



COLORADO
Department of
Transportation

FINAL PLANNING & ENVIRONMENTAL LINKAGES (PEL) REPORT

US 24 PLANNING & ENVIRONMENTAL LINKAGES STUDY

March 2018





US 24 Planning and Environmental Linkages Study



The public agencies that were engaged in the preparation of this Planning and Environmental Linkages (PEL) Study for the United States Highway 24 (US 24) corridor in El Paso County between Powers Boulevard (CO 21) and Ramah have expressed their support of this plan, as defined in this Final Planning and Environmental Linkages Report, dated March 2018.

- ✦ Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) agree that this study fits the criteria for the FHWA PEL planning process. Through this process, the evaluation and findings of the PEL study can be more readily applied to subsequent National Environmental Policy Act (NEPA) evaluations.
- ✦ The agencies will work to complete the NEPA environmental evaluation requirements for the improvements recommended in this report along the US 24 corridor. The agencies will work cooperatively to fund and implement the improvements.
- ✦ The agencies will develop collaborative transportation partnerships to support the corridor recommendations through the Pikes Peak Area Council of Governments (PPACG) process to facilitate transportation improvements along the US 24 corridor.

Written letters of support from the agencies represented on the US 24 PEL Technical Advisory Committee have been requested and will be compiled as they are received. The Technical Advisory Committee supports the recommendations of this study as indicated by those letters.

_____	_____
Andy Stecklein - Colorado Department of Transportation	(Date)
_____	_____
John Hall - Colorado Department of Transportation	(Date)
_____	_____
Rob Frei - Colorado Department of Transportation	(Date)
_____	_____
Melinda Urban - Federal Highway Administration	(Date)
_____	_____
Victoria Chavez - El Paso County	(Date)
_____	_____
Zakar Alazzeah - City of Colorado Springs	(Date)
_____	_____
Jon Hogeboom - Towns of Calhan and Ramah	(Date)
_____	_____
Ken Prather - Pikes Peak Area Council of Governments	(Date)



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List of Acronyms and Abbreviations

AFB	Air Force Base
AM	ante meridiem (morning)
BGEA	Bald and Golden Eagle Protection Act
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CNHP	Colorado National Heritage Program
CO	Carbon Monoxide
CO #	Colorado State Highway
CPW	Colorado Parks and Wildlife
CWA	Clean Water Act
dBA	A-weighted decibel
DMNS	Denver Museum of Nature and Science
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GHG	greenhouse gases
GIS	Geographic Information Services
HAP	Hazardous Air Pollutants
ITS	Intelligent Transportation System
LOS	Level of Service
LOSS	Level of Service of Safety
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
MP	milepost
mph	miles per hour
MSATs	Mobile Source Air Toxics



US 24 Planning and Environmental Linkages Study



NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NO ₂	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Properties
NWS	National Wetland Survey
O ₃	ground level ozone
PEL	Planning and Environmental Linkages
PFYC	Potential Fossil Yield Classification System
PM	post meridiem (afternoon/evening)
PPACG	Pikes Peak Area Council of Governments
ROW	right-of-way
SO ₂	sulfur dioxide
SPFs	Segment Safety Performance Functions
SRHP	State Register of Historic Properties
TAZ	Transportation Analysis Zone
TES	threatened and endangered species
TPR	Transportation Planning Region
TSM	Transportation System Management
UCM	University of Colorado Museum
US	United States
US 24	United States Highway 24
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service



INTRODUCTION

This report documents the results of a Planning and Environmental Linkages (PEL) study conducted to identify 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 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 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 was conducted following Federal Highway Administration (FHWA) PEL guidance regarding the integration of transportation planning and the National Environmental Policy Act (NEPA) process, which encourages the use of planning studies to provide information for incorporation into future NEPA documents (23 Code of Federal Regulations [CFR] 450). The goal of these early integrated planning efforts is to streamline subsequent alternatives analysis during the NEPA processes.

This PEL study is intended to provide the framework for the short- and long-term implementation of transportation improvements as funding is available. The technical reports prepared for this PEL study are intended for use in support of future NEPA documentation with minimal re-evaluation of alternatives.

The following NEPA process principles were followed for this PEL study:

- ✦ Preparation of a project Purpose and Need
- ✦ Screening of alternatives utilizing a NEPA-appropriate process to identify feasible and significantly different alternatives
- ✦ Coordination with federal, state, and local agencies, including concurrence at key decision points to align with those of the NEPA process:
 - » Purpose and Need
 - » Range of alternatives
 - » Screening evaluation criteria
 - » Identification of the Recommended Alternatives

A project Purpose and Need was developed in accordance with Council of Environmental Quality NEPA regulations (40 CFR 1506.13). A public process utilizing technical data was



applied to identify a reasonable range of alternatives, as described by the Council on Environmental Quality guidance (40 CFR 1502.14). Reasonable alternatives include those that are practical or reasonable from the technical and economic standpoint and using common sense.

Initial improvement concepts were screened to eliminate those that did not meet the project Purpose and Need. The concepts were combined to create corridor alternatives for evaluation to identify those that were deemed unreasonable. The alternatives evaluation process determined impacts and feasibility by considering traffic operations, multimodal accommodations, community impacts, environmental impacts, engineering, and cost. Based on the alternatives evaluation, one or two Recommended Alternatives of corridor improvements were identified for each corridor segment to carry forward into future NEPA processes and project development.

This PEL Report summarizes the findings and recommendations for the US 24 corridor improvements. The following interim reports (available on the project website and from project team members) were completed throughout the study process and provide additional information and details regarding the analyses:

- ✦ *Final Corridor Conditions Report* (December 2016)
- ✦ *Final Alternatives Report* (October 2017)

Study Area

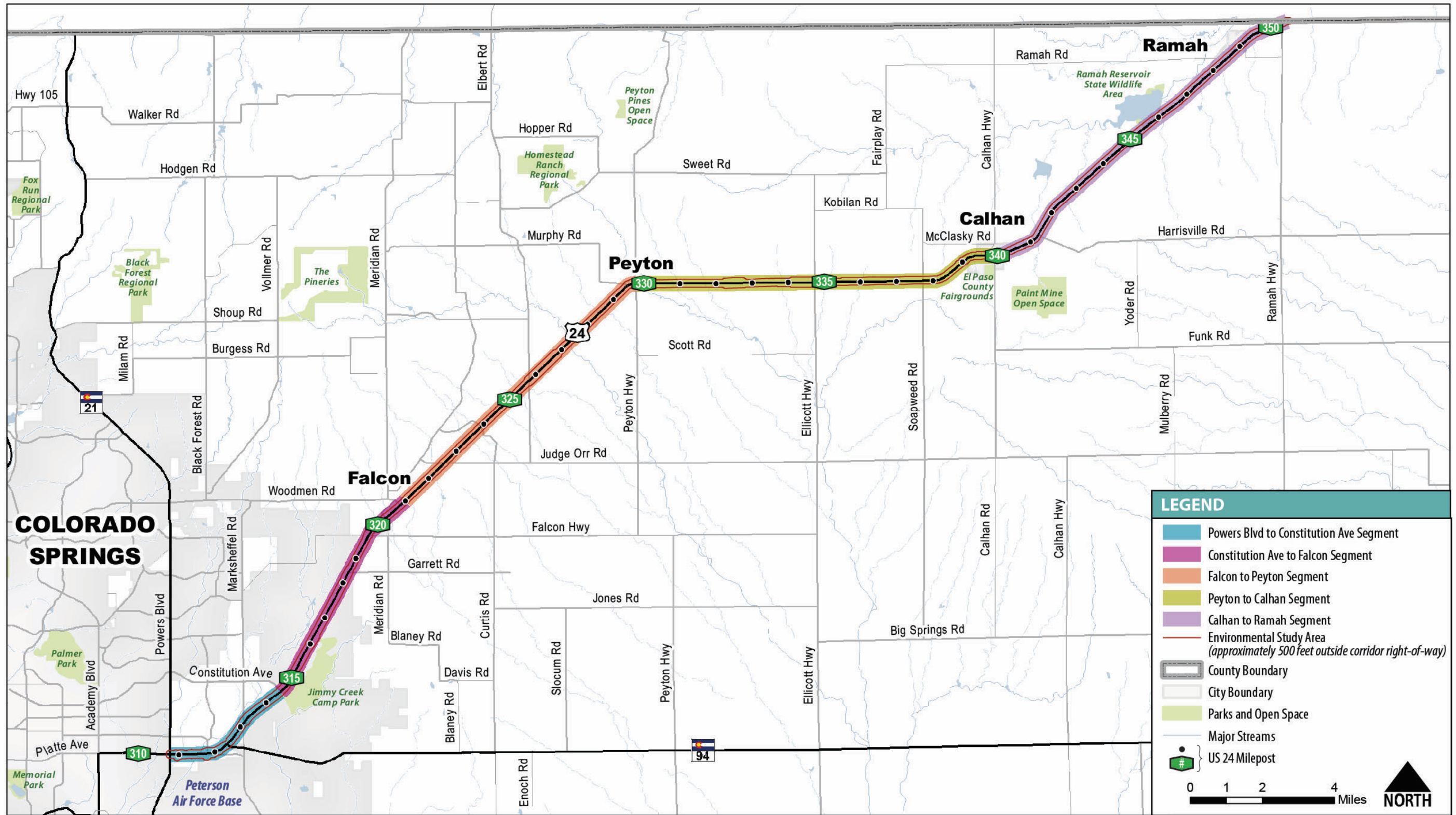
The traffic study area and the environmental resource review area are illustrated in **Figure 1**. The west end of the study corridor is in the City of Colorado Springs and the highway travels through the Towns of Calhan and Ramah to the east. The majority of the US 24 study corridor lies within unincorporated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



Figure 1. Study Area





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US 24

The study corridor is a section of the US 24 highway beginning at the interchange with Powers Boulevard (CO 21) in Colorado Springs. The US 24 corridor travels through El Paso County and Elbert County and ends at an interchange with I-70 east of Limon at Exit 363. At the Powers Boulevard (CO 21) interchange, the US 24 highway follows Powers Boulevard to the south before turning west as Fountain Boulevard through Colorado Springs and continuing west through the mountains.

The geometric characteristics of the US 24 study corridor are highly variable. The US 24 study corridor consists of two-lane, three-lane, and four-lane cross-sections with right-of-way ranging from 100 feet east of Peyton to as wide as 250 feet between Peterson Road and Garrett Road. Typical right-of-way along the majority of the corridor is 100 to 170 feet. The pavement along the corridor is primarily asphalt.

US 24 from Powers Boulevard (CO 21) to Garrett Road is four lanes with a depressed median, except at the intersections with the frontage road immediately east of Powers Boulevard (CO 21), where there are raised median islands. There are two through lanes in the westbound direction and a single through lane in the eastbound direction between Soap Weed Road and Calhan. The remainder of the corridor has a single travel lane in each direction.

CDOT defines the functional classification of the US 24 corridor between Powers Boulevard (CO 21) and Marksheffel Road as a Principal Arterial - Freeways and Expressways. Through the rest of the study area, the highway is classified as a Principal Arterial - Other. For access control, CDOT classifies the corridor as Expressway from Powers Boulevard (CO 21) to Peyton Highway and Regional Highway for the rest of the study area, except for the section through the Town of Calhan, which is classified as Non-Rural Principal Highway.



US 24 at Powers Boulevard (CO 21)

Shoulder widths vary significantly along the corridor, but all shoulders that exist are paved. The speed limit along US 24 through the majority of the study area is 65 miles per hour (mph). The speed limit is 55 mph through the more urbanized areas of Colorado Springs (west of CO 94), Falcon (between Garrett Road and Judge Orr Road), Peyton, and Ramah. Through downtown Calhan, the speed limit is 35 mph with sections outside of the town at 45 mph and 55 mph.

Auxiliary lanes exist at some major signalized and stop-controlled public street intersections, but many key intersections do not have auxiliary lanes for all deceleration and acceleration movements.



Surrounding Land Use

Development of former agricultural land to residential and employment uses has been occurring as the Colorado Springs metropolitan area continues to grow. The demand for transportation facilities and services rises in proportion to increases in population, employment, and improved economic conditions. In 2010, about 650,000 people lived in the Pikes Peak region and by 2040 the region will grow by more than 350,000 people. This study utilized the travel demand model developed by Pikes Peak Area Council of Governments (PPACG) to project future traffic volumes along the US 24 study corridor.

