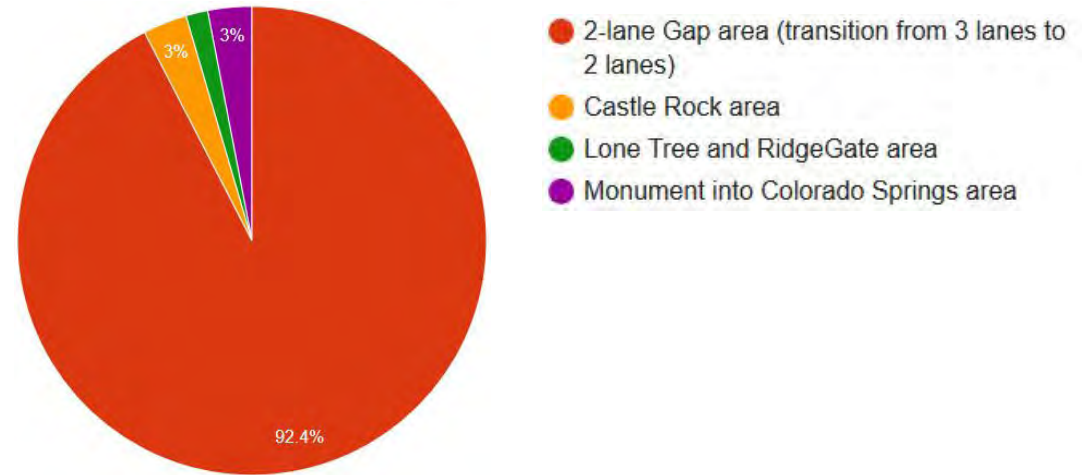


# What We've Heard

## 1<sup>st</sup> Public Meetings Series Held in January 2017 in Douglas County and Colorado Springs

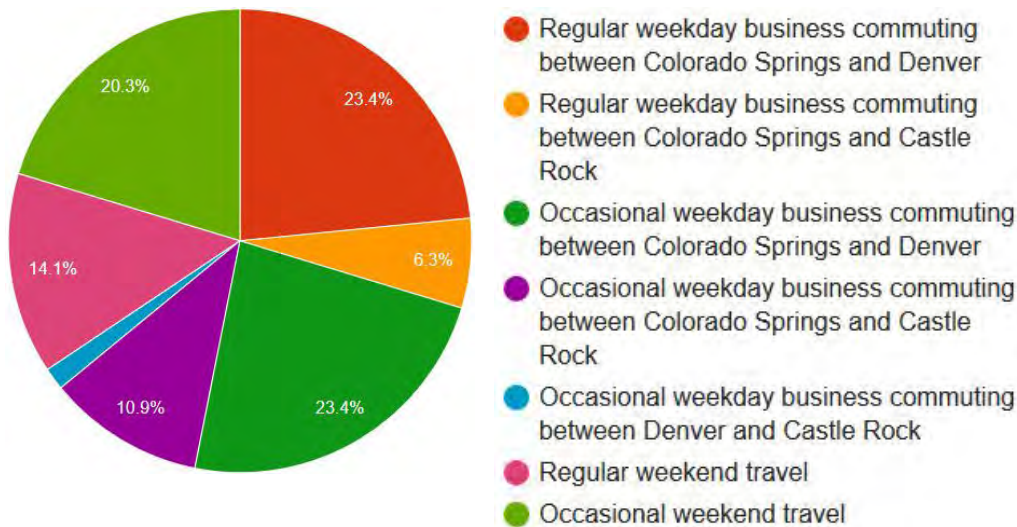
- 362 Attendees
- 74 comments submitted
- Responses on comment form:

## Where do you think the most problems with travel occur in the corridor? (66 responses)

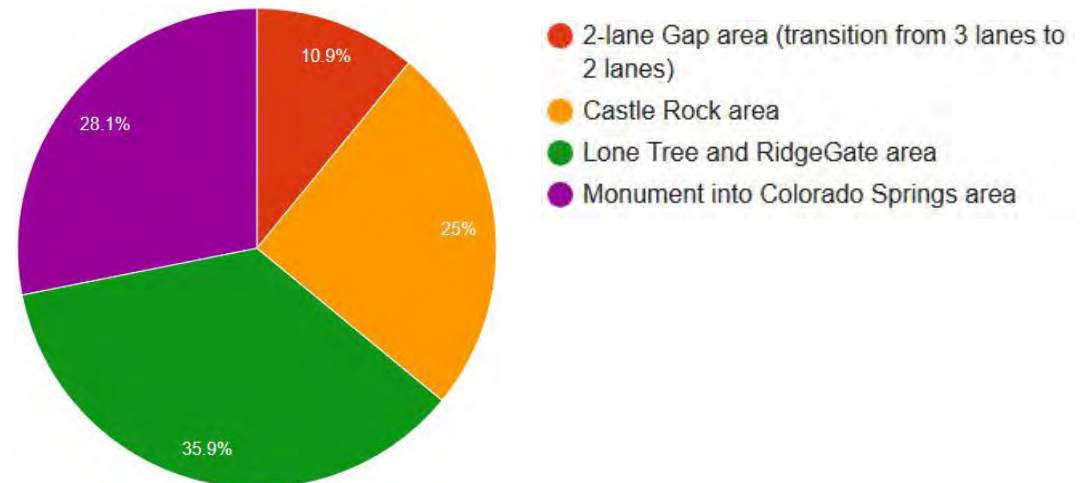


## How do you most often use the corridor? (64 responses)

(64 responses)



## Where do you think the second most problems with travel occur in the corridor? (64 responses)



# Extensive Stakeholder Involvement and Coordination to Advance Supported Projects

**Project website:** [www.codot.gov/projects/I25COSDEN](http://www.codot.gov/projects/I25COSDEN)

## Project Management Team (PMT)

The PMT is comprised of CDOT, FHWA, and consultant team staff. This group meets monthly to oversee the management of this study.

## Technical Working Group (TWG)

The TWG is comprised of engineering, planning, and environmental staff from CDOT, FHWA, and agencies along or representing corridor jurisdictions. This group is helping to develop and review alternatives, provide technical advice, and serve as the primary connection with elected officials and community organizations.

## Steering Committee (SC)

The SC is comprised of elected officials representing each jurisdiction along the corridor. This group will review the PEL study's analyses and recommendations to prioritize, plan, and implement corridor improvements. The SC meets monthly and is working cooperatively with CDOT to develop solutions that address the needs of corridor communities and other travelers.

## Stakeholder Focus Groups

Briefings are being conducted as part of ongoing organization meetings. CDOT will reach out to these groups, including organizations such as Chambers of Commerce, media representatives, Home Owners Associations, and environmental groups. Stakeholder focus groups will be kept informed of the progress of this project via email updates and in-person meetings.

## Public Meetings

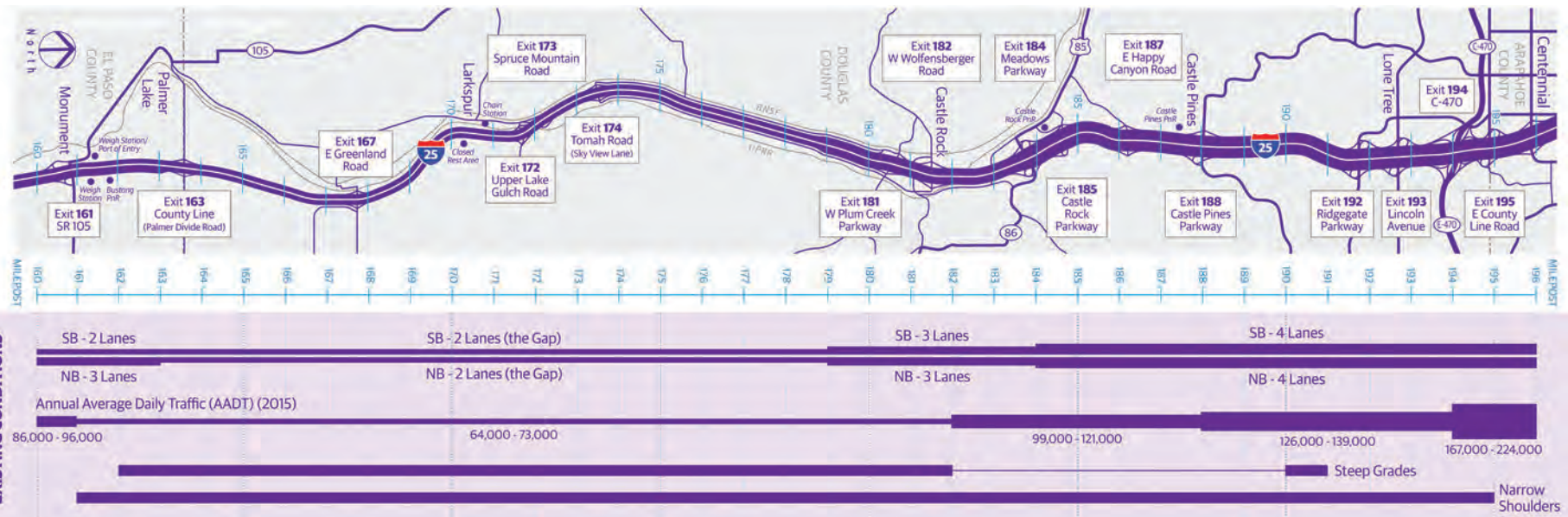
Two public meetings were held in January 2017, to introduce the PEL Study, educate the public on the PEL process, and collect input about the vision for the study and potential transportation improvements. The April 2017 meetings represent the second round of public meetings, this time aimed at presenting the purpose and need and the range of alternatives being considered. Additional public meetings are planned in fall 2017, and spring/fall 2018.



CDOT Executive Director, Shailen Bhatt, announced on January 6, 2017 that CDOT would accelerate design and environmental review of improvements through the Gap. Joining him at the press conference were, from left to right: FHWA Colorado Division Administrator, John Cater; Colorado Springs Mayor, John Suthers; Douglas County Commissioner, Roger Partridge, and El Paso County Commissioner, Sallie Clark.



# Corridor Overview

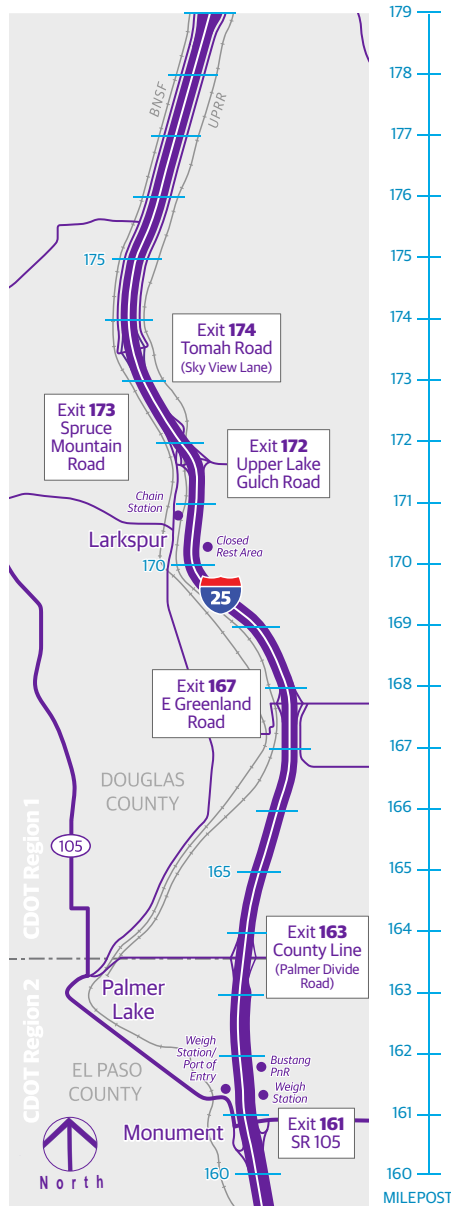


# Corridor Segments

## Segment 1

### MP 161 to MP 179: The Gap

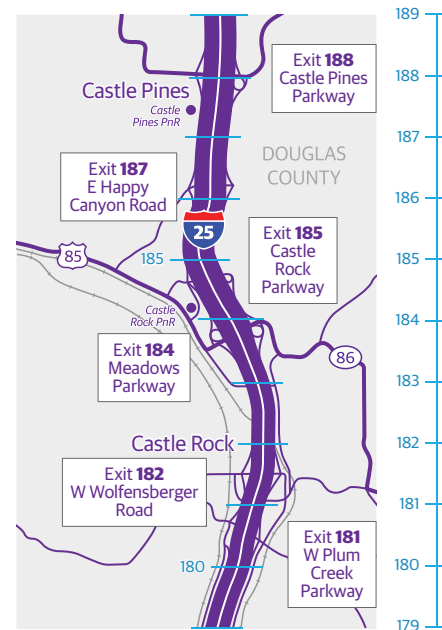
- Rural 4 lane
- Stable land use, large open space areas
- Steady climbing grades southbound (more than 1,000 feet elevation gain)
- Narrow shoulders
- Varied topography with hills, steep slopes, and vertically offset travel lanes (northbound is higher than southbound)
- 6 interchanges, mostly original (1960s)
- Existing (2015) Annual Average Daily Traffic: 64,000 to 68,000
- Percent of trucks: 5.8 to 6.6



## Segment 2

### MP 179 to MP 189: Castle Rock to Castle Pines

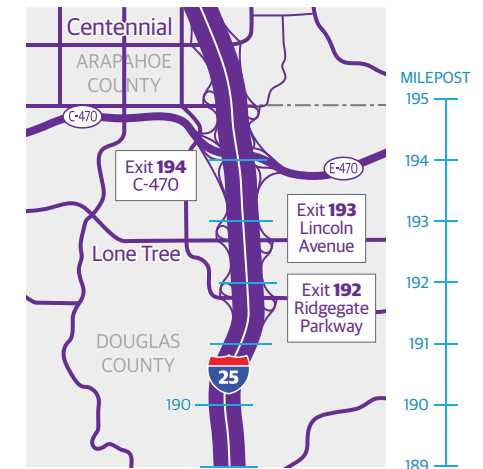
- Urban 6 lane
- Narrow shoulders
- Developed and growing communities
- 6 interchanges
- Existing (2015) Annual Average Daily Traffic: 99,000 to 121,000
- Percent of trucks: 5.1 to 5.5



## Segment 3

### MP 189 to 194: Denver South

- Urban 8 lane, recently widened
- Rapidly developing commercial and residential area
- 3 interchanges
- Existing (2015) Annual Average Daily Traffic: 126,000 to 178,000
- Percent of trucks: 4.8 to 7.2





# Grade Changes and Large Trucks

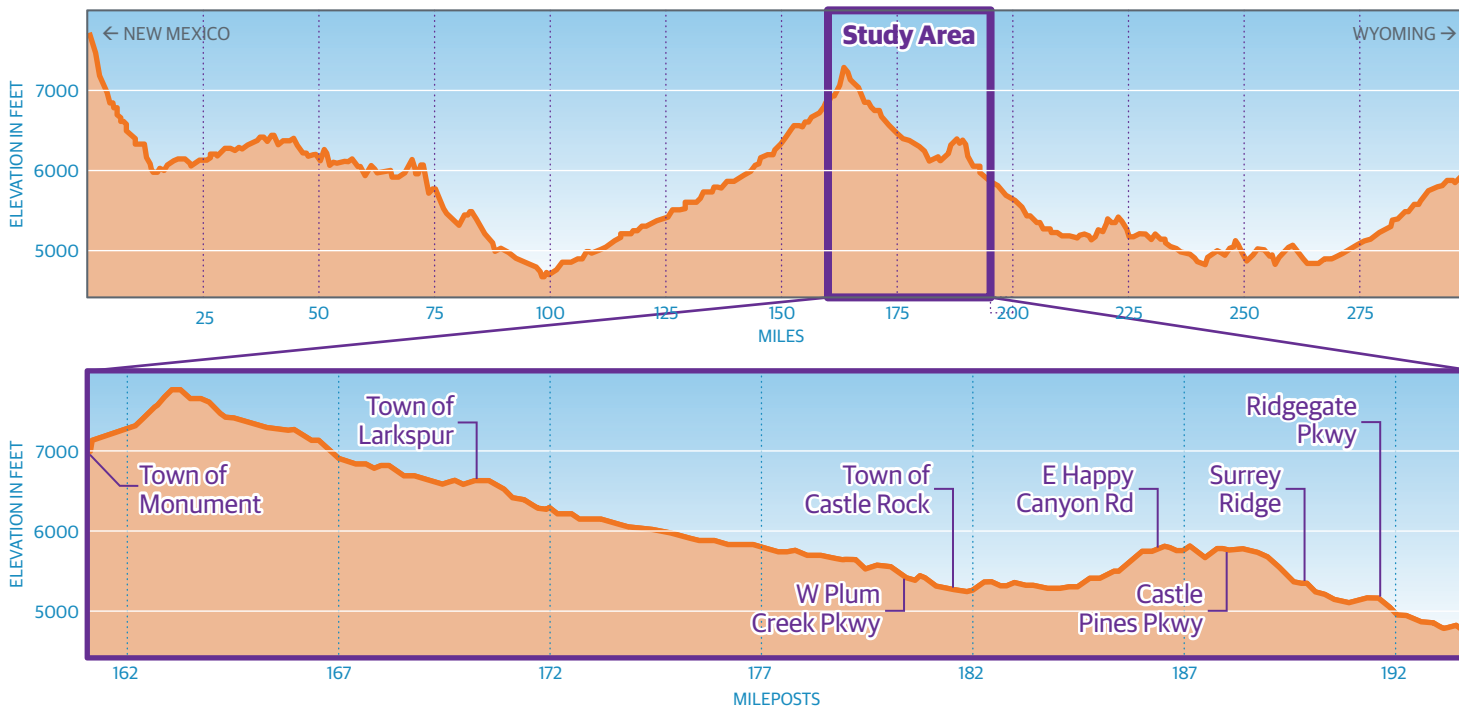
**Monument Hill is a high point of I-25 through Colorado** with long stretches of climbing grades in both directions in the study area.

- Grades are especially challenging for heavy trucks, which account for 5 to 7 percent of traffic in the corridor
- The two-lane Gap section is generally climbing in the southbound direction.
- Trucks generally travel 10 mph to as much as 20 mph slower than cars, which introduces turbulence and conflicts in the traffic stream when cars pass trucks at high speed and when slow moving trucks pass slower moving trucks

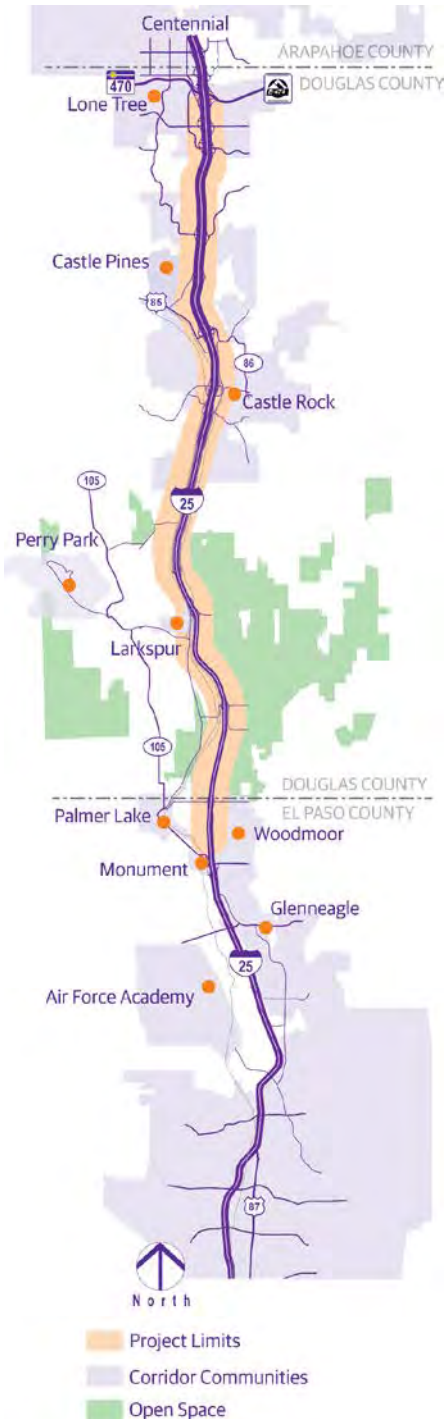


## Colorado Motor Carriers' Concerns

- Locations of truck weigh stations
- Chain-up locations and opportunities
- Narrow travel lanes
- Narrow shoulders (not sufficient for parking)
- Lack of detours
- Speed differentials and variability in travel speeds



# What is a Planning and Environmental Linkages (PEL) Study, and why is CDOT doing it?



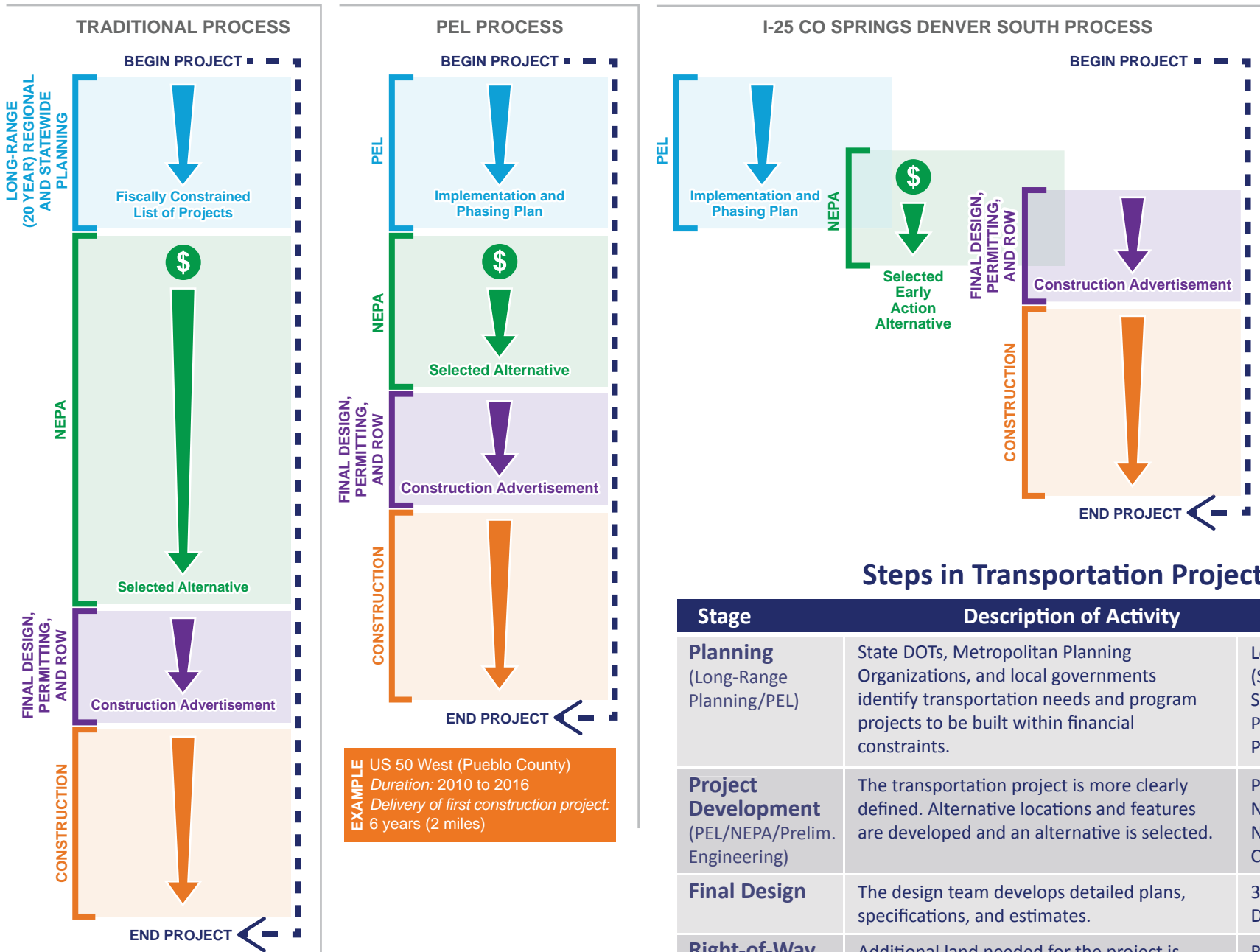
A PEL study is a process CDOT and FHWA use to accelerate delivery of transportation projects by combining federal requirements for long-range transportation planning and environmental clearances.

The PEL will help CDOT:

- Define and prioritize projects in the corridor
- Determine project costs, funding, financing, and delivery options
- Engage with local corridor communities, regional travelers, and other interested stakeholders about corridor issues and priorities
- Identify significant environmental constraints that may influence design options and/or delay project development with lengthy environmental reviews
- Support efficient transition to National Environmental Policy Act (NEPA) processes, final design, and construction

CDOT has committed to advancing an early action project focused on the Gap area into NEPA and preliminary engineering concurrent with the PEL.

# I-25 PEL and NEPA Process



**EXAMPLE** US 50 West (Pueblo County)  
 Duration: 2010 to 2016  
 Delivery of first construction project: 6 years (2 miles)

**EXAMPLE** I-25 Through Colorado Springs  
 Duration: 1997 to 2008  
 Delivery of first construction project: 11 years (12 miles)

**\$** Construction funding identified (Traditional and PEL processes) or assumed (I-25 process)

**EXAMPLE** This process is unique for this corridor, and no examples are available. CDOT and FHWA, in cooperation with local communities, are following a concurrent PEL, NEPA, and design process to prepare an early action project for construction once funds are identified. Other projects identified through the PEL will go through NEPA, design, and construction processes once additional funds are identified.

## Steps in Transportation Project Development

Stage	Description of Activity	Example Documents
<b>Planning</b> (Long-Range Planning/PEL)	State DOTs, Metropolitan Planning Organizations, and local governments identify transportation needs and program projects to be built within financial constraints.	Long-Range Transportation Plans (Statewide/Regional Transportation Plans) Short-Term Transportation Improvement Programs PEL Study
<b>Project Development</b> (PEL/NEPA/Prelim. Engineering)	The transportation project is more clearly defined. Alternative locations and features are developed and an alternative is selected.	PEL Study NEPA Environmental Assessment NEPA Environmental Impact Statement Conceptual to Preliminary Engineering
<b>Final Design</b>	The design team develops detailed plans, specifications, and estimates.	30% plans, 60% plans, 90% plans, Final Design, Project Specification
<b>Right-of-Way</b>	Additional land needed for the project is purchased.	Right-of-way plans, acquisitions, and negotiations
<b>Construction</b>	The State or local government selects the contractor, who then builds the project.	Request for Proposals, Contracting



# CDOT's Responsibilities and Budget

## Our Transportation Infrastructure

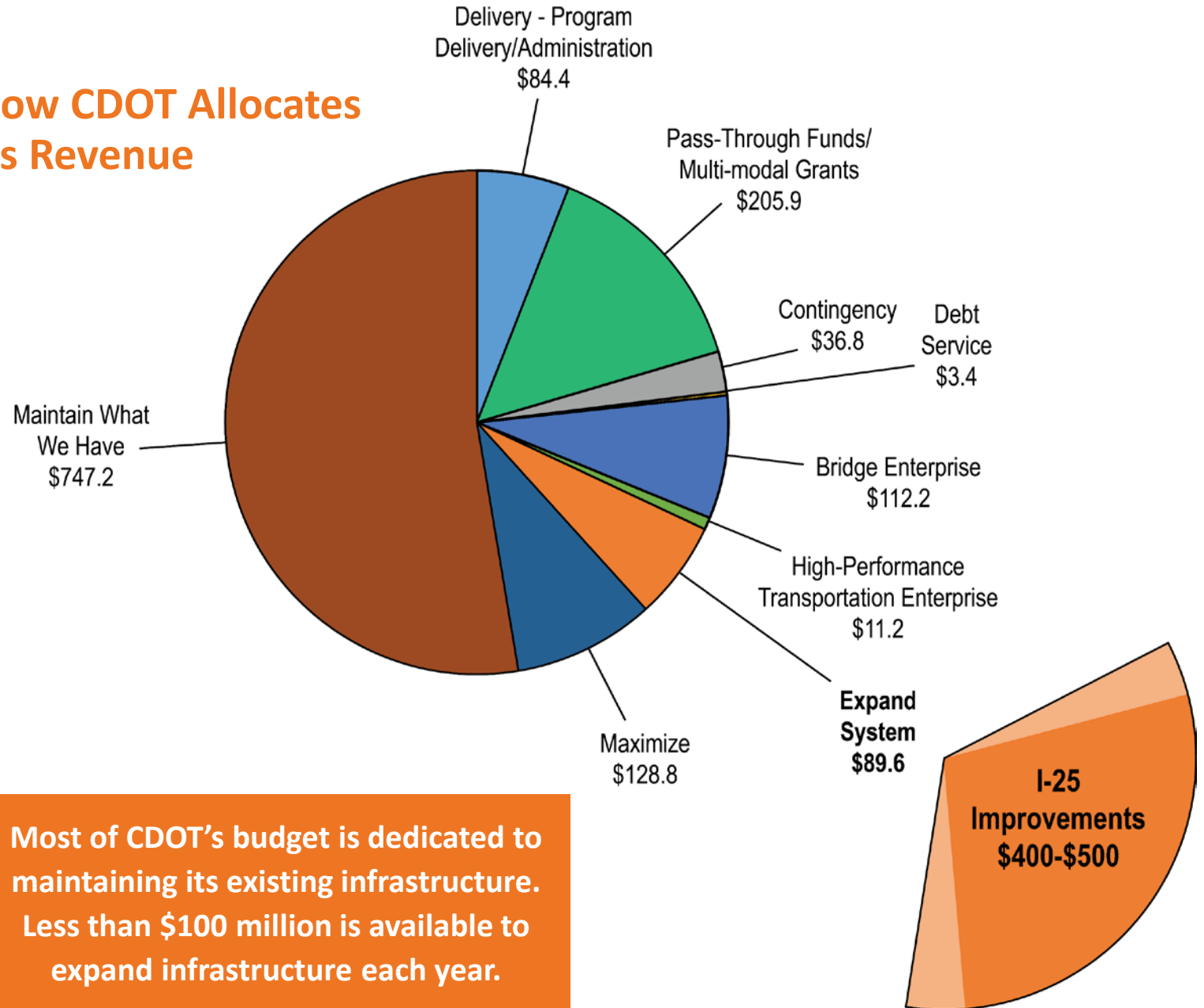
**CDOT**  
MAINTAINS & OPERATES  
**23,000**  
TOTAL  
LANE MILES  
OF HIGHWAY

**3,454**  
BRIDGES

**35** MOUNTAIN  
PASSES  
OPEN YEAR-ROUND

**SPENDS**  
**\$69** MILLION  
EACH YEAR ON  
SNOW REMOVAL

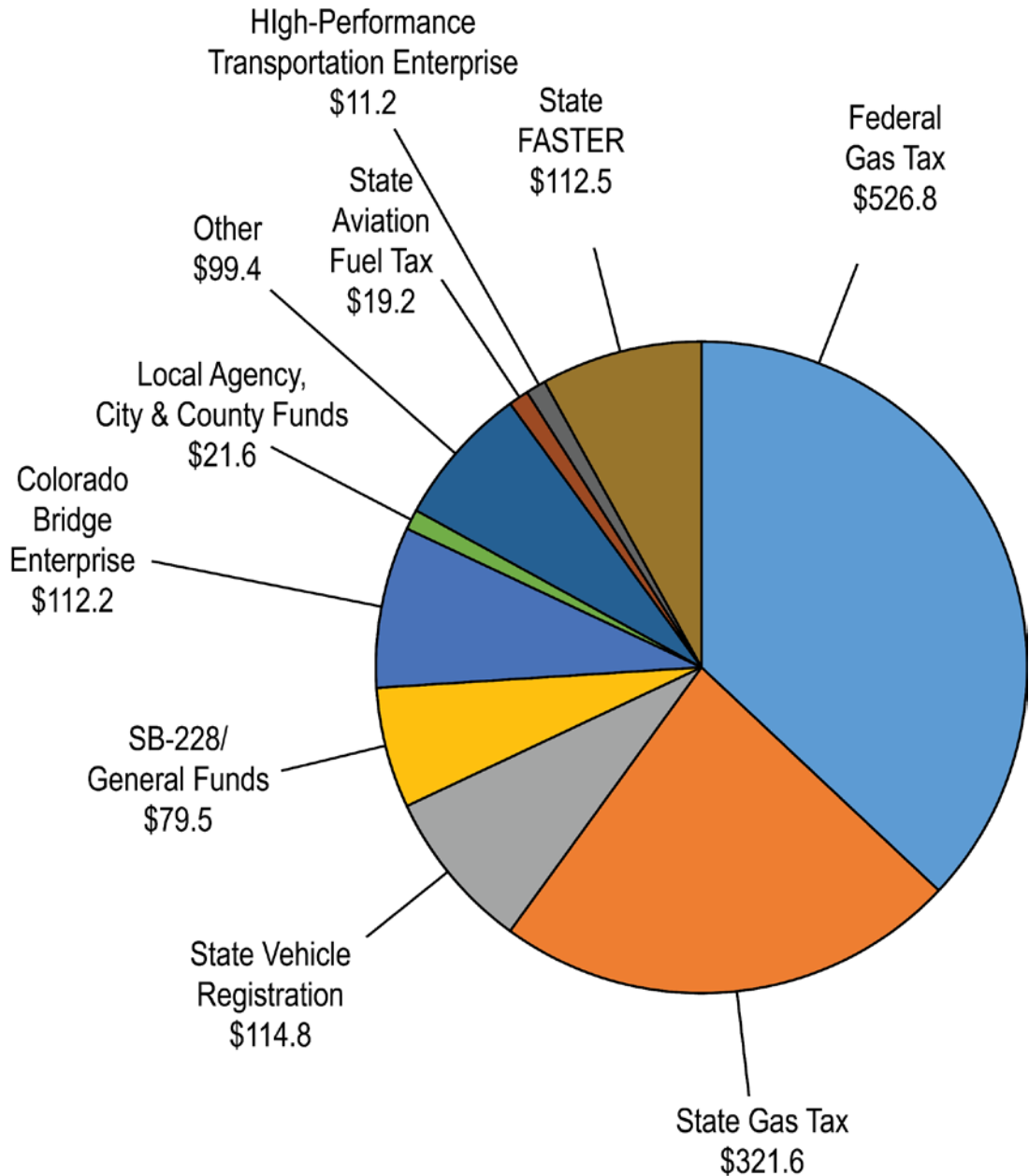
## How CDOT Allocates Its Revenue



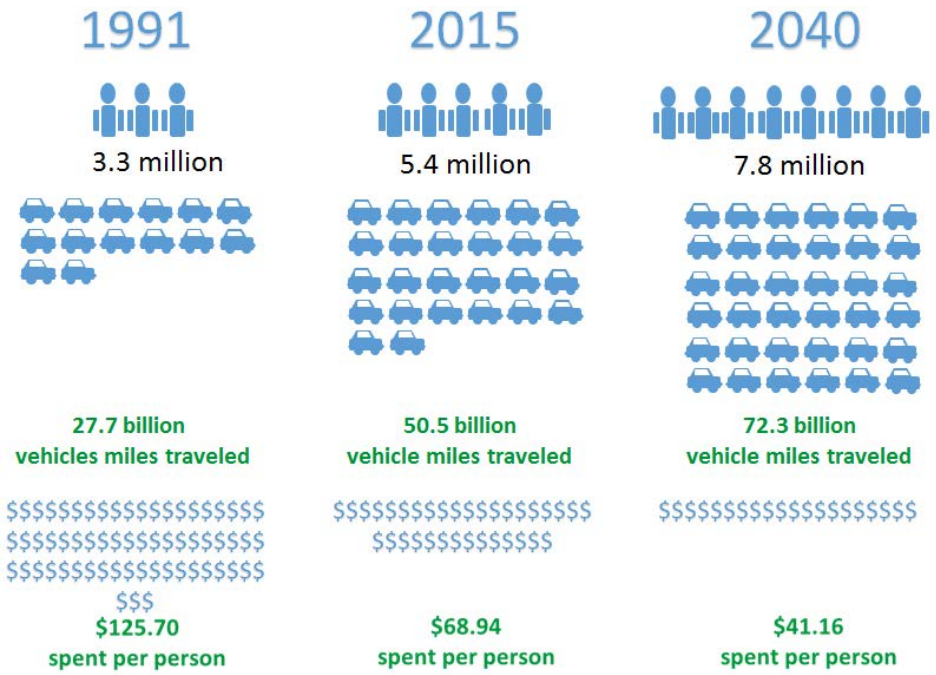
Most of CDOT's budget is dedicated to maintaining its existing infrastructure. Less than \$100 million is available to expand infrastructure each year.

# Sources of Transportation Revenue

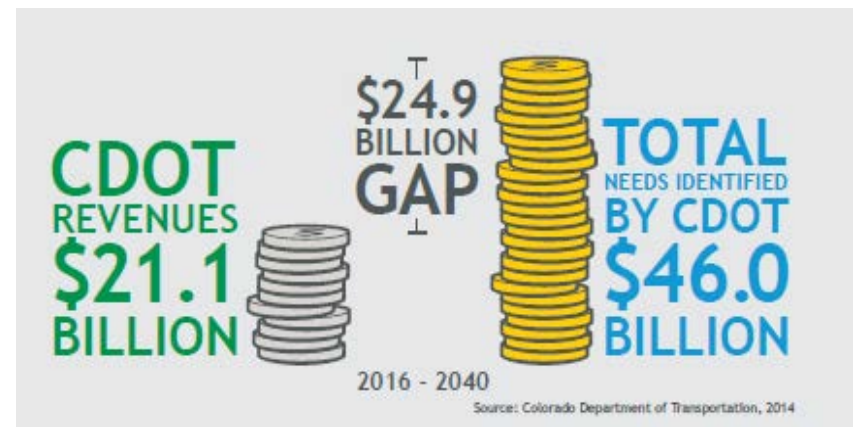
## Where CDOT's Funding Comes From



## Our Challenge: Continued Growth



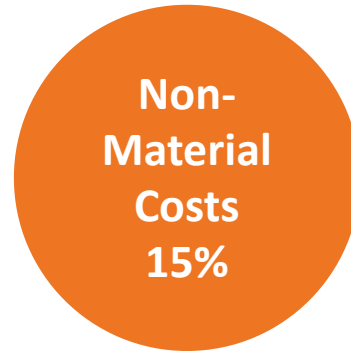
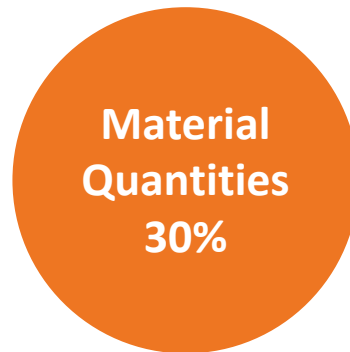
All dollar figures adjusted for inflation



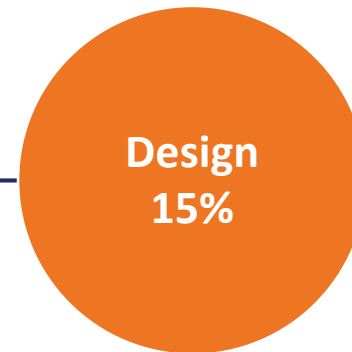
# Conceptual-Level Cost Estimating

## What are the main components of a conceptual-level cost estimate?

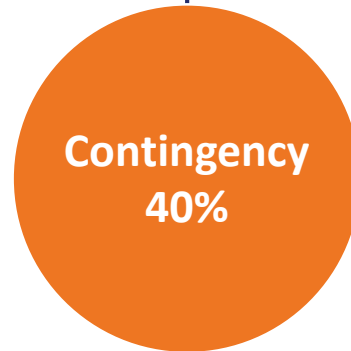
- Earthwork
- Pavement
- Bridges and Culverts
- Guardrail



- Mobilization
- Environmental Clearance
- Traffic Control
- Survey
- Permanent Water Quality BMPs

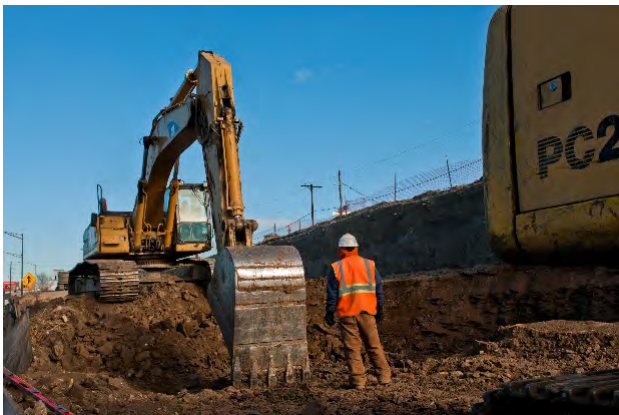


- Design Engineering
- Construction Engineering



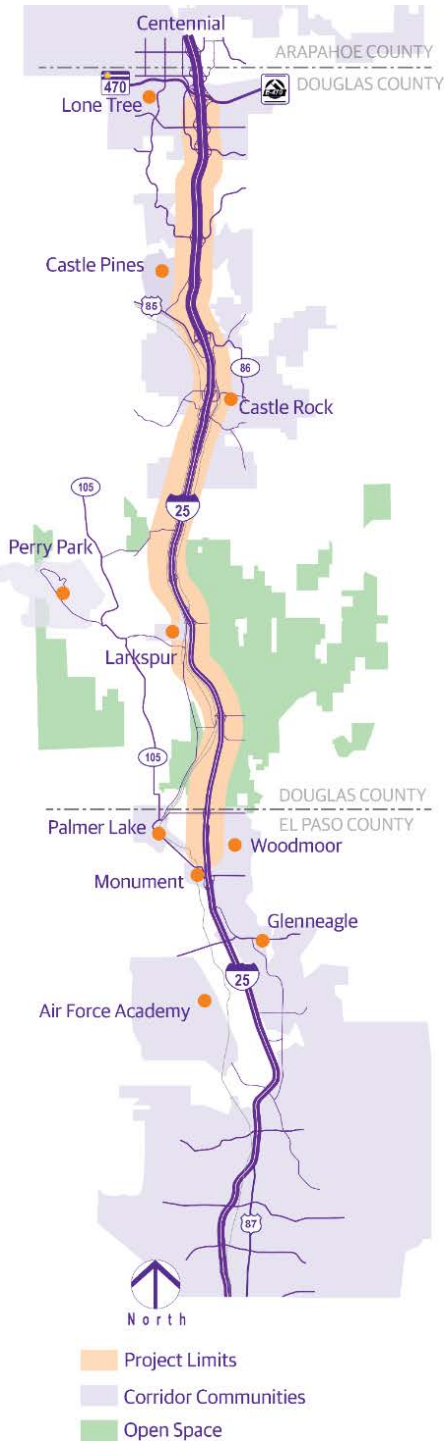
Accounts for the large number of unknowns at the conceptual stage. This percentage will decrease as design progresses.

A single cubic yard of dirt costs approximately \$15.00 to move



# Purpose of I-25 Improvements

Enhance safety and improve travel reliability and mobility of I-25 between Colorado Springs and Denver South



## Other Goals for Corridor Improvements

- Be compatible with the natural and human environment
- Support corridor communities' land use, development, and economic goals
- Integrate and leverage technological innovations and advanced travel demand management/transportation system management strategies

# Why are Improvements Needed?

## SAFETY

A high number of crashes occur on the corridor. The mix of users and travel speeds, along with difficult passing conditions and limited recovery areas, present special challenges. Higher than expected crashes occur due to weather, wildlife conflicts, and darkness.

## RELIABILITY

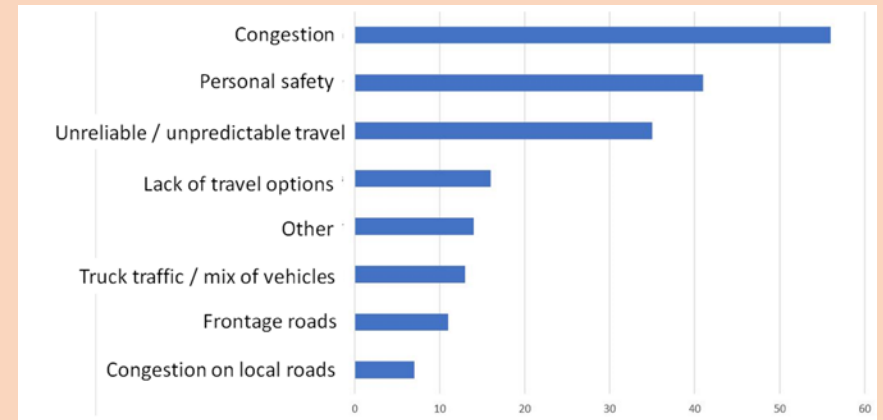
Travel times in the corridor are highly variable; unexpected and unreasonably long traffic delays are increasingly common, and delays are getting worse, particularly on weekends.

## MOBILITY

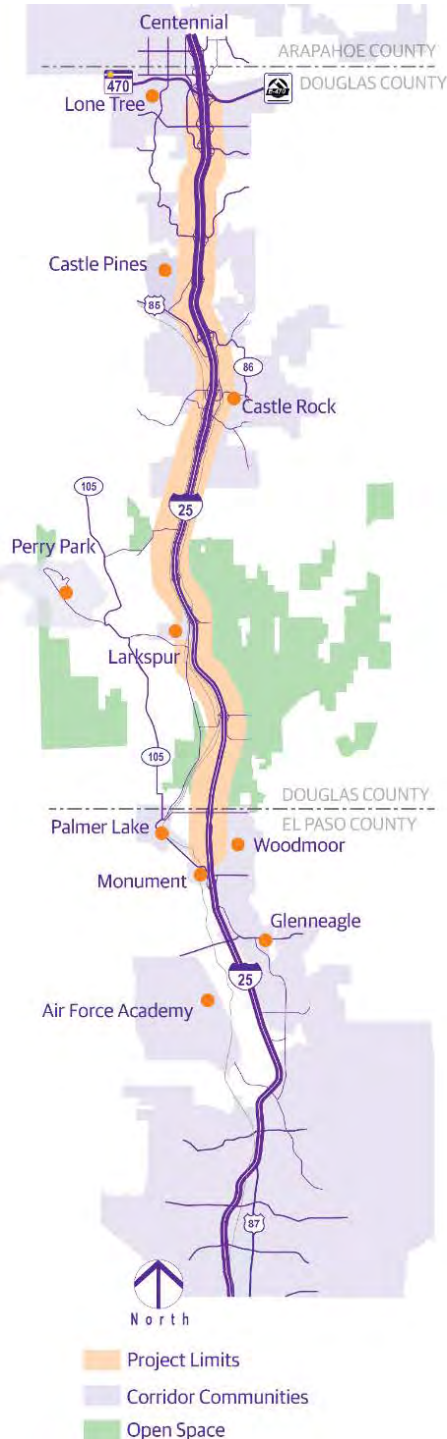
Physical conditions in the corridor hamper mobility. With no reasonable alternate routes or other reliable travel options, drivers have little option but to be stuck in traffic during congested conditions. Maneuvering in the corridor is challenging due to the mix of vehicles and varying operating speeds, lack of passing opportunities, steady uphill grades, and narrow shoulders and medians that do not provide adequate recovery space for disabled vehicles or shelter from severe weather.

### Public Input Consistent with Identified Needs

What are your top three concerns with travel in the corridor?



# PEL Purpose and Need



## Communicates the problems and makes a case for action

- What are we trying to accomplish and why is it necessary?
- Needs establish the evidence of the problems
- Can include other non-transportation goals

## Foundation for evaluating and prioritizing alternatives for transportation improvements or investments

- Basis for determining the range of alternatives
- Prioritize based on purpose and need and other goals

# Summary of Infrastructure Deficiencies

## Inside and outside shoulder widths are substandard (too narrow) throughout the corridor

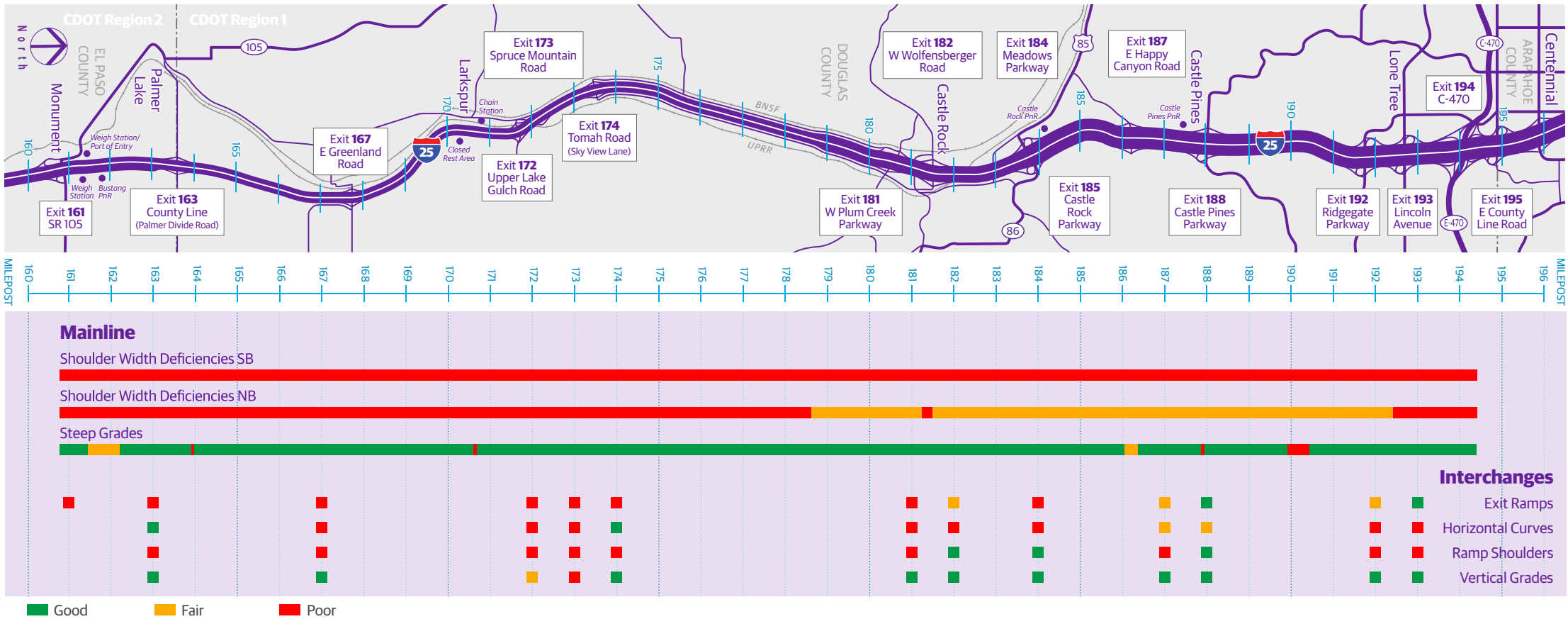
- Current design standards specify 12-foot shoulders
- Shoulder widths (inside and outside) of less than 10 feet were rated poor
- Shoulder widths of 10 feet (inside and outside) were considered fair

## Vertical grades present challenges throughout the corridor

- Current design standards specify a 4 percent maximum grade
- Locations where vertical grades were between 4 and 5 percent were rated fair, and areas with steeper than 5 percent grades were rated poor
- Although not rated poor, the steady climbing grades between Castle Rock and Monument impacts traffic flow and speeds

## Nearly all interchanges in the study area have ramp deficiencies

- Deficiencies include short exit ramps, undesirable horizontal curves, narrow ramp shoulders, and/or steeper than desired vertical grades



# Challenges and Opportunities for Incident Management Along the Corridor



## What are the challenges of incident management in this corridor?

- Narrow shoulders and barriers adjacent to roadway
- Long distances between interchanges
- Not enough emergency crossovers
- Lack of adequate detour routes
- Not enough emergency parking facilities
- Not enough closure gates
- Closure gates not in ideal locations

## What are the opportunities to improve incident management in this corridor?

- Relocate existing or install new Variable Message Signs so motorists can choose an alternate route outside of the study corridor
- Install breaks in median barriers to relocate disabled vehicles off of roadway
- Install road closure gates at north and south ends of corridor where there are more facilities to accommodate parking and services for travelers
- Increase width of shoulders to enable responders to access incident scene, park emergency response vehicles out of travel lanes, and improve safety of responders
- Define appropriate detour routes and provide information to responders and motorists
- Enhance requirements for and enforcement of chain use for heavy vehicles
- Streamline communications so all agencies use same radio channel
- Synchronize road closure gate locks and provide combination to all agencies
- Develop plan and procedures for rerouting and/or parking commercial vehicles outside of the study corridor during closures

## Who responds to incidents in this corridor?

- Colorado Department of Transportation
- Colorado State Patrol
- Douglas County Sheriff
- Lone Tree Police
- Parker Police
- Castle Rock Police
- Larkspur Police
- South Metro Fire and Emergency Medical Services
- Castle Rock Fire and Rescue
- Larkspur Fire and Emergency Medical Services



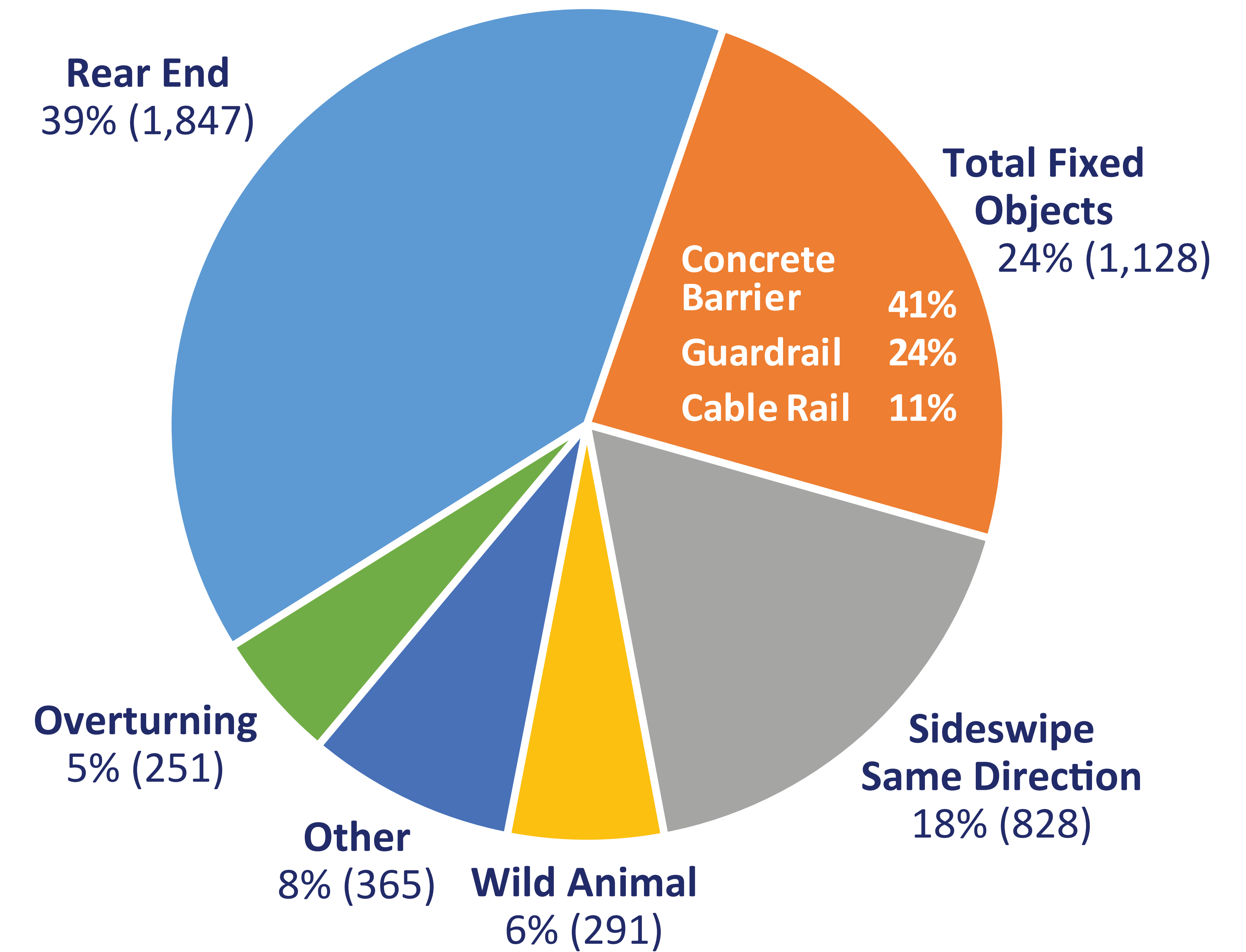
# Crash Types and Findings (2011 through 2015)

## I-25 Safety Preliminary Findings

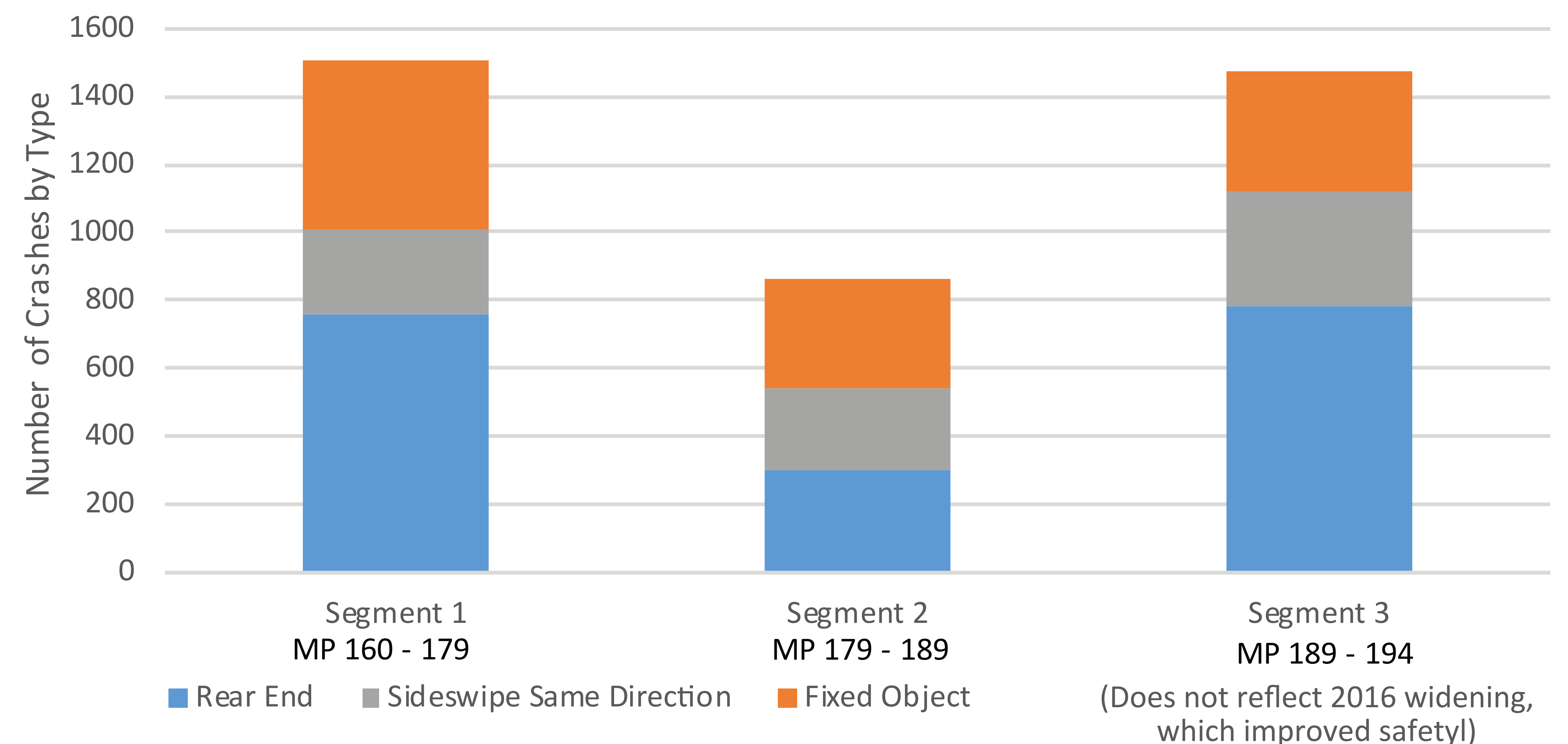
- **Total Crashes:** 4,710
  - 3,414 Property Damage Only
  - 1,283 Injury
  - 13 Fatality
- **Type:** 80% of total crashes are rear-end, sideswipe same direction, and fixed object
  - Rear-end/sideswipe crashes indicate turbulence (variability in conditions, speeds, driver behaviors, etc.) in traffic stream
  - Rear-end/sideswipe crashes occur more often at locations where number of lanes increase or decrease
  - Fixed object crashes occur when people drive off of the shoulders
  - Fixed object crashes occur more often at interchange locations
- **Speed:** Most crashes occur below posted speed limit
  - Suggests congested conditions or drivers traveling too fast for conditions (weather/road surface)
- **Roadway Condition:** 26% occur on wet road surfaces
  - More crashes than expected occur during weather events and on wet roadways
- **Potential to Reduce Crashes:** Moderate to high potential to reduce crashes along 75% of study corridor

**Note:** 2015 is the most recent data available. Additional information on wildlife-vehicle collisions is presented at Environmental station.

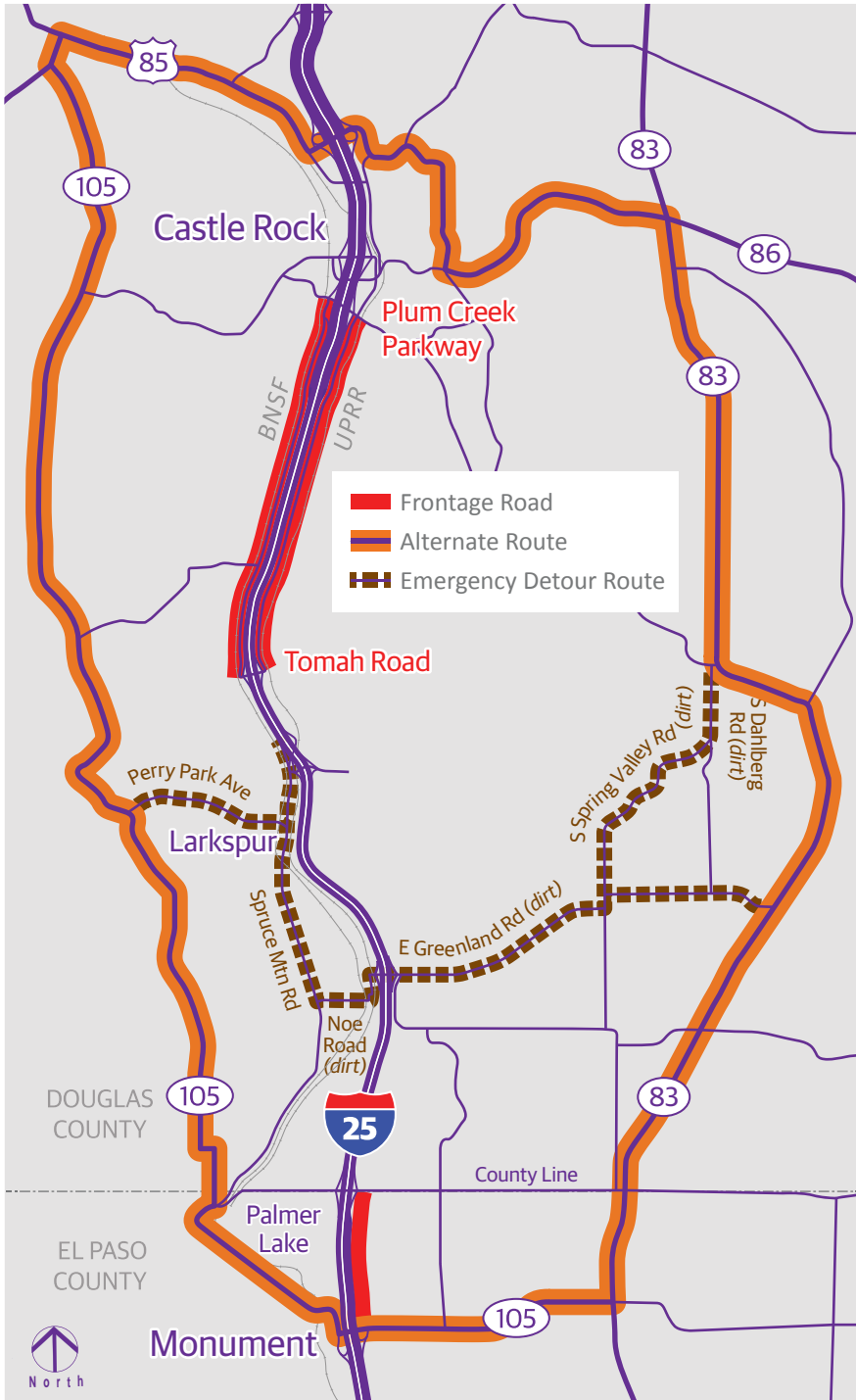
## Crash Type Distribution



## Rear End, Sideswipe Same Direction, and Fixed Object Crashes by Location



# Alternate Routes and Frontage Roads



## Between Monument and Castle Rock, alternate routes to I-25 are limited

- West of I-25 between County Line Rd in Monument and Wolfensberger Rd in Castle Rock, SH 105 is a narrow, two-lane local roadway (S. Perry Park Rd.) that is not maintained as a state highway and is not a viable route for trucks or interstate traffic
- East of I-25, SH 83 provides a better option; however, drivers must make the decision to avoid I-25 in Colorado Springs/Monument (northbound) or Castle Rock (southbound)



## Within this stretch, frontage roads are discontinuous and local roads, many of which are unpaved, do not provide viable detours for travelers to avoid incidents on I-25

- With no viable detours, drivers can be stuck on I-25 for hours waiting for incidents to clear
- Accessing and clearing incidents is further complicated for emergency responders because narrow shoulders do not provide a way around stopped traffic nor adequate room to investigate or move crashes from the travel lanes



Trucks have very limited options when I-25 is closed. Local roads are not designed for truck traffic, and I-25 shoulders are too narrow for trucks to park on the side of the road.



Local roads through Larkspur, like the unpaved Noe Road, are not designed to handle interstate or truck traffic. Town leaders report that cut-through traffic has increased substantially as travel delays on I-25 have worsened.

## Importance of a Reliable Trip

### The I-25 corridor between Colorado Springs and Denver has become increasingly crowded.

- Over the past two years, CDOT has observed notably higher volumes and significantly longer travel delays.
- Travel times are increasing overall, periods of delays are extending over many hours, and the longest travel times are regularly twice the average free flow times.
- Travel times are increasing unpredictable, with an average trip between Colorado Springs sometimes taking less than an hour but can often take several hours. Not being able to plan travel times is frustrating.

**In the rural Gap section, delays occur outside of commuter and typical rush hours.**

- The longest delays occur summer and fall weekends.
- About half of the longest travel times through this stretch are related to incidents – crashes, weather conditions, or events, indicating this is not just a volume issue.

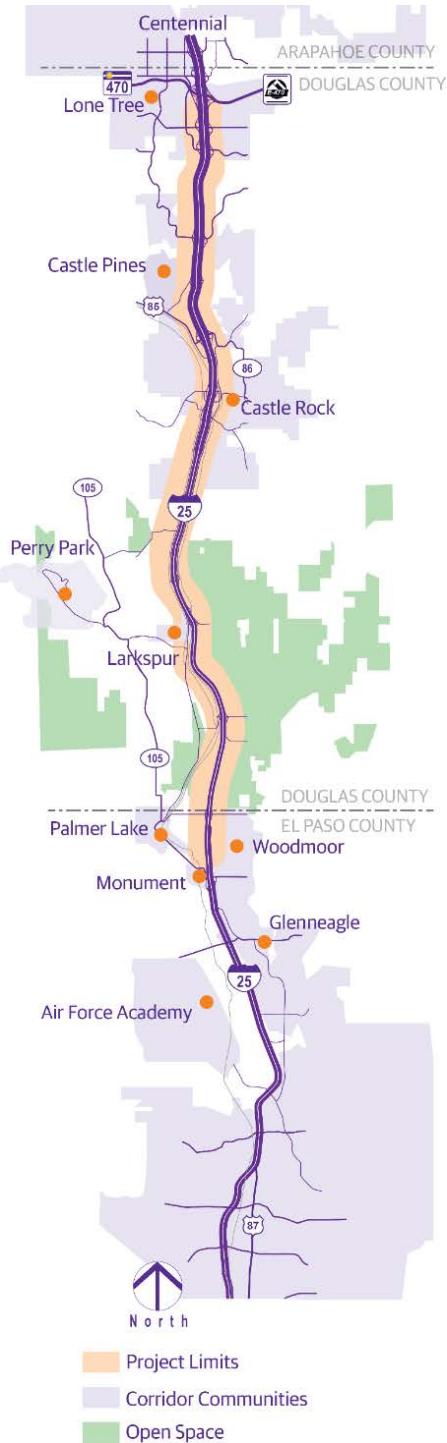


**North of the Gap, the corridor experiences congestion and travel delays more typical of the Front Range urban areas.**

- Travel delays are primarily associated with morning and evening commute travel
- Delays also occur on the weekends in this stretch. As with the Gap section, weekend delays are more often related to incidents.

# Alternatives Will Be Designed to Respond to Corridor Needs

Elements will be selected and included in corridor-wide and segment-specific alternative recommendations based on their ability to meet project needs.



## Improve Safety and Reduce Crashes

- Targeted safety improvements for locations throughout the corridor with moderate to high potential for reducing crashes
- Improved incident management
- Safe conditions for corridor workers (maintenance, enforcement, emergency responders)

## Improve Travel Time Reliability and Reduce Delays

- Congestion relief (increased capacity)
- Strategies for delays related to crashes and severe weather conditions, and special events (e.g., Renaissance Festival, Air Force Academy football games)
- Operational strategies to provide reliable travel choices (such as express lanes or variable use shoulders)

## Serve Diverse Users and Improve Mobility

- Improved local and regional travel, including considerations for system and off-system improvements (frontage roads, alternate routes)
- Travel choices – transit, connected vehicles, bicycles, etc.
- Improved freight operations
- Special event coordination and management

# PEL Alternatives Evaluation Criteria

## Level 1 Screening Criteria: Will alternatives work?

Level 1 screening is intended to eliminate alternatives with fatal flaws; most alternatives pass through Level 1 screening for further evaluation.

**Purpose and Need:** Does the alternative improve safety, mobility, and reliability?

**Compatibility with Community Goals:** Does the alternative support nearby community goals? Does the alternative cause community disruption?

**Compatibility with Regional Transportation Network:** Is the alternative supportive of regional transportation goals?

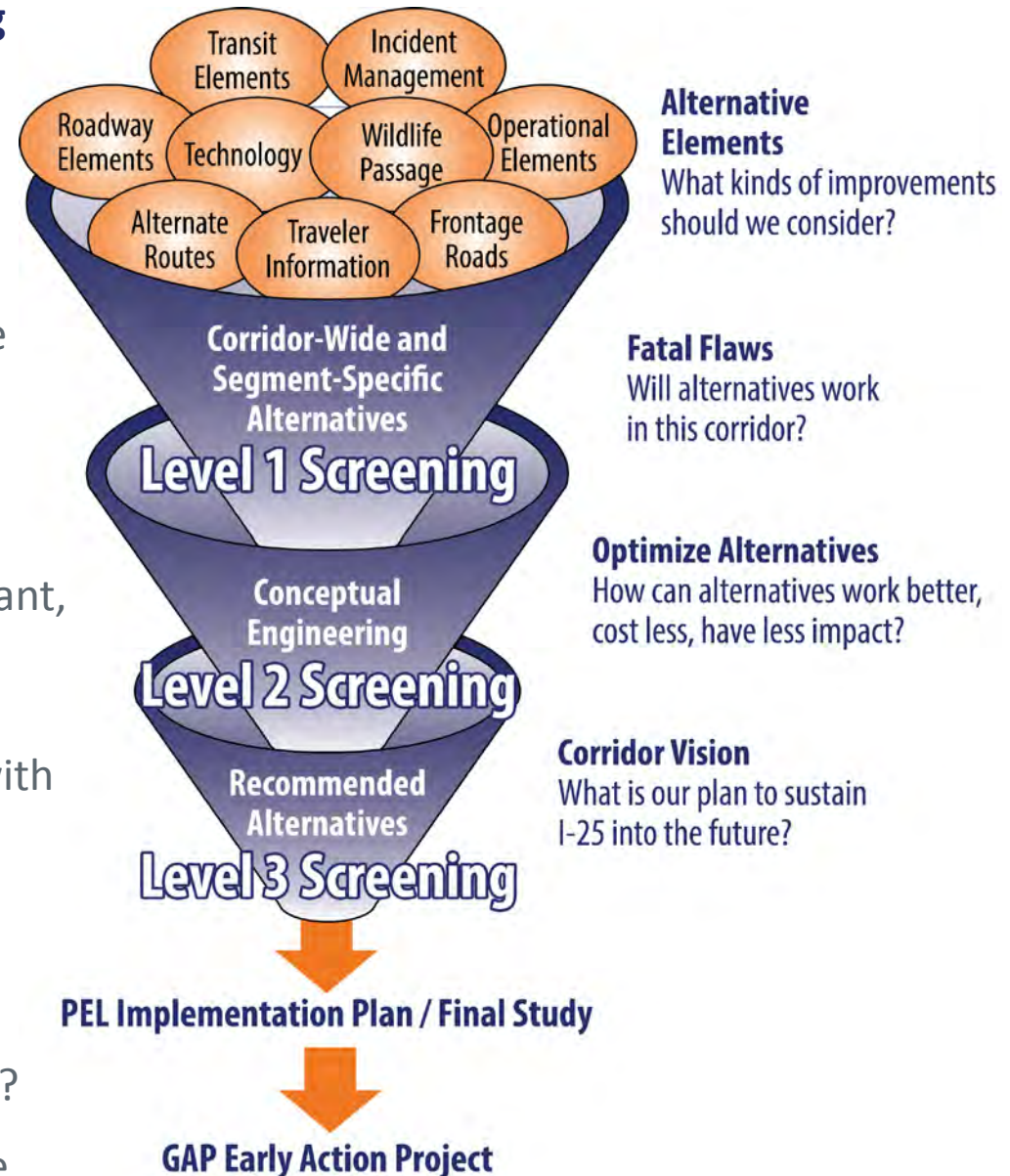
**Environmental Impacts:** Does the alternative cause a significant, negative effect on the environment? Which resources are impacted?

**Engineering Feasibility:** Can the alternative be constructed with typical engineering and construction methods?

**Ability to Accommodate Innovative Technologies:** How well does the alternative incorporate existing and emerging technologies?

**Cost:** Is the cost reasonable in comparison to expected funds?

**Public Benefits / Support:** Is the alternative supported by the majority of the general public and other stakeholder groups?



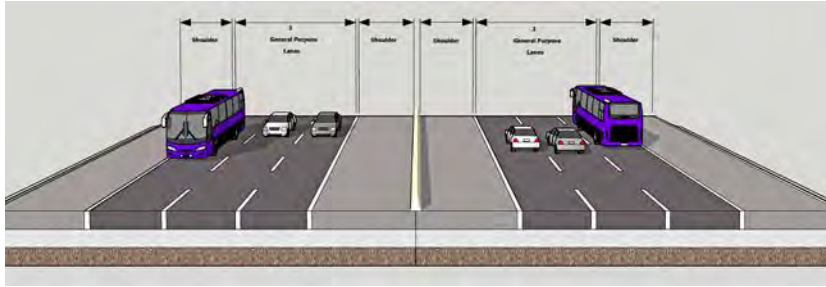
## Alternative Elements with Potential Corridor-wide Application

- **Expanded roadway template: additional travel lanes and widened shoulders**
  - How many lanes? How wide are shoulders? How will they operate?
- **Express lanes / connected or self-driving vehicle priority / other technology lanes / transit or HOV priority**
- **Expanded transit options**
  - Expanded or improved Bustang service
  - New passenger rail service
- **Improved alternate routes and/or frontage roads**
- **Operational improvements**
  - Variable speed limits
  - Passing restrictions / slow moving vehicle strategies
  - Incident management planning and event coordination
  - Driver information, vehicle messaging signs, cell phone alerts, etc.
- **Bike paths, regional water quality, solar lane lighting, truck staging areas, railroad coordination, others**



# Segment 1 (The Gap) Considerations

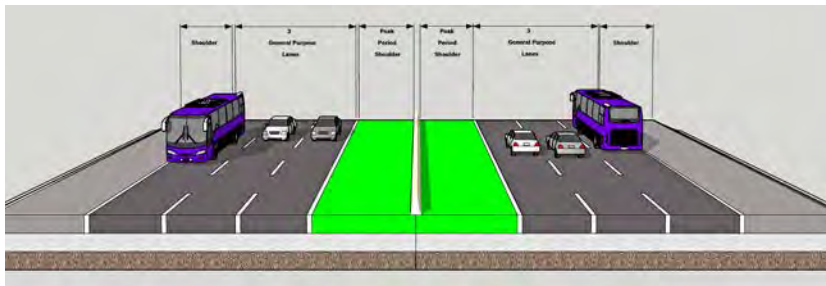
## Lane Configuration Alternatives



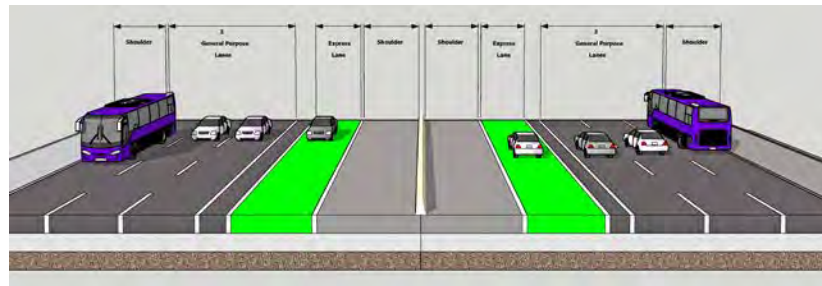
**Configuration 1:** 3 general purpose lanes, full inside and outside shoulders



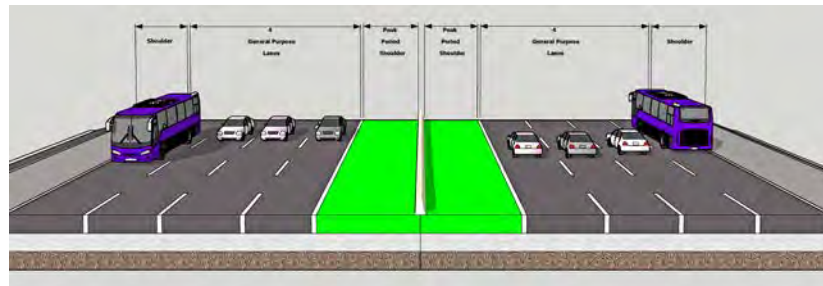
**Configuration 2:** 2 general purpose lanes, 1 express lane each direction, full inside and outside shoulders



**Configuration 3:** 3 general purpose lanes, peak period inside shoulder each direction, full outside shoulders



**Configuration 4:** 3 general purpose lanes, 1 express lane each direction, full inside and outside shoulders



**Configuration 5:** 4 general purpose lanes, peak period inside shoulder each direction, full outside shoulders

## Interchanges

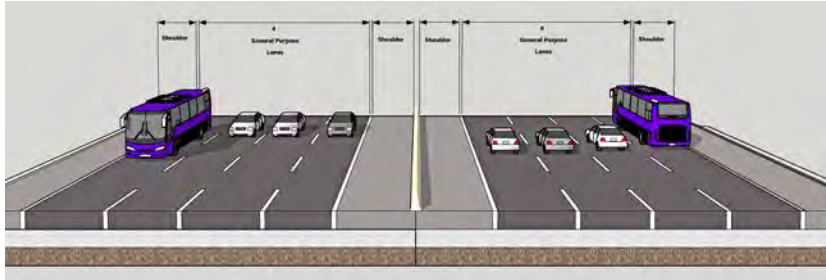
- Interchange improvements to County Line, Greenland, Sky View (Tomah) – keep existing diamond configuration
- Combine Upper Lake Gulch Road and Spruce Mountain Road interchange into one interchange at Spruce Mountain Road or a split diamond between Upper Lake Gulch Road and Spruce Mountain Road
- Consider future plans for Crystal Valley interchange

## Alternate Routes

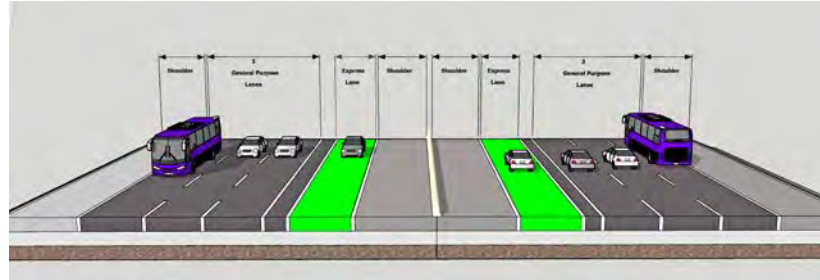
- Improvements to SH83 and SH 105 to accommodate larger volume of traffic and truck traffic
- Extending frontage roads south of Sky View Lane (Tomah Road) to Spruce Mountain Road (west and east of I-25)
- Improvements to S Andrews Road/E Best Road/E Greenland Road

# Segment 2 Considerations

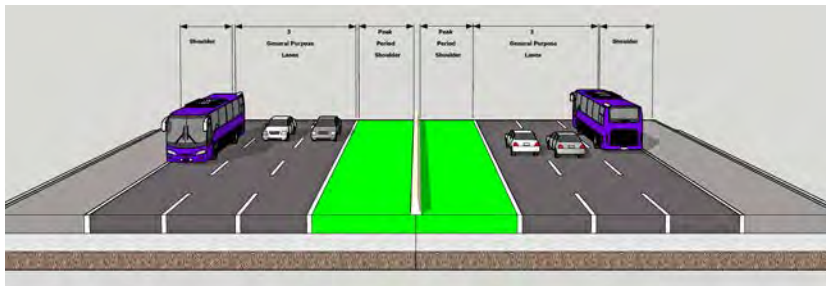
## Lane Configuration Alternatives



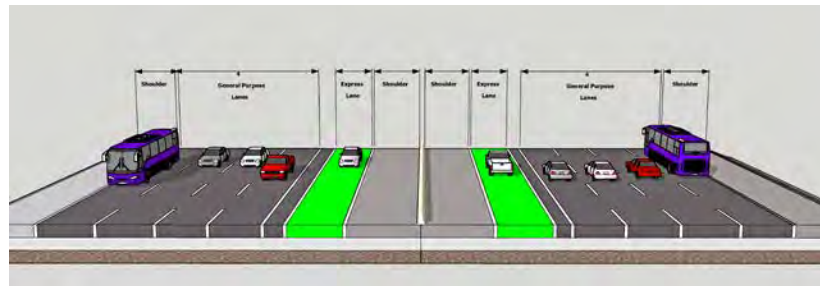
**Configuration 1:** 4 general purpose lanes, inside and outside shoulders



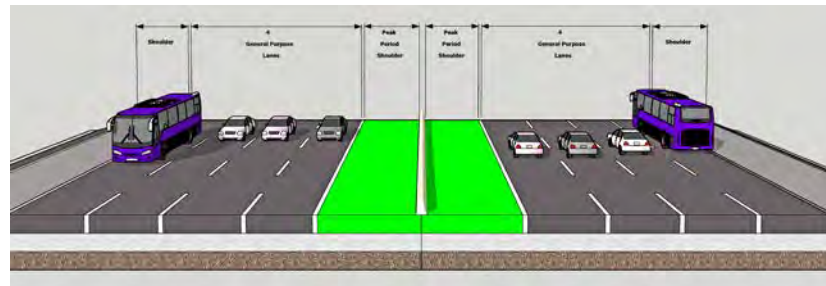
**Configuration 2:** 3 general purpose lanes, 1 express lane each direction, full inside and outside shoulders



**Configuration 3:** 3 general purpose lanes, peak period inside shoulder each direction, full outside shoulders



**Configuration 4:** 4 general purpose lanes, 1 express lane each direction, full inside and outside shoulders



**Configuration 5:** 4 general purpose lanes, peak period inside shoulder each direction, full outside shoulders

## Interchanges

- Potential US 85 direct connection to I-25
- Plum Creek Parkway interchange improvements

## Alternate Routes

- Potential frontage road improvements

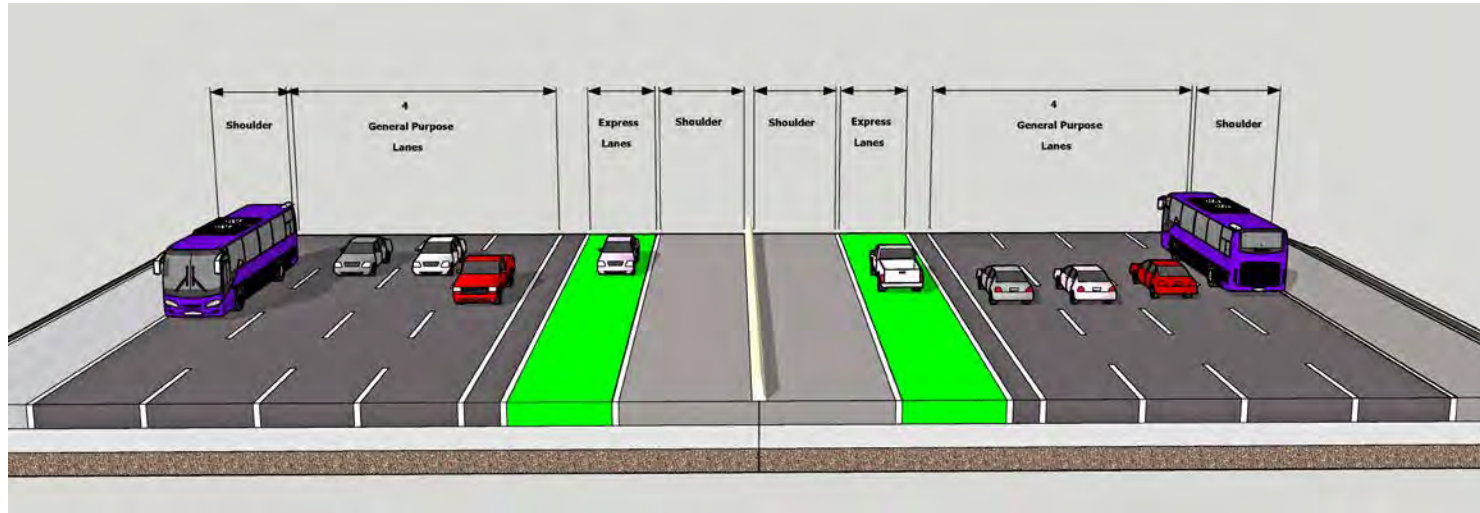
## Other

- Bustang stop
- Bike trail connection (Colorado Front Range Trail) to Castle Pines Parkway

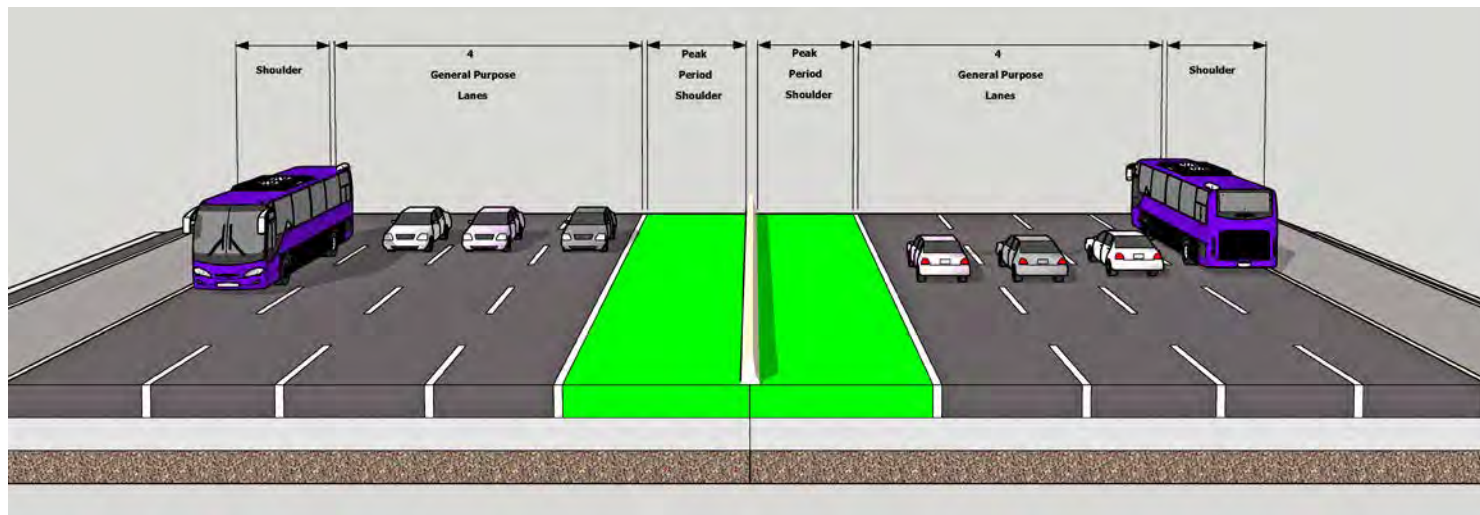


# Segment 3 Considerations

## Lane Configuration Alternatives



**Configuration 1:** 4 general purpose lanes, 1 express lane each direction, full inside and outside shoulders



**Configuration 2:** 4 general purpose lanes, peak period inside shoulder each direction, full outside shoulders

## Interchanges

- Direct connect ramps from managed lanes or peak period shoulders to managed lanes on C-470 and toll lanes on E-470

## Other

- Queue warning
- Variable speed limits

# Transit Elements

## Bustang

**CDOT's Interregional Bus Service:** Connects major populations, employment centers and local transit entities along the I-25 and I-70 corridors

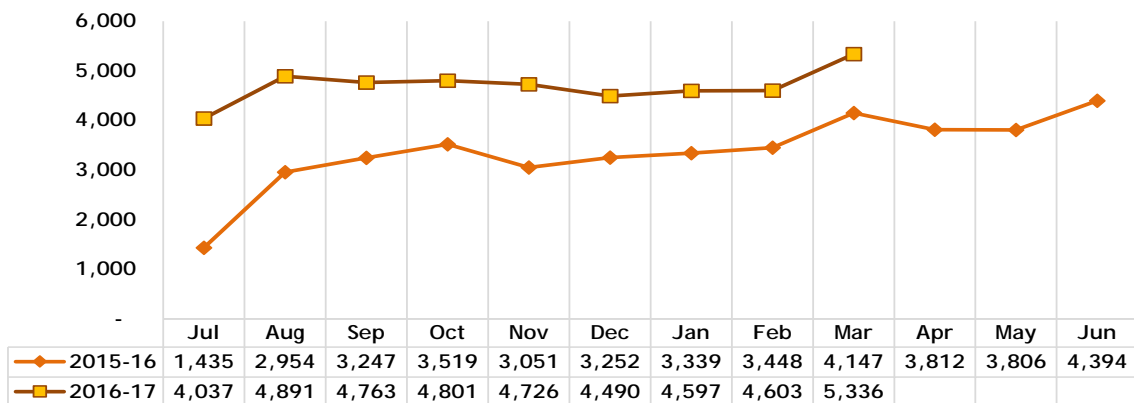
**Launched Summer 2015:** Strong ridership growth and positive reviews from riders

**South Line Serves Colorado Springs-Denver:**  
7 trips each direction weekdays

**Expanded Service:** Limited weekend trips, including Bustang to Broncos from Colorado Springs

## Bustang Consistently Gaining Ridership

SOUTH ROUTE RIDERSHIP COS - DEN



## Rail Transit

- CDOT feasibility study for implementing high-speed train across the Front Range called the Interregional Connectivity Study

<https://www.codot.gov/projects/ICS>

- Recommends an initial operating segment from Fort Collins to Colorado Springs
- System is feasible according to Federal Railroad Administration criteria
- Next step is Tier 1 Environmental Impact Statement
- Some stakeholder interest in reconsidering use of freight corridors and/or implementing conventional speed commuter rail



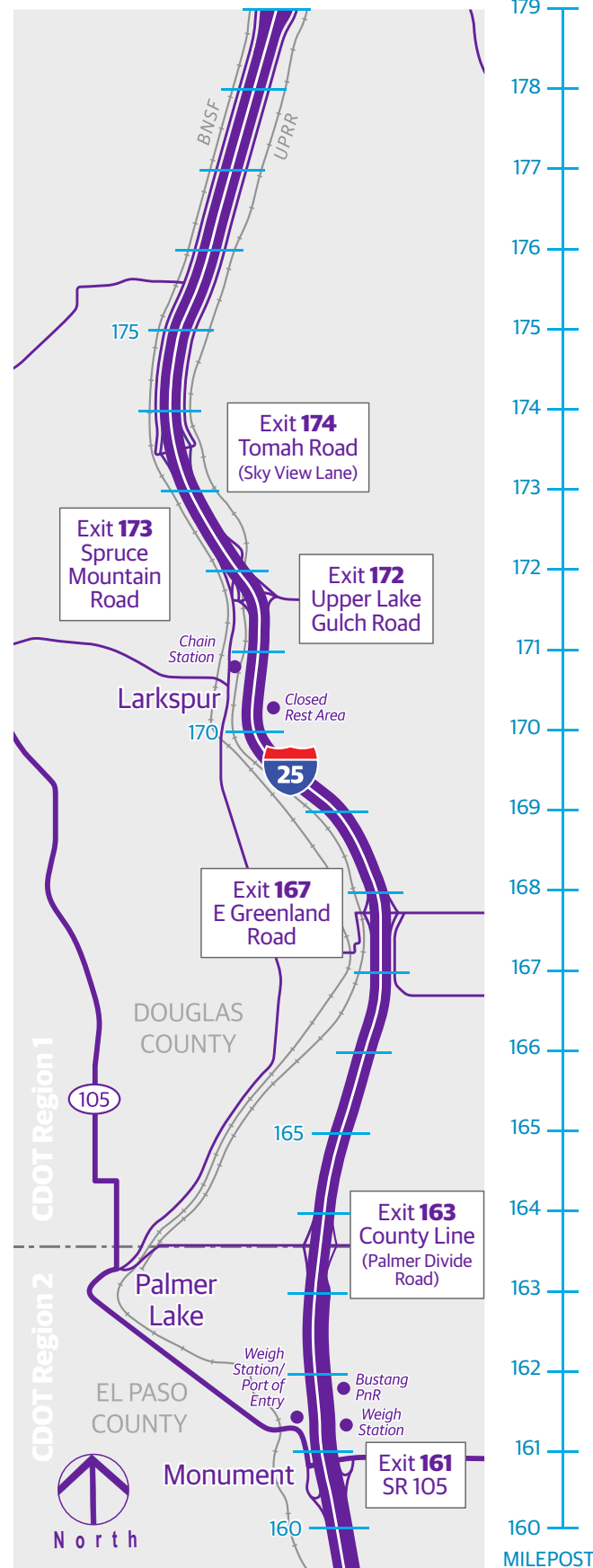
# What We Are Thinking for Segment 1

## What We Heard from You

### Alternative Elements MP 161 to MP 179: The Gap

- Roadway template
  - Combinations of additional lanes, shoulder widths
  - Variations in operating scenarios (managed lanes and shoulders)
- Interchanges
- Alternate routes, frontage roads, local roads
- Wildlife crossings
- Truck facilities, closed rest stops
- Queue warning

### Segment 1



### Milepost Specific

- Consider new interchange at Crystal Valley Parkway
- Relocate frontage road west of railroad tracks
- Remove existing cable rail; limits ability to get on frontage road when I-25 is closed due to an incident
- Enforce no passing on double yellow line along west frontage road
- Consider extending frontage road from Tomah Exit to Spruce Mtn. Road
- Heavy accident area
- Do not open road to Bear Dance Drive
- Accommodate traffic for 500 proposed campsites
- Accommodate new truck stop
- Flatten tight curves
- Railroad constraints at Upper Lake Gulch Road
- Re-open rest area
- Flatten tight curves
- Heavy congestion in this location
- Improve lighting
- Improve existing one-lane underpass at Greenland interchange
- Dangerous location due to high speed and roadway geometry
- Andrews Road needs to be improved and used as an alternative route
- Consider cell phone pull-out station
- Improve lighting
- Consider climbing lane southbound direction to Monument Hill
- Provide noise barriers
- 3-lane to 2-lane transition northbound on Monument Hill – safety issue due to drop at crest of hill
- County Line Road bridge in poor condition with poor visibility at ramp terminals
- Road grade needs improvement – unsafe
- Move weigh station north of County Line Road
- Widen roadway at weigh station
- Change left merge lane to right merge lane

### General Comments

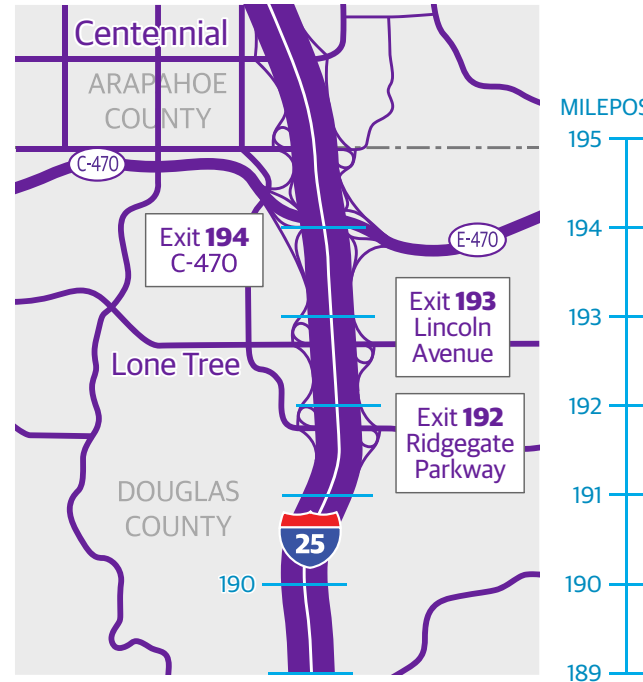
- Reduce speed limit to 65 mph
- Enforce speed limit, including minimum speed limit
- Provide bike lanes along corridor
- Provide rail options, including high-speed rail
- Show current traffic conditions on Variable Message Signs
- Provide four travel lanes in each direction

# What We Are Thinking for Segments 2 and 3

## Alternative Elements MP 189 to 194: Denver South

- Roadway template
  - Combinations of additional lanes, shoulder widths, operating scenarios
- Direct managed lane/shoulder connections to C-470/E-470
- Queue warning

## Segment 3



## Milepost Specific

- Are existing 3 general-purpose lanes at C-470/E-470 going to be addressed?
- How is congestion addressed at Lincoln Avenue?
- Heavy congestion during AM peak hour
- Show future RTD Light Rail Station
- Improve stopping sight distance restricted by concrete median barrier
- Provide emergency exit access

## General Comments

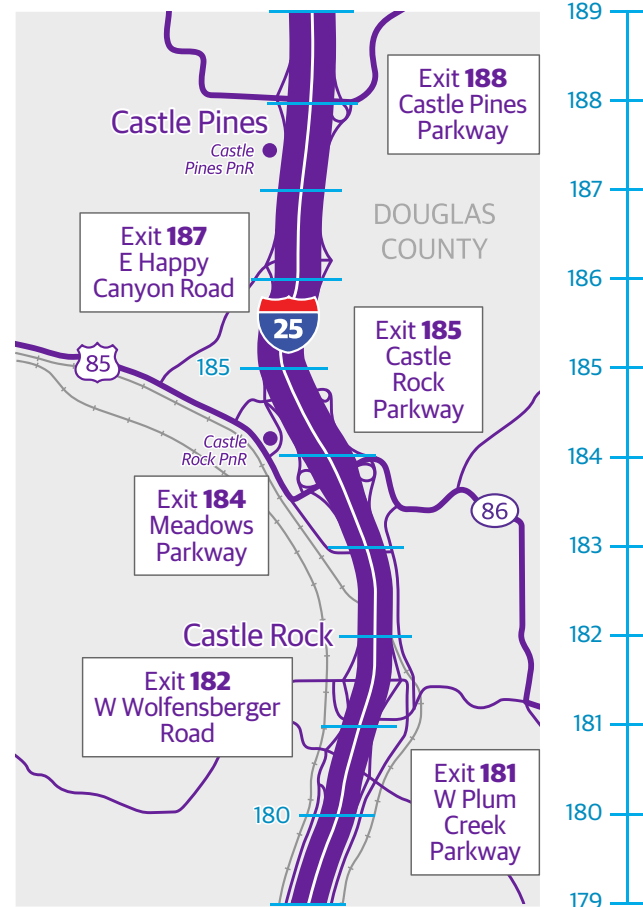
- Congestion remains heavy, especially during morning peak hours

## What We Heard from You

## Alternative Elements MP 179 to MP 189: Castle Rock to Castle Pines

- Roadway template
  - Combinations of additional lanes, shoulder widths, operating scenarios
- Interchanges
- Local road improvements, transit and bike connections

## Segment 2



## Milepost Specific

- Add emergency crossover
- Extend east frontage road to Happy Canyon
- Improve drainage issue
- Add more Variable Message Signs to alert drivers of incidents ahead
- Consider US 85 southbound connection to I-25
- Add Variable Message Sign to alert drivers if there is an incident between MP 182 and MP 183 and south of MP 181
- Dangerous location; high accident area
- Bottleneck going from 3 to 2 lanes southbound during PM peak hour
- Consider new interchange at Crystal Valley Parkway

## General Comments

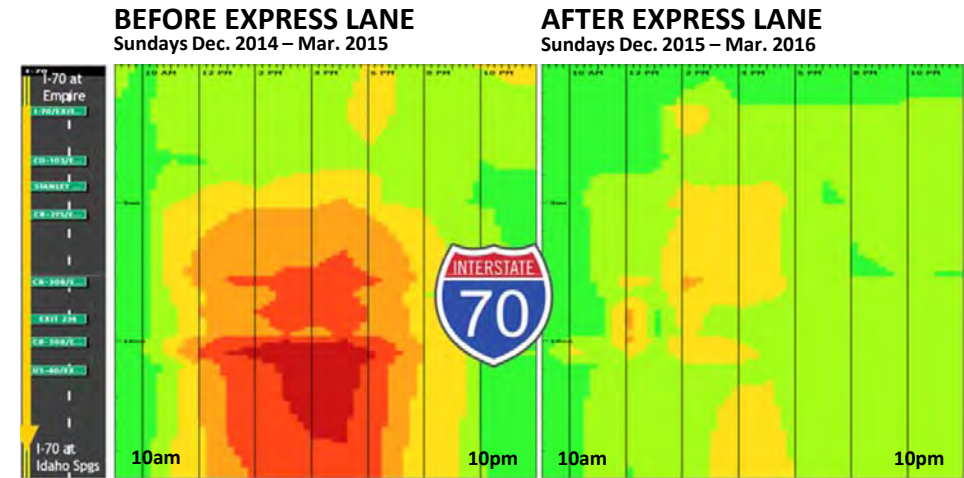
- Multi-modal transportation alternatives
- Lower speed limit to 65 mph north of MP 184
- Consider rail options

# What Are Express Lanes, and How Do They Benefit Traffic Flow?

Express Lanes are employed across the Front Range to help mitigate congestion on the State's most traveled roads.

## Express Lanes Provide Two Primary Benefits

1. Reliable travel times in the Express Lanes and reduced congestion across all travel lanes
2. Revenue generation to supplement long-term maintenance and sometimes construction funding or project financing



CDOT has seen improved system performance in every corridor where express lanes have been implemented

## Operational Improvement Strategies

### Highway Operations = How traffic flows through the corridor

**Traffic flow can be improved without significantly altering the physical characteristics of a highway (e.g., adding lanes, redesigning interchange, etc.)**

- Incident management (a coordinated plan when road closure or accidents occur)
- Use restriction (no passing locations, minimum speed limits)
- Concrete strip delineators (improve visibility of median)
- Special event coordination (Renaissance Festival, others)
- Expanded heavy tow and courtesy patrol operations
- Expanded Bustang service for special events
- Variable message signs (curve warning, accident warning, wildlife warning, travel time)
- Shoulder operations (peak period shoulders, bus on shoulders, managed shoulder)
- Variable speed limits
- Improved coordination with Colorado State Patrol when accident occur
- Weigh-in-motion (mobile truck weight enforcement)
- Wildlife detection/warning systems
- Expanded use of social media channels (text message alerts of accidents or closures, traffic apps )
- Improved lighting

# Proven Technologies



Dynamic Warning Signs



Express Lanes



Travel Time Indicator Signs



In-Pavement Solar Lights



Colorado Roads App/Text Alerts



# Emerging Technologies

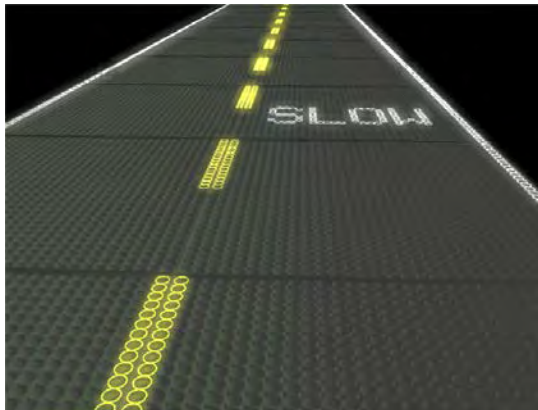
## Autonomous Vehicles



Dynamic Lane Assignment



In-Pavement Electric Vehicle Charging



Solar Panel Pavement



Dynamic Shoulder Lanes



Dynamic Speed Limits



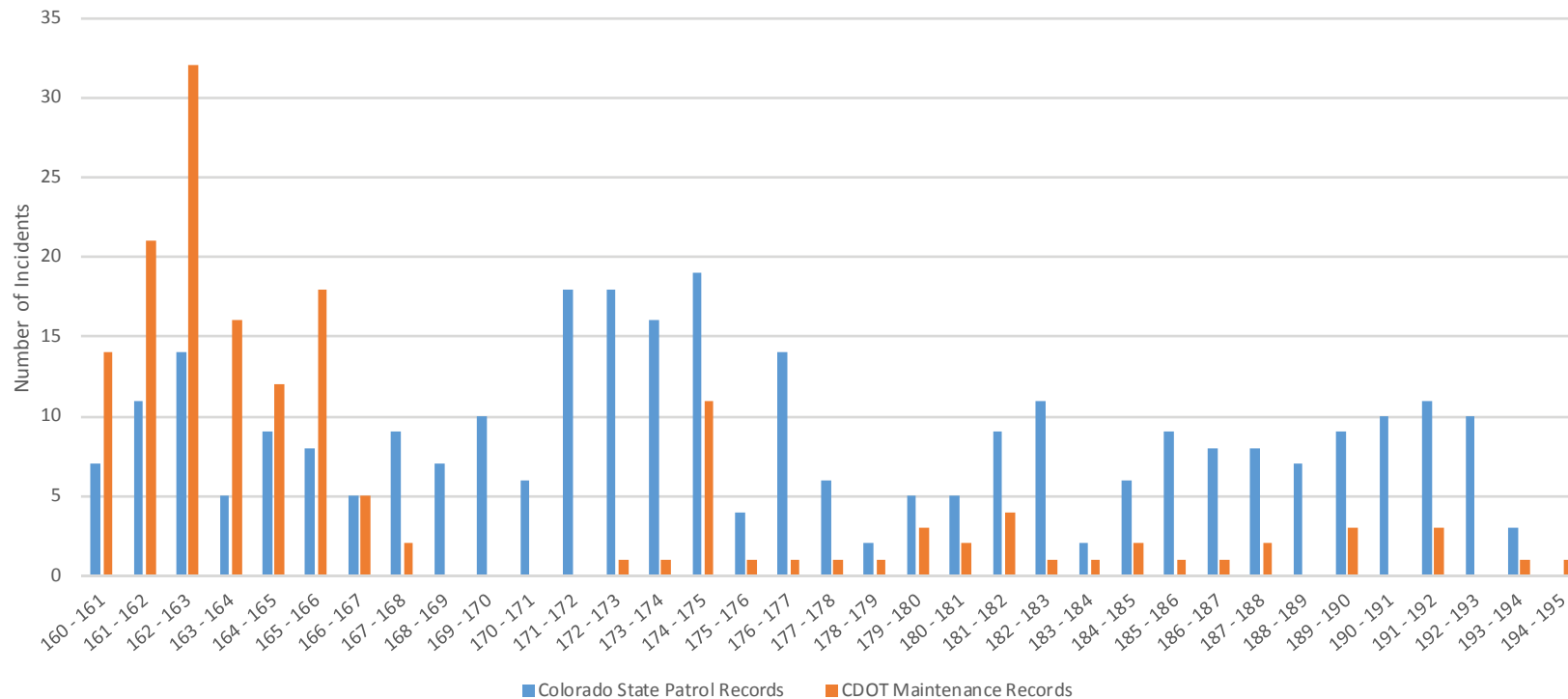
# Wildlife Conflict Points

**Wildlife-vehicle collisions** account for about 6 percent of all reported crashes in the corridor

- Official records from Colorado State Patrol document 291 incidents between January 2011 and December 2015
- CDOT maintenance crews responded to 162 separate incidents between June 2005 and September 2016
- Carcass data suggest crashes involving wild animals may be underreported
- Wildlife movement across I-25 is especially prevalent in the rural, open space areas south of Greenland to south of Plum Creek, which is also where the highest concentration of collisions (around 50 percent) occurred



## Locations of Crashes Involving Wildlife



# Enhanced Wildlife Passage Improves Safety and Fosters Wildlife Movement



SH 9 - Colorado



US 160 - Colorado



SH 9 - Colorado



US 89 - Utah



SH 9 - Colorado



US 93 - Montana

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# Near-term Actions that CDOT Is Considering Ahead of Early Action Project

## Initial Actions

CDOT is considering several projects that could be implemented ahead of an early action project. Projects are being evaluated for their potential to:

- Be implemented in 18 months or less
- Have minimal environmental impact (and clearance requirements)
- Provide notable safety or mobility benefits
- Can be implemented within existing budgets with existing staff (or qualify for special funding)

Projects that are not advanced as initial actions will be considered in alternatives analysis and included in recommendations as appropriate.



## Types of Initial Action Projects Being Evaluated

- Staging/recovery areas for incident response and enforcement
  - Breaks in median barrier
  - Grading of turn arounds or pullouts
- Expand heavy-tow and courtesy patrol programs
- Variable speed limits or speed advisories
- Improved event coordination, especially with Renaissance Festival



- Signing and striping safety improvements, such as curve signs, advisory speeds, chevrons, delineators, pavement markings
- Increased Bustang service and potential new Castle Rock park n ride
- "Rules of the road" or other public information campaigns