66 and US 36 intersection show almost no growth. However, the Town of Lyons has redevelopment planned for the area between McConnell Drive and East Highland Drive. If the redevelopment adds significant volume to the north leg of the US 36/SH 66 intersection or to the SH 66 mainline, it could result in poor operations.
  - *ARWAS* — Properties along Sections 1B and 1C planned to use the ARWAS typically include single-family homes, farms, or low-volume businesses. Properties not dedicated as a Boulder County Conservation Easement or Open Space could redevelop with higher density levels than what is currently planned. If this occurs adjacent to the ARWAS, reassessment would be necessary of the ARWAS operations and where it intersects with SH 66 crossroads. The ARWAS would provide access for low-volume connections only. If land use changes and higher volumes are projected, the ARWAS should be removed and traffic should access SH 66 directly.

Section 2 Results

- **Risks:** Most properties adjacent to SH 66 in Section 2 are built-out, incorporated into City of Longmont's Long-Range Plan, or identified as Boulder County Open Space. Performing the operational sensitivity analysis resulted in degraded operations with long delays at the following intersections:
  - *Hover/95th Street* — If traffic volumes are higher than projected, this intersection may not operate acceptably as a partial displaced left turn (PEL recommendation). Depending on movements impacted by the addition of traffic and the magnitude of additional traffic volumes, additional movements may need to be displaced, or a grade-separated intersection may be more appropriate.
  - *US 287* — If volumes are higher than projected, certain movements of the fully displaced left turn intersection (PEL recommendation) may experience long queues, which could impact design and capacity of the left turn lanes. If volumes increase significantly over DRCOG's model projections, a grade-separated interchange may become more appropriate.
  - *Pace Street* — With significant added volume (Scenario 2), Pace Street would operate at LOS E in the evening peak. Operations at this intersection can be improved by constructing additional turn lanes beyond what was anticipated in the PEL, such as a dual westbound or northbound left turn.
- **Vulnerability:** Modeling shows high volumes generally traveling from north of SH 66 toward Longmont and Boulder in the morning peak (reverse in the evening peak). A Section 2 vulnerability includes potential inaccuracies in projected future turning movements because SH 66 is on the outer limits of the DRCOG model. This location results in limited nodes for traffic to enter and exit the model. If growth patterns outside the network distribute traffic differently as development occurs, some intersections may experience different north-south patterns than planned in the PEL, which could impact future intersections.

Section 3 Results

- **Risks:** Section 3 is primarily rural, but sections near SH 66 are within the current or planned growth boundaries for Longmont and Mead. The following intersections is anticipated to near capacity if higher than anticipated traffic volumes occur:
  - *County Line Road* — Based on 2040 projections, County Line Road is anticipated to operate at LOS D during morning and evening peak periods. Increasing volumes by 10 percent or 20 percent results in LOS E for most peak periods. Adding traffic at this location also results in long peak hour directional queues on SH 66. If Section 3 experiences significantly higher volumes than projected, an alternative intersection treatment or grade-separated interchange may become more appropriate.

Section 3 Results (Continued)

- **Vulnerability:** TAZs in this section project moderate to high planned growth. However, TAZs in Weld County near SH 66 typically are large (6 or more square miles) and may not reflect fully planned growth of surrounding local agencies. Also, several TAZs adjacent to SH 66 have overlapping growth boundaries for Longmont and Mead. The PEL team assessed several planned developments currently being platted in this section. While each development generally fits into DRCOG's growth projections, if the same density were applied to remaining undeveloped land in the TAZ, growth would be significantly higher than projected.
- An additional Section 3 risk is that Mead recently updated their Transportation Plan. The changes were incorporated into current 2040 DRCOG projections, but they may not reflect ongoing planning processes. In that case, unanticipated land use changes or additional projected trips onto SH 66 may occur.