East of the Powers Boulevard (CO 21) interchange in Colorado Springs, US 24 crosses through an industrial and commercial area serviced via limited access intersections and frontage roads north and south of the highway. A recreational vehicle park south of US 24 is the only residential use in the area adjacent to the highway. About one mile east of Powers Boulevard (CO 21), the Peterson Road interchange provides direct access to Peterson Air Force Base (AFB) south of US 24 with primarily residential development to the north of the highway. CO 94 provides access to Schriever AFB, about 8.5 miles east of US 24.



US 24 east of Constitution Avenue

The area surrounding US 24 remains rural in nature between Constitution Avenue and Falcon Highway.

At the Meridian Road and Woodmen Road intersections, there are a number of commercial centers serving the community of Falcon, anchored by retailers like Safeway and Walmart, along with community resources like the High Prairie Library, Falcon Legacy Campus, and



US 24 at Falcon

Rock Island Trailhead. East of Woodmen Road to Judge Orr Road, US 24 travels through more Falcon residential subdivisions to the north and rural properties to the south. The Meadow Lake Airport is southeast of the US 24/Judge Orr Road intersection. East of Judge Orr Road to Peyton, the area north of the highway is primarily undeveloped/agricultural properties while the area adjacent to the highway to the south is rural residential development.

The town development of Peyton lies north of US 24 with the post office, a restaurant, and a general store along the highway. East of Peyton, the area along US 24 is characterized primarily by agricultural uses. A variety of commercial establishments and single family residential houses line the US 24 highway through the Town of Calhan. The Calhan Auction



Market is located on the east side of Calhan, at the corner of US 24 and Yoder Street, and the El Paso County Fair and Events Complex is located along the south side of town.

The Paint Mine Open Space is located approximately two miles southeast of Calhan off of US 24. The Ramah Reservoir State Wildlife Area is located north of US 24 with an access four miles west of Ramah. The Town of Ramah is north of US 24 with access points to the highway at Commercial Street, Cedar Street, 3rd Street, and Ramah Road.

Future Land Use

Socioeconomic data from the PPACG 2010 and 2040 regional travel demand models (adopted 2040 Small Area Forecast dataset) were compiled for the Transportation Analysis Zones (TAZs) partially or fully located approximately four miles north and south of the US 24 highway corridor. The household and employment totals for year 2010 and forecasted year 2040 are shown in Table 1. As shown, 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%.

Table 1. Travel Demand Forecasting Land Use Growth

	HOUSEHOLDS	EMPLOYMENT
Year 2010	30,344	23,190
Year 2040	69,782	51,568
Absolute Growth	+ 39,438	+ 28,378
Percent Growth	130%	122%
Annual Growth	2.8%	2.7%

Source: PPACG 2010 and 2040 (adopted Small Area Forecasts) regional travel demand models

Increased household and employment is expected with planned large-scale community development east of Colorado Springs, growing past the Falcon community towards Peyton. The existing undeveloped area between Constitution Avenue and Falcon Highway is expected to be filled with increases in both households and employment. Population and employment density increases substantially in Falcon, particularly from Meridian Road to Elbert Road. Most of this relatively dramatic increase in density is based on preliminary developer plans, which may be revised with lower densities and/or different types of land uses with more developer and agency coordination during the development approval process.

East of Peyton, the area surrounding the US 24 corridor is expected to remain low-density rural development and agricultural.



Regional Planning Context

The US 24 corridor and the surrounding area have been included in studies with substantial transportation components. Relevant past planning studies, listed in **Table 2**, were reviewed in relation to the transportation system within or in close proximity to the study corridor.

Table 2. Previously Completed Studies

STUDY / PROJECT	YEAR/ STATUS	LEAD AGENCY	NOTES
Small Area Traffic Report for the Falcon Area	2001	El Paso County	Part of current County Master Plan
Intermodal Transportation Plan	2001	City of Colorado Springs	
Stapleton Corridor Study	2003	El Paso County	Defined Stapleton realignment that now exists
Highway 94 Comprehensive Plan	2003	El Paso County	Part of current County Master Plan
US 24 Access Control Plan Peterson Boulevard to Elbert Highway	2006	CDOT	Current Access Control Plan - some access modifications made. Will need updated with study recommendations.
Banning Lewis Ranch Master Plan	2008	City of Colorado Springs	Map showing planned land use and roadway network
Falcon/Peyton Small Area Master Plan	2008	El Paso County	Part of current County Master Plan
Major Transportation Corridors Plan	2011	El Paso County	Update in process during study
Peterson Air Force Base Transportation Plan Final Environmental Assessment	2013	Peterson AFB	Preferred Alternative supports US 24 corridor capacity improvements
Parks Master Plan Update	2013	El Paso County	
Park System Master Plan	2014	City of Colorado Springs	
Marksheffel Road South Corridor Preservation Plan with PEL Study	2014	El Paso County	Provides traffic forecasts for US 24/Marksheffel intersection and proposed intersection improvements
Moving Forward - 2040 Regional Transportation Plan	2015	PPACG	Current PPACG plan includes US 24 projects consistent with recommendations. Update in process through 2018.
2040 Regional Transportation Plan Central Front Range Transportation Planning Region	2015	CDOT	
Colorado State Highway Freight Plan	2015	CDOT	Recommendations consistent with study alternatives



Relevant current planning studies, listed in **Table 3**, were also monitored by the project team and coordinated with study agency representatives from the lead agencies in relation to the surrounding land use and potential transportation improvements within or in close proximity to the US 24 study corridor.

Table 3. Current Studies/Projects

STUDY / PROJECT	YEAR/ STATUS	LEAD AGENCY	NOTES
Meadow Lake Airport Master Plan Study	2015	Meadow Lake Airport	All alternatives assume widening US 24 to 4 lanes within the 2020-2030 timeframe. The alternatives do not assume the realignments of Judge Orr Road and Blue Gill Drive.
2016 Major Transportation Corridors Plan Update	Adopted December 2016	El Paso County	General highway widening and regional trail improvements consistent with PEL study recommendations - coordinated by El Paso County representatives.
Military Base Expansion/Contraction	On-going planning efforts		Study coordinating with base representatives, but military planning dependent on administration and other global factors. Changes could affect traffic forecasts along west half of corridor.
Meridian South-Falcon Park-n-Ride	Design in process	El Paso County	Preliminary design in process (by HDR)
Traffic Impact Studies/Referrals - Hillcrest Commercial Park (US 24/CO 94) 12/14/16 - Judge Orr RV Park (US 24/Judge Orr) 12/29/16 - Falcon Marketplace (US 24/Woodmen) 2/21/17	Current developments	To CDOT	Studies/letters received from CDOT and reviewed for potential impacts to study alternatives.
Colorado Military Academy Traffic Impact Study	Draft April 2017	To El Paso County	No proposed improvements at US 24/Peterson interchange intersections.
Joint Land Use Study	In process	PPACG	Review website regularly and coordinate through TAC PPACG representative
2045 Regional Transportation Plan	In process Planned for completion by 11/2019	PPACG	July 2017 - Currently working on objectives and targets for plan
City of Colorado Springs Comprehensive Plan (PlanCOS)	In process	City of Colorado Springs	Study will include new projections about future density within the city. August 2017 -Working on developing the plan through chapters review with committees. Draft plan expected early 2018.



US 24 Planning and Environmental Linkages Study



US 24 East (between I-25 and Elbert Road) was identified in the *Moving Forward Plan* as a strategic corridor and a Congestion Management Corridor Plan was developed for the US 24 corridor from Powers Boulevard to Peyton Highway to assist local communities and PPACG in developing projects to manage congestion. The Vision Statement developed for this section of US 24 with the *Moving Forward Plan* focuses on increasing mobility and improving safety to maintain system quality. Goals and objectives are to increase travel reliability and improve mobility for all modes of travel, to support commuter travel, to accommodate growth in freight transport, to reduce crash rates, and to preserve the existing transportation system.

The recommended transportation improvements along US 24 are consistent with local and regional planning documents, including the strategies identified in PPACG's US 24 (Powers Boulevard to Peyton Highway) Congestion Management Corridor Plan.



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 processes.

US 24 east of Colorado Springs is an important highway providing transportation connectivity between Colorado Springs, Peterson 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.
- ✦ Lack of passing opportunities and the volume of slow-moving vehicles reduces the overall capacity of the corridor. Without highway improvements, 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.

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 SUMMARY

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 and recommendation of alternatives to limit the need for consideration during future NEPA processes.

The development and evaluation of the corridor improvement alternatives, summarized in this section, is documented in the *Final Alternatives Report* (October 2017). The evaluation matrices for each level of screening are included in **Appendix A**. The alternatives screening process included public involvement and outreach efforts conducted with the local agencies and area stakeholders.

No Action Alternative

The No Action alternative does not meet the Purpose and Need. The No Action alternative is included for comparison to the operational and safety benefits that would result from potential improvements. The No Action Alternative would not provide any improvements beyond the existing transportation system and the identified funded projects, but 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 that 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 US 24. (completed)
- ✦ **US 24 Pavement Overlay Constitution - Garrett:** Highway overlay and traffic signal improvements at the US 24 and Garrett Road intersection. (completed)
- ✦ **Meridian South Park-n-Ride with New Meridian Connection:** Realignment of Meridian Road with a new traffic signal on US 24, shifting the intersection west of the existing location, and construction of a new park-n-ride facility.
- ✦ **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 some have been completed.



Transportation System Management (TSM) Improvements

TSM improvements identify options that would maximize the efficiency of the existing transportation system without major investments in new infrastructure. An option that optimized the signal timing and progression along the US 24 study corridor between Powers Boulevard (CO 21) and Falcon, without other improvements or changes in traffic volumes, was evaluated. The signal timing changes provided minimal improvement in peak hour LOS at the intersections. The action alternatives offer greater intersection operational improvements and roadway improvements are needed to improve the overall corridor operations and safety.

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 additional consideration that had “fatal flaws” (that did not meet the Purpose and Need) or were considered unreasonable for the US 24 study corridor.

The initial concepts 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, geometric constraints, and safety concerns related to congestion and highway conditions. The initial concepts were developed based on input from the agency stakeholders, public open house, and 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 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 as part of a potential corridor-wide



solution. If a concept was able to meet only a narrow scope of the needs or was 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 corridor-wide options that were carried forward to Level 2 screening.

Up to 33 concepts and the No Action concept were considered for each highway segment during the Level 1 screening. One highway cross-section concept (four lanes with continuous acceleration/deceleration lanes in the Powers Boulevard to Constitution Avenue segment), two multimodal elements (improved transit service in the Falcon to Peyton and Peyton to Calhan segments), one corridor management strategy (travel demand management strategies in the Falcon to Peyton segment), and two technology concepts (video monitoring and travel time indicators in all segments) were eliminated from further consideration because they do not meet the project Purpose and Need. 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 Comparative Screening

The purpose of the Level 2 screening was to estimate and compare how well corridor alternatives perform in meeting the project Purpose and Need in a 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 results of the Level 2 screening identified alternatives that are most practical or feasible to carry forward for consideration as study recommendations.

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.



Five action alternatives were considered for the Powers Boulevard to Constitution Avenue segment and three action alternatives were carried forward for further consideration in the Level 3 evaluation. Five action alternatives were considered for the Constitution Avenue to Falcon segment and two action alternatives were carried forward. Three action alternatives were considered for the Falcon to Peyton segment and two action alternatives were carried forward. Two action alternatives were considered for the Peyton to Calhan segment and one action alternative was carried forward. Two action alternatives were considered for the Calhan to Ramah segment and one action alternative was carried forward. The No Action Alternative was also carried forward for comparative evaluation with each highway segment.

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 for the Level 3 evaluation.

Level 3 Detailed Evaluation

With the Level 3 evaluation, steps were taken to further narrow the alternatives and to refine the design elements of the remaining alternatives. Design concepts were considered with each alternative to minimize costs and environmental impacts and maximize operational and safety benefits. Prior to the Level 3 evaluation, elements from the two action alternatives carried forward from Level 2 screening for the Falcon (Woodmand Road) to Peyton segment were combined considering traffic volumes to create a single, optimized alternative for the segment that is four lanes where warranted by forecasted volumes.

