Appendix F
Alternatives Evaluation

Alternatives Analysis
Levels 1 and 2 Technical Memorandum

Alternatives Analysis
Level 3 Evaluation

I-25 PEL: Colorado Springs Denver South Connection

August 2019

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Introduction

This memorandum documents the third level of alternatives development and evaluation for the Interstate 25 (I-25) Colorado Springs Denver South Connection Planning and Environmental Linkages (PEL) study. The PEL Study began in fall 2016 to evaluate alternative concepts for 34 miles of the I-25 corridor between the Town of Monument and the Colorado Highway 470/E-470 (C/E-470). The alternatives analysis for the PEL was well underway in fall 2017 when the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), and local stakeholders advanced development of the I-25 South Gap Project (Gap project) from the PEL Study as an early action project. The Gap project added one lane of highway capacity (in the form of an Express Lane [EL]) to each direction of I-25 between Monument and Castle Rock (approximately 18 miles).

After completion of the I-25 South Gap Environmental Assessment (EA), work on this PEL Study resumed with a third level of alternatives evaluation. The Level 3 evaluation compared one traffic modeling scenarios and the No Action Alternative (which includes the Gap project) to assess additional highway capacity and operational needs for the I-25 mainline. Each scenario represents an option for operating the existing number of lanes or adding lanes to improve mobility and travel reliability in the corridor. Some of these scenarios, as explained in subsequent text, are based on the Core Concepts from each of the three study segments that were carried forward from the Level 2 evaluation. Additional scenarios were identified to encompass a range of capacity improvement options representing the minimum (no new lanes) to the maximum expansion (double the width of the existing facility).

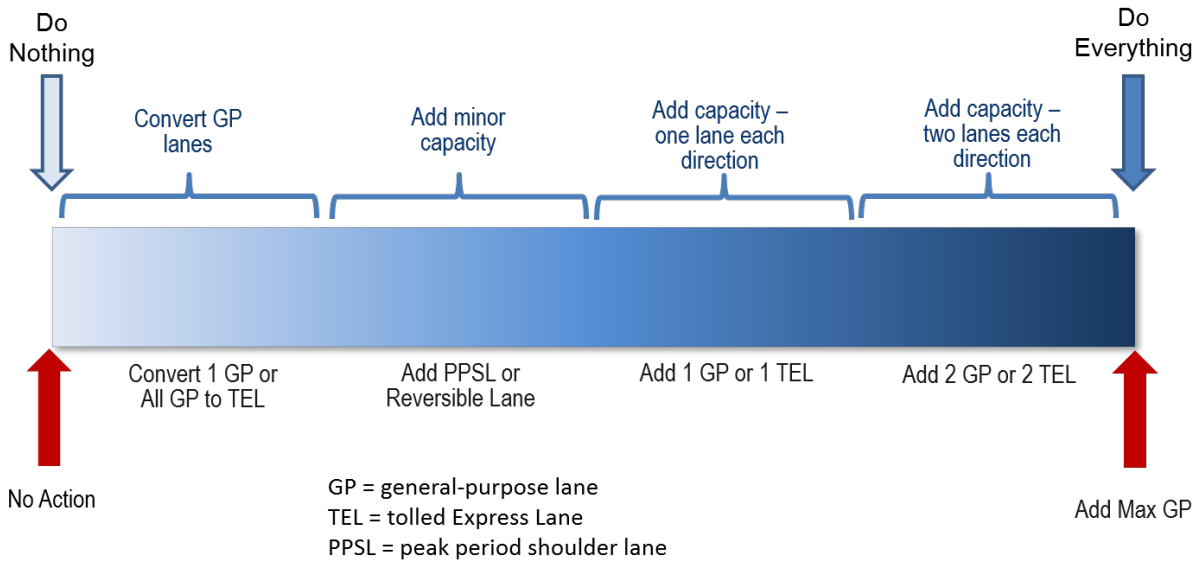
The Level 3 evaluation focused on corridor-wide scenarios primarily for the purpose of travel demand modeling. The travel performance of each scenario was measured as an indicator of relative safety, reliability, and mobility benefits. Consistent with the Level 1 and Level 2 evaluations, additional criteria were included to further assess safety benefits, consistency with local and regional community planning goals, and the potential for impacts to the built and natural environment. The collective assessment of these criteria helped to gauge overall alignment of scenarios with the PEL Purpose, Needs, and Goals.

The Level 3 recommendations presented in this memorandum focus on standalone improvements (Core Concepts) that best meet the identified purpose and need. In coordination with the Technical Working Group (TWG) and stakeholders, CDOT will prepare an implementation plan for the recommended Core Concepts. During future National Environmental Policy Act (NEPA) studies, these Core Concepts will be supplemented with additional elements needed to improve performance and meet project Needs and Goals in each segment.

Modeling Scenarios Evaluated

Scenarios were evaluated to represent a broad range of highway capacity improvement options for the I-25 mainline between Monument and C-470 (Table 1). These scenarios were not intended to serve as preliminary design alternatives. As depicted on Figure 1, they were intended purely to inform decision-making regarding highway capacity and operational needs on I-25.

Figure 1. Modeling Scenarios



Attachment A presents typical sections developed for each of the evaluated scenarios, with an example depicted on Figure 2. Based on the typical section for each scenario, the lane configurations were developed in MicroStation to establish the width of pavement along the corridor and estimate cut and fill limits and right of way (ROW) impacts. Mapbooks illustrating the conceptual layout of each scenario were developed and are also included in Attachment A, with an example depicted on Figure 3.

No Action Scenario

- The No Action modeling scenario is based on the Denver Regional Council of Governments (DRCOG) and Pikes Peak Area Council of Governments (PPACG) models, which include the existing network, projects in the construction phase, and committed projects in each metropolitan planning organization's (MPO's) region. As described in the Traffic Performance and Mobility section, the models from both MPOs were combined and the construction elements from the Gap project were added.
- Structure locations and dimensions are estimated based on design data from the Gap project, Online Transportation Information Systems (OTIS) structure data, and visual inspection of the 2017 aerials.

Mainline I-25 Scenarios

The following assumptions were used in developing the width of pavement and estimating cut and fill limits and ROW impacts for the mainline I-25 scenarios:

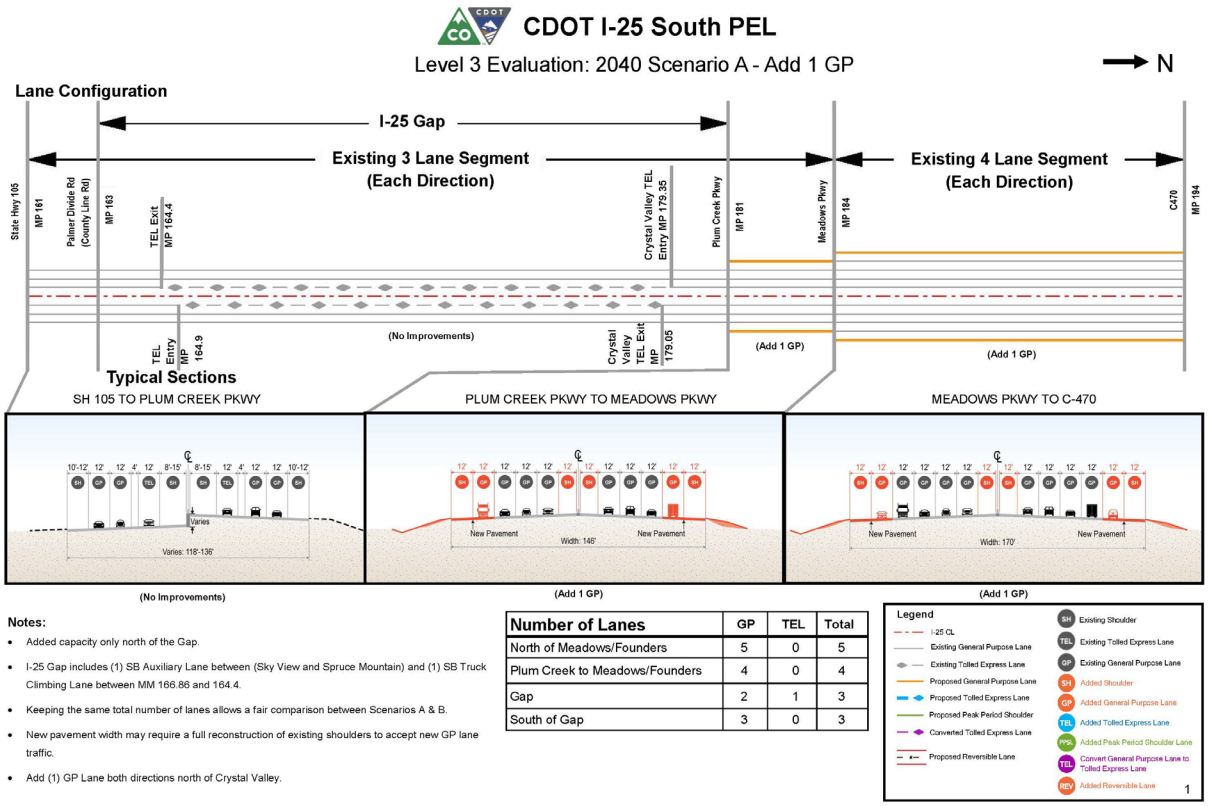
- Full standard typical sections were used with no design refinements to avoid or minimize impacts, or reduce costs. This approach likely results in a conservative estimate of impacts but allows a reasonable and consistent comparison among the scenarios.
- Mitigation efforts (such as relocation of frontage roads, trails, railroads, or floodplain) were not included.

- Each scenario maintains the No Action median barrier centerline control and widens equally to the outside.
- With the exception of maintaining the variable inside shoulders cleared in the *I-25 South Gap Project EA Reevaluation* (CDOT 2019), all scenarios apply standard 12-foot-wide inside/outside shoulders throughout the corridor.
- Scenarios do not add additional earthwork or pavement to extend the 1.15 miles of the truck climbing lane constructed in the Gap project to connect with the Monument Port of Entry.
- Scenarios that add lanes to the Gap segment (State Highway [SH] 105 to Plum Creek Parkway) will convert the existing 1.15 miles of truck climbing lane to a through lane.
- Scenarios that add ELs in Segments 2 and 3 have a southern EL terminus at Crystal Valley Parkway, which is the entrance and exit location approved in the I-25 South Gap EA. For Scenario K, which proposes a new EL for the length of the corridor, the southern terminus of the EL is County Line/Palmer Divide Road.
- Scenario roadside end conditions apply 18-foot Z-slopes and 4:1 cut and fill slopes to a maximum extent of 30 feet. If cut or fill slopes do not match existing ground with this criterion, a retaining wall with guardrail is placed at the outside shoulder location to minimize impact. The 18 feet used for the Z-slope calculations is a conservative assumption that accounts for unknown field conditions that may require ditches and other minor appurtenances.
- A 15-foot buffer was applied to the outside of the cuts, fills, and retaining wall locations that match existing grade. This 15-foot buffer sets the construction limits of each scenario.
- An additional 15-foot buffer was applied to the construction limits to estimate the ROW limits.
- The No Action condition at the northern and southern termini of the study is three travel lanes in each direction. Because some scenarios propose more than three lanes at the northern and southern limits of the study, a transition would be needed. Location of lane drops to transition scenarios back to No Action conditions at the northern and southern termini of project are not defined within this level of evaluation.

Table 1. Modeling Scenarios

Scenario	Scenario Description
No Action	2040 Regional Transportation Plan network, which includes existing plus committed projects and those improvements being constructed with the I-25 South Gap Project.
Scenario A	Adds one GP lane in each direction between Plum Creek Parkway and C-470.
Scenario B	Adds one EL in each direction between Plum Creek Parkway and C-470.
Scenario C	Adds one PPSL in each direction between Plum Creek Parkway and C-470. This scenario was not modeled. Results were inferred from Scenario B for peak period conditions
Scenario D	Converts one GP lane in each direction to an EL between Plum Creek Parkway and C-470.
Scenario E	Converts all GP lanes in each direction to ELs for the entire length of the corridor (SH 105 to C-470).
Scenario F	Adds one reversible lane, between Plum Creek Parkway and C-470. This scenario was not modeled. Results were inferred from Scenario A for peak period conditions.
Scenario G	Adds one GP lane in each direction between SH 105 and Plum Creek Parkway and two GP lanes in each direction between Plum Creek Parkway and C-470.
Scenario H	Adds two GP lanes between SH 105 and Meadows/Founders Parkway and three GP lanes from Meadows/Founders Parkway to C-470. The number of lanes was determined based on the point at which peak hour traffic does not experience substantial congestion (volume to capacity ratios on I-25 less than 0.85).
Scenario I	Adds one GP lane in each direction between SH 105 and Plum Creek Parkway and one EL in each direction between Plum Creek Parkway and C-470.
Scenario J	Adds one GP lane each direction between SH 105 and C-470.
Scenario K	Adds one EL in each direction between Palmer Divide Road and Plum Creek Parkway and two ELs in each direction between Plum Creek Parkway and C-470.

Figure 1. Example of Scenario Lane Configuration and Typical Section

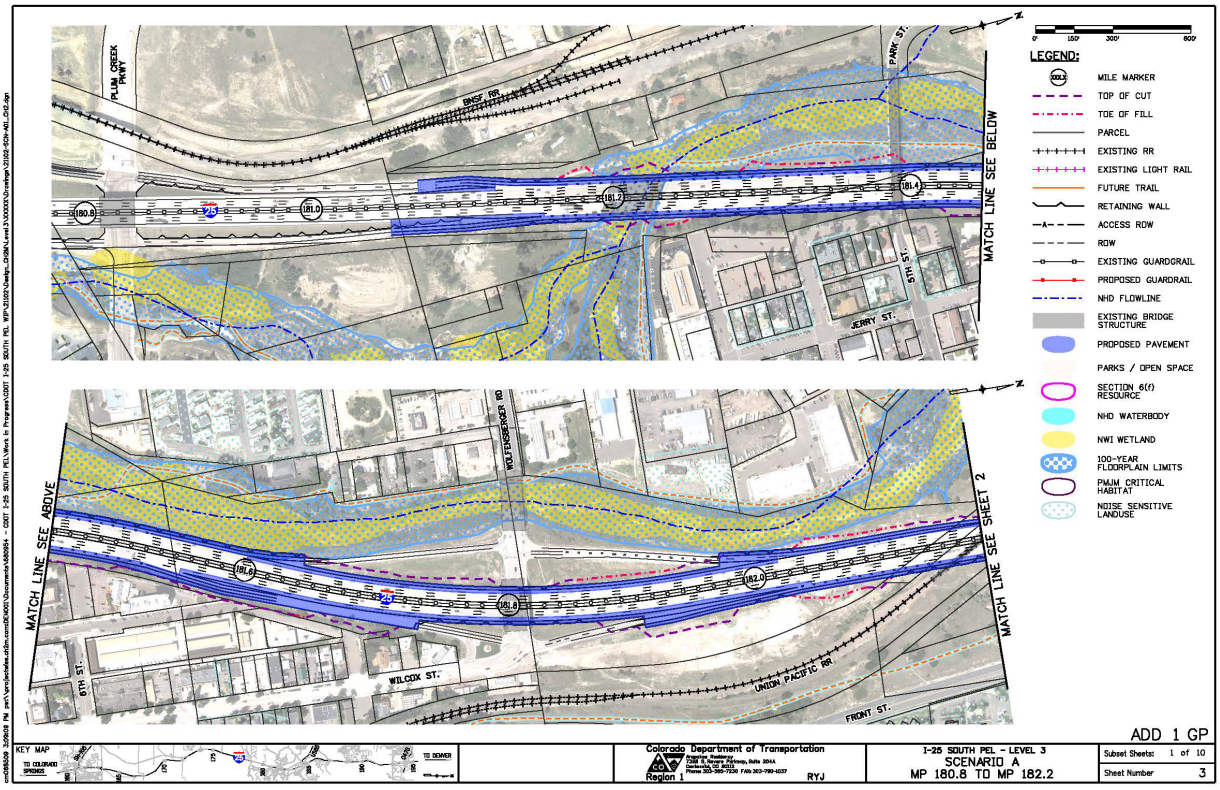


Notes:

- Added capacity only north of the Gap.
- I-25 Gap includes (1) SB Auxiliary Lane between (Sky View and Spruce Mountain) and (1) SB Truck Climbing Lane between MM 166.86 and 164.4.
- Keeping the same total number of lanes allows a fair comparison between Scenarios A & B.
- New pavement width may require a full reconstruction of existing shoulders to accept new GP lane traffic.
- Add (1) GP Lane both directions north of Crystal Valley.

Number of Lanes	GP	TEL	Total
North of Meadows/Founders	5	0	5
Plum Creek to Meadows/Founders	4	0	4
Gap	2	1	3
South of Gap	3	0	3

Figure 2. Example of Scenario Layout



Evaluation Criteria and Process

The Level 3 evaluation was intended to identify the number and type of lanes necessary to meet the purpose and needs of the mainline highway elements of this project, with consideration for the impacts associated with each scenario. A rough order of magnitude cost was also considered for comparison purposes between scenarios. The Level 3 evaluation criteria are listed in Table 2. Specific performance metrics were identified for each criterion to evaluate the scenarios qualitatively or quantitatively depending on the nature of the metric. Based on the evaluation results for each criterion, scenarios were assigned ratings to generally indicate how the scenario performed relative to the No Action scenario and other scenarios. The evaluation process, methodology, and rating system are summarized in Table 2 and explained in more detail in the subsections following sections.

Table 2. Level 3 Evaluation Criteria

Evaluation Criteria	Performance Metrics	Evaluation Method	Rating System	Relevance of Performance Metric
Traffic Performance/ Mobility	VHT; travel time; travel demand on I-25 (travel time and travel demand presented for GP and non-GP lanes)	Quantitative	Good/Fair/Poor	This criterion is a fundamental measure of how well each scenario meets the project purpose and need. Congestion was identified as a key contributor to safety, reliability, and mobility issues in the corridor.
Safety	Potential for crash reduction on I-25	Qualitative	Good/Fair/Poor	This criterion is a fundamental measure of how well each scenario meets the project purpose and need by enhancing safety.
Travel Time Reliability	Minimize impacts from recurring peak-hour and non-recurring incident and event-related congestion on I-25	Qualitative (summarized from Level 2)	Good/Fair/Poor	This criterion is a fundamental measure of how well each scenario meets the project purpose and need. Accounts for operational differences between managed lanes and GP lanes.
Incident Management	Reduce incident-related delays on I-25 and improve safety during incidents	Qualitative (summarized from Level 2)	Good/Fair/Poor	Relates to safety and travel time reliability.
Infrastructure Considerations	Impacts to RTD light rail track, freight railroad track, local roads, bridge structures, and major culverts	Quantitative	Good/Fair/Poor	Assesses how well each scenario addresses the project goal to be compatible with the built environment.
Infrastructure Considerations (continued)	Order of magnitude capital cost for scenarios	Qualitative	Good/Fair/Poor	Provides understanding of the relative cost of implementing each scenario.

Evaluation Criteria	Performance Metrics	Evaluation Method	Rating System	Relevance of Performance Metric
Environmental Resource Impacts	Impacts to economic, community, and natural resources	Quantitative	Low/Moderate/High	Consideration of natural resources, adjacent communities, and economic goals early in the planning stage of transportation projects is a primary function of PEL studies to aid in decision-making. Compatibility with the natural and built environment is also a goal of the project.
Compatibility with Community Planning Goals	Does not preclude community land use or transportation goals, projects in Master Plans, or opportunities for economic development	Qualitative (summarized from Level 2)	Low/Moderate/High	Assesses how well each scenario addresses the project goal of providing transportation solutions to support corridor communities' land use, development, and economic goals.

Notes:

VHT – vehicle hours traveled

RTD – Regional Transportation District

Traffic Performance and Mobility

Improving mobility between Monument and Denver South for local, regional, and interstate travelers is a fundamental part of the project purpose and need. To measure how well each scenario meets the project purpose and need to improve mobility, 2040 travel forecasts were developed for the No Action scenario and each of the I-25 mainline scenarios. Details regarding the traffic modeling for the PEL Study are documented in the *Technical Note - I-25 South PEL Travel Demand Forecasting* (Steer 2019).

Because the project corridor traverses the DRCOG and PPACG MPO boundaries, the DRCOG FOCUS 2.0 model was extended into northern El Paso County. This involved combining both the networks and the trip matrices of the models from the two MPO regions. A traffic count program was undertaken for the study. The model was calibrated to existing conditions using traffic counts and available travel time data. The model was refined to reflect the 2040 No Action scenario, which includes the following:

- One EL in each direction within the Gap
- A new interchange at Crystal Valley Parkway
- A 1.15-mile-long southbound climbing lane south of the Greenland Road interchange
- An auxiliary lane southbound between Sky View Lane and Spruce Mountain Road

This updated No Action model served as the baseline for the scenario modeling and Level 3 evaluation. Consistent with CDOT policy, the following assumptions were made for travel within ELs:

- A target speed of 45 mph was implemented to maximize throughput.
- High Occupancy Vehicle (three or more occupants) lanes were toll free.

- Public transit was allowed toll free.
- A surcharge for trucks was included.

The model was then used to conduct select link analysis to understand travel patterns and define the following EL access/egress locations:

- C/E-470 direct-connect ramps
- South of RidgeGate Parkway
- Between Happy Canyon Road and Castle Rock Parkway
- At Crystal Valley Parkway per Gap EA design

These egress points are not final. Determination of final egress points will be based on a Traffic and Revenue study and evaluated as part of a project level NEPA phase analysis and subsequent concept of operations plan.

Through coordination with the PEL Traffic Working Group, the following performance metrics were selected to assess how well each scenario would improve mobility in the project corridor:

- VHT in 2040
- Travel time (minutes) in 2040
- Travel demand (daily traffic volume) in 2040

Each of these performance metrics is explained in more detail in the following sections.

Vehicle Hours of Travel

Vehicle hours of travel is a measure of effectiveness used to assess system-wide travel performance and quality including changes in off-highway performance; i.e., the local street system. Results were determined for the entire subarea model, consisting of parts of the DRCOG and PPACG model areas, roughly bounded by the following:

- Belleview Avenue to the north
- Kiowa-Bennett Road and Elbert Road to the east
- US 85 and SH 105 to the west
- Interquest Parkway to the south

By comparing all scenarios, the percent change in VHT from the No Action was used to define the following evaluation thresholds:

- Good = a VHT decrease of 2 percent or more
- Fair = VHT change between -2 percent and +2 percent
- Poor = a VHT increase of 2 percent or more

Travel time

Future 2040 peak period travel times on I-25 from Monument to C-470 were calculated for each of the scenarios. This metric is an indicator of the expected interstate performance on a typical workday (northbound AM and southbound PM) barring any major incidents. Travel times in the GP lanes and in the managed lanes (EL, PPSL, and reversible lanes) were obtained from the model results. Because the travel times were calculated for the entire length of the corridor, portions of the travel times for the EL reflect that some of this travel occurs in GP lanes depending on the scenario. The travel time performance of the GP lanes and the managed lanes was compared between scenarios as well as against the No Action scenario. If the travel time was more than one standard deviation of the mean, it was rated as good; within one

standard deviation of the mean, it was assigned a fair rating; and less than one standard deviation, was poor. These good, fair, or poor ratings represented the composite travel time performance for both the GP lanes and managed lanes.

Travel demand

The two-way volume of daily traffic in 2040 was projected for each of the scenarios, including the No Action Scenario. These projections were broken down by GP lane traffic volumes, managed lane traffic volumes, and total daily traffic volumes. The following locations were deemed representative locations in the corridor:

- Castle Pines Parkway to RidgeGate Parkway
- Wolfensberger Road to Meadows/Founders Parkway
- Greenland Road to Upper Lake Gulch Road

The projected 2040 traffic volumes of each scenario vary depending on the number and operation of travel lanes because these factors affect the convenience and desirability of the route. The amount of traffic projected to use the interstate under each scenario as compared with the No Action is an indicator of the effectiveness of the scenario in accommodating future travel demand. The portion of each scenario's total volume captured by managed lanes indicates the effectiveness of the managed lane strategy. These two metrics were used to determine the good, fair, or poor ratings.

Safety

The Level 3 evaluation of safety was a qualitative evaluation that compared the scenarios to each other and assigned a rating of good, fair, or poor based on the ability of each scenario to reduce the potential for existing predominant crash types. The ratings indicate relative differences between the scenarios that were determined based on engineering judgment and knowledge of industry-published research about safety strategy effectiveness.

The evaluation assumed that each of the highway capacity scenarios will provide the opportunity to incorporate proven safety strategies, per industry best practices, at specific locations to address crash concentrations and along the length of the project for a systemic approach to improving safety. These strategies were identified as supplemental elements in the Level 1 evaluation. For the purposes of evaluating scenarios in Level 3, it was assumed these strategies would be included in each highway capacity scenario. The strategies would be selected with consideration to the existing crash history and the known contributing factors that compromise safety for the traveling public in general and specifically for this project, which include the following:

- High visibility signs, markings, and delineators
- Location-specific signing for curves
- Minor geometric improvements to some curves
- Minor drainage improvements to improve roadway surface conditions

- Widened shoulders, which provide the following safety benefits:
  - Provides more room for recovery and crash avoidance
  - Allows officers to better enforce driver behavior because they can park on the shoulder to monitor traffic and pull drivers over to the shoulder without impacting traffic flow on the mainline
  - Enables first responders to use the shoulder to travel to incident scenes relatively unimpeded, which shortens emergency response times
  - Provides more space to move disabled vehicles out of mainline travel lanes so incidents can be cleared more quickly, which reduces the potential for secondary crashes

Travel Time Reliability

Travel time reliability is measured by comparing high-delay days (unexpectedly long trip time) to free flow conditions (vehicles traveling at the posted speed limit). Travel time reliability was assessed for the existing project corridor in 2017 as part of the Initial Corridor Assessment (ICA) (CDOT 2018) completed for this PEL Study. This assessment identified when and where travelers in the corridor experience exceptionally long trip times based on 2015 and 2016 data. Level 3 applied a qualitative evaluation based on the long-term ability of a scenario to (1) deliver reliable travel times during peak-hour congestion and (2) minimize the effect of incidents and events that impact travel time reliability. This criterion focuses on differentiating between GP lanes and managed lanes. The addition of GP lanes can improve reliability by reducing congestion and congestion-related incidents that impact the travel time reliability. However, as congestion increases over time, the reliability benefits of adding GP lanes is eroded. Managed lanes such as ELs, PPSLs, and reversible lanes are operated to promote consistent speeds and reliable travel times and can provide this benefit long-term. Based on this qualitative assessment, scenarios were rated as good if they would provide one or more lanes that could be managed to promote reliable travel times, fair if they would reduce congestion and improve safety in the near-term, and poor if they do not increase capacity or expand managed lane options.

Additional factors related to reliability are measured in other Level 3 criteria, including the following:

- Additional safety measures that would reduce the likelihood of crashes are considered in the Safety section of this technical memorandum.
- Increased availability or consistency of shoulder areas (or other space-enabling incidents) to be cleared more quickly are considered in the Incident Management section of this technical memorandum.
- Additional capacity to reduce congestion and congestion-related incidents is considered in the Traffic Performance and Mobility section of this technical memorandum.

Incident Management

Incident management evaluation involves assessing the ability of a scenario to reduce incident-related delays and improve safety during incidents response, which are fundamental to the project purpose and need. The qualitative evaluation results for this criterion were summarized

from the Level 2 evaluation. Scenarios were then rated as good, fair, or poor based on the following factors:

- Increases availability or consistency of shoulder areas (or other space-enabling incidents) to be cleared more quickly.
- Provides a lane that can be managed for use by emergency vehicles responding to incidents.
- Reduces congestion, allowing emergency responders to reach incidents faster. The degree of anticipated congestion relief correlates positively to the amount of benefit for incident management.

Scenarios were rated good if they provide two or more of these benefits, including more substantial congestion relief; fair if they provide one of these benefits and some degree of congestion relief; and poor if they do not provide any measurable benefit.

Infrastructure Considerations

The No Action infrastructure considered in this evaluation includes existing infrastructure and infrastructure from committed projects including RTD light rail, freight railroad, local frontage roads, interstate bridge structures, and major culverts. The locations and dimensions of No Action scenario infrastructure were estimated based on design data from the Gap project, OTIS structure data, and visual inspection of 2017 aerial imagery. Infrastructure was evaluated against the estimated construction limits of each scenario to quantify impacts. Construction limits were estimated by modeling the limits of cut or fill necessary to implement the paved width of each scenario without design exceptions. Potential infrastructure impacts quantified include the following:

- Acres of impact to RTD light rail ROW
- Acres of impact to freight rail track ROW
- Acres of impact to local frontage roads ROW
- Number of interstate bridge structures
- Number of major culverts (single-cell or multi-cell concrete box culverts)

Evaluation of this criterion was also intended to provide high-level information about the order of magnitude cost to implement each scenario. Order of magnitude costs are based on an estimated quantity of: earthwork, pavement, aggregate base course, retaining walls, and bridge structures to construct new infrastructure or replace existing infrastructure on mainline I-25. A contingency was then applied to arrive at a rough order of magnitude cost for each scenario. Although ROW costs are likely to be substantial and a large percentage of the overall cost of future projects, ROW costs were intentionally excluded from the cost estimates because of the high level of uncertainty and assumptions at this level of analysis.

Scenarios were rated as good, fair, or poor based on the magnitude of potential impacts to No Action scenario infrastructure and the rough order of magnitude cost of each scenario.

Environmental Resource Impacts

To provide a high-level assessment of relative impacts across scenarios, resource impacts that could be readily quantified were calculated. Resource data used for the evaluation was compiled during the ICA. The following resources were included in this evaluation:

- Noise
- Environmental Justice
- Open Space
- Parks/Trails
- 6(f) Resources
- Public/Private Property
- Farmland
- Historic Resources
- Hazardous Material
- Water Resources
- Floodplains
- Wetlands/Riparian
- Habitat Conservation Areas
- Wildlife Movement
- Threatened and Endangered Species

Resources not specifically evaluated in Level 3 are either covered by evaluation of the resources detailed previously or would require more detailed analysis to determine impacts. This includes air quality, visual resources, Section 4(f) properties, water quality, and aquatic resources. Although individual Section 4(f) properties were not identified during the Level 3 evaluation, many of the existing and planned recreational parks, as well as historic properties, would likely qualify for Section 4(f) consideration.

Geographic Information System (GIS) data from the ICA was evaluated against the conceptual-level construction limits and ROW for each scenario to quantify impacts. Construction limits were estimated by modeling the limits of cut or fill necessary to implement the paved width of each scenario without design exceptions. The ROW was estimated by applying a 15-foot buffer to the construction limits.

Direct impacts to environmental resources were tallied and summarized by either number (historic properties), linear feet (trails and streams), or acreage (parks and wetlands). Depending on the nature of the resource, impacts were calculated either from the edge of construction limits or from ROW limits. Construction limits were used for natural resources such as wetlands. ROW limits were used for resources and adjacent land outside of CDOTs existing ROW that would be affected if incorporated into CDOT ROW to implement a scenario, such as parks and private property. Indirect impacts associated with potential traffic increases on the local network and associated impacts were also considered. These impacts were inferred from results of the Traffic Performance/Mobility evaluation.

Scenarios were rated as having low, moderate, or high impacts based on the nature and magnitude of potential impacts to the resources listed here.

Compatibility with Community Planning Goals

Compatibility with community planning goals was evaluated to assess how well each scenario addresses the project Goal of providing transportation solutions to support corridor communities' land use, development, and economic goals. The qualitative evaluation results for this criterion were summarized from the Level 2 evaluation. Scenarios were then rated as good if they highly support Goals and planned projects, fair if they are generally compatible with Goals or would not preclude planned projects, or poor if they may be incompatible with Goals or preclude planned projects.

Level 3 Evaluation Results

This section identifies the Level 3 evaluation results, which are summarized in Table 3 and discussed further in the following sections. Table 3 shows the scenarios across the top row and performance metrics for each criterion down the left column. The evaluation results are reported either as numerical data (quantitative) or a written explanation (qualitative) along with a graphic symbol of how the scenario rates relative to the No Action scenario and the other scenarios.

Traffic Performance and Mobility

Barring any incidents, during typical peak period conditions, drivers can currently expect to traverse I-25 from Monument to C-470 in about 35 minutes on average. The traffic on I-25 is expected to increase 50 percent from 2017 to 2040; and without improvements beyond the No Action scenario, the corridor travel time will almost double.

The scenarios with the greatest increases in capacity (Scenarios G, H, I, and K), whether GP lane or EL, have the best traffic performance relative to other scenarios evaluated. While congestion is projected to persist under any of these scenarios, 2040 travel times on I-25 between Monument and C-470 would be between 11 and 40 minutes faster (depending on the scenario and direction of peak period travel) than if no additional improvements beyond the No Action Alternative were implemented.

Scenario E, which converts all GP lanes to ELs, causes significant traffic diversion to the local road system (doubles traffic on SH 105 and increases traffic on SH 83 threefold) and overall does not accommodate as much traffic demand as the other scenarios. Adding just one GP lane north of the Gap, as in Scenario A, does not improve travel times enough to be rated better than poor. However, in addition to Scenario A, Scenarios B, C, D, and F may provide phasing options toward a broader corridor improvement scenario such as Scenario I or Scenario K.

Safety

Aside from the No Action scenario, which would not address any of the safety issues in the corridor, all highway capacity scenarios offer some degree of improvement for safety and were rated good or fair. This is primarily because proven safety strategies per industry best practices were assumed to be included. In addition, many of the scenarios would increase the capacity of the road, which is likely to reduce the predominant crash types related to congestion.

Per travel demand modeling results, Scenario E would divert traffic to local roadways and highways, which would reduce congestion and the potential for congestion-related crashes on I-25. For this reason, Scenario E would offer the highest potential for crash reduction on I-25 (although would likely increase crash potential on local roads where I-25 traffic is diverted).

Table 3. Level 3 Evaluation Summary

Evaluation Criteria		Modeling Scenarios											
		No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Traffic Performance/Mobility													
2040 Vehicle Hours Traveled (VHT)													
Study Area VHT (Daily Vehicle Hours Traveled)		N/A	◒	◒	◒	◒	○	◒	●	●	●	●	●
		862,000	850,000	851,000	854,000	867,000	910,000	854,000	839,000	831,000	845,000	844,000	843,000
Change from No Action		N/A	-1.4%	-1.3%	-0.9%	+0.6%	+5.6%	-0.9%	-2.7%	-3.5%	-2.0%	-2.1%	-2.2%
2040 Peak Period Travel Time (General Purpose Lanes/Non-General-Purpose Lanes)													
AM Northbound Weekday (Minutes)		○	○	◒	◒	○	◒	◒	●	●	●	◒	●
		57 49	50 42	53 35	53 37	64 35	NA 35	53 35	39 37	33 32	46 33	43 41	44 34
PM Southbound Weekday (Minutes)		○	○	◒	◒	◒	◒	◒	●	●	●	◒	●
		71 49	69 43	64 33	65 35	70 32	NA 36	64 33	40 37	31 30	40 34	43 39	45 29
2040 Travel Demand at Representative Locations in Corridor (Vehicles per Day)													
Castle Pines Parkway to RidgeGate Parkway	GP	223,000	229,000	202,000	213,000	186,000	NA	217,000	233,000	235,000	203,000	230,000	195,000
	Non-GP	NA	NA	19,000	11,000	29,000	174,000	9,000	NA	NA	19,000	NA	26,000
	Total	223,000	229,000	221,000	224,000	215,000	174,000	226,000	233,000	235,000	222,000	230,000	221,000
Wolfensberger Road to Meadows/Founders Parkway	GP	175,000	186,000	160,000	168,000	134,000	NA	171,000	192,000	196,000	165,000	188,000	158,000
	Non-GP	NA	NA	24,000	13,000	32,000	164,000	10,000	NA	NA	21,000	NA	30,000
	Total	175,000	186,000	184,000	181,000	166,000	164,000	181,000	192,000	196,000	186,000	188,000	188,000
Greenland Road to Upper Lake Gulch Road	GP	95,000	95,000	95,000	95,000	94,000	NA	95,000	113,000	121,000	111,000	112,000	93,000
	Non-GP	25,000	26,000	25,000	26,000	26,000	92,000	26,000	12,000	4,000	13,000	11,000	30,000
	Total	120,000	121,000	120,000	121,000	120,000	92,000	121,000	125,000	125,000	124,000	123,000	123,000

Evaluation Criteria	Modeling Scenarios											
	No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Travel Demand Rating	N/A	◒	◒	◒	◒	○	◒	◒	◒	◒	◒	◒
		Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the EL is moderate relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the PPSL is moderate relative to other scenarios, but is less effective than EL.	Accommodates less traffic than the No Action. Portion of traffic captured by the EL is high relative to other scenarios.	Accommodates less traffic than the No Action. Portion of traffic captured by the EL is high relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the reversible lane is moderate relative to other scenarios but is less effective than EL and PPSL.	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios.	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the EL is moderate relative to other scenarios, but the additional GP lane in the Gap makes EL less effective.	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is high relative to other scenarios.
Safety on I-25												
Potential for Crash Reduction on I-25 (qualitative)	○	◒	◒	◒	◒	●	◒	◒	◒	◒	◒	◒
	Existing crash types and rates would continue north of the Gap. Congestion-related crashes could worsen over time as congestion increases.	Could reduce congestion-related crashes but increase potential for lane-changing crashes.	Could reduce congestion-related crashes. Potential for crash reduction in GP lanes depends on effectiveness of EL in reducing congestion in GP lanes.	Could reduce congestion-related crashes, but increase potential for lane-changing crashes, particularly near begin/end points. Elimination of recovery area could increase potential for sideswipe-same direction crashes. Eliminates staging area for disabled vehicles, increasing potential for secondary crashes.	Could reduce congestion-related crashes. Potential for crash reduction in GP lanes depends on effectiveness of EL in reducing congestion in GP lanes.	Likely to reduce overall volumes on I-25, which could reduce the likelihood of congestion-related crashes.	Could reduce congestion-related crashes but would introduce a weaving section where lane merges into GP lane, which could increase potential for crashes at that location.	Could reduce congestion-related crashes but increase potential for lane-changing crashes.	Could reduce congestion-related crashes but increase potential for lane-changing crashes. Congestion-related crashes could persist where lane-reduction occurs.	Additional travel lane (EL) could reduce congestion-related crashes. Additional GP lane in Gap could reduce congestion-related crashes but increase potential for lane-changing crashes.	Could reduce congestion-related crashes but increase potential for lane-changing crashes.	Additional travel lane could reduce congestion-related crashes. Potential for crash reduction in GP lanes depends on effectiveness of EL in reducing congestion in GP lanes.

Evaluation Criteria	Modeling Scenarios											
	No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Travel Time Reliability on I-25												
	○	◒	●	●	●	●	●	◒	◒	●	◒	●
Improvement in providing reliable travel time through corridor, minimizing impacts from recurring peak hour and non-recurring incident-related congestion	Unreliable trip time associated with peak period congestion, incidents, weather, and special events would continue to be an issue in the corridor.	Would slightly improve trip reliability in the short-term by reducing congestion and related delays and crashes.	EL network managed to promote consistent speeds and reliable travel times. May also improve reliability in GP lanes by reducing congestion and related delays and crashes.	PPSL use in peak periods improves overall highway capacity when volumes are highest; provides managed opportunity for reliable travel in peak periods when the shoulders are operated as travel lanes.	EL network managed to promote consistent speeds and reliable travel times.	EL network managed to promote consistent speeds and reliable travel times. May reduce overall volumes on I-25, which could slightly improve reliability by reducing congestion and related delays and crashes.	Reversible Lane managed to promote consistent speeds and reliable travel times in peak periods. May also slightly improve reliability in GP lanes (one direction only) by reducing congestion and related delays and crashes.	Would improve trip reliability by reducing congestion and related delays and crashes in the near-term but does not promote long-term reliability	Would improve trip reliability by reducing congestion and related delays and crashes in the near-term but does not promote long-term reliability.	EL network managed to promote consistent speeds and reliable travel times. Additional GP lane in Gap would improve reliability by reducing congestion and related delays and crashes.	Would improve trip reliability by reducing congestion and related delays and crashes in the near-term but does not promote long-term reliability.	EL network managed to promote consistent speeds and reliable travel times. May also improve reliability in GP lanes by reducing congestion and related delays and crashes.
Incident Management on I-25 (Results summarized from Level 2 Evaluation; Scenarios not specifically evaluated in Level 2, were inferred based on Level 2 results)												
	○	◒	●	◒	◒	●	◒	●	●	●	●	●
Reduce incident-related delays and improve safety during incidents	No measurable change in incident-related delays or safety during incidents north of the Gap.	Would provide additional space for incident response safety and reduce delays during incidents.	EL can be managed for use during incident response and would provide additional space for incident response safety and reduce delays during incidents.	PPSL can be managed for use during incident response. However, adding traffic to shoulder reduces incident management response space during peak periods.	EL can be managed for use during incident response and could improve incident response times by providing a potentially less congested lane for access to incidents. (Removing one GP lane may increase incidents.)	Would improve incident response times on I-25 because some traffic would divert to local roadway system. (Could increase the number of incidents on local roads.)	Could reduce driver delay and improve incident response times if the lane is configured in the direction affected by the incident. However, effectiveness would be limited by access opportunities because of barriers and gates.	Would provide additional space for incident response safety and reduce delays during incidents.	Would provide additional space for incident response safety and reduce delays during incidents.	EL can be managed for use during incident response and would provide additional space for incident response safety and reduce delays during incidents.	Would provide additional space for incident response safety and reduce delays during incidents.	EL can be managed for incident response and provide additional space for incident response safety and reduce delays during incidents.
Infrastructure Considerations (Impacts and Cost)												
Impacts to:	N/A	◒	◒	●	●	●	◒	○	○	○	◒	○
RTD Light Rail Track (Acres)		5.03	5.33	4.61	4.61	4.40	5.13	6.09	6.91	6.40	5.02	4.89
Freight Railroad Track (Acres)		1.38	1.49	1.32	1.32	1.27	1.44	4.28	11.21	4.10	3.65	4.09
Frontage Roads (Acres)		2.02	8.56	6.15	6.15	0.79	2.62	40.72	56.27	41.65	39.94	35.90
Bridge Structures (Each)		16	19	15	15	13	16	28	29	27	24	27

Evaluation Criteria	Modeling Scenarios											
	No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Major Culverts (Each)		2	2	2	2	2	2	4	4	4	4	4
Cost (relative $ – $$$$$)		$$	$$	$	$	$	$$	$$$$	$$$$$	$$$$	$$$	$$$$
Notes: Acreage impacts to RTD light rail, freight, and frontage roads are based on the right-of-way needs from each facility. Dollar signs are used to symbolize rough order of magnitude costs for comparison purposes between scenarios.												
Environmental Impacts												
Impacts to economic, community, and natural resources	○ Minor physical impacts to adjacent land and resources but would continue to result in congestion related impacts with increasing severity.	● Would result in minor impacts associated with minor widening beyond existing ROW.	● Would result in minor impacts associated with minor widening beyond existing ROW.	● Would result in minor impacts associated with minor widening beyond existing ROW.	● Would result in negligible to minor impacts associated with traffic increases on local road network.	○ Minor physical impacts to adjacent land and resources, but would result in major impacts associated with traffic increases on local road network.	● Would result in minor impacts associated with minor widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.	○ Would result in major impacts associated with extensive widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.
Compatibility with Community Planning Goals (Results summarized from Level 2 Evaluation; Scenarios not specifically evaluated in Level 2, were inferred based on Level 2 results)												
	○ Does not preclude community land use goals, transportation planning goals, or projects in master plans.	◒ Could be inconsistent with plans and goals that depend upon improved safety, mobility, and reliability on I-25.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	○ Not compatible with local transportation plans and may impact local transportation projects not anticipated or designed to handle interstate traffic.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	○ Could promote economic development. May preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.

Good ● Fair ◒ Poor ○

Notes:

N/A = not applicable

The improvements proposed for Scenarios A, B, C, D, F, G, H, I, J, and K provide the ability to reduce predominant existing crash types but may increase the potential for other crash types because of the additional lanes and interaction between ELs and GP lanes. The severity of these crash types varies depending upon the prevailing conditions. Although these 10 scenarios received the same fair rating, some of these scenarios are less favorable than others from a safety perspective.

- Scenario C: The use of the shoulder during peak periods increases capacity, which can reduce congestion-related crashes. However, because traffic in the PPSL would generally be traveling faster than in the GP lanes, the speed differential could introduce the potential for crashes that do not typically occur under existing conditions. Use of the inside shoulder as a peak period travel lane also reduces the ability to move disabled vehicles out of the travel lanes; the occurrence and presence of an incident increases the potential for secondary crashes.
- Scenarios G and H provide the highest number of GP lanes, which increases the potential for lane-changing type crashes and weaving-type crashes within interchange areas. The scenarios with a mix of ELs and GP lanes are more favorable than Scenarios G and H because the operation of the ELs restrict the interaction with GP lanes, which would result in a lower potential for lane-changing crashes.

Travel Time Reliability

Scenarios adding capacity with GP lanes (Scenarios A, G, H, and J) were rated fair because they reduce congestion and related delays and crashes, but these benefits erode over time as traffic volumes increase in the future. Increased capacity and reduced congestion contribute to fewer crashes and improved ability to clear incidents more quickly, which improves trip reliability by reducing the number of days drivers encounter higher than average travel times. Scenarios proposing to convert to or add one or more managed lanes (Scenarios B, C, D, E, F, I, and K) would provide one or more lanes that are operated specifically to provide reliable travel times even during peak period congestion. These scenarios were rated good because they are anticipated to offer travel time reliability in the managed lanes most of the time.

Incident Management

Aside from the No Action scenario, which would not reduce incident-related delays or improve safety during incidents, all highway capacity scenarios offer some degree of benefit for incident management because they would bring the corridor to standards including implementation of 12-foot-wide inside and outside shoulders. The wider and consistent shoulder widths would better enable emergency responders to reach and clear incidents faster. Most of the build scenarios would also offer some degree of congestion relief, allowing emergency responders to reach incidents faster.

Scenarios receiving a fair rating include A, C, D, and F. These scenarios would provide additional space for emergency response ranging from 12-foot shoulders to one additional lane. Scenario A would provide additional space and some degree of congestion relief, but no additional lanes that could be managed for emergency use during incidents. Scenarios C and D would provide some degree of congestion relief and lanes that could be managed for emergency use during incidents, but additional space is limited to 12-foot shoulders. Scenario F

would provide some degree of congestion relief, 12-foot shoulders, and an additional lane that could be managed for emergency use during incidents. However, effectiveness of the reversible lane for incident management would be limited by access opportunities because of barriers and gates.

Scenarios receiving a good rating (Scenarios B, E, G, H, I, J, and K) provided more overall benefit for incident management. Scenario B would provide some degree of congestion relief, 12-foot shoulders, and an additional lane that could be managed for emergency use during incidents. Scenario E is anticipated to have substantially lower volumes than other scenarios, would have 12-foot shoulders, and would provide lanes that could be managed for emergency use during incidents. Scenarios G, H, I, J, and K all provide 12-foot shoulders and more congestion relief than the fair-rated scenarios because of the addition of two lanes (one in the Gap). Scenarios I and K would also provide additional lanes that could be managed for emergency use during incidents.

Infrastructure Considerations

The order of magnitude cost of each scenario and the degree of impacts to infrastructure existing under the 2040 No Action scenario are primarily a product of the additional width needed for each scenario.

Scenarios proposing to add one or more lanes in the Gap and two or more lanes north of the Gap (Scenarios G, H, and K) have the greatest impact to No Action infrastructure and the highest order of magnitude cost relative to other Level 3 scenarios. These scenarios were rated poor. Although not as impactful as Scenarios G, H, and K, Scenario I is also rated poor because the impacts were slightly higher than the fair rated scenarios and the cost is estimated to be similar to Scenario G.

Scenarios proposing to add one lane north of the Gap (Scenarios A, B, and F) have moderate impacts to No Action infrastructure and mid-range order of magnitude cost relative to other Level 3 scenarios. These scenarios are rated fair. Scenario J, which is also rated fair, has slightly higher impacts than the other scenarios in this grouping because it includes improvements in the Gap, but the differences are minor and the order of magnitude cost is similar.

Scenarios proposing no additional lanes (Scenarios C, D, and E) would still bring the facility to design standards, which would result in a minor amount of widening. These scenarios would have lower impacts to No Action infrastructure and lower order of magnitude cost relative to other Level 3 scenarios. These scenarios were rated good.

Environmental Resource Impacts

The nature and magnitude of impacts relates to the additional width needed for each scenario and the community impacts potentially caused by substantial diversion of traffic to the local network.

The lowest impact scenarios were those proposing to add one lane north of the Gap (Scenarios A, B, C, and F) or convert a GP lane to an EL (Scenario D). These scenarios would result in minor widening that could be implemented mostly within existing ROW. While there is some variance in the level of impact that would be associated with these scenarios, impacts to

adjacent resources under any of these scenarios would be low relative to other Level 3 scenarios.

Scenarios proposing to add one lane in the GAP and one to two lanes north of the Gap (Scenarios G, I, J, and K) would have a larger increase in the width of the corridor and would affect the entire corridor rather than the segments north of the Gap only. The additional width as compared to the low-impact scenarios results in a considerable increase in impacts to private property, historic properties, conservation easements/open space, noise-sensitive resources, farmland, floodplains, riparian conservation zone, wetlands, and wildlife movement corridors. As a result, these scenarios would result in a moderate level of impact to adjacent resources relative to other Level 3 scenarios.

The following three scenarios were deemed to have high impacts based on either direct or indirect impact potential:

- The No Action scenario would not result in widening or have direct impacts to adjacent resources along the corridor. However, impacts associated with high levels of congestion would include substantial travel delay and economic impacts.
- Scenario E would result in minor widening to bring the corridor to standards and would result in substantial traffic impacts on the local transportation network. While direct impacts to adjacent property and resources from widening would be relatively low, community and business impacts associated with overloading the local network would include substantial travel delay, noise, and economic impacts.
- Scenario H would roughly double the width of the interstate resulting in substantial impacts to adjacent natural and built environment resources. Resources impacts associated with Scenario H would be more than double the moderately rated scenarios in some instances, including ROW, conservation easement/open space, historic properties, and wetlands.

A summary of impacts by resource types is provided in Attachment B. Additional information was collected and will be provided in the PEL Report (e.g., specific trail and park names or Environmental Justice block group numbers).

Compatibility with Community Planning Goals

With a few exceptions, the scenarios were rated fair as they would generally be compatible with community planning goals or would not preclude planned projects. Scenarios rated poor for incompatibility with Goals or potential to preclude planned projects include the following:

- The No Action scenario would not improve safety, mobility, or reliability on I-25 and could be inconsistent with plans or Goals reliant upon these outcomes.
- By converting all existing GP lanes to ELs, Scenario E would likely overload the local transportation network with interstate traffic impacting local transportation projects not anticipated or designed to handle the additional traffic volumes.
- By doubling the width of the interstate, Scenario H would substantially improve the capacity of I-25 and reduce travel times, which may encourage economic development and is compatible with local transportation goals. However, the much wider footprint of the facility

would have substantial impact to adjacent land and may preclude planned projects along the interstate.

Public and Stakeholder Coordination

The project team met with the public and stakeholders through the Level 3 process to solicit input and feedback on the process, evaluation criteria, and results.

Resource Agency Group and Technical Working Group

The project team met with the Resource Agency Group (RAG) and TWG during the Level 3 evaluation to solicit feedback on the evaluation process, results, and recommendations. These meetings are summarized in Table 4.

Table 4. RAG/TWG Meetings

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
September 7, 2018	Presented Level 3 screening process, criteria, performance metrics, and modeling scenarios	No input related to Level 3.	N/A
November 2, 2018	Presented travel demand forecasting assumptions, modeling scenarios, and preliminary results. Reviewed other criteria to capture impacts.	Need to consider transit and planned development in the evaluation.	Transit elements were identified as supplemental elements in Levels 1 and 2 and conversations regarding station location options are ongoing. The transit evaluation will be presented in a technical memorandum and in the PEL Report.
		Template from the PEL needs to be compatible with planned improvements at Black Feather Trail, Happy Canyon Road, Meadows/Founders Parkway, and Lincoln Avenue.	The Level 3 evaluation considers compatibility with community plans.
		Questions about model segments north of C-470.	The traffic team reviewed two different locations for EL access, at C/E-470 and several miles south of C/E-470 and did not see a significant impact to EL volumes. VHT analysis across the entire network covered as far north as Belleview Avenue, but EL facilities did not extend north of C/E-470.

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
December 7, 2018	More in-depth presentation of modeling scenarios (including design assumptions), criteria (including methodologies), and results of analysis for all criteria.	Do not eliminate the PPSL; can be combined with any alternative.	The PPSL option is not eliminated in Level 3.
		There should be more difference between scenarios for safety.	While Level 3 only includes three rating levels for each criterion, CDOT recognizes there are some finer distinctions between scenarios for safety and other criteria.
		Compatibility with the future Interregional Connectivity Study (ICS) should be considered.	The ICS alignment was not factored into the Level 3 evaluation of traffic modeling scenarios. Potential conflicts between the ICS alignment and the recommended buildout of the I-25 mainline will be assessed as part of CDOT's implementation plan and recommended next steps following the PEL Study.
		The impact to Preble's meadow jumping mouse habitat looks high relative to the amount of ROW needs for each scenario.	Adjusted to calculate critical habitat instead of occupied habitat.
		If interchanges, such as Wolfensberger, need to be modified in the future, this could have impacts on the mainline.	Various interchange improvements were identified as supplemental elements in Level 1 and 2. Impacts to interchanges will be discussed with the TWG/RAG and documented in the PEL Report.
February 1, 2019	Summary of results and feedback from stakeholders and public.	Why add a lane north of the Gap with the existing bottleneck at C/E-470?	See the Recommendations section of this memorandum for an explanation of the Level 3 recommendations including transition zones at each terminus of the study.
		Even though CDOT has said that any additional lane in the Gap may be a GP lane or managed lane (e.g., EL), there are some who will be disappointed if an additional lane is not a GP lane.	This input will be considered and shared with future NEPA teams during development of projects in the corridor.
		Coordination with the Colorado Motor Carriers Association (CMCA) is needed to address the port of entry (POE) chain up stations and bus traffic through the POE. If the POE moves, the new site needs to be flat but cannot be located on the Air Force Academy property.	Various supplemental elements including the POE were identified as supplemental elements in Level 1 and 2. Discussions regarding the existing POE and potential future sites will be discussed with the CMCA and other stakeholders as part of a future TWG/RAG workshop.

Steering Committee

The project team met with the Steering Committee during the Level 3 evaluation to solicit feedback on the evaluation process, results, and recommendations. These meetings are summarized in Table 5.

Table 5. Steering Committee Meetings

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
September 14, 2018	Presented Level 3 screening process and criteria	PEL team needs to have a good understanding of current population projections and master plans along the corridor.	This process was completed using approved metropolitan planning organization models.
		Questions about how freight is being considered in the corridor, including the use of chain up stations for trucks.	Various freight improvements were identified as supplemental elements in Level 1 and 2. Freight improvements will be discussed further with the RAG/TWG and documented in the PEL Report.
		Acknowledgement that the cost of ELs is more than the GP lanes because ELs also include tolling components, buffers, signage, and similar.	The order of magnitude costs presented in this report demonstrate this difference.
November 9, 2018	Presented travel demand forecasting assumptions, modeling scenarios, and preliminary results.	Question regarding how the analysis accounts for connected vehicles.	The Level 3 analysis demonstrates it is not feasible to accommodate the expected traffic demand on I-25 between Colorado Springs and Denver solely by adding more lanes to the interstate. CDOT is incorporating communications infrastructure on State routes to facilitate use of new technologies such as connected vehicles and autonomous vehicles, which are anticipated to improve the capacity and safety on highway facilities. In addition, PEL recommendations will consider how to facilitate new transportation technologies.

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
December 14, 2018	More in-depth presentation of modeling scenarios, criteria, and results of traffic performance analysis. Also provided preliminary recommendations.	Question about how often a PPSL would be in use if employed in this corridor.	A PPSL would be used during peak periods when traffic volumes and congestion are the highest.
		Overall support for the direction of the study recommendations for additional highway capacity. Support for additional two lanes north of the Gap and one additional lane in the Gap.	This input will be considered and shared with future NEPA teams during development of projects in the corridor.
		If a GP lane is converted to an EL, also need to look at adding a GP lane during future NEPA studies.	This input will be considered and shared with future NEPA teams during development of projects in the corridor.
		Need to evaluate auxiliary lanes in PEL or another study.	Auxiliary lanes were identified as a supplemental element in the Level 1 and 2 evaluations and will be discussed in the PEL Report.
		There was considerable discussion about transit including the Monument Park-n-Ride and an additional transit center in Castle Rock. The group would like to see transit information at the next Steering Committee Meeting.	Transit is being considered. The evaluation will be presented in a technical memorandum and in the PEL Report.
February 8, 2019	Summary of results and feedback from stakeholders and public.	Need to consider lane-imbalance north of C/E-470 exit, which is a 3-lane section connecting to a proposed 6-lane section between C-470 and Meadows/Founders Parkway as recommended in Level 3.	While not included in the Level 3 modeling scenarios, lane drops may be needed to match the lane configuration that exists when full build-out in the Study Area occurs (see the Recommendation section for discussion).
		PPSL should be retained as a potential phasing option.	The PPSL option is not eliminated in Level 3.
		Concern about PPSL because of the important role that shoulders play for emergency response.	This issue is recognized and acknowledged in the Level 3 analysis.

Public Involvement

Public meetings were held in Castle Rock on January 15, 2019, and Colorado Springs on January 17, 2019. The purpose of these meetings was to reintroduce the PEL Study, which was put on hold to focus on delivery of the I-25 South Gap Project (now under construction); provide an update on I-25 corridor improvements being studied; and gather input on recommendations for I-25 improvements after the Gap project. Approximately 37 people participated in these meetings.

Dialogue with the public at the meetings indicated general support for the overall vision of I-25 including the highway capacity recommendation, transit, and localized highway improvements. Other feedback included the following:

- Interest in how toll revenues from the Gap project would be applied to the corridor
- Interest in local or other road improvements, such as improvements to SH 83 and timing and effects of the Crystal Valley interchange
- Positive feedback on the I-25 South Gap Project construction
- Positive responses to both short- and longer-term transit options

CDOT solicited public input through a questionnaire provided at the meeting and made available on the CDOT website: http://i25cosden.codot.commentinput.com/?id=bdx27. Based on responses received, more reliable travel times and reduced congestion on I-25 were the top two transportation needs identified by the public. More than 60 percent of respondents indicated that the CDOT recommendations (as explained in Chapter 6 of this document) meet the transportation needs of the corridor. Concerns with CDOT recommendations included the following:

- Toll lanes and their potential impact on SH 83
- Poor quality of planning on the Gap project and the PEL Study
- Insufficient funding to implement CDOT's overall vision for the study segment of I-25 and maintain the corridor once it is complete
- Improved capacity through emerging vehicle technologies may reduce the need for widening the interstate
- Impacts to conservation easements from widening the interstate

Other transportation improvements suggested by the public to address transportation needs included passing lanes and shoulders on SH 83, improvements to support emerging vehicle technologies, frontage road improvements near Crystal Valley Parkway, and a bicycle path connection between the Plum Creek Trail and Front Range Trail.

Recommendations

Conclusions from the Level 3 evaluation and recommendations regarding highway capacity Core Concepts are summarized in Table 6 and explained in more detail in the following sections.

Table 6. Summary of Level 3 Recommendations

Highway Capacity Core Concepts	Representative Scenarios	Conclusions and Recommendations
Add Combination of GP Lanes and ELs	Scenario I	Extending the EL from Plum Creek Parkway to C-470 is a viable phasing option; adding a GP lane south of Plum Creek Parkway may also be a viable phasing option, but a second additional travel lane north of Plum Creek Parkway is recommended to better address travel demand
Add ELs Only	Scenarios B and K	Extending the EL from Plum Creek Parkway to C-470 is a viable phasing option; a second EL throughout the corridor is one of the recommended options to better address travel demand
Add GP Lanes Only	Scenarios A, G, H, and J	Not recommended because adding GP lanes alone does not meet long-term travel time reliability needs
Convert GP Lanes to ELs	Scenarios D and E	Converting one GP to an EL may be a viable phasing option and is considered a potential interim solution; converting all GPs to ELs is not recommended because of traffic impacts on the local transportation network
Add PPSL	Scenario C	Adding a PPSL north of Plum Creek Parkway may be a viable phasing option and is considered a potential interim solution
Add Reversible Lane	Scenario F	Adding a reversible lane is not recommended because it only serves one direction of traffic at a time and the direction split of traffic volumes in this corridor is not very pronounced (60/40)

Core Concepts Carried Forward

Based on the results of the Level 3 evaluation and consideration of input from stakeholders and the public, CDOT recommends one additional travel lane in each direction in the Gap segment between SH 105 and Plum Creek Parkway, and two additional travel lanes in each direction north of the Gap between Plum Creek Parkway and C-470. This recommendation would ultimately result in four travel lanes in each direction between SH 105 and Plum Creek Parkway, five travel lanes in each direction between Plum Creek Parkway and Meadows/Founders Parkway, and six travel lanes in each direction between Meadows/Founders Parkway and C-470.

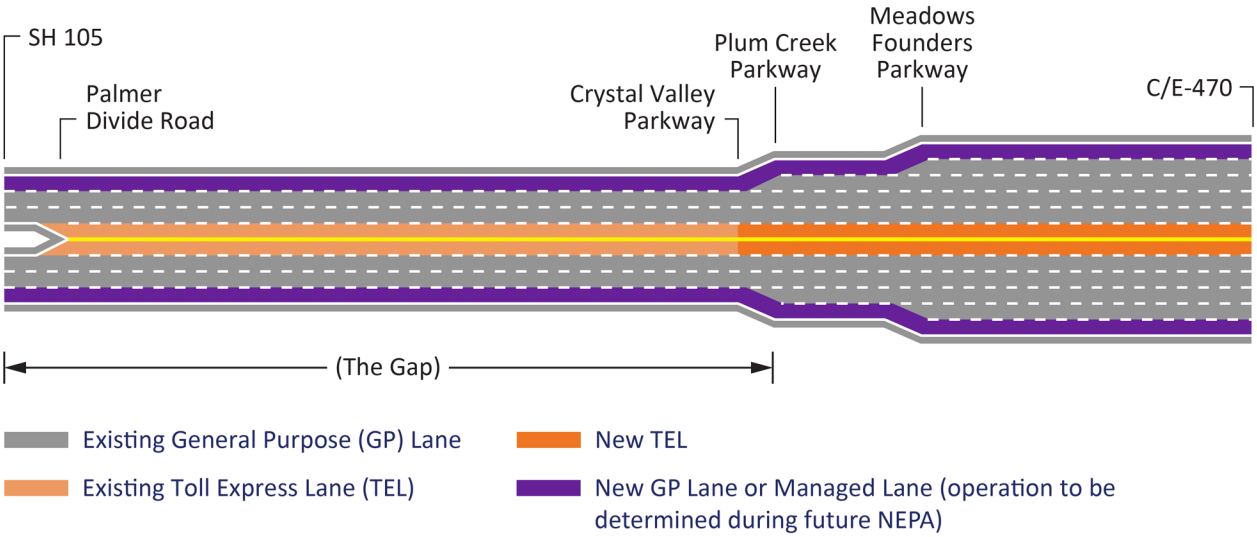
The modeling exercise completed for the Level 3 evaluation confirmed that while capacity expansions can improve travel times, they will not eliminate congestion issues. To provide reliable travel times in the corridor and maximize the effectiveness of the EL being constructed as part of the I-25 South Gap Project, one of the additional travel lanes constructed north of Plum Creek Parkway is recommended to be an EL. A continuous EL is critical to meeting the purpose and need because managed lanes provide long-term travel time reliability in the corridor. The EL also provides a faster, more reliable trip for bus service in the corridor, which, combined with complementary investments such as additional buses and increased service, can lead to increased transit ridership. In addition, a mix of ELs and GP lanes is more favorable from a safety perspective than a configuration with GP lanes only, because the operation of the ELs

restrict the interaction with GP lanes, which would result in a lower potential for lane-changing crashes.

The operation of the other travel lane to be added between SH 105 and C-470 would be determined if and when funding for those improvements is identified and they advance into NEPA and design. This additional travel lane would further improve mobility in the corridor as volumes continue to increase over time. The additional space allows better maneuverability to pass slower vehicles or avoid incidents. As the vehicle fleet transitions to increasingly autonomous vehicles, availability of lanes for dedicated autonomous vehicle use would improve the viability of the corridor for this emerging technology.

While not specifically modelled, the evaluation results of Scenarios G and K indicate the recommended lane configuration (Figure 4) would provide substantial traffic benefits as compared with the No Action scenario, reducing regional VHT between 2.2 and 2.7 percent, reducing travel times during peak travel periods by 12 to 31 minutes, and accommodating the projected 2040 traffic volumes. The Core Concept recommendation will be modeled to confirm traffic performance with results provided in the PEL Report.

Figure 3. Core Concept Recommendation



Phasing Options for Core Concept Recommendation

It is likely the ultimate configuration of I-25 between Monument and Denver South will be implemented in phases based on priority and availability of funding. Phasing recommendations will be part of the implementation plan included in the PEL Report. The timeframe for implementation of PEL recommendations is not known at this time. Because the Core Concept recommendation proposes more lanes on I-25 between SH 105 and C-470 than will exist with all No Action improvements completed, future project teams will need to consider the transition zones at each end of the Study Area. At the southern end of the Study Area, a lane drop would be needed to match the existing 3-lane section at SH 105. At the northern end of the Study Area, a new lane drop would be needed at Lincoln Avenue or County Line Road and the ELs may connect with ELs on C-470 westbound and E-470 eastbound. These transitions are

dependent on the number of lanes existing south of SH 105 and crossing C-470 when full build-out in the Study Area occurs.

The following discusses phasing options for the Core Concept recommendation. These options are based on scenarios modeled for Level 3. While some of them do not fully meet the purpose and needs of the PEL Study as an ultimate solution, they offer some combination of safety, mobility, or reliability benefits and could function as a long-term or interim component of project phasing.

- Converting one GP lane to an EL in each direction between Plum Creek Parkway and C-470 was modeled in Scenario D and offers a low-cost interim option to meet the need for travel time reliability. This option is not expected to improve travel times in the remaining GP lanes (no change in southbound PM peak period travel time and 7-minute increase in AM northbound peak period travel time) and could have some traffic impacts on the local road network but would provide a more reliable travel option in the corridor by extending the managed lane concept currently being implemented in the Gap. This option would result in a continuous EL in each direction between Monument and South Denver and is expected to offer EL users 14 to 17 minutes of travel time savings over the 2040 No Action.
- Creating a PPSL in each direction between Plum Creek Parkway and C-470 was evaluated in Scenario C (with modeling results inferred from Scenario B) and may offer a lower-cost interim option to meet the need for travel time reliability. Further analysis of existing shoulder conditions is necessary before determining if converting shoulders to a travel lane is a cost-effective option. Adding PPSLs would have travel time savings for the GP lanes (4 to 6 minutes) and would provide a more reliable travel option in the corridor by improving the inside shoulders between Plum Creek Parkway and C-470 to function as managed lanes during AM and PM peak periods. The PPSL is expected to offer users 12 to 14 minutes of travel time savings over the 2040 No Action.
- Adding an EL in each direction between Plum Creek Parkway and C-470 was modeled in Scenario B and offers a moderate-cost, long-term option to meet the need for travel time reliability. This option would have travel time savings for the GP lanes (4 to 7 minutes) and would provide a more reliable travel option in the corridor by extending the managed lane concept currently being implemented in the Gap. This option would result in a continuous EL in each direction between Monument and South Denver and would be expected to offer EL users 14 to 16 minutes of travel time savings over the 2040 No Action.
- Adding one GP lane in each direction between SH 105 and Plum Creek Parkway was not modeled independently, but was modeled as part of Scenarios G, I, and J. Depending on the needs determined during future NEPA studies, this phasing option could offer a moderate cost, long-term option to improve mobility in the corridor. If implemented in conjunction with or subsequent to implementation of an EL in each direction between Plum Creek Parkway and C-470 (Scenario I), this phasing option offers substantial time savings in the GP lanes; 11 minutes in the AM northbound direction and 31 minutes in the PM southbound direction, as compared to the 2040 No Action.

Scenarios Not Recommended

Based on the results of the Level 3 evaluation and consideration of input from stakeholders and the public, CDOT does not recommend further evaluation of the scenarios listed in this section because they do not meet the identified purpose and need, would have comparatively low benefits, or have similar benefits to scenarios with lower impacts. The following explains considerations regarding each of these scenarios in more detail:

- Scenario A: Adding one GP lane in each direction north of Plum Creek Parkway would have minimal travel time benefits with savings of 2 to 7 minutes compared with the 2040 No Action scenario. The additional GP lane would slightly improve reliability by reducing congestion and congestion-related incidents that impact travel time reliability. However, as congestion increases over time, the minimal reliability benefits of adding a GP lane would be eroded and would not meet long-term travel time reliability needs. Therefore, Scenario A would have limited effectiveness in addressing the purpose and need and is not recommended for further evaluation.
- Scenario E: Converting all existing GP lanes to ELs is predicted to lower I-25 traffic volumes on I-25 because approximately 10 percent of I-25 traffic (approximately 88,000 vehicles per day as compared with the 2040 No Action scenario) would divert from the interstate to local routes to avoid paying tolls on I-25. The lower traffic volumes on the interstate would reduce congestion and related delays and crashes, resulting in safety and travel time reliability improvements on the interstate. Travel time reliability would also be improved by the ELs, which are managed to promote consistent speeds and reliable travel times. However, the improvements in I-25 performance would be at the cost of the local transportation network and adjacent communities. The VHT on the Study Area transportation network would increase by 5.6 percent because interstate traffic would divert to and overwhelm the local network creating excessive congestion and delay. While the cost and direct impacts of this scenario are low, the indirect impacts on adjacent communities (traffic, noise, and economic) could be substantial. Therefore, Scenario E is not consistent with project Goals regarding compatibility with the natural/built environment and community plans and goals, and therefore, is not recommended for further evaluation.
- Scenario F: Adding a reversible lane from Plum Creek Parkway to C-470 would have similar travel time benefits to adding an EL or PPSL, but only in the direction that the reversible lane is being operated. In this corridor, the directional split of traffic volumes is approximately 60 percent northbound and 40 percent southbound in the AM with the reverse split in the PM. Because the reversible lane only serves one direction of traffic at a time, only 60 percent of the traffic would be served by this scenario. Because the directional split of traffic volumes in this corridor is not very pronounced, traffic congestion in the off-peak direction would persist. Further, the infrastructure (such as barriers) required to operate a reversible lane limits future flexibility in using pavement space. Addition of an EL or PPSL in both directions provides more benefit and flexibility than a reversible lane. Therefore, Scenario F is not recommended for further evaluation.
- Scenario G: Adding one GP lane in each direction from SH 105 to Plum Creek Parkway and two GP lanes in each direction from Plum Creek Parkway to C-470 would result in substantial travel time savings: 18 minutes in the AM northbound direction and 31 minutes in

the PM southbound direction, as compared to the 2040 No Action scenario. The additional GP lanes would improve reliability by reducing congestion and congestion-related incidents that impact travel time. However, as congestion increases over time, the reliability benefits of adding GP lanes would be eroded and would not meet long-term travel time reliability needs. Therefore, Scenario G is not recommended for further evaluation.

- Scenario H: Roughly doubling the capacity of the interstate by adding two GP lanes in each direction between SH 105 and Meadows/Founders Parkway and three GP lanes in each direction from Meadows/Founders Parkway to C-470 would have the most travel time benefits of any of the modeled scenarios: 19 minutes in the AM northbound direction and 40 minutes in the PM southbound direction, as compared to the 2040 No Action scenario. The additional GP lanes would improve reliability by reducing congestion and congestion-related incidents that impact travel time. However, as congestion increases over time, the reliability benefits of adding GP lanes would be eroded and would not meet long-term travel time reliability needs. The much wider footprint of the interstate would also have substantial impacts to adjacent property and natural resources and preliminary estimates indicate this scenario would cost about 50 percent more than the Core Concept recommendation. Therefore, Scenario H is not recommended for further evaluation.
- Scenario J: Adding one GP lane in each direction for the length of the corridor would result in substantial travel time savings: 14 minutes in the AM northbound direction and 28 minutes in the PM southbound direction, as compared to the 2040 No Action scenario. The additional GP lane would improve reliability in the near-term by reducing congestion and congestion-related incidents that impact travel time. However, as congestion increases over time, the reliability benefits of adding a GP lane would be eroded and would not meet long-term travel time reliability needs. Therefore, Scenario J is not recommended for further evaluation.

Next Steps

CDOT will work closely with the TWG and Steering Committee to develop an implementation plan for the Core Concept recommendation. After considering input and refining the implementation plan, CDOT will hold a final set of public meetings to gather public input on the final PEL Study recommendations.

All aspects of the PEL Study will be documented in the PEL Report, which will be made available for public and stakeholder review. Once FHWA has provided a letter of acceptance, the planning products from this PEL Study can be used in future NEPA studies to advance projects in the study corridor.

References

Colorado Department of Transportation (CDOT). 2019. *I-25 South Gap Project EA Reevaluation.* January.

Attachment A
Level 1 Evaluation Matrix

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Level I Evaluation Screening Table

NOTE: At Level 1, each segment is being evaluated individually. Subsequent levels of evaluation will include a review of the dependencies and continuity of elements, and combinations of elements, between the three segments.
Level 1 result classifications are defined as:
Carried Forward as Core Concept = has the potential to address the project's purpose and need by itself (i.e., standalone).
Carried Forward as Supplemental Element = has the potential to enhance the Core Concept(s).
Not Recommended for Further Evaluation = will not be evaluated further in the study due to comparatively negligible benefits, and/or higher impacts than other concepts/elements.
Eliminated = does not meet the Purpose and Need established within this study.

CONCEPTS for SEGMENT 1 (MP 161-179): The Gap, Monument to Castle Rock	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
No Action	N	N	N	N	Carried Forward as Core Concept	Although the No Action does not meet the purpose and need, it is advanced as a baseline condition for comparison.
Infrastructure Elements						
LANE CONFIGURATION (NOTE: Existing lane configuration is two lanes in each direction.)						
Add One General Purpose Lane Each Direction (three lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	
Add One Express Lane Each Direction (three lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	
Add One General Purpose Lane and One Express Lane Each Direction (four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	
Add Two General Purpose Lanes Each Direction (four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Route continuity better when combined with four lane element in Segment 2.
Add Two Express Lanes Each Direction (four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Route continuity better when combined with four lane element in Segment 2.
Add Auxiliary Lanes between Tomah Exit and Spruce Mountain Road	Y	Y	Y	Y	Carried Forward as Core Concept	Could act as frontage roads.
Add Southbound Truck Climbing Lane(s) or Passing Lane(s) at Monument Hill	Y	Y	Y	Y	Carried Forward as Core Concept	
Add One Reversible Lane	Y	N	N	Y	Not Recommended for Further Evaluation	Reversible lane is not effective because volume split of traffic NB and SB does not indicate peak directions.
Add New Elevated Travelway Each Direction (three lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	
Add Express Lane and Convert Existing General Purpose Lanes to Express Lanes (three lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Future evaluation would need to evaluate effects on alternate routes.
Add/Convert Peak Period Shoulder	Y	Y	Y	Y	Carried Forward as Core Concept	
INTERCHANGES						
Improve County Line Road / I-25	Y	Y	Y	Y	Carried Forward as Supplemental Element	Local mobility could be improved with interchange reconfiguration.
Improve Greenland Road / I-25	Y	Y	N	Y	Carried Forward as Supplemental Element	Greenland Road interchange is used to offload I-25 traffic when Monument Hill is closed. Improving the interchange could improve incident management.
Improve Upper Lake Gulch Road / I-25	Y	Y	Y	Y	Carried Forward as Supplemental Element	Combine interchange with Spruce Mountain Road. Local mobility could be improved with interchange reconfiguration.
Improve Spruce Mountain Road / I-25	Y	Y	Y	Y	Carried Forward as Supplemental Element	Combine interchange with Upper Lake Gulch Road. Local mobility could be improved with interchange reconfiguration.
Improve Sky View Lane (Tomah Road) / I-25	Y	Y	Y	Y	Carried Forward as Supplemental Element	Local mobility could be improved with interchange reconfiguration.

Summary: *Segment 1 resulted in 10 Core Concepts and 43 Supplemental Elements being carried forward. 1 Core Concept and 10 Supplemental Elements are Not Recommended for Further Evaluation.6 Supplemental Elements are Eliminated.*

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Level I Evaluation Screening Table

NOTE: At Level 1, each segment is being evaluated individually. Subsequent levels of evaluation will include a review of the dependencies and continuity of elements, and combinations of elements, between the three segments.
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CONCEPTS for SEGMENT 1 (MP 161-179): The Gap, Monument to Castle Rock	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Infrastructure Elements Cont.						
Add new Crystal Valley Parkway / I-25 (planned by others)	Y	Y	Y	Y	Carried Forward as Supplemental Element	New interchange would provide improved local access and mobility. EA and FONSI completed for developer-funded project.
STRUCTURES						
Replace/Rehabilitate County Line Road / I-25 bridge, MP 163.3	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.
Replace/Rehabilitate East Plum Creek bridge, MP 167.3	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate Greenland Road box culvert, MP 167.5	Y	N	Y	Y	Carried Forward as Supplemental Element	Local mobility improved with two-way traffic through structure.
Replace/Rehabilitate Upper Lake Gulch Road / I-25 NB bridge, MP 171.8	Y	N	N	N	Carried Forward as Supplemental Element	Bridge has a structurally deficient rating. Bridge carries I-25; therefore, improving the bridge directly improves I-25.
Replace/Rehabilitate Upper Lake Gulch Road / I-25 SB bridge, MP 171.8	Y	N	N	N	Carried Forward as Supplemental Element	Bridge has a structurally deficient rating. Bridge carries I-25; therefore, improving the bridge directly improves I-25.
Replace/Rehabilitate Railroad bridge, MP 172.0	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate East Plum Creek bridge, MP 172.2	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate Spruce Mountain Road / I-25 bridge, MP 172.3	N	N	N	N	Eliminated	Bridge has a functionally obsolete rating. Bridge does not carry I-25; therefore, improving the bridge does not directly improve I-25.
Replace/Rehabilitate Sky View Lane (Tomah Road) / I-25 bridge, MP 173.8	N	N	N	N	Eliminated	Bridge has a functionally obsolete rating. Bridge does not carry I-25; therefore, improving the bridge does not directly improve I-25.
ALTERNATE ROUTES AND LOCAL ROADS						
Improve State Highway 83	N	Y	Y	Y	Not Recommended for Further Evaluation	Improvements to alternate routes or local roads do not directly improve the safety of I-25. While these roads do serve as detours to I-25 traffic when incidents occur, their primary function is to serve local traffic (e.g. Noe, Andrews, and Best Roads) or trips outside the PEL corridor (SH-83 and SH-105). El Paso County has several projects under construction and planned to improve the state highways in Segment 1. Improvements to local roads would be undertaken at the county or municipal levels.
Improve State Highway / County Road 105	N	Y	Y	Y	Not Recommended for Further Evaluation	
Improve Noe Road	N	Y	N	Y	Not Recommended for Further Evaluation	
Improve South Andrews Road	N	Y	N	Y	Not Recommended for Further Evaluation	
Improve Spruce Mountain Road	N	Y	N	Y	Not Recommended for Further Evaluation	
Improve East Best Road	N	Y	N	Y	Not Recommended for Further Evaluation	
Improve East Greenland Road	N	Y	N	Y	Not Recommended for Further Evaluation	
FRONTAGE ROADS						
Extend I-25 Frontage Roads (east and west of I-25) South from Sky View Lane to Spruce Mountain Road	N	Y	Y	Y	Carried Forward as Supplemental Element	
OTHER PHYSICAL ELEMENTS						
Improved Inside Shoulder (width may vary)	Y	Y	N	Y	Carried Forward as Supplemental Element	
Improved Outside Shoulder (width may vary)	Y	Y	N	Y	Carried Forward as Supplemental Element	
Infrastructure Elements Cont.						
Add Wildlife Crossings / Fencing	Y	Y	N	N	Carried Forward as Supplemental Element	

Summary: *Segment 1 resulted in 10 Core Concepts and 43 Supplemental Elements being carried forward. 1 Core Concept and 10 Supplemental Elements are Not Recommended for Further Evaluation.6 Supplemental Elements are Eliminated.*

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Level I Evaluation Screening Table

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New Carpool/Park-n-Ride Lot(s)	Y	Y	N	N	Carried Forward as Supplemental Element	
Improve Monument Bustang Park-n-Ride Facility	N	N	Y	N	Carried Forward as Supplemental Element	
Add / Improve Lighting	Y	N	Y	Y	Carried Forward as Supplemental Element	Darkness is a safety concern in some locations. Darkness is also valued for environmental reasons.
Add Emergency Parking	Y	N	Y	Y	Carried Forward as Supplemental Element	
Add Turnouts	Y	Y	N	Y	Carried Forward as Supplemental Element	
Improve and/or add emergency median crossover(s)	Y	Y	N	Y	Carried Forward as Supplemental Element	
Relocate Port of Entry / Weigh Station	Y	Y	N	N	Carried Forward as Supplemental Element	
Add / Relocate Chain-Up / Chain-Down Stations	Y	Y	N	Y	Carried Forward as Supplemental Element	
Reopen Rest Areas	Y	N	N	Y	Carried Forward as Supplemental Element	
Repurpose Rest Areas	Y	Y	N	Y	Carried Forward as Supplemental Element	
Multimodal Elements						
Add Passenger Rail along I-25 (high speed or commuter rail)	N	Y	Y	N	Carried Forward as Supplemental Element	
Add Commuter Rail along Existing BNSF/UPRR Corridor	N	N	Y	N	Not Recommended for Further Evaluation	While the BNSF/UPRR lines generally follow I-25 in Segment 1, the alignment diverges in the Palmer Lake area. Additionally, the regional nature of trip patterns through Segment 1 would not be served by a commuter rail through the Gap area, which would be forced to diverge from the PEL corridor when the tracks diverge south of Castle Rock.
Extend Light Rail E/F/R Line(s) South along I-25 to from Castle Rock to Monument	N	Y	Y	N	Not Recommended for Further Evaluation	Light Rail is not appropriate for Segment 1 (overall distance and distance between stations, speeds, seating capacity, power/grades). Passenger rail along I-25 is evaluated as a separate element.
Add Bus Rapid Transit (BRT) on Dedicated Facility	N	Y	Y	N	Not Recommended for Further Evaluation	Dedicated BRT offers little advantage over enhanced bus service in a regional setting; enhanced conventional bus service can achieve same advantages.
Expand Bustang Service	N	Y	Y	N	Carried Forward as Supplemental Element	Reliability would be improved if express lane is implemented with transit priority. Includes more round trips, and improvements to Monument Park-n-Ride, and new Bustang station in Castle Rock.
Add Trail Underpass at Upper Lake Gulch Road	N	N	Y	N	Carried Forward as Supplemental Element	
Add Trail Underpass at State Highway / County Road 105	N	N	Y	N	Carried Forward as Supplemental Element	
Add Continuous Bicycle/Pedestrian Path	N	N	Y	N	Carried Forward as Supplemental Element	

Summary: *Segment 1 resulted in 10 Core Concepts and 43 Supplemental Elements being carried forward. 1 Core Concept and 10 Supplemental Elements are Not Recommended for Further Evaluation.6 Supplemental Elements are Eliminated.*

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CONCEPTS for SEGMENT 1 (MP 161-179): The Gap, Monument to Castle Rock	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Operations Elements						
Consider Express Lane Fee Structure	N	N	Y	N	Carried Forward as Supplemental Element	In conjunction with conversion of existing lanes to express lanes or new express lanes.
Update Incident Management Plan	Y	Y	Y	Y	Carried Forward as Supplemental Element	
Accommodate Autonomous Vehicles	Y	Y	Y	N	Carried Forward as Supplemental Element	
Add Queue Warning	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add Ramp Metering	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add Wildlife Detection and Alert System	Y	Y	N	N	Carried Forward as Supplemental Element	
Enhance ITS infrastructure	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add VMS signage	Y	Y	N	Y	Carried Forward as Supplemental Element	
Enhance Lane Markings (e.g., solar lights)	Y	Y	N	N	Carried Forward as Supplemental Element	
Implement Variable Speed Limits	Y	Y	N	N	Carried Forward as Supplemental Element	Must include enforcement to be effective.
Implement Automated Speed Enforcement	Y	Y	N	N	Carried Forward as Supplemental Element	
Add Commercial Truck Emergency Parking / Refuge	Y	Y	N	Y	Carried Forward as Supplemental Element	
Improve Special Event Traffic Control Coordination	Y	Y	N	Y	Carried Forward as Supplemental Element	
Implement Changes to Speed Limits	Y	Y	N	N	Carried Forward as Supplemental Element	
Expand Weigh in Motion	Y	Y	N	N	Carried Forward as Supplemental Element	

Summary: *Segment 1 resulted in 10 Core Concepts and 43 Supplemental Elements being carried forward. 1 Core Concept and 10 Supplemental Elements are Not Recommended for Further Evaluation.6 Supplemental Elements are Eliminated.*

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Level I Evaluation Screening Table

NOTE: At Level 1, each segment is being evaluated individually. Subsequent levels of evaluation will include a review of the dependencies and continuity of elements, and combinations of elements, between the three segments.
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Carried Forward as Supplemental Element = has the potential to enhance the Core Concept(s).
Not Recommended for Further Evaluation = will not be evaluated further in the study due to comparatively negligible benefits, and/or higher impacts than other concepts/elements.
Eliminated = does not meet the Purpose and Need established within this study.

CONCEPTS for SEGMENT 2 (MP 179-189): Castle Rock to Castle Pines	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
No Action	N	N	N	N	Carried Forward as Core Concept	Although the No Action does not meet the purpose and need, it is advanced as a baseline condition for comparison.
Infrastructure Elements						
LANE CONFIGURATION (NOTE: Existing lane configuration is three lanes each direction south of Founders Parkway and four lanes each direction north of Founders Parkway.)						
Add One General Purpose Lane Each Direction south of Founders Parkway (continuous four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Provides lane continuity with four lane section to the north.
Add One Express Lane Each Direction South of Founders Parkway (continuous four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Express lane continuity better with conversion of one existing general purpose lane each direction to express lane north of Founders Parkway. Would need to determine how express lane operations would transition / convert for existing four lane section north of Founders Parkway.
Add Two General Purpose Lanes Each Direction South of Founders Parkway; Add One General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Route continuity better when combined with five lane element in Segment 3.
Add One General Purpose Lane and One Express Lane Each Direction South of Founders Parkway; Add One Express Lane or General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Route continuity better when combined with five lane element in Segment 3. Would need to determine how express lane operations would transition / convert for section north of Founders Parkway.
Add Two Express Lanes Each Direction South of Founders Parkway; Add One Express Lane Each Direction North of Founders Parkway (continuous five lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Route continuity better when combined with five lane element in Segment 3. Express lane continuity better with conversion of one existing general purpose lane each direction to express lane north of Founders Parkway. Would need to determine how express lane operations would transition / convert for section north of Founders Parkway.
Add One Reversible Lane	Y	Y	Y	Y	Carried Forward as Core Concept	
Add New Elevated Travelway Each Direction (four/five lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Would not address lane balance with three to four lane section.
Convert One Existing Lane to Express Lane (three/four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Would not address lane balance with three to four lane section.
Convert All Existing Lanes to Express Lanes (three/four lanes)	Y	Y	N	N	Carried Forward as Core Concept	Would likely push commercial truck/interstate traffic onto local road network, reducing local mobility.
Add/Convert Peak Period Shoulder	Y	Y	Y	Y	Carried Forward as Core Concept	
Add Auxiliary Lane(s)	Y	Y	Y	Y	Carried Forward as Core Concept	

Summary: *Segment 2 resulted in 11 Core Concepts and 24 Supplemental Elements being carried forward. 4 Supplemental Elements are Not Recommended for Further Evaluation. 19 Supplemental Elements are Eliminated.*

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Level I Evaluation Screening Table

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Carried Forward as Core Concept = has the potential to address the project's purpose and need by itself (i.e., standalone).
Carried Forward as Supplemental Element = has the potential to enhance the Core Concept(s).
Not Recommended for Further Evaluation = will not be evaluated further in the study due to comparatively negligible benefits, and/or higher impacts than other concepts/elements.
Eliminated = does not meet the Purpose and Need established within this study.

CONCEPTS for SEGMENT 2 (MP 179-189): Castle Rock to Castle Pines	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Infrastructure Elements Cont.						
INTERCHANGES						
Improve Plum Creek Parkway / I-25	Y	Y	Y	Y	Carried Forward as Supplemental Element	
Improve Wilcox Street / Wolfsenrberger Road / I-25	Y	Y	Y	Y	Carried Forward as Supplemental Element	
Restore US 85 / I-25 Connection (at Black Feather, by others)	Y	Y	Y	Y	Carried Forward as Supplemental Element	
Improve Meadows Parkway / Founders Parkway / I-25	N	N	N	N	Eliminated	Interchange improvements not needed.
Improve Castle Rock Parkway / I-25	N	N	N	N	Eliminated	Interchange improvements not needed.
Add New Happy Canyon Road / I-25 (new by others)	Y	Y	Y	Y	Carried Forward as Supplemental Element	
Improve Castle Pines Parkway / I-25	N	N	N	N	Eliminated	Interchange improvements not needed.
STRUCTURES						
Replace/Rehabilitate I-25 NB Over Plum Creek Parkway, MP 180.8	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate I-25 SB Over Plum Creek Parkway, MP 180.8	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate I-25 NB Over East Plum Creek, MP 181.2	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate I-25 SB Over East Plum Creek, MP 181.2	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate 5th Street Over I-25 , MP 181.5	N	N	N	N	Eliminated	Bridge has a functionally obsolete rating. Bridge does not carry I-25; therefore, improving the bridge does not directly improve I-25.
Replace/Rehabilitate I-25 Over Plum Creek, MP 181.9	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate Wolfsenberger Over I-25 , MP 181.9	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.
Replace/Rehabilitate UPRR Over I-25, MP 182.2	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.
Replace/Rehabilitate County Road 107 Over I-25, MP 182.4	N	N	N	N	Eliminated	Bridge has a structurally deficient rating. Bridge does not carry I-25; therefore, improving the bridge does not directly improve I-25.
Replace/Rehabilitate Black Feather Trail Over I-25 , MP 183.3	N	N	N	N	Eliminated	Bridge has a functionally obsolete rating. Bridge does not carry I-25; therefore, improving the bridge does not improve I-25.
Replace/Rehabilitate Founders Over I-25 , MP 184.2	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.
Replace/Rehabilitate Castle Rock Parkway Over I-25, MP 185.0	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.
Replace/Rehabilitate Happy Canyon Over I-25, MP 187.0	N	N	N	N	Eliminated	Bridge has a structurally deficient rating. Bridge does not carry I-25; therefore, improving the bridge does not directly improve I-25.

Summary: *Segment 2 resulted in 11 Core Concepts and 24 Supplemental Elements being carried forward. 4 Supplemental Elements are Not Recommended for Further Evaluation. 19 Supplemental Elements are Eliminated.*

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Level I Evaluation Screening Table

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Eliminated = does not meet the Purpose and Need established within this study.

CONCEPTS for SEGMENT 2 (MP 179-189): Castle Rock to Castle Pines	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Infrastructure Elements Cont.						
Replace/Rehabilitate Castle Pines Parkway Over I-25 , MP 188.5	N	N	N	N	Eliminated	Bridge has a structurally deficient rating. Bridge does not carry I-25; therefore, improving the bridge does not directly improve I-25.
ALTERNATE ROUTES AND LOCAL ROADS						
Improve US Highway 85	N	Y	Y	Y	Not Recommended for Further Evaluation	Does not improve I-25 directly and are already available as an alternate routes for incident management. Improvements to local roads would be undertaken at the county or municipal levels.
Improve State Highway 83	N	Y	Y	Y	Not Recommended for Further Evaluation	
Other Local Road Improvements	N	N	N	N	Eliminated	
FRONTAGE ROADS						
Add I-25 Frontage Road from Founders Parkway North to Castle Pines Parkway	N	N	Y	Y	Carried Forward as Supplemental Element	Front Street provides frontage travel south of Founders Parkway. North of Castle Pines Parkway, South Havana Street provides frontage travel. A frontage road in this location could assist in offloading I-25 in the event of I-25 closure north of Castle Rock.
OTHER PHYSICAL ELEMENTS						
Improve Inside Shoulder (width may vary)	Y	Y	N	Y	Carried Forward as Supplemental Element	
Improve Outside Shoulder (width may vary)	Y	Y	N	Y	Carried Forward as Supplemental Element	
New Park-N-Ride Facility	N	N	Y	N	Carried Forward as Supplemental Element	
Add Emergency Parking	Y	N	Y	Y	Carried Forward as Supplemental Element	
Add / Improve Lighting	Y	N	Y	Y	Carried Forward as Supplemental Element	
Infrastructure Elements Cont.						
Add Wildlife Crossings / Fencing	Y	Y	N	N	Carried Forward as Supplemental Element	
Multimodal Elements						
Add Passenger Rail along I-25 (high speed or commuter rail)	N	Y	Y	N	Carried Forward as Supplemental Element	
Add Commuter Rail along Existing BNSF/UPRR Corridor	N	N	N	N	Eliminated	The existing UPRR and BNSF lines bypass the majority of Segment 2, failing to serve either local or regional trips.
Extend Light Rail E/F/R Line(s) South along I-25 to Castle Rock	N	Y	Y	N	Not Recommended for Further Evaluation	Light Rail is not appropriate for Segment 2 (overall distance and distance between stations, speeds, seating capacity, power/grades). Passenger rail along I-25 is evaluated as a separate element.
Add Bus Rapid Transit (BRT) on Dedicated Facility	N	Y	Y	N	Not Recommended for Further Evaluation	Dedicated BRT offers little advantage over enhanced bus service in a regional setting; enhanced conventional bus service can achieve same advantages.

Summary: *Segment 2 resulted in 11 Core Concepts and 24 Supplemental Elements being carried forward. 4 Supplemental Elements are Not Recommended for Further Evaluation. 19 Supplemental Elements are Eliminated.*

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CONCEPTS for SEGMENT 2 (MP 179-189): Castle Rock to Castle Pines	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Multimodal Elements Cont.						
Expand Bustang Service	N	Y	Y	N	Carried Forward as Supplemental Element	Reliability would be improved if express lane is implemented with transit priority. Includes more round trips, and new Bustang station in Castle Rock.
Add Front Range Trail Connection to Castle Pines Parkway	N	N	Y	N	Carried Forward as Supplemental Element	
Operations Elements						
Consider Express Lane Fee Structure	N	N	Y	N	Carried Forward as Supplemental Element	In conjunction with conversion of existing lanes to express lanes or new express lanes.
Accommodate Autonomous Vehicle Lanes	Y	Y	Y	N	Carried Forward as Supplemental Element	
Add Queue Warning	Y	Y	N	Y	Carried Forward as Supplemental Element	
Operations Elements Cont.						
Add Ramp Metering	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add Wildlife Detection and Alert System	Y	Y	N	N	Carried Forward as Supplemental Element	
Enhance ITS infrastructure	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add VMS signage	Y	Y	N	Y	Carried Forward as Supplemental Element	
Enhance Lane Markings	Y	Y	N	N	Carried Forward as Supplemental Element	
Implement Variable Speed Limits	Y	Y	N	N	Carried Forward as Supplemental Element	Must include enforcement to be effective.
Implement Changes to Speed Limits	Y	Y	N	N	Carried Forward as Supplemental Element	

Summary: *Segment 2 resulted in 11 Core Concepts and 24 Supplemental Elements being carried forward. 4 Supplemental Elements are Not Recommended for Further Evaluation. 19 Supplemental Elements are Eliminated.*

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CONCEPTS for SEGMENT 3 (MP 189-194): Denver South	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
No Action	N	N	N	N	Carried Forward as Core Concept	Although the No Action does not meet the purpose and need, it is advanced as a baseline condition for comparison.
Infrastructure Elements						
LANE CONFIGURATION (NOTE: Existing lane configuration is four lanes each direction.)						
Add One Express Lane Each Direction (five lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	Route continuity better when combined with five lane element in Segment 2.
Add One Reversible Lane	Y	Y	Y	Y	Carried Forward as Core Concept	
New Elevated Travelway Each Direction (five lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	
Convert One Existing Lane to Express Lane (four lanes)	Y	Y	Y	Y	Carried Forward as Core Concept	
Add New Truck Climbing Lane SB at Surrey Ridge	Y	Y	Y	Y	Carried Forward as Core Concept	
Add Auxiliary Lane(s)	Y	Y	Y	Y	Carried Forward as Core Concept	
Convert All Existing Lanes to Express Lanes Each Direction (four lanes)	Y	Y	N	Y	Carried Forward as Core Concept	Would likely push commercial truck traffic onto local road network.
Add/Convert Peak Period Shoulder	Y	Y	N	Y	Carried Forward as Core Concept	
INTERCHANGES						
Improve RidgeGate Parkway / I-25	N	N	N	N	Eliminated	Interchange improvements not needed.
Improve Lincoln Avenue / I-25	N	N	Y	Y	Carried Forward as Supplemental Element	I-25 widening would require reconfiguration of this interchange. Ultimate vision is a single point urban interchange. Will require local partnerships.
Add New Direct Express Lane Connection to E-470 and C-470	N	Y	Y	Y	Carried Forward as Supplemental Element	
STRUCTURES						
Replace/Rehabilitate I-25 Over Surrey Ridge, MP 189.7	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate I-25 Over Happy Canyon Creek, MP 191.1	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Replace/Rehabilitate I-25 Over RidgeGate Parkway, MP 192.0	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge carries I-25.
Add New Future RTD LRT Bridge Over I-25, MP TBD (by others)	N	N	N	N	Eliminated	Improvement by others.
Lincoln Avenue Over I-25, MP 193.0	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.
Add New RTD Pedestrian Bridge Over I-25, MP 193.7 (by others)	N	N	N	N	Eliminated	Improvement by others.
Add New Structures at C-470 Interchange	N	N	N	N	Eliminated	Bridge is in acceptable condition. Bridge does not carry I-25.

Summary: *Segment 3 resulted in 8 Core Concepts and 18 Supplemental Elements being carried forward. 2 Supplemental Elements are Not Recommended for Further Evaluation. 13 Supplemental Elements are Eliminated.*

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CONCEPTS for SEGMENT 3 (MP 189-194): Denver South	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Infrastructure Elements Cont.						
ALTERNATE ROUTES AND LOCAL ROADS						
Improve RidgeGate Parkway	N	N	N	N	Eliminated	Does not improve I-25 directly. Local road improvements would be undertaken at the county or municipal levels.
Improve Lincoln Avenue	N	N	N	N	Eliminated	
Other Local Road Improvements	N	N	N	N	Eliminated	
OTHER PHYSICAL ELEMENTS						
Add Chain Up / Chain Down Station	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add Emergency Parking	Y	N	Y	Y	Carried Forward as Supplemental Element	
Add Emergency Median Crossover Between Castle Pines Parkway and RidgeGate Parkway	Y	Y	N	y	Carried Forward as Supplemental Element	
Add Wildlife Crossings / Fencing	Y	Y	N	N	Carried Forward as Supplemental Element	
Multimodal Elements						
Add Passenger Rail along I-25 (high speed or commuter rail)	N	Y	Y	N	Carried Forward as Supplemental Element	
Add Commuter Rail along Existing BNSF/UPRR Corridor	N	N	N	N	Eliminated	In Segment 3, the existing UPRR and BNSF lines have left the I-25 corridor and, instead, follow the US-85 corridor.
Extend E/F/R Line(s) South of RidgeGate to Castle Rock	N	Y	Y	N	Not Recommended for Further Evaluation	Light Rail is not appropriate for Segment 3 (overall distance and distance between stations, speeds, seating capacity, power/grades). Passenger rail along I-25 is evaluated as a separate element.
Add Bus Rapid Transit (BRT) on Dedicated Facility	N	Y	Y	N	Not Recommended for Further Evaluation	Dedicated BRT offers little advantage over enhanced bus service in a regional setting; enhanced conventional bus service can achieve same advantages.
Expand Bustang Service	N	Y	Y	N	Carried Forward as Supplemental Element	Reliability would be improved if express lane is implemented with transit priority. Includes more round trips.
Add Trail Underpass at Lone Tree Southern Corporate Limits	N	N	Y	N	Carried Forward as Supplemental Element	
Add Bicycle Connectivity to Centennial Trail	N	N	Y	N	Carried Forward as Supplemental Element	
Operations Elements						
Consider Express Lane Fee Structure	N	N	Y	N	Carried Forward as Supplemental Element	In conjunction with conversion of existing lanes to express lanes or new express lanes. Requires conversion of existing lane to express lane or new express lane.
Accommodate Autonomous Vehicle Lanes	Y	Y	Y	N	Carried Forward as Supplemental Element	
Add Queue Warning	Y	Y	N	Y	Carried Forward as Supplemental Element	
Add / Improve Lighting	N	N	N	N	Eliminated	No identified issues with lighting in this segment.
Enhance ITS infrastructure	Y	Y	N	Y	Carried Forward as Supplemental Element	

Summary: *Segment 3 resulted in 8 Core Concepts and 18 Supplemental Elements being carried forward. 2 Supplemental Elements are Not Recommended for Further Evaluation. 13 Supplemental Elements are Eliminated.*

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CONCEPTS for SEGMENT 3 (MP 189-194): Denver South	**ADVANCES SAFETY?** (potential to reduce crashes or improve infrastructure deficiencies on I-25)	**IMPROVES RELIABILITY?** (potential to improve travel time, improve travel time predictability, or reduce delays on I-25)	**ENHANCES REGIONAL AND/OR LOCAL MOBILITY?** (potential to provide improved travel options, reduces diversion to local roads)	**IMPROVES INCIDENT MANAGEMENT?** (potential to reduce response/clear time, improve responder safety, reduce crashes, provide route around accident, improve driver communication/coordination)	**RESULT of LEVEL 1 EVALUATION**	**COMMENTS**
Operations Elements Cont.						
Add VMS signage	Y	Y	N	Y	Carried Forward as Supplemental Element	
Enhance Lane Marking	Y	Y	N	N	Carried Forward as Supplemental Element	
Implement Variable Speed Limits	Y	Y	N	N	Carried Forward as Supplemental Element	Must include enforcement to be effective.
Implement Speed Limit Changes	Y	Y	N	N	Carried Forward as Supplemental Element	

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Attachment B
Level 2 Evaluation Matrix

Segment 1: Add One General Purpose Lane Each Direction (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Additional lane increases the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Additional lane would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures. • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability.	• Would provide additional capacity but may not result in reliable travel times during high volume periods when the highway becomes congested.
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lane would increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• New travel lane would provide more capacity to serve trips on I-25, which would reduce travel pressure and volumes on local roads and alternate routes.
		• New lane would likely not impact existing transit operations but would not preclude future transit options.
		• New lane would not provide any additional support for non-vehicular travel choices.
		• Not consistent with CDOT's goals for adding capacity and managing congestion.
		• Operations and maintenance work are improved because additional lanes improve work zone flexibility.
		• Additional lanes increase the maintenance/plowing burden.
		• Freight travel could be improved and conflicts reduced by having additional travel lane.	

Segment 1: Add One General Purpose Lane Each Direction (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity • A three-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay within CDOT's ROW. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. Likely to stay within ROW and be assessed in an EA.	• Retaining walls associated with widening would introduce new vertical element. • Biological and aquatic Resources impacts to Plum Creek and its tributaries would likely require mitigation.

Segment 1: Add One Express Lane Each Direction (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane could reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending upon level of use of Express Lanes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns.	• Maneuverability and crash reductions across three lanes may be limited due to restriction in use of Express Lane. • Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as Express Lane would be operated to promote consistent speeds and reliable travel times. • Additional lane would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending on level of use of Express Lanes. •	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time.
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane.
		• New travel lane could provide more capacity to serve trips on I-25 if other drivers choose to use Express Lane which could reduce travel pressure and volumes on local roads and alternate routes.
		• Consistent with CDOT's goals for adding capacity and managing congestion.	

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New express lane(s) may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE. • New express lane(s) does not preclude future transit options. • New express lane(s) may provide support for car/van pooling. • Operations and maintenance work are improved because additional lanes improve work zone flexibility. • Additional lanes increase the maintenance/plowing burden.	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A three-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay within CDOT's ROW. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. Likely to stay within CDOT's ROW and be assessed.	• Mitigation may be needed due to sensitive environmental conditions in surrounding area. • Retaining walls, signs, and gantries associated with Express Lane would introduce new vertical element.

Segment 1: Add One General Purpose Lane and One Express Lane Each Direction (four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional GP and Express travel lanes would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional GP travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Additional GP lane increases the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time. • Additional GP lane increases the weaving length and number of lanes to weave across at interchanges for Express lane drivers.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as Express Lane would be operated to promote consistent speeds and reliable travel times. • Additional lane would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures. • Would provide additional capacity and the additional express lane will provide reliable travel times during high volume periods when the highway becomes congested.	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• Additional travel lanes provide improved travel options for drivers that choose to pay for a reliable travel time.
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane.
		• New travel lanes could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes.
		• Consistent with CDOT's goals for adding capacity and managing congestion in urban corridors.	

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New express lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE. • New express lane does not preclude future transit options. • New express lane may provide support for car/van pooling. • Operations and maintenance work are improved because additional lanes improve work zone flexibility. • Additional lanes increase the maintenance/plowing burden.	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one general purpose lane and one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A four-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay with CDOT's ROW. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Outside widening increases potential for in compatibility with Conservation Easements. • Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. While potentially being able to be constructed within existing CDOT ROW, culvert widening and bridge reconstruction would impact sensitive environmental resources concentrated along Plum Creek and its tributaries, and may impact the historic and recreational resources adjacent to I-25.	• Mitigation likely to be need do to sensitive environmental conditions in surrounding area. • Retaining walls, signs, and gantries associated with Express Lane would introduce new vertical element. • Widening to the outside would bring traffic closer to the campground and residential areas in the Monument area. • Outside widening would increase potential for impacts to Plum Creek floodplain, riparian areas, and potentially eligible historic properties bordering the corridor.

Segment 1: Add Two General Purpose Lanes Each Direction (four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lanes would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lanes would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Additional travel lanes increase the potential for crashes related to lane changing that occur when drivers to the left and right attempt to maneuver into the same lane at the same time. • Additional travel lanes increase the weaving length and number of lanes to weave across at interchanges.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Additional lane would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures. • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability.	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lanes would increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• New travel lanes would provide more capacity to serve trips on I-25, which would reduce travel pressure and volumes on local roads and alternate routes.
		• New lane would likely not impact existing transit operations but would not preclude future transit options.
		• New lanes would not provide any additional support for non-vehicular travel choices.
		• Not consistent with CDOT's goals for adding capacity and managing congestion.
		• Operations and maintenance work are improved because additional lanes improve work zone flexibility.	

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• Additional lanes increase the maintenance/plowing burden. • Freight travel could be improved and conflicts reduced by having additional travel lanes. •	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding two general purpose lanes in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity • A four-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay within CDOT's ROW. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Outside widening increases potential for incompatibility with conservation easements. • Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. While potentially being able to be constructed within existing CDOT ROW, culvert widening and bridge reconstruction would impact sensitive environmental resources concentrated along Plum Creek and its tributaries,, and may impact the historic and recreational resources adjacent to I-25.	• Mitigation likely to be needed due to sensitive environmental conditions in surrounding area. • Retaining walls would introduce new vertical element. • Widening to the outside would bring traffic closer to the campground and residential areas in the Monument area. • Outside widening would increase potential for impacts to Plum Creek floodplain, riparian areas, and potentially eligible historic properties bordering the corridor.

Segment 1: Add Two Express Lanes Each Direction (four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lanes could reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending upon level of use of Express Lanes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns. • Additional travel lanes increase the weaving length and number of lanes to weave across at interchanges.	• Maneuverability and crash reduction across four lanes may be limited due to restriction in use of Express Lanes. • Opportunity to address specific locations for localized safety improvements in combination with this element. ☐ • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as Express Lanes would be operated to promote consistent speeds and reliable travel times. • Additional lanes would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending on level of use of Express Lanes.	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• Additional travel lanes provides improved travel options for drivers that choose to pay for a reliable travel time.
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lanes.
		• New travel lanes could provide more capacity to serve trips on I-25 if other drivers choose to use Express Lanes which could reduce travel pressure and volumes on local roads and alternate routes.
		• Consistent with CDOT's goals for adding capacity and managing congestion.	

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New express lanes may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE. • New express lanes do not preclude future transit options. • New express lanes may provide support for car/van pooling. • Operations and maintenance work are improved because additional lanes improve work zone flexibility. • Additional lanes increase the maintenance/plowing burden.	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding two Express Lanes in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially less congested lanes with more shoulder room to utilize to travel to incidents. • A four-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay within CDOT's ROW. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Outside widening increases potential for incompatibility with Conservation Easements. • Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. While potentially being able to be constructed within existing CDOT ROW, culvert widening and bridge reconstruction would impact sensitive environmental resources concentrated along Plum Creek and its tributaries, and may impact the historic and recreational resources adjacent to I-25.	• Mitigation likely to be needed due to sensitive environmental conditions in surrounding area. • Retaining walls, signs, and gantries associated with Express Lane would introduce new vertical element. • Widening to the outside would bring traffic closer to the campground and residential areas in the Monument area. • Outside widening would increase potential for impacts to Plum Creek floodplain, riparian areas, and potentially eligible historic properties bordering the corridor.

Segment 1: Add Auxiliary Lanes between Tomah exit and Larkspur exit

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Allows acceleration/deceleration to occur outside of the mainline travel lanes. This will promote more homogeneous travel speeds in the through lanes that will reduce turbulence, which has been demonstrated to improve safety. • Additional lane would increase maneuverability when an incident occurs adjacent to the auxiliary lanes.	
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• New auxiliary lane would partially reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures. • Provides additional queuing capacity for traffic exiting to Renaissance Festival	• Would be a more viable option with options that add additional capacity by either GP or managed lanes.
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New auxiliary lane would add local capacity to I-25, increasing the appeal for local trips and potentially removing some traffic from the local road network.
		• New lane would likely not impact existing transit operations but would not preclude future transit options and could provide support for future local bus routing.
		• New lane would not provide any additional support for non-vehicular travel choices.
		• New lane is not consistent with CDOT's goals for adding capacity and managing future congestion in urban corridors.
		• Operations and maintenance work are improved because additional lanes improve work zone flexibility.
		• Additional lanes increase the maintenance/plowing burden.	

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• New auxiliary lanes would improve incident response times in this segment and potentially further if the improvements are tied to improvements to Spruce Mountain Road. • The auxiliary lanes would provide better access to emergency detour and alternate routes during all incident types.	•
Compatibility with Community Planning Goals			

Segment 1: Add Auxiliary Lanes between Tomah exit and Larkspur exit

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Compatible. Impact to Bear Dance Conservation Easement west of I-25 could likely be avoided by constructing auxiliary lane within CDOT ROW. • Would not significantly improve frontage access to neighborhoods adjacent to the Conservation Easement, which is currently provided by Bear Dance Drive, Old Territorial Road, and Perry Park Avenue. • Conceptually would not preclude planned local transportation projects	• Columbine Open Space/Fee Title Area present along east side of I-25 south of Tomah Road. • Bear Dance Golf Course is west of I-25 and separated by Bear Dance Drive, the BNSF rail line, and the existing Frontage Road. • Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. Auxiliary lane west of the highway could likely be constructed within CDOT existing ROW. Mitigation likely needed for biological and aquatic resources impacts associated with Plum Creek tributaries	• Mitigation for Plum Creek tributary crossing impacts would likely be needed. • Preble's meadow jumping mouse occupied range present along all the Plum Creek tributaries between Upper Lake Gulch Road and Tomah Road. • J A Ranch, potentially eligible historic property located east of I-25, south of Tomah Road.

Segment 1: Add Southbound Truck Climbing Lane(s) or Passing Lane(s)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Separate lanes for slower moving vehicles would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Reduces the potential for rear-end and sideswipe same direction crashes involving slow-moving trucks.	
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• New SB truck climbing or passing lane would partially reduce traffic delay from slow moving vehicles passing another slow moving vehicle. • Additional capacity would partially decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability.	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New SB truck climbing or passing lane would add capacity to I-25.
		• New SB truck climbing or passing lane would likely not impact existing transit operations but would not preclude future transit options and could provide support for future local bus routing.
		• New SB truck climbing or passing lane would not provide any additional support for non-vehicular travel choices.
		• Operations and maintenance work are improved because additional lanes improve work zone flexibility.
		• Additional lanes increase the maintenance/plowing burden.	

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding southbound truck climbing or passing lanes has the potential to reduce crashes by minimizing slow moving vehicle impacts on traffic flow • It would improve incident response times for southbound incidents and provide for more space to safely respond to incidents where it is located.	
Compatibility with Community Planning Goals			

Segment 1: Add Southbound Truck Climbing Lane(s) or Passing Lane(s)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Compatible. Coordination with Conservation Easement and restrictions would be required but likely compatible if improvements stay within CDOT's ROW. • Truck lane would provide improved movement of freight. • Conceptually would not preclude planned local transportation projects.	• Adjacent Greenland Ranch is Conservation and Fee Title Area. • Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely to stay within CDOT ROW and qualify for CE.	• Greenland Ranch straddles I-25 through the Monument Hill area. • Plum Creek major tributaries are located east of the northbound side of I-25 through Monument Hill area. • Gantries and signage associated with truck lane would introduce new vertical element in the Gap. • Likely to be supported by CMCA .

Segment 1: Add New Elevated Travelway Each Direction (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as Express Lane would be operated to promote consistent speeds and reliable travel times. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending on level of use of Express Lanes. • Elevated roadway would be more prone to icing •	• Assume Travel way is an Express Lane • More predictable travel times could improve driver behavior and promote a safer and more pleasant travel experience.
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time.
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane.
		• New travel lane could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes.
		• Diversion to local roads could persist if drivers choose not to use Express Lane.
		• Consistent with CDOT's goals for adding capacity and managing congestion.
		• Restricted width limits flexibility for mobility during incident management.
			• Assume Travel way is an Express Lane
			• Maneuverability and crash reductions across three lanes may be limited due to restriction in use of Express Lane.

Segment 1: Add New Elevated Travelway Each Direction (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A three-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Compatible with conservation easements from a ROW standpoint; not compatible from a land use standpoint. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects	• Elevated travelway would border open space and conservation easementss • Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would constrain Crystal Valley interchange construction
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Although likely able to be completed within existing ROW, an elevated travelway would significantly change the visual character of the corridor. • Support structures for facility could act as a wildlife boundary, further disrupting large animal movement	• Cantilever or viaduct-type of structure would introduce significant new vertical element to the area, potentially obstructing views of and from the road.

Segment 1: Add Express Lane and Convert Existing General Purpose Lanes to Express Lanes (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Additional lane increases the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as the express lanes would be operated to promote more consistent speeds and reliable travel times. • Additional lanes would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures.	• Would require legislative action at state and federal level
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• Imposing a toll on all general purpose lanes will likely encourage more traffic to divert to local roads.
		• Repurposed express lanes may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE.
		• Repurposed express lanes do not preclude future transit options.
		• Repurposed express lanes may provide support for car/van pooling.
		• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New travel lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• Additional travel lanes provide improved travel options for drivers that choose to pay for a reliable travel time.
		• Consistent with CDOT's goals for adding capacity and managing congestion.
		• New express lanes may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE.	

Segment 1: Add Express Lane and Convert Existing General Purpose Lanes to Express Lanes (three lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• Operations and maintenance work are improved because additional lanes improve work zone flexibility. • Additional lanes increase the maintenance/plowing burden.	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lanes and converting one general purpose lane to an Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially less congested lanes with more shoulder room to utilize to travel to incidents. • A three-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management. •
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay within CDOT's ROW. • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Development and access requests (e.g., Jellystone Campground expansion) would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. Likely to stay withing ROW and be assessed in an EA	• Mitigation may be need due to sensitive environmental area. • Retaining walls, signs, and gantries associated with Express Lanes would introduce new vertical element. • Conversion of existing general purpose lane to Express Lane could generate public support or criticism

Segment 1: Add/Convert Peak Period Shoulder

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Should be implemented with speed harmonization or reduced speed limits to promote homogeneous travel speeds, which has been demonstrated to improve safety. • May impact safety of first responders at incident scene.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as the shoulder lane would be operated to promote more consistent speeds and reliable travel times during peak periods. • Off-peak and short-duration congestion would continue to impact travel times. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending on level of use of Express Lanes.	• Assume the peak period shoulder would be a express lane.
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New shoulder lane would draw some traffic from general purpose lanes, increasing the appeal for local trips and potentially removing some traffic from the local road network.
		• New shoulder lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE.
		• New shoulder lane does not preclude future transit options.
		• New shoulder lane would not provide any additional support for non-vehicular travel choices.
		• New shoulder lane is consistent with CDOT's goals for adding capacity and managing future congestion in urban corridors.
		• New shoulder lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident.
		• New shoulder lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream.
		• New shoulder lanes provides improved travel options for drivers that choose to pay for a reliable travel time.
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lanes.
			• Assume the peak period shoulder would be a express lane.
			• Mobility benefits are when Peak Period Shoulder is operational.

Segment 1: Add/Convert Peak Period Shoulder

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New shoulder lane could provide more capacity to serve trips on I-25 if other drivers choose to use Express Lanes which could reduce travel pressure and volumes on local roads and alternate routes. • New shoulder lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE. • Operations and maintenance work are improved because additional lanes improve work zone flexibility. • Additional lanes increase the maintenance/plowing burden.	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding/converting peak period shoulders in each direction to I-25 would enhance its reliability during peak times. • Because the shoulder is being utilized for travel, it is not available for incident management activities. Responders may need to close the affected lane and the adjacent lane to safely deal with incidents, minimizing its effectiveness at improving incident management activities. • It may improve incident response times by providing more capacity upstream of the incident. •	• The design and operation of the peak period shoulder lane has a large impact on its usefulness for incident management and reduction in dealys.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Coordination with conservation easements and restrictions would be required but likely compatible if improvements stay within CDOT's ROW • Improvements to mobility and reliability would benefit economic development regionally and locally. • Conceptually would not preclude planned local transportation projects.	• Development and access request (e.g., Jellystone Campground expansion would continue to be reviewed per CDOT's normal procedures. • Conceptually would not preclude Crystal Valley interchange construction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely stay within ROW and qualify for CE	• Mitigation may be needed due to sensitive environmental conditions in surrounding area. • Retaining walls, signs, and gantries associated with Express lane would introduce new vertical element.

Segment 2: Add One General Purpose Lane Each Direction south of Founders Parkway (continuous four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Additional lane increases the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Additional lane would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane would increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• New travel lane would provide more capacity to serve trips on I-25, which would reduce travel pressure and volumes on local roads and alternate routes
		• New lane would likely not impact existing transit operations but would not preclude future transit options
		• New lane would not provide any additional support for non-vehicular travel choices
		• Not consistent with CDOT's goals for adding capacity and managing congestion
		• Operations and maintenance work are improved because an additional route improves work zone flexibility
		• Additional road increases the maintenance/plowing burden
		• Freight travel could be improved and conflicts reduced by having additional route choice	

Segment 2: Add One General Purpose Lane Each Direction south of Founders Parkway (continuous four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one general purpose lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity • A four-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	•
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned mixed use areas in Caste Rock south of Founders Parkway. • Compatible with Castle Rock transportation goals to develop an efficient roadway network to allow for ease of movement through the Town. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• IFair. Could likely be constructed within existing CDOT ROW and be assessed in an EA. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. \ • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway

Segment 2: Add One Express Lane Each Direction South of Founders Parkway (continuous four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane could reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending upon level of use of Express Lanes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns.	• Maneuverability and crash reductions across three lanes may be limited due to restriction in use of Express Lane. • Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as express lane would be operated to promote more consistent speeds and reliable travel times • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of express lanes	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane
		• New travel lane could provide more capacity to serve trips on I-25 if other drivers choose to use Express Lane which could reduce travel pressure and volumes on local roads and alternate routes
		• Consistent with CDOT's goals for adding capacity and managing congestion.
		• New express lane(s) may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• New express lane(s) does not preclude future transit options	

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New express lane(s) may provide support for car/van pooling • Operations and maintenance work are improved because additional lanes improve work zone flexibility • Additional lanes increase the maintenance/plowing burden	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A four-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned mixed use areas in Caste Rock south of Founders Parkway. • Compatible with Castle Rock transportation goals to develop an efficient roadway network to allow for ease of movement through the Town. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. Could likely be constructed within existing CDOT ROW and be assessed in an EA. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway. • Signs and gantries associated with Express Lane would introduce new vertical element.

Segment 2: Add Two General Purpose Lanes Each Direction South of Founders Parkway; Add One General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lanes would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Additional lanes increase the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time. • Crashes may persist in southbound direction at boundary between Segments 1 and 2 in lane-reduction influence area.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Additional lane would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lanes would increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• New travel lanes would provide more capacity to serve trips on I-25, which would reduce travel pressure and volumes on local roads and alternate routes
		• New lane would likely not impact existing transit operations but would not preclude future transit options
		• New lanes would not provide any additional support for non-vehicular travel choices
		• Not consistent with CDOT's goals for adding capacity and managing congestion
		• Operations and maintenance work are improved because additional lanes improve work zone flexibility.
		• Additional lanes increase the maintenance/plowing burden	

Segment 2: Add Two General Purpose Lanes Each Direction South of Founders Parkway; Add One General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• Freight travel could be improved and conflicts reduced by having additional travel lanes.	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding two general purpose lanes (one north of Founder's Parkway) for a continuous five lane section in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity • A five-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• An increase in weaving type crashes may offset the crash benefit
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned residential and mixed use areas in Caste Rock and Castle Pines. • Compatible with Castle Rock and Castle Pines transportation goals to improve travel reliability and support mixed use development. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area. • Conceptually does not preclude construction of Crystal Valley Road interchange or reconstruction of the Happy Canyon Road interchange.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Unlikely to be constructed within existing CDOT ROW with increased potential for significant impacts. Class of action likely an EA or EIS. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area and Newlin Gulch tributaries.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south and north of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway. • Sensitive noise land uses bordering I-25 through Castle Pines

Segment 2: Add One General Purpose Lane and One Express Lane Each Direction South of Founders Parkway; Add One Express Lane or General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lanes would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending upon level of use of Express Lane. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns. • Additional lanes increase the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time. • Crashes may persist in southbound direction at boundary between Segments 1 and 2 in lane-reduction influence area.	• Maneuverability and crash reductions across four lanes may be limited due to restriction in use of Express Lane. • Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as express lane would be operated to promote more consistent speeds and reliable travel times • Additional lanes would reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures • Would provide additional capacity and the additional lanes will provide reliable travel times during high volume periods when the highway becomes congested.	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lanes provide improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane	

Segment 2: Add One General Purpose Lane and One Express Lane Each Direction South of Founders Parkway; Add One Express Lane or General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New travel lanes could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes • Consistent with CDOT's goals for adding capacity and managing congestion in urban corridors. • New express lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE • New travel lanes do not preclude future transit options • New express lane may provide support for car/van pooling • Operations and maintenance work are improved because additional lanes improve work zone flexibility • Additional lanes increase the maintenance/plowing burden	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one general purpose lane and one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A five-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management. • An increase in weaving crashes may offset the crash benefit
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned residential and mixed use areas in Caste Rock and Castle Pines. • Compatible with Castle Rock and Castle Pines transportation goals to improve travel reliability and support mixed use development. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area. • Conceptually does not preclude construction of Crystal Valley Road interchange or reconstruction of the Happy Canyon Road interchange.
Environmental Impacts			

Segment 2: Add One General Purpose Lane and One Express Lane Each Direction South of Founders Parkway; Add One Express Lane or General Purpose Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Unlikely to be constructed within existing CDOT ROW with increased potential for significant impacts. Class of action likely an EA or EIS. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area and Newlin Gulch tributaries.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south and north of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway. • Sensitive noise land uses bordering I-25 through Castle Pines. • Increased signage and gantryways associated with Express Lanes would increase presence of vertical elements throughout Segment 2.

Segment 2: Add Two Express Lanes Each Direction South of Founders Parkway; Add One Express Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lanes could reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending upon level of use of Express Lanes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns. • Additional lanes increase the potential for crashes related to lane changing that occur when drivers in the left and right lanes attempt to maneuver into the center lane at the same time. • Crashes may persist in southbound direction at boundary between Segments 1 and 2 in lane-reduction influence area. Additional travel lanes would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes.	• Maneuverability and crash reductions across three lanes may be limited due to restriction in use of Express Lane.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as express lanes would be operated to promote more consistent speeds and reliable travel times • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of express lanes	
Mobility			
• Provide additional travel options • Serves regional trip demand on I-25 • Reduces I-25 traffic diversions to local roads • Promotes multimodal options • Supports CDOT network goals for operations • Supports CDOT network goals for asset management	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations) • Ability to improve existing transit operations (qualitative) • Ability to not preclude / support new transit options (potential ROW conflicts) o Bus Rapid Transit (BRT) o Commuter Rail o High-Speed Rail (ICS)	• New travel lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident • New travel lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream • Additional travel lanes provide improved travel options for drivers that choose to pay for a reliable travel time • Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lanes	

Segment 2: Add Two Express Lanes Each Direction South of Founders Parkway; Add One Express Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
	• Provides additional travel choices (options for multiple modes and travel choices) • Compatible with CDOT operational strategies for I-25 • Compatible with CDOT asset management goals	• New travel lanes could provide more capacity to serve trips on I-25 if other drivers choose to use Express Lanes which could reduce travel pressure and volumes on local roads and alternate routes • Consistent with CDOT's goals for adding capacity and managing congestion • New express lanes may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE • New express lanes do not preclude future transit options • New express lanes may provide support for car/van pooling • Operations and maintenance work are improved because additional lanes improve work zone flexibility • Additional lanes increase the maintenance/plowing burden	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Implementing two Express Lanes in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially less congested lanes with more shoulder room to utilize to travel to incidents. • A five-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management. • An increase in weaving type crashes may offset the crash benefit
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned residential and mixed use areas in Caste Rock and Castle Pines. • Compatible with Castle Rock and Castle Pines transportation goals to improve travel reliability and support mixed use development. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area. • Conceptually does not preclude construction of Crystal Valley Road interchange or reconstruction of the Happy Canyon Road interchange.
Environmental Impacts			

Segment 2: Add Two Express Lanes Each Direction South of Founders Parkway; Add One Express Lane Each Direction North of Founders Parkway (continuous five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Unlikely to be constructed within existing CDOT ROW with increased potential for significant impacts. Class of action likely an EA or EIS. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area and Newlin Gulch tributaries.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south and north of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway. • Sensitive noise land uses bordering I-25 through Castle Pines. • Increased signage and gantryways associated with Express Lanes would increase presence of vertical elements throughout Segment 2

Segment 2: Add One Reversible Lane

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Introduces a weaving section where lane merges into GP lanes, which could increase turbulence and potential for rear-end and sideswipe same direction crashes at the merge influence area.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as reversible lane would be operated to promote more consistent speeds and reliable travel times in one direction only • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability in one direction only • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of reversible lanes	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New reversible lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use reversible lane
		• New travel lane could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes
			• Assumes reversible lane has managed/special use restrictions (i.e., HOV and transit only)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• Diversion to local roads could persist if drivers choose not to use managed reversible lane • Consistent with CDOT's goals for adding capacity and managing congestion • Restricted width limits flexibility for mobility during incident management	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding a reversible lane would not affect incident response times significantly due to the need to control the lane with fixed barriers and gates thus reducing access opportunities. • There would be the possibility of using the reversible lane to move more traffic in the affected direction, however this would only be useful during Major or Extended incidents due to the time for changeover of the lane. • If the lane is configured in the direction affected by the incident it would help reduce driver delay and could improve incident response times. • Some additional width in the transition areas of the reversible lane and entries/exits may be available to use as safety or staging areas for incident management	• This improvement could cause complications for first responders if the incident is in the reversible lane but they respond to the general purpose lanes.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned mixed use areas in Caste Rock south of Founders Parkway. • Compatible with Castle Rock transportation goals to develop an efficient roadway network to allow for ease of movement through the Town. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely constructible within CDOT's existing ROW and qualify for a CE with minimal mitigation.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway.

Segment 2: Add One Reversible Lane

Criteria	Level 2 Performance Measure	Result	Comments / Notes
			• Signs and gantries associated with reversible lane would introduce new vertical element.

Segment 2: Add New Elevated Travelway Each Direction (four/five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as Express Lane would be operated to promote consistent speeds and reliable travel times • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of Express Lane • Elevated roadway would be more prone to icing	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane
		• New travel lane could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes
		• Diversion to local roads could persist if drivers choose not to use Express Lane
		• Consistent with CDOT's goals for adding capacity and managing congestion
		• Restricted width limits flexibility for mobility during incident management
			• Assumes travel-way has managed/special use restrictions (i.e., HOV and transit only)

Segment 2: Add New Elevated Travelway Each Direction (four/five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A four or five-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management. • An increase in weaving crashes may offset reductions in other crash types
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Compatible with economic development goals of Castle Rock and Castle Pines; incompatible with land use goal to maintain rural/small town character.	• Conceptually may constrain Happy Canyon Road interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Compatible with economic development goals of Castle Rock and Castle Pines; incompatible with land use goal to maintain rural/small town character.	• Cantilever or viaduct-type of structure would introduce significant new vertical element to the area, potentially obstructing views of and from the road. • Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway.

Segment 2: Convert One Existing Lane to Express Lane (three/four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Depending upon level of Express Lane use, congestion may increase in GP lanes, which would increase congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns.	• Maneuverability and crash reductions across two/three lanes may be limited due to restriction in use of Express Lane. • Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved in Express Lane as it would be operated to promote consistent speeds and reliable travel times • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of Express Lane • Peak period travel reliability and travel times may degrade in general purpose lanes as express lane usage will likely be lower than previous use as a general purpose lane	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• Repurposing one general purpose lane as an Express Lane may encourage more traffic to divert to local roads
		• Consistent with CDOT's goals for adding capacity and managing congestion
		• Express Lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• Express Lane does not preclude future transit options
		• Express Lane may provide support for car/van pooling
		• Additional Express Lane technology will increase the maintenance burden	

Segment 2: Convert One Existing Lane to Express Lane (three/four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Converting one general purpose lane to an Express ' in each direction to I-25 would enhance its reliability provide additional space for incident response safet impacting throughput less significantly during incider response. • It would improve incident response times by providin potentially less congested lane with more shoulder r utilize to travel to incidents.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lane to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Compatible with Castle Rock and Castle Pines transportation goals to develop an efficient roadway network to allow for ease of movement through the I-25 corridor. • Conceptually does not preclude local transportation projects.	• Conceptually does not preclude Happy Canyon Road interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely to qualify for CE. • Mitigation minimal or absent	• Gantries and signage associated with Express Lane would increase number of vertical elements in Segment 2. • Minimal or absent widening would greatly reduce potential for impacts to aquatic and biological resources.

Segment 2: Convert All Existing Lanes to Express Lanes (three/four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• No impact to safety, other than spot specific safety improvements.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved in Express Lanes as they would be operated to promote more consistent speeds and reliable travel times	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• Imposing a toll on all general purpose lanes will likely encourage more traffic to divert to local roads
		• Repurposed express lanes may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• Repurposed express lanes do not preclude future transit options
		• Repurposed express lanes may provide support for car/van pooling
		• Additional travel lanes provide improved travel options for drivers that choose to pay for a reliable travel time
		• Consistent with CDOT's goals for adding capacity and managing congestion
		• Additional Express Lanes technology will increase the maintenance burden
			•

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• If all lanes were tolled, it is assumed that traffic would divert to another roadway system, thus reducing overall traffic and improving incident response times. • This alternative could increase the number of incidents occurring on the local road system.	•
Compatibility with Community Planning Goals			

Segment 2: Convert All Existing Lanes to Express Lanes (three/four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Incompatible with local transportation plans as I-25 traffic would be pushed onto the local roadway network, specifically in Castle Rock and Castle Pines. • Conceptually may constrain or preclude local transportation projects not anticipated or designed to handle interstate traffic.	• Conceptually would not preclude Happy Canyon Road interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Converting all lanes likely to push a higher-than-existing-volume and type of traffic onto the local roadway network. Class of action anticipated to be an EIS.	• Anticipated strong public controversy and high degree of secondary impacts to surrounding local roadway network and adjacent sensitive resources. • Gantries and signage associated with Express Lanes would increase number of vertical elements in Segment 2.

Segment 2: Add/Convert Peak Period Shoulder

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Should be implemented with speed harmonization or reduced speed limits to promote homogeneous travel speeds, which has been demonstrated to improve safety. • May impact safety of first responders at incident scene.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as the shoulder lane would be operated to promote more consistent speeds and reliable travel times during peak periods • Off-peak and short-duration congestion would continue to impact travel times • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of managed shoulder lanes	• Assume the peak period shoulder would be a express lane
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New shoulder lane would draw some traffic from general purpose lanes, increasing the appeal for local trips and potentially removing some traffic from the local road network
		• New shoulder lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• New shoulder lane does not preclude future transit options
		• New shoulder lane would not provide any additional support for non-vehicular travel choices
		• New shoulder lane is consistent with CDOT's goals for adding capacity and managing future congestion in urban corridors
		• New shoulder lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New shoulder lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• New shoulder lanes provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use managed shoulder lanes
			• Assumes peak period shoulder lane is a managed lane (i.e., tolled, HOV, transit, etc) similar to I-70 PPSL

Segment 2: Add/Convert Peak Period Shoulder

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding/converting peak period shoulders in each direction to I-25 would enhance its reliability during peak times. • Because the shoulder is being utilized for travel, it is not available for incident management activities. Responders may need to close the affected lane and the adjacent lane to safely deal with incidents, minimizing its effectiveness at improving incident management activities. • It may improve incident response times by providing more capacity upstream of the incident.	• The design and operation of the peak period shoulder lane has a large impact on its usefulness for incident management and reduction in delays.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Compatible with Castle Rock and Castle Pines transportation goals to develop an efficient roadway network to allow for ease of movement through the I-25 corridor. • Conceptually does not preclude local transportation projects. • Could promote economic development for planned residential and mixed use areas in Caste Rock and Castle Pines.	• Conceptually does not preclude Happy Canyon Road interchange reconstruction. • Shoulder widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Could likely be constructed within existing CDOT ROW and qualify as a CE.	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway. • Signs and gantries associated with Peak Period Shoulder would introduce new vertical element.

Segment 2: Add Auxiliary Lane(s)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Allows acceleration/deceleration to occur outside of the mainline travel lanes. This will promote more homogeneous travel speeds in the through lanes that will reduce turbulence, which has been demonstrated to improve safety. • Additional lane would increase maneuverability when an incident occurs adjacent to the auxiliary lanes.	• Opportunity to address specific locations for localized safety improvements in combination with this element. • Improved shoulders are a key element for safety in all segment-long alternatives.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• New auxiliary lane would partially reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures • Additional capacity would partially decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability	• Would be a more viable option with options that add additional capacity by either GP or managed lanes
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New auxiliary lane would add local capacity to I-25, increasing the appeal for local trips and potentially removing some traffic from the local road network
		• New lane would likely not impact existing transit operations but would not preclude future transit options and could provide support for future local bus routing
		• New lane would not provide any additional support for non-vehicular travel choices
		• New lane is not consistent with CDOT's goals for adding capacity and managing future congestion in urban corridors
		  • Operations and maintenance work are improved because additional lanes improve work zone flexibility
		  • Additional lanes increase the maintenance/plowing burden	

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• New auxiliary lanes would improve incident response times in this segment. • The auxiliary lanes would provide better access to emergency detour and alternate routes during all incident types.	
Compatibility with Community Planning Goals			

Segment 2: Add Auxiliary Lane(s)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No conservation easements present; however, existing and planned parks and are adjacent to I-25 south of Founders within Castle Rock. • Could promote economic development for planned residential and mixed use areas in Caste Rock and Castle Pines. • Compatible with Castle Rock and Castle Pines transportation goals to improve travel reliability and support mixed use development. • Conceptually does not preclude local transportation projects.	• Widening toward Plum Creek in Castle Rock would immediately encounter the Plum Creek floodplain/floodway area. • Conceptually may constrain reconstruction of the Happy Canyon Road interchange.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. Unlikely to be constructed within existing CDOT ROW Class of action likely an EA or EIS. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area and Newlin Gulch tributaries	• Preble's meadow jumping mouse habitat along west side of I-25 from Plum Creek Parkway to north of Wolfersberger Road interchanges. • Potential eligible historic properties on both sides of CDOT's ROW in Segment 2 south and north of Founders Parkway. • Plum Creek regulatory floodway crossing just north of Plum Creek Parkway.

Segment 3: Add One Express Lane Each Direction (five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane could reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Congestion and resulting congestion-related crashes in existing GP lanes may persist depending upon level of use of Express Lanes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as express lane would be operated to promote more consistent speeds and reliable travel times • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of express lane	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane
		• New travel lane could provide more capacity to serve trips on I-25 if other drivers choose to use Express Lane which could reduce travel pressure and volumes on local roads and alternate routes
		• Consistent with CDOT's goals for adding capacity and managing congestion	

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New express lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE • New express lane does not preclude future transit options • New express lane may provide support for car/van pooling • Operations and maintenance work are improved because additional lane improves work zone flexibility • Additional lane increase the maintenance/plowing burden	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A five-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management. • An increase in weaving crashes may offset the crash benefit
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Could promote economic development for planned mixed use areas in RidgeGate and Lone Tree areas. • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects.	• Conceptually would not preclude Lincoln Avenue interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. May not be able to be constructed within existing CDOT ROW. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area.	• ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25

Segment 3: Add One Reversible Lane

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Additional travel lane would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Introduces a weaving section where lane merges into GP lanes, which could increase turbulence and potential for rear-end and sideswipe same direction crashes at the merge influence area.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as reversible lane would be operated to promote more consistent speeds and reliable travel times in one direction only • Additional capacity would decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability in one direction only • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of reversible lanes	•
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New reversible lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use reversible lane
		• New travel lane could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes
		• Diversion to local roads could persist if drivers choose not to use managed reversible lane
		• Consistent with CDOT's goals for adding capacity and managing congestion
			• Assumes reversible lane has managed/special use restrictions (i.e., HOV and transit only)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• Restricted width limits flexibility for mobility during incident management	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding a reversible lane would not affect incident response times significantly due to the need to control the lane with fixed barriers and gates thus reducing access opportunities. • There would be the possibility of using the reversible lane to move more traffic in the affected direction, however this would only be useful during Major or Extended incidents due to the time for changeover of the lane. • If the lane is configured in the direction affected by the incident it would help reduce driver delay and could improve incident response times. • Some additional width in the transition areas of the reversible lane and entries/exits may be available to use as safety or staging areas for incident management	• This improvement could cause complications for first responders if the incident is in the reversible lane but they respond to the general purpose lanes.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Could promote economic development for planned mixed use areas in RidgeGate and Lone Tree areas. • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects.	• Conceptually would not preclude Lincoln Avenue interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Fair. May not be able to be constructed within existing CDOT ROW. • Mitigation likely from impacts to biological, aquatic, and floodplain resources concentrated within the adjacent Plum Creek riparian area.	• ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25

Segment 3: New Elevated Travelway Each Direction (five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Additional travel lane would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as Express Lane would be operated to promote consistent speeds and reliable travel times • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of Express Lane • Elevated roadway would be more prone to icing	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New travel lane would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New travel lane could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
		• Additional travel lane provides improved travel options for drivers that choose to pay for a reliable travel time
		• Freight travel could be improved and conflicts reduced if other drivers choose to use Express Lane
		• New travel lane could provide more capacity to serve trips on I-25, which could reduce travel pressure and volumes on local roads and alternate routes
		• Diversion to local roads could persist if drivers choose not to use Express Lane
		• Consistent with CDOT's goals for adding capacity and managing congestion
		• Restricted width limits flexibility for mobility during incident management
			• Assumes travel-way has managed/special use restrictions (i.e., HOV and transit only)

Segment 3: New Elevated Travelway Each Direction (five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding one Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would reduce delays for drivers during all incident types • It would improve incident response times by providing more capacity and potentially a less congested lane with more shoulder room to utilize to travel to incidents. • A five-lane section has the potential for crash reduction due to additional room for slower moving vehicles.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lanes to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management. • An increase in weaving crashes may offset other crash type reductions
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Could promote economic development for planned mixed use areas in RidgeGate and Lone Tree areas. • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects.	• Conceptually may constrain interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Likely significant environmental impacts and public controversy. Class of action anticipated to be an EIS.	• Cantilever or viaduct-type of structure would introduce significant new vertical element to the area. • Potential eligible historic properties in Happy Canyon Area • ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25

Segment 3: Convert One Existing Lane to Express Lane (four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Depending upon level of Express Lane use, congestion may increase in GP lanes, which would increase congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Differing travel speeds between a higher-speed Express Lane and lower-speed GP lanes during high volume periods could present safety concerns.	• Maneuverability and crash reductions across four lanes may be limited due to restriction in use of Express Lane. • Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved in Express Lane as it would be operated to promote consistent speeds and reliable travel times • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of Express Lane • Peak period travel reliability and travel times may degrade in general purpose lanes as express lane usage will likely be lower than previous use as a general purpose lane	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• Repurposing one general purpose lane as an Express Lane may encourage more traffic to divert to local roads
		• Consistent with CDOT's goals for adding capacity and managing congestion
		• Express Lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• Express Lane does not preclude future transit options
		• Express Lane may provide support for car/van pooling
		• Additional Express Lane technology will increase the maintenance burden	

Segment 3: Convert One Existing Lane to Express Lane (four lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Converting one general purpose lane to an Express Lane in each direction to I-25 would enhance its reliability and provide additional space for incident response safety while impacting throughput less significantly during incident response. • It would improve incident response times by providing a potentially less congested lane with more shoulder room to utilize to travel to incidents.	• The improvements to incident response times from this alternative are dependent on how access to/from the Express Lane is managed. If emergency vehicles can easily cross from Express Lane to General Purpose Lanes, this improvement is maximized. • Design and management practices for the Express Lane will impact its usefulness for incident management.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Could promote economic development for planned mixed use areas in RidgeGate and Lone Tree areas. • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects.	• Conceptually would not preclude Lincoln Avenue interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely to qualify for CE.	• ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25

Segment 3: Add New Truck Climbing Lane SB at Surrey Ridge

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Separate lane for slower moving vehicles would increase maneuverability overall and promote more homogeneous travel speeds that will reduce turbulence, which has been demonstrated to improve safety. • Reduces the potential for rear-end and sideswipe same direction crashes involving slow-moving truck.	
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• New SB truck climbing or passing lane would partially reduce traffic delay from slow moving vehicles passing another slow moving vehicle • Additional capacity would partially decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability	• Assumes 1-3 miles of climbing lane only, between and independent from RidgeGate and Castle Pines Pkwy
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New SB truck climbing or passing lane would add capacity to I-25
		• New SB truck climbing or passing lane would likely not impact existing transit operations but would not preclude future transit options and could provide support for future local bus routing
		• New SB truck climbing or passing lane would not provide any additional support for non-vehicular travel choices
		• Operations and maintenance work are improved because additional lane improves work zone flexibility
		• Additional lane increases the maintenance/plowing burden
			• Assumes 1-3 miles of climbing lane only, between and independent from RidgeGate and Castle Pines Pkwy

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding southbound truck climbing or passing lanes has the potential to reduce crashes by minimizing slow moving vehicle impacts on traffic flow • It would improve incident response times for southbound incidents and provide for more space to safely respond to incidents where it is located.	
Compatibility with Community Planning Goals			

Segment 3: Add New Truck Climbing Lane SB at Surrey Ridge

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects. • Truck lane would provide improved movement of freight.	• May constrain interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely to stay within CDOT ROW and qualify for CE.	• Greenland Ranch straddles I-25 through the Monument Hill area. • Plum Creek major tributaries are located east of the northbound side of I-25 through Monument Hill area. • Gantries and signage associated with truck lane would introduce new vertical element in Segment 3. • Likely to be supported by CMCA • ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25

Segment 3: Add Auxiliary Lane(s)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Allows acceleration/deceleration to occur outside of the mainline travel lanes. This will promote more homogeneous travel speeds in the through lanes that will reduce turbulence, which has been demonstrated to improve safety. • Additional lane would increase maneuverability when an incident occurs adjacent to the auxiliary lanes.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• New auxiliary lane would partially reduce traffic delay from non-recurring events such as crashes, disabled vehicles, and other shoulder closures • Additional capacity would partially decrease the impacts on travel time from congestion, special events, and incidents, improving trip time reliability	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New auxiliary lane would add local capacity to I-25, increasing the appeal for local trips and potentially removing some traffic from the local road network
		• New auxiliary lane would likely not impact existing transit operations but would not preclude future transit options and could provide support for future local bus routing
		• New auxiliary lane would not provide any additional support for non-vehicular travel choices
		• New auxiliary lane is not consistent with CDOT's goals for adding capacity and managing future congestion in urban corridors
		• Operations and maintenance work are improved because additional lane improves work zone flexibility
		• Additional lane increases the maintenance/plowing burden	

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• New auxiliary lanes would improve incident response times in this segment. • The auxiliary lanes would provide better access to emergency detour and alternate routes during all incident types.	
Compatibility with Community Planning Goals			

Segment 3: Add Auxiliary Lane(s)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Could promote economic development for planned mixed use areas in RidgeGate and Lone Tree areas. • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects.	• Conceptually would not preclude interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Likely to qualify for CE.	• ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25

Segment 3: Convert All Existing Lanes to Express Lanes Each Direction (five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• No impact to safety, other than spot specific safety improvements.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved in Express Lanes as they would be operated to promote more consistent speeds and reliable travel times	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• Imposing a toll on all general purpose lanes will likely encourage more traffic to divert to local roads
		• Repurposed express lanes may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• Repurposed express lanes do not preclude future transit options
		• Repurposed express lanes may provide support for car/van pooling
		• Additional travel lanes provide improved travel options for drivers that choose to pay for a reliable travel time
		• Consistent with CDOT's goals for adding capacity and managing congestion
		• Additional Express Lanes technology will increase the maintenance burden	

Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• If all lanes were tolled, it is assumed that traffic would divert to another roadway system, thus reducing overall traffic and improving incident response times. • This alternative could increase the number of incidents occurring on the local road system.	
Compatibility with Community Planning Goals			

Segment 3: Convert All Existing Lanes to Express Lanes Each Direction (five lanes)

Criteria	Level 2 Performance Measure	Result	Comments / Notes
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• Incompatible with local transportation plans as I-25 traffic would be pushed onto the local roadway network, specifically in Castle Rock and Castle Pines. • Conceptually may constrain or preclude local transportation projects not anticipated or designed to handle interstate traffic.	• Conceptually does not preclude interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Poor. Converting all lanes likely to push a higher-than-existing-volume and Interstate-level type of traffic onto the local roadway network. Class of action anticipated to be an EIS.	• Anticipated strong public controversy and high degree of secondary impacts to surrounding local roadway network and adjacent sensitive resources. • Gantries and signage associated with Express Lanes would increase number of vertical elements in Segment 3.

Segment 3: Add/Convert Peak Period Shoulder

Criteria	Level 2 Performance Measure	Result	Comments / Notes
Safety			
• Reduce crashes • Improve infrastructure/address deficiencies	• Potential for crash reduction (qualitative) • Potential to address safety concerns overall (qualitative assessment of improvements at specific locations of LOSS III or IV)	• Would reduce congestion and congestion-related crashes, such as rear-end, sideswipe same direction, and secondary crashes. • Should be implemented with speed harmonization or reduced speed limits to promote homogeneous travel speeds, which has been demonstrated to improve safety. • May impact safety of first responders at incident scene.	• Opportunity to address specific locations for localized safety improvements in combination with this element.
Reliability			
• Improve travel times • Improve predictability of travel times • Reduce delays on I-25	• Improvement in non-recurring congestion (qualitative assessment of incident management, weather, special event management)	• Travel reliability would be improved as the shoulder lane would be operated to promote more consistent speeds and reliable travel times during peak periods • Off-peak and short-duration congestion would continue to impact travel times • Congestion and resulting congestion-related crashes in existing general purpose lanes may persist depending on level of use of managed shoulder lanes	
Mobility			

• Provide additional travel options
• Serves regional trip demand on I-25
• Reduces I-25 traffic diversions to local roads
• Promotes multimodal options
• Supports CDOT network goals for operations
• Supports CDOT network goals for asset management
	• Discourages cut-through traffic on local roads (qualitative; improves I-25 operations)
	• Ability to improve existing transit operations (qualitative)
	• Ability to not preclude / support new transit options (potential ROW conflicts)
	  o Bus Rapid Transit (BRT)
	  o Commuter Rail
	  o High-Speed Rail (ICS)
	• Provides additional travel choices (options for multiple modes and travel choices)
	• Compatible with CDOT operational strategies for I-25
	• Compatible with CDOT asset management goals
		• New shoulder lane would draw some traffic from general purpose lanes, increasing the appeal for local trips and potentially removing some traffic from the local road network
		• New shoulder lane may provide travel time and reliability benefits to intercity transit, pending agreement with HPTE
		• New shoulder lane does not preclude future transit options
		• New shoulder lane would not provide any additional support for non-vehicular travel choices
		• New shoulder lane is consistent with CDOT's goals for adding capacity and managing future congestion in urban corridors
		• New shoulder lanes would provide additional space for incident response and allow more through traffic to maneuver around the incident
		• New shoulder lanes could increase maneuverability overall, provide more passing opportunities, and reduce turbulence in the traffic stream
			• Assumes peak period shoulder lane would be a managed facility (i.e., tolled, HOV, transit, etc), similar to I-70 PPSL

Criteria	Level 2 Performance Measure	Result	Comments / Notes
		• New shoulder lanes provides improved travel options for drivers that choose to pay for a reliable travel time • Freight travel could be improved and conflicts reduced if other drivers choose to use managed shoulder lanes	
Incident Management			
• Reduce delays related to incident management • Improve safety for drivers and responders during incidents • Improve driver communication / coordination • Improve emergency responder communication / coordination	• Improved time to respond to incidents (qualitative) • Potential for crash reduction (qualitative) • Ability to provide emergency detours / alternate routes (qualitative)	• Adding/converting peak period shoulders in each direction to I-25 would enhance its reliability during peak times. • Because the shoulder is being utilized for travel, it is not available for incident management activities. Responders may need to close the affected lane and the adjacent lane to safely deal with incidents, minimizing its effectiveness at improving incident management activities. • It may improve incident response times by providing more capacity upstream of the incident.	• The design and operation of the peak period shoulder lane has a large impact on its usefulness for incident management and reduction in delays.
Compatibility with Community Planning Goals			
• Compatible with Conservation Easements • Does not preclude community land use or transportation goals / projects in Master Plans • Capitalizes on opportunities for economic development / attracting businesses	• Compatible with Conservation Easements • Conceptually does not preclude planned local transportation projects (e.g., Happy Canyon interchange reconstruction, Crystal Valley / Douglas Lanes new interchange) (qualitative) • Attractive to economic development (qualitative)	• No Conservation Easements adjacent to I-25 in Segment 3 • Could promote economic development for planned mixed use areas in RidgeGate and Lone Tree areas. • Compatible with local transportation goals. • Conceptually does not preclude local transportation projects.	• Conceptually would not preclude Lincoln Avenue interchange reconstruction.
Environmental Impacts			
• Relative environmental effects / level of significance – fits a category of action that has been demonstrated to have limited environmental impacts (CE), potential for significant effects (EA), likely significant effects (EIS)	• Good (CE or limited), Fair (EA or some effects but mitigated), Poor (EIS or hard to mitigate and/or significant)	• Good. Could likely qualify as a CE.	• ROW becomes constrained north of Lincoln Avenue • Glendale Farms Open Space adjacent to I-25 • Signs and gantries associated with Peak Period Shoulder would introduce new vertical element to Segment 3.

Alternatives Analysis
Level 3 Technical Memorandum

Alternatives Analysis
Level 3 Evaluation

I-25 PEL: Colorado Springs Denver South Connection

August 2019

Prepared For:
Colorado Department of Transportation

CDOT Project No.
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Introduction

This memorandum documents the third level of alternatives development and evaluation for the Interstate 25 (I-25) Colorado Springs Denver South Connection Planning and Environmental Linkages (PEL) study. The PEL Study began in fall 2016 to evaluate alternative concepts for 34 miles of the I-25 corridor between the Town of Monument and the Colorado Highway 470/E-470 (C/E-470). The alternatives analysis for the PEL was well underway in fall 2017 when the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), and local stakeholders advanced development of the I-25 South Gap Project (Gap project) from the PEL Study as an early action project. The Gap project added one lane of highway capacity (in the form of an Express Lane [EL]) to each direction of I-25 between Monument and Castle Rock (approximately 18 miles).

After completion of the I-25 South Gap Environmental Assessment (EA), work on this PEL Study resumed with a third level of alternatives evaluation. The Level 3 evaluation compared one traffic modeling scenarios and the No Action Alternative (which includes the Gap project) to assess additional highway capacity and operational needs for the I-25 mainline. Each scenario represents an option for operating the existing number of lanes or adding lanes to improve mobility and travel reliability in the corridor. Some of these scenarios, as explained in subsequent text, are based on the Core Concepts from each of the three study segments that were carried forward from the Level 2 evaluation. Additional scenarios were identified to encompass a range of capacity improvement options representing the minimum (no new lanes) to the maximum expansion (double the width of the existing facility).

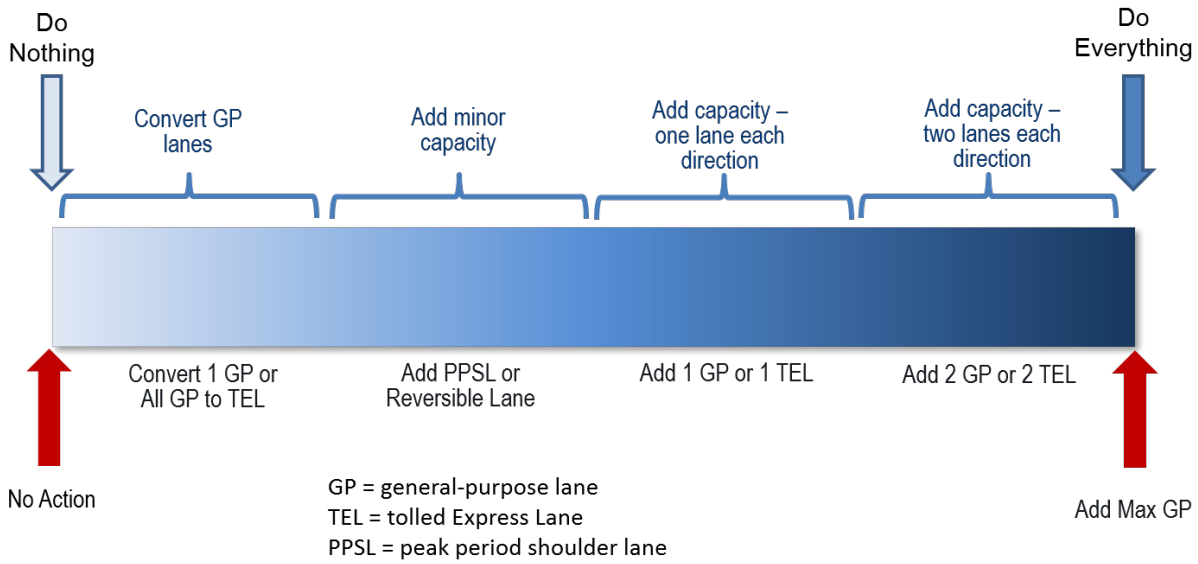
The Level 3 evaluation focused on corridor-wide scenarios primarily for the purpose of travel demand modeling. The travel performance of each scenario was measured as an indicator of relative safety, reliability, and mobility benefits. Consistent with the Level 1 and Level 2 evaluations, additional criteria were included to further assess safety benefits, consistency with local and regional community planning goals, and the potential for impacts to the built and natural environment. The collective assessment of these criteria helped to gauge overall alignment of scenarios with the PEL Purpose, Needs, and Goals.

The Level 3 recommendations presented in this memorandum focus on standalone improvements (Core Concepts) that best meet the identified purpose and need. In coordination with the Technical Working Group (TWG) and stakeholders, CDOT will prepare an implementation plan for the recommended Core Concepts. During future National Environmental Policy Act (NEPA) studies, these Core Concepts will be supplemented with additional elements needed to improve performance and meet project Needs and Goals in each segment.

Modeling Scenarios Evaluated

Scenarios were evaluated to represent a broad range of highway capacity improvement options for the I-25 mainline between Monument and C-470 (Table 1). These scenarios were not intended to serve as preliminary design alternatives. As depicted on Figure 1, they were intended purely to inform decision-making regarding highway capacity and operational needs on I-25.

Figure 1. Modeling Scenarios



Attachment A presents typical sections developed for each of the evaluated scenarios, with an example depicted on Figure 2. Based on the typical section for each scenario, the lane configurations were developed in MicroStation to establish the width of pavement along the corridor and estimate cut and fill limits and right of way (ROW) impacts. Mapbooks illustrating the conceptual layout of each scenario were developed and are also included in Attachment A, with an example depicted on Figure 3.

No Action Scenario

- The No Action modeling scenario is based on the Denver Regional Council of Governments (DRCOG) and Pikes Peak Area Council of Governments (PPACG) models, which include the existing network, projects in the construction phase, and committed projects in each metropolitan planning organization's (MPO's) region. As described in the Traffic Performance and Mobility section, the models from both MPOs were combined and the construction elements from the Gap project were added.
- Structure locations and dimensions are estimated based on design data from the Gap project, Online Transportation Information Systems (OTIS) structure data, and visual inspection of the 2017 aerials.

Mainline I-25 Scenarios

The following assumptions were used in developing the width of pavement and estimating cut and fill limits and ROW impacts for the mainline I-25 scenarios:

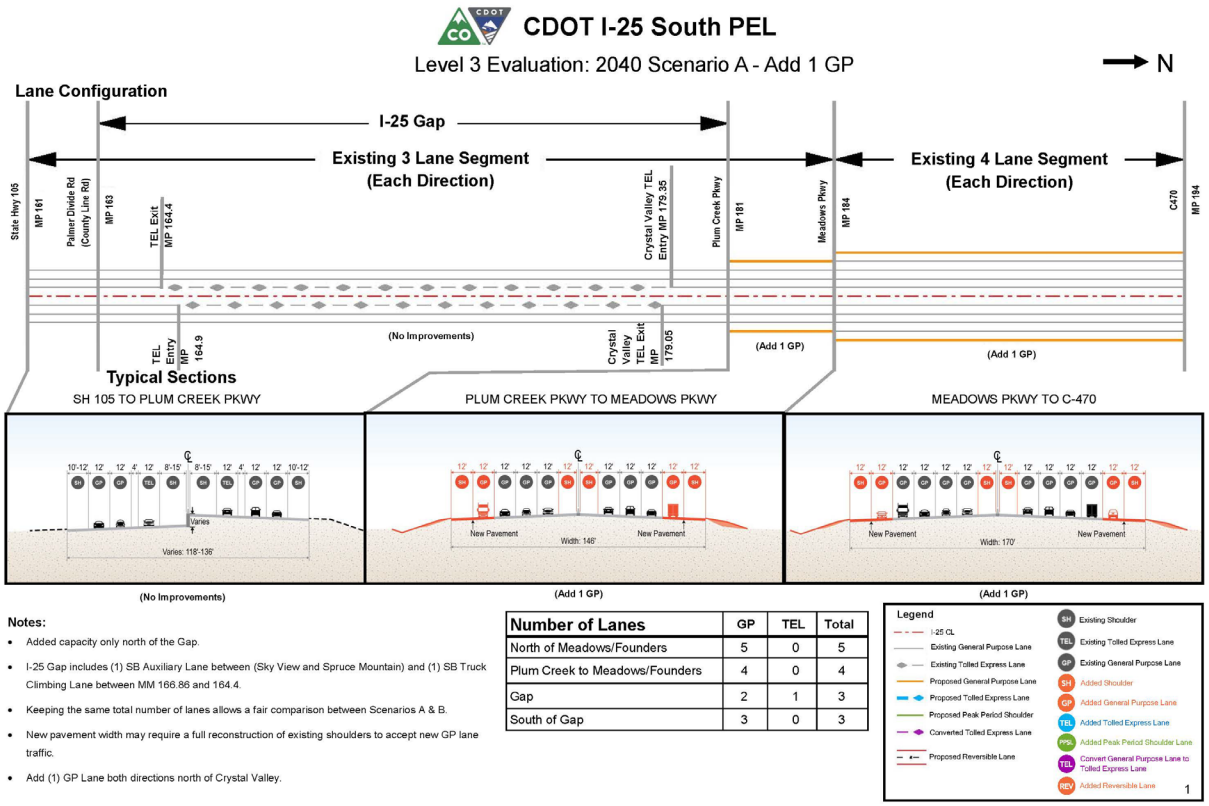
- Full standard typical sections were used with no design refinements to avoid or minimize impacts, or reduce costs. This approach likely results in a conservative estimate of impacts but allows a reasonable and consistent comparison among the scenarios.
- Mitigation efforts (such as relocation of frontage roads, trails, railroads, or floodplain) were not included.

- Each scenario maintains the No Action median barrier centerline control and widens equally to the outside.
- With the exception of maintaining the variable inside shoulders cleared in the *I-25 South Gap Project EA Reevaluation* (CDOT 2019), all scenarios apply standard 12-foot-wide inside/outside shoulders throughout the corridor.
- Scenarios do not add additional earthwork or pavement to extend the 1.15 miles of the truck climbing lane constructed in the Gap project to connect with the Monument Port of Entry.
- Scenarios that add lanes to the Gap segment (State Highway [SH] 105 to Plum Creek Parkway) will convert the existing 1.15 miles of truck climbing lane to a through lane.
- Scenarios that add ELs in Segments 2 and 3 have a southern EL terminus at Crystal Valley Parkway, which is the entrance and exit location approved in the I-25 South Gap EA. For Scenario K, which proposes a new EL for the length of the corridor, the southern terminus of the EL is County Line/Palmer Divide Road.
- Scenario roadside end conditions apply 18-foot Z-slopes and 4:1 cut and fill slopes to a maximum extent of 30 feet. If cut or fill slopes do not match existing ground with this criterion, a retaining wall with guardrail is placed at the outside shoulder location to minimize impact. The 18 feet used for the Z-slope calculations is a conservative assumption that accounts for unknown field conditions that may require ditches and other minor appurtenances.
- A 15-foot buffer was applied to the outside of the cuts, fills, and retaining wall locations that match existing grade. This 15-foot buffer sets the construction limits of each scenario.
- An additional 15-foot buffer was applied to the construction limits to estimate the ROW limits.
- The No Action condition at the northern and southern termini of the study is three travel lanes in each direction. Because some scenarios propose more than three lanes at the northern and southern limits of the study, a transition would be needed. Location of lane drops to transition scenarios back to No Action conditions at the northern and southern termini of project are not defined within this level of evaluation.

Table 1. Modeling Scenarios

Scenario	Scenario Description
No Action	2040 Regional Transportation Plan network, which includes existing plus committed projects and those improvements being constructed with the I-25 South Gap Project.
Scenario A	Adds one GP lane in each direction between Plum Creek Parkway and C-470.
Scenario B	Adds one EL in each direction between Plum Creek Parkway and C-470.
Scenario C	Adds one PPSL in each direction between Plum Creek Parkway and C-470. This scenario was not modeled. Results were inferred from Scenario B for peak period conditions
Scenario D	Converts one GP lane in each direction to an EL between Plum Creek Parkway and C-470.
Scenario E	Converts all GP lanes in each direction to ELs for the entire length of the corridor (SH 105 to C-470).
Scenario F	Adds one reversible lane, between Plum Creek Parkway and C-470. This scenario was not modeled. Results were inferred from Scenario A for peak period conditions.
Scenario G	Adds one GP lane in each direction between SH 105 and Plum Creek Parkway and two GP lanes in each direction between Plum Creek Parkway and C-470.
Scenario H	Adds two GP lanes between SH 105 and Meadows/Founders Parkway and three GP lanes from Meadows/Founders Parkway to C-470. The number of lanes was determined based on the point at which peak hour traffic does not experience substantial congestion (volume to capacity ratios on I-25 less than 0.85).
Scenario I	Adds one GP lane in each direction between SH 105 and Plum Creek Parkway and one EL in each direction between Plum Creek Parkway and C-470.
Scenario J	Adds one GP lane each direction between SH 105 and C-470.
Scenario K	Adds one EL in each direction between Palmer Divide Road and Plum Creek Parkway and two ELs in each direction between Plum Creek Parkway and C-470.

Figure 1. Example of Scenario Lane Configuration and Typical Section

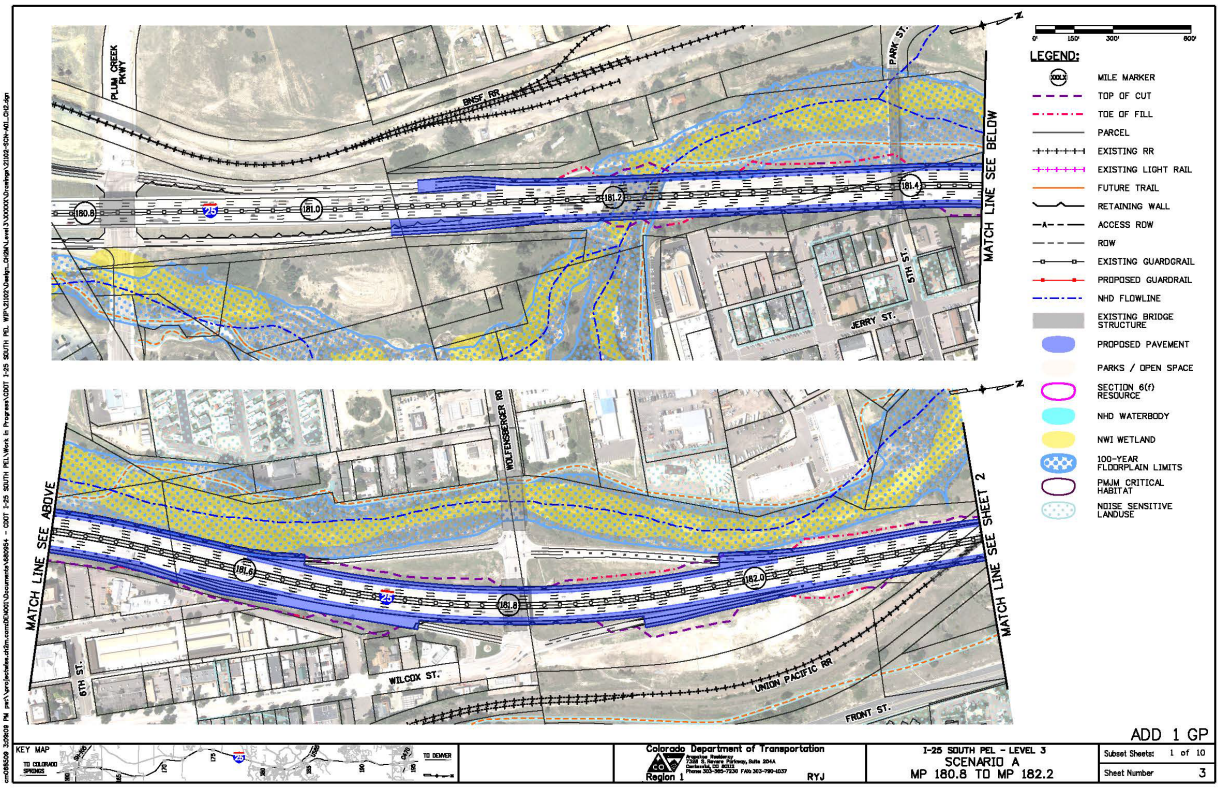


Notes:

- Added capacity only north of the Gap.
- I-25 Gap includes (1) SB Auxiliary Lane between (Sky View and Spruce Mountain) and (1) SB Truck Climbing Lane between MM 166.86 and 164.4.
- Keeping the same total number of lanes allows a fair comparison between Scenarios A & B.
- New pavement width may require a full reconstruction of existing shoulders to accept new GP lane traffic.
- Add (1) GP Lane both directions north of Crystal Valley.

Number of Lanes	GP	TEL	Total
North of Meadows/Founders	5	0	5
Plum Creek to Meadows/Founders	4	0	4
Gap	2	1	3
South of Gap	3	0	3

Figure 2. Example of Scenario Layout



Evaluation Criteria and Process

The Level 3 evaluation was intended to identify the number and type of lanes necessary to meet the purpose and needs of the mainline highway elements of this project, with consideration for the impacts associated with each scenario. A rough order of magnitude cost was also considered for comparison purposes between scenarios. The Level 3 evaluation criteria are listed in Table 2. Specific performance metrics were identified for each criterion to evaluate the scenarios qualitatively or quantitatively depending on the nature of the metric. Based on the evaluation results for each criterion, scenarios were assigned ratings to generally indicate how the scenario performed relative to the No Action scenario and other scenarios. The evaluation process, methodology, and rating system are summarized in Table 2 and explained in more detail in the subsections following sections.

Table 2. Level 3 Evaluation Criteria

Evaluation Criteria	Performance Metrics	Evaluation Method	Rating System	Relevance of Performance Metric
Traffic Performance/ Mobility	VHT; travel time; travel demand on I-25 (travel time and travel demand presented for GP and non-GP lanes)	Quantitative	Good/Fair/Poor	This criterion is a fundamental measure of how well each scenario meets the project purpose and need. Congestion was identified as a key contributor to safety, reliability, and mobility issues in the corridor.
Safety	Potential for crash reduction on I-25	Qualitative	Good/Fair/Poor	This criterion is a fundamental measure of how well each scenario meets the project purpose and need by enhancing safety.
Travel Time Reliability	Minimize impacts from recurring peak-hour and non-recurring incident and event-related congestion on I-25	Qualitative (summarized from Level 2)	Good/Fair/Poor	This criterion is a fundamental measure of how well each scenario meets the project purpose and need. Accounts for operational differences between managed lanes and GP lanes.
Incident Management	Reduce incident-related delays on I-25 and improve safety during incidents	Qualitative (summarized from Level 2)	Good/Fair/Poor	Relates to safety and travel time reliability.
Infrastructure Considerations	Impacts to RTD light rail track, freight railroad track, local roads, bridge structures, and major culverts	Quantitative	Good/Fair/Poor	Assesses how well each scenario addresses the project goal to be compatible with the built environment.
Infrastructure Considerations (continued)	Order of magnitude capital cost for scenarios	Qualitative	Good/Fair/Poor	Provides understanding of the relative cost of implementing each scenario.

Evaluation Criteria	Performance Metrics	Evaluation Method	Rating System	Relevance of Performance Metric
Environmental Resource Impacts	Impacts to economic, community, and natural resources	Quantitative	Low/Moderate/High	Consideration of natural resources, adjacent communities, and economic goals early in the planning stage of transportation projects is a primary function of PEL studies to aid in decision-making. Compatibility with the natural and built environment is also a goal of the project.
Compatibility with Community Planning Goals	Does not preclude community land use or transportation goals, projects in Master Plans, or opportunities for economic development	Qualitative (summarized from Level 2)	Low/Moderate/High	Assesses how well each scenario addresses the project goal of providing transportation solutions to support corridor communities' land use, development, and economic goals.

Notes:

VHT – vehicle hours traveled

RTD – Regional Transportation District

Traffic Performance and Mobility

Improving mobility between Monument and Denver South for local, regional, and interstate travelers is a fundamental part of the project purpose and need. To measure how well each scenario meets the project purpose and need to improve mobility, 2040 travel forecasts were developed for the No Action scenario and each of the I-25 mainline scenarios. Details regarding the traffic modeling for the PEL Study are documented in the *Technical Note - I-25 South PEL Travel Demand Forecasting* (Steer 2019).

Because the project corridor traverses the DRCOG and PPACG MPO boundaries, the DRCOG FOCUS 2.0 model was extended into northern El Paso County. This involved combining both the networks and the trip matrices of the models from the two MPO regions. A traffic count program was undertaken for the study. The model was calibrated to existing conditions using traffic counts and available travel time data. The model was refined to reflect the 2040 No Action scenario, which includes the following:

- One EL in each direction within the Gap
- A new interchange at Crystal Valley Parkway
- A 1.15-mile-long southbound climbing lane south of the Greenland Road interchange
- An auxiliary lane southbound between Sky View Lane and Spruce Mountain Road

This updated No Action model served as the baseline for the scenario modeling and Level 3 evaluation. Consistent with CDOT policy, the following assumptions were made for travel within ELs:

- A target speed of 45 mph was implemented to maximize throughput.
- High Occupancy Vehicle (three or more occupants) lanes were toll free.

- Public transit was allowed toll free.
- A surcharge for trucks was included.

The model was then used to conduct select link analysis to understand travel patterns and define the following EL access/egress locations:

- C/E-470 direct-connect ramps
- South of RidgeGate Parkway
- Between Happy Canyon Road and Castle Rock Parkway
- At Crystal Valley Parkway per Gap EA design

These egress points are not final. Determination of final egress points will be based on a Traffic and Revenue study and evaluated as part of a project level NEPA phase analysis and subsequent concept of operations plan.

Through coordination with the PEL Traffic Working Group, the following performance metrics were selected to assess how well each scenario would improve mobility in the project corridor:

- VHT in 2040
- Travel time (minutes) in 2040
- Travel demand (daily traffic volume) in 2040

Each of these performance metrics is explained in more detail in the following sections.

Vehicle Hours of Travel

Vehicle hours of travel is a measure of effectiveness used to assess system-wide travel performance and quality including changes in off-highway performance; i.e., the local street system. Results were determined for the entire subarea model, consisting of parts of the DRCOG and PPACG model areas, roughly bounded by the following:

- Belleview Avenue to the north
- Kiowa-Bennett Road and Elbert Road to the east
- US 85 and SH 105 to the west
- Interquest Parkway to the south

By comparing all scenarios, the percent change in VHT from the No Action was used to define the following evaluation thresholds:

- Good = a VHT decrease of 2 percent or more
- Fair = VHT change between -2 percent and +2 percent
- Poor = a VHT increase of 2 percent or more

Travel time

Future 2040 peak period travel times on I-25 from Monument to C-470 were calculated for each of the scenarios. This metric is an indicator of the expected interstate performance on a typical workday (northbound AM and southbound PM) barring any major incidents. Travel times in the GP lanes and in the managed lanes (EL, PPSL, and reversible lanes) were obtained from the model results. Because the travel times were calculated for the entire length of the corridor, portions of the travel times for the EL reflect that some of this travel occurs in GP lanes depending on the scenario. The travel time performance of the GP lanes and the managed lanes was compared between scenarios as well as against the No Action scenario. If the travel time was more than one standard deviation of the mean, it was rated as good; within one

standard deviation of the mean, it was assigned a fair rating; and less than one standard deviation, was poor. These good, fair, or poor ratings represented the composite travel time performance for both the GP lanes and managed lanes.

Travel demand

The two-way volume of daily traffic in 2040 was projected for each of the scenarios, including the No Action Scenario. These projections were broken down by GP lane traffic volumes, managed lane traffic volumes, and total daily traffic volumes. The following locations were deemed representative locations in the corridor:

- Castle Pines Parkway to RidgeGate Parkway
- Wolfensberger Road to Meadows/Founders Parkway
- Greenland Road to Upper Lake Gulch Road

The projected 2040 traffic volumes of each scenario vary depending on the number and operation of travel lanes because these factors affect the convenience and desirability of the route. The amount of traffic projected to use the interstate under each scenario as compared with the No Action is an indicator of the effectiveness of the scenario in accommodating future travel demand. The portion of each scenario's total volume captured by managed lanes indicates the effectiveness of the managed lane strategy. These two metrics were used to determine the good, fair, or poor ratings.

Safety

The Level 3 evaluation of safety was a qualitative evaluation that compared the scenarios to each other and assigned a rating of good, fair, or poor based on the ability of each scenario to reduce the potential for existing predominant crash types. The ratings indicate relative differences between the scenarios that were determined based on engineering judgment and knowledge of industry-published research about safety strategy effectiveness.

The evaluation assumed that each of the highway capacity scenarios will provide the opportunity to incorporate proven safety strategies, per industry best practices, at specific locations to address crash concentrations and along the length of the project for a systemic approach to improving safety. These strategies were identified as supplemental elements in the Level 1 evaluation. For the purposes of evaluating scenarios in Level 3, it was assumed these strategies would be included in each highway capacity scenario. The strategies would be selected with consideration to the existing crash history and the known contributing factors that compromise safety for the traveling public in general and specifically for this project, which include the following:

- High visibility signs, markings, and delineators
- Location-specific signing for curves
- Minor geometric improvements to some curves
- Minor drainage improvements to improve roadway surface conditions

- Widened shoulders, which provide the following safety benefits:
  - Provides more room for recovery and crash avoidance
  - Allows officers to better enforce driver behavior because they can park on the shoulder to monitor traffic and pull drivers over to the shoulder without impacting traffic flow on the mainline
  - Enables first responders to use the shoulder to travel to incident scenes relatively unimpeded, which shortens emergency response times
  - Provides more space to move disabled vehicles out of mainline travel lanes so incidents can be cleared more quickly, which reduces the potential for secondary crashes

Travel Time Reliability

Travel time reliability is measured by comparing high-delay days (unexpectedly long trip time) to free flow conditions (vehicles traveling at the posted speed limit). Travel time reliability was assessed for the existing project corridor in 2017 as part of the Initial Corridor Assessment (ICA) (CDOT 2018) completed for this PEL Study. This assessment identified when and where travelers in the corridor experience exceptionally long trip times based on 2015 and 2016 data. Level 3 applied a qualitative evaluation based on the long-term ability of a scenario to (1) deliver reliable travel times during peak-hour congestion and (2) minimize the effect of incidents and events that impact travel time reliability. This criterion focuses on differentiating between GP lanes and managed lanes. The addition of GP lanes can improve reliability by reducing congestion and congestion-related incidents that impact the travel time reliability. However, as congestion increases over time, the reliability benefits of adding GP lanes is eroded. Managed lanes such as ELs, PPSLs, and reversible lanes are operated to promote consistent speeds and reliable travel times and can provide this benefit long-term. Based on this qualitative assessment, scenarios were rated as good if they would provide one or more lanes that could be managed to promote reliable travel times, fair if they would reduce congestion and improve safety in the near-term, and poor if they do not increase capacity or expand managed lane options.

Additional factors related to reliability are measured in other Level 3 criteria, including the following:

- Additional safety measures that would reduce the likelihood of crashes are considered in the Safety section of this technical memorandum.
- Increased availability or consistency of shoulder areas (or other space-enabling incidents) to be cleared more quickly are considered in the Incident Management section of this technical memorandum.
- Additional capacity to reduce congestion and congestion-related incidents is considered in the Traffic Performance and Mobility section of this technical memorandum.

Incident Management

Incident management evaluation involves assessing the ability of a scenario to reduce incident-related delays and improve safety during incidents response, which are fundamental to the project purpose and need. The qualitative evaluation results for this criterion were summarized

from the Level 2 evaluation. Scenarios were then rated as good, fair, or poor based on the following factors:

- Increases availability or consistency of shoulder areas (or other space-enabling incidents) to be cleared more quickly.
- Provides a lane that can be managed for use by emergency vehicles responding to incidents.
- Reduces congestion, allowing emergency responders to reach incidents faster. The degree of anticipated congestion relief correlates positively to the amount of benefit for incident management.

Scenarios were rated good if they provide two or more of these benefits, including more substantial congestion relief; fair if they provide one of these benefits and some degree of congestion relief; and poor if they do not provide any measurable benefit.

Infrastructure Considerations

The No Action infrastructure considered in this evaluation includes existing infrastructure and infrastructure from committed projects including RTD light rail, freight railroad, local frontage roads, interstate bridge structures, and major culverts. The locations and dimensions of No Action scenario infrastructure were estimated based on design data from the Gap project, OTIS structure data, and visual inspection of 2017 aerial imagery. Infrastructure was evaluated against the estimated construction limits of each scenario to quantify impacts. Construction limits were estimated by modeling the limits of cut or fill necessary to implement the paved width of each scenario without design exceptions. Potential infrastructure impacts quantified include the following:

- Acres of impact to RTD light rail ROW
- Acres of impact to freight rail track ROW
- Acres of impact to local frontage roads ROW
- Number of interstate bridge structures
- Number of major culverts (single-cell or multi-cell concrete box culverts)

Evaluation of this criterion was also intended to provide high-level information about the order of magnitude cost to implement each scenario. Order of magnitude costs are based on an estimated quantity of: earthwork, pavement, aggregate base course, retaining walls, and bridge structures to construct new infrastructure or replace existing infrastructure on mainline I-25. A contingency was then applied to arrive at a rough order of magnitude cost for each scenario. Although ROW costs are likely to be substantial and a large percentage of the overall cost of future projects, ROW costs were intentionally excluded from the cost estimates because of the high level of uncertainty and assumptions at this level of analysis.

Scenarios were rated as good, fair, or poor based on the magnitude of potential impacts to No Action scenario infrastructure and the rough order of magnitude cost of each scenario.

Environmental Resource Impacts

To provide a high-level assessment of relative impacts across scenarios, resource impacts that could be readily quantified were calculated. Resource data used for the evaluation was compiled during the ICA. The following resources were included in this evaluation:

- Noise
- Environmental Justice
- Open Space
- Parks/Trails
- 6(f) Resources
- Public/Private Property
- Farmland
- Historic Resources
- Hazardous Material
- Water Resources
- Floodplains
- Wetlands/Riparian
- Habitat Conservation Areas
- Wildlife Movement
- Threatened and Endangered Species

Resources not specifically evaluated in Level 3 are either covered by evaluation of the resources detailed previously or would require more detailed analysis to determine impacts. This includes air quality, visual resources, Section 4(f) properties, water quality, and aquatic resources. Although individual Section 4(f) properties were not identified during the Level 3 evaluation, many of the existing and planned recreational parks, as well as historic properties, would likely qualify for Section 4(f) consideration.

Geographic Information System (GIS) data from the ICA was evaluated against the conceptual-level construction limits and ROW for each scenario to quantify impacts. Construction limits were estimated by modeling the limits of cut or fill necessary to implement the paved width of each scenario without design exceptions. The ROW was estimated by applying a 15-foot buffer to the construction limits.

Direct impacts to environmental resources were tallied and summarized by either number (historic properties), linear feet (trails and streams), or acreage (parks and wetlands). Depending on the nature of the resource, impacts were calculated either from the edge of construction limits or from ROW limits. Construction limits were used for natural resources such as wetlands. ROW limits were used for resources and adjacent land outside of CDOTs existing ROW that would be affected if incorporated into CDOT ROW to implement a scenario, such as parks and private property. Indirect impacts associated with potential traffic increases on the local network and associated impacts were also considered. These impacts were inferred from results of the Traffic Performance/Mobility evaluation.

Scenarios were rated as having low, moderate, or high impacts based on the nature and magnitude of potential impacts to the resources listed here.

Compatibility with Community Planning Goals

Compatibility with community planning goals was evaluated to assess how well each scenario addresses the project Goal of providing transportation solutions to support corridor communities' land use, development, and economic goals. The qualitative evaluation results for this criterion were summarized from the Level 2 evaluation. Scenarios were then rated as good if they highly support Goals and planned projects, fair if they are generally compatible with Goals or would not preclude planned projects, or poor if they may be incompatible with Goals or preclude planned projects.

Level 3 Evaluation Results

This section identifies the Level 3 evaluation results, which are summarized in Table 3 and discussed further in the following sections. Table 3 shows the scenarios across the top row and performance metrics for each criterion down the left column. The evaluation results are reported either as numerical data (quantitative) or a written explanation (qualitative) along with a graphic symbol of how the scenario rates relative to the No Action scenario and the other scenarios.

Traffic Performance and Mobility

Barring any incidents, during typical peak period conditions, drivers can currently expect to traverse I-25 from Monument to C-470 in about 35 minutes on average. The traffic on I-25 is expected to increase 50 percent from 2017 to 2040; and without improvements beyond the No Action scenario, the corridor travel time will almost double.

The scenarios with the greatest increases in capacity (Scenarios G, H, I, and K), whether GP lane or EL, have the best traffic performance relative to other scenarios evaluated. While congestion is projected to persist under any of these scenarios, 2040 travel times on I-25 between Monument and C-470 would be between 11 and 40 minutes faster (depending on the scenario and direction of peak period travel) than if no additional improvements beyond the No Action Alternative were implemented.

Scenario E, which converts all GP lanes to ELs, causes significant traffic diversion to the local road system (doubles traffic on SH 105 and increases traffic on SH 83 threefold) and overall does not accommodate as much traffic demand as the other scenarios. Adding just one GP lane north of the Gap, as in Scenario A, does not improve travel times enough to be rated better than poor. However, in addition to Scenario A, Scenarios B, C, D, and F may provide phasing options toward a broader corridor improvement scenario such as Scenario I or Scenario K.

Safety

Aside from the No Action scenario, which would not address any of the safety issues in the corridor, all highway capacity scenarios offer some degree of improvement for safety and were rated good or fair. This is primarily because proven safety strategies per industry best practices were assumed to be included. In addition, many of the scenarios would increase the capacity of the road, which is likely to reduce the predominant crash types related to congestion.

Per travel demand modeling results, Scenario E would divert traffic to local roadways and highways, which would reduce congestion and the potential for congestion-related crashes on I-25. For this reason, Scenario E would offer the highest potential for crash reduction on I-25 (although would likely increase crash potential on local roads where I-25 traffic is diverted).

Table 3. Level 3 Evaluation Summary

Evaluation Criteria		Modeling Scenarios											
		No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Traffic Performance/Mobility													
2040 Vehicle Hours Traveled (VHT)													
Study Area VHT (Daily Vehicle Hours Traveled)		N/A	◒	◒	◒	◒	○	◒	●	●	●	●	●
		862,000	850,000	851,000	854,000	867,000	910,000	854,000	839,000	831,000	845,000	844,000	843,000
Change from No Action		N/A	-1.4%	-1.3%	-0.9%	+0.6%	+5.6%	-0.9%	-2.7%	-3.5%	-2.0%	-2.1%	-2.2%
2040 Peak Period Travel Time (General Purpose Lanes/Non-General-Purpose Lanes)													
AM Northbound Weekday (Minutes)		○	○	◒	◒	○	◒	◒	●	●	●	◒	●
		57 49	50 42	53 35	53 37	64 35	NA 35	53 35	39 37	33 32	46 33	43 41	44 34
PM Southbound Weekday (Minutes)		○	○	◒	◒	◒	◒	◒	●	●	●	◒	●
		71 49	69 43	64 33	65 35	70 32	NA 36	64 33	40 37	31 30	40 34	43 39	45 29
2040 Travel Demand at Representative Locations in Corridor (Vehicles per Day)													
Castle Pines Parkway to RidgeGate Parkway	GP	223,000	229,000	202,000	213,000	186,000	NA	217,000	233,000	235,000	203,000	230,000	195,000
	Non-GP	NA	NA	19,000	11,000	29,000	174,000	9,000	NA	NA	19,000	NA	26,000
	Total	223,000	229,000	221,000	224,000	215,000	174,000	226,000	233,000	235,000	222,000	230,000	221,000
Wolfensberger Road to Meadows/Founders Parkway	GP	175,000	186,000	160,000	168,000	134,000	NA	171,000	192,000	196,000	165,000	188,000	158,000
	Non-GP	NA	NA	24,000	13,000	32,000	164,000	10,000	NA	NA	21,000	NA	30,000
	Total	175,000	186,000	184,000	181,000	166,000	164,000	181,000	192,000	196,000	186,000	188,000	188,000
Greenland Road to Upper Lake Gulch Road	GP	95,000	95,000	95,000	95,000	94,000	NA	95,000	113,000	121,000	111,000	112,000	93,000
	Non-GP	25,000	26,000	25,000	26,000	26,000	92,000	26,000	12,000	4,000	13,000	11,000	30,000
	Total	120,000	121,000	120,000	121,000	120,000	92,000	121,000	125,000	125,000	124,000	123,000	123,000

Evaluation Criteria	Modeling Scenarios											
	No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Travel Demand Rating	N/A	◒	◒	◒	◒	○	◒	◒	◒	◒	◒	◒
		Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the EL is moderate relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the PPSL is moderate relative to other scenarios, but is less effective than EL.	Accommodates less traffic than the No Action. Portion of traffic captured by the EL is high relative to other scenarios.	Accommodates less traffic than the No Action. Portion of traffic captured by the EL is high relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the reversible lane is moderate relative to other scenarios but is less effective than EL and PPSL.	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios.	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios.	Accommodates about the same amount of traffic as the No Action. Portion of traffic captured by the EL is moderate relative to other scenarios, but the additional GP lane in the Gap makes EL less effective.	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is low relative to other scenarios	Accommodates more traffic than the No Action. Portion of traffic captured by the EL is high relative to other scenarios.
Safety on I-25												
Potential for Crash Reduction on I-25 (qualitative)	○	◒	◒	◒	◒	●	◒	◒	◒	◒	◒	◒
	Existing crash types and rates would continue north of the Gap. Congestion-related crashes could worsen over time as congestion increases.	Could reduce congestion-related crashes but increase potential for lane-changing crashes.	Could reduce congestion-related crashes. Potential for crash reduction in GP lanes depends on effectiveness of EL in reducing congestion in GP lanes.	Could reduce congestion-related crashes, but increase potential for lane-changing crashes, particularly near begin/end points. Elimination of recovery area could increase potential for sideswipe-same direction crashes. Eliminates staging area for disabled vehicles, increasing potential for secondary crashes.	Could reduce congestion-related crashes. Potential for crash reduction in GP lanes depends on effectiveness of EL in reducing congestion in GP lanes.	Likely to reduce overall volumes on I-25, which could reduce the likelihood of congestion-related crashes.	Could reduce congestion-related crashes but would introduce a weaving section where lane merges into GP lane, which could increase potential for crashes at that location.	Could reduce congestion-related crashes but increase potential for lane-changing crashes.	Could reduce congestion-related crashes but increase potential for lane-changing crashes. Congestion-related crashes could persist where lane-reduction occurs.	Additional travel lane (EL) could reduce congestion-related crashes. Additional GP lane in Gap could reduce congestion-related crashes but increase potential for lane-changing crashes.	Could reduce congestion-related crashes but increase potential for lane-changing crashes.	Additional travel lane could reduce congestion-related crashes. Potential for crash reduction in GP lanes depends on effectiveness of EL in reducing congestion in GP lanes.

Evaluation Criteria	Modeling Scenarios											
	No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Travel Time Reliability on I-25												
	○	◒	●	●	●	●	●	◒	◒	●	◒	●
Improvement in providing reliable travel time through corridor, minimizing impacts from recurring peak hour and non-recurring incident-related congestion	Unreliable trip time associated with peak period congestion, incidents, weather, and special events would continue to be an issue in the corridor.	Would slightly improve trip reliability in the short-term by reducing congestion and related delays and crashes.	EL network managed to promote consistent speeds and reliable travel times. May also improve reliability in GP lanes by reducing congestion and related delays and crashes.	PPSL use in peak periods improves overall highway capacity when volumes are highest; provides managed opportunity for reliable travel in peak periods when the shoulders are operated as travel lanes.	EL network managed to promote consistent speeds and reliable travel times.	EL network managed to promote consistent speeds and reliable travel times. May reduce overall volumes on I-25, which could slightly improve reliability by reducing congestion and related delays and crashes.	Reversible Lane managed to promote consistent speeds and reliable travel times in peak periods. May also slightly improve reliability in GP lanes (one direction only) by reducing congestion and related delays and crashes.	Would improve trip reliability by reducing congestion and related delays and crashes in the near-term but does not promote long-term reliability	Would improve trip reliability by reducing congestion and related delays and crashes in the near-term but does not promote long-term reliability.	EL network managed to promote consistent speeds and reliable travel times. Additional GP lane in Gap would improve reliability by reducing congestion and related delays and crashes.	Would improve trip reliability by reducing congestion and related delays and crashes in the near-term but does not promote long-term reliability.	EL network managed to promote consistent speeds and reliable travel times. May also improve reliability in GP lanes by reducing congestion and related delays and crashes.
Incident Management on I-25 (Results summarized from Level 2 Evaluation; Scenarios not specifically evaluated in Level 2, were inferred based on Level 2 results)												
	○	◒	●	◒	◒	●	◒	●	●	●	●	●
Reduce incident-related delays and improve safety during incidents	No measurable change in incident-related delays or safety during incidents north of the Gap.	Would provide additional space for incident response safety and reduce delays during incidents.	EL can be managed for use during incident response and would provide additional space for incident response safety and reduce delays during incidents.	PPSL can be managed for use during incident response. However, adding traffic to shoulder reduces incident management response space during peak periods.	EL can be managed for use during incident response and could improve incident response times by providing a potentially less congested lane for access to incidents. (Removing one GP lane may increase incidents.)	Would improve incident response times on I-25 because some traffic would divert to local roadway system. (Could increase the number of incidents on local roads.)	Could reduce driver delay and improve incident response times if the lane is configured in the direction affected by the incident. However, effectiveness would be limited by access opportunities because of barriers and gates.	Would provide additional space for incident response safety and reduce delays during incidents.	Would provide additional space for incident response safety and reduce delays during incidents.	EL can be managed for use during incident response and would provide additional space for incident response safety and reduce delays during incidents.	Would provide additional space for incident response safety and reduce delays during incidents.	EL can be managed for incident response and provide additional space for incident response safety and reduce delays during incidents.
Infrastructure Considerations (Impacts and Cost)												
Impacts to:	N/A	◒	◒	●	●	●	◒	○	○	○	◒	○
RTD Light Rail Track (Acres)		5.03	5.33	4.61	4.61	4.40	5.13	6.09	6.91	6.40	5.02	4.89
Freight Railroad Track (Acres)		1.38	1.49	1.32	1.32	1.27	1.44	4.28	11.21	4.10	3.65	4.09
Frontage Roads (Acres)		2.02	8.56	6.15	6.15	0.79	2.62	40.72	56.27	41.65	39.94	35.90
Bridge Structures (Each)		16	19	15	15	13	16	28	29	27	24	27

Evaluation Criteria	Modeling Scenarios											
	No Action Scenario	Scenario A: Add 1 GP Lane	Scenario B: Add 1 EL	Scenario C: Add 1 PPSL	Scenario D: Convert 1 GP to EL	Scenario E: Convert all GP to EL	Scenario F: Add Reversible Lane	Scenario G: Add 2 GP Lanes	Scenario H: Add Max GP Lanes	Scenario I: "B" plus 1 GP in Gap	Scenario J: "A" plus 1 GP in Gap	Scenario K: Add 2 EL
Major Culverts (Each)		2	2	2	2	2	2	4	4	4	4	4
Cost (relative $ – $$$$$)		$$	$$	$	$	$	$$	$$$$	$$$$$	$$$$	$$$	$$$$
Notes: Acreage impacts to RTD light rail, freight, and frontage roads are based on the right-of-way needs from each facility. Dollar signs are used to symbolize rough order of magnitude costs for comparison purposes between scenarios.												
Environmental Impacts												
Impacts to economic, community, and natural resources	○ Minor physical impacts to adjacent land and resources but would continue to result in congestion related impacts with increasing severity.	● Would result in minor impacts associated with minor widening beyond existing ROW.	● Would result in minor impacts associated with minor widening beyond existing ROW.	● Would result in minor impacts associated with minor widening beyond existing ROW.	● Would result in negligible to minor impacts associated with traffic increases on local road network.	○ Minor physical impacts to adjacent land and resources, but would result in major impacts associated with traffic increases on local road network.	● Would result in minor impacts associated with minor widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.	○ Would result in major impacts associated with extensive widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.	◒ Would result in moderate impacts associated with moderate widening beyond existing ROW.
Compatibility with Community Planning Goals (Results summarized from Level 2 Evaluation; Scenarios not specifically evaluated in Level 2, were inferred based on Level 2 results)												
	○ Does not preclude community land use goals, transportation planning goals, or projects in master plans.	◒ Could be inconsistent with plans and goals that depend upon improved safety, mobility, and reliability on I-25.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	○ Not compatible with local transportation plans and may impact local transportation projects not anticipated or designed to handle interstate traffic.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	○ Could promote economic development. May preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.	◒ Could promote economic development. Does not preclude projects in master plans. Compatible with local transportation goals.

Good ● Fair ◒ Poor ○

Notes:

N/A = not applicable

The improvements proposed for Scenarios A, B, C, D, F, G, H, I, J, and K provide the ability to reduce predominant existing crash types but may increase the potential for other crash types because of the additional lanes and interaction between ELs and GP lanes. The severity of these crash types varies depending upon the prevailing conditions. Although these 10 scenarios received the same fair rating, some of these scenarios are less favorable than others from a safety perspective.

- Scenario C: The use of the shoulder during peak periods increases capacity, which can reduce congestion-related crashes. However, because traffic in the PPSL would generally be traveling faster than in the GP lanes, the speed differential could introduce the potential for crashes that do not typically occur under existing conditions. Use of the inside shoulder as a peak period travel lane also reduces the ability to move disabled vehicles out of the travel lanes; the occurrence and presence of an incident increases the potential for secondary crashes.
- Scenarios G and H provide the highest number of GP lanes, which increases the potential for lane-changing type crashes and weaving-type crashes within interchange areas. The scenarios with a mix of ELs and GP lanes are more favorable than Scenarios G and H because the operation of the ELs restrict the interaction with GP lanes, which would result in a lower potential for lane-changing crashes.

Travel Time Reliability

Scenarios adding capacity with GP lanes (Scenarios A, G, H, and J) were rated fair because they reduce congestion and related delays and crashes, but these benefits erode over time as traffic volumes increase in the future. Increased capacity and reduced congestion contribute to fewer crashes and improved ability to clear incidents more quickly, which improves trip reliability by reducing the number of days drivers encounter higher than average travel times. Scenarios proposing to convert to or add one or more managed lanes (Scenarios B, C, D, E, F, I, and K) would provide one or more lanes that are operated specifically to provide reliable travel times even during peak period congestion. These scenarios were rated good because they are anticipated to offer travel time reliability in the managed lanes most of the time.

Incident Management

Aside from the No Action scenario, which would not reduce incident-related delays or improve safety during incidents, all highway capacity scenarios offer some degree of benefit for incident management because they would bring the corridor to standards including implementation of 12-foot-wide inside and outside shoulders. The wider and consistent shoulder widths would better enable emergency responders to reach and clear incidents faster. Most of the build scenarios would also offer some degree of congestion relief, allowing emergency responders to reach incidents faster.

Scenarios receiving a fair rating include A, C, D, and F. These scenarios would provide additional space for emergency response ranging from 12-foot shoulders to one additional lane. Scenario A would provide additional space and some degree of congestion relief, but no additional lanes that could be managed for emergency use during incidents. Scenarios C and D would provide some degree of congestion relief and lanes that could be managed for emergency use during incidents, but additional space is limited to 12-foot shoulders. Scenario F

would provide some degree of congestion relief, 12-foot shoulders, and an additional lane that could be managed for emergency use during incidents. However, effectiveness of the reversible lane for incident management would be limited by access opportunities because of barriers and gates.

Scenarios receiving a good rating (Scenarios B, E, G, H, I, J, and K) provided more overall benefit for incident management. Scenario B would provide some degree of congestion relief, 12-foot shoulders, and an additional lane that could be managed for emergency use during incidents. Scenario E is anticipated to have substantially lower volumes than other scenarios, would have 12-foot shoulders, and would provide lanes that could be managed for emergency use during incidents. Scenarios G, H, I, J, and K all provide 12-foot shoulders and more congestion relief than the fair-rated scenarios because of the addition of two lanes (one in the Gap). Scenarios I and K would also provide additional lanes that could be managed for emergency use during incidents.

Infrastructure Considerations

The order of magnitude cost of each scenario and the degree of impacts to infrastructure existing under the 2040 No Action scenario are primarily a product of the additional width needed for each scenario.

Scenarios proposing to add one or more lanes in the Gap and two or more lanes north of the Gap (Scenarios G, H, and K) have the greatest impact to No Action infrastructure and the highest order of magnitude cost relative to other Level 3 scenarios. These scenarios were rated poor. Although not as impactful as Scenarios G, H, and K, Scenario I is also rated poor because the impacts were slightly higher than the fair rated scenarios and the cost is estimated to be similar to Scenario G.

Scenarios proposing to add one lane north of the Gap (Scenarios A, B, and F) have moderate impacts to No Action infrastructure and mid-range order of magnitude cost relative to other Level 3 scenarios. These scenarios are rated fair. Scenario J, which is also rated fair, has slightly higher impacts than the other scenarios in this grouping because it includes improvements in the Gap, but the differences are minor and the order of magnitude cost is similar.

Scenarios proposing no additional lanes (Scenarios C, D, and E) would still bring the facility to design standards, which would result in a minor amount of widening. These scenarios would have lower impacts to No Action infrastructure and lower order of magnitude cost relative to other Level 3 scenarios. These scenarios were rated good.

Environmental Resource Impacts

The nature and magnitude of impacts relates to the additional width needed for each scenario and the community impacts potentially caused by substantial diversion of traffic to the local network.

The lowest impact scenarios were those proposing to add one lane north of the Gap (Scenarios A, B, C, and F) or convert a GP lane to an EL (Scenario D). These scenarios would result in minor widening that could be implemented mostly within existing ROW. While there is some variance in the level of impact that would be associated with these scenarios, impacts to

adjacent resources under any of these scenarios would be low relative to other Level 3 scenarios.

Scenarios proposing to add one lane in the GAP and one to two lanes north of the Gap (Scenarios G, I, J, and K) would have a larger increase in the width of the corridor and would affect the entire corridor rather than the segments north of the Gap only. The additional width as compared to the low-impact scenarios results in a considerable increase in impacts to private property, historic properties, conservation easements/open space, noise-sensitive resources, farmland, floodplains, riparian conservation zone, wetlands, and wildlife movement corridors. As a result, these scenarios would result in a moderate level of impact to adjacent resources relative to other Level 3 scenarios.

The following three scenarios were deemed to have high impacts based on either direct or indirect impact potential:

- The No Action scenario would not result in widening or have direct impacts to adjacent resources along the corridor. However, impacts associated with high levels of congestion would include substantial travel delay and economic impacts.
- Scenario E would result in minor widening to bring the corridor to standards and would result in substantial traffic impacts on the local transportation network. While direct impacts to adjacent property and resources from widening would be relatively low, community and business impacts associated with overloading the local network would include substantial travel delay, noise, and economic impacts.
- Scenario H would roughly double the width of the interstate resulting in substantial impacts to adjacent natural and built environment resources. Resources impacts associated with Scenario H would be more than double the moderately rated scenarios in some instances, including ROW, conservation easement/open space, historic properties, and wetlands.

A summary of impacts by resource types is provided in Attachment B. Additional information was collected and will be provided in the PEL Report (e.g., specific trail and park names or Environmental Justice block group numbers).

Compatibility with Community Planning Goals

With a few exceptions, the scenarios were rated fair as they would generally be compatible with community planning goals or would not preclude planned projects. Scenarios rated poor for incompatibility with Goals or potential to preclude planned projects include the following:

- The No Action scenario would not improve safety, mobility, or reliability on I-25 and could be inconsistent with plans or Goals reliant upon these outcomes.
- By converting all existing GP lanes to ELs, Scenario E would likely overload the local transportation network with interstate traffic impacting local transportation projects not anticipated or designed to handle the additional traffic volumes.
- By doubling the width of the interstate, Scenario H would substantially improve the capacity of I-25 and reduce travel times, which may encourage economic development and is compatible with local transportation goals. However, the much wider footprint of the facility

would have substantial impact to adjacent land and may preclude planned projects along the interstate.

Public and Stakeholder Coordination

The project team met with the public and stakeholders through the Level 3 process to solicit input and feedback on the process, evaluation criteria, and results.

Resource Agency Group and Technical Working Group

The project team met with the Resource Agency Group (RAG) and TWG during the Level 3 evaluation to solicit feedback on the evaluation process, results, and recommendations. These meetings are summarized in Table 4.

Table 4. RAG/TWG Meetings

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
September 7, 2018	Presented Level 3 screening process, criteria, performance metrics, and modeling scenarios	No input related to Level 3.	N/A
November 2, 2018	Presented travel demand forecasting assumptions, modeling scenarios, and preliminary results. Reviewed other criteria to capture impacts.	Need to consider transit and planned development in the evaluation.	Transit elements were identified as supplemental elements in Levels 1 and 2 and conversations regarding station location options are ongoing. The transit evaluation will be presented in a technical memorandum and in the PEL Report.
		Template from the PEL needs to be compatible with planned improvements at Black Feather Trail, Happy Canyon Road, Meadows/Founders Parkway, and Lincoln Avenue.	The Level 3 evaluation considers compatibility with community plans.
		Questions about model segments north of C-470.	The traffic team reviewed two different locations for EL access, at C/E-470 and several miles south of C/E-470 and did not see a significant impact to EL volumes. VHT analysis across the entire network covered as far north as Belleview Avenue, but EL facilities did not extend north of C/E-470.

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
December 7, 2018	More in-depth presentation of modeling scenarios (including design assumptions), criteria (including methodologies), and results of analysis for all criteria.	Do not eliminate the PPSL; can be combined with any alternative.	The PPSL option is not eliminated in Level 3.
		There should be more difference between scenarios for safety.	While Level 3 only includes three rating levels for each criterion, CDOT recognizes there are some finer distinctions between scenarios for safety and other criteria.
		Compatibility with the future Interregional Connectivity Study (ICS) should be considered.	The ICS alignment was not factored into the Level 3 evaluation of traffic modeling scenarios. Potential conflicts between the ICS alignment and the recommended buildout of the I-25 mainline will be assessed as part of CDOT's implementation plan and recommended next steps following the PEL Study.
		The impact to Preble's meadow jumping mouse habitat looks high relative to the amount of ROW needs for each scenario.	Adjusted to calculate critical habitat instead of occupied habitat.
		If interchanges, such as Wolfensberger, need to be modified in the future, this could have impacts on the mainline.	Various interchange improvements were identified as supplemental elements in Level 1 and 2. Impacts to interchanges will be discussed with the TWG/RAG and documented in the PEL Report.
February 1, 2019	Summary of results and feedback from stakeholders and public.	Why add a lane north of the Gap with the existing bottleneck at C/E-470?	See the Recommendations section of this memorandum for an explanation of the Level 3 recommendations including transition zones at each terminus of the study.
		Even though CDOT has said that any additional lane in the Gap may be a GP lane or managed lane (e.g., EL), there are some who will be disappointed if an additional lane is not a GP lane.	This input will be considered and shared with future NEPA teams during development of projects in the corridor.
		Coordination with the Colorado Motor Carriers Association (CMCA) is needed to address the port of entry (POE) chain up stations and bus traffic through the POE. If the POE moves, the new site needs to be flat but cannot be located on the Air Force Academy property.	Various supplemental elements including the POE were identified as supplemental elements in Level 1 and 2. Discussions regarding the existing POE and potential future sites will be discussed with the CMCA and other stakeholders as part of a future TWG/RAG workshop.

Steering Committee

The project team met with the Steering Committee during the Level 3 evaluation to solicit feedback on the evaluation process, results, and recommendations. These meetings are summarized in Table 5.

Table 5. Steering Committee Meetings

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
September 14, 2018	Presented Level 3 screening process and criteria	PEL team needs to have a good understanding of current population projections and master plans along the corridor.	This process was completed using approved metropolitan planning organization models.
		Questions about how freight is being considered in the corridor, including the use of chain up stations for trucks.	Various freight improvements were identified as supplemental elements in Level 1 and 2. Freight improvements will be discussed further with the RAG/TWG and documented in the PEL Report.
		Acknowledgement that the cost of ELs is more than the GP lanes because ELs also include tolling components, buffers, signage, and similar.	The order of magnitude costs presented in this report demonstrate this difference.
November 9, 2018	Presented travel demand forecasting assumptions, modeling scenarios, and preliminary results.	Question regarding how the analysis accounts for connected vehicles.	The Level 3 analysis demonstrates it is not feasible to accommodate the expected traffic demand on I-25 between Colorado Springs and Denver solely by adding more lanes to the interstate. CDOT is incorporating communications infrastructure on State routes to facilitate use of new technologies such as connected vehicles and autonomous vehicles, which are anticipated to improve the capacity and safety on highway facilities. In addition, PEL recommendations will consider how to facilitate new transportation technologies.

Date	Level 3 Discussion	Relevant Input from Committee	Response from PEL Study Team
December 14, 2018	More in-depth presentation of modeling scenarios, criteria, and results of traffic performance analysis. Also provided preliminary recommendations.	Question about how often a PPSL would be in use if employed in this corridor.	A PPSL would be used during peak periods when traffic volumes and congestion are the highest.
		Overall support for the direction of the study recommendations for additional highway capacity. Support for additional two lanes north of the Gap and one additional lane in the Gap.	This input will be considered and shared with future NEPA teams during development of projects in the corridor.
		If a GP lane is converted to an EL, also need to look at adding a GP lane during future NEPA studies.	This input will be considered and shared with future NEPA teams during development of projects in the corridor.
		Need to evaluate auxiliary lanes in PEL or another study.	Auxiliary lanes were identified as a supplemental element in the Level 1 and 2 evaluations and will be discussed in the PEL Report.
		There was considerable discussion about transit including the Monument Park-n-Ride and an additional transit center in Castle Rock. The group would like to see transit information at the next Steering Committee Meeting.	Transit is being considered. The evaluation will be presented in a technical memorandum and in the PEL Report.
February 8, 2019	Summary of results and feedback from stakeholders and public.	Need to consider lane-imbalance north of C/E-470 exit, which is a 3-lane section connecting to a proposed 6-lane section between C-470 and Meadows/Founders Parkway as recommended in Level 3.	While not included in the Level 3 modeling scenarios, lane drops may be needed to match the lane configuration that exists when full build-out in the Study Area occurs (see the Recommendation section for discussion).
		PPSL should be retained as a potential phasing option.	The PPSL option is not eliminated in Level 3.
		Concern about PPSL because of the important role that shoulders play for emergency response.	This issue is recognized and acknowledged in the Level 3 analysis.

Public Involvement

Public meetings were held in Castle Rock on January 15, 2019, and Colorado Springs on January 17, 2019. The purpose of these meetings was to reintroduce the PEL Study, which was put on hold to focus on delivery of the I-25 South Gap Project (now under construction); provide an update on I-25 corridor improvements being studied; and gather input on recommendations for I-25 improvements after the Gap project. Approximately 37 people participated in these meetings.

Dialogue with the public at the meetings indicated general support for the overall vision of I-25 including the highway capacity recommendation, transit, and localized highway improvements. Other feedback included the following:

- Interest in how toll revenues from the Gap project would be applied to the corridor
- Interest in local or other road improvements, such as improvements to SH 83 and timing and effects of the Crystal Valley interchange
- Positive feedback on the I-25 South Gap Project construction
- Positive responses to both short- and longer-term transit options

CDOT solicited public input through a questionnaire provided at the meeting and made available on the CDOT website: http://i25cosden.codot.commentinput.com/?id=bdx27. Based on responses received, more reliable travel times and reduced congestion on I-25 were the top two transportation needs identified by the public. More than 60 percent of respondents indicated that the CDOT recommendations (as explained in Chapter 6 of this document) meet the transportation needs of the corridor. Concerns with CDOT recommendations included the following:

- Toll lanes and their potential impact on SH 83
- Poor quality of planning on the Gap project and the PEL Study
- Insufficient funding to implement CDOT's overall vision for the study segment of I-25 and maintain the corridor once it is complete
- Improved capacity through emerging vehicle technologies may reduce the need for widening the interstate
- Impacts to conservation easements from widening the interstate

Other transportation improvements suggested by the public to address transportation needs included passing lanes and shoulders on SH 83, improvements to support emerging vehicle technologies, frontage road improvements near Crystal Valley Parkway, and a bicycle path connection between the Plum Creek Trail and Front Range Trail.

Recommendations

Conclusions from the Level 3 evaluation and recommendations regarding highway capacity Core Concepts are summarized in Table 6 and explained in more detail in the following sections.

Table 6. Summary of Level 3 Recommendations

Highway Capacity Core Concepts	Representative Scenarios	Conclusions and Recommendations
Add Combination of GP Lanes and ELs	Scenario I	Extending the EL from Plum Creek Parkway to C-470 is a viable phasing option; adding a GP lane south of Plum Creek Parkway may also be a viable phasing option, but a second additional travel lane north of Plum Creek Parkway is recommended to better address travel demand
Add ELs Only	Scenarios B and K	Extending the EL from Plum Creek Parkway to C-470 is a viable phasing option; a second EL throughout the corridor is one of the recommended options to better address travel demand
Add GP Lanes Only	Scenarios A, G, H, and J	Not recommended because adding GP lanes alone does not meet long-term travel time reliability needs
Convert GP Lanes to ELs	Scenarios D and E	Converting one GP to an EL may be a viable phasing option and is considered a potential interim solution; converting all GPs to ELs is not recommended because of traffic impacts on the local transportation network
Add PPSL	Scenario C	Adding a PPSL north of Plum Creek Parkway may be a viable phasing option and is considered a potential interim solution
Add Reversible Lane	Scenario F	Adding a reversible lane is not recommended because it only serves one direction of traffic at a time and the direction split of traffic volumes in this corridor is not very pronounced (60/40)

Core Concepts Carried Forward

Based on the results of the Level 3 evaluation and consideration of input from stakeholders and the public, CDOT recommends one additional travel lane in each direction in the Gap segment between SH 105 and Plum Creek Parkway, and two additional travel lanes in each direction north of the Gap between Plum Creek Parkway and C-470. This recommendation would ultimately result in four travel lanes in each direction between SH 105 and Plum Creek Parkway, five travel lanes in each direction between Plum Creek Parkway and Meadows/Founders Parkway, and six travel lanes in each direction between Meadows/Founders Parkway and C-470.

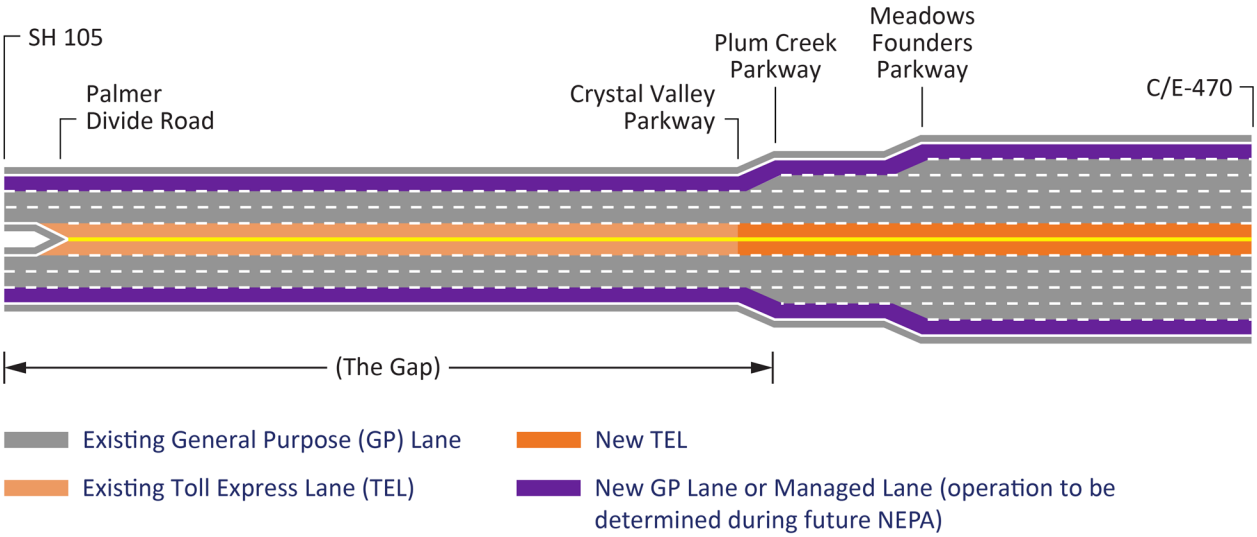
The modeling exercise completed for the Level 3 evaluation confirmed that while capacity expansions can improve travel times, they will not eliminate congestion issues. To provide reliable travel times in the corridor and maximize the effectiveness of the EL being constructed as part of the I-25 South Gap Project, one of the additional travel lanes constructed north of Plum Creek Parkway is recommended to be an EL. A continuous EL is critical to meeting the purpose and need because managed lanes provide long-term travel time reliability in the corridor. The EL also provides a faster, more reliable trip for bus service in the corridor, which, combined with complementary investments such as additional buses and increased service, can lead to increased transit ridership. In addition, a mix of ELs and GP lanes is more favorable from a safety perspective than a configuration with GP lanes only, because the operation of the ELs

restrict the interaction with GP lanes, which would result in a lower potential for lane-changing crashes.

The operation of the other travel lane to be added between SH 105 and C-470 would be determined if and when funding for those improvements is identified and they advance into NEPA and design. This additional travel lane would further improve mobility in the corridor as volumes continue to increase over time. The additional space allows better maneuverability to pass slower vehicles or avoid incidents. As the vehicle fleet transitions to increasingly autonomous vehicles, availability of lanes for dedicated autonomous vehicle use would improve the viability of the corridor for this emerging technology.

While not specifically modelled, the evaluation results of Scenarios G and K indicate the recommended lane configuration (Figure 4) would provide substantial traffic benefits as compared with the No Action scenario, reducing regional VHT between 2.2 and 2.7 percent, reducing travel times during peak travel periods by 12 to 31 minutes, and accommodating the projected 2040 traffic volumes. The Core Concept recommendation will be modeled to confirm traffic performance with results provided in the PEL Report.

Figure 3. Core Concept Recommendation



Phasing Options for Core Concept Recommendation

It is likely the ultimate configuration of I-25 between Monument and Denver South will be implemented in phases based on priority and availability of funding. Phasing recommendations will be part of the implementation plan included in the PEL Report. The timeframe for implementation of PEL recommendations is not known at this time. Because the Core Concept recommendation proposes more lanes on I-25 between SH 105 and C-470 than will exist with all No Action improvements completed, future project teams will need to consider the transition zones at each end of the Study Area. At the southern end of the Study Area, a lane drop would be needed to match the existing 3-lane section at SH 105. At the northern end of the Study Area, a new lane drop would be needed at Lincoln Avenue or County Line Road and the ELs may connect with ELs on C-470 westbound and E-470 eastbound. These transitions are

dependent on the number of lanes existing south of SH 105 and crossing C-470 when full build-out in the Study Area occurs.

The following discusses phasing options for the Core Concept recommendation. These options are based on scenarios modeled for Level 3. While some of them do not fully meet the purpose and needs of the PEL Study as an ultimate solution, they offer some combination of safety, mobility, or reliability benefits and could function as a long-term or interim component of project phasing.

- Converting one GP lane to an EL in each direction between Plum Creek Parkway and C-470 was modeled in Scenario D and offers a low-cost interim option to meet the need for travel time reliability. This option is not expected to improve travel times in the remaining GP lanes (no change in southbound PM peak period travel time and 7-minute increase in AM northbound peak period travel time) and could have some traffic impacts on the local road network but would provide a more reliable travel option in the corridor by extending the managed lane concept currently being implemented in the Gap. This option would result in a continuous EL in each direction between Monument and South Denver and is expected to offer EL users 14 to 17 minutes of travel time savings over the 2040 No Action.
- Creating a PPSL in each direction between Plum Creek Parkway and C-470 was evaluated in Scenario C (with modeling results inferred from Scenario B) and may offer a lower-cost interim option to meet the need for travel time reliability. Further analysis of existing shoulder conditions is necessary before determining if converting shoulders to a travel lane is a cost-effective option. Adding PPSLs would have travel time savings for the GP lanes (4 to 6 minutes) and would provide a more reliable travel option in the corridor by improving the inside shoulders between Plum Creek Parkway and C-470 to function as managed lanes during AM and PM peak periods. The PPSL is expected to offer users 12 to 14 minutes of travel time savings over the 2040 No Action.
- Adding an EL in each direction between Plum Creek Parkway and C-470 was modeled in Scenario B and offers a moderate-cost, long-term option to meet the need for travel time reliability. This option would have travel time savings for the GP lanes (4 to 7 minutes) and would provide a more reliable travel option in the corridor by extending the managed lane concept currently being implemented in the Gap. This option would result in a continuous EL in each direction between Monument and South Denver and would be expected to offer EL users 14 to 16 minutes of travel time savings over the 2040 No Action.
- Adding one GP lane in each direction between SH 105 and Plum Creek Parkway was not modeled independently, but was modeled as part of Scenarios G, I, and J. Depending on the needs determined during future NEPA studies, this phasing option could offer a moderate cost, long-term option to improve mobility in the corridor. If implemented in conjunction with or subsequent to implementation of an EL in each direction between Plum Creek Parkway and C-470 (Scenario I), this phasing option offers substantial time savings in the GP lanes; 11 minutes in the AM northbound direction and 31 minutes in the PM southbound direction, as compared to the 2040 No Action.

Scenarios Not Recommended

Based on the results of the Level 3 evaluation and consideration of input from stakeholders and the public, CDOT does not recommend further evaluation of the scenarios listed in this section because they do not meet the identified purpose and need, would have comparatively low benefits, or have similar benefits to scenarios with lower impacts. The following explains considerations regarding each of these scenarios in more detail:

- Scenario A: Adding one GP lane in each direction north of Plum Creek Parkway would have minimal travel time benefits with savings of 2 to 7 minutes compared with the 2040 No Action scenario. The additional GP lane would slightly improve reliability by reducing congestion and congestion-related incidents that impact travel time reliability. However, as congestion increases over time, the minimal reliability benefits of adding a GP lane would be eroded and would not meet long-term travel time reliability needs. Therefore, Scenario A would have limited effectiveness in addressing the purpose and need and is not recommended for further evaluation.
- Scenario E: Converting all existing GP lanes to ELs is predicted to lower I-25 traffic volumes on I-25 because approximately 10 percent of I-25 traffic (approximately 88,000 vehicles per day as compared with the 2040 No Action scenario) would divert from the interstate to local routes to avoid paying tolls on I-25. The lower traffic volumes on the interstate would reduce congestion and related delays and crashes, resulting in safety and travel time reliability improvements on the interstate. Travel time reliability would also be improved by the ELs, which are managed to promote consistent speeds and reliable travel times. However, the improvements in I-25 performance would be at the cost of the local transportation network and adjacent communities. The VHT on the Study Area transportation network would increase by 5.6 percent because interstate traffic would divert to and overwhelm the local network creating excessive congestion and delay. While the cost and direct impacts of this scenario are low, the indirect impacts on adjacent communities (traffic, noise, and economic) could be substantial. Therefore, Scenario E is not consistent with project Goals regarding compatibility with the natural/built environment and community plans and goals, and therefore, is not recommended for further evaluation.
- Scenario F: Adding a reversible lane from Plum Creek Parkway to C-470 would have similar travel time benefits to adding an EL or PPSL, but only in the direction that the reversible lane is being operated. In this corridor, the directional split of traffic volumes is approximately 60 percent northbound and 40 percent southbound in the AM with the reverse split in the PM. Because the reversible lane only serves one direction of traffic at a time, only 60 percent of the traffic would be served by this scenario. Because the directional split of traffic volumes in this corridor is not very pronounced, traffic congestion in the off-peak direction would persist. Further, the infrastructure (such as barriers) required to operate a reversible lane limits future flexibility in using pavement space. Addition of an EL or PPSL in both directions provides more benefit and flexibility than a reversible lane. Therefore, Scenario F is not recommended for further evaluation.
- Scenario G: Adding one GP lane in each direction from SH 105 to Plum Creek Parkway and two GP lanes in each direction from Plum Creek Parkway to C-470 would result in substantial travel time savings: 18 minutes in the AM northbound direction and 31 minutes in

the PM southbound direction, as compared to the 2040 No Action scenario. The additional GP lanes would improve reliability by reducing congestion and congestion-related incidents that impact travel time. However, as congestion increases over time, the reliability benefits of adding GP lanes would be eroded and would not meet long-term travel time reliability needs. Therefore, Scenario G is not recommended for further evaluation.

- Scenario H: Roughly doubling the capacity of the interstate by adding two GP lanes in each direction between SH 105 and Meadows/Founders Parkway and three GP lanes in each direction from Meadows/Founders Parkway to C-470 would have the most travel time benefits of any of the modeled scenarios: 19 minutes in the AM northbound direction and 40 minutes in the PM southbound direction, as compared to the 2040 No Action scenario. The additional GP lanes would improve reliability by reducing congestion and congestion-related incidents that impact travel time. However, as congestion increases over time, the reliability benefits of adding GP lanes would be eroded and would not meet long-term travel time reliability needs. The much wider footprint of the interstate would also have substantial impacts to adjacent property and natural resources and preliminary estimates indicate this scenario would cost about 50 percent more than the Core Concept recommendation. Therefore, Scenario H is not recommended for further evaluation.
- Scenario J: Adding one GP lane in each direction for the length of the corridor would result in substantial travel time savings: 14 minutes in the AM northbound direction and 28 minutes in the PM southbound direction, as compared to the 2040 No Action scenario. The additional GP lane would improve reliability in the near-term by reducing congestion and congestion-related incidents that impact travel time. However, as congestion increases over time, the reliability benefits of adding a GP lane would be eroded and would not meet long-term travel time reliability needs. Therefore, Scenario J is not recommended for further evaluation.

Next Steps

CDOT will work closely with the TWG and Steering Committee to develop an implementation plan for the Core Concept recommendation. After considering input and refining the implementation plan, CDOT will hold a final set of public meetings to gather public input on the final PEL Study recommendations.

All aspects of the PEL Study will be documented in the PEL Report, which will be made available for public and stakeholder review. Once FHWA has provided a letter of acceptance, the planning products from this PEL Study can be used in future NEPA studies to advance projects in the study corridor.

References

Colorado Department of Transportation (CDOT). 2019. *I-25 South Gap Project EA Reevaluation.* January.

Attachment A
Scenario Typical Sections and Conceptual Layouts

Attachment B
Environmental and ROW Impact Summary

Environmental Resources	Scenarios										
	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E	Scenario F	Scenario G	Scenario H	Scenario I	Scenario J	Scenario K
Historic Resources											
Total Number of Properties	16	18	15	15	13	17	29	41	30	25	24
Conservation Easements/Open Space											
Total Number of Properties	1	1	1	0	0	1	6	10	7	7	4
Total Acreage of Properties	0.01	0.01	0.001	0	0	0.001	0.86	7.02	0.88	0.94	0.61
Trails											
Total Number of Trails	4	4	4	4	4	4	4	4	4	4	4
Total Linear Feet of Trails	910.5	1197.2	883.01	883.01	896.36	1073.24	1520.37	2239.56	1389.7	1245.28	1640.37
Section 6(f) Properties											
Total Number of Properties	0	0	0	0	0	0	0	0	0	0	0
Total Acreage of Properties	0	0	0	0	0	0	0	0	0	0	0
National Hydrology Dataset Flowline											
Total Number of Streams	18	22	21	21	17	18	44	45	44	43	42
Total Linear Feet of Streams	1657.89	2595.9	1698.63	1698.63	1123.51	2220.44	5550.65	8477.4	5907.09	5033.02	5500.42
National Wetland Inventory											
Total Number of Wetlands	7	9	7	7	7	8	16	22	16	15	15
Total Acreage of Wetlands	0.45	0.68	0.30	0.30	0.3	0.57	1.344135	3.44	1.5	1.32	1.71
Environmental Justice (Low-Income, Minority, and LEP)											
Low Income Block Groups Exceeding County Average	7	8	7	7	7	5	8	8	8	8	7
Minority Block Groups Exceeding County Average	10	10	10	10	10	7	11	11	11	11	10
LEP Block Groups Exceeding County Average	10	10	10	10	10	7	12	12	12	12	10
Noise Sensitive Land Uses											
Total Number of Noise Sensitive Land Uses	39	42	42	42	39	39	67	67	66	66	55
Hazardous Material Sites											
Total Number of Hazardous Material Sites	9	13	12	12	7	10	17	29	16	15	18
Farmland											
Total Acreage of Farmland	11.32	11.74	11.00	11.00	10.71	11.77	54.14	62.62	53.62	53.36	53.46
100-Year Floodplain											
Total Acreage of 100-Year Floodplain	8.33	9.2	7.17	7.17	6.56	8.49	39.89	50.44	39.43	37.9	38.7
Riparian Conservation Zone											
Total Acreage of Riparian Conservation Zone	0.57	0.88	0.39	0.39	0.38	0.76	10.85	22.92	12.57	12.56	13.08
Acreage of Critical PMJM											
Total Acreage of Critical PMJM Habitat	0	0	0	0	0	0	0	0	0	0	0
Impediments to Wildlife Movement											
Total Linear Mileage of Wildlife Movement	1.3	1.8	1.7	1.7	1.3	1.3	7.8	7.6	7.6	1.8	6.5
Total Acreage of Wildlife Movement Area	26.07	31.37	28.91	28.91	23.87	26.29	169.97	197.46	170.9	170	171.12

	Scenarios										
	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E	Scenario F	Scenario G	Scenario H	Scenario I	Scenario J	Scenario K
Number of Parcels Impacted	**99**	**106**	**81**	**81**	**62**	**102**	**156**	**231**	**133**	**118**	**129**
Acreage of Parcels Impacts	**12.18**	**18.18**	**9.63**	**9.63**	**6.54**	**13.53**	**35.56**	**72.22**	**26.18**	**17.8**	**30.87**
Impacts by Parcel Type											
Number of Residential Properties	30	30	22	22	20	29	44	65	39	28	35
Acreage of Residential Properties	1.53	2.51	0.72	0.72	1.45	2.2	3.49	13.12	3.07	1.55	2.75
Number of Commercial Properties	14	16	11	11	11	17	23	34	18	14	19
Acreage of Commercial Properties	0.65	1.39	0.66	0.66	0.16	1.1	4.04	4.4	1.82	0.85	2.8
Number of Agricultural Properties	10	10	7	7	5	10	14	26	15	16	15
Acreage of Agricultural Properties	1.76	2.29	0.79	0.79	0.83	2.24	5.04	11.78	2.18	1.92	3.45
Number of Church, School, or Recreational Properties	0	0	0	0	0	0	3	5	0	1	0
Acreage of Church, School, or Recreational Properties	0	0	0	0	0	0	0.05	0.42	0	0.01	0
Number of Municipal Properties	13	14	12	12	8	13	20	25	22	16	20
Acreage of Municipal Properties	2.26	4.03	2.95	2.95	1.24	2.43	6.51	13.12	7.08	5.42	7.59
Number of County Properties	12	15	9	9	6	11	21	33	19	18	16
Acreage of County Properties	1.75	1.44	1.03	1.03	0.19	0.85	6.74	10.16	4.24	1.39	5.17
Number of Metro District Properties	7	6	8	8	4	7	15	9	5	6	12
Acreage of Metro District Properties	0.49	0.55	0.53	0.53	0.1	0.66	1.95	1.43	0.39	0.46	1.66
Number of HOA Properties	4	3	2	2	2	2	2	5	2	3	2
Acreage of HOA Properties	0.51	0.76	0.18	0.18	0.08	0.56	0.88	1.2	1.06	0.65	1.04
Number of Utility Properties	3	5	4	4	3	4	8	10	7	6	7
Acreage of Utility Properties	2	2.19	1.92	1.92	1.81	2.14	5.37	12.08	4.77	4.27	4.85
Number of Other/Vacant Properties	6	7	6	6	3	9	6	19	6	10	3
Acreage of Other/Vacant Properties	1.23	3.02	0.86	0.86	0.68	1.35	1.5	4.51	1.57	1.28	1.56