Section 4 Results

- **Risks:** Section 4 is primarily rural, but sections near SH 66 are within the planned or current growth boundaries for Mead and Firestone. The following intersections are anticipated to be nearing capacity if higher-than-anticipated traffic volumes occur:
  - *Weld County Road 7* — The evening peaks for both Scenario 1 and Scenario 2 resulted in LOS E.
  - *Mead Place* — Mead Place is one of the few higher volume unsignalized intersections in this section. The intersection recommendation in the PEL includes three-quarter movement. Given the high volume of nearby right-turning traffic onto SH 66 from the I-25 northbound ramp or from WCR 9.5, minimal gaps would be available for traffic to turn into and out of Mead Place. As development occurs, it is important that higher volume unsignalized locations be secondary property accesses and that drivers have options to enter and exit at a signalized intersection. For Mead Place, additional access could be provided from WCR 9.5.
- **Vulnerability:** TAZs in this section project moderate to high planned growth. However, TAZs in Weld County near SH 66 typically are quite large (6 or more square miles) and may not fully reflect the planned growth of the surrounding local agencies. Also, several of the TAZs immediately adjacent to SH 66 have overlapping growth boundaries for Mead and Firestone. The PEL team assessed several planned developments currently being platted in this Section. While each development generally fits into DRCOG's growth projections, if the same density were applied to remaining undeveloped land in the TAZ, growth would be significantly higher than projected.

  An additional Section 4 risk is that Mead recently updated its Transportation Plan. The changes were incorporated into current 2040 DRCOG projections, but they may not reflect ongoing planning processes. In that case, unanticipated land use changes or additional projected trips onto SH 66 may occur. Additionally, Firestone is planning to update its Transportation Plan in the next several years, which also could impact SH 66 projected volumes.

Section 5 Results

- **Risks:** Section 5 is primarily rural, but sections near SH 66 are within the planned or current growth boundaries for Mead and Firestone. The following intersections are anticipated to be nearing capacity if there are higher-than-anticipated traffic volumes:
  - *Weld County Road 11* — Based on 2040 projections, WCR 11 has significant remaining capacity and is anticipated to operate at LOS C during the morning and peak periods with the intersection improvements recommended in the PEL. Increasing the volumes by 10 or 20 percent results in LOS E for most peak periods. If significantly higher volumes occur at this intersection than were projected in the DRCOG model, additional auxiliary lanes or an alternative intersection treatment may be appropriate.
  - *Weld County Road 11.5* — Based on 2040 projections, WCR 11.5 has significant remaining capacity and is anticipated to operate at LOS C during morning and peak periods with the intersection improvements recommended in the PEL. Increasing volumes by 20 percent results in LOS E in the evening peak periods. If significantly higher volumes occur at this intersection than were projected in the DRCOG model, this intersection may require additional turn lanes.
- **Vulnerability:** TAZs in Section 5 project moderate to high planned growth. However, TAZs in Weld County near SH 66 are typically quite large (6 or more square miles) and may not fully reflect planned growth of the surrounding local agencies. Also, several TAZs immediately adjacent to SH 66 have overlapping growth boundaries for Mead and Firestone. The PEL team assessed several planned developments currently being platted in this Section. While each development generally fits into DRCOG's growth projections, if the same density were applied to remaining undeveloped land in the TAZ, growth would be significantly higher than projected.

  An additional risk in Section 5 is that Mead recently updated its Transportation Plan. The changes were incorporated into current 2040 DRCOG projections, but they may not reflect ongoing planning processes. In that case, unanticipated land use changes or additional projected trips onto SH 66 may occur. Additionally, Firestone is planning to update its Transportation Plan in the next several years, which could also impact SH 66 projected volumes.

Next Steps

- The proposed process for evaluating and identifying operational threats to SH 66 includes:
  - working with agencies to monitor locations that could be at a higher risk
  - working with communities to implement solutions to improve the baseline corridor LOS
  - working with developers and local communities to fund improvements when an intersection or a section may have unacceptable operations based on PEL recommended improvements
  - monitoring the corridor through the ACP process

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6. Agency Coordination and Public Involvement

FHWA and CDOT committed to involving local agencies and the public throughout the SH 66 PEL process. Participants included federal, state, and local government representatives; regional transportation planning entities; railroad operators; community groups; businesses; property owners; and residents.

Desired outcomes of the coordination and outreach efforts include the following:

- Stakeholder input contributing to the PEL study's information base, findings, and recommendations
- Stakeholders that are well-informed about the study
- Meaningful input by the TAC, EC, and the public to help CDOT make sound and publicly supported decisions
- An understanding and documentation about what decisions were made during the study and the rationale for them
- An understanding about how the PEL study will move forward and how stakeholders will be involved

Supporting Documentation

- **Appendix F** Agency Coordination: Documents the SH 66 PEL process of agency coordination and engagement
- **Appendix G** Public Involvement: Documents the SH 66 PEL process of public outreach and involvement

How was agency coordination and public outreach managed during the PEL process?

The Project Team prepared an Agency Coordination and Public Outreach Plan (the outreach plan) for the SH 66 PEL at the beginning of this study. This plan set forth the public involvement process for the study and described the agency coordination and public outreach intent, initiatives, responsibilities, and tasks to be carried out as part of the study. The outreach plan defined various roles, responsibilities, issues, and guidelines for a successful outreach effort. It identified specific public involvement activities and established time frames in which to implement them.

Agency Coordination Overview

- CDOT worked closely with the corridor's local communities and other agencies throughout the study process. Coordination largely occurred through TAC, which was made up of technical staff from the following agencies:
  - Boulder County
  - DRCOG
  - Town of Firestone
  - City of Longmont
  - FHWA
  - Town of Lyons
  - Town of Mead
  - RTD
  - Weld County
- The TAC assisted in the PEL study process and served as a sounding board for technical aspects of the project. All project analyses, evaluations, and recommendations were vetted through the TAC before being presented to the public and elected officials or before being posted on the project website. TAC members also kept their respective organizations, community groups, and elected officials updated on the study's progress and findings.
- The Project Team also worked closely with the corridor's elected officials throughout the study process. One or two elected officials from each community and county along the corridor made up the EC. The EC provided policy-level guidance on the study. This group met at key milestones and decision points in the project when the Project Team needed input and concurrence of the elected officials to proceed.
- At key project milestones, the project team also updated the SH 66 Coalition. The Coalition is a group of local communities who formed with the goal to improve the entire SH 66 corridor and to obtain funding to implement solutions identified in the PEL and ACP. Although the SH 66 Coalition is not facilitated by CDOT, CDOT was invited to participate. Agency coordination documentation can be found in **Appendix F-2**.

Focused Agency Collaboration

- **Stakeholder Interviews**: Upon initiating the PEL, the Project Team interviewed key stakeholders in December 2016 and February 2017. All participating agencies were asked to describe SH 66, its role through their community, and their top concerns regarding travel along the corridor. Feedback received by the Project Team helped inform development of the project's purpose and need and alternatives development and screening process. Supporting documentation for the stakeholder interviews can be found in **Appendix F-3**.
- **Visioning Workshop**: The Project Team conducted a Visioning Workshop with key stakeholders, including TAC and EC members, in April 2017. The purpose of the workshop was to understand a vision for the future SH 66 corridor. Attendees participated in a series of activities to identify the corridor's role today, current problems, and potential solutions. Results from this visioning workshop informed the development of the project's purpose and need. **Appendix F-4** includes supporting documentation for the visioning workshop.

Public and agency stakeholders' most frequently used words by to describe SH 66 today

Words commonly heard in SH 66 stakeholder interviews

SH 66 Planning and Environmental Linkages Study

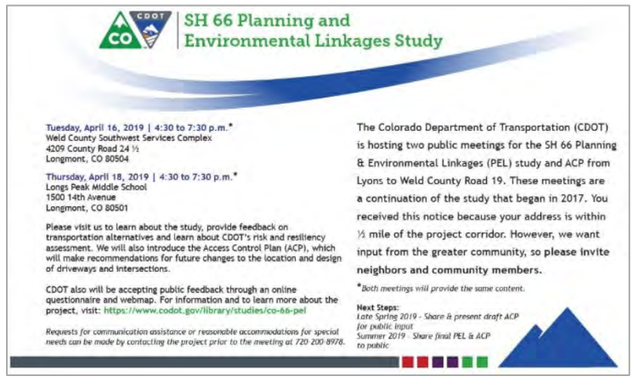
How were individuals and members of the public engaged during the PEL process?

The Project Team conducted public outreach activities based on the type of feedback desired and decisions to be made. The team also used engagement platforms to share updates and gather feedback.

Public Outreach: Project Website and Social Media

- CDOT hosted a dedicated website (https://www.codot.gov/library/studies/co-66-pel) for the project to provide information about the study and enable ongoing communication. The site provided a PEL study and process overview and included information about SH 66, meeting announcements, and meeting materials. Contact information for CDOT's project manager was included, which enabled the public to contact the Project Team with comments at any time.

- CDOT's social media accounts were used to provide project updates and announce upcoming public open houses; a press release was also distributed to advertise public open houses. TAC and EC members were provided a project flyer for each milestone and were encouraged to distribute the flyers using each community's distribution list and social media accounts.


SH 66 Planning and Environmental Linkages Study

Tuesday, April 16, 2019 | 4:30 to 7:30 p.m.*
Weld County Southwest Services Complex
4209 County Road 24 ½
Longmont, CO 80504

Thursday, April 18, 2019 | 4:30 to 7:30 p.m.*
Longs Peak Middle School
1500 14th Avenue
Longmont, CO 80501

Please visit us to learn about the study, provide feedback on transportation alternatives and learn about CDOT's risk and resiliency assessment. We will also introduce the Access Control Plan (ACP), which will make recommendations for future changes to the location and design of driveways and intersections.

CDOT also will be accepting public feedback through an online questionnaire and webmap. For information and to learn more about the project, visit: https://www.codot.gov/library/studies/co-66-pel

Requests for communication assistance or reasonable accommodations for special needs can be made by contacting the project prior to the meeting at 720 200 8978.

The Colorado Department of Transportation (CDOT) is hosting two public meetings for the SH 66 Planning & Environmental Linkages (PEL) study and ACP from Lyons to Weld County Road 19. These meetings are a continuation of the study that began in 2017. You received this notice because your address is within ½ mile of the project corridor. However, we want input from the greater community, so **please invite neighbors and community members.**

*Both meetings will provide the same content.

Next Steps:
Late Spring 2019 - Share & present draft ACP for public input
Summer 2019 - Share final PEL & ACP to public

Sample post card sent to residents

Public Outreach: Public Open Houses

- Each round of public open houses included one meeting on the eastern side of the planning corridor and another on the western side. Each meeting was an open-house format with the same information being presented at each set of meetings. This allowed interested members of the public to select the location and a time that worked best for their schedules.
  - *April 2017 Open Houses* — Had approximately 55 attendees and introduced the public to the study and existing corridor conditions. The Project Team distributed questionnaires asking the public to characterize the role of SH 66 through their community, to identify their top concerns regarding travel on SH 66, and to identify their expectations of the study. **Appendix G1** includes supporting documentation for these open house meetings.
  - *April 2019 Open Houses* — Had approximately 110 attendees, presented the Level 2b transportation alternatives, and provided information about CDOT's risk and resiliency assessment. The ACP was also introduced during these open house meetings. Using a questionnaire, the community was asked to provide feedback on which Level 2b recommendations they supported and which ones concerned them. Attendees were also asked to identify which improvements they felt should be completed on the corridor first. The same survey, along with meeting materials, was also posted on the project website for two weeks following the last open house. **Appendix G2** includes supporting documentation for these open house meetings.
  - *September 2019 Open Houses* — Had approximately 60 attendees and presented Level 3 recommended projects along the entire corridor, along with the potential environmental impacts. Attendees were also able to view a list of future access changes. Attendees were again provided a questionnaire to submit feedback; the same questionnaire was also posted on the project website. Questions focused on prioritizing intersection/interchange options at major intersections and identifying the priority transportation need for each section along the planning corridor. **Appendix G3** includes supporting documentation for these open house meetings.
- To support the concurrent ACP development, an open house was held on July 25, 2019, which had approximately 90 attendees. ACP information was displayed, including which access points might be consolidated, closed, and/or moved. Other traffic movement alternatives were presented.
- Open Houses were advertised through CDOT's (and local agencies') websites and newsletters, CDOT's social media accounts, press releases, posting of flyers in local communities (at the local agencies' discretion), email distribution, and postcard notifications to residents within one-half mile of the planning corridor.

Public Comments

- The project team tracked and compiled public comments from several sources, including public open houses, project website, letters, email correspondence, and telephone conversations. At key project milestones, public comments were summarized and included in the analysis and planning process.
- **April 2017 PEL Kickoff Public Comment Themes** (31 completed questionnaires)**:**
  - The most important roles that SH 66 plays in the community – access to businesses, serving as a regional highway, and access to Rocky Mountain National Park.
  - Top three concerns regarding travel on SH 66 – difficult or dangerous to get onto and off SH 66, safety, and too much traffic.
  - The top three problems to be addressed in the future –adding turn lanes, making turn lanes longer, and accommodating bicycles and pedestrians with safe crossings.
- **April 2019 Level 2b Analysis Public Comment Themes** (77 completed questionnaires):
  - Respondents emphasized the need to widen SH 66, to control access, to restrict turning and to include safety improvements in the final plan.
  - Residents along the corridor are concerned about noise levels and how the options will contribute to the problem.
  - The overall theme of safety is clearly expressed in the comments, specifically making a left-hand turn onto SH 66 or from SH 66 is challenging at all hours.
  - Speed was also mentioned often as a contributing factor to safety. Although most felt it would be appropriate to lower the speed limit, others felt that increasing the speed limit would help traffic move more smoothly along SH 66 resulting in fewer accidents.
- **September 2019 Level 3 Analysis Public Comment Themes** (49 completed questionnaires)**:**
  - Safety was identified as the highest transportation need for all sections of SH 66 within the planning corridor.
  - Noise along the corridor continues to be a concern for corridor residents. Some residents also expressed concern about how the various options may impact air quality and their property values.
  - Respondents generally support the expansion of SH 66 to 4-lanes for the length of the planning corridor.
  - Considerable feedback was received regarding the area of McCall Drive and North 66th St.
- Comments were also accepted throughout the planning process via the "submit feedback" link on the project website. The Project Team reviewed comments received from the website and sent a response to each individual. **Appendix G4** includes these comments.

7. Additional Next Steps

This chapter highlights additional requirements that would be necessary as PEL options are advanced and implemented.

Access Control Plan

- Upon completion of the ACP, an Intergovernmental Agreement (IGA) will be developed for all agencies in the SH 66 study limits. This will include Boulder County, Weld County, Town of Lyons, City of Longmont, Town of Mead, and Town of Firestone.
- After receiving approval by each entity, the IGA will be approved, signed, and adopted by each agency. The plan ultimately will be approved by CDOT's State Access Manager, and the plan will become law. To implement recommendations of the ACP, there will need to be continuing coordination among agencies.
- As development occurs along the corridor, apply ACP recommendations in collaboration with local agencies. Some initial disruption may occur; with further implementation of the ACP, a net access control benefit will be realized.
- The ACP process and final recommendations are detailed in **Appendix H**.

Scoping, Design, and Construction

- Once a project is included in the TIP, funding requirements are confirmed for ROW, utility, environmental, design, and construction needs. A project scoping meeting can be held to confirm project delivery method, project objectives, funding sources, and schedule.
- CDOT's project delivery process includes standard milestones for scoping, design, and construction. Projects sponsored by local agencies that involve federal funding and/or CDOT oversight must follow CDOT's local agency process. In terms of bicycle/pedestrian considerations, the proposed bicycle and pedestrian path and ARWAS must be accommodated with safety in mind through whatever intersection types are implemented.
- Projects are designed and built according to a project delivery method:
  - *Design-Bid-Build* — Includes survey, cost estimating, and preliminary and final design to confirm construction plans and specifications that are released for bid to construction contractors once design is complete
  - *Design-Build* — Plans are developed to 30 percent design to select a team of designers/contractors to complete the project. Factors used in team selection include qualifications, duration, price, and innovation.
  - *Construction Management/General Contractor* — The agency contracts separately with a designer and a construction manager. A contractor is selected to provide construction management input during the design process and to perform construction management services and construction work. If the Construction Management/General Contractor and agency cannot reach a mutually agreeable negotiated contract amount or they choose not to negotiate, the project will be advertised for competitive bid.

Acquisition of Property for Right of Way

- When acquisitions are necessary based on record information and field surveys, a title report is ordered and used to prepare property descriptions, exhibits, and ROW plans. The process includes property appraisal and then acquisition negotiations.
- Typically, the timeframe between identification and transfer of ownership takes about 18 months to meet all Uniform Relocation Act requirements. However, it may be possible to obtain possession earlier based on project needs.
- Implementation of projects that involve acquisition of property for ROW must comply with the Uniform Relocation Act.

Managed Lanes

- FHWA defines managed lanes as "Highway facilities or a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions."
- The Colorado Transportation Commission approved the *Managed Lanes Policy Directive 1603.0* on December 28, 2012. The purpose of the policy directive (CDOT 2013) is "to ensure use of managed lanes is strongly considered during planning and development of capacity improvements on state highway facilities within Colorado."
- As projects are implemented, reference CDOT's *Managed Lanes Guidelines* (CDOT 2019) for more information.

How is CDOT thinking about transportation technology for SH 66?

Throughout the course of the SH 66 PEL study, CDOT has considered current technologies and is working to make the corridor ready for emerging technologies that would advance purpose and needs of SH 66, along with corridor goals.

Figure 19. Technology Examples for SH 66

Innovative and Emerging Transportation Technologies

- For existing innovative technology, CDOT understands its potential uses and benefits, which makes decision making for existing technology investments more tangible. Conversely, emerging or future technologies can be moving targets in terms of standards, protocols, systems, business processes, etc. As a result, this PEL aims to strike a balance by:
  - Planning flexibility in infrastructure so that emerging and future technology needs can be accommodated easily and so that early investments are possible while not investing in uncertain infrastructure along SH 66.
  - Planning actionable PEL outcomes so that CDOT and local agencies can take advantage of technology today, while actively preparing for the future.
- This list summarizes existing technologies that offer current and future benefits. These technologies can be implemented now, but they also provide infrastructure and systems needed to accommodate future connected vehicle and automated vehicle (CV/AV) applications:
  - Adaptive Traffic Signal Control — Adaptive traffic signals have been used effectively in CDOT Region 4 for many years. These signals dynamically adjust signal timing, coordination, and progression based on traffic demand and can result in improved traffic flow and safety when used in proper locations. A previous CDOT study shows SH 66 between Colorado Boulevard and US 287 could benefit from adaptive traffic signal control (Atkins 2016). Adaptive signal controls will benefit from emerging CV technologies and will communicate with AVs in the future to optimize traffic flows.
  - Smart/Adaptive Streetlights — Light emitting diode and new communications capabilities allow streetlights to become "smart" and to adapt to current conditions. Benefits include improved safety and improved sustainability through energy and dark sky savings. Lights can change brightness based on the presence or absence of vehicles, pedestrians or other factors (**Figure 19**); can include remote video and audio monitoring by staff; can include Wi-Fi connectivity, can include warning sirens for severe weather or emergencies. With their communications capabilities, these lights will be important with emerging CV/AVs.
  - Blank Out Signs for Pedestrian Crossings — Blank out signs restrict right or left turns at signalized intersections when pedestrians are crossing and improve safety for pedestrians. Signs are activated with pedestrian push buttons and/or can use passive systems like infrared, video, LiDAR, etc., to detect the presence of crossing pedestrians. This information will be valuable to share with CV/AVs to alert them to crossing pedestrians.
  - Variable Speed Limits — Variable speed limits can be used to improve safety and smooth traffic by alerting drivers of slower traffic flow from weather, congestion, accidents, etc. They will be used in the future by CV/AVs to regulate speed for optimal traffic flow.
- Communications and power will be increasingly important for emerging technologies. Future smart cities and CV applications require closer spacing of physical infrastructure than currently exists.
  - For example, the multi-use side path along the corridor can be constructed with removable planes over a communications duct (**Figure 19**).
  - This feature would provide easy access, increase communications capacity, and allow future connections involving new infrastructure/technology.
  - This feature improves safety for maintenance crews, getting them off the roadway, plus closures require less extensive traffic control.

8. References

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