The following alternatives were considered 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 4 – Four Lanes to Rex Rd and New Passing Lanes to Peyton
- ✦ Peyton to Calhan
 - » Alternative 2 – Two Lanes with New Passing Lanes
- ✦ Calhan to Ramah
 - » Alternative 2 – Two Lanes with New Passing Lanes



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

- ✦ Traffic Operations
 - » Intersection LOS and delay during future (2040) peak hours
 - » Average travel speeds along US 24 for the future (2040) peak hours
- ✦ Safety
 - » Anticipated annual crash reduction for identified predominant crash patterns
- ✦ Community
 - » Number of potential properties impacted
 - » General public and agency support and concerns
- ✦ Environmental Resources
 - » Potential impacts on environmental resources within the built and natural environment
- ✦ Multimodal Connectivity
 - » Enhancements to regional multimodal transportation options by providing infrastructure or operational improvements for pedestrian and bicyclists
 - » Enhancements to freight mobility along US 24 by providing infrastructure to optimize freight movement and safety
- ✦ Implementability
 - » Conceptual level probable costs (low, moderate, high)

Level 3 Evaluation Results

The Level 3 evaluation resulted in one alternative being not recommended. In the Powers Boulevard to Constitution Avenue segment, Alternative 5 - Eight Lanes was not recommended for further consideration because the alternative would result in more community impacts, reduced multimodal mobility, and higher cost without substantially better operations or safety benefits.

After a comparison of the action alternatives against the Level 3 criteria and performance measures, the following Recommended Alternative for each segment was determined to meet the project Purpose and Need and secondary goals to the highest degree while minimizing environmental and community impacts.



The following alternatives make up the Recommended Alternative for the US 24 corridor:

- ✦ Powers Boulevard to Constitution Avenue
 - » Alternative 4 – Six Lanes with Interchanges at CO 94, Marksheffel Road, and Constitution Avenue
- ✦ Constitution Avenue to Falcon (Woodmen Road)
 - » Alternative 5 – Six Lanes
- ✦ Falcon (Woodmen Road) to Peyton
 - » Alternative 4 – Four Lanes to Rex Rd and New Passing Lanes to Peyton
- ✦ Peyton to Calhan
 - » Alternative 2 – Two Lanes with New Passing Lanes
- ✦ Calhan to Ramah
 - » Alternative 2 – Two Lanes with New Passing Lanes

The peak period shoulder lanes considered in the two study segments along US 24 between Powers Boulevard (CO 21) and Falcon may be considered as a short-term phase of the six-lane widening. The peak period shoulder lanes would reduce congestion and improve intersection operations under short-term, peak period traffic conditions, but the full six lanes with interchanges would be needed between Powers Boulevard (CO 21) and Falcon to meet the operational and safety goals for the forecasted 2040 corridor conditions.

The recommended improvements along the US 24 corridor are described in the “Study Recommendations” section of this report.



AGENCY AND PUBLIC COORDINATION

Understanding the ideas, perspectives, and needs of key stakeholders in the US 24 corridor study area was critical to building broadly supported decisions and solutions. Stakeholder involvement was emphasized throughout the PEL process and feedback was solicited from the agency and public partners at key decision points to foster acceptance of recommendations.

Agency Coordination

Executive Committee Meetings

An Executive Committee was formed to discuss policy-level decisions and keep elected officials and high-level agency staff engaged in the study. The Executive Committee included representatives from the following communities and agencies:

- ✦ CDOT
- ✦ El Paso County
- ✦ City of Colorado Springs
- ✦ Town of Calhan
- ✦ Town of Ramah
- ✦ PPACG
- ✦ Central Front Range Transportation Planning Region (TPR)

Four meetings of the Executive Committee were held:

- ✦ April 25, 2016 (joint meeting with the study's Technical Advisory Committee)
- ✦ September 29, 2016
- ✦ February 13, 2017
- ✦ August 7, 2017

Technical Advisory Committee Meetings

The study included the formation of a Technical Advisory Committee that met frequently with the project team to provide technical input. The Technical Advisory Committee included staff from:

- ✦ CDOT
- ✦ FHWA
- ✦ El Paso County
- ✦ City of Colorado Springs
- ✦ Town of Calhan
- ✦ Town of Ramah
- ✦ PPACG
- ✦ Central Front Range TPR



The Technical Advisory Committee Charter, signed by all Technical Advisory Committee members, identified roles, responsibilities, and the decision-making process for the project. The Charter established the concurrence points with meetings at key milestones within the study process and stated that concurrence for decisions presented at Technical Advisory Committee meetings was provided with acceptance of the distributed meeting notes.

The Technical Advisory Committee was heavily involved in shaping the alternatives that were considered, alternatives evaluation criteria and performance measures, as well as prioritizing study recommendations. Members of the Technical Advisory Committee kept their respective elected officials updated between Executive Committee meetings.

Concurrence was provided at the following key milestones:

- ✦ Technical Advisory Committee Charter
- ✦ Purpose and Need Statement
- ✦ Evaluation Criteria
- ✦ Initial Alternatives Developed
- ✦ Level 1 Alternatives Screening Results
- ✦ Level 2 Alternatives Screening Results
- ✦ Improvement Recommendations
- ✦ Funding and Prioritization Recommendations
- ✦ Final Study Recommendations

Ten meetings of the Technical Advisory Committee were held:

- ✦ April 25, 2016
- ✦ June 14, 2016
- ✦ July 12, 2016
- ✦ August 30, 2016
- ✦ October 31, 2016
- ✦ December 12, 2016
- ✦ February 6, 2017
- ✦ April 3, 2017
- ✦ June 1, 2017
- ✦ October 18, 2017

Resource Agency Coordination

The study was coordinated with local, state and federal resource agencies, including:

- ✦ Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division
- ✦ CDPHE, Hazardous Materials and Waste Management Division
- ✦ CDPHE, Water Quality Control Division
- ✦ Colorado Parks and Wildlife (CPW)
- ✦ Colorado Historical Society/Colorado State Historic Preservation Office
- ✦ U.S. Army Corps of Engineers (USACE), Regulatory Division



- ✦ U.S. Environmental Protection Agency (EPA)
- ✦ U.S. Fish and Wildlife Service (USFWS)
- ✦ Paint Brush Hills Metropolitan District
- ✦ Cherokee Metropolitan District
- ✦ Fountain Creek Watershed
- ✦ Upper Black Squirrel Creek Ground Water Management District
- ✦ Town of Ramah
- ✦ Colorado State Land Board

Information was distributed to representatives at these resource agencies at three points during the study. Early in the study, a letter and study area map were mailed as an introduction to the PEL study process and confirmation of preferred contact information was requested. A second letter outlined the project Purpose and Need and requested review of the Draft Corridor Conditions Report related to their specific resource(s). The final letter provided a link to the Final Alternatives Report and draft study recommendations to facilitate review to identify potential resource impacts and next steps required for future NEPA processes. A summary matrix of the resource agency coordination and input is included in **Appendix B**.

Other Agency Coordination

Small group meetings were held with individuals representing public agencies and organizations and others directly affected by the project work to identify likely impacts and help shape the study recommendations.

These meetings and presentations occurred as follows:

- ✦ Freight Industry/Colorado Motor Carriers Association - January 7 and July 20, 2017
- ✦ Town of Calhan - July 17, 2017
- ✦ El Paso County staff - July 17, 2017
- ✦ PPACG Technical Advisory Committee - August 17, 2017
- ✦ PPACG Citizens Advisory Committee - August 30, 2017
- ✦ PPACG Board of Directors - September 3, 2017

Public Participation

In an effort to gain as much community input as possible, public participation was emphasized throughout the study process. It was important that all participants, including potential users of the corridor and roadways in the vicinity, understand each alternative evaluated. The project web page and graphics used at meetings clearly illustrated proposed alternatives and the evaluations of benefits and impacts.



General Public Meetings

This study held general public meetings at three points in the study to share information and gather input. Meetings were held as follows:

- ✦ Public Meeting #1
 - » August 16, 2016 at Meridian Ranch Recreation Center
 - » August 23, 2016 at Peyton Career Technical Education Facility
- ✦ Public Meeting #2
 - » March 2, 2017 at Falcon Legacy Campus Gymnasium
- ✦ Public Meeting #3
 - » September 28, 2017 at Meridian Point Church

The first meeting served to introduce the study and discuss corridor travel conditions and the need for improvement. At the second meeting, the alternatives and Level 1 and 2 evaluation results were presented for comment. Draft study recommendations were presented at the final meeting for feedback prior to finalizing and prioritizing study recommendations. The meetings were each attended by 40 - 70 individuals.

Major Stakeholder Coordination

Early in the study, major stakeholders were identified using project team and Technical Team input. Letters were mailed to these contacts to inform them of the study and verify appropriate contact information for future updates. These stakeholders included:

- ✦ Meadow Lake Airport - meeting held December 12, 2016
- ✦ Colorado Springs Airport
- ✦ Falcon Heights Property Owner Association
- ✦ Norwood Development, Banning-Lewis Ranch
- ✦ El Paso County Community Services Department
- ✦ Peterson AFB
- ✦ Schriever AFB

Focus Groups

Focus Groups were formed to advise the project team of the concerns of various groups of stakeholders in the area. These meetings provided a forum for informing stakeholder groups and allowed detailed discussion of topics relevant to each of them. Focus groups included representatives from:

- ✦ School districts (Falcon District 49, Calhan District RJ-1, Peyton District 23JT, Colorado Springs District 11, and Big Sandy District 100J)
- ✦ Air Force Bases (Peterson AFB and Schriever AFB)



- ✦ Emergency service providers (Falcon Fire Department, Colorado Springs Fire Department, Big Sandy Fire Department, El Paso County Sheriff's Office, and ucHealth Memorial Hospital)

The project team, comprised of CDOT and project consultant staff, met with the focus groups at two points in the study. At the first round of meetings, a presentation was made to introduce the study and Purpose and Need, and Level 1 screening concepts. Draft Level 3 alternatives were reviewed at the second round of meetings. At both points, focus group member feedback was solicited and used by the project team in the alternatives evaluation.

Meetings were held as follows:

- ✦ School Focus Group meetings - January 26, 2017 and June 5, 2017
- ✦ Air Force Base Focus Group meetings - January 26, 2017 and June 5, 2017
- ✦ Emergency service provider Focus Group meeting - June 5, 2017

Community Outreach

In addition to the previously mentioned methods of information distribution, project team members conducted community outreach activities to reach people at convenient locations with project information.

Project team members staffed a booth at the Calhan Summer Fest on July 15, 2016. The annual event is hosted by the Town of Calhan and is typically attended by 1,500 people. The booth provided study information and public comments regarding existing conditions and needed improvements were gathered on a study area map. Project staff discussed the study with over 40 people who frequently drive the US 24 corridor.

A study update presentation was made at a special session Calhan Town Hall meeting on December 6, 2016. This meeting was advertised through print media, flyers in community gathering places, and through the project's electronic mailing list. Approximately 25 members of the public attended to learn about the study process, Purpose and Need, and initial alternatives being considered.

Study mailing list sign-up opportunity and brief description of the study effort was provided during two El Paso County Commissioner town hall meetings, held on January 28, 2017 and March 18, 2017.

Information Distribution

The study utilized many methods of advertising and outreach. Each public meeting was preceded by a news release, which was sent to local media outlets as well as local jurisdictions' Public Information Officers for inclusion in their community bulletins. Flyers advertising the public meetings were distributed door-to-door to community gathering places and high traffic businesses in the US 24 corridor area. A postcard mailer was sent to over 10,000 property owners prior to each public meeting, and an email was sent to the electronic mailing list. A project hotline phone number was established and populated with study information; this also provided a forum for public comments. Some public meetings were covered by local print and TV news media, further increasing awareness.



Public Comments

Input was solicited at the public, community, and focus group meetings and community members were also able to submit comments via the project web page throughout the course of the study. Public meeting graphics and summaries of comments received were subsequently posted on the project web page, www.codot.gov/projects/us-24-pel-study.

Comments received were shared with project staff and the Technical Advisory Committee and considered during the alternatives development, evaluation, and refinement process. Summaries of comments received are included in **Appendix C**.



STUDY RECOMMENDATIONS

Based on the results of the alternatives evaluation process, recommendations for corridor transportation improvements will be carried forward into future project development and NEPA evaluation, if required. Technical Advisory Committee Members agreed to the identification of the recommendations from this PEL study. These recommendations were presented at the third public meeting for the PEL study to solicit feedback on the alternatives evaluation process and the draft study recommendations. Comments received from the public indicate general concurrence with the recommended improvements.

The Recommended Alternatives for the study segments are shown in **Figures 2 through 6**. The design concept for the Recommended Alternative is shown in a conceptual plan set included in **Appendix D**. Design elements were refined to add more definition, considering design solutions to minimize costs and property impacts while maximizing corridor benefits. **Appendix E** includes design technical memorandums and structure recommendations considered for the conceptual design and cost estimates for elements of the Recommended Alternatives. This information may be utilized for further project development.

Roadway Elements

The cross-sections along the US 24 highway between Powers Boulevard (CO 21) and Ramah for the Recommended Alternative are shown in the figures for each study segment. In order to identify and evaluate the potential physical impacts of the roadway widening, an assumed impact area of 25 feet from the edge of pavement was established and included on both sides of the roadway in the proposed typical sections. It is assumed that this impact area could accommodate the area needed for grading, slopes, utilities, or landscaping. However, the required area may be more than 25 feet if more grading is required or amenities are desired, while less area may be needed if walls are constructed to mitigate the amount of right-of-way is required. The right-of-way width required for the US 24 corridor, and the associated property impacts, will be explored in more detail during final design efforts with the identification of specific needs for utilities and roadside improvements (e.g., grading, drainage).

Between Powers Boulevard (CO 21) and Woodmen Road, US 24 is three travel lanes in each direction with right turn deceleration and acceleration lanes and left turn lanes at intersections, as warranted. A depressed median is provided with 12-foot inside and outside shoulders. Peak period shoulder lanes may be considered as a short-term phase of the ultimate six-lane widening.

East of Woodmen Road, US 24 narrows to two travel lanes in each direction with right turn deceleration and acceleration lanes and left turns at intersections, as warranted. A depressed median is provided with four-foot inside and 12-foot outside shoulders.



Approximately a half-mile east of Stapleton Road, at the location of a future Rex Road (identified by other studies), US 24 narrows to a two-lane highway cross-section. Right turn deceleration and acceleration lanes and left turn lanes are provided at intersections, as warranted. Inside shoulders are four feet wide and outside shoulders are 12 feet wide.

Eastbound and westbound passing lanes are provided west of Peyton, between approximately MP 327.7 and MP 328.7. East of Peyton, the existing eastbound passing lane is improved with additional length, from approximately MP 131.8 to MP 132.8. West of Calhan, the existing westbound passing lane is improved with additional length between 8th Street and Soapweed Road. Outside shoulders are 10 feet wide.

Through Calhan, US 24 remains one lane in each direction with a raised median through some areas and left turn lanes at intersections, as warranted. Parking remains with ten-foot outside shoulders/parking through town. Eight-foot sidewalks are provided on both sides of the highway.

East of Calhan, US 24 remains a two-lane highway cross-section. Right turn deceleration and acceleration lanes and left turn lanes are provided at intersections, as warranted. Outside shoulders are 10 feet wide. East of Calhan, an eastbound passing lane is provided from Harrisville Road to approximately MP 342.5. West of Ramah, a westbound passing lanes is provided from Blasingame Road to approximately MP 346.9.

Corridor Intersections

Interchanges are recommended as the long-term recommendations at the CO 94, Marksheffel Road, and Constitution Avenue intersections to meet the future travel demand and mobility needs on the west end of the corridor, while balancing the accessibility to the planned area development west of Falcon. Considering the potential volume growth along US 24, it is expected that the Marksheffel Road intersection would first warrant an interchange, followed by the CO 94 interchange, and the Constitution Avenue interchange. However, the volume growth and associated timing of interchange needs at specific intersections are highly dependent on the area development phasing patterns. The traffic volumes along US 24 and intersection operations should be monitored for increased delay, operational issues, and safety concerns associated with increasing congestion.

At-grade intersection improvements, including auxiliary lanes and traffic signals, are recommended at the other major intersections along the corridor. The additional lanes recommended at each intersection are illustrated with the Recommended Alternative are shown in the figures for each study segment.

The study evaluation showed the Barnes Road and Garrett Road intersections may operate poorly in 2040. The levels of service at those intersections, as well the other intersections in the Constitution Avenue to Falcon segment, are dependent on the forecasted traffic volumes from the future development planned adjacent to the corridor. This study recommends an at-grade intersection at those locations, rather than a grade-separated interchange. However, the required intersection laneage should be updated with more detail information regarding neighborhood layouts and internal roadway networks to optimize intersection and corridor operations.



Figure 2. Powers Boulevard to Constitution Avenue - Recommendations

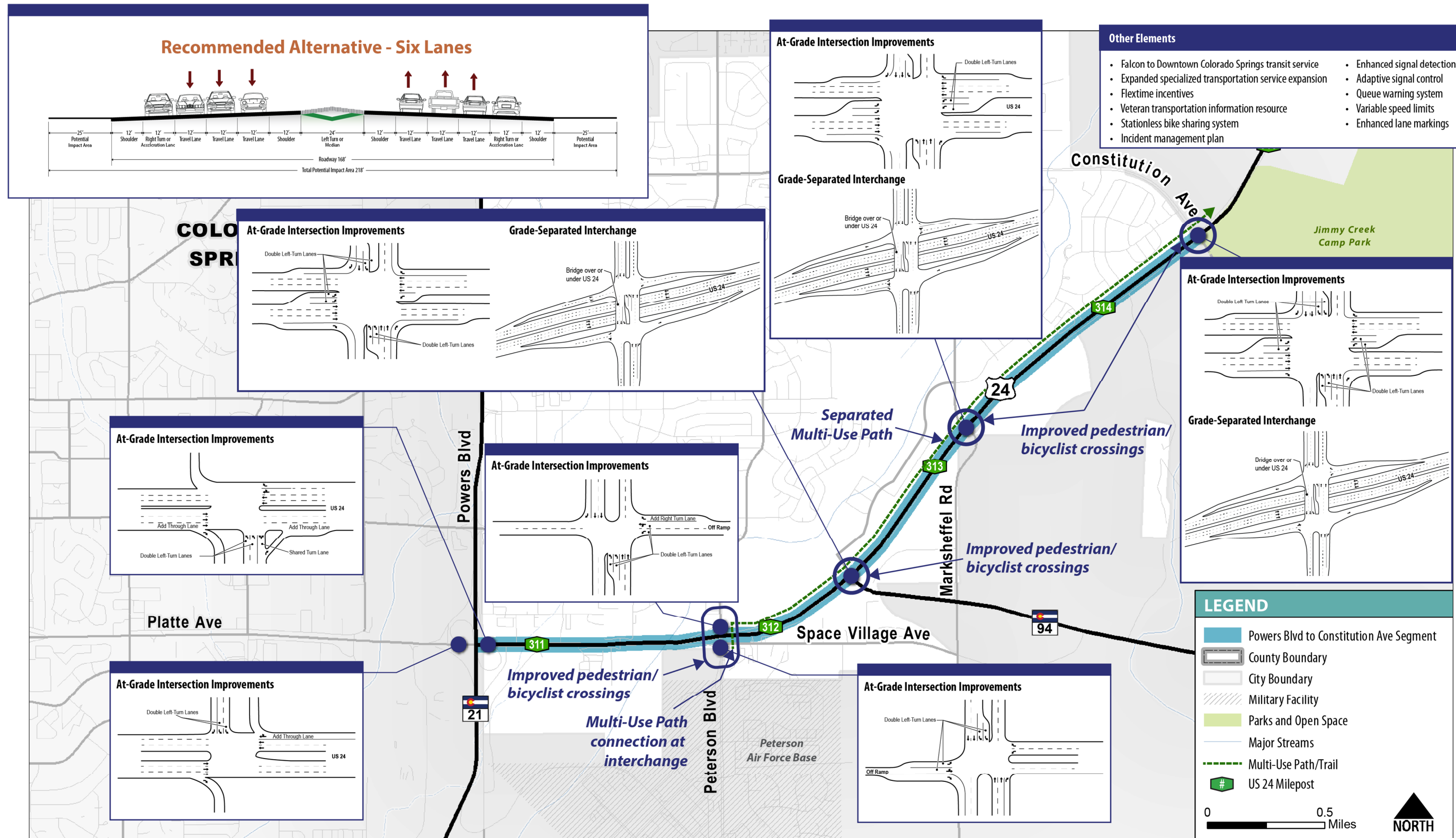




Figure 3. Constitution Avenue to Falcon (Woodmen Road) - Recommendations

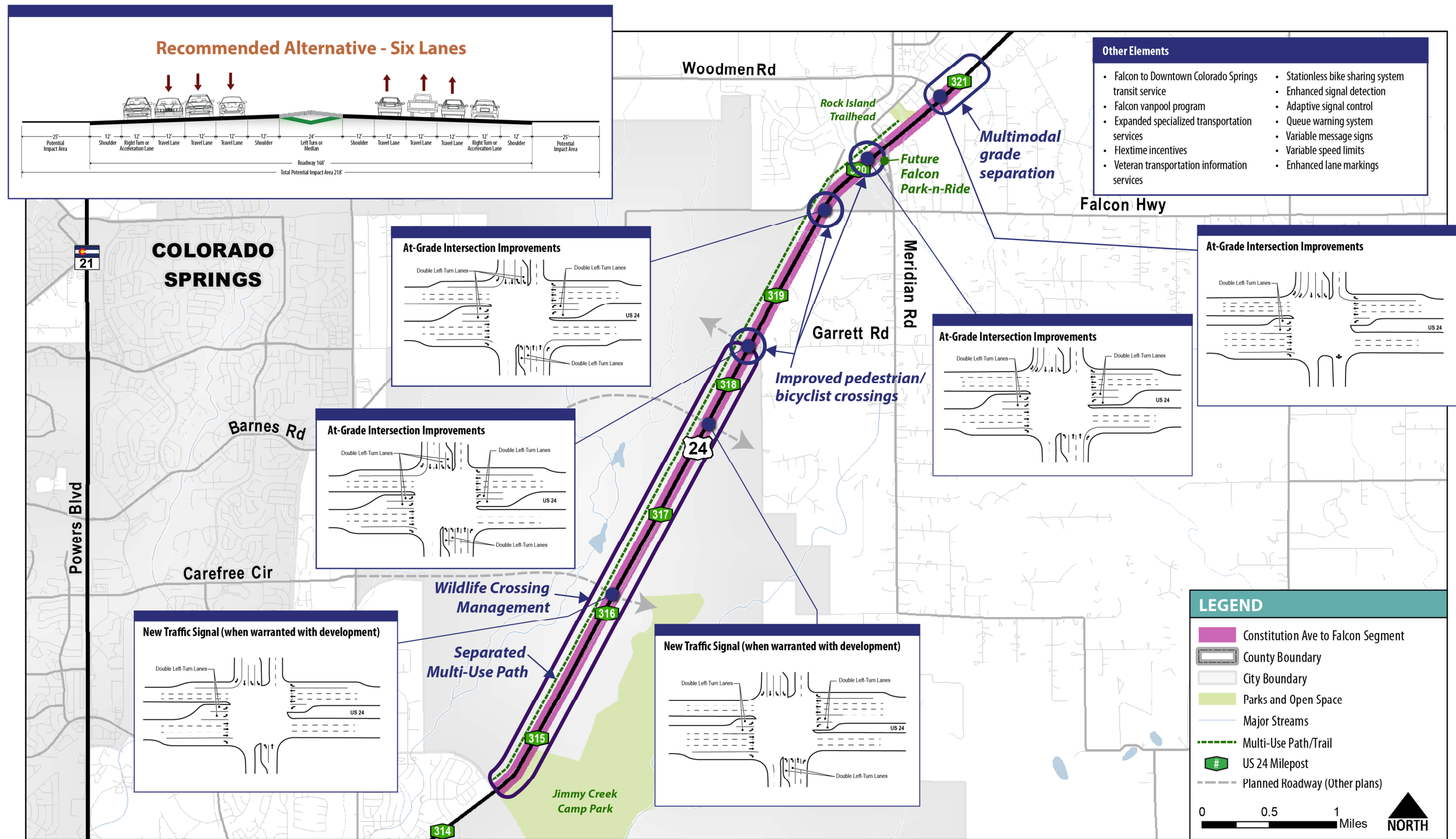




Figure 4. Falcon (Woodmen Road) to Peyton - Recommendations

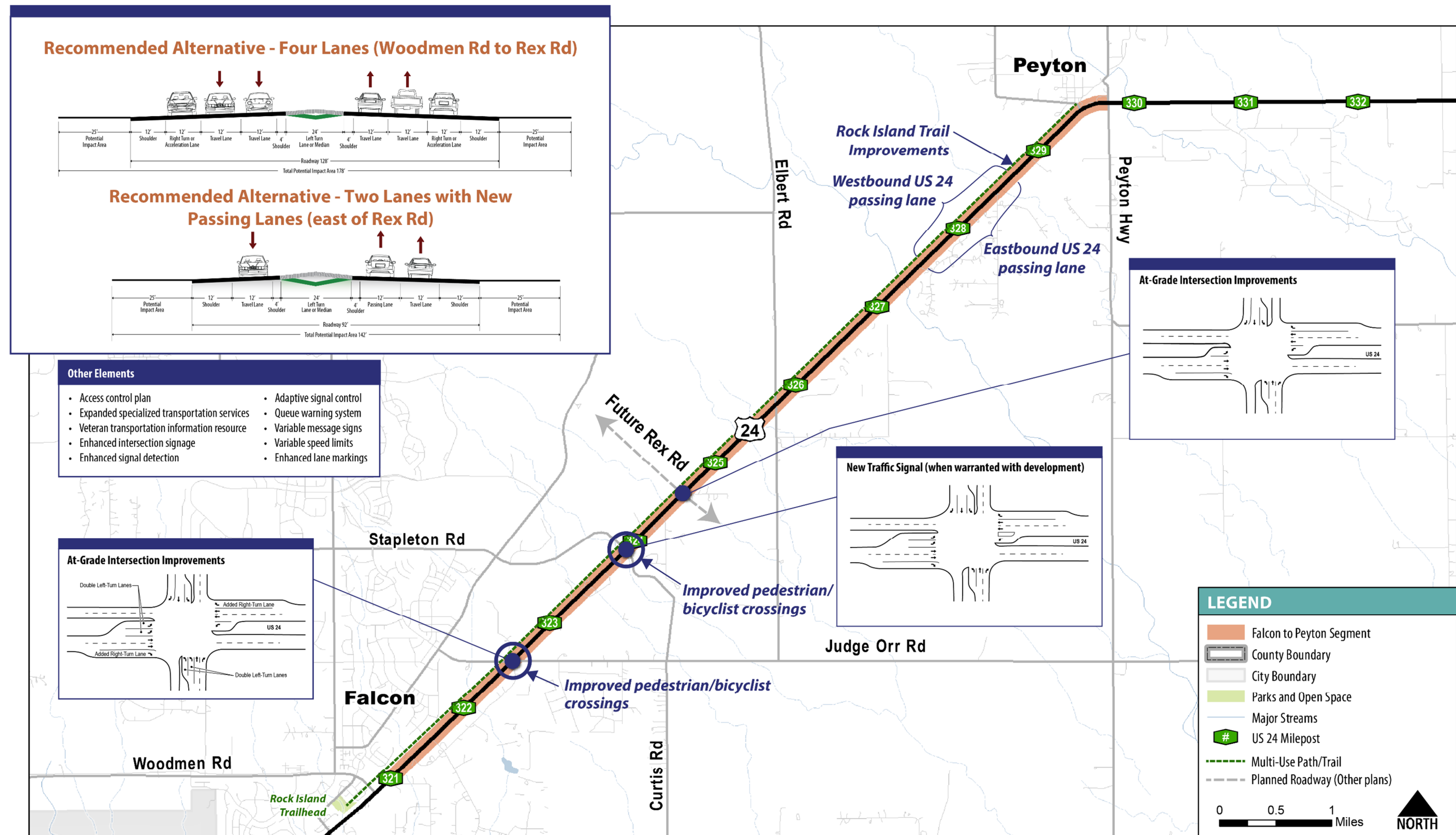




Figure 5. Peyton to Calhan - Recommendations

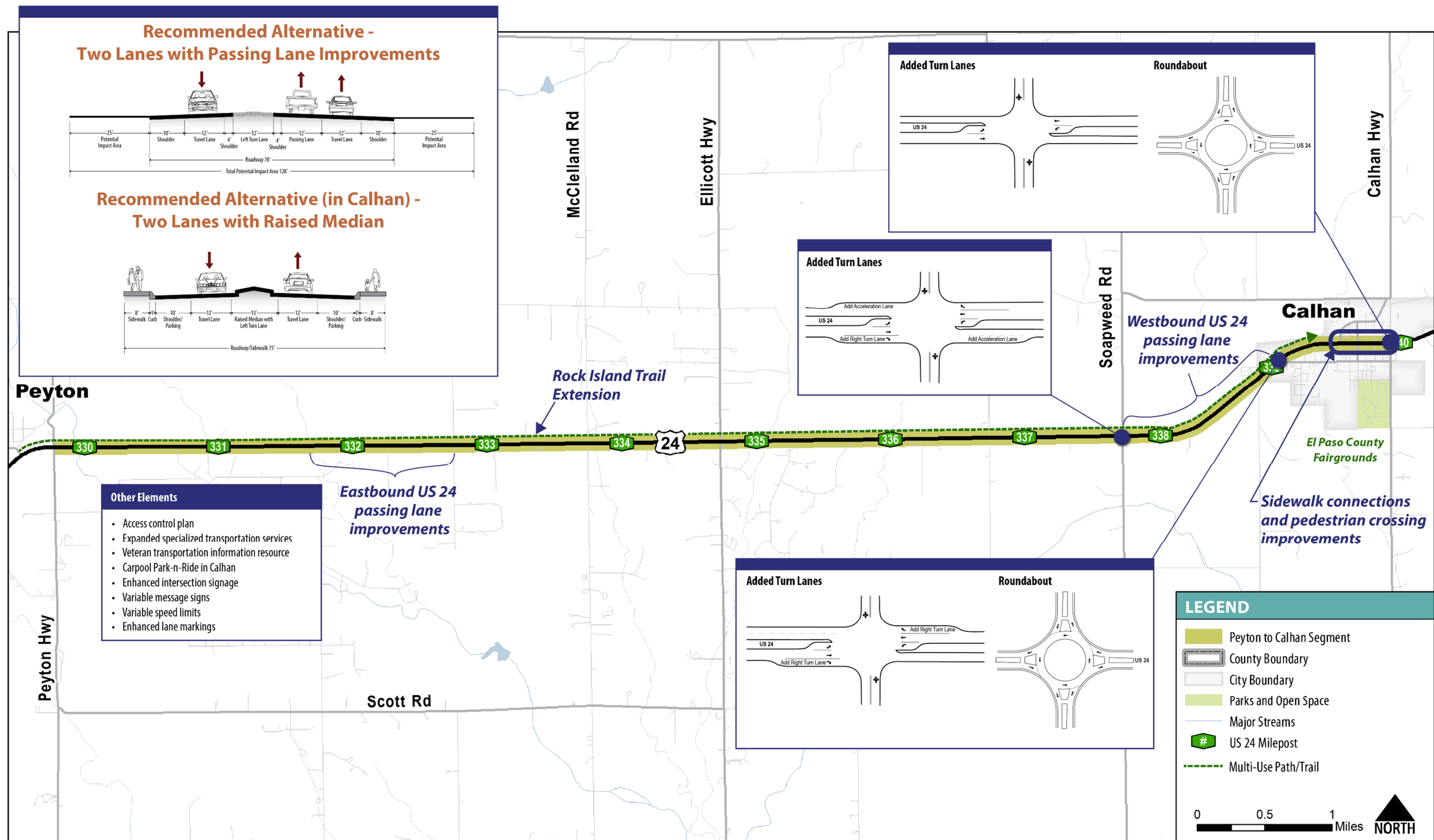
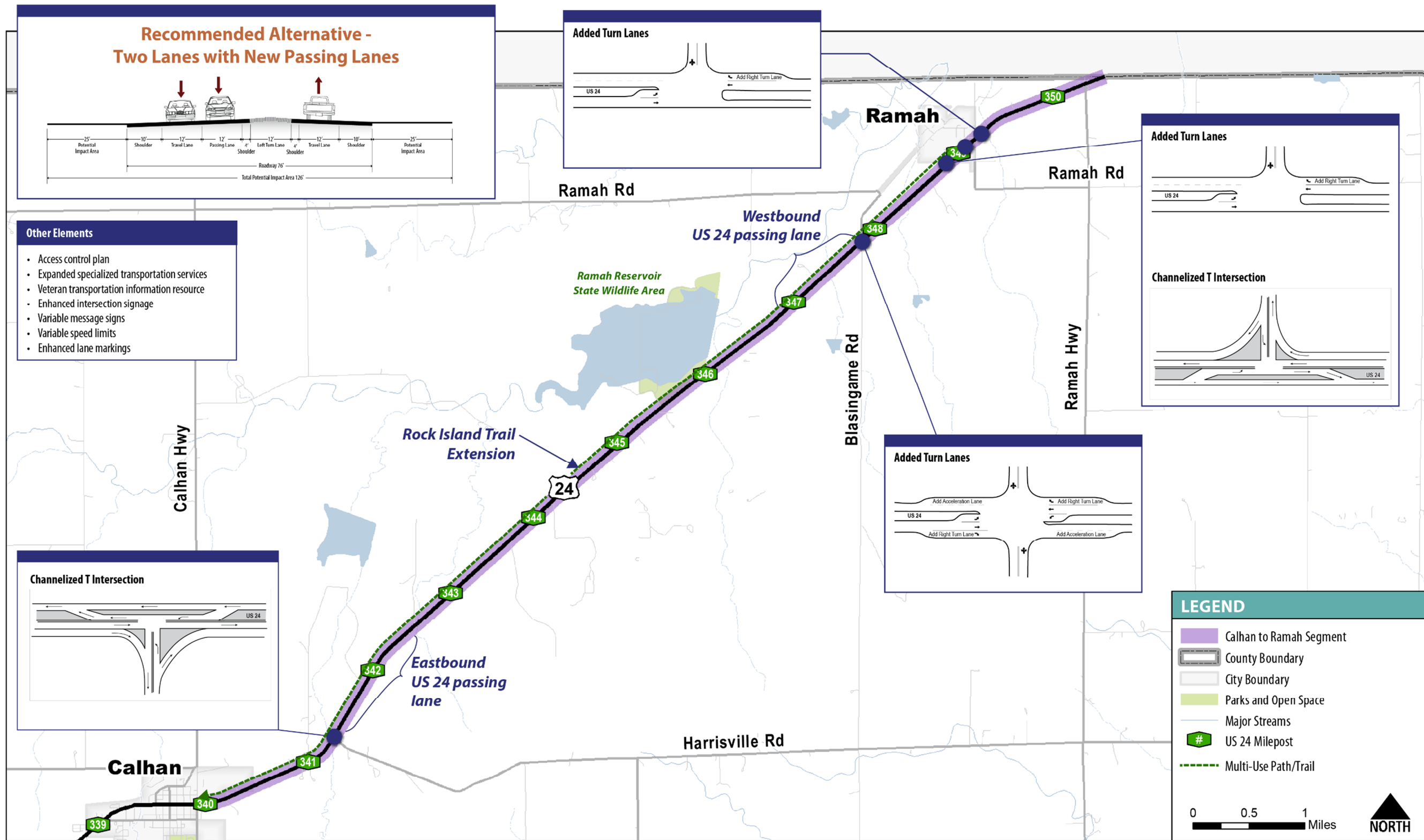




Figure 6. Calhan to Ramah - Recommendations





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Town of Calhan

Recommended improvements along US 24 through the Town of Calhan are illustrated in **Figure 7**. Between Manitou Street and Yoder Street, US 24 remains one lane in each direction with a two-way left turn lane or a raised median. With the raised median, left turn lanes are provided at the main intersections. Parking remains with ten-foot outside shoulders/parking through town.

West of Manitou Street, US 24 is widened to provide turn lanes at intersections and a raised median between 8th Street and Cascade Street and between Fountain Street and Manitou Street. The location and length of the raised medians will be coordinated with the Town of Calhan during future project development and/or the development of the US 24 Access Control Plan through town. Driveway access will also be determined in coordination with Town staff and property owners.

Additional turn lanes are recommended at the 8th Street and Yoder Street intersections on the edges of town. Public comment was received during the study regarding concerns with speeding along US 24 through town. Roundabouts may be considered at the 8th Street and Yoder Street intersections to reduce speeds through the downtown Calhan area. If roundabouts are considered with future project development, the design will need to accommodate large trucks traveling along US 24. Roundabouts would likely have more property impacts than the additional turn lanes at those intersections.

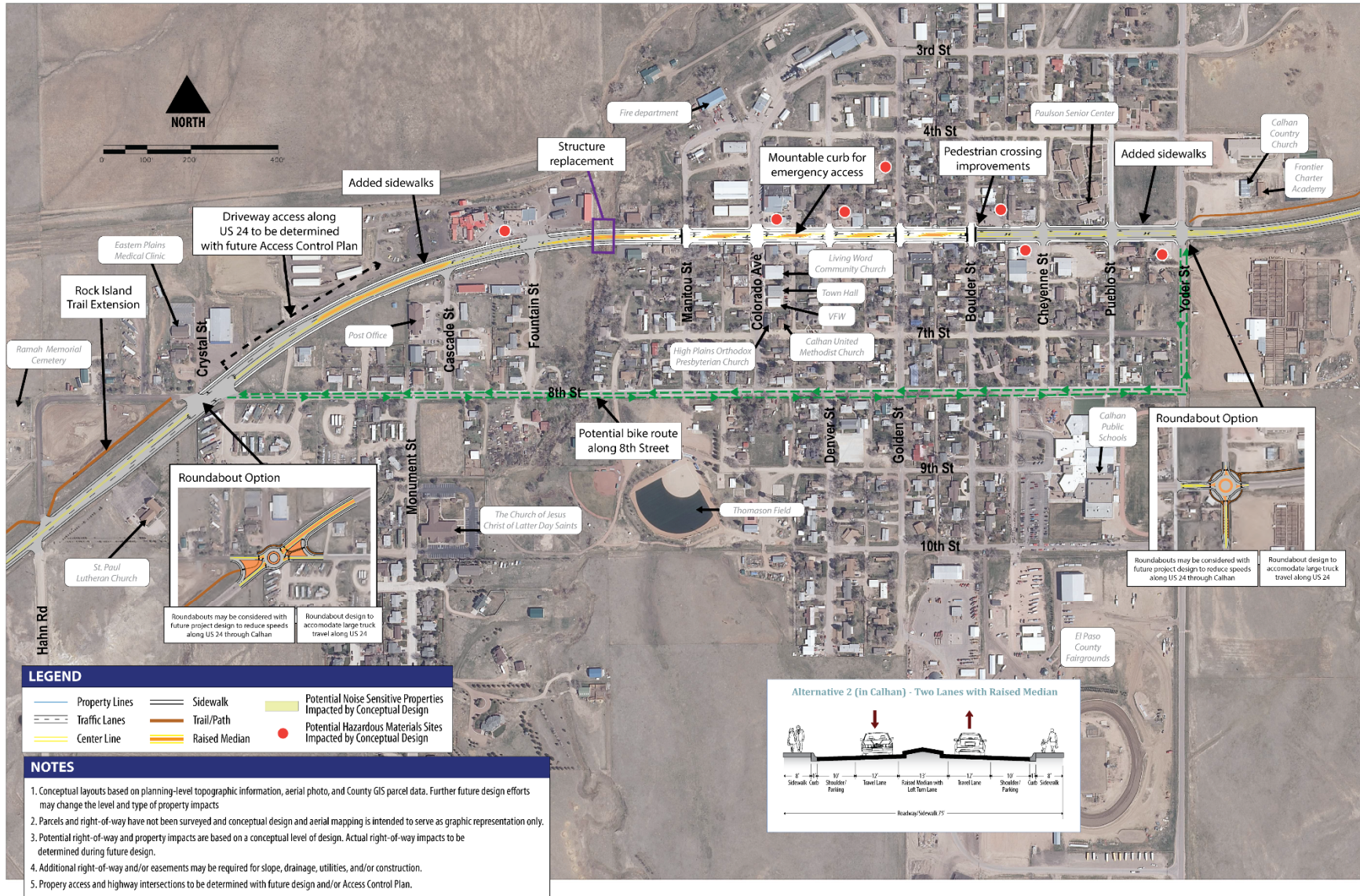
Eight-foot sidewalks are provided on both sides of US 24 between 8th Street and Yoder Street. Pedestrian crossing improvements are also recommended at two locations in the center of town. In order to minimize property impacts, the Rock Island Trail extension is not shown through downtown Calhan. Pedestrians along the trail may continue through town utilizing the sidewalks along US 24. However, bicyclists would either need to ride on the highway, or an on-street bike facility may be provided along 8th Street, which experiences lower traffic volume and less truck traffic. Other bike route options may be explored with future project development.



US 24 Planning and Environmental Linkages Study



Figure 7. Downtown Calhan Recommendations





US 24 Access Control Plan Recommendations

In January 2005, CDOT, El Paso County, and the City of Colorado Springs created the US 24 Access Control Plan, which regulates access to US 24 between Peterson Boulevard and Elbert Road. It was officially approved on June 1, 2006. **Table 4** summarizes the minor modifications recommended to the existing Access Control Plan in order to reflect the PEL Study recommendations for roadway and intersection configurations. No changes are proposed to the number or types of accesses shown in the Access Control Plan.

Table 4. Access Control Plan Recommended Revisions

MILEPOST	SIDE	DESCRIPTION	ACCESS CONTROL PLAN RECOMMENDATION	PEL STUDY RECOMMENDATION
MP 313.23	North/South	Marksheffel Road	Signalized, full movement	Signalized, full movement with future interchange, when warranted
MP 313.92	North	Claremont Ranch neighborhood, Right-in, right-out	May be closed when Constitution interchange constructed	May be closed with highway and/or Constitution or Marksheffel intersection improvements
MP 320.81	North	Old Meridian Road	Right-in, right-out with mountable curb for Falcon Fire emergency vehicles when new Meridian Road constructed (not available for use by any other property owner)	Mountable curb access conditional for Falcon Fire Department on adjacent property
MP 322.50	South	Bluegill Road	Future signalized, full movement	Access closed with road realignment to Judge Orr Road
MP 322.54	North/South	Judge Orr Road	Access closed with realignment to Blue Gill Road	Signalized, full movement

Following recommendations from this study, CDOT will work with El Paso County to establish a new Access Control Plan along US 24 from Elbert Road to the County line. CDOT will also work with El Paso County and the City of Colorado Springs to complete the recommended modifications to the existing Access Control Plan between Peterson Boulevard and Elbert Road. Only the changes outlined in Table 4 will be made to the existing Access Control Plan.

Bicycle and Pedestrian Accommodations

Construction of crosswalks at intersections and appropriate sidewalk connections and bike route signing/stripping on area streets is recommended in conjunction with the corresponding area roadway improvements. Construction of a parallel adjacent multi-use path connection between Peterson Boulevard and Falcon and extension of the Rock Island Trail east of Falcon is also recommended in conjunction with the highway improvements along US 24.

As described with the Roadway Elements, an assumed impact area of 25 feet from the edge of pavement was established and included on both sides of the roadway in the proposed typical



sections and layouts for the corridor recommendations. It is assumed that this impact area could accommodate the area needed for grading, slopes, sidewalks, or landscaping. In areas with the multi-use path or Rock Island Trail adjacent to the roadway corridor, this impact area (25 feet) was assumed to not include the path, since a path may require additional grading and slope impacts beyond a standard sidewalk due to the additional width and clear zone requirements. Whether this additional area is CDOT or County right-of-way or easement, would need to be considered with individual properties along the corridor as more detailed design is completed and more accurate areas of construction are identified. The maintenance responsibilities of such a path or trail would also need to be established.

As the US 24 highway is widened or improved, pedestrian and bicyclist grade separations may be considered to connect the new multi-use path and Rock Island Trail to neighborhoods or parks across the highway. For example, there are planned trails within the Jimmy Camp Creek Park area west of Falcon and a grade-separated trail connection across US 24 would benefit the regional community. CDOT should coordinate US 24 roadway projects with the area local agencies, park agencies, and trail and open space groups to consider trail components and connections that can serve the multimodal recreational commuter needs.

As pedestrian and bicycle elements of the recommendations proceed into further project development, feasibility and impacts will need to be addressed and refined. It is recommended that inter-jurisdictional pedestrian and bicycle facility planning be undertaken by the City of Colorado Springs, El Paso County, and the Town of Calhan to complete missing links in the multimodal network in areas where the jurisdictions interface. The provision of pedestrian and bicycle facilities on local streets in Calhan should be coordinated with local residents and businesses.

System Management Recommendations

The Recommended Alternative includes system management strategies to manage travel demand along the US 24 corridor. The recommendations are:

- ✦ Improved Transit Service - New transit service between Falcon and Colorado Springs, originating from the new Falcon park-n-ride lot currently being designed.
- ✦ Specialized Transportation Service Expansion - Expansion of transportation services for disabled and senior residents of eastern El Paso County (provided through Calhan Senior Services and Silver Key Service) to provide additional daily service and vehicles.
- ✦ Calhan Park-n-Ride - Parking provided at an existing parking lot not fully utilized during weekday commute periods (like at a church) to encourage carpooling for Calhan residents to reduce traffic volumes along the corridor.
- ✦ Flextime Incentives - Financial incentives for employers and employees to encourage travel to and from work outside of the peak hours of congestion, particularly in the segment between Powers Boulevard and Falcon.
- ✦ Veteran's Transportation Resource - Addition of transportation information to the resources provided by the El Paso County Veterans Service Office.
- ✦ Falcon Vanpool - Focused marketing of the existing Metro Mountain Transit vanpool program to the Falcon area for use with the new Falcon park-n-ride lot currently being designed.



- ✦ Stationless Bike Sharing System - Bike sharing program that utilizes GPS tracking for bike locations and smart locks to allow people to lock the bike to a bike rack anywhere within a designated service area. Peterson AFB, the new Falcon park-n-ride, and the existing Rock Island Trailheads are potential locations for the program.
- ✦ Incident Management Plan - A planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents, so that traffic flow may be restored as safely and quickly as possible. The existing plan for the US 24 corridor will be updated in coordination with public and private sector partners.
- ✦ Enhanced Intersection/Destination Signage - Signage for intersecting street names and destinations in advance of the cross-street intersections, located to provide adequate sign visibility, decision time, and deceleration prior to the intersection.

Because most system management strategies would improve regional mobility with minimal community and environmental impacts, these types of recommended elements should be pursued as funding for these supplemental transportation improvements becomes available.

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*, improvement strategies recommended 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)



These improvement strategies are included as part of the highway Recommended Alternative improvements along the corridor.

Technology Recommendations

The Recommended Alternative includes technology applications to maximize the traffic and safety benefits along the US 24 corridor. The recommendations are:

- ✦ Enhanced Signal Detection - Traffic controller upgrades and additional detectors at strategic locations for collection and analysis of controller events to allow the fine-tuning of signal operations regularly and for all periods of the day.
- ✦ Adaptive Signal Control - Traffic signal control technology in which traffic signal timing changes automatically via computer algorithms based on real-time traffic conditions.
- ✦ Queue Warning System - Advanced, dynamic signage connected to downstream traffic signals and detectors to alert motorists of upcoming stopped traffic, thereby reducing rear-end crashes associated with traffic back-ups from signals.
- ✦ Variable Message Signs (VMS) - Electronic signs located along the corridor to relay information to drivers about travel and roadway conditions to improve driver route selection, mitigate the severity and duration of incidents, and improve the transportation network's overall performance.
- ✦ Variable Speed Limits - Electronic speed limit signage to allow the dynamic adjustment of speed limits for appropriate travel speeds based on traffic, weather, or other roadway conditions. Variable speed limits can improve safety by increasing uniform behavior of motorists and reducing the likelihood of congestion- or weather-related crashes.
- ✦ Enhanced Lane Markings - Brightly reflective pavement markings, reflectors, or lights on the pavement to enhance driver recognition of roadway geometry and lane configuration, as well as other new technology to support driverless vehicle recognition of lane configuration.

Many of the technology recommendations require ancillary infrastructure in order to operate and communicate with motorists, as well as with the rest of the CDOT Intelligent Transportation System (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 right-of-way 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 projects for ITS installations should be evaluated within right-of-way constraints. The required ancillary infrastructure and potential additional right-of-way needs for specific technology options will be identified with further project development.



Managed Lane Considerations

The configuration and operation of additional US 24 lanes as managed lanes were not developed for the corridor. The alternatives evaluation considered a separated express lane alternative assumed to operate as a managed lane, but all other alternatives were analyzed as general purpose lanes. However, future capacity improvements (additional lanes) may include managed lane strategies to optimize operations. Infrastructure elements of the recommended improvements would facilitate the implementation of managed lanes, including relatively wide shoulders and grade separations at high-volume intersections.

Conceptual Cost Estimates

A summary of the approximate costs for the recommended roadway improvements is summarized by study segment in **Table 5**. The costs are in 2017 dollars and are based on the concept level of design detail of the study. There are a total of \$420 to \$510 million in construction of the recommended roadway improvements. Right-of-way costs were not included in the construction cost estimate.

Table 5. Conceptual Construction Cost Estimates – by Study Segment

US 24 CORRIDOR STUDY SEGMENT	CONSTRUCTION COST ESTIMATE ⁽¹⁾
Powers Boulevard to Constitution Avenue	\$140 - 170 Million
Constitution Avenue to Falcon (Woodmen Road)	\$105 - 125 Million
Falcon (Woodmen Road) to Peyton	\$75 - 90 Million
Peyton to Calhan	\$45 - 55 Million
Calhan to Ramah	\$55 - 70 Million

⁽¹⁾ Costs in 2017 dollars

Specific right-of-way limits for corridor and intersection improvements would not be set until completion of preliminary and final design. However, the conceptual improvement plans and cross-sections provide a general indication of the potential future right-of-way needs. Where the long-term recommendations for interchanges are located (CO 94, Marksheffel Road, and Constitution Avenue intersections), right-of-way area for a relatively large interchange footprint should be considered for reservation/preservation, so as not to preclude future capacity improvements with new development.



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AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

One of the goals of the PEL process is to identify potential impacts early in the planning process so that impacts can be avoided or minimized to the extent possible. The Recommended Alternative from this PEL study was conceptually designed to minimize environmental impacts while meeting the Purpose and Need. Specific mitigation measures for remaining environmental impacts will be determined during subsequent NEPA evaluation processes and further project development.

Construction of the Recommended Alternative project elements may result in direct, indirect, and cumulative impacts to environmental resources depending on the type and location of the resource in proximity to the improvements. The resources that may be impacted by transportation improvements with the study area were evaluated in the *Final Corridor Conditions Report* (December 2016).

If a project from the Recommended Alternative receives Federal funding and/or involves a State or Federal facility, the results of the PEL study will be carried forward at that time into project development, additional environmental review (NEPA-level or similar state environmental review process), and design. If the project is solely funded with local funds, a NEPA review process would still be required if there is any “federal nexus”, such as a permit or an access need. Also, any project that will require permits from Federal agencies, such as a Section 404 Permit (impacts to wetlands) and/or modifications to the floodplain requiring coordination with the Federal Emergency Management Agency (FEMA), will initiate the NEPA process.

Environmental Analysis

The environmental resources that were studied were selected based on the characteristics of the study area. The resources considered are generally consistent with NEPA, its implementing regulations, and with FHWA and CDOT guidelines. A summary of the overview findings is described below for the Recommended Alternative, previously described in this report.

The environmental study area surrounding the US 24 corridor focused on most likely physical impacts of corridor transportation improvements. Generally, environmental resources were identified within 500 feet of the highway corridor (a total of 1,000 feet wide along the corridor). To take into account the potential for indirect or secondary effects to community or environmental resources as a result of the recommended improvements, relatively large and regional resources were identified outside of the 1,000-foot boundary.



Parks and Recreational Resources – Section 4(f) and Section 6(f)

Parks and recreational resources were evaluated within the study area. Publicly owned parks and recreation facilities are regulated under Section 4(f) of the Department of Transportation Act of 1966 which stipulates that FHWA and other US DOT agencies cannot approve the use of land from publicly owned parks, recreational facilities, wildlife and waterfowl refuges, or public and private historic sites unless there is no feasible and prudent alternative to the use of the land, and the action includes all possible planning to minimize harm to the 4(f) resource resulting from the use. Section 4(f) also applies if publically owned land is formally designated as a planned park or recreation area not yet developed and determined significant. Inclusion of the land and its function within a city or county Master Plan would be evidence of a formal designation.

Some park and recreational resources are also regulated under the Land and Water Conservation Fund (LWCF) Act of 1965 which established a federal funding program to assist states in developing outdoor recreation sites. Section 6(f) of the LWCF Act prohibits the conversion of property acquired or developed with these funds to a non-recreational purpose without the approval of the National Park Service.

There are five existing parks and/or recreational resources located within the area surrounding the US 24 corridor, which may be impacted by the Recommended Alternative:

- ✦ Jimmy Camp Creek Park
- ✦ Rock Island Trail
- ✦ Rock Island Trailhead (Park)
- ✦ Ramah Baseball Field
- ✦ Ramah Reservoir State Wildlife Area

Potential recreational Section 4(f) properties that could be impacted by the Recommended Alternative should be evaluated for Section 4(f) applicability. When FHWA determines that a project as proposed may use a Section 4(f) property, there are three methods available to approve the use; preparing a de minimis impact determination; applying a programmatic Section 4(f) evaluation; or preparing an individual Section 4(f) evaluation. If the proposed improvements impact a Section 4(f) property, one of these processes will need to be completed.

Section 6(f) of the LWCF Act of 1965 applies to all recreational properties that were either purchased or improved with funds from the LWCF (FHWA, 2013). Section 6(f) protects these properties as public recreation facilities in perpetuity and prohibits a “conversion” of a property from recreational use unless a suitable (size, usefulness, monetary value) property can be found (FHWA, 2013). The LWCF Act is run by the National Park Service and administered locally in Colorado by Colorado Parks and Wildlife.

Ramah Reservoir State Wildlife Area is a Section 6(f) resource that may be impacted by the Recommended Alternative.



Community and Social Resources (with Environmental Justice)

Community resources include a variety of factors that may affect quality of life for a population. The following potential impacts should be considered: community cohesion; community resources (e.g., schools, churches, parks, retail shopping, etc.); community values and vision; community transportation resources (alternative modes of transportation); and community mixed-use developments.

Environmental justice legislation was created out of concerns that facilities were being placed in minority and low-income populations without regard to the consequences of these actions. In accordance with Council on Environmental Quality guidance, minority and low income populations occur where either:

- ✦ The minority or low-income population of the affected area exceeds 50%.
- ✦ The population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Development within the area surrounding the US 24 corridor is composed of residential, agricultural, light industrial, recreational and commercial properties including retail stores, restaurants, campgrounds, schools, and automotive and fueling service stations. Community facilities within the study area that may be impacted by the Recommended Alternative are listed in **Table 6**.

Table 6. Community Facilities

NAME	ADDRESS / LOCATION
Ramah Baseball Field	Southwest corner of Main Street and South Chestnut Street
Ramah Reservoir State Wildlife Area	Four miles west of Ramah north of US 24
Frontier Charter Academy/Calhan Country Church	488 Yoder Street, Calhan
Paulson Senior Center	406 Cheyenne Street, Calhan
Calhan Post Office	655 Cascade Street, Calhan
Eastern Plains Medical Clinic	560 Crystola Street, Calhan
St. Paul Lutheran Church and Preschool	1450 5th Street, Calhan
Peyton Post Office	13055 Bradshaw Road, Peyton
Rock Island Trailhead and Regional Trail	McLaughlin Road, Falcon
Pikes Peak Community College/Patriot Learning Center	11990 Swingline Road, Falcon
High Prairie Library	7035 Old Meridian Road, Peyton
Falcon Fire Protection District	7030 Old Meridian Road, Peyton
Falcon Meadow RV Campground	11150 US 24, Peyton
Sand Creek Golf Course	6865 Galley Road, Colorado Springs
The Wrangler Motel/RV Ranch	6225 East Platte Avenue, Colorado Springs



A review of the US 24 study corridor revealed that there are four Census tracts and seven block groups within the area that could be impacted by a future project.

Minority populations are composed of ethnic and/or racial minorities. As defined in FHWA Order 6640.23, a minority is a person who is African American, Hispanic, Asian American, American Indian or Alaskan Native. Census blocks with a higher percentage of minorities than the respective county would be evaluated for disproportionately high and adverse effects and selected for outreach.

Based on the CDOT guidance, block groups that are located in the community study area were compared to the state of Colorado and El Paso County data to evaluate if minority groups are present. Reviewing preliminary data, there are six block groups within eight Census tracts within the community study area, Census Tracts 50, 51.11, 54.01, 59, and 62, that exceeded the minority percentages for El Paso County. Therefore, these block groups have been identified as minority populations.

To evaluate whether there are low-income populations in a community study area, two things must be established: 1) the low-income threshold dollar amount, number, and percentages for a particular county; and 2) the number and percentage of low-income populations in the community study area that will be compared to the county percentage. The low-income threshold means a household income at or below the Department of Health and Human Services poverty guidelines. As part of future NEPA studies, potentially affected census block groups with an average household income below that of the respective county would be evaluated for disproportionately high and adverse effects and selected for outreach.

The El Paso County low income threshold was assessed to be \$48,984 in which the El Paso County percentage was 43%. Three of the eight Census Tracts, Census Tracts 40.08, 50, and 62, were above the El Paso County percentage at 70%, 59%, and 66% percent, respectively.

A detailed analysis of the impacts to the community and environmental justice populations related to the implementation of project elements of the Recommended Alternative should be conducted. Coordination with local business owners, residents, planners, and other local officials should occur. Ongoing coordination with local planners should be an essential part of future project development to ensure that changes resulting from the Recommended Alternative are compatible with environmental regulations and the local planning offices. Additionally, ongoing conversations with property owners, businesses, and residences potentially affected should also be a critical part of future project development.

Air Quality

Air quality is regulated at the national level by the Clean Air Act of 1970, as amended in 1977 and 1990. The Clean Air Act regulates emissions through the National Ambient Air Quality Standards (NAAQS) and the Hazardous Air Pollutants (HAP) program, which includes Mobile Source Air Toxics (MSATs). Specific requirements are placed on the transportation planning process in air quality nonattainment areas that do not meet the NAAQS emissions limits and in areas that have been reclassified from nonattainment to attainment/maintenance areas.

The NAAQS regulates six criteria pollutants: Carbon monoxide (CO), ground level ozone (O₃), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter, and lead. The EPA has established health- and welfare-based exposure and concentration limits for the NAAQS (EPA,



2016a). Of the six NAAQS pollutants, transportation sources contribute to CO, NO₂, particulate matter (PM₁₀ and PM_{2.5}), and ozone. The EPA works with states and local jurisdictions to monitor ambient air levels for these pollutants. In addition, MSATs have been identified as an issue of concern related to transportation projects (EPA, 2016b). Greenhouse gases (GHGs) are currently regulated via the permitting requirements of the Clean Air Act, with large sources such as power plants required to report GHG emissions (EPA, 2016c). Although transportation-related sources are also large contributors to GHG emissions, these sources are not regulated for GHG at present.

The eastern portion of the study area (from Elbert Road [MP 326] to Ramah Highway [MP 350.4]) is within an attainment status for all NAAQS criteria pollutants; therefore, no quantitative analysis would be required in a subsequent NEPA analysis within this portion of the study area.

The western portion of the study area (from Powers Boulevard to Elbert Road) is located within the Colorado Springs Carbon Monoxide Attainment/Maintenances Area; therefore a quantitative analysis for CO may be necessary for a subsequent NEPA analysis.

The existing conditions along the study corridor for each major category of pollutants are:

- ✦ **Criteria pollutants:** Since 2002, all areas in Colorado are in attainment of all NAAQS criteria pollutants except for ozone in the Front Range area. Areas that were previously in nonattainment for CO and particulate matter have been re-designated to attainment/maintenance status (CDPHE, 2016). CDPHE operates four air quality monitors in El Paso County, measuring CO, SO₂, O₃, and particulate matters PM₁₀ and PM_{2.5} (CDPHE, 2016). There have been SO₂ exceedances of the standard at a monitoring site along US 24; however, the occasional high values have not yet resulted in a violation of the NAAQS (CDPHE, 2016). This monitoring site was added in January 2013 and, in addition to the monitor, a meteorological tower has also been installed to better understand the reasons behind these elevated concentration events (CDPHE, 2016). In addition to particulate matter, ozone levels in El Paso County occasionally rise to the NAAQS threshold value, but there have not been exceedances of the standard as of the most recent reporting year (2016).
- ✦ **Mobile Source Air Toxics:** Tools and techniques for assessing MSATs are limited, and there are no approved exposure-concentration limits. FHWA has issued interim guidance for MSAT analyses associated with NEPA studies based on a tiered approach with no analysis necessary for projects with no potential MSAT effects, a qualitative analysis for projects with low potential MSAT effects, and a quantitative analysis to differentiate alternatives with higher potential MSAT effects (Biondi, E., 2016).
- ✦ **Greenhouse Gases:** Recent concerns with climate change have prompted calls for reducing GHGs, of which carbon dioxide is a primary component. FHWA is working nationally with other modal administrations through the DOT Center for Climate Change and Environmental Forecasting to develop strategies to reduce transportation's contribution to greenhouse gases - particularly carbon dioxide emissions - and to assess the risks to transportation systems and services from climate changes. At the state level, there are also several programs underway in Colorado to address transportation GHGs. Because climate change is a global issue and the emissions changes due to study alternatives are very small compared to global totals, the GHG emissions associated with this study are assumed to not need to be calculated.



Noise

FHWA procedures for noise abatement are outlined in Title 23 Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. CDOT has established noise levels at which noise abatement must be considered. Known as Noise Abatement Criteria (NAC), these criteria vary according to a property's land use category. CDOT has determined that a traffic noise impact occurs when the projected traffic noise levels meet or exceed the NAC levels, or when projected noise levels substantially exceed existing noise conditions. CDOT defines "substantially exceeding the existing noise levels" as an increase of 10 A-weighted decibel (dBA) or more over the existing levels (CDOT, 2015).

Activity Category A receptors were not identified within the study area. Many Activity Category B receptors (residential) areas adjacent to the highway corridor may also be impacted by the Recommended Alternative. Several Activity Category C receptors (all community resources) may be impacted by the Recommended Alternative, in the Falcon, Peyton, and Calhan community areas. Activity Category D (interior noise readings) will not need to be considered for this project. Activity Category E receptors are located throughout the US 24 study corridor and are more prevalent near areas of development, which may be impacted by the Recommended Alternative. Activity Category F receptors are located along the study corridor, and in rural areas this category includes manufacturing and farming uses. These locations are considered to generate significant on-site noise and are not considered noise-sensitive receptors. Undeveloped lands not permitted for development (Activity Category G) do not have noise thresholds; however, these lands should be included in noise assessments if noise contour lines depict noise levels of 66 dBA and 71 dBA.

A noise assessment should be performed to determine noise sensitive receptors that may be impacted by the Recommended Alternative. Typically, any receptors within 500 feet of the roadway are included in the analysis to be sure that they will not exceed the NAC threshold. The noise assessment should include modeling both existing and future conditions to evaluate if mitigation may be required.

For noise mitigation to be recommended as part of the project, it must be considered both "reasonable and feasible" based on CDOT criteria. Noise mitigation is feasible if it can be constructed without major engineering or safety issues, provides a reduction of at least five decibels to at least one impacted receptor, and a wall that is 20 feet high of less reduces noise by at least seven decibels at a minimum of one benefitted receptor. Reasonableness deals with whether the barrier can be designed to achieve a noise reduction of seven decibels at a minimum of one benefitted receptor, whether the barrier can be constructed in a cost-efficient manner, and the desires of the community. All three of these criteria must be met for a barrier to be considered reasonable to construct.

Hazardous Materials

Hazardous materials include substances or materials which have been determined by the EPA to be capable of posing an unreasonable risk to health, safety, or property. Hazardous materials may exist along the US 24 study corridor at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. An



environmental database records search was conducted for the area surrounding the US 24 corridor (GeoSearch, 2016). Generally, if a facility identified in the records database report was active with an event that had the potential to contaminate the study area, or groundwater flow could cause migration of the contaminants into the study area, then the facility was considered a potential impact.

There are 15 identified hazardous material facilities along the US 24 corridor that would likely be impacted by the Recommended Alternative. The facilities are largely concentrated in the developed areas near Powers Boulevard (CO 21) and the Falcon, Peyton, and Calhan communities.

Environmental contaminants may be encountered during ground-disturbing activities at or near the hazardous materials facilities located near the Recommended Alternative. The most fundamental, but often not feasible, management for hazardous materials is to avoid activities within contaminated sites.

A Modified Phase I Environmental Site Assessment or CDOT Initial Site Assessment should be conducted at site-specific locations to evaluate hazardous materials that may require remediation prior to acquisition or development. Based on the results of the future investigations, further subsurface investigations, including the collection of subsurface soil samples and groundwater samples, may be required to delineate the specific horizontal and vertical extents of contamination. During the design process, this information can be used to identify avoidance options, when possible, and to develop specific contaminated soils/groundwater material management or mitigation measures.

Former and abandoned landfills have been previously present along the corridor. These areas should be reviewed during project refinements to evaluate the need for further subsurface investigations. If evidence of a landfill is discovered during construction, the CDPHE Division of Solid Waste Management should be contacted immediately.

Mines

Geographic Information Services data was obtained from the Colorado Division of Reclamation, Mining, and Safety to identify potential permitted mine locations within the study area and their characteristics (Colorado Division of Reclamation, Mining and Safety, 2011). The review of data of past and current mining operations revealed that no mining sites occur in the study area.

Cultural Resources

A file search was conducted in June 2016 on History Colorado's database for the sections of land within the environmental study area. Site files for all previously surveyed properties along the study corridor were reviewed. Lists of properties on the State and National Registers in El Paso County were reviewed. Furthermore, a field assessment was conducted to verify the location and existence of any properties that may have been listed on the State or National Registers and any previously surveyed properties assessed as eligible for inclusion on the Colorado State Register of Historic Properties (SRHP) or National Register of Historic Properties (NRHP).



Included in this report are those properties which have been listed on the NRHP, on the Colorado SRHP, and those that have been assessed as eligible for inclusion on the NRHP. For PEL studies, designated local landmarks are also included. However, El Paso County and the local communities of Falcon, Peyton, Calhan, and Ramah do not have any local landmark designation programs. In addition, the City of Colorado Springs does not have any designated landmarks or historic districts along the US 24 study corridor.

Table 7 outlines the cultural resources located within the study area that have been surveyed and are recorded as either eligible, needs data, or have no determination for listing on the NRHP. The remaining resources identified in the COMPASS file search have an official or field determination of *not eligible*; therefore, these sites are not reflected in the table.

Table 7. Known Historic and Archaeological Properties in the Study Corridor

SITE NUMBER	LOCATION	NAME	NRHP STATUS
5EP.3320	Historic Bridge	Sand Creek Bridge	Historic Bridge was <i>Officially Eligible</i> for the NRHP; however, the historic bridge has been removed and replaced with a modern bridge. The existing bridge is <i>Not Eligible</i> for the NRHP.
5EP.868 5EP.868.6	Railroad	Denver & New Orleans Railroad	Feature is <i>Officially Eligible</i> for the NRHP
5EP.3561	Historic Bridge	Black Squirrel Creek Bridge	Historic Bridge was listed on the NRHP; however, the historic bridge has been removed and replaced with a modern bridge. The existing bridge is <i>Not Eligible</i> for the NRHP.
5EP.1815 5EP.1815.1 5EP.1815.2 5EP.1815.7 5EP.1815.8 5EP.1815.11	Railroad	Chicago Rock Island & Pacific Railroad	Feature is <i>Officially Eligible</i> for the NRHP. Railroad was abandoned and the tracks were removed in 1993-94.
5EP.868.3	Historic Bridge	Golden Belt Route Highway Bridge	Field Eligible
5EP.868.9	Historic Bridge	Golden Belt Route Highway Bridge	Field Eligible
5EP.1277	Archaeological	N/A	Needs data
5EP.1287	Archaeological	N/A	Needs data
5EP.1289	Archaeological	N/A	Needs data
5EP.1736	Historic Ranch	B/K Ranch Centennial Farm	No determination
5EP.3920	Archaeological	N/A	Feature is <i>Officially Eligible</i> for the NRHP
5EP.3923	Archaeological	N/A	Needs data
5EP.3929	Archaeological	N/A	Needs data
5EP.4676	Historic Ranch	Banning Lewis Ranch Site	Feature is <i>Officially Eligible</i> for the NRHP
5EP.6943	Historical Marker	N/A	No determination

Source: COMPASS database (July 2016)

More than 50 properties along the US 24 study corridor have previously been documented. Included in the previous surveys of this predominantly agricultural area are ranches, farms,



homes, businesses, railroads and depots, churches, bridges, culverts, and roads. Of those surveyed features, the following four features are listed on the SRHP or NRHP or have been assessed as eligible for inclusion on the NRHP:

- ✦ Sand Creek Bridge (East of US 24/Powers Avenue) 5EP.3320
- ✦ Denver & New Orleans Railroad (Between Marksheffel Road and Falcon) 5EP.868.6
- ✦ Black Squirrel Creek Bridge (West of Peyton) 5EP.3561
- ✦ Chicago Rock Island & Pacific Railroad (Between Falcon and Ramah) 55EP.1815, 5EP.1815.1, 5EP.1815.7, 5EP.1815.8, 5EP.1815.11

In addition, the field assessment showed that there were several ranches, homes, and business structures that were over 50 years of age that would need further historic research to determine their eligibility during future project development. All resources identified in this study will need to be evaluated once a project is identified, and it is possible that the eligibility status noted in this report could change once the Section 106 process takes place. This resource information is being provided to show that there are known historic properties in the study area.

Previous resource identification in the area surrounding the US 24 study corridor includes 39 prehistoric archaeological sites, 13 historic archaeological sites, and numerous combined historic/historical archaeological sites. The combined historic/historical archaeological sites are all associated with historic railways and automobile roads.

Avoidance of impacts to historic properties listed or evaluated as eligible for inclusion on the NRHP is preferred over mitigation. A Section 106 review and State Historic Preservation Officer coordination will be required for further project development of elements of the Recommended Alternative.

Historic sites of national, state or local significance in public or private ownership including NRHP listed and eligible properties are considered Section 4(f) resources. An adverse effect determination under Section 106 typically results in a “use” under Section 4(f) of the US DOT Act of 1966. Use of Section 4(f) resources should be avoided and minimized wherever possible. A Section 4(f) evaluation may be required if use of these resources is imperative as a result of a corridor project.

Paleontological Resources

Important paleontological resources must be identified and considered during planning for federally assisted transportation projects, in accordance with Prehistorical and Archaeological Resources Act of 1973. The study area is located near areas with a high potential for paleontological resources. A History Colorado file search was used to identify archaeological and paleontological resources within the area that have been previously surveyed. Google Earth, US Geological Survey (USGS) topographic and geological maps were also reviewed to identify geological units, resource distribution, resource types, and development patterns. The Potential Fossil Yield Classification System (PFYC) (Murphey et al., 2015) was also referenced to determine the potential for fossils based on the geologic units within the study area.



According to data provided by the Denver Museum of Nature and Science (DMNS), there are 11 previously recorded fossil localities within the Denver (Dawson) Formation within the same Townships as the US 24 study area. These include 10 fossil plant localities and one fossil vertebrate locality. The University of Colorado Museum (UCM) has 15 localities in the Denver Formation within the same Townships as the study area. These yielded fossil reptiles and mammals. The UCM has an additional 30 localities in the Denver Formation and six in Pleistocene deposits in El Paso County, and the DMNS has an additional 14 localities in the Denver Formation in El Paso County. A search of the online Paleobiology database shows an additional five localities from the Denver (Dawson) Formation in El Paso County which produced fossil plants, dinosaur bone fragments and turtle. Only one fossil locality is situated within the study area. UCM Locality 89112 produced four bone fragments of an unidentified reptile, which were discovered by former CDOT staff paleontologist S.M. Wallace.

During further project phases, a paleontological survey may need to be conducted to evaluate potential sensitive geologic units. A qualified paleontologist may need to locate potential resources and work with the project team to avoid, minimize, and mitigate resource effects.

Prime and Unique Farmlands

For this study, data was obtained from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database for El Paso County and was analyzed to determine the presence or absence of prime farmland along the US 24 study corridor. Prime farmland exists throughout the area surrounding the US 24 corridor, and therefore may be impacted by the Recommended Alternative. The prime farmland in El Paso County is only considered prime if it is irrigated. There is no unique farmland in El Paso County (NRCS, 2016c).

A detailed analysis of the project design impacts to the existing prime farmland should occur as well as coordination with local planners and other local officials. Ongoing coordination with local planners and NRCS representatives should be part of further project development to be sure that changes resulting from a project are compatible with environmental regulations and the local planning offices. Additionally, ongoing conversations with property owners, businesses, and residents potentially affected will be a critical part of the project development process.

Floodways and 100-year Floodplains

There are numerous FEMA floodplains that cross the US 24 study corridor between Powers Boulevard (CO 21) and Ramah. There are two types of FEMA floodplains along the corridor, Zone A and Zone AE, as well as Regulatory Floodways. The definitions of these types of floodplains are:

- ✦ **Zone A** is defined as areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies.
- ✦ **Zone AE** is defined as areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods.
- ✦ A "**Regulatory Floodway**" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.



Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations.

There are two floodways that cross the US 24 study corridor and the majority of the floodplains that cross the US 24 corridor are Zone A, with no detailed study conducted on the drainageway. Most of these floodplains are unnamed tributaries to a larger named drainageway. There are currently three floodplains with detailed hydraulic analysis and, when FEMA publishes the preliminary map changes, six floodplains will have detailed hydraulic studies to support them. There are a total of 28 FEMA floodplains that cross this alignment.

The Clean Water Act (CWA) requires each state to publish an annual list of water bodies that are not meeting their designated uses because of excess pollutants; these pollutants can be naturally occurring or a result of human activity. The list, known as the Section 303(d) list, is based on violations of water quality standards and is organized by watersheds, which are further divided into stream segments. Fountain Creek and multiple tributaries are included on the Impaired Waters 303(d) List for the State of Colorado which include *E.coli* (CDPHE, 2012). The impairments should be considered during project refinement.

As part of further project development of the Recommended Alternative, floodplain modeling will be required to assess future floodplain impