COLORADO
Department of Transportation

FINAL ALTERNATIVES REPORT

US 24 PLANNING & ENVIRONMENTAL LINKAGES STUDY

October 2017

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List of Acronyms and Abbreviations

ACP	Access Control Plan
AFB	Air Force Base
AM	ante meridiem (morning)
ATR	automated traffic recorder
CCTV	closed-circuit television
CDOT	Colorado Department of Transportation
CO	Colorado State Highway
FHWA	Federal Highway Administration
IMP	Incident Management Plan
ITS	Intelligent Transportation System
LOS	Level of Service
LOSS	Level of Service of Safety
MP	milepost
NEPA	National Environmental Policy Act
PEL	Planning and Environmental Linkages
PM	post meridiem (afternoon/evening)
PPACG	Pikes Peak Area Council of Governments
ROW	right-of-way
RWIS	roadway weather information station
SPFs	Segment Safety Performance Functions
TAC	Technical Advisory Committee
US	United States
US 24	United States Highway 24
VMS	variable message signs
vpd	vehicles per day

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INTRODUCTION

This report documents the development and analysis of alternatives for transportation improvements on United States Highway (US) 24 from Powers Boulevard (Colorado State Highway [CO] 21) to Ramah Highway at the El Paso County line, a distance of approximately 40 miles, from milepost (MP) 311 to MP 350.

The Colorado Department of Transportation (CDOT) initiated this US 24 Planning and Environmental Linkages (PEL) Study to examine existing transportation conditions and anticipated problem areas along the US 24 corridor in El Paso County between Powers Boulevard and the Town of Ramah. The study has identified and screened a reasonable range of potential transportation improvements to develop an implementation plan for projects to meet the operational, safety, and capacity needs along the corridor.

The study is being conducted using the PEL approach. The PEL process is a study approach developed by CDOT and the Federal Highway Administration (FHWA) to identify transportation issues and environmental concerns, which can be applied to make planning decisions and for planning analysis. PEL studies link planning to environmental issues and result in useful information that may ultimately be used to prepare a National Environmental Policy Act (NEPA) study and final design. An objective of this study is to work with stakeholders to analyze transportation issues and explore a range of short- and long-term actions along the US 24 corridor.

Study Area

The traffic study area and the environmental resource review area are illustrated in **Figure 1**. The west end of the study corridor is in the City of Colorado Springs and the highway travels through the Towns of Calhan and Ramah to the east. The majority of the US 24 study corridor lies within unincorporated El Paso County.

The characteristics and needs along the 40-mile length of the US 24 study corridor are diverse. To effectively focus on improvements that could address the local transportation issues as well as needs of the overall corridor, the following five corridor segments were identified based on adjacent land uses, current and future traffic volumes, and physical and operational characteristics:

- Powers Boulevard to Constitution Avenue (MP 311 – 314.6)
- Constitution Avenue to Falcon (Woodmen Road) (MP 314.6 - 321)
- Falcon (Woodmen Road) to Peyton (MP 321 - 330)
- Peyton to Calhan (MP 330 - 340)
- Calhan to Ramah (MP 340 - 350)

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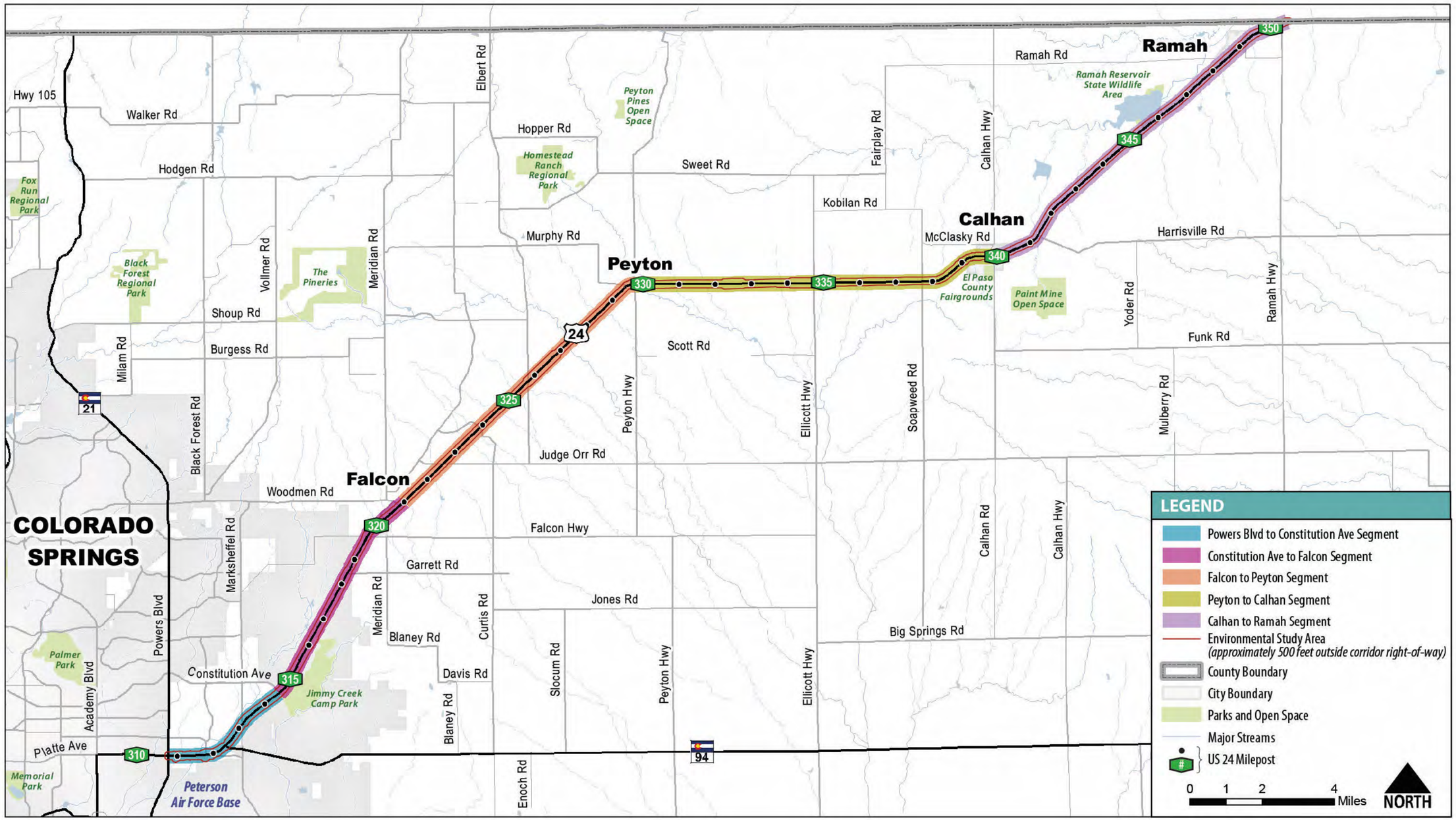
Figure 1: Study Area



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PURPOSE AND NEED

CDOT, in cooperation with local communities and other agencies, initiated this PEL study to identify and assess potential transportation improvements along US 24 through El Paso County. This Purpose and Need statement was developed in coordination with agency stakeholders with review by the general public. The specific needs, summarized below, are based on the analysis and findings documented in this report and in separate documents prepared as part of this project, including the Corridor Conditions Report (December 2016). Thorough documentation of the process and recommendations is a critical element of the PEL process so the decisions can be used in future NEPA process(es).

US 24 east of Colorado Springs is an important highway providing transportation connectivity between Colorado Springs, Peterson Air Force Base (AFB), and the Colorado Springs Airport and the growing suburban community of Falcon and rural communities of Peyton, Calhan and Ramah. Connecting with I-25 south of downtown Colorado Springs and with I-70 at Limon, the US 24 corridor provides regional mobility for the rural areas of El Paso County and is a designated critical freight corridor serving freight movements between I-70 in eastern Colorado and Colorado Springs and southern Colorado.

The 40-mile US 24 study corridor varies in character and use. Near Colorado Springs, US 24 is a congested suburban corridor supporting regional commuter traffic and local businesses. To the northeast, the highway serves as the main thoroughfare for local communities, as well as a valuable regional connection between I-25 and I-70.

The American Association of State Highway and Transportation Officials uses the term Level of Service (LOS) to describe the operational characteristics of intersections and roadways. LOS is related to control delay at intersections and speed and delay along highways as a measure of traffic flow and level of congestion, measured on a scale of A to F. LOS A describes conditions with essentially uninterrupted flow and minimal delay. LOS F describes a breakdown of traffic flow where there exists excessive congestion delay.

CDOT has developed Highway Segment Safety Performance Functions (SPFs) to estimate the average crash frequency for a specific site type as it relates to the annual average daily traffic of the segment. These SPFs are used to predict the potential that a corridor has for crash reduction based on the observed versus the predicted crash frequency, which is called the Level of Service of Safety (LOSS).

Purpose

The purpose of transportation improvements recommended by this study is to improve regional and local mobility, improve existing and future corridor and intersection operations, and enhance safety for all users along the existing US 24 highway from Powers Boulevard (CO 21) to Ramah Road.

Need

Transportation improvements are needed to address:

- **Regional and Local Mobility:** Drivers along the US 24 corridor between Powers Boulevard (CO 21) and Marksheffel Road and surrounding the Meridian Road intersection experience substantial delays and queues during peak travel periods today. Congestion along the corridor is expected to worsen by 2040 with longer delays, slower speeds, and unreliable travel times at these locations as well as at new areas of congestion east of Meridian Road to Stapleton Road and between Elbert Road and Calhan, as traffic volumes increase with local and regional population and employment growth.
- **Traffic Operational Issues:** Traffic operations along the US 24 corridor are inadequate with frequent interruptions in traffic flow due to intersection operations along the four-lane highway segments west of Garrett Road and turning traffic maneuvers with limited passing opportunities along the two-lane highway segments east of Falcon.
- **Safety Concerns:** There is a higher than expected number of crashes along the US 24 corridor, particularly between Colorado Springs and Peyton. Predominant crash types are related to traffic congestion, intersection conflicts, and lack of recovery area.

Regional and Local Mobility

- Employment in the area surrounding the corridor is forecasted to increase by over 28,000 jobs by year 2040, an increase of 122% over the 2010 totals, equating to an annual increase of 2.7%. Population in the area is forecasted to increase by over 39,000 households, an increase of 130% over the 2010 totals. This equates to an annual increase of 2.8%.
- Traffic volumes along US 24 east of Falcon have remained fairly steady with moderate growth in daily traffic. However, traffic volumes west of Falcon have grown substantially with local residential development, with traffic volumes increasing over 40% between 2010 and 2016.
- Existing (2016) daily traffic volumes along US 24 east of Powers Boulevard (CO 21) are 41,000 vehicles per day (vpd), projected to almost double to 80,000 vpd by 2040. Existing volumes are less than 20,000 vpd east of Constitution Avenue, but volumes are expected to increase to about 40,000 vpd. Much of this increase is expected with planned development between Colorado Springs and Falcon. Between Falcon and Peyton, existing daily traffic volumes are less than 10,000 vpd, projected to increase to about 20,000 vpd by 2040. East of Peyton, existing daily traffic volumes along US 24 are less than 6,000 vpd, projected to exceed 10,000 vpd by 2040. Between Calhan and Ramah, daily traffic volumes are expected to double to 6,000 vpd by 2040.

- The US 24 study corridor is a designated critical freight corridor serving freight movements between I-70 in eastern Colorado and Colorado Springs and southern Colorado. Though the truck volumes are greatest (about 2,500 trucks per day) between Powers Boulevard and CO 94, the percentage of truck traffic to the overall daily volume is greatest at the east end of the corridor with 10% of vehicles being trucks near Ramah.
- The intersections at the west end of the study corridor, at the Peterson Road interchange and at Marksheffel Road, currently operate poorly at LOS E and F during the AM or PM peak commute hours. The US 24 study corridor performs near or at capacity in the westbound direction approaching the Woodmen Road and Meridian Road intersections in Falcon, and the Marksheffel Road intersection during the AM peak hours. Between Stapleton Road and Peyton, the corridor operates at LOS D in both directions during the AM and PM peak hours. The other sections of the corridor operate at LOS C or better during peak hours.
- Without highway improvements, congestion along the US 24 study corridor is expected to worsen by 2040 with longer intersection delays, slower speeds, and extended queues, as well as new areas of congestion east of Falcon. Intersection operations are expected to degrade with almost all of the primary intersections west of Peyton operating poorly at LOS E and F during the AM or PM peak commute hours. The US 24 study corridor is expected to exceed capacity west of Peyton and operate at LOS D in both directions during the AM or PM peak hours between Peyton and Calhan.

Traffic Operations

- The US 24 corridor east of Colorado Springs is an important route for regional east-west vehicular travel, as well as a critical access to the regional transportation system for local residents and businesses. Recognizing these different vehicular users, transportation improvements should provide a balance of regional mobility and local access with safe and reliable corridor and intersection operations.
- The lack of access control along the US 24 east of Constitution Avenue creates unmanaged left turns and crossing movements of traffic, which contributes to congestion and reduces the capacity of the highway, particularly in proximity to high-volume intersections like Garrett Road, Meridian Road, and Judge Orr Road.
- Geometric constraints and deficiencies exist, including potential clear zone deficiencies and variable shoulder widths, which could warrant repair or reconstruction, particularly with limited widths at bridges.
- East of Garrett Road, the highway traffic volumes, intersections, and truck volumes contribute to speed differentials, which, coupled with the lack of intersection turn lanes and passing opportunities, contribute to congestion and operational issues.

Safety

- Over a 5-year period from 2010 to 2015, there were 674 crashes on US 24 from Powers Boulevard (CO 21) to Ramah. There were 6 fatal crashes, 260 injury crashes and 404 property damage only crashes.

- Throughout the entire corridor, the most prevalent crash types were rear-end (38%), fixed object (14%) and broadside crashes (12%).
- Both the Powers Boulevard to Constitution Avenue and the Constitution Avenue to Falcon segments are LOSS IV with a high potential for crash reduction measures to be implemented. The segment from Falcon to Peyton is at LOSS III, which means there is a moderate to high potential for crash reduction. For the segments between Peyton and Calhan and from Calhan and Ramah there is a low to moderate potential for crash reduction (LOSS II).
- The vast majority of crashes along the US 24 study corridor occurred along the west half of the corridor. A total of 581 crashes (86% of all crashes) occurred west of Peyton, with the remaining 93 crashes (14% of all crashes) occurring between Peyton and Ramah. The most prevalent types of crashes between Powers Boulevard and Peyton were rear-end crashes, which is typical for the more congested portion of the corridor. East of Peyton, the most prevalent type of crash was a fixed object, which are oftentimes single-vehicle crashes.
- The intersections with the most crashes were Meridian Road, Woodmen Road, CO 94, and Marksheffel Road. These intersections are all signalized and all had rear end crashes as the most frequent crash type.
- One driveway access on the corridor had a notable number of crashes. The Diamond Shamrock convenience store access immediately west of Meridian Road recorded nine crashes during the five-year period. Broadside crashes were the most frequent crash type (with five crashes) that occurred when a driver was making a northbound left turn out of the Diamond Shamrock access.

Secondary Project Goals

Additional goals of the transportation improvements for the US 24 study corridor are to:

- Support local and regional plans
- Avoid and minimize environmental impacts
- Balance mobility and access for existing and future land and economic development
- Accommodate growth in freight transport
- Complement local community surroundings
- Accommodate multimodal connections
- Preserve the existing transportation system

ALTERNATIVES EVALUATION PROCESS

The intent of the alternatives development and evaluation process is to identify and screen a broad range of reasonable improvement alternatives for the US 24 corridor that recognizes the diverse elements of the US 24 roadway and surrounding environment. The alternatives development and evaluation process included developing screening criteria based on the project Purpose and Need, developing a full range of reasonable alternatives, and documenting the elimination of alternatives to limit the need for consideration during future NEPA process(es).

During the project initiation period, baseline data were collected for the physical, operational, and environmental conditions of the study area. This information led to the development of the project Purpose and Need, presented earlier in this report.

Evaluation criteria were established for the different levels of screening, prior to the development of alternatives. Initial improvement concepts were developed to provide a range of reasonable options focused on addressing the project Purpose and Need. The options responded to the 2040 traffic volumes as developed in the travel demand forecasting. These Level 1 concepts were subjected to a "fatal flaw" screening to eliminate concepts that do not meet the project Purpose and Need. Those concepts carried forward for further evaluation were combined to develop corridor alternatives, which were compared to each other in a Level 2 evaluation. The alternatives remaining after the Level 2 evaluation will be further refined and evaluated in Level 3 for final recommendation in the PEL Study Report.

Agency and Public Coordination

Understanding the ideas, perspectives, and needs of key stakeholders along the corridor is critical to building broadly supported decisions and solutions. Throughout the PEL study, stakeholder involvement was emphasized and feedback was solicited from local agency and public partners at key decision points to foster acceptance of study recommendations.

The study included the formation of the Technical Advisory Committee (TAC) that met frequently with the project team to provide technical input. The TAC included staff from CDOT, FHWA, Pikes Peak Area Council of Governments (PPACG) El Paso County, Colorado Springs, Town of Calhan, and Town of Ramah. The TAC was heavily involved in shaping the alternatives evaluation criteria and performance measures, as well as the alternatives that were considered. Members of the TAC kept their respective elected officials updated and brought elected official feedback to the project team. The evaluation criteria, performance measures, alternatives development, and alternatives screening were reviewed and approved by the TAC throughout the study coordination process. TAC members also reviewed and concurred with the Purpose and Need.

The study has been coordinated with local, State, and Federal resource agencies. Early in the study, a letter was mailed as an introduction to the PEL study and confirmation of the agency contact for future review. A second letter was mailed with the project Purpose and Need and a request for review of the Draft Environmental Scan Report. Resource agency comments are being tracked for summary in the PEL study report documentation. The study recommendations will be sent for review by the resource agencies and to identify potential resource impacts and next steps required for future NEPA processes and project development.

Small group meetings were held with stakeholders to identify likely impacts and help shape the study recommendations. Presentations to inform stakeholders and gather feedback were made.

In an effort to gain as much community input as possible, this study will hold three public meetings. The first public meeting was held in August 2016 to introduce the project and discuss corridor travel conditions and the need for improvement. The second public meeting was held in March 2017 to gather input on the improvements under consideration. A third and last public meeting will be held to present the draft study recommendations.

No Action Alternative

Under the No Action Alternative, only improvements that are already planned and funded by CDOT, El Paso County, or the other local municipalities are included. Each of these funded projects is shown in **Figure 2**. The No Action Alternative would not provide any improvements beyond the existing transportation system and the identified funded projects. However, the No Action Alternative includes safety and maintenance activities that are required to sustain the transportation system.

The No Action Alternative includes only those projects that have committed funding sources and those projects would be built regardless of other improvements that are identified as part of this study. Those projects include:

- **Marksheffel Improvements:** Improvements along Marksheffel Road south of US 24, including an additional northbound through lane at the US 24 intersection.
- **US 24 Pavement Overlay Constitution – Garrett:** Highway overlay and traffic signal improvements at the US 24 and Garrett Road intersection.
- **Meridian South Park-n-Ride with New Meridian Connection:** Realignment of Meridian Road with a new traffic signal on US 24, shifting the intersection south of the existing location, and construction of a new park-n-ride facility.
- **Judge Orr Channel Improvements:** Drainage improvements at Judge Orr Road north of US 24, including stabilizing channel erosion.
- **US 24 Passing Lanes West of Peyton**: Widening along US 24 west of Peyton to provide eastbound and westbound passing lanes.
- **7th Street Improvements:** Roadway resurfacing.
- **8th Street Improvements:** Roadway resurfacing.
- **Ramah Local Streets Chip and Seal:** Roadway chip and seal paving for local streets.

These projects were identified early in the study process and many have been completed.

Figure 2. Transportation Projects in No Action Alternative

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Initial Concept Development

The initial concepts were developed from reasonable options focused on addressing the project Purpose and Need and issues identified in the evaluation of existing conditions, including vehicular traffic congestion west of Falcon, operational issues related to highway traffic volumes, intersections, truck volumes, and geometric constraints, and safety concerns related to congestion and highway conditions. The initial concepts were developed based on input from the TAC, public input, and the technical input of the project team.

To effectively focus on improvements that could address the local transportation issues as well as needs of the overall corridor, concepts were defined for each of the five corridor segments. The concepts were categorized by:

- highway cross-section;
- intersection;
- multimodal elements;
- corridor management; and
- technology.

Level 1 (Purpose and Need) Screening

Level 1 screening identified a range of corridor improvement concepts that could meet the project Purpose and Need, while eliminating concepts from detailed consideration that had "fatal flaws" (that did not meet the Purpose and Need) or were considered unreasonable for the US 24 study corridor. Level 1 screening criteria were developed to screen concepts in the following areas: regional and local mobility, traffic operations, and safety.

Corridor concepts were evaluated with a "Yes" or "No" answer to the following questions to demonstrate each concept's ability to meet the individual project needs.

- Regional and Local Mobility
  - » Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?
- Traffic Operations
  - » Does the alternative improve existing and future traffic operations along US 24?
- Safety Concerns
  - » Does the alternative provide safety improvements along US 24?

An alternative concept that has a "No" answer to all of the above questions was considered to not meet the project Purpose and Need and was eliminated from further consideration. If a concept was determined to meet most of the needs and should be evaluated quantitatively and with more criteria to make an informed decision for recommendation, it was carried forward to Level 2 screening for further evaluation. If a concept was able to meet only a narrow scope of the needs or is believed to not provide a corridor solution on its own, it was noted as eliminated as a stand-alone alternative. In order to identify the best solution

possible, favorable attributes of a concept eliminated as a stand-alone alternative were considered as elements of other options that were carried forward to Level 2 screening.

Level 2 Comparative Screening

The purpose of the Level 2 screening was to establish a means for estimating and comparing how well corridor alternatives perform in meeting the project Purpose and Need in a cost-effective and least environmentally harmful manner. The Level 2 screening expanded measures for each criterion from Level 1 screening and provided additional screening criteria based on the project goals.

Infrastructure concepts carried forward from the Level 1 screening were combined and applied to locations along each corridor segment to create corridor alternatives and to provide information for further assessment in the Level 2 evaluation. More details for alternatives were added, as appropriate, to understand the projected study area traffic flows and intersection operations.

The Level 2 evaluation criteria for the infrastructure alternatives focused on elements responding to the project Purpose and Need and goals. The alternatives were compared to determine how well each concept meets the following evaluation criteria:

- Traffic Operations
- Safety
- Community
- Environmental Resources
- Multimodal Connectivity
- Implementability

Performance measures were developed to compare each alternative against the evaluation criteria and the project Purpose and Need. These measures were a mix of qualitative and quantitative assessments, based on the criteria and the availability of data at this stage of development.

Corridor management and technology concepts carried forward from the Level 1 screening were defined and evaluated separately from the corridor infrastructure alternatives, utilizing the same general elements of the project Purpose and Need and goals. The strategies remaining after this level of screening were combined with the remaining infrastructure alternatives to provide comprehensive recommendations.

Level 3 Detailed Evaluation

Further steps are being taken to refine the conceptual design elements of the corridor recommendations, considering design solutions to minimize costs and community impact and maximize operational and safety benefits. This third level of evaluation will be described with the study recommendations in the PEL Study Report. Long-term recommendations will likely have short-term project elements identified as phases or stand-alone projects.

LEVEL 1 SCREENING

The initial improvement concepts included capacity, safety, and operational improvements along the US 24 study corridor. A variety of concepts were identified for consideration, focusing on the corridor's largest issues identified in the Purpose and Need, including congestion, traffic operational issues, and safety concerns.

Level 1 Concepts

To effectively focus on improvements that could address the local transportation issues as well as needs of the overall corridor, concepts were defined for each of the five corridor segments. The concepts were categorized by highway cross-section, intersection, multimodal elements, corridor management, and technology. Considering the issues and constraints along each segment and the project Purpose and Need, the following concepts, in addition to the No Action Alternative, were considered in the Level 1 screening.

Powers Blvd to Constitution Ave Segment

Highway Cross Section

- Four Lanes with Continuous Acceleration/Deceleration Lanes
- Five Lanes with Reversible Lane (barrier-separated with grade separation at signals)
- Four Lanes with Peak Period Shoulder Lanes
- Separated Express Lanes (barrier-separated with grade separation at signals)
- Six Lanes
- Eight Lanes

Intersection

- At-Grade Intersection Improvements
- Grade-Separated Interchange

Multimodal Elements

- Improved Crossing for Pedestrians/Bicyclists at Traffic Signals
- Pedestrian/Bicyclist Grade Separation of US 24
- Separated Multi-use Path
- Bicycle Lane/Shoulder on US 24
- Improved Transit Service

Corridor Management

- Travel Demand Management Strategies
- Incident Management Plan (IMP)
- Freight Management Strategies

Technology

- Enhanced Traffic Signal Detection
- Adaptive Signal Control
- Video Monitoring
- Queue Warning System
- Variable Message Signs
- Travel Time Indicators
- Dynamic Speed Limits
- Road/Weather Information Systems
- Weather Management Technologies
- Enhanced Lane Markings

Constitution Ave to Falcon (Woodmen Road) Segment

Highway Cross Section

- Four Lanes with Continuous Acceleration/Deceleration Lanes
- Five Lanes with Reversible Lane (barrier-separated with grade separation at signals)
- Four Lanes with Peak Period Shoulder Lanes
- Separated Express Lanes (barrier-separated with grade separation at signals)
- Six Lanes
- Wildlife Crossings

Intersection

- At-Grade Intersection Improvements
- Continuous Flow Intersection
- Roundabout
- Junior Interchange

Multimodal Elements

- Improved Crossings for Pedestrians/Bicyclists at Traffic Signals
- Pedestrian/Bicyclist Grade Separation of US 24
- Rock Island Trail Improvements/Extension
- Bicycle Lane/Shoulder on US 24
- Improved Transit Service

Corridor Management

- Travel Demand Management Strategies
- Incident Management Plan
- Freight Management Strategies

Technology

- Enhanced Traffic Signal Detection
- Adaptive Signal Control
- Video Monitoring
- Queue Warning System
- Variable Message Signs
- Travel Time Indicators
- Dynamic Speed Limits
- Road/Weather Information Systems
- Weather Management Technologies
- Enhanced Lane Markings
- Wildlife Detection and Alert Systems

Falcon (Woodmen Road) to Peyton Segment

Highway Cross Section

- Two Lanes plus New Auxiliary Lanes
- Two Lanes with New Passing Lanes
- Four Lanes
- Shoulder Widening
- Vertical and Horizontal Alignment Modifications
- Wildlife Crossings

Intersection

- At-Grade Intersection Improvements
- Median U-Turn Intersection
- Jug Handle Intersection
- Continuous Flow Intersection
- Channelized T Intersection
- Quadrant Road Intersection
- Roundabout
- Junior Interchange

Multimodal Elements

- Improved Crossings for Pedestrians/Bicyclists at Traffic Signals
- Pedestrian/Bicyclist Grade Separation of US 24
- Rock Island Trail Improvements
- Bicycle Lane/Shoulder on US 24
- Improved Transit Service

Corridor Management

- Travel Demand Management Strategies
- Incident Management Plan
- Freight Management Strategies

Technology

- Enhanced Traffic Signal Detection
- Adaptive Signal Control
- Video Monitoring
- Queue Warning System
- Variable Message Signs
- Travel Time Indicators
- Dynamic Speed Limits
- Road/Weather Information Systems
- Weather Management Technologies
- Enhanced Lane Markings
- Wildlife Detection and Alert Systems

Peyton to Calhan Segment

Highway Cross Section

- Two Lanes plus New Auxiliary Lanes
- Two Lanes with New Passing Lanes
- Two Lanes with Raised Median (in Calhan)
- Shoulder Widening
- Vertical and Horizontal Alignment Modifications
- Wildlife Crossings

Intersection

- At-Grade Intersection Improvements
- Channelized T Intersection
- Roundabout (in Calhan)

Multimodal Elements

- New Sidewalk (in Calhan)
- Rapid Flashing Beacon Pedestrian Crossing (in Calhan)
- Pedestrian/Bicyclist Grade Separation of US 24
- Separated Multi-use Path
- Bicycle Lane/Shoulder on US 24
- Improved Transit Service

Corridor Management

- Access Consolidation/Access Control
- Incident Management Plan
- Enhanced Intersection/Destination Signage
- Freight Management Strategies

Technology

- Video Monitoring
- Variable Message Signs
- Travel Time Indicators
- Dynamic Speed Limits
- Road/Weather Information Systems
- Weather Management Technologies
- Enhanced Lane Markings
- Wildlife Detection and Alert Systems

Calhan to Ramah Segment

Highway Cross Section

- Two Lanes plus New Auxiliary Lanes
- Two Lanes with New Passing Lanes
- Shoulder Widening
- Vertical and Horizontal Alignment Modifications
- Wildlife Crossings

Intersection

- At-Grade Intersection Improvements
- Channelized T Intersection

Multimodal Elements

- Pedestrian/Bicyclist Grade Separation of US 24
- Separated Multi-use Path
- Bicycle Lane/Shoulder on US 24

Corridor Management

- Access Consolidation/Access Control
- Incident Management Plan
- Enhanced Intersection/Destination Signage
- Freight Management Strategies

Technology

- Video Monitoring
- Variable Message Signs
- Travel Time Indicators
- Dynamic Speed Limits
- Road/Weather Information Systems
- Weather Management Technologies
- Enhanced Lane Markings
- Wildlife Detection and Alert Systems

Level 1 Screening Evaluation

The concepts were evaluated against the Level 1 screening criteria to identify fatal flaws related to the project Purpose and Need. Concepts that received a fatal flaw rating on all of the criteria elements (that is, all "No" responses) were eliminated from further consideration as a stand-alone alternative.

The Level 1 Screening and Analysis Matrix is included in **Appendix A**. The color ratings shown with the evaluation results for each criterion in the screening matrices are used as a visual indication of the comparative characteristics of a criterion between options. The colors are not used as an indication of a decision (i.e., an option with many "red" ratings was not automatically rendered unreasonable). The colors are a general indication of the following:

- Green = Comparatively beneficial and/or minor impacts
- Black = Comparatively neutral benefits and/or moderate impacts
- Red = Comparatively negative and/or major impacts

The reasons for elimination related to the Purpose and Need are shown in the summary of results.

Level 1 Screening Results

Several concepts were eliminated from further consideration by this study because they do not meet the project Purpose and Need. These concepts may be considered with other projects. The eliminated alternatives were:

Concepts Eliminated

All Segments

Technology

- Video Monitoring

  This concept does not meet Purpose and Need because it does not address recurring congestion with added capacity or operational improvements and does not provide improved safety along US 24 with no changes in roadway conditions or traffic disruptions.

- Travel Time Indicators

  This concept does not meet Purpose and Need because it does not address recurring congestion with added capacity or operational improvements and does not provide improved safety along US 24 with no changes in roadway conditions or traffic disruptions.

Powers Boulevard to Constitution Avenue

Highway Cross Section

- Four Lanes with Continuous Acceleration/Deceleration Lanes

  This concept does not meet Purpose and Need because it does not provide adequate capacity to reduce future delays or queuing along US 24 and traffic disruptions would continue to cause operational issues.

Falcon (Woodmen Road) to Peyton

Multimodal Elements

- Improved Transit Service

  This concept does not meet Purpose and Need because it does not remove notable traffic volume from the US 24 corridor, does not improve roadway conditions that create disruptions in traffic flow, and does not provide improved safety along US 24.

Corridor Management

- Travel Demand Management Strategies

  This concept does not meet Purpose and Need because it does not remove notable traffic volume from the US 24 corridor, does not improve roadway conditions that create disruptions in traffic flow, and does not provide improved safety along US 24.

Peyton to Calhan

Multimodal Elements

- Improved Transit Service

  This concept does not meet Purpose and Need because it does not remove notable traffic volume from the US 24 corridor, does not improve roadway conditions that create disruptions in traffic flow, and does not provide improved safety along US 24.

All other concepts were carried forward for further evaluation in Level 2 screening either as a stand-alone alternative or as elements of larger-scale alternatives.

LEVEL 2 SCREENING

Concepts from the Level 1 screening that were recommended for further evaluation were combined and applied to locations along each corridor segment to create corridor alternatives and to provide information to evaluate potential benefits and impacts. The purpose of the Level 2 screening was to complete additional analysis to compare how well each alternative meets the Purpose and Need, compare how well each alternative would perform, and identify what general impacts each alternative would have. The results of the Level 2 screening identified alternatives that are most practical or feasible to carry forward for consideration as study recommendations.

Due to the difference in type and magnitude of benefits and impacts, corridor management alternatives and technology alternatives were evaluated separately from the alternatives consisting of infrastructure elements.

Level 2 Infrastructure Alternatives

The following corridor infrastructure alternatives were developed from the concepts carried forward from Level 1 screening. Illustrations summarizing the elements of the alternatives are included in **Appendix B**.

Alternative Conceptual Layout

In order to fairly compare the impacts of alternatives through the Level 2 screening process, cross-sections with right-of-way (ROW) assumptions were developed for each alternative based on appropriate standards for the assumed roadway classification and multimodal elements. The cross-sections developed for each alternative are included in the illustrations of the alternatives. The ROW assumed for each alternative based on those cross-sections was intended to provide width for vehicular travel, as well as utilities and roadside improvements (e.g., grading, drainage). The opportunity to modify the ROW width in locations to mitigate specific property impacts or optimize operations and/or safety may be considered further in the study or during subsequent NEPA and design.

Powers Boulevard to Constitution Avenue

Alternative 1 – Four Lanes with Reversible Lane

This alternative consists of two travel lanes in each direction along US 24 with acceleration/ deceleration lanes and turn lanes at intersections and a reversible center lane to serve through traffic in the peak travel direction (westbound in the morning peak period and eastbound in the evening peak period). Intersection improvements would occur at ramp intersections of the Powers Boulevard and Peterson Boulevard interchanges with additional

turn lanes. Grade-separated interchanges with free-flow traffic on US 24 would be constructed at CO 94, Marksheffel Road, and Constitution Avenue. A separated multi-use path would be constructed parallel to US 24.

Alternative 2 – Four Lanes with Peak Period Shoulder Lanes

This alternative consists of two travel lanes in each direction along US 24 with acceleration/deceleration lanes and turn lanes at intersections and peak period shoulder lanes. Shoulders in both directions along US 24 would be opened as a through lane to serve traffic during peak periods. Intersection improvements would occur at ramp intersections of the Powers Boulevard and Peterson Boulevard interchanges with additional turn lanes. Grade-separated interchanges with free-flow traffic on US 24 would be constructed at CO 94, Marksheffel Road, and Constitution Avenue. A separated multi-use path would be constructed parallel to US 24.

Alternative 3 – Four Lanes with Separated Express Lanes

This alternative consists of two travel lanes in each direction along US 24 acceleration/deceleration lanes and turn lanes at intersections and one additional lane in each direction to serve through traffic as separated express lanes. The express lanes would be barrier-separated, with select openings for ingress/egress between major intersections, and grade-separated at traffic signals, to provide high capacity and reliability for through traffic. Intersection improvements would occur at ramp intersections of the Powers Boulevard and Peterson Boulevard interchanges with additional turn lanes. At-grade intersection improvements would be made at all other segment intersections with additional turn lanes. A separated multi-use path would be constructed parallel to US 24.

Alternative 4 – Six Lanes

This alternative consists of widening along US 24 to provide three travel lanes in each direction with acceleration/deceleration lanes and turn lanes at intersections. Intersection improvements would occur at ramp intersections of the Powers Boulevard and Peterson Boulevard interchanges with additional turn lanes. Either grade-separated interchanges with free-flow traffic on US 24 or at-grade intersection improvements would be constructed at all other major segment intersections. A separated multi-use path would be constructed parallel to US 24.

Alternative 5 – Eight Lanes

This alternative consists of widening along US 24 to provide four travel lanes in each direction with acceleration/deceleration lanes and turn lanes at intersections. Intersection improvements would occur at ramp intersections of the Powers Boulevard and Peterson Boulevard interchanges with additional turn lanes. At-grade intersection improvements would be made at all other segment intersections with additional turn lanes. A separated multi-use path would be constructed parallel to US 24.

Constitution Avenue to Falcon (Woodmen Road)

Alternative 1 – Four Lanes with Continuous Acceleration/Deceleration Lanes

This alternative consists of two travel lanes in each direction along US 24 with acceleration/deceleration lanes between every intersection. At-grade intersection improvements would occur at Garrett Road and Falcon Highway. The remaining intersections (future Carefree Circle, Barnes Road, Meridian Road, and Woodmen Road) would have at-grade intersection improvements or grade-separated interchanges providing free-flow traffic on US 24 with low-speed ramps (junior interchanges). A separated multi-use path would be constructed parallel to US 24 and a multimodal grade separation would be constructed near Falcon.

Alternative 2 – Four Lanes with Reversible Lane

This alternative consists of two travel lanes in each direction along US 24 with acceleration/deceleration lanes and turn lanes at intersections and a reversible center lane to serve through traffic in the peak travel direction (westbound in the morning peak period and eastbound in the evening peak period). At-grade intersection improvements would occur at Garrett Road and Falcon Highway. The future intersections at Carefree Circle and Barnes Road would have at-grade intersection improvements or junior interchanges. Meridian Road and Woodmen Road would provide at-grade intersection improvements, junior interchanges or grade-separated interchanges. A separated multi-use path would be constructed parallel to US 24 and a multimodal grade separation would be constructed near Falcon.

Alternative 3 – Four Lanes with Peak Period Shoulder Lanes

This alternative consists of two travel lanes in each direction along US 24 with acceleration/deceleration lanes and turn lanes at intersections and peak period shoulder lanes. Shoulders in both directions along US 24 would be opened as a through lane to serve traffic during peak periods. At-grade intersection improvements would occur at Garrett Road and Falcon Highway. The future intersections at Carefree Circle and Barnes Road would have at-grade intersection improvements or junior interchanges. Meridian Road and Woodmen Road would provide at-grade intersection improvements, junior interchanges or grade-separated interchanges. A separated multi-use path would be constructed parallel to US 24 and a multimodal grade separation would be constructed near Falcon.

Alternative 4 – Four Lanes with Separated Express Lanes

This alternative consists of two travel lanes in each direction along US 24 acceleration/deceleration lanes and turn lanes at intersections and one additional lane in each direction to serve through traffic as separated express lanes. The express lanes would be barrier-separated, with select openings for ingress/egress between major intersections, and grade-separated at traffic signals, to provide high capacity and reliability for through traffic. At-grade intersection improvements would occur at Garrett Road and Falcon Highway. The future intersections at Carefree Circle and Barnes Road would have at-grade intersection improvements or junior interchanges. Meridian Road and Woodmen Road would provide at-grade intersection improvements, junior interchanges or grade-separated interchanges. A separated multi-use path would be constructed parallel to US 24 and a multimodal grade separation would be constructed near Falcon.

Alternative 5 – Six Lanes

This alternative consists of widening along US 24 to provide three travel lanes in each direction with acceleration/deceleration lanes and turn lanes at intersections. At-grade intersection improvements would occur at Garrett Road and Falcon Highway. The remaining intersections (future Carefree Circle, Barnes Road, Meridian Road, and Woodmen Road) would have at-grade intersection improvements or grade-separated interchanges providing free-flow traffic on US 24 with low-speed ramps (junior interchanges). A separated multi-use path would be constructed parallel to US 24 and a multimodal grade separation would be constructed near Falcon.

Falcon (Woodmen Road) to Peyton

Alternative 1 – Two Lanes plus New Auxiliary Lanes

This alternative consists of one travel lane in each direction along US 24 with acceleration/ deceleration lanes and turn lanes at intersections. The Judge Orr Road intersection would be improved with added turn lanes. The Stapleton Road and future intersection between MPs 324 and 325 would be an at-grade intersection with a jughandle layout or a junior interchange. The existing Rock Island Trail would be improved east of the existing trailhead.

Alternative 2 – Two Lanes with New Passing Lanes

This alternative consists of one travel lane in each direction along US 24 with acceleration/ deceleration lanes and turn lanes at intersections and additional passing lanes to provide passing opportunities along the segment. The Judge Orr Road intersection would be improved with added turn lanes. The Stapleton Road and future intersection between MPs 324 and 325 would be an at-grade intersection with a jughandle layout or a junior interchange. The existing Rock Island Trail would be improved east of the existing trailhead.

Alternative 3 – Four Lanes

This alternative consists of widening along US 24 to provide two travel lanes in each direction with acceleration/deceleration lanes and turn lanes at intersections. The Judge Orr Road intersection would be improved with added turn lanes. The Stapleton Road and future intersection between MPs 324 and 325 would be an at-grade intersection with a jughandle layout or a junior interchange. The existing Rock Island Trail would be improved east of the existing trailhead.

Peyton to Calhan

Alternative 1 – Two Lanes plus New Auxiliary Lanes

This alternative consists of one travel lane in each direction along US 24 with acceleration/ deceleration lanes and turn lanes at intersections. The intersections of 8th Street and Calhan Highway in Calhan would have added turn lanes or would be a roundabout. The existing Rock Island Trail would be extended east of the existing trailhead in Peyton. Pedestrian crossing improvements, such as a rapid flashing beacon, would be installed at pedestrian crossings in Calhan.

Alternative 2 – Two Lanes with New Passing Lanes

This alternative consists of one travel lane in each direction along US 24 with acceleration/deceleration lanes and turn lanes at intersections and additional passing lanes to provide passing opportunities along the segment. A raised median would be installed in Calhan to channelize traffic, facilitate pedestrian and bicyclist crossings, and slow traffic traveling through town. The intersections of 8th Street and Calhan Highway in Calhan would have added turn lanes or would be a roundabout. The existing Rock Island Trail would be extended east of the existing trailhead in Peyton. Pedestrian crossing improvements, such as a rapid flashing beacon, would be installed at pedestrian crossings in Calhan.

Calhan to Ramah

Alternative 1 – Two Lanes plus New Auxiliary Lanes

This alternative consists of one travel lane in each direction along US 24 with acceleration/deceleration lanes and turn lanes at intersections. The intersections on US 24 adjacent to Ramah would have added turn lanes to facilitate access to/from the highway.

Alternative 2 – Two Lanes with New Passing Lanes

This alternative consists of one travel lane in each direction along US 24 with acceleration/deceleration lanes and turn lanes at intersections and additional passing lanes to provide passing opportunities along the segment. The intersections on US 24 adjacent to Ramah would have added turn lanes to facilitate access to/from the highway.

Level 2 Evaluation Criteria

For Level 2 screening, the evaluation criteria focused on elements responding to the project Purpose and Need and goals: traffic operations, safety, community, environmental resources, multimodal connectivity, and implementability. The alternatives were evaluated to identify fatal flaws related to infeasibility, cost, or unacceptable community or environmental impacts and to compare how well each concept meets the project Purpose and Need and goals.

The alternatives were compared to determine how well each concept meets the following evaluation criteria:

- Traffic Operations
  - Ability of the alternative to provide roadway capacity to meet 2040 travel demand
  - Ability of the alternative to allow intersections to operate at a LOS D or better during future (2040) peak hours
  - Ability of the alternative to optimize future (2040) vehicular travel time for regional and local trips along the corridor
- Safety
  - Ability of the alternative to address unsafe physical (clear zone, sight distance) or operational conditions (congestion, lack of access control, passing/overtaking maneuvers) along US 24

  - Ability of the alternative to reduce the number of potential multimodal conflict points
- Community
  - Ability of the alternative to provide consistency with the *US 24 Access Control Plan (ACP)* and reasonable access compatible with the functional characteristics of the roadway
  - Ability of the alternative to provide consistency with the US 24 East Corridor Plan developed with the PPACG *2040 Moving Forward Plan*
  - Relative property impacts based on number of residential and business properties impacted
  - Ability of the alternative to receive general public and agency support for the transportation recommendations
  - Ability of the alternative to support local and regional planning efforts
  - Ability of the alternative to complement local community surroundings with design and operational context
- Environmental Resources
  - Ability of the alternative to avoid and minimize impacts on environmental resources within the built and natural environment
    - Parks, open space, and trails
    - Noise
    - Previously identified and potential historic sites
    - Floodplains
    - Wetlands and waters of the US
    - Potential threatened and endangered species habitat
    - Potential hazardous materials sites
- Multimodal Connectivity
  - Ability of the alternative to provide infrastructure for local pedestrian and bicyclist movements
  - Ability of the alternative to accommodate the expansion of regional multimodal transportation options
  - Ability of the alternative to enhance freight mobility along US 24
- Implementability
  - Relative cost of the alternative
  - Ability to phase implementation into fundable construction projects

Level 2 Infrastructure Alternatives Screening

The Level 2 comparative screening provided an evaluation to confirm that each alternative meets the Purpose and Need and to identify those alternatives that are most practical or feasible to carry forward for consideration with study recommendations. The Level 2 Comparative Screening Matrix providing the summary of results for the corridor infrastructure alternatives is included in **Appendix C**.

Level 2 System Management Alternatives Evaluation

The system management alternatives considered along the corridor are described below with a simplified evaluation considering the Level 2 evaluation criteria.

Improved Transit Service

Two separate transit/shuttle services were previously provided to Peterson AFB: Mountain Metro Transit's Route 24 and the Orbiter Shuttle. Until 2008, Route 24 provided access on Peterson AFB. When the service was discontinued in 2008, the Orbiter began, which provided internal service to anyone with base access from 2008-2012. Since the discontinuation of the Orbiter in 2012, Route 24 has not been reinstated and the closest route to Peterson AFB is Route 23, which provides service between the Citadel Mall Transfer Center and Morning Sun Avenue along a number of roads east of Powers Boulevard.

Mountain Metro Transit previously operated two routes that served Falcon to Colorado Springs (downtown and Garden of the Gods). The routes operated from November 2005 to April 2009. Until January 2009, the routes operated in both directions with some slight modifications. Route E1, with service to downtown Colorado Springs, operated three westbound trips in the morning peak period and two in the afternoon peak period. One eastbound trip was provided in the morning peak period and three afternoon peak period trips were provided. Route E2, with service to the Garden of the Gods, provided slightly more service with a total of four runs in the morning peak period in the westbound direction. Two shortened trips were provided in the afternoon. The reverse occurred during the evening peak period. Route E1 averaged 6 passengers per trip and Route E2 averaged 12 passengers per trip.

CDOT and El Paso County are currently coordinating on the construction of a park-n-ride at Old Meridian Road, in conjunction with the New Meridian Road construction. This park-n-ride is anticipated to serve people looking to carpool, vanpool and ride transit. The adoption of the US 24 ACP (July 2005) created the opportunity for the park-n-ride facility at the Old Meridian Road alignment. The Pikes Peak Regional Park and Ride Study also identifies this location. In the short term, the park-n-ride will be used for carpooling and vanpooling with a long-term goal of providing express transit service to the park-n-ride. The park-n-ride will have 225 spaces.

Falcon to Colorado Springs Service

In an effort to provide transit service between Falcon and Colorado Springs, transit service between the two communities will provide service at a 60-minute headway. Due to the directional nature of the travel between these two communities, directional service would be provided, with service from Falcon to Colorado Springs during the morning peak period and

Colorado Springs to Falcon during the evening peak period. Depending on scheduling, a reverse trip from Colorado Springs in the morning and from Falcon in the evening could offer trips instead of deadheading. This service would originate from the Falcon park-n-ride. This would be express service from Falcon within Mountain Metro Transit's existing service area to provide a transportation option with a travel time that competes with driving.

Since Mountain Metro Transit operated this service previously, it is critical to gauge demand for this service with some kind of shared ride service initially, which could determine the potential for a more traditional service between Falcon and Colorado Springs. Mountain Metro Transit's current transit service does not go east of Peterson Air Force Base and funding partnerships would likely have to be developed to serve this new area.

BENEFITS	TRADEOFFS
▪ Potential reduced traffic congestion during peak hours ▪ Minimal to no expected property impacts ▪ Improved multimodal access and connectivity	▪ Limited safety benefit ▪ Relatively high costs due to likely subsidy

Based on the operational and multimodal benefits, this alternative is **carried forward** for consideration with future transit service.

Peterson AFB to Downtown Colorado Springs Service

This is identified in the 2040 PPACG Regional Transportation Plan as a possible future service option. The military bases are major destinations that people travel to and from within the Colorado Springs metropolitan area. This service would be similar to the service from Falcon to downtown Colorado Springs to serve the commuter trip. Directional service would provide morning service from Colorado Springs to Peterson AFB and reverse service in the afternoon.

BENEFITS	TRADEOFFS
▪ Minimal to no expected property impacts	▪ Limited reduction in traffic congestion along corridor ▪ Limited safety benefit ▪ Limited improvement to multimodal access and connectivity for overall corridor ▪ Relatively high costs due to likely subsidy

Based on the limited operational and multimodal benefits for the overall corridor, this alternative is **not recommended** for consideration with future transit service.

Specialized Transportation Service Expansion

Through Calhan Senior Services, transportation is currently provided for residents in Eastern El Paso County every Tuesday and Thursday and every other Monday. Reservations are required and are open to people with disabilities except in Calhan, where there is a 60 and older criteria for riders. The ridership fee is based on a suggested donation, so funding for this transportation service is not consistent. This service would be expanded to provide service every Monday through Friday. Possible funding sources for riders who do not have a disability or 60 and older would expand the service without necessarily needing more vehicles and/or drivers if there are open seats available.

The Silver Key Service is important for people who live in Colorado Springs and want to travel east. This service is limited to people 60 or older or people under 60 with an Americans with Disabilities Act certification. Right now, Silver Key's eastern boundary is roughly Marksheffel Road. To expand service, funding would be provided to allow more vehicles to access the area east of Colorado Springs to Falcon (roughly US 24 and Woodmen Road). In addition to individual rides, Silver Key could also provide weekly trips to Peterson AFB. Currently, Silver Key provides access to Fort Carson and the Air Force Academy.

Specialized transportation services often have limited funding available and many associated restrictions that go along with funding related to the type of rider and/or geographic location. Coordination and identifying more funding will likely be the largest challenges for this alternative.

BENEFITS	TRADEOFFS
▪ Improved travel access and connectivity ▪ Minimal to no expected property impacts	▪ Limited traffic congestion benefit ▪ Limited safety benefit ▪ Relatively high costs with coordination efforts and potential restrictions

Based on the multimodal and community benefits for the overall corridor, this alternative is **carried forward** for consideration with future transit service.

Transportation Demand Management Strategies

Calhan Park-n-Ride

In an effort to utilize existing parking lots instead of constructing new parking lots for park-n-ride facilities, a church within Calhan may be willing to allow people to park in their lot during the week when church services are not occurring. This lot would be used as a carpool lot for people sharing rides. An example would be St. Paul Lutheran Church, in a convenient location on the south side of US 24 just west of Calhan. This location would capture people traveling along US 24 from Calhan, likely traveling to Colorado Springs.

BENEFITS	TRADEOFFS
▪ Improved travel access and connectivity ▪ Minimal to no expected property impacts ▪ Relatively low cost (with coordination with church)	▪ Limited traffic congestion benefit ▪ Limited safety benefit

Based on the multimodal and community benefits with relatively low cost, this alternative is **carried forward** for consideration.

Flextime Incentives

The morning and evening peak periods experience higher volumes and congestion because workers are traveling to and from traditional work positions that generally start between 8 AM and 9 AM and end between 4 PM and 5 PM. Flextime allows more variation in the work day by allowing staggered start/end times determined either through formal or informal policies. Many policies set parameters on the variability of schedules by addressing the following: requiring work times within a specific time range (i.e. 6 AM to 7 PM) and setting a span of hours that must be worked, regardless of work schedule (i.e. 10 AM to 2 PM).

As a strategy for the congested area along US 24 between Peterson Boulevard and Powers Boulevard, employers and government agencies could offer a financial incentive for people who travel to and from certain businesses outside of certain peak hours of congestion. Peterson AFB is a large employer with the potential for providing a financial incentive for flexible work times. The incentive could be issued through a transponder system and/or by looking at times arriving at work based on "clocking-in" or swiping an ID card.

BENEFITS	TRADEOFFS
▪ Potential for reduced traffic congestion ▪ Potential for reduced crashes related to congestion ▪ Minimal to no expected property impacts ▪ Relatively low cost	▪ Limited multimodal benefits

Based on the operational and safety benefits with relatively low cost, this alternative is **carried forward** for consideration.

Veteran's Transportation Information Services

As part of the El Paso County Veterans Service Office, transportation information would be added. Since El Paso County has a strong veteran population, this is especially important information to provide. It is a way to provide a service and information to the resources that already exist through this office where veterans go for general resources.

BENEFITS	TRADEOFFS
▪ Improved travel access and connectivity ▪ Minimal to no expected property impacts ▪ Relatively low cost	▪ Limited traffic congestion benefit ▪ Limited safety benefit

Based on the multimodal and community benefits with low cost, this alternative is **carried forward** for consideration with future transit service.

Vanpool

There are established vanpool routes throughout the region. Commuters can join or create a new vanpool route and Mountain Metro Transit provides the van, insurance, maintenance and gas. Vanpools provide shared transportation for commutes of 5 to 12 people where the riders pay a low monthly fare. Vanpools allow flexibility among the group to determine the logistics of pick-up and drop-off locations and times. The easiest and fastest vanpool groups start at a common location for pick-up and drop-off of all passengers at the same location. It helps if the passengers live in the same neighborhood and work at the same employer or office complex. This concept consists of focused marketing of the program to the Falcon area for use with the new Falcon Park-n-Ride lot.

BENEFITS	TRADEOFFS
▪ Potential for reduced traffic congestion ▪ Potential for reduced crashes related to congestion ▪ Improved multimodal access and connectivity ▪ Minimal to no expected property impacts ▪ Relatively low cost within existing program	▪ No substantial limitations or constraints

Based on the operational and safety benefits with relatively low cost, this alternative is **carried forward** for consideration.

Stationless Bike Sharing System

To provide similar benefits of bike sharing in a lower density area, stationless bike sharing approaches bike sharing in a more flexible manner. Instead of having the system based on a network of stations, this type of system employs a smart lock that allows people to lock the bike to a bike rack anywhere within a designated service area. Companies like SOBI and viaCycle utilize smart locks so that users can find bikes based on GPS tracking. Removing the stations eliminates a high cost component of the system and allows a system to grow and/or shrink as necessary. This type of system would be appropriate in Colorado Springs near major employers and locations to allow people using shuttles to travel to Colorado Springs the opportunity to get around locally during the day. The military bases will also be a good location for service areas for the bikes. This alternative will be most effective when paired with other alternatives that allow people to share rides or utilize transit.

Recommended locations for this program are:

- Peterson AFB – The base is currently working on a bike loaner program to operate within the base. This mode could provide access internally as well as externally around the base.
- Falcon Park-n-Ride
- Rock Island Trailhead in Falcon

BENEFITS	TRADEOFFS
▪ Improved multimodal access and connectivity ▪ Minimal to no expected property impacts ▪ Relatively low cost within existing program	▪ Limited traffic congestion benefits ▪ Limited safety benefits

Based on the multimodal and community benefits with low cost, this alternative is **carried forward** for consideration.

Incident Management Plan

An IMP consists of a planned multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. An effective IMP reduces the duration and impacts of incidents and improves the safety of motorists, crash victims, and emergency responders. IMP activities are typically categorized into functional areas: detection and verification; traveler information; response; scene management and traffic control; and quick clearance and recovery.

This coordinated process involves a number of public and private sector partners along the highway, including:

- Law Enforcement
- Fire and Rescue
- Emergency Medical Services
- Transportation
- Public Safety Communications
- Emergency Management
- Towing and Recovery
- Hazardous Materials Contractors
- Traffic Information Media

There is an existing IMP for El Paso and Teller Counties that includes US 24. This alternative would update the IMP for the US 24 corridor, coordinating the public and private sector partners to define the process for managing traffic incidents along the corridor.

BENEFITS	TRADEOFFS
▪ Reduced traffic congestion and improved traffic operations ▪ Reduced crashes related to incidents ▪ Minimal to no expected property impacts	▪ Limited multimodal benefits ▪ Relatively low to moderate costs

Based on the operational and safety benefits, this alternative is **carried forward** for consideration.

Freight Management Strategies

Freight on Colorado's State Highway System is key to Colorado's economic prosperity. Efficient and reliable truck deliveries allow businesses, residents, and visitors to get the right products to the right people at the right time at a reasonable cost. The US 24 study corridor is identified as a Colorado State Highway Freight Corridor in the *Colorado State Highway Freight Plan* (July 2015). These corridors are considered critical for the interregional, intrastate, interstate, national, and international movement of freight. US 24 is also a hazardous materials route providing critical access between Colorado Springs and the Port of Entry on I-70 at Limon, as well as the overall I-70 east corridor.

Consistent with the *Colorado State Highway Freight Plan,* potential improvement strategies to address the freight corridor needs identified for the US 24 study corridor include:

- For safety:
  - Passing lanes
  - Auxiliary lanes at intersections
  - Shoulder improvements
  - Truck parking
- For mobility/congestion:
  - Intersection reconstruction
  - Passing lanes
  - Shoulder improvements
- For geometrics
  - Bridge replacement
  - Intersection improvements
  - Shoulders
  - Widening (passing lanes)

The improvement strategies listed are being considered by the study as part of the highway alternatives defined along the corridor.

The only strategy not under consideration for the US 24 study corridor is truck parking. Truck parking facilities support the movement of freight on the State Highway System and the lack of truck parking along the US 24 corridor between Colorado Springs and Limon was identified as an issue during coordination with the Colorado Motor Carriers Association. Updating the truck parking facility study and developing an action plan for addressing current and future truck parking needs on the State Highway System is a statewide strategy recommendation from the *Colorado State Highway Freight Plan*.

Access Control Plan

An ACP consists of proactive management of vehicular access points along the highway corridor. The existing and future allowable locations and type of access are identified, considering access spacing, operations/congestion, and geometry to maintain overall mobility and safety along the corridor.

There currently is an ACP established along US 24 between Peterson Boulevard and Elbert Road. The ACP provides proactive management of vehicular access points to land parcels adjacent to US 24 by identifying existing and future allowable access points to the highway. This alternative would develop an ACP for US 24 from Elbert Road to the El Paso County line.

Good access management promotes safe and efficient use of the transportation network. An ACP provides an important means of maintaining mobility by providing a plan for effective ingress and egress to a facility, efficient spacing and design to preserve the functional integrity, and overall operational viability of street and road systems. The ACP addresses intersection spacing, driveway spacing, traffic signal spacing, median treatments and median openings, and street connections.

Studies show that implementing access management provides three major benefits to transportation systems with increased roadway capacity, reduced crashes, and shortened travel time for motorists. All of these benefits are essentially the result of minimizing or managing the number of conflict points that exist along a corridor.

BENEFITS	TRADEOFFS
▪ Reduced traffic congestion and improved traffic operations ▪ Reduced crashes ▪ Minimal to no expected property impacts ▪ Relatively low cost	▪ Limited multimodal benefits

Based on the operational and safety benefits with low cost, this alternative is **carried forward** for consideration.

Enhanced Intersection/Destination Signage

Along rural corridors like US 24 with relatively high highway speeds and unsignalized intersections, signage with intersection and/or destination locations in advance of intersections can facilitate appropriate deceleration and reduce erratic driver maneuvers at

the intersections. The concept consists of signage in advance of the cross-street intersections, located to provide adequate sign visibility, decision time, and deceleration prior to the intersection.

Benefits	Tradeoffs
▪ Improved traffic operations ▪ Reduced crashes ▪ Relatively low cost ▪ Minimal to no expected property impacts	▪ Limited multimodal benefits

Based on the operational and safety benefits with low cost, this alternative is **carried forward** for consideration.

Summary of Recommendations

The results of the evaluation of the system management alternatives are shown in **Table 1**.

Table 1. Summary of System Management Alternatives Evaluation

System Management Alternative	Recommendation	Segment				
		Powers to Constitution	Constitution to Falcon	Falcon to Peyton	Peyton to Calhan	Calhan to Ramah
Falcon to Colorado Springs Transit Service	Carry Forward	■	■			
Peterson AFB to Colorado Springs Transit Service	Not Recommended	■	■			
Specialized Transportation Service Expansion	Carry Forward	■	■	■	■	■
Carpool Park-n-Ride	Carry Forward		(planned by others)		■	
Flextime Incentives	Carry Forward	■	■			
Veteran Transportation Information Services	Carry Forward	■	■	■	■	■
Vanpool	Carry Forward	■	■			
Stationless Bike Sharing System	Carry Forward	■	■			
Incident Management Plan	Carry Forward	■	■	■	■	■
Freight Management Strategies	Carry Forward (as part of highway alternatives)	■	■	■	■	■
Access Control Plan	Carry Forward	(exists)	(exists)	■	■	■
Enhanced Intersection Signage	Carry Forward				■	■

Level 2 Technology Alternatives Evaluation

Existing devices were compiled from the CDOT Cognos database and CTMS software. Intelligent Transportation System (ITS) infrastructure along the corridor includes:

- Automated traffic recorders (ATR) – permanent continuously-counting traffic counter stations installed in-pavement (owned/operated by the CDOT Division of Transportation Development)
- Closed-circuit television (CCTV) cameras – cameras provide 360-degree still or streaming video to identify incidents along the highway
- Roadway weather information stations (RWIS) – devices gather data on atmospheric, weather, and road surface conditions to inform motorists and guide decisions
- Variable message signs (VMS) – roadside electronic signs displaying messages for communication with motorists about traffic congestion, travel times, incidents, roadwork, special events, weather advisories, or alerts

The majority of the existing devices are located on the west end of the corridor, west of Constitution Avenue. The only RWIS along the corridor is located on the west side of the Powers Boulevard interchange. A VMS is located along eastbound US 24 just east of the Powers Boulevard interchange. A CCTV camera is located at the Marksheffel Road intersection. An ATR is located between CO 94 and Marksheffel Road and another ATR is located east of Constitution Avenue. Further east, a CCTV camera is located at the Woodmen Road intersection. Another VMS is located along eastbound US 24 just west of Calhan.

Future transportation technology alternatives considered along the corridor are described below with a simplified evaluation considering the Level 2 evaluation criteria.

Enhanced Signal Detection

Good detection is key to the efficient operation of a signalized intersection. Enhanced traffic signal detection includes controller software and firmware upgrades, as well as the addition of detectors at strategic locations, which will allow the collection and analysis of high-resolution controller events. This data logging capability provides valuable information that allows the fine-tuning of signal operations regularly and for all periods of the day. Enhanced detection also allows for bicycle detection, facilitating traffic control for all modes.

BENEFITS	TRADEOFFS
▪ Reduced traffic congestion at intersection ▪ Potential for reduced crashes related to congestion ▪ Minimal to no expected property impacts ▪ Ability for enhanced bicycle detection ▪ Relatively low cost for signal detection upgrades	▪ No substantial limitations or constraints

Based on the operational and safety benefits with relatively low cost, this alternative is **carried forward** for consideration at traffic signal locations.

Adaptive Signal Control

This concept consists of traffic signal control technology in which traffic signal timing changes automatically via computer algorithms based on real-time traffic demand to accommodate variable traffic patterns and reduce traffic congestion. For optimum operational benefit, traffic signals over a substantial distance along US 24 would be connected and controlled with the adaptive signal system to provide the most efficient signal timing along the corridor reacting to real-time traffic conditions.

BENEFITS	TRADEOFFS
▪ Reduced traffic congestion at intersection ▪ Potential for reduced crashes related to congestion ▪ Minimal to no expected property impacts	▪ Limited multimodal benefits ▪ Relatively high cost with required communication upgrades, required signal upgrades, system development, programming, and monitoring

Based on the operational and safety benefits, this alternative is **carried forward** for consideration at traffic signal locations.

Queue Warning System

This concept connects advanced, dynamic signage to downstream traffic signals to alert motorists of upcoming stopped traffic, thereby reducing rear-end crashes associated with traffic back-ups from signals. Queue detection may be placed in advance of the signal to activate the warning signs. The queue warning signs need to be located in appropriate upstream locations to alert drivers to upcoming queues with enough time to respond accordingly. The signs must be activated by the downstream signal and/or queue detection, not simply on all the time, so drivers will pay attention to the warnings.

BENEFITS	TRADEOFFS
▪ Potential for reduced rear-end and right-angle crashes at intersections ▪ Minimal to no expected property impacts ▪ Relatively low cost for signal detection and sign communication and power	▪ Limited traffic congestion benefits ▪ Limited multimodal benefits

Based on the safety benefits with relatively low cost, this alternative is **carried forward** for consideration at traffic signal locations.

Variable Message Signs

VMS are a key component to relaying travel time and incident information to drivers. They improve driver route selection, reduce travel time, mitigate the severity and duration of incidents, and improve the network's overall performance. VMS need to be placed in locations with high visibility that will not distract drivers and also provide useful information about the conditions ahead. The signs are side mounted or mounted overhead of the roadway on a cantilever, sign bridge or other structure. VMS can work well in combination or independently from other real-time warning and alert systems.

BENEFITS	TRADEOFFS
▪ Potential for reduced traffic congestion with driver information to change route ▪ Potential for reduced crashes with driver information related to congestion and adverse weather conditions ▪ Minimal to no expected property impacts ▪ Relatively low to moderate cost for communication and power to signs (depending on location)	▪ Limited multimodal benefits

Based on the operational and safety benefits with relatively low to moderate cost, this alternative is **carried forward** for consideration at various locations along the corridor.

Variable Speed Limits

This concept consists of dynamically adjusted speed limits for appropriate travel speeds based on traffic, weather, or other roadway conditions. The speed limits can be regulatory and enforceable or they can be recommended speed advisories. Variable speed limits can improve safety by increasing uniform behavior of motorists and reducing the likelihood of congestion- or weather-related crashes and they can delay the onset of congestion.

BENEFITS	TRADEOFFS
▪ Potential for reduced congestion with more uniform speeds ▪ Potential for reduced crashes related to congestion and adverse weather conditions ▪ Minimal to no expected property impacts ▪ Relatively low to moderate cost for communication and power to signs (depending on location)	▪ Limited multimodal benefits

Based on the operational and safety benefits with relatively low to moderate cost, this alternative is **carried forward** for consideration at various locations along the corridor.

Road Weather Information System

An RWIS is comprised of environmental sensor stations in the field and a communication system for data transfer. These stations measure atmospheric, pavement, and/or water level conditions. Central RWIS hardware and software are used to process observations from sensor stations to monitor conditions or develop forecasts, and display or disseminate road weather information to support decision-making.

BENEFITS	TRADEOFFS
▪ Potential for reduced crashes related to adverse weather conditions ▪ Minimal to no expected property impacts	▪ Limited traffic congestion benefits ▪ Limited multimodal benefits ▪ Relatively high cost for system equipment, communication, and power

Based on the limited operational benefits with relatively high cost, this alternative is **not recommended** for further consideration with this study.

Enhanced Lane Markings

This concept consists of brightly reflective pavement markings, reflectors, or lights to enhance driver recognition of roadway geometry and lane configuration, as well as other new technology to support driverless vehicle recognition of lane configuration. Enhanced lane markings would require maintenance plans for paint markings and lighting, and ambient lighting sensors.

BENEFITS	TRADEOFFS
▪ Potential for operational benefits related to highway alignment, particularly in non-lit rural areas ▪ Potential for reduced crashes related to geometrics, darkness, and adverse weather conditions ▪ Minimal to no expected property impacts ▪ Relatively low to moderate cost for materials and maintenance	▪ Limited multimodal benefits

Based on the operational and safety benefits with relatively low to moderate cost, this alternative is **carried forward** for consideration at various locations along the corridor.

Wildlife Detection and Alert Systems

This concept consists of wildlife detection systems and roadway markings and signage with activated flashing warning beacons installed along the roadway at known wildlife movement locations. The wildlife detection and alert systems are most effective when the animals are naturally directed to the crossing, whether that is with fencing, foliage or topography. The alert systems need to be sensitive enough to pick up a wide variety within the species, as well

as other species that may start using the crossing. However, if the alert system is too sensitive, the alert systems are activated when no animals are present and motorists will become desensitized from the alert constantly being active.

Benefits	Tradeoffs
▪ Minimal to no expected property impacts	▪ Limited traffic congestion benefits ▪ Limited potential for safety effectiveness with existing technology and lack of topography for effective direction to crossing ▪ Limited multimodal benefits ▪ Relatively moderate to high cost for construction and maintenance

Based on the limited operational and safety benefits with relatively moderate to high cost, this alternative is **not recommended** for further consideration with this study.

Summary of Recommendations

The results of the evaluation of the technology alternatives are summarized in **Table 2**. The technology alternatives are recommended for application along specific corridor segments based on the operational and geometric conditions within each segment and the associated optimization of benefits for each technology.

Table 2. Summary of Technology Alternatives Evaluation

Technology Alternative	Recommendation	Segment				
		Powers to Constitution	Constitution to Falcon	Falcon to Peyton	Peyton to Calhan	Calhan to Ramah
Enhanced Signal Detection	Carry Forward	■	■	■		
Adaptive Signal Control	Carry Forward	■	■	■		
Queue Warning System	Carry Forward	■	■	■		
Variable Message Signs	Carry Forward		■	■	■	■
Variable Speed Limits	Carry Forward	■	■	■	■	■
Road Weather Information System	Not Recommended					
Enhanced Lane Markings	Carry Forward	■	■	■	■	■
Wildlife Detection and Alert Systems	Not Recommended					

Implications of Technology Alternatives

Many of the technology alternatives carried forward require ancillary infrastructure in order to operate and communicate with motorists, as well as with the rest of the CDOT ITS network. The technology requires power, communications (fiber optic cable and/or microwave), and detection inputs. At present, minimal ancillary infrastructure exists along the corridor. A fiber optic backbone is limited to the west end of the corridor, along US 24 from Powers Boulevard (CO 21) to Judge Orr Road. Power may be available near the highway in areas along the corridor, but may still require lengthy new cable runs to reach any ITS installations adjacent to the roadway.

It is also important to consider potential impacts to ROW with ITS deployment. While some ITS equipment is installed in-pavement or adjacent to the roadway, ancillary cabinets and poles need to be located outside the clear zone or protected by guardrail, along with maintenance access, so ITS installations should be evaluated within ROW constraints. The required ancillary infrastructure and potential additional ROW needs for specific technology options will be identified with study recommendations and potential implementation projects.

Level 2 Screening Results

The Level 2 screening resulted in alternatives being eliminated, not recommended, or carried forward, as listed below.

Alternatives Eliminated

In the Level 2 screening, the following alternatives were eliminated from further consideration by this study because they do not meet the project Purpose and Need:

Powers Boulevard to Constitution Avenue

- Alternative 1 – Four Lanes with Reversible Lane

  This alternative was eliminated because the alternative does not meet the Purpose and Need to improve mobility and safety along the corridor due to the limited capacity of the reversible lane and the new safety concerns introduced with driver expectancy issues related to the reversible lane operations.

Constitution Avenue to Falcon (Woodmen Road)

- Alternative 1 – Four Lanes with Continuous Acceleration/Deceleration Lanes

  This alternative was eliminated from further consideration because the alternative does not meet the Purpose and Need to improve mobility along the corridor because the additional capacity is limited to intersections.

- Alternative 2 – Four Lanes with Reversible Lane

  This alternative was eliminated from further consideration because the alternative does not meet the Purpose and Need to improve safety along the corridor due to the new safety concerns introduced with driver expectancy issues related to the reversible lane operations.

Elements of these alternatives may be considered with other projects with different goals and needs.

Alternatives Not Recommended

The following alternatives were not recommended for further consideration due to unreasonable impacts or lack of benefits when compared to other reasonable alternatives:

Powers Boulevard to Constitution Avenue

- Alternative 3 – Four Lanes with Separated Express Lanes

  This alternative was not recommended for further consideration because the improvements would result in relatively higher property impacts and cost without better local mobility for drivers accessing the corridor than other alternatives.

Constitution Avenue to Falcon (Woodmen Road)

- Alternative 4 – Four Lanes with Separated Express Lanes

  This alternative was not recommended for further consideration because the improvements would result in relatively higher property impacts and cost with similar capacity benefits to other alternatives.

Falcon (Woodmen Road) to Peyton

- Alternative 1 – Two Lanes plus New Auxiliary Lanes

  This alternative was not recommended for further consideration because the improvements would result in similar impacts without substantially better mobility, traffic operations, and safety benefits than other alternatives.

Peyton to Calhan

- Alternative 1 – Two Lanes plus New Auxiliary Lanes

  This alternative was not recommended for further consideration because the improvements would result in similar impacts without substantially better mobility, traffic operations, and safety benefits than other alternatives.

Calhan to Ramah

- Alternative 1 – Two Lanes plus New Auxiliary Lanes

  This alternative was not recommended for further consideration because the improvements would result in similar impacts without substantially better mobility, traffic operations, and safety benefits than other alternatives.

Alternatives Carried Forward

The following alternatives were carried forward for further consideration in the Level 3 evaluation:

Powers Boulevard to Constitution Avenue

- Alternative 2 – Four Lanes with Peak Period Shoulder Lanes
- Alternative 4 – Six Lanes
- Alternative 5 – Eight Lanes

Constitution Avenue to Falcon (Woodmen Road)

- Alternative 3 – Four Lanes with Peak Period Shoulder Lanes
- Alternative 5 – Six Lanes

Falcon (Woodmen Road) to Peyton

- Alternative 2 – Two Lanes with New Passing Lanes
- Alternative 3 – Four Lanes

Peyton to Calhan

- Alternative 2 – Two Lanes with New Passing Lanes

Calhan to Ramah

- Alternative 2 – Two Lanes with New Passing Lanes

LEVEL 3 EVALUATION

Alternatives from the Level 2 comparative screening that were recommended for further evaluation are being refined to add more definition of the proposed improvements, to better understand the operations and costs of the alternatives, and to provide information for further assessment in the Level 3 evaluation. This third level of evaluation will be described with the study recommendations in the PEL Study Report. Long-term recommendations will likely have short-term project elements identified as phases or stand-alone projects.

Level 3 Alternatives

The following alternatives were carried forward from the Level 2 screening:

Powers Boulevard to Constitution Avenue

- Alternative 2 – Four Lanes with Peak Period Shoulder Lanes
- Alternative 4 – Six Lanes
- Alternative 5 – Eight Lanes

Constitution Avenue to Falcon (Woodmen Road)

- Alternative 3 – Four Lanes with Peak Period Shoulder Lanes
- Alternative 5 – Six Lanes

Falcon (Woodmen Road) to Peyton

- Alternative 2 – Two Lanes with New Passing Lanes
- Alternative 3 – Four Lanes

Peyton to Calhan

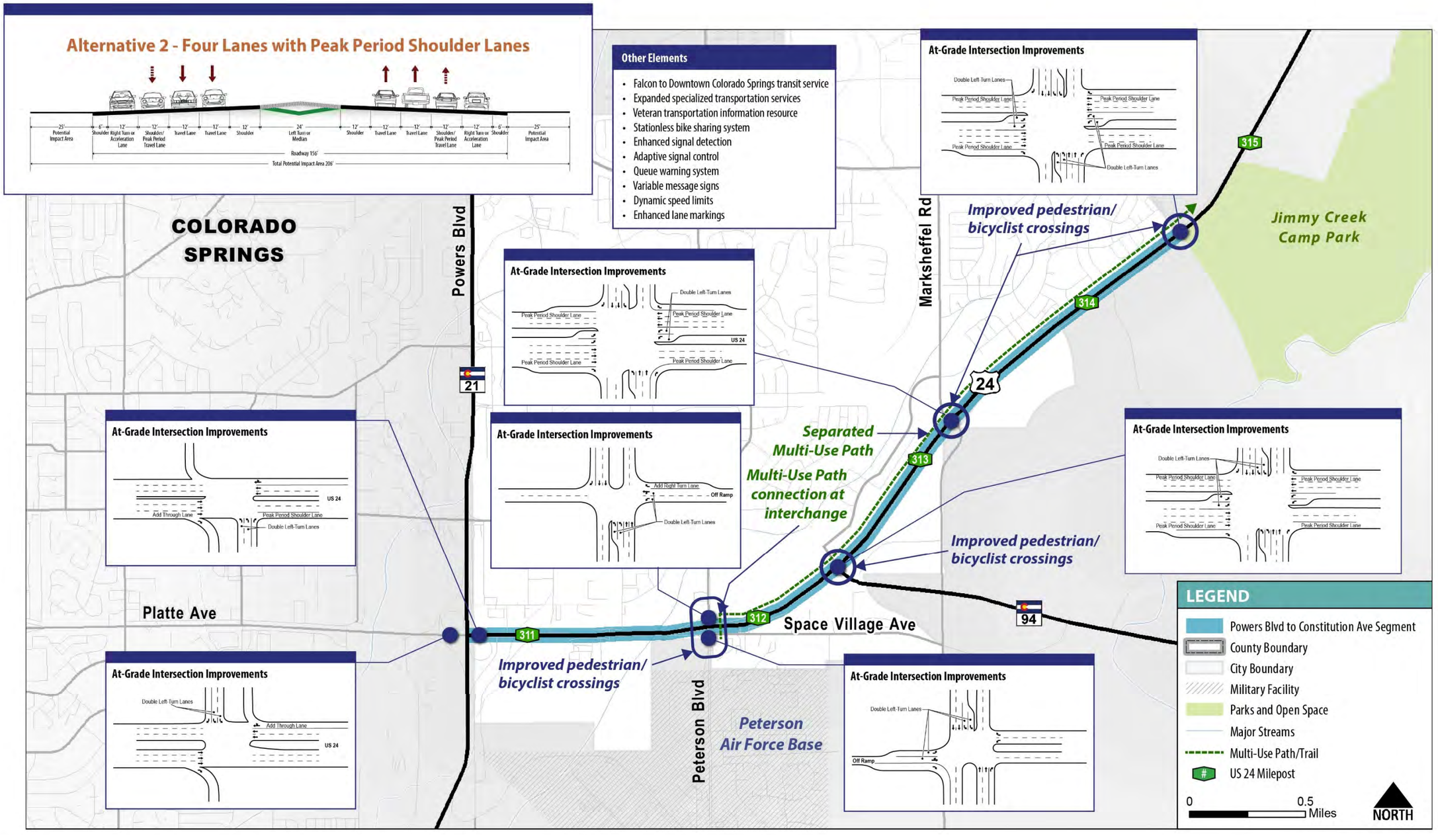
- Alternative 2 – Two Lanes with New Passing Lanes

Calhan to Ramah

- Alternative 2 – Two Lanes with New Passing Lanes

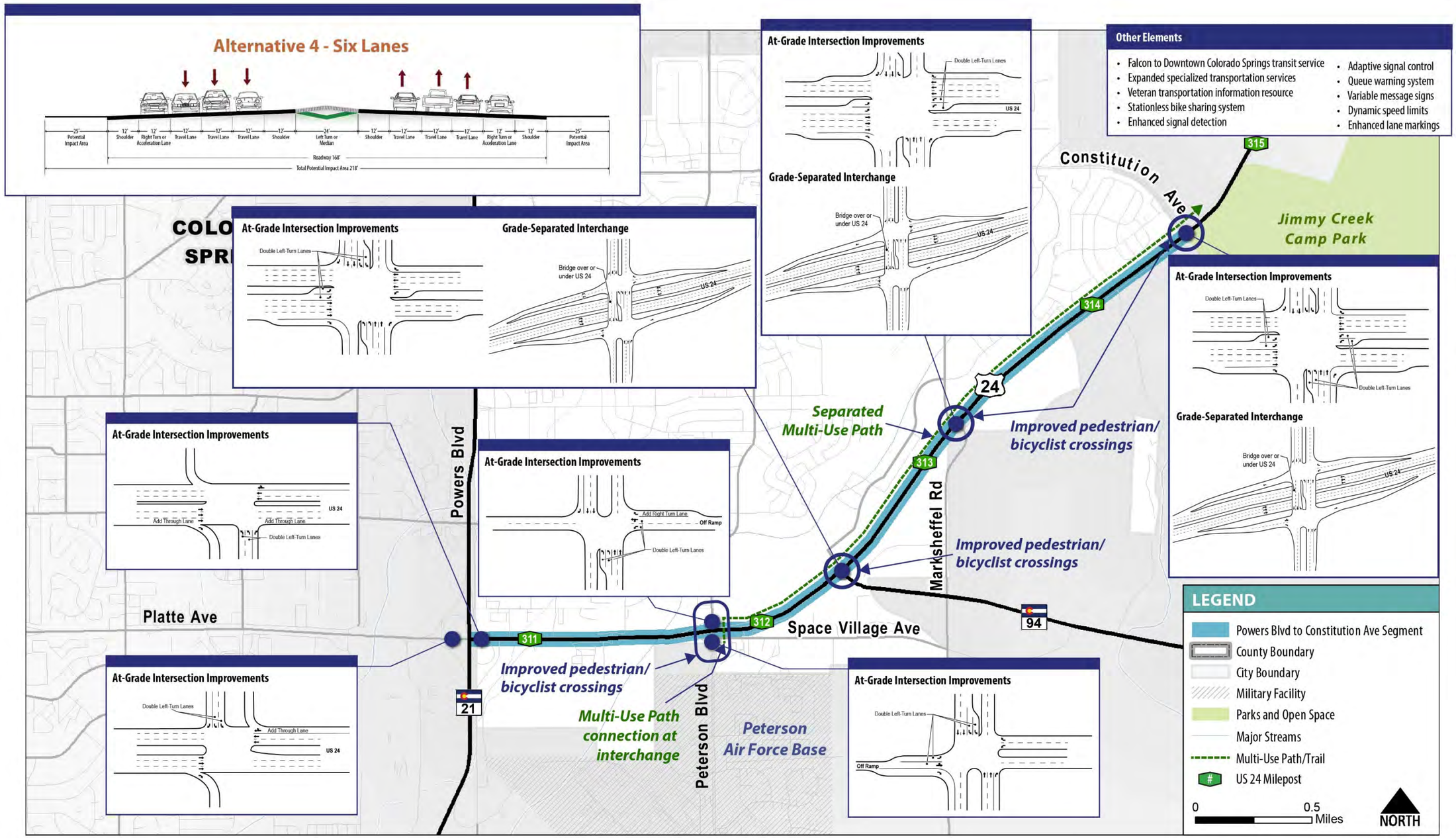
Illustrations summarizing the elements of the alternatives are shown in **Figures 3 through 10**.

Figure 3. Powers to Constitution Avenue Segment – Alternative 2. Four Lanes with Peak Period Shoulder Lanes



1

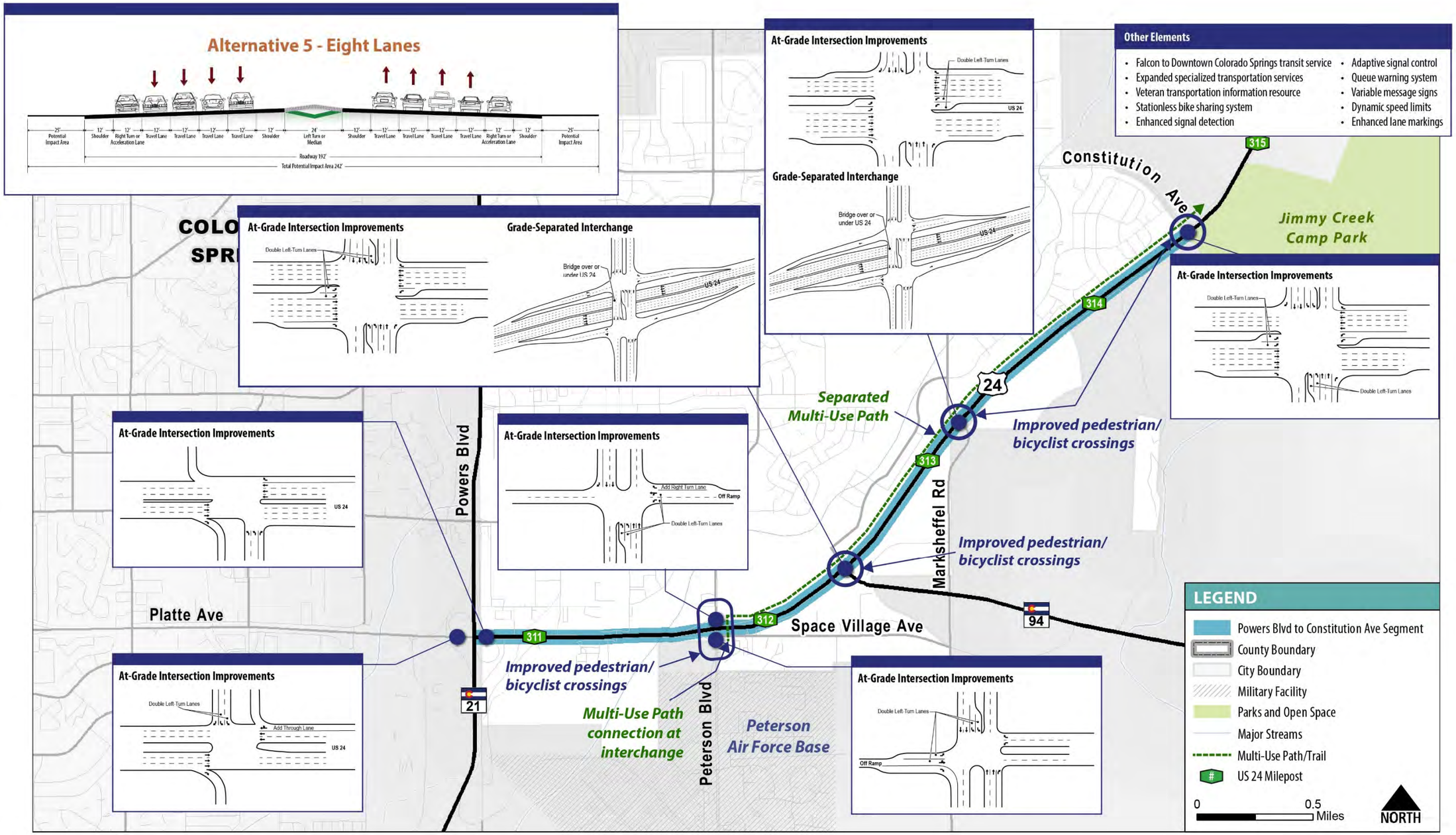
Figure 4. Powers to Constitution Avenue Segment – Alternative 4. Six Lanes



2

1

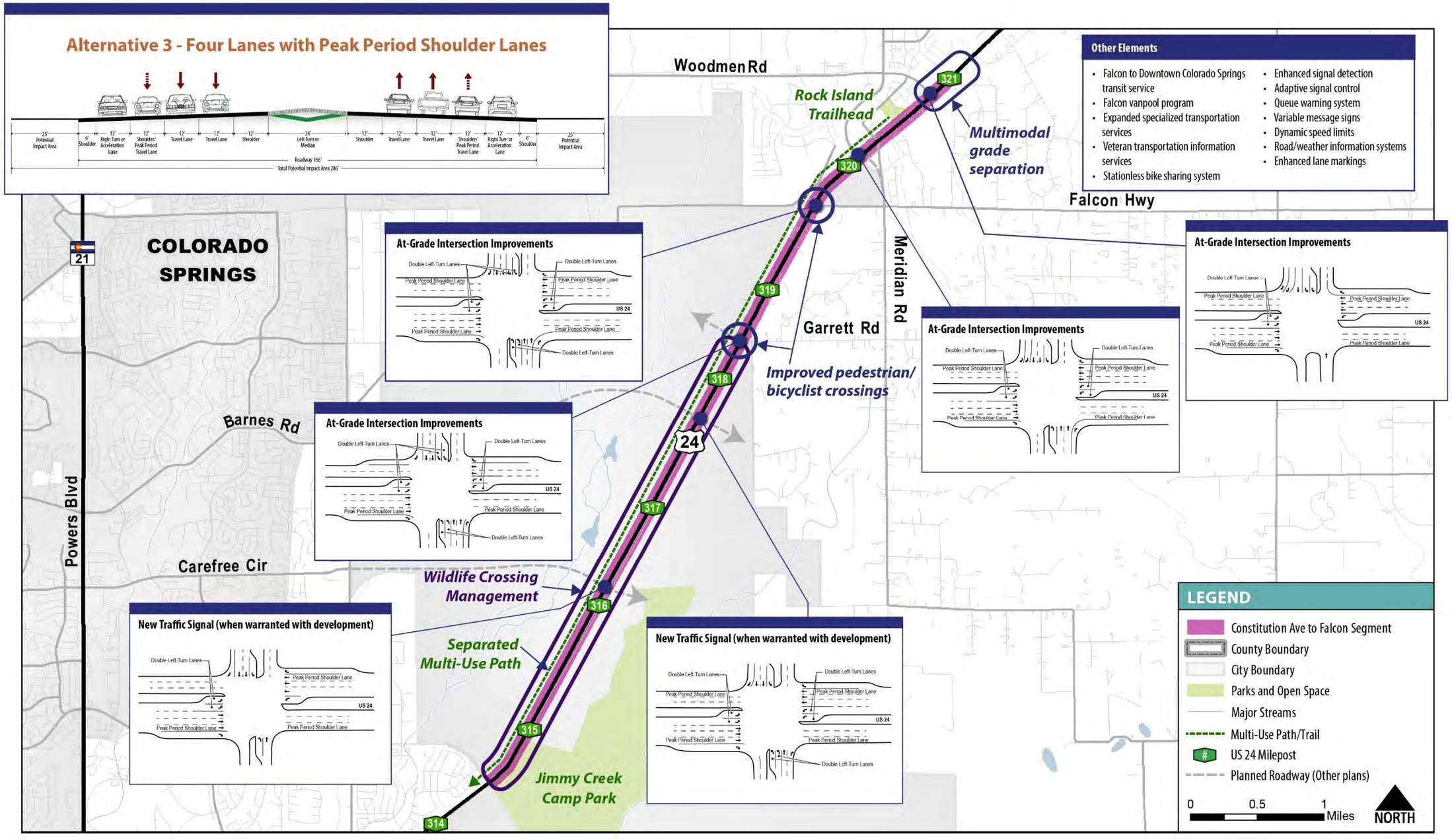
Figure 5. Powers to Constitution Avenue Segment – Alternative 5. Eight Lanes



2

1

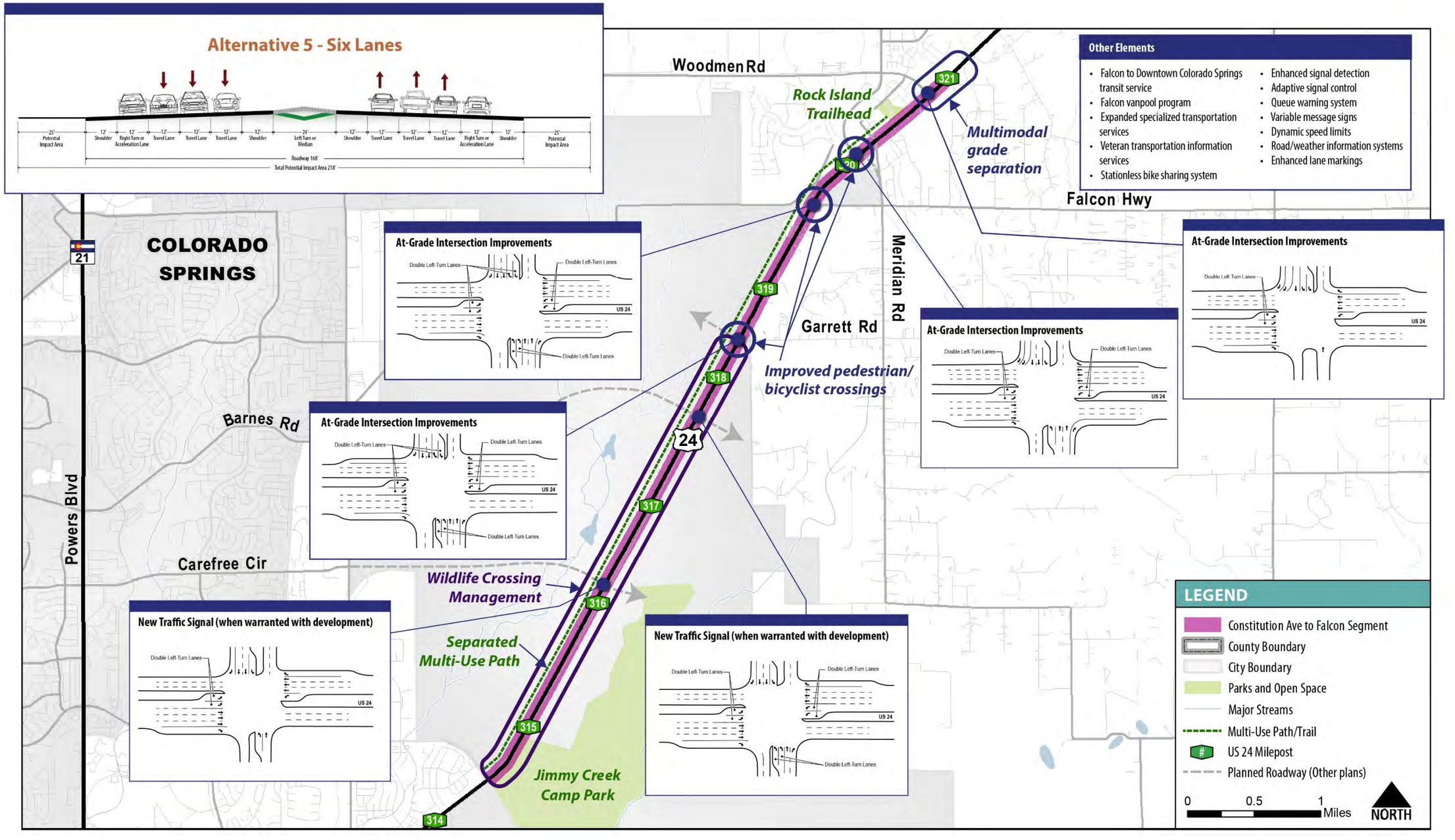
Figure 6. Constitution Avenue to Falcon (Woodmen Road) Segment – Alternative 3. Four Lanes with Peak Period Shoulder Lanes



2

1

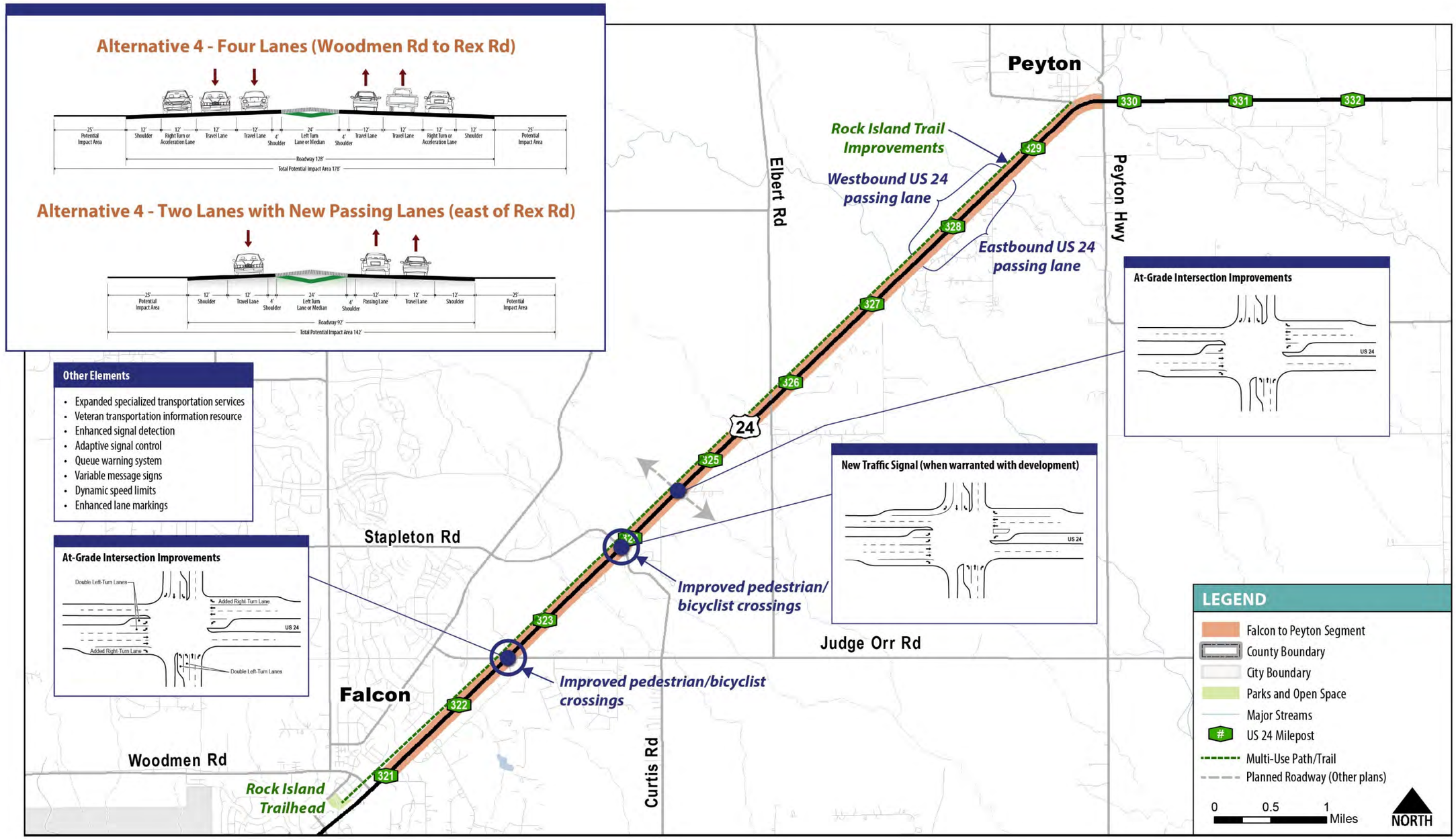
Figure 7. Constitution Avenue to Falcon (Woodmen Road) Segment – Alternative 5. Six Lanes



2

1

Figure 8. Falcon (Woodmen Road) to Peyton Segment – Alternative 4. Four Lanes and Two Lanes with New Passing Lanes



2

Figure 9. Peyton to Calhan Segment – Alternative 2. Two Lanes with New Passing Lanes

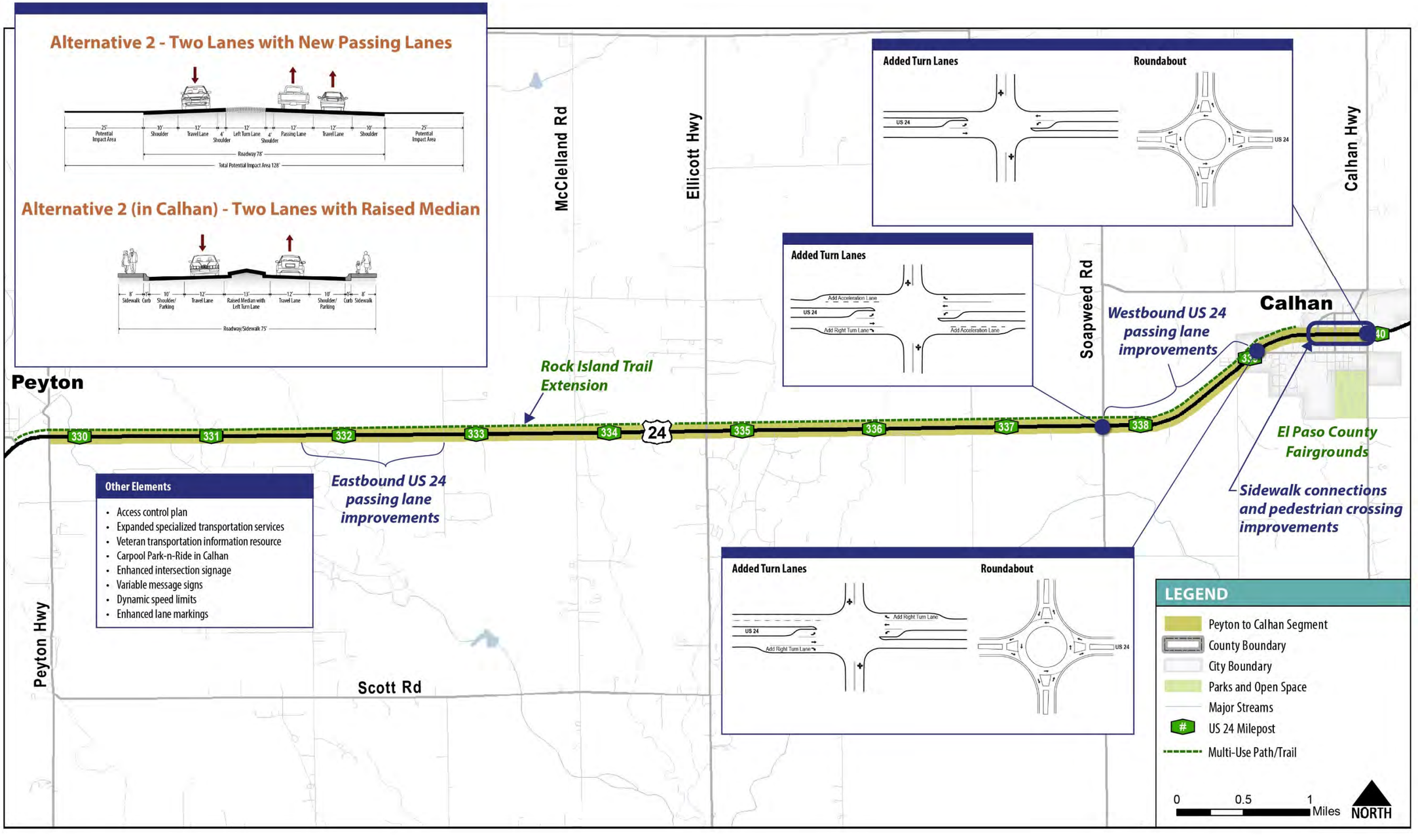
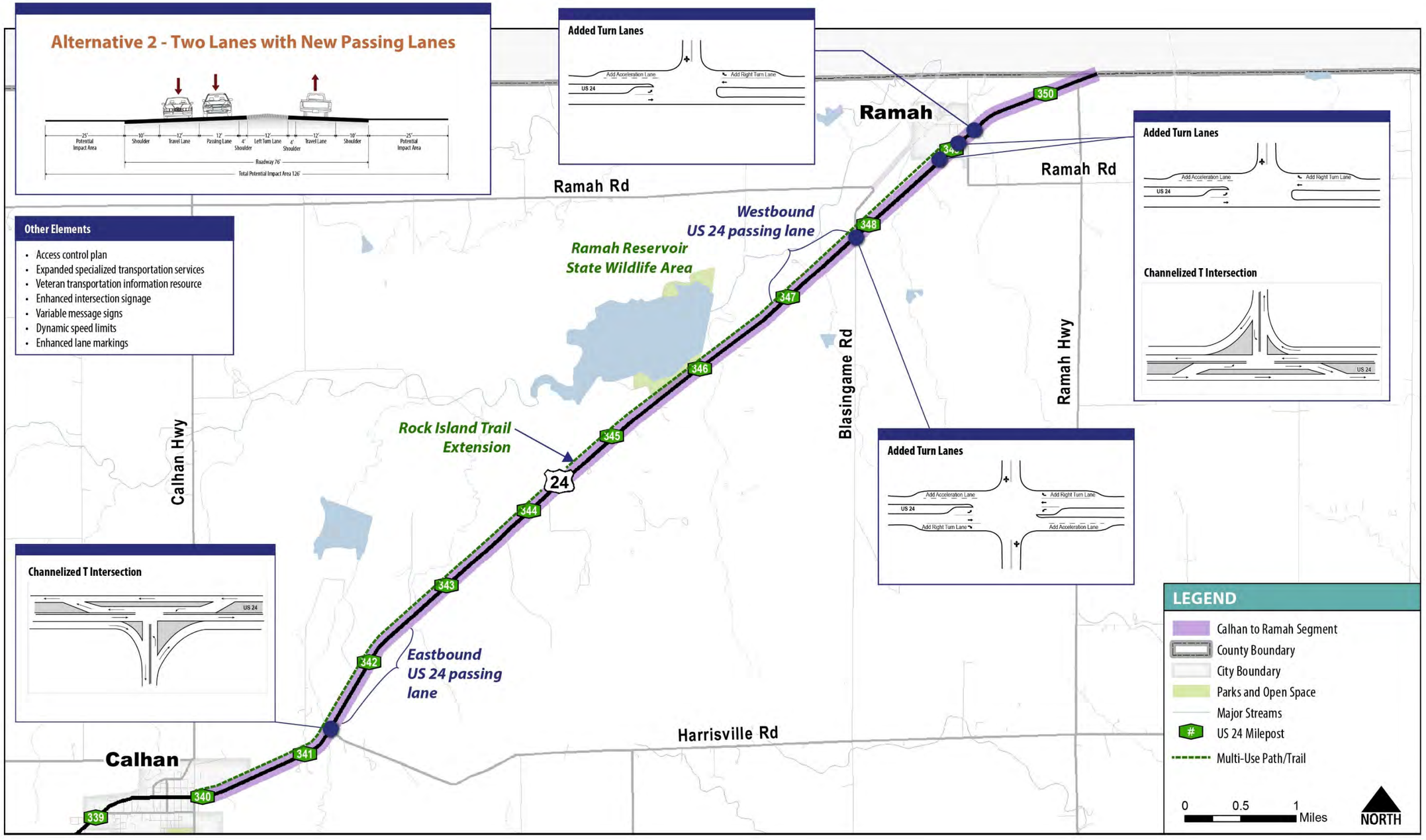


Figure 10. Calhan to Ramah Segment – Alternative 2. Two Lanes with New Passing Lanes



Level 3 Evaluation Criteria

For the Level 3 evaluation, the criteria from Level 2 were narrowed and adjusted to show the expected operations and potential safety improvements, as well as differences in the benefits and impacts of the remaining alternatives. Input provided during meetings with the TAC and area stakeholders and the general public open house was considered in the development of the evaluation criteria.

The color ratings for each Level 3 criterion are defined below. The alternatives will be compared to determine how well each concept meets the following evaluation criteria:

Traffic Operations

Intersection Level of Service and Delay

- Overall intersection LOS and delay (seconds/vehicle) for the key intersections along US 24 for the AM and PM peak hour during future years.
- Rating:
  - Green = LOS C or better
  - Black = LOS D
  - Red = LOS E or F

Average Travel Speeds

- Average eastbound and westbound travel speed along US 24 for the AM and PM peak hours under 2040 traffic conditions.
- Rating:
  - Green = 50 percent or more increase over No Action
  - Black = 10 – 50 percent increase over No Action
  - Red = Less than 10 percent increase or decrease over No Action

Safety

Anticipated Annual Crash Reduction

- Expected annual crash reduction due to alternative elements for predominant crash patterns identified in the *US 24 Corridor Conditions Report*.
- Rating:
  - Green = 20 percent or more decrease in crashes
  - Black = less than 20 percent decrease in crashes
  - Red = no decrease or increase in crashes

Community

Number of Potential Properties Impacted

- The number of impacted properties calculated for each alternative based on the conceptual roadway design layout and the anticipated ROW requirements.
- The number of impacted properties categorized as residential, business, or public.
- Rating:
  - Green = Less than 25 properties impacted
  - Black = Between 25 and 50 properties impacted
  - Red = More than 50 properties impacted

General Public and Agency Support and Concerns

- Noted consistency with local and regional plans as well as general support from the public and agency stakeholders.
- Rating:
  - Green = Consistent with established local and regional plans with general support from the public and agencies involved
  - Red = Not consistent with established local and regional plans without general support from the public and agencies involved

Environmental Resources

Potential Impacts on Environmental Resources

- Noted benefits and impacts to surrounding environmental resources.
- Rating:
  - Green = Minor to no impacts to surrounding built or natural environment
  - Black = Relatively moderate impacts to surrounding built or natural environment
  - Red = Relatively major impacts to surrounding built or natural environment

Multimodal Connectivity

Enhancements to Regional Multimodal Transportation Options

- Noted pedestrian/bicyclist infrastructure or operational treatments along and across US 24 to accommodate and encourage pedestrian and bicyclist activity.
- Rating:
  - Green = Substantial improvement in regional biking and walking opportunities
  - Black = Minor to moderate expansion in regional biking and walking opportunities
  - Red = No improvement in regional biking and walking opportunities

Enhancements to Freight Mobility along US 24

- Noted infrastructure along US 24 to optimize freight movement and safety.
- Rating:
  - Green = Substantial improvement in freight mobility and safety
  - Black = Minor to moderate improvement in freight mobility and safety
  - Red = No improvement in freight mobility and safety

Implementability

Conceptual Level Probable Costs

- Evaluation of costs (in 2017 dollars) based on amount of new or reconstructed roadway, size of required structures, major cut/fill variances, and overall footprint of alternative conceptual layout.
- ROW costs are not included in estimate of construction cost.
- Rating:
  - Green = Relatively low costs
  - Black = Relatively moderate costs
  - Red = Relatively high costs

Level 3 Screening Evaluation

The Level 3 alternatives are being evaluated with the evaluation criteria above to provide more information on the benefits and impacts of the potential study recommendations, as well as additional infrastructure needs, such as structures and drainage. This third level of evaluation will be described with the study recommendations in the PEL Study Report. The recommendations will include large-scale improvements and separate, short-term improvements. Long-term recommendations will likely have short-term project elements identified as phases or stand-alone projects.

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APPENDIX A

LEVEL 1 SCREENING MATRIX

US 24 Planning and Environmental Linkages Study

Level 1 Screening Matrix - Powers Blvd to Constitution Ave Segment

12/2/16

Level 1 Evaluation Criteria	N/A	Highway						Intersection		Multimodal Elements				
	No Action	Four Lanes with Continuous Acceleration/ Deceleration Lanes	Four Lanes with Reversible Lane	Four Lanes with Peak Period Shoulder Lanes	Four Lanes with Separated Express Lanes	Six Lanes	Eight Lanes	At-Grade Intersection Improvements	Grade-Separated Interchange	Improved Crossing for Pedestrians/ Bicyclists at Traffic Signals	Pedestrian/ Bicyclist Grade Separation of US 24	Separated Multi-Use Path	Bicycle Lane/ Shoulder on US 24	Improved Transit Service
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide adequate capacity to reduce existing or future delays or queuing along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**YES**
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not provide adequate capacity for future traffic volumes so traffic disruptions will continue along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** No safety improvements provided along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)
SUMMARY OF RESULTS	**Carried Forward:** Baseline Comparison	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with future volume conditions along US 24	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address operational issues associated with roadway characteristics and does not provide safety improvements along US 24
Notes										May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May provide slight reduction in delays or queuing with some mode shift to transit

US 24 Planning and Environmental Linkages Study

Level 1 Screening Matrix - Powers Blvd to Constitution Ave Segment

12/2/16

Level 1 Evaluation Criteria	Corridor Management			Technology									
	Travel Demand Management Strategies	Incident Management Plan	Freight Management Strategies	Enhanced Traffic Signal Detection	Adaptive Signal Control	Video Monitoring	Queue Warning System	Variable Message Signs	Travel Time Indicators	Dynamic Speed Limits	Road/Weather Information Systems	Weather Management Technologies	Enhanced Lane Markings
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**YES**	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**
SUMMARY OF RESULTS	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address operational issues associated with roadway characteristics and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion with future volume conditions along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion with future volume conditions along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24
Notes	May be carried forward as an element of another alternative; May provide reduction in delays or queuing with reduced peak hour volumes	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to incidents	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to truck volume and movements	May be carried forward as an element of another alternative; May address short-term congestion, as well as operational issues and safety concerns related to intersection operations	May be carried forward as an element of another alternative; May address short-term congestion, as well as operational issues and safety concerns related to intersection operations		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to intersection queues	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to speeds along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to changing weather conditions along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to weather conditions and lane markings maintenance along the US 24 corridor

US 24 Planning and Environmental Linkages Study

Level 1 Screening Matrix - Constitution Ave to Falcon (Woodmen Road) Segment

12/2/16

Level 1 Evaluation Criteria	N/A	Highway						Intersection				Multimodal Elements				
	No Action	Four Lanes with Continuous Acceleration/ Deceleration Lanes	Four Lanes with Reversible Lane	Four Lanes with Peak Period Shoulder Lanes	Four Lanes with Separated Express Lanes	Six Lanes	Wildlife Crossings	At-Grade Intersection Improvements	Continuous Flow Intersection	Roundabout	Junior Interchange	Improved Crossing for Pedestrians/ Bicyclists at Traffic Signals	Pedestrian/ Bicyclist Grade Separation of US 24	Rock Island Trail Improvements/ Extension	Bicycle Lane/ Shoulder on US 24	Improved Transit Service
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide adequate capacity to reduce existing or future delays or queuing along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce recurring congestion and does not remove substantial traffic volume from US 24 corridor	**YES**
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruption in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** No safety improvements provided along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)
SUMMARY OF RESULTS	**Carried Forward:** Baseline Comparison	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address operational issues associated with roadway characteristics and does not provide safety improvements along US 24
Notes							May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife					May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May provide slight reduction in delays or queuing with some mode shift to transit

Level 1 Screening Matrix - Constitution Ave to Falcon (Woodmen Road) Segment

12/2/16

Level 1 Evaluation Criteria	Corridor Management			Technology										
	Travel Demand Management Strategies	**Incident Management Plan**	**Freight Management Strategies**	**Enhanced Traffic Signal Detection**	**Adaptive Signal Control**	**Video Monitoring**	**Queue Warning System**	**Variable Message Signs**	**Travel Time Indicators**	**Dynamic Speed Limits**	**Road/Weather Information Systems**	**Weather Management Technologies**	**Enhanced Lane Markings**	**Wildlife Detection and Alert Systems**
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**YES**	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**YES**
SUMMARY OF RESULTS	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address operational issues associated with roadway characteristics and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion with future volume conditions along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion with future volume conditions along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24
Notes	May be carried forward as an element of another alternative; May provide reduction in delays or queuing with reduced peak hour volumes	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to incidents	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to truck volume and movements	May be carried forward as an element of another alternative; May address short-term congestion, as well as operational issues and safety concerns related to intersection operations	May be carried forward as an element of another alternative; May address short-term congestion, as well as operational issues and safety concerns related to intersection operations		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to intersection queues	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to speeds along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to changing weather conditions along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to weather conditions and lane markings maintenance along the US 24 corridor	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife

US 24 Planning and Environmental Linkages Study

Level 1 Screening Matrix - Falcon (Woodmen Road) to Peyton Segment

12/2/16

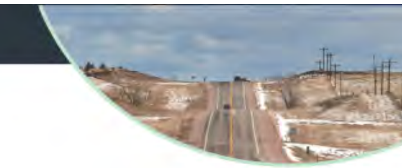
Level 1 Evaluation Criteria	N/A	Highway						Intersection								Multimodal Elements				
	No Action	Two Lanes plus New Auxiliary Lanes	Two Lanes with New Passing Lanes	Four Lanes	Shoulder Widening	Vertical and Horizontal Alignment Modifications	Wildlife Crossings	At-Grade Intersection Improvements	Median U-Turn Intersection	Jug Handle Intersection	Continuous Flow Intersection	Channelized T Intersection	Quadrant Road Intersection	Roundabout	Junior Interchange	Improved Crossing for Pedestrians/ Bicyclists at Traffic Signals	Pedestrian/ Bicyclist Grade Separation of US 24	Rock Island Trail Improvements	Bicycle Lane/ Shoulder on US 24	Improved Transit Service
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**YES**	**YES**	**YES**	**NO** Does not provide added capacity to reduce existing or future recurring congestion at intersections	**NO** Does not provide added capacity at intersections to reduce existing or future recurring congestion	**NO** Does not provide added capacity at intersections to reduce existing or future recurring congestion	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity and does not remove notable traffic volume from US 24 corridor
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruption in traffic flow	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** No safety improvements provided along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)
SUMMARY OF RESULTS	**Carried Forward:** Baseline Comparison	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion at intersections	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion at intersections	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with roadway characteristics along US 24	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24
Notes					May be carried forward as an element of another alternative; May address operational issues and safety concerns related to roadway geometrics	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to roadway geometrics	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife									May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	

US 24 Planning and Environmental Linkages Study

Level 1 Screening Matrix - Falcon (Woodmen Road) to Peyton Segment

12/2/16

Level 1 Evaluation Criteria	Corridor Management			Technology										
	Travel Demand Management Strategies	**Incident Management Plan**	**Freight Management Strategies**	**Enhanced Traffic Signal Detection**	**Adaptive Signal Control**	**Video Monitoring**	**Queue Warning System**	**Variable Message Signs**	**Travel Time Indicators**	**Dynamic Speed Limits**	**Road/Weather Information Systems**	**Weather Management Technologies**	**Enhanced Lane Markings**	**Wildlife Detection and Alert Systems**
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide added capacity and does not remove notable traffic volume from US 24 corridor	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**NO** Does not provide adequate capacity to reduce future delays or queuing along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**YES**
SUMMARY OF RESULTS	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion or operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion with future volume conditions along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion with future volume conditions along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24
Notes		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to incidents	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to truck volume and movements	May be carried forward as an element of another alternative; May address short-term congestion, as well as operational issues and safety concerns related to intersection operations	May be carried forward as an element of another alternative; May address short-term congestion, as well as operational issues and safety concerns related to intersection operations		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to intersection queues	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to speeds along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to changing weather conditions along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to weather conditions and lane markings maintenance along the US 24 corridor	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife



Level 1 Screening Matrix - Peyton to Calhan Segment

12/2/16

Level 1 Evaluation Criteria	N/A	Highway						Intersection			Multimodal Elements					
	No Action	**Two Lanes plus New Auxiliary Lanes**	**Two Lanes with New Passing Lanes**	**Two Lanes with Raised Median (in Calhan)**	**Shoulder Widening**	**Vertical and Horizontal Alignment Modifications**	**Wildlife Crossings**	**At-Grade Intersection Improvements**	**Channelized T Intersection**	**Roundabout (in Calhan)**	**New Sidewalk (in Calhan)**	**Rapid Flashing Beacon Pedestrian Crossing (in Calhan)**	**Pedestrian/ Bicyclist Grade Separation of US 24**	**Separated Multi-use Path**	**Bicycle Lane/ Shoulder on US 24**	**Improved Transit Service**
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide improvements to reduce future delays or queuing along US 24	**YES**	**YES**	**YES**	**NO** Does not provide added capacity to reduce existing or future recurring congestion at intersections	**NO** Does not provide added capacity at intersections to reduce existing or future recurring congestion	**NO** Does not provide added capacity at intersections to reduce existing or future recurring congestion	**YES**	**YES**	**YES**	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity and does not remove notable traffic volume from US 24 corridor
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruption in traffic flow	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** No safety improvements provided along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)
SUMMARY OF RESULTS	**Carried Forward:** Baseline Comparison	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion at intersections	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion at intersections	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with roadway characteristics along US 24	**Carried Forward**	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24
Notes					May be carried forward as an element of another alternative; May address operational issues and safety concerns related to roadway geometrics	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to roadway geometrics	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife				May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	

Level 1 Screening Matrix - Peyton to Calhan Segment

12/2/16

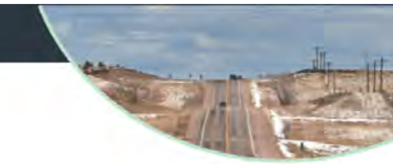
Level 1 Evaluation Criteria	Corridor Management				Technology							
	Access Consolidation/ Access Control	Incident Management Plan	Enhanced Intersection/ Destination Signage	Freight Management Strategies	Video Monitoring	Variable Message Signs	Travel Time Indicators	Dynamic Speed Limits	Road/Weather Information Systems	Weather Management Technologies	Enhanced Lane Markings	Wildlife Detection and Alert Systems
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**YES**
SUMMARY OF RESULTS	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24
Notes	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to lack of access control	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to incidents	May be carried forward as an element of another alternative; May address operational issues and safety concerns with improved intersection operations	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to truck volume and movements		May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to speeds along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to changing weather conditions along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to weather conditions and lane markings maintenance along the US 24 corridor	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife

US 24 Planning and Environmental Linkages Study

Level 1 Screening Matrix - Calhan to Ramah Segment

12/2/16

Level 1 Evaluation Criteria	N/A	Highway					Intersection		Multimodal Elements		
	No Action	Two Lanes plus New Auxiliary Lanes	Two Lanes with New Passing Lanes	Shoulder Widening	Vertical and Horizontal Alignment Modifications	Wildlife Crossings	At-Grade Intersection Improvements	Channelized T Intersection	Pedestrian/ Bicyclist Grade Separation of US 24	Separated Multi-use Path	Bicycle Lane/ Shoulder on US 24
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide improvements to reduce future delays or queuing along US 24	**YES**	**YES**	**NO** Does not provide added capacity to reduce existing or future recurring congestion at intersections	**NO** Does not provide added capacity at intersections to reduce existing or future recurring congestion	**NO** Does not provide added capacity at intersections to reduce existing or future recurring congestion	**YES**	**YES**	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion	**NO** Does not provide added capacity at intersections to reduce recurring congestion
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruption in traffic flow	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**NO** No safety improvements provided along US 24	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
SUMMARY OF RESULTS	**Carried Forward:** Baseline Comparison	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion at intersections	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion at intersections	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with roadway characteristics along US 24	**Carried Forward**	**Carried Forward**	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24
Notes				May be carried forward as an element of another alternative; May address operational issues and safety concerns related to roadway geometrics	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to roadway geometrics	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife			May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts	May be carried forward as an element of another alternative; May address safety concerns associated with pedestrian and bicyclist conflicts



Level 1 Screening Matrix - Calhan to Ramah Segment

12/2/16

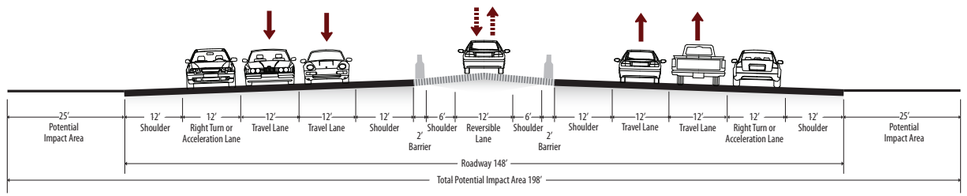
Level 1 Evaluation Criteria	Corridor Management				Technology							
	Access Consolidation/ Access Control	Incident Management Plan	Enhanced Intersection/ Destination Signage	Freight Management Strategies	Video Monitoring	Variable Message Signs	Travel Time Indicators	Dynamic Speed Limits	Road/Weather Information Systems	Weather Management Technologies	Enhanced Lane Markings	Wildlife Detection and Alert Systems
Regional and Local Mobility Does the alternative reduce delays, travel time, and/or speed impacts experienced along US 24 during peak travel periods?	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24	**NO** Does not provide added capacity to reduce existing or future recurring congestion along US 24
Traffic Operations Does the alternative improve existing and future traffic operations along US 24?	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow	**YES**	**YES**	**YES**	**YES**	**NO** Does not improve roadway characteristics or conditions that create disruptions in traffic flow
Safety Concerns Does the alternative provide safety improvements along US 24?	**YES**	**YES**	**YES**	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**NO** Does not provide improved safety along US 24 (no change in roadway conditions or traffic disruptions)	**YES**	**YES**	**YES**	**YES**	**YES**
SUMMARY OF RESULTS	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues and does not provide safety improvements along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion along US 24	**Eliminated as a Stand-Alone:** Does not meet Purpose and Need because it does not address recurring congestion and operational issues associated with peak hour congestion along US 24
Notes	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to lack of access control	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to incidents	May be carried forward as an element of another alternative; May address operational issues and safety concerns with improved intersection operations	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to truck volume and movements		May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information		May be carried forward as an element of another alternative; May address operational issues and safety concerns related to speeds along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns with enhanced traveler information	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to changing weather conditions along the US 24 corridor	May be carried forward as an element of another alternative; May address operational issues and safety concerns related to weather conditions and lane markings maintenance along the US 24 corridor	May be carried forward as an element of another alternative; May address safety concerns associated with crashes involving wildlife

APPENDIX B

LEVEL 2 INFRASTRUCTURE ALTERNATIVES

POWERS BLVD TO CONSTITUTION AVE SEGMENT - ALTERNATIVE 1

Alternative 1 - Four Lanes with Reversible Lane



Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings

COLORADO SPRINGS

Murray Blvd

Palmer Park Rd

Powers Blvd

Peterson Rd

Constitution Ave

Marksheffel Rd

Platte Ave

Space Village Ave

Peterson Blvd

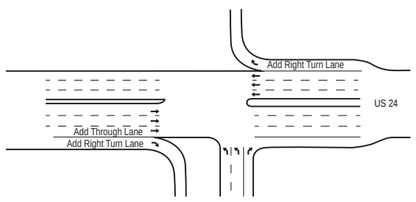
Peterson Air Force Base

Jimmy Creek Camp Park

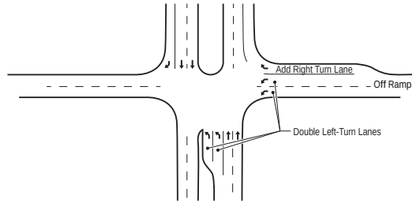
Separated Multi-Use Path

21 310 311 312 313 314 315 24 94

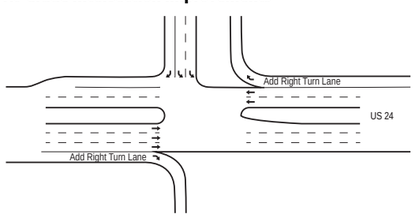
At-Grade Intersection Improvements



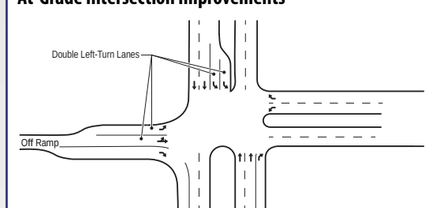
At-Grade Intersection Improvements



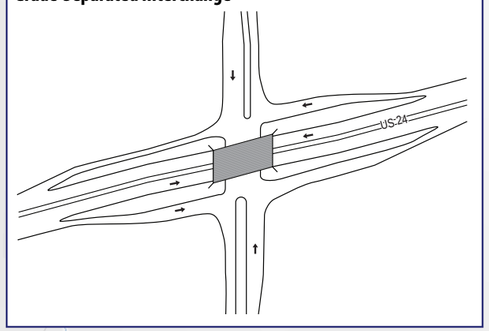
At-Grade Intersection Improvements



At-Grade Intersection Improvements



Grade-Separated Interchange



LEGEND

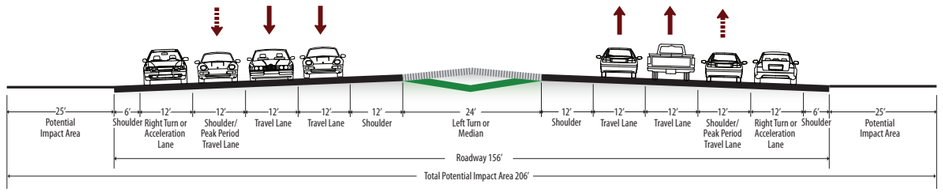
- Powers Blvd to Constitution Ave Segment
- County Boundary
- City Boundary
- Military Facility
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 Miles

NORTH

POWERS BLVD TO CONSTITUTION AVE SEGMENT - ALTERNATIVE 2

Alternative 2 - Four Lanes with Peak Period Shoulder Lanes



Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings

COLORADO SPRINGS

Murray Blvd

Palmer Park Rd

Powers Blvd

Peterson Rd

Constitution Ave

Marksheffel Rd

Platte Ave

Space Village Ave

Peterson Blvd

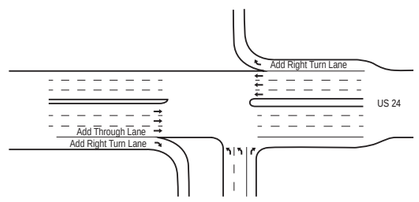
Peterson Air Force Base

Jimmy Creek Camp Park

Separated Multi-Use Path

21 310 311 312 313 314 315 24 94

At-Grade Intersection Improvements



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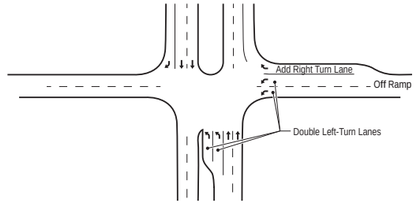
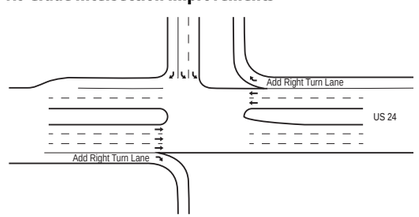
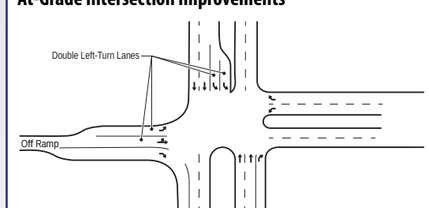


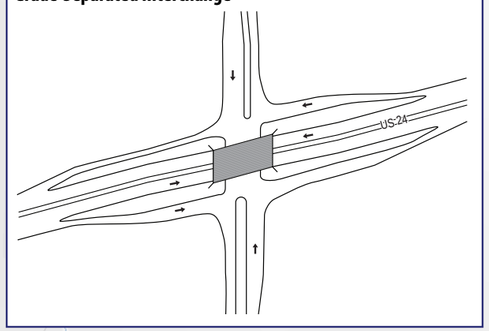
At-Grade Intersection Improvements



At-Grade Intersection Improvements



Grade-Separated Interchange



LEGEND

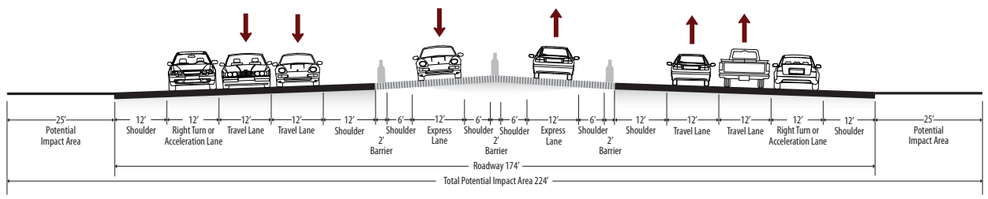
- Powers Blvd to Constitution Ave Segment
- County Boundary
- City Boundary
- Military Facility
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- # US 24 Milepost

0 0.5 Miles

NORTH

POWERS BLVD TO CONSTITUTION AVE SEGMENT - ALTERNATIVE 3

Alternative 3 - Four Lanes with Separated Express Lanes



Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings

COLORADO SPRINGS

Murray Blvd

Palmer Park Rd

Platte Ave

Powers Blvd

Peterson Rd

Constitution Ave

Marksheffel Rd

Space Village Ave

Peterson Blvd

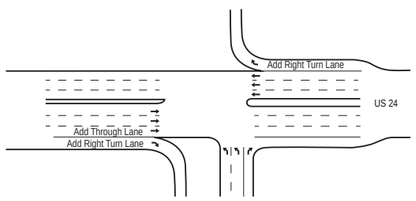
Peterson Air Force Base

Jimmy Creek Camp Park

Separated Multi-Use Path

21 310 311 312 313 314 315 24 94

At-Grade Intersection Improvements



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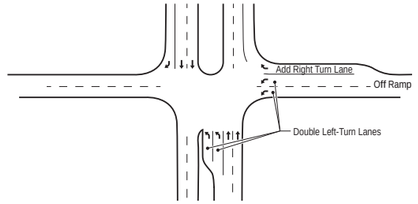

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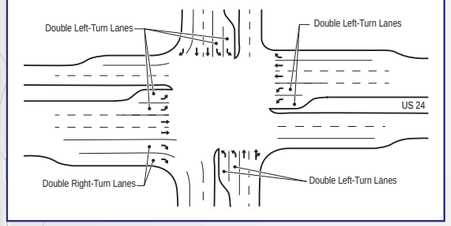
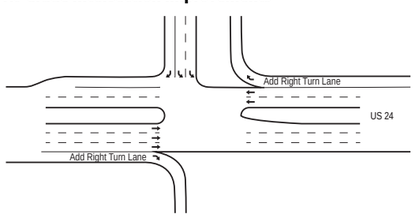
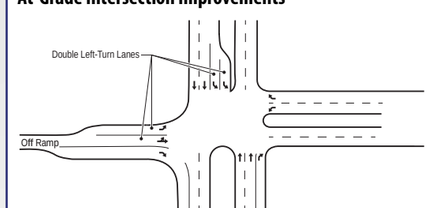


At-Grade Intersection Improvements



At-Grade Intersection Improvements



LEGEND

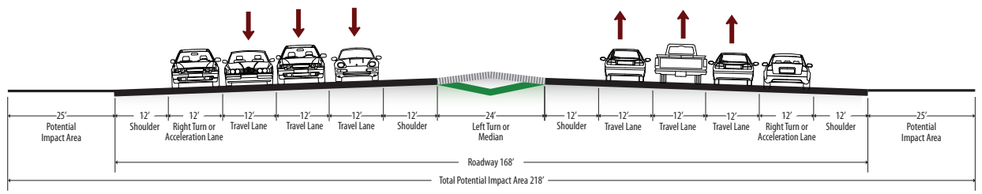
- Powers Blvd to Constitution Ave Segment
- County Boundary
- City Boundary
- Military Facility
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 Miles

NORTH

POWERS BLVD TO CONSTITUTION AVE SEGMENT - ALTERNATIVE 4

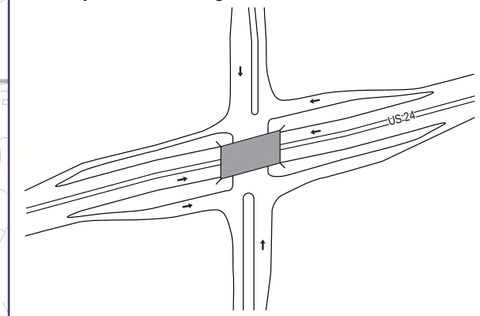
Alternative 4 - Six Lanes



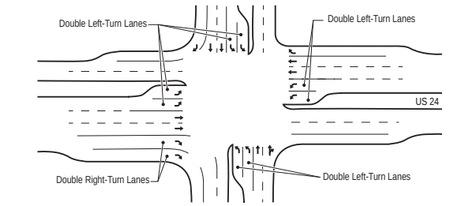
Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings

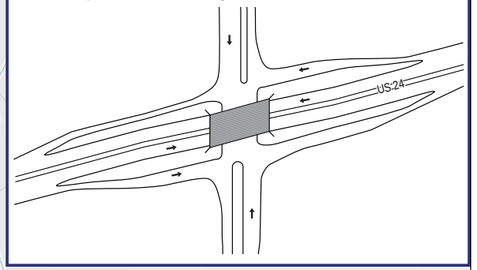
Grade-Separated Interchange



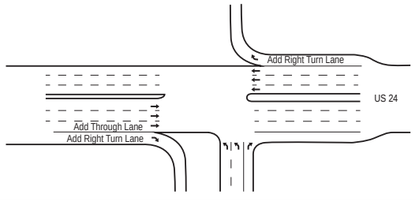
At-Grade Intersection Improvements



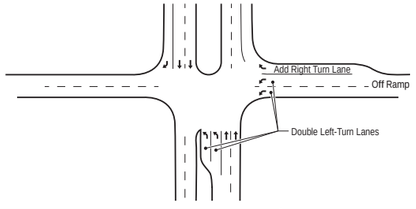
Grade-Separated Interchange



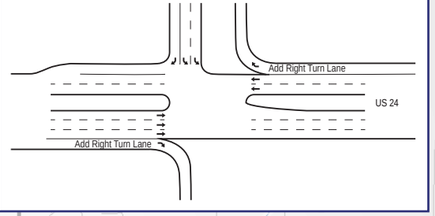
At-Grade Intersection Improvements



At-Grade Intersection Improvements



At-Grade Intersection Improvements



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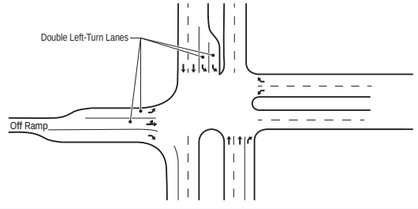


COLORADO SPRINGS

Murray Blvd

Palmer Park Rd

Powers Blvd

Peterson Rd

Platte Ave

Space Village Ave

Peterson Blvd

Peterson Air Force Base

Separated Multi-Use Path

Jimmy Creek Camp Park

21 310 311 312 313 314 315 24 94

LEGEND

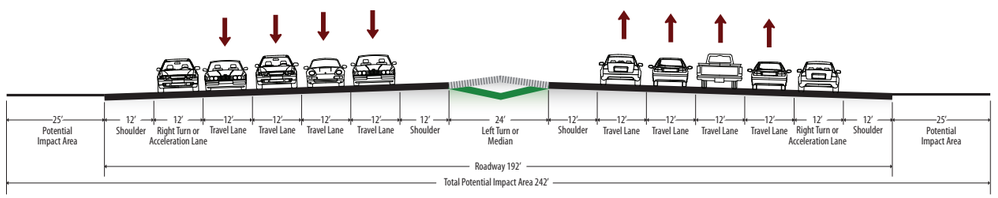
- Powers Blvd to Constitution Ave Segment
- County Boundary
- City Boundary
- Military Facility
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 Miles

NORTH

POWERS BLVD TO CONSTITUTION AVE SEGMENT - ALTERNATIVE 5

Alternative 5 - Eight Lanes



Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings

COLORADO SPRINGS

Murray Blvd

Palmer Park Rd

Powers Blvd

Peterson Rd

Marksheffel Rd

Constitution Ave

Platte Ave

Space Village Ave

Peterson Blvd

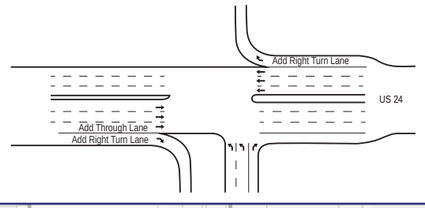
Peterson Air Force Base

Jimmy Creek Camp Park

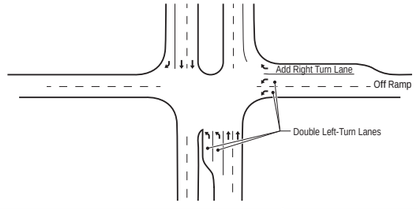
Separated Multi-Use Path

21 310 311 312 313 314 315 24 94

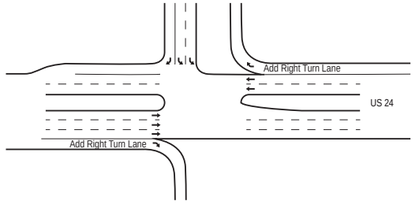
At-Grade Intersection Improvements



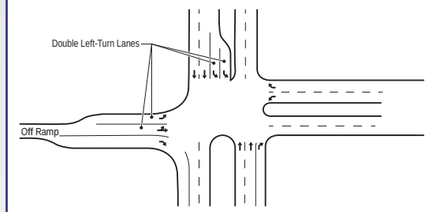
At-Grade Intersection Improvements



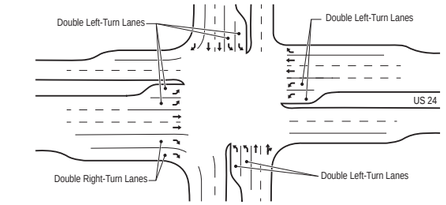
At-Grade Intersection Improvements



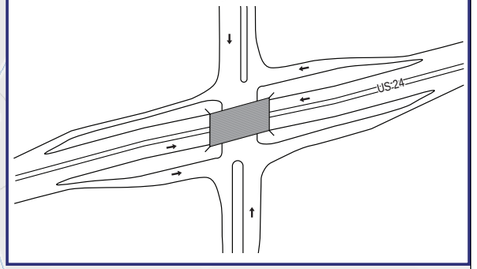
At-Grade Intersection Improvements



At-Grade Intersection Improvements



Grade-Separated Interchange



LEGEND

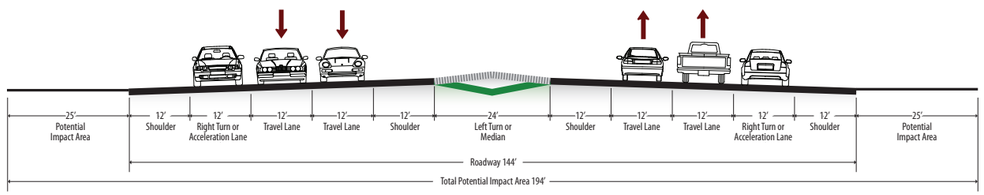
- Powers Blvd to Constitution Ave Segment
- County Boundary
- City Boundary
- Military Facility
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost (#)

0 0.5 Miles

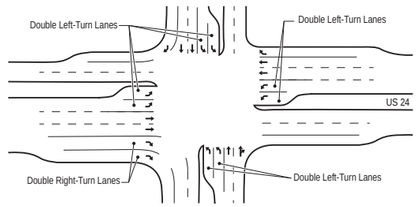
NORTH

CONSTITUTION AVE TO FALCON SEGMENT - ALTERNATIVE 1

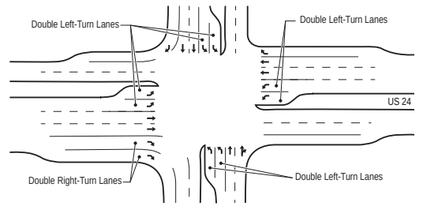
Alternative 1 - Four Lanes with Continuous Acceleration/Deceleration Lanes



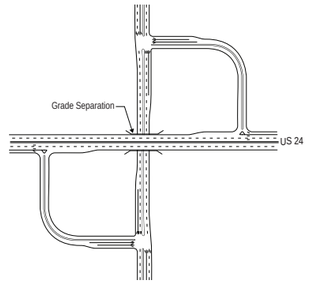
At-Grade Intersection Improvements



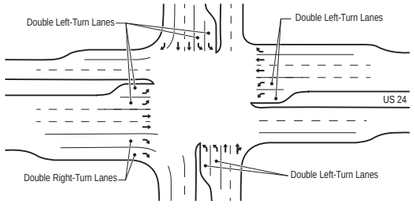
At-Grade Intersection Improvements



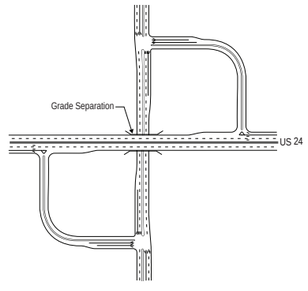
Junior Interchange



At-Grade Intersection Improvements



Junior Interchange



Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

LEGEND

- Constitution Ave to Falcon Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost
- Planned Roadway (Other plans)

0 0.5 1 Miles

NORTH

Woodmen Rd
Rock Island Trailhead
Pedestrian/Bicyclist Grade Separation
Tamlin Rd
Falcon Hwy
Meridian Rd
Curtis Rd
Garrett Rd
Jones Rd
Blaney Rd
COLORADO SPRINGS
Barnes Rd
Peterson Rd
Markshaffel Rd
Powers Blvd
Carefree Cir
Wildlife Crossing
Rock Island Trail Extension
Constitution Ave
Jimmy Creek Camp Park
21
24
314
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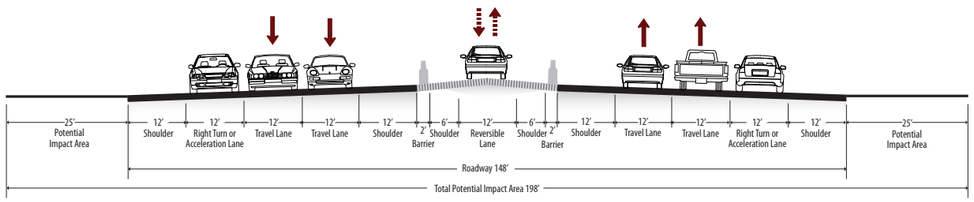
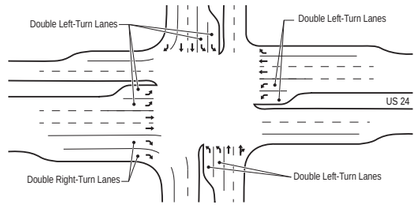
321

CONSTITUTION AVE TO FALCON SEGMENT - ALTERNATIVE 2

Alternative 2 - Four Lanes with Reversible Lane



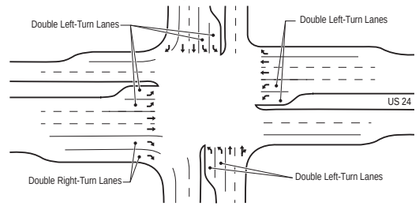
At-Grade Intersection Improvements



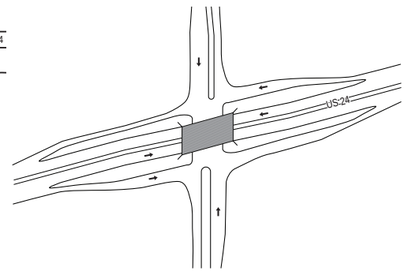
Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

At-Grade Intersection Improvements



Grade Separated Intersection



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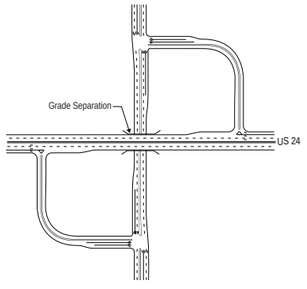
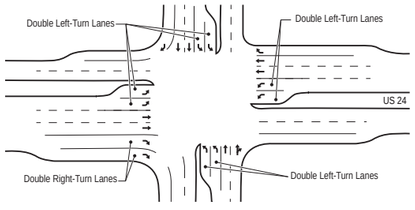


At-Grade Intersection Improvements



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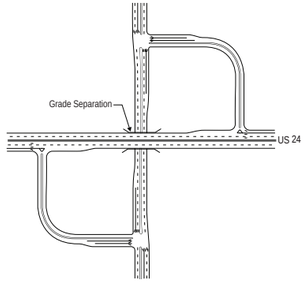


LEGEND

- Constitution Ave to Falcon Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost
- Planned Roadway (Other plans)

0 0.5 1 Miles

NORTH

Rock Island Trailhead

Pedestrian/Bicyclist Grade Separation

Wildlife Crossing

Rock Island Trail Extension

Jimmy Creek Camp Park

Woodmen Rd

Tamlin Rd

Falcon Hwy

Meridian Rd

Garrett Rd

Blaney Rd

Constitution Ave

Carefree Cir

Barnes Rd

Peterson Rd

Markshieffel Rd

Powers Blvd

COLORADO SPRINGS

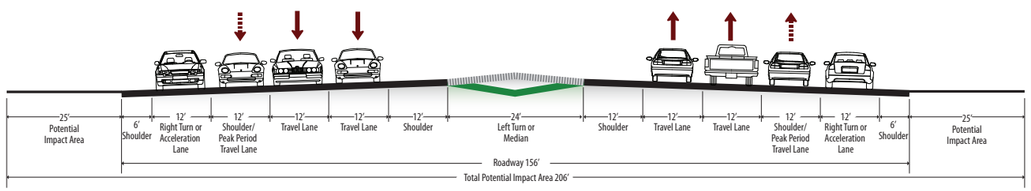
21

24

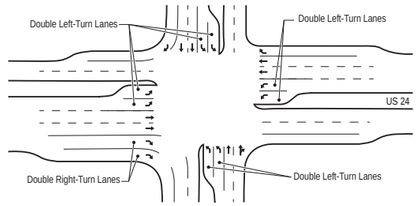
314 315 316 317 318 319 320 321

CONSTITUTION AVE TO FALCON SEGMENT - ALTERNATIVE 3

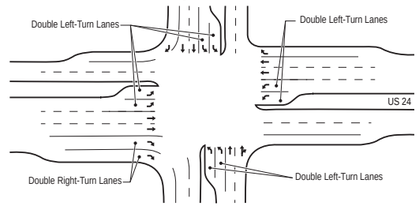
Alternative 3 - Four Lanes with Peak Period Shoulder Lanes



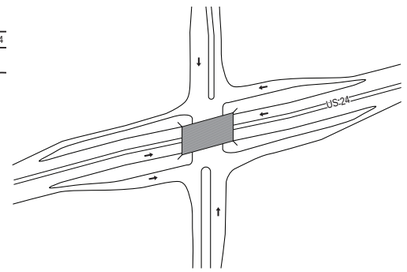
At-Grade Intersection Improvements



At-Grade Intersection Improvements



Grade Separated Intersection



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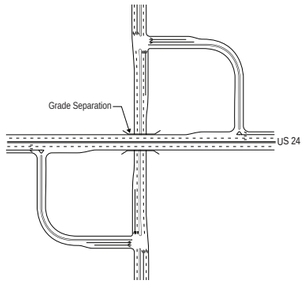
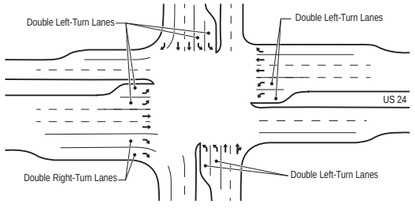


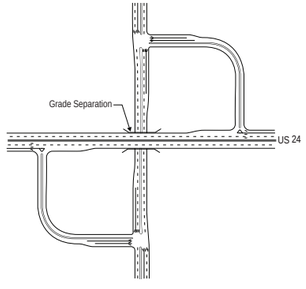
Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

At-Grade Intersection Improvements



Junior Interchange



LEGEND

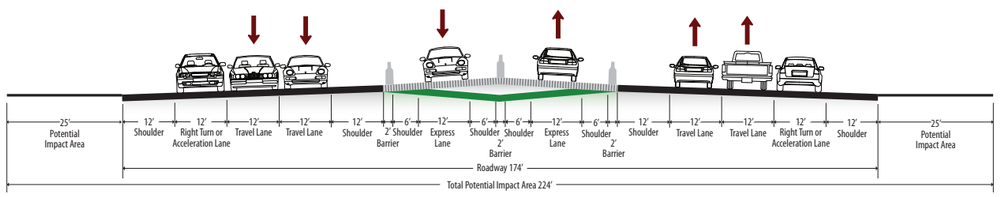
- Constitution Ave to Falcon Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost
- Planned Roadway (Other plans)

0 0.5 1 Miles

NORTH

CONSTITUTION AVE TO FALCON SEGMENT - ALTERNATIVE 4

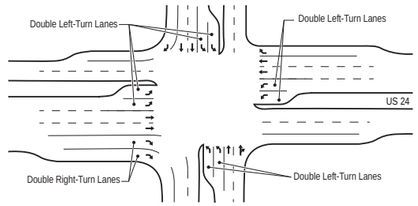
Alternative 4 - Four Lanes with Separated Express Lanes



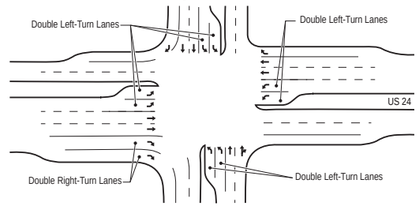
Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

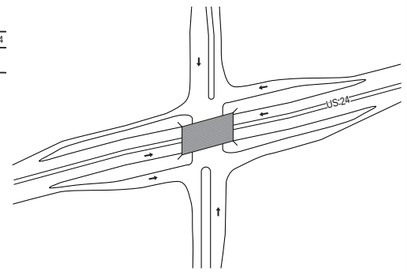
At-Grade Intersection Improvements



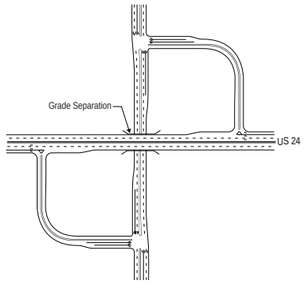
At-Grade Intersection Improvements



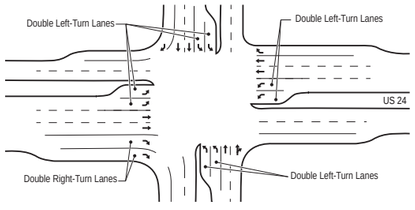
Grade Separated Intersection



Junior Interchange



At-Grade Intersection Improvements



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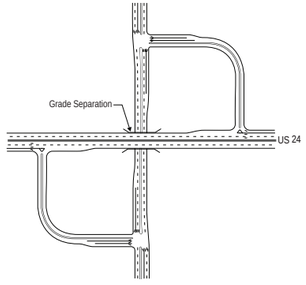


LEGEND

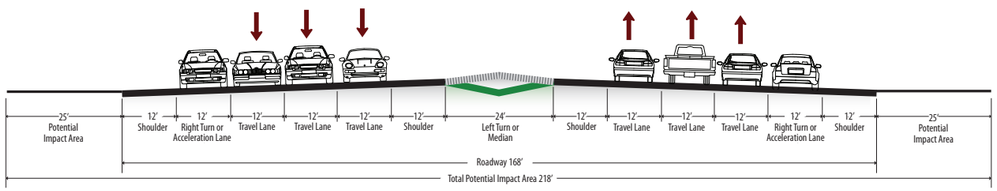
- Constitution Ave to Falcon Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost
- Planned Roadway (Other plans)

0 0.5 1 Miles

NORTH

CONSTITUTION AVE TO FALCON SEGMENT - ALTERNATIVE 5

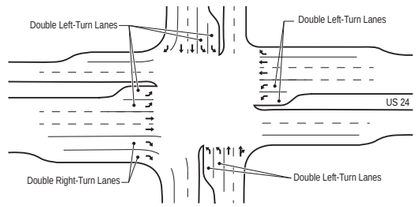
Alternative 5 - Six Lanes



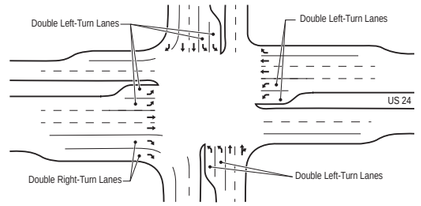
Other Elements

- Improved transit service
- Travel demand management strategies
- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

At-Grade Intersection Improvements



At-Grade Intersection Improvements



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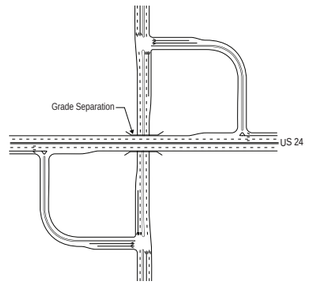
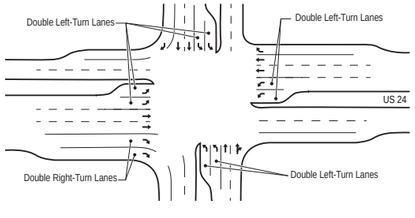


At-Grade Intersection Improvements



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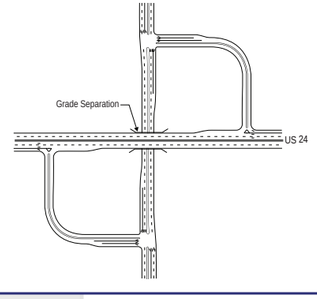

Woodmen Rd
Rock Island Trailhead
Pedestrian/Bicyclist Grade Separation
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Falcon Hwy
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Curtis Rd
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Blaney Rd
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LEGEND

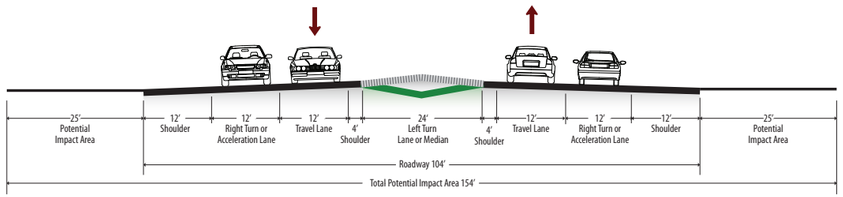
- Constitution Ave to Falcon Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Multi-Use Path/Trail
- US 24 Milepost
- Planned Roadway (Other plans)

0 0.5 1 Miles

NORTH

FALCON TO PEYTON SEGMENT - ALTERNATIVE 1

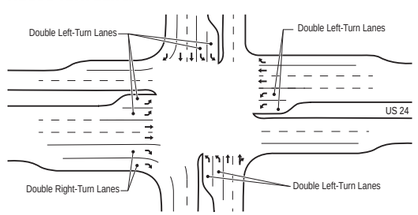
Alternative 1 - Two Lanes plus New Auxiliary Lanes



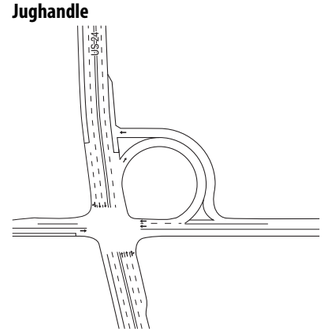
Other Elements

- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

Added Turn Lanes



Jughandle



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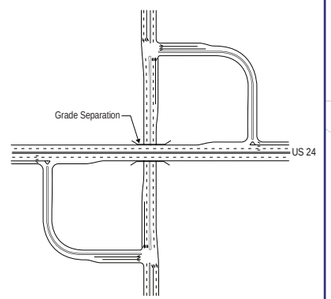
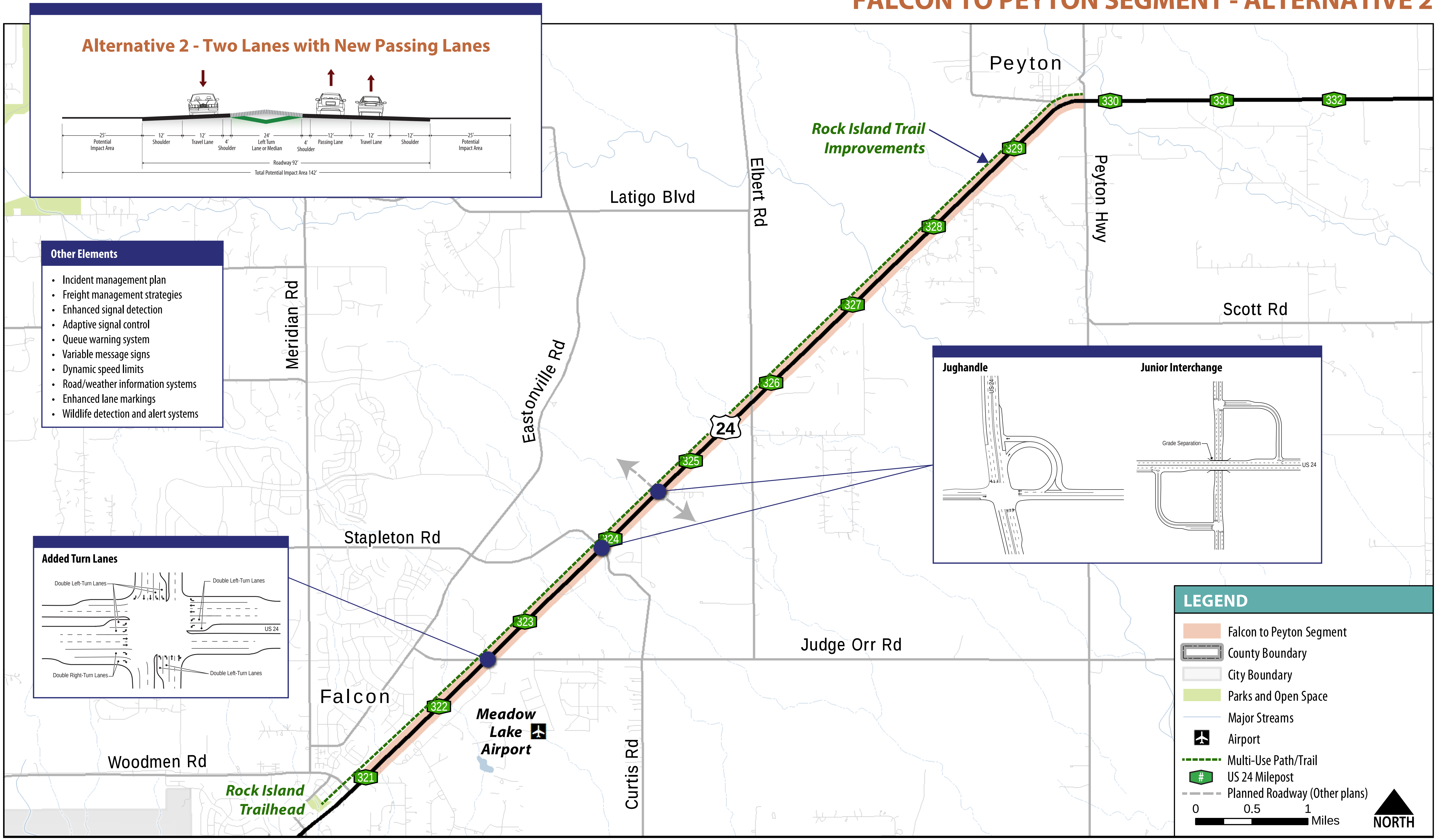


US 24 Planning and Environmental Linkages Study

FALCON TO PEYTON SEGMENT - ALTERNATIVE 2



Alternative 2 - Two Lanes with New Passing Lanes
25' Potential Impact Area
12' Shoulder
12' Travel Lane
4' Shoulder
24' Left Turn Lane or Median
4' Shoulder
12' Passing Lane
12' Travel Lane
12' Shoulder
25' Potential Impact Area
Roadway 92'
Total Potential Impact Area 142'
Other Elements
Incident management plan
Freight management strategies
Enhanced signal detection
Adaptive signal control
Queue warning system
Variable message signs
Dynamic speed limits
Road/weather information systems
Enhanced lane markings
Wildlife detection and alert systems
Added Turn Lanes
Double Left-Turn Lanes
Double Left-Turn Lanes
US 24
Double Right-Turn Lanes
Double Left-Turn Lanes
Jughandle
Junior Interchange
Grade Separation
US 24
Peyton
Rock Island Trail Improvements
Latigo Blvd
Elbert Rd
Peyton Hwy
Scott Rd
Meridian Rd
Eastonville Rd
Stapleton Rd
Judge Orr Rd
Falcon
Meadow Lake Airport
Woodmen Rd
Curtis Rd
Rock Island Trailhead
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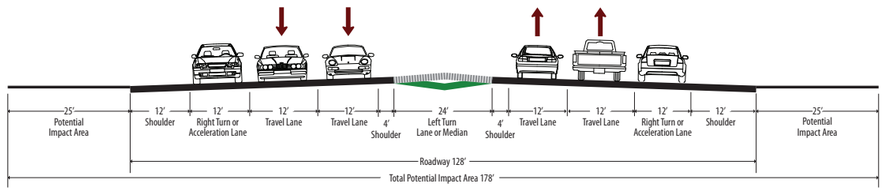
LEGEND
Falcon to Peyton Segment
County Boundary
City Boundary
Parks and Open Space
Major Streams
Airport
Multi-Use Path/Trail
US 24 Milepost
Planned Roadway (Other plans)
0 0.5 1 Miles
NORTH

FALCON TO PEYTON SEGMENT - ALTERNATIVE 3

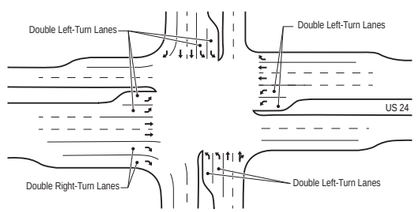
Alternative 3 - Four Lanes



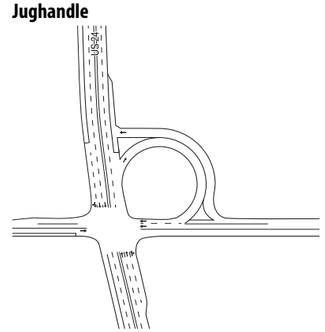
Other Elements

- Incident management plan
- Freight management strategies
- Enhanced signal detection
- Adaptive signal control
- Queue warning system
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

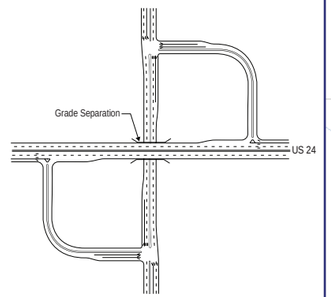
Added Turn Lanes



Jughandle



Junior Interchange



Peyton
Latigo Blvd
Elbert Rd
Peyton Hwy
Scott Rd
Meridian Rd
Eastonville Rd
Stapleton Rd
Judge Orr Rd
Falcon
Woodmen Rd
Curtis Rd
Rock Island Trail Improvements
Meadow Lake Airport
Rock Island Trailhead
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LEGEND

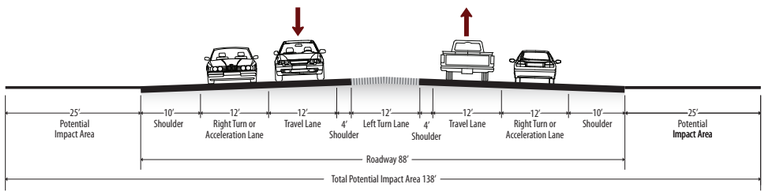
- Falcon to Peyton Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Airport
- Multi-Use Path/Trail
- US 24 Milepost
- Planned Roadway (Other plans)

0 0.5 1 Miles

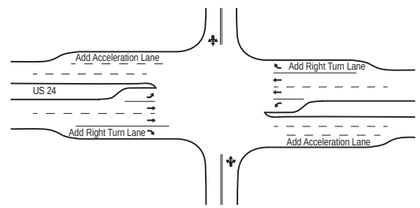
NORTH

PEYTON TO CALHAN SEGMENT - ALTERNATIVE 1

Alternative 1 - Two Lanes plus New Auxiliary Lanes



Added Turn Lanes



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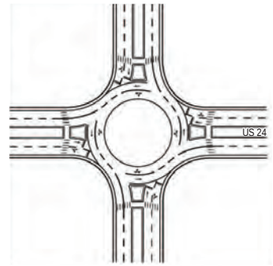

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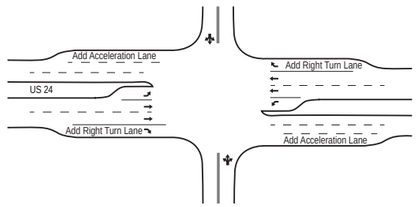

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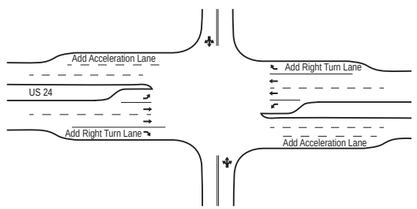


Roundabout

Other Elements

- Rapid flashing beacon pedestrian crossing (Calhan)
- Access control plan
- Incident management strategies
- Enhanced intersection signage
- Freight management strategies
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

LEGEND

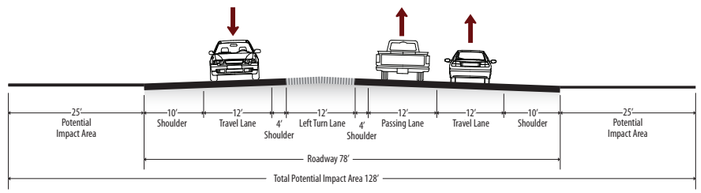
- Peyton to Calhan Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Airport
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 1 Miles

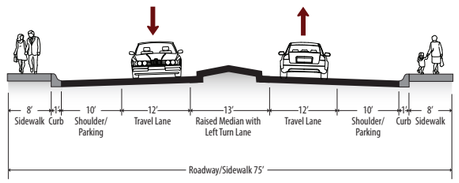
NORTH

PEYTON TO CALHAN SEGMENT - ALTERNATIVE 2

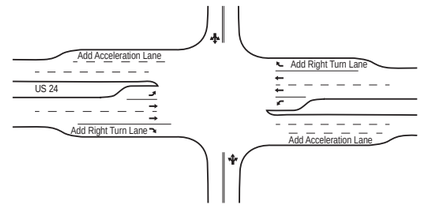
Alternative 2 - Two Lanes with New Passing Lanes



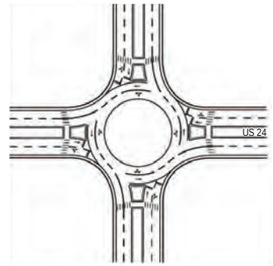
Alternative 2 (in Calhan) - Two Lanes with Raised Median



Added Turn Lanes



Roundabout



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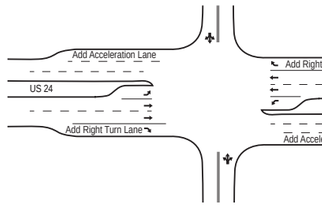
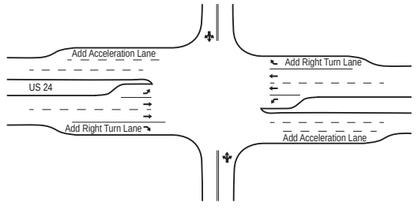


Roundabout

Added Turn Lanes



Other Elements

- Rapid flashing beacon pedestrian crossing (Calhan)
- Access control plan
- Incident management strategies
- Enhanced intersection signage
- Freight management strategies
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

Peyton

Kobilan Rd

McClelland Rd

Ellicott Hwy

Calhan Hwy

Soapweed Rd

Calhan

Rock Island Trail Extension

El Paso County Fairgrounds

330 331 332 333 334 24 335 336 337 338 40

Peyton Hwy

Mc Clelland Rd

Ellicott Hwy

Scott Rd

LEGEND

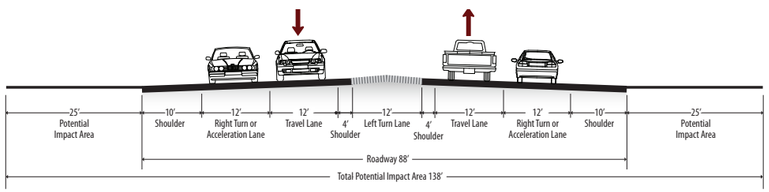
- Peyton to Calhan Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Airport
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 1 Miles

NORTH

CALHAN TO RAMAH SEGMENT - ALTERNATIVE 1

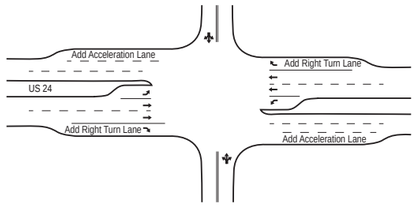
Alternative 1 - Two Lanes with New Auxiliary Lanes



Other Elements

- Access control plan
- Rapid flashing beacon pedestrian crossing (Calhan)
- Incident management strategies
- Enhanced intersection signage
- Freight management strategies
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

Added Turn Lanes



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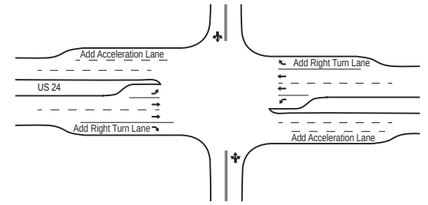

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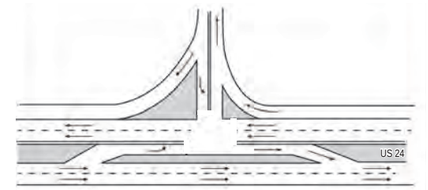

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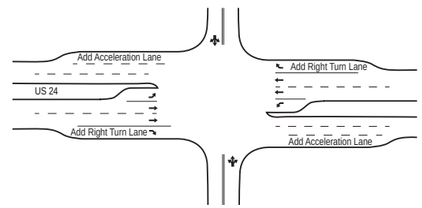

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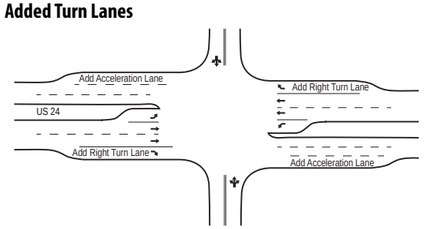
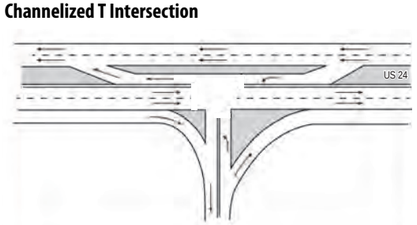


Channelized T Intersection



Ramah

Ramah Rd

Ramah Rd

Ramah Reservoir
State Wildlife Area

Rock Island Trail
Extension

Ramah Dam Rd

Blasingame Rd

Ramah Hwy

Eurich Rd

Calhan Hwy

Harrisville Rd

Calhan

339 340 341 342 343 344 345 346 347 348 349 350

24

LEGEND

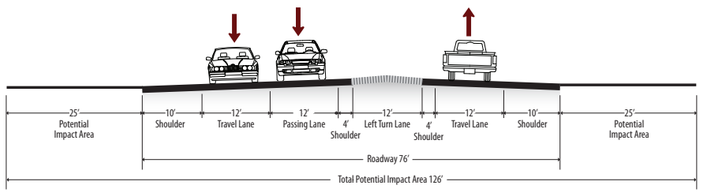
- Calhan to Ramah Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Airport
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 1 Miles

NORTH

CALHAN TO RAMAH SEGMENT - ALTERNATIVE 2

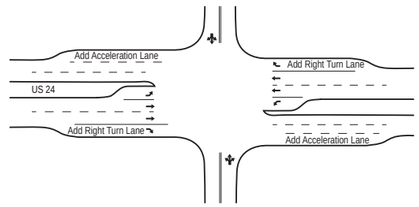
Alternative 2 - Two Lanes with New Passing Lanes



Other Elements

- Access control plan
- Rapid flashing beacon pedestrian crossing (Calhan)
- Incident management strategies
- Enhanced intersection signage
- Freight management strategies
- Variable message signs
- Dynamic speed limits
- Road/weather information systems
- Enhanced lane markings
- Wildlife detection and alert systems

Added Turn Lanes



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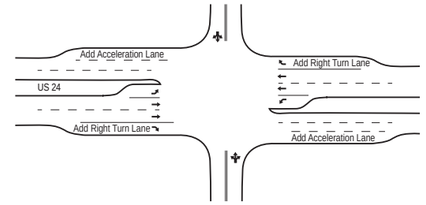

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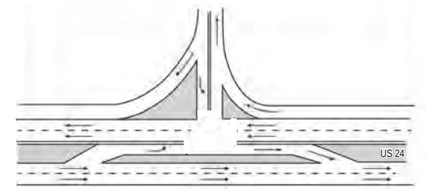

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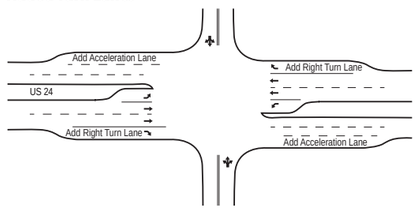

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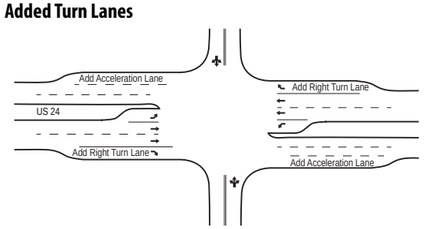

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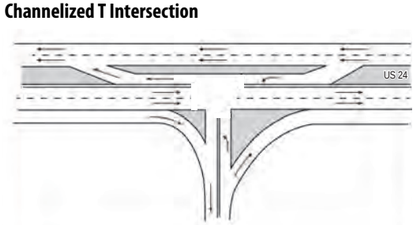

Ramah

Ramah Rd

Ramah Rd

Ramah Hwy

Ramah Reservoir State Wildlife Area

Rock Island Trail Extension

Eurich Rd

Calhan Hwy

Ramah Dam Rd

Blasingame Rd

Harrisville Rd

Calhan

339 340 341 342 343 344 345 346 347 348 350

24

LEGEND

- Calhan to Ramah Segment
- County Boundary
- City Boundary
- Parks and Open Space
- Major Streams
- Airport
- Multi-Use Path/Trail
- US 24 Milepost

0 0.5 1 Miles

NORTH

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APPENDIX C

LEVEL 2 SCREENING MATRIX

US 24 Planning and Environmental Linkages Study

Level 2 Screening Matrix - Powers Blvd to Constitution Ave Segment

4/6/17

Level 2 Evaluation Criteria		NA	1	2	3	4	5
		No Action	Four Lanes with Reversible Lane	Four Lanes with Peak Period Shoulder Lanes	Four Lanes with Separated Express Lanes	Six Lanes	Eight Lanes
Traffic Operations	Ability of the alternative to provide roadway capacity to meet 2040 travel demand	Forecasted 2040 demand (80,000 veh/day) exceeds capacity (65,600 veh/day). No capacity improvements and poor traffic operations.	Forecasted 2040 demand (80,000 veh/day) exceeds capacity (72,400 veh/day). Capacity improvements only during peak hours in peak direction.	Forecasted 2040 demand (80,000 veh/day) exceeds capacity (79,200 veh/day). Capacity improvements only during peak hours.	Forecasted 2040 demand (80,000 veh/day) less than capacity (91,000 veh/day). Capacity improvements with express lanes grade-separated through intersections.	Forecasted 2040 demand (80,000 veh/day) close to capacity (79,100 - 98,300 veh/day). Some capacity improvements, particularly during off-peak hours and at grade-separated interchange options.	Forecasted 2040 demand (80,000 veh/day) substantially less than capacity (105,400 - 130,000 veh/day), particularly during off-peak hours and at grade-separated interchange options.
	Ability of the alternative to allow intersections to operate at LOS D or better during future (2040) peak hours	Intersection operations degrade to LOS F with long delays and queues.	Intersection operations improve to LOS D or better with grade-separated interchanges removing traffic signals on US 24, but queuing remains from Powers Blvd east due to capacity constraints.	Intersection operations improve to LOS D or better with grade-separated interchanges removing traffic signals on US 24, but queuing remains from Powers Blvd east due to capacity constraints.	Delays and queues are reduced, but signal operations remain unacceptable at LOS F.	Some at-grade intersections remain unacceptable at LOS F, but with reduced delay and queuing. Intersection operations improve with grade-separated interchange options removing traffic signals on US 24.	Some at-grade intersections remain unacceptable at LOS F, but with reduced delay and queuing. Intersection operations improve with grade-separated interchange options removing traffic signals on US 24.
	Ability of the alternative to optimize future (2040) vehicular travel time for regional and local trips along the corridor	Travel time traveling along the corridor and accessing the corridor increases substantially due to intersection delays and queuing.	Travel time improvements along the corridor with grade-separated interchanges and reversible lane during peak hours in peak direction.	Travel time improvements along the corridor with grade-separated interchanges and additional lane in each direction during peak hours.	Travel time for traffic traveling through the corridor is reduced substantially, but travel time for traffic accessing the corridor is not improved.	Travel time improvements along the corridor, particularly during off-peak hours, but congestion remains with at-grade intersection options and travel time not substantially improved during peak hours.	Notable travel time improvements traveling along the corridor and accessing the corridor, although some delays remain with at-grade intersection options.
Safety	Ability of the alternative to address unsafe physical or operational conditions along US 24	No changes to existing physical conditions and operational conditions worsen with increased delays and queues.	Safety benefits to US 24 traffic with grade-separated interchanges, but new safety concerns introduced with driver expectancy issues related to reversible operations as only corridor in region.	Safety benefits to US 24 traffic with grade-separated interchanges, but minimal safety benefits with peak period lanes due to queues remaining from highway capacity constraints.	Some safety benefits of reduced congestion and queues at intersections and separated express lanes for through traffic, but remaining congestion for at-grade intersections.	Safety benefits of reduced congestion and queues at intersections, and substantially reduced conflict points with grade-separated interchange options.	Improvements address safety issues associated with peak hour congestion, particularly with grade-separated interchange options.
	Ability of the alternative to reduce the number of potential multimodal conflict points	No reduction in potential multimodal conflict points.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets, but interchanges provide grade-separated crossing of US 24.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets, but interchanges provide grade-separated crossing of US 24.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections, but grade-separated express lanes will lower traffic volume conflicts at intersections.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.
Community	Ability of the alternative to provide consistency with the US 24 Access Control Plan and reasonable access compatible with the functional characteristics of the roadway	Maintaining all existing accesses is not consistent with Access Control Plan.	Access Control Plan includes future interchange at Constitution Ave, but signals at CO 94 and Marksheffel Rd.	Access Control Plan includes future interchange at Constitution Ave, but signals at CO 94 and Marksheffel Rd.	Access Control Plan includes signals at CO 94 and Marksheffel Rd, but future interchange at Constitution Ave.	With at-grade intersection options at CO 94 and Marksheffel Rd and interchange at Constitution Ave control consistent with Access Control Plan.	With at-grade intersection options at CO 94 and Marksheffel Rd and interchange at Constitution Ave control consistent with Access Control Plan.
	Ability of the alternative to provide consistency with the US 24 East Congestion Management Plan	No improvements to US 24 corridor is not consistent with the US 24 East Congestion Management Plan.	Lack of US 24 widening for a full lane in each direction not consistent with US 24 East Congestion Management Plan.	Lack of US 24 widening for a full lane in each direction not consistent with US 24 East Congestion Management Plan.	Widening for a full lane in each direction is consistent with US 24 East Congestion Management Plan.	Widening for a full lane in each direction is consistent with US 24 East Congestion Management Plan.	Widening for additional full lanes in each direction is consistent with US 24 East Congestion Management Plan.
	Relative property impacts based on estimated acres of residential and business properties impacted	No right-of-way impacts.	36 properties potentially impacted	76 properties potentially impacted	90 properties potentially impacted	78 properties potentially impacted	101 properties potentially impacted
	Ability of the alternative to receive general public and agency support for the transportation recommendations	Congestion and operational issues not acceptable for agency and public stakeholders.	Public responded negatively to alternative and congestion and operational issues generally not acceptable.	Public showed slight preference for alternative although key agency stakeholder does not prefer grade separations at intersections.	General public neutral on alternative and key agency stakeholder does not prefer grade separations for express lanes.	General public neutral on alternative and agency stakeholders agree with widening, but without grade separations at intersections.	General public neutral on alternative and agency stakeholders generally agree with widening, although key agency stakeholder prefers six lanes and at-grade intersections.
	Ability of the alternative to support local and regional planning efforts	No improvements to US 24 corridor is not consistent with previous local and regional planning efforts.	Remaining congestion along US 24 not consistent with previous local and regional planning efforts.	Remaining congestion along US 24 not consistent with previous local and regional planning efforts.	Highway widening and interchange access at Constitution Ave consistent with previous local and regional planning efforts.	Highway widening and interchange access at Constitution Ave consistent with previous local and regional planning efforts.	Highway widening consistent with previous local and regional planning efforts.
	Ability of the alternative to complement local community surroundings with design and operational context	Congestion and operational issues do not complement surrounding future suburban development.	Design and operations consistent with urbanized expressway corridor, although additional access control required between Powers Blvd and Peterson Rd.	Design and operations consistent with urbanized expressway corridor, although additional access control required between Powers Blvd and Peterson Rd.	Design and operations consistent with urbanized expressway corridor, although additional access control required between Powers Blvd and Peterson Rd.	Design and operations consistent with urbanized expressway corridor.	Design and operations consistent with urbanized expressway corridor.

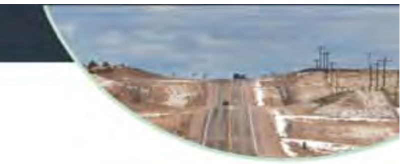
US 24 Planning and Environmental Linkages Study

Level 2 Screening Matrix - Powers Blvd to Constitution Ave Segment

4/6/17

Level 2 Evaluation Criteria		NA	1	2	3	4	5
		No Action	Four Lanes with Reversible Lane	Four Lanes with Peak Period Shoulder Lanes	Four Lanes with Separated Express Lanes	Six Lanes	Eight Lanes
Environmental Resources	Ability of the alternative to avoid and minimize impacts on environmental resources within the built and natural environment	Some impacts to air quality due to increasing congestion. Some impacts to wildlife movements with increasing volume and congestion.	Property impacts to 2 potential hazardous material sites	Property impacts to 3 potential hazardous material sites	Property impacts to 4 potential hazardous material sites	Property impacts to 4 potential hazardous material sites	Property impacts to 4 potential hazardous material sites Potential impacts to World Golf & Sand Creek Golf Course
Multimodal Connectivity	Ability of the alternative to provide infrastructure for local pedestrian and bicyclist movements (across US 24)	No infrastructure added to facilitate pedestrian and bicyclist movements.	Interchanges provide grade-separated crossing of US 24.	Interchanges provide grade-separated crossing of US 24.	Grade-separated lanes at intersections accommodate potential at-grade crossing improvements at signalized intersections.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.
	Ability of the alternative to accommodate the expansion of regional multimodal transportation options (along US 24)	Continued congestion and lack of pedestrian and bicyclist facilities do not accommodate additional transit, pedestrian, or bicyclist travel options.	Multi-use path provided along the corridor, along with additional transit opportunities, although continued congestion may discourage transit use.	Multi-use path provided along the corridor, along with additional transit opportunities, although continued congestion may discourage transit use.	Multi-use path provided along the corridor and transit may use express lanes to provide travel time incentive.	Multi-use path provided along the corridor, along with additional transit opportunities with reduced congestion, particularly with grade-separated interchange options.	Multi-use path provided along the corridor, along with additional transit opportunities with reduced congestion, particularly with grade-separated interchange options.
	Ability of the alternative to enhance freight mobility along US 24	No enhancements for freight mobility along the corridor.	Freight mobility enhanced with wider shoulders, grade-separated interchanges, and removal of traffic signals along US 24.	Freight mobility enhanced with wider shoulders, grade-separated interchanges, and removal of traffic signals along US 24.	Freight mobility enhanced with wider shoulders and trucks may use express lanes to reduce travel time and conflicts.	Freight mobility enhanced with wider shoulders, more lanes for passing, and grade-separated interchange options.	Freight mobility enhanced with wider shoulders, more lanes for passing, and grade-separated interchange options.
Implementability	Relative cost of the alternative	No construction cost and no right-of-way acquisition.	Relatively high cost due to infrastructure for reversible lane operations, interchange construction and potential right-of-way acquisitions, and maintenance for new bridge structures at interchanges.	Relatively high cost due to infrastructure for peak period shoulder lane operations, interchange construction and potential right-of-way acquisitions, and maintenance for new bridge structures at interchanges.	Relatively high cost due to infrastructure for grade-separated express lane at intersections, potential right-of-way acquisitions, and maintenance for new bridge structures at intersections.	Relatively moderate cost with highway widening and at-grade intersection improvements. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.	Relatively moderate cost with highway widening and at-grade intersection improvements. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.
	Ability to phase implementation into fundable construction projects	N/A	Interchanges can be constructed as separate projects, but infrastructure and operations for reversible lane must be implemented as one project.	Interchanges can be constructed as separate projects, but operations for peak period shoulder lanes must be implemented as one project.	At-grade intersection improvements can be constructed as separate projects, but infrastructure and operations for separated express lanes must be implemented as one project for capacity benefits.	Intersection/interchange improvements can be constructed as separate projects and highway widening can be constructed in sections as separate projects with capacity benefits.	Intersection/interchange improvements can be constructed as separate projects and highway widening can be constructed in sections as separate projects with capacity benefits.
SUMMARY OF RESULTS		CARRIED FORWARD	ELIMINATED	CARRIED FORWARD	NOT RECOMMENDED	CARRIED FORWARD	CARRIED FORWARD
Notes		Further analysis required as the No Action Alternative for comparison to improvement alternatives.	This alternative is eliminated from further consideration because the alternative does not meet the Purpose and Need to improve mobility and safety along the corridor due to the limited capacity of the reversible lane and the new safety concerns introduced with driver expectancy issues related to the reversible lane operations. This alternative also has relatively high cost and is not consistent with previous planning efforts.	This alternative is carried forward for further evaluation because the improvements provide adequate vehicular capacity for peak hour operations and would provide traffic operational and safety benefits related to peak hour congestion with fewer impacts than other alternatives and flexibility to serve as a phased implementation for full widening.	This alternative is not recommended for further consideration because the improvements would result in comparably higher property impacts without better local mobility for drivers accessing the corridor than other alternatives.	This alternative is carried forward for further evaluation because the improvement provides adequate vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with fewer property impacts than other alternatives and opportunities to implement as separate, fundable projects.	This alternative is carried forward for further evaluation because the improvement provides substantially more vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with some property impacts and opportunities to implement as separate, fundable projects.

GREEN = Comparatively beneficial and/or minor impacts
BLACK = Comparatively neutral benefits and/or moderate impacts
RED = Comparatively minor benefits and/or major impacts



Level 2 Screening Matrix - Constitution Ave to Falcon (Woodmen Rd) Segment

4/6/17

Level 2 Evaluation Criteria		NA No Action	1 Four Lanes with Continuous Acceleration/Deceleration Lanes	2 Four Lanes with Reversible Lane	3 Four Lanes with Peak Period Shoulder Lanes	4 Four Lanes with Separated Express Lanes	5 Six Lanes
Traffic Operations	Ability of the alternative to provide roadway capacity to meet 2040 travel demand	Forecasted 2040 demand (42,000 veh/day) exceeds capacity (37,800 veh/day). No capacity improvements and poor traffic operations.	Forecasted 2040 demand (42,000 veh/day) exceeds capacity (39,800 veh/day). Minimal operational improvements along the corridor.	Forecasted 2040 demand (42,000 veh/day) less than capacity (46,600 veh/day). Capacity improvements only during peak hours in peak direction.	Forecasted 2040 demand (42,000 veh/day) less than capacity (53,400 veh/day). Capacity improvements only during peak hours.	Forecasted 2040 demand (42,000 veh/day) substantially less than capacity (64,000 veh/day). Capacity improvements with express lanes grade-separated through intersections.	Forecasted 2040 demand (42,000 veh/day) substantially less than capacity (59,900 - 79,100 veh/day). Substantial capacity improvements, particularly during off-peak hours and at grade-separated interchange options.
	Ability of the alternative to allow intersections to operate at LOS D or better during future (2040) peak hours	Intersection operations degrade to LOS F with long delays and queues.	Intersection operations remain at LOS F with at-grade intersection options, but with reduced delay and queuing.	Intersection operations improve to LOS D or better at all intersections.	Intersection operations improve to LOS D or better at all intersections.	Intersection operations improve to LOS D or better at all intersections.	Intersection operations improve to LOS D or better at all intersections.
	Ability of the alternative to optimize future (2040) vehicular travel time for regional and local trips along the corridor	Travel time traveling along the corridor and accessing the corridor increases substantially due to intersection delays and queuing.	Limited improvement in travel time along the corridor or accessing the corridor.	Travel time improvements along the corridor limited to peak hours in peak direction.	Travel time improvements along the corridor limited to peak hours.	Travel time for traffic traveling through the corridor is reduced substantially, but travel time for traffic accessing the corridor is not improved.	Notable travel time improvements traveling along the corridor and accessing the corridor.
Safety	Ability of the alternative to address unsafe physical or operational conditions along US 24	No changes to existing physical conditions and operational conditions worsen with increased delays and queues.	Minimal safety benefits of reduced congestion and queues at intersections, but wildlife crossing addresses crashes related to wildlife.	Safety benefits limited to peak hours and new safety concerns introduced with driver expectancy issues related to reversible operations as only corridor in region. Wildlife crossing addresses crashes related to wildlife.	Improvements address safety issues associated with peak hour congestion, particularly with grade-separated interchange options. Wildlife crossing addresses crashes related to wildlife.	Some safety benefits of reduced congestion and queues at intersections and separated express lanes for through traffic. Wildlife crossing addresses crashes related to wildlife.	Improvements address safety issues associated with peak hour congestion, particularly with grade-separated interchange options. Wildlife crossing addresses crashes related to wildlife.
	Ability of the alternative to reduce the number of potential multimodal conflict points	No reduction in potential multimodal conflict points.	Pedestrian/bicyclist grade separation would reduce potential conflict. The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.	Pedestrian/bicyclist grade separation would reduce potential conflict. The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.	Pedestrian/bicyclist grade separation would reduce potential conflict. The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.	Pedestrian/bicyclist grade separation would reduce potential conflict. The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.	Pedestrian/bicyclist grade separation would reduce potential conflict. The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points across side streets. Grade-separated interchange options would reduce conflict. Additional lanes with at-grade intersection options would increase conflict.
Community	Ability of the alternative to provide consistency with the US 24 Access Control Plan and reasonable access compatible with the functional characteristics of the roadway.	Maintaining all existing accesses is not consistent with Access Control Plan.	At-grade intersection control consistent with Access Control Plan.	At-grade intersection control consistent with Access Control Plan.	At-grade intersection control consistent with Access Control Plan.	At-grade intersection control consistent with Access Control Plan.	At-grade intersection control consistent with Access Control Plan.
	Ability of the alternative to provide consistency with the US 24 East Congestion Management Plan	No improvements to US 24 corridor is not consistent with the US 24 East Congestion Management Plan.	Limited intersection improvements not consistent with US 24 East Congestion Management Plan.	Peak hour capacity improvements not consistent with US 24 East Congestion Management Plan.	Peak hour capacity improvements not consistent with US 24 East Congestion Management Plan.	Widening for full lane in each direction is consistent with US 24 East Congestion Management Plan.	Widening for full lane in each direction is consistent with US 24 East Congestion Management Plan.
	Relative property impacts based on estimated acres of residential and business properties impacted	No right-of-way impacts.	35 properties potentially impacted	35 properties potentially impacted	36 properties potentially impacted	38 properties potentially impacted	36 properties potentially impacted
	Ability of the alternative to receive general public and agency support for the transportation recommendations	Congestion and operational issues not acceptable for agency and public stakeholders.	Public showed slight preference for alternative although agency stakeholders generally agree with more capacity improvements.	Public responded negatively to alternative and agency stakeholders neutral on alternative.	Public showed slight preference for alternative and agency stakeholders neutral on alternative.	General public neutral on alternative and key agency stakeholder does not prefer grade separations for express lanes.	General public neutral on alternative and agency stakeholders agree with widening, but without grade separations at intersections.
	Ability of the alternative to support local and regional planning efforts	No improvements to US 24 corridor is not consistent with previous local and regional planning efforts.	Remaining congestion along US 24 not consistent with previous local and regional planning efforts. Improved at-grade intersection configurations at Meridian and Woodmen intersections consistent with previous local plans.	Operational improvements consistent with previous local and regional planning efforts. Improved at-grade intersection configurations at Meridian and Woodmen intersections consistent with previous local plans.	Operational improvements consistent with previous local and regional planning efforts. Improved at-grade intersection configurations at Meridian and Woodmen intersections consistent with previous local plans.	Highway widening consistent with previous local and regional planning efforts. Improved at-grade intersection configurations at Meridian and Woodmen intersections consistent with previous local plans.	Highway widening consistent with previous local and regional planning efforts. Improved at-grade intersection configurations at Meridian and Woodmen intersections consistent with previous local plans.
	Ability of the alternative to complement local community surroundings with design and operational context	Congestion and operational issues do not complement surrounding future suburban development.	Design and operations consistent with urbanized expressway corridor.	Design and operations consistent with urbanized expressway corridor, although additional access control may be required at intersections.	Design and operations consistent with urbanized expressway corridor, although additional access control may be required at intersections.	Design and operations consistent with urbanized expressway corridor, although additional access control may be required at intersections.	Design and operations consistent with urbanized expressway corridor.

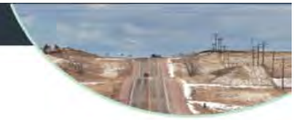
Level 2 Screening Matrix - Constitution Ave to Falcon (Woodmen Rd) Segment

4/6/17

Level 2 Evaluation Criteria		NA No Action	1 Four Lanes with Continuous Acceleration/Deceleration Lanes	2 Four Lanes with Reversible Lane	3 Four Lanes with Peak Period Shoulder Lanes	4 Four Lanes with Separated Express Lanes	5 Six Lanes
Environmental Resources	Ability of the alternative to avoid and minimize impacts on environmental resources within the built and natural environment	Some impacts to air quality due to increasing congestion. Some impacts to wildlife movements with increasing congestion.	Property impacts to 4 potential hazardous material sites Potential impacts to Falcon Meadow RV Campground, Falcon Fire Station, Pikes Peak Library (High Prairie), PPCC Falcon Campus, Rock Island Trailhead Wildlife crossing improvements facilitate wildlife movements	Property impacts to 4 potential hazardous material sites Potential impacts to Falcon Meadow RV Campground, Falcon Fire Station, Pikes Peak Library (High Prairie), PPCC Falcon Campus, Rock Island Trailhead Wildlife crossing improvements facilitate wildlife movements	Property impacts to 4 potential hazardous material sites Potential impacts to Falcon Meadow RV Campground, Falcon Fire Station, Pikes Peak Library (High Prairie), PPCC Falcon Campus, Rock Island Trailhead Wildlife crossing improvements facilitate wildlife movements	Property impacts to 4 potential hazardous material sites Potential impacts to Falcon Meadow RV Campground, Falcon Fire Station, Pikes Peak Library (High Prairie), PPCC Falcon Campus, Rock Island Trailhead Wildlife crossing improvements facilitate wildlife movements	Property impacts to 4 potential hazardous material sites Potential impacts to Falcon Meadow RV Campground, Falcon Fire Station, Pikes Peak Library (High Prairie), PPCC Falcon Campus, Rock Island Trailhead Wildlife crossing improvements facilitate wildlife movements
Multimodal Connectivity	Ability of the alternative to provide infrastructure for local pedestrian and bicyclist movements (across US 24)	No infrastructure added to facilitate pedestrian and bicyclist movements.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.	Additional lanes and reversible lane operations hinder potential at-grade crossing improvements at signalized intersections, but interchange options provide grade-separated crossing of US 24.	Additional lanes and peak period operations hinder potential at-grade crossing improvements at signalized intersections, but interchange options provide grade-separated crossing of US 24.	Grade-separated lanes at intersections accommodate potential at-grade crossing improvements at signalized intersections. Interchange options provide grade-separated crossing of US 24.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.
	Ability of the alternative to accommodate the expansion of regional multimodal transportation options (along US 24)	Continued congestion and lack of pedestrian and bicyclist facilities do not accommodate additional transit, pedestrian, or bicyclist travel options.	Multi-use path provided along the corridor, along with additional transit opportunities, although continued congestion may discourage use.	Multi-use path provided along the corridor, along with additional transit opportunities, although continued congestion at intersections may discourage use.	Multi-use path provided along the corridor, along with additional transit opportunities, although continued congestion at intersections may discourage use.	Multi-use path provided along the corridor and transit may use express lanes to provide travel time incentive.	Multi-use provided along the corridor, along with additional transit opportunities with reduced congestion, particularly with grade-separated interchange options.
	Ability of the alternative to enhance freight mobility along US 24	No enhancements for freight mobility along the corridor.	Freight mobility enhanced with wider shoulders and grade-separated interchange options.	Freight mobility enhanced with wider shoulders and grade-separated interchange options.	Freight mobility enhanced with wider shoulders and grade-separated interchange options.	Freight mobility enhanced with wider shoulders and trucks may use express lanes to reduce travel time and conflicts.	Freight mobility enhanced with wider shoulders, more lanes for passing, and grade-separated interchange options.
Implementability	Relative cost of the alternative	No construction cost and no right-of-way acquisition.	Relatively low cost with limited highway widening and at-grade intersection improvements. Relatively moderate cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.	Relatively moderate cost due to infrastructure for reversible lane infrastructure and operations. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.	Relatively moderate cost due to infrastructure for peak period shoulder lane operations. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.	Relatively high cost due to infrastructure for grade-separated express lane at intersections, potential right-of-way acquisitions, and maintenance for new bridge structures at intersections.	Relatively moderate cost with highway widening and at-grade intersection improvements. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.
	Ability to phase implementation into fundable construction projects	N/A	Intersection/interchange improvements can be constructed as separate projects and acceleration/deceleration lanes can be constructed as separate projects with some benefits.	Interchanges can be constructed as separate projects, but infrastructure and operations for reversible lane must be implemented as one project.	Interchanges can be constructed as separate projects, but operations for peak period shoulder lanes must be implemented as one project.	At-grade intersection improvements can be constructed as separate projects, but infrastructure and operations for separated express lanes must be implemented as one project for capacity benefits.	Intersection/interchange improvements can be constructed as separate projects and highway widening can be constructed in sections as separate projects with capacity benefits.
SUMMARY OF RESULTS		CARRIED FORWARD	ELIMINATED	ELIMINATED	CARRIED FORWARD	NOT RECOMMENDED	CARRIED FORWARD
Notes		Further analysis required as the No Action Alternative for comparison to improvement alternatives.	This alternative is eliminated from further consideration because the alternative does not meet the Purpose and Need to improve mobility along the corridor due to the additional capacity limited at intersections.	This alternative is eliminated from further consideration because the alternative does not meet the Purpose and Need to improve safety along the corridor due to the new safety concerns introduced with driver expectancy issues related to the reversible lane operations. This alternative also has relatively high cost and is not consistent with previous planning efforts.	This alternative is carried forward for further evaluation because the improvement provides additional vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with fewer property impacts than other alternatives and opportunities to implement as separate, fundable projects.	This alternative is not recommended for further consideration because the improvements would result in comparably higher property impacts and cost with similar capacity benefits to other alternatives.	This alternative is carried forward for further evaluation because the improvement provides substantially more vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with some property impacts and opportunities to implement as separate, fundable projects.

GREEN = Comparatively beneficial and/or minor impacts
BLACK = Comparatively neutral benefits and/or moderate impacts
RED = Comparatively minor benefits and/or major impacts

US 24 Planning and Environmental Linkages Study



Level 2 Screening Matrix - Falcon (Woodmen Rd) to Peyton Segment

4/6/17

Level 2 Evaluation Criteria		NA	1	2	3
		No Action	Two Lanes plus New Auxiliary Lanes	Two Lanes with New Passing Lanes	Four Lanes
Traffic Operations	Ability of the alternative to provide roadway capacity to meet 2040 travel demand	Forecasted 2040 demand (23,000 veh/day) exceeds capacity (16,200 veh/day). No capacity improvements and poor traffic operations.	Forecasted 2040 demand (23,000 veh/day) exceeds capacity (17,000 veh/day). Operational improvements limited to intersection locations.	Forecasted 2040 demand (23,000 veh/day) less than capacity (25,600 veh/day). Operational improvements at intersections and along corridor.	Forecasted 2040 demand (23,000 veh/day) substantially less than capacity (33,700 veh/day). Operational improvements at intersections and along corridor.
	Ability of the alternative to allow intersections to operate at LOS D or better during future (2040) peak hours	Intersection operations degrade to LOS F with long delays and queues.	Intersection operations improve to LOS D or better at all intersections.	Intersection operations improve to LOS D or better at all intersections.	Intersection operations improve to LOS D or better at all intersections.
	Ability of the alternative to optimize future (2040) vehicular travel time for regional and local trips along the corridor	Travel time traveling along the corridor and accessing the corridor increases substantially due to intersection delays and queuing.	Some improvement in travel time accessing the corridor at intersections, but no notable improvement in travel time along the corridor.	Notable travel time improvements traveling along the corridor and accessing the corridor.	Notable travel time improvements traveling along the corridor and accessing the corridor.
Safety	Ability of the alternative to address unsafe physical or operational conditions along US 24	No changes to existing physical conditions and operational conditions worsen with increased delays and queues.	Some improvements in safety at intersections, but no changes to safety issues related to passing maneuvers.	Improvements address safety issues associated with intersection congestion and some passing maneuvers.	Improvements address safety issues associated with intersection congestion and passing maneuvers.
	Ability of the alternative to reduce the number of potential multimodal conflict points	No reduction in potential multimodal conflict points.	Crossing improvements of the Rock Island Trail at intersections would reduce multimodal conflict points. Additional lanes would increase conflict.	Crossing improvements of the Rock Island Trail at intersections would reduce multimodal conflict points. Additional lanes would increase conflict.	Crossing improvements of the Rock Island Trail at intersections would reduce multimodal conflict points. Additional lanes would increase conflict.
Community	Ability of the alternative to provide consistency with the US 24 Access Control Plan and reasonable access compatible with the functional characteristics of the roadway	Maintaining all existing accesses is not consistent with Access Control Plan.	At-grade intersection options consistent with Access Control Plan to Elbert Highway and other intersection and corridor improvements consistent with transitioning suburban highway.	At-grade intersection options consistent with Access Control Plan to Elbert Highway and other intersection and corridor improvements consistent with transitioning suburban highway.	At-grade intersection options consistent with Access Control Plan to Elbert Highway and other intersection and corridor improvements consistent with transitioning suburban highway.
	Ability of the alternative to provide consistency with the US 24 East Congestion Management Plan	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.
	Relative property impacts based on estimated acres of residential and business properties impacted	No right-of-way impacts.	61 properties potentially impacted	61 properties potentially impacted	65 properties potentially impacted
	Ability of the alternative to receive general public and agency support for the transportation recommendations	Congestion and operational issues not acceptable for agency and public stakeholders.	Public showed slight preference for alternative although agency stakeholders generally agree more capacity improvements needed.	General public neutral on alternative and agency stakeholders agree with passing lanes.	Public showed slight preference for alternative and agency stakeholders agree with widening where capacity needed.
	Ability of the alternative to support local and regional planning efforts	No improvements to US 24 corridor is not consistent with previous local and regional planning efforts.	Remaining congestion along US 24 not consistent with previous local and regional planning efforts. Improved at-grade intersection at Judge Orr and Blue Gill Rd intersections consistent with previous local plans.	Highway widening consistent with previous local and regional planning efforts. Improved at-grade intersection at Judge Orr and Blue Gill Rd intersections consistent with previous local plans.	Highway widening consistent with previous local and regional planning efforts. Improved at-grade intersection at Judge Orr and Blue Gill Rd intersections consistent with previous local plans.
	Ability of the alternative to complement local community surroundings with design and operational context	Congestion and operational issues do not complement surrounding future suburban development.	Design and operations consistent with suburban highway corridor.	Design and operations consistent with suburban highway corridor.	Design and operations consistent with suburban highway corridor.
Environmental Resources	Ability of the alternative to avoid and minimize impacts on environmental resources within the built and natural environment	Some impacts to air quality due to increasing congestion.	Property impacts to 4 potential hazardous sites Potential impacts to Post Office	Property impacts to 2 potential hazardous sites	Property impacts to 4 potential hazardous sites Potential impacts to Post Office
Multimodal Connectivity	Ability of the alternative to provide infrastructure for local pedestrian and bicyclist movements (across US 24)	No infrastructure added to facilitate pedestrian and bicyclist movements.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.
	Ability of the alternative to accommodate the expansion of regional multimodal transportation options (along US 24)	Lack of pedestrian and bicyclist facility improvements do not encourage use and connections to adjacent planned facilities.	Rock Island Trail improvements to encourage use and connections to adjacent planned facilities.	Rock Island Trail improvements to encourage use and connections to adjacent planned facilities.	Rock Island Trail improvements to encourage use and connections to adjacent planned facilities.
	Ability of the alternative to enhance freight mobility along US 24	No enhancements for freight mobility along the corridor.	Freight mobility enhanced with wider shoulders, added turn lanes, and grade-separated interchange options.	Freight mobility enhanced with additional passing lanes, wider shoulders, added turn lanes, and grade-separated interchange options.	Freight mobility enhanced with additional lanes for passing, wider shoulders, added turn lanes, and grade-separated interchange options.
Implementability	Relative cost of the alternative	No construction cost and no right-of-way acquisition.	Relatively low cost with limited highway widening and at-grade intersection improvements. Relatively moderate cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.	Relatively moderate cost with highway widening and at-grade intersection improvements. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.	Relatively moderate cost with highway widening and at-grade intersection improvements. Relatively high cost with grade-separated interchange options due to additional infrastructure, potential right-of-way acquisition, and maintenance of bridge structures.
	Ability to phase implementation into fundable construction projects	N/A	Intersection/interchange improvements can be constructed as separate projects and acceleration/deceleration lanes can be constructed as separate projects with some benefits.	Intersection/interchange improvements can be constructed as separate projects and passing lanes can be constructed as separate projects with capacity benefits.	Intersection/interchange improvements can be constructed as separate projects and highway widening can be constructed in sections as separate projects with capacity benefits.
SUMMARY OF RESULTS		CARRIED FORWARD	NOT RECOMMENDED	CARRIED FORWARD	CARRIED FORWARD
Notes		Further analysis required as the No Action Alternative for comparison to improvement alternatives.	This alternative is not recommended for further consideration because the improvements would result in similar impacts to other alternatives without substantially better mobility, traffic operations, and safety benefits than other alternatives.	This alternative is carried forward for further evaluation because the improvement provides additional vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with fewer property impacts than other alternatives and opportunities to implement as separate, fundable projects.	This alternative is carried forward for further evaluation because the improvement provides substantially more vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with some property impacts and opportunities to implement as separate, fundable projects.

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RED = Comparatively minor benefits and/or major impacts

US 24 Planning and Environmental Linkages Study

Level 2 Screening Matrix - Peyton to Calhan Segment

4/6/17

Level 2 Evaluation Criteria		NA No Action	1 Two Lanes plus New Auxiliary Lanes	2 Two Lanes with New Passing Lanes
Traffic Operations	Ability of the alternative to provide roadway capacity to meet 2040 travel demand	Forecasted 2040 demand (12,000 veh/day) less than capacity (14,200 veh/day).	Forecasted 2040 demand (12,000 veh/day) less than capacity (14,900 veh/day).	Forecasted 2040 demand (12,000 veh/day) substantially less than capacity (21,200 veh/day).
	Ability of the alternative to allow intersections to operate at LOS D or better during future (2040) peak hours	Intersection operations at LOS D or better.	Intersection operations at LOS D or better and delays are reduced.	Intersection operations at LOS D or better and delays are reduced.
	Ability of the alternative to optimize future (2040) vehicular travel time for regional and local trips along the corridor	Travel time traveling along the corridor and accessing the corridor increases substantially due to higher traffic and truck volumes traveling the corridor.	Some improvement in travel time accessing the corridor at intersections, but no notable improvement in travel time along the corridor.	Notable travel time improvements traveling along the corridor and accessing the corridor.
Safety	Ability of the alternative to address unsafe physical or operational conditions along US 24	No changes to existing physical conditions and operational conditions worsen with increased traffic volumes.	Some improvements in safety at intersections, but no changes to safety issues related to passing maneuvers, narrow shoulders, or other geometric issues.	Improvements address safety issues associated with intersection congestion, passing maneuvers, and highway geometrics.
	Ability of the alternative to reduce the number of potential multimodal conflict points	No reduction in potential multimodal conflict points.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections, but provides area for pedestrians and bicyclists off the highway shoulder. Roundabout options would decrease speed and reduce multimodal conflict points in Calhan.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections, but provides area for pedestrians and bicyclists off the highway shoulder. Roundabout options would decrease speed and reduce multimodal conflict points in Calhan.
Community	Ability of the alternative to provide consistency with the US 24 Access Control Plan and reasonable access compatible with the functional characteristics of the roadway	Maintaining all existing accesses is not compatible with high speeds and functionality of rural highway.	Corridor improvements consistent with rural highway corridor. At-grade intersection improvements consistent with rural highway. Roundabouts considered with lower speeds in Calhan.	Corridor improvements consistent with rural highway corridor. At-grade intersection improvements consistent with rural highway. Roundabouts considered with lower speeds in Calhan.
	Ability of the alternative to provide consistency with the US 24 East Congestion Management Plan	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.
	Relative property impacts based on estimated acres of residential and business properties impacted	No right-of-way impacts.	146 properties potentially impacted	100 properties potentially impacted
	Ability of the alternative to receive general public and agency support for the transportation recommendations	Operational issues not acceptable for agency and public stakeholders.	General public neutral on overall alternative and responded negatively to roundabouts in Calhan, and agency stakeholders generally agree more capacity and safety improvements needed.	Public showed slight preference for alternative, although they responded negatively to roundabouts in Calhan, and agency stakeholders agree with passing lanes.
	Ability of the alternative to support local and regional planning efforts	No improvements to support area development.	No previous local and regional planning efforts for highway corridor, but intersection improvements support potential area development plans, as identified in the future.	No previous local and regional planning efforts for highway corridor, but intersection improvements support potential area development plans, as identified in the future.
	Ability of the alternative to complement local community surroundings with design and operational context	Congestion and operational issues do not complement rural surroundings.	Design and operations consistent with rural highway corridor.	Design and operations consistent with rural highway corridor.
Environmental Resources	Ability of the alternative to avoid and minimize impacts on environmental resources within the built and natural environment	Some impacts to air quality due to increasing congestion.	Property impacts to 7 potential hazardous material sites Potential impacts to St. Paul Lutheran Church, Paulson Senior Center, Calhan Community Church, and Post Office	Property impacts to 7 potential hazardous material sites Potential impacts to St. Paul Lutheran Church, Paulson Senior Center, Calhan Community Church, and Post Office
Multimodal Connectivity	Ability of the alternative to provide infrastructure for local pedestrian and bicyclist movements (across US 24)	In Calhan, lack of sidewalk and pedestrian crossings discourage walking and biking.	In Calhan, intersection and corridor improvements provide opportunity for at-grade crossing improvements.	In Calhan, intersection improvements provide opportunity for at-grade crossing improvements and median provides waiting area for pedestrians as well as area for additional signage.
	Ability of the alternative to accommodate the expansion of regional multimodal transportation options (along US 24)	Lack of pedestrian and bicyclist facilities do not accommodate additional pedestrian or bicyclist travel options.	Multi-use path provided along the corridor to encourage use and connections to adjacent planned facilities.	Multi-use path provided along the corridor to encourage use and connections to adjacent planned facilities.
	Ability of the alternative to enhance freight mobility along US 24	No enhancements for freight mobility along the corridor.	Freight mobility enhanced with wider shoulders and added turn lanes.	Freight mobility enhanced with additional passing lanes, added turn lanes, and wider shoulders.
Implementability	Relative cost of the alternative	No construction cost and no right-of-way acquisition.	Relatively low cost with limited highway widening and at-grade intersection improvements.	Relatively moderate cost with highway widening and at-grade intersection improvements.
	Ability to phase implementation into fundable construction projects	N/A	Intersection improvements can be constructed as separate projects and acceleration/deceleration lanes can be constructed as separate projects with some capacity benefits.	Intersection improvements can be constructed as separate projects and passing lanes can be constructed as separate projects with capacity benefits.
SUMMARY OF RESULTS		CARRIED FORWARD	NOT RECOMMENDED	CARRIED FORWARD
Notes		Further analysis required as the No Action Alternative for comparison to improvement alternatives.	This alternative is not recommended for further consideration because the improvements would result in similar impacts to other alternatives without substantially better mobility, traffic operations, and safety benefits than other alternatives.	This alternative is carried forward for further evaluation because the improvement provides additional vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with fewer property impacts than other alternatives and opportunities to implement as separate, fundable projects.

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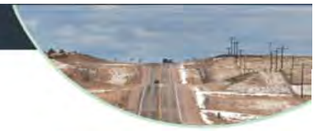
US 24 Planning and Environmental Linkages Study



Level 2 Screening Matrix - Calhan to Ramah Segment

4/6/17

Level 2 Evaluation Criteria		NA No Action	1 Two Lanes plus New Auxiliary Lanes	2 Two Lanes with New Passing Lanes
Traffic Operations	Ability of the alternative to provide roadway capacity to meet 2040 travel demand	Forecasted 2040 demand (6,000 veh/day) substantially less than capacity (14,200 veh/day).	Forecasted 2040 demand (6,000 veh/day) substantially less than capacity (14,900 veh/day).	Forecasted 2040 demand (6,000 veh/day) substantially less than capacity (21,200 veh/day).
	Ability of the alternative to allow intersections to operate at LOS D or better during future (2040) peak hours	Intersection operations at LOS B.	Intersection operations at LOS B with reduced delay.	Intersection operations at LOS B with reduced delay.
	Ability of the alternative to optimize future (2040) vehicular travel time for regional and local trips along the corridor	Travel time traveling along the corridor and accessing the corridor increases due to higher traffic and truck volumes traveling the corridor.	Some improvement in travel time accessing the corridor at intersections, but no notable improvement in travel time along the corridor.	Notable travel time improvements traveling along the corridor and accessing the corridor.
Safety	Ability of the alternative to address unsafe physical or operational conditions along US 24	No changes to existing physical conditions and operational conditions worsen with increased traffic volumes.	Some improvements in safety at intersections, but no changes to safety issues related to passing maneuvers, narrow shoulders, or other geometric issues.	Improvements address safety issues associated with intersection congestion, passing maneuvers, and highway geometrics.
	Ability of the alternative to reduce the number of potential multimodal conflict points	No reduction in potential multimodal conflict points.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections, but provides area for pedestrians and bicyclists off the highway shoulder.	The Rock Island Trail Extension on north side of US 24 increases multimodal conflict points at the intersections, but provides area for pedestrians and bicyclists off the highway shoulder.
Community	Ability of the alternative to provide consistency with the US 24 Access Control Plan and reasonable access compatible with the functional characteristics of the roadway	Maintaining all existing accesses is not compatible with high speeds and functionality of rural highway.	Intersection and corridor improvements consistent with rural highway corridor.	Intersection and corridor improvements consistent with rural highway corridor.
	Ability of the alternative to provide consistency with the US 24 East Congestion Management Plan	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.	N/A US 24 East Congestion Management Plan does not cover this segment of the corridor.
	Relative property impacts based on estimated acres of residential and business properties impacted	No right-of-way impacts.	52 properties potentially impacted	48 properties potentially impacted
	Ability of the alternative to receive general public and agency support for the transportation recommendations	Operational issues not acceptable for agency and public stakeholders.	General public neutral on alternative and agency stakeholders generally agree more capacity and safety improvements needed.	Public showed slight preference for alternative and agency stakeholders agree with passing lanes.
	Ability of the alternative to support local and regional planning efforts	No improvements to support area development.	No previous local and regional planning efforts for highway corridor, but intersection improvements support potential area development plans, as identified in the future.	No previous local and regional planning efforts for highway corridor, but intersection improvements support potential area development plans, as identified in the future.
	Ability of the alternative to complement local community surroundings with design and operational context	Congestion and operational issues do not complement rural surroundings.	Design and operations consistent with rural highway corridor.	Design and operations consistent with rural highway corridor.
Environmental Resources	Ability of the alternative to avoid and minimize impacts on environmental resources within the built and natural environment	Some impacts to air quality due to increasing congestion.	No notable environmental resource impacts expected	No notable environmental resource impacts expected
Multimodal Connectivity	Ability of the alternative to provide infrastructure for local pedestrian and bicyclist movements (across US 24)	No infrastructure added to facilitate pedestrian and bicyclist movements.	Intersection improvements provide opportunity for at-grade crossing improvements.	Intersection improvements provide opportunity for at-grade crossing improvements.
	Ability of the alternative to accommodate the expansion of regional multimodal transportation options (along US 24)	Lack of pedestrian and bicyclist facilities do not accommodate additional pedestrian or bicyclist travel options.	Multi-use path provided along the corridor to encourage use and connections to adjacent planned facilities.	Multi-use path provided along the corridor to encourage use and connections to adjacent planned facilities.
	Ability of the alternative to enhance freight mobility along US 24	No enhancements for freight mobility along the corridor.	Freight mobility enhanced with wider shoulders and added turn lanes.	Freight mobility enhanced with additional passing lanes, added turn lanes, and wider shoulders.
Implementability	Relative cost of the alternative	No construction cost and no right-of-way acquisition.	Relatively low cost with limited highway widening and at-grade intersection improvements.	Relatively moderate cost with highway widening and at-grade intersection improvements.
	Ability to phase implementation into fundable construction projects	N/A	Intersection improvements can be constructed as separate projects and acceleration/deceleration lanes can be constructed as separate projects with some capacity benefits.	Intersection improvements can be constructed as separate projects and passing lanes can be constructed as separate projects with capacity benefits.
SUMMARY OF RESULTS		CARRIED FORWARD	NOT RECOMMENDED	CARRIED FORWARD
Notes		Further analysis required as the No Action Alternative for comparison to improvement alternatives.	This alternative is not recommended for further consideration because the improvements would result in similar impacts to other alternatives without substantially better mobility, traffic operations, and safety benefits than other alternatives.	This alternative is carried forward for further evaluation because the improvement provides additional vehicular capacity along the corridor and would provide traffic operational and safety benefits related to congestion with fewer property impacts than other alternatives and opportunities to implement as separate, fundable projects.

GREEN = Comparatively beneficial and/or minor impacts
BLACK = Comparatively neutral benefits and/or moderate impacts
RED = Comparatively minor benefits and/or major impacts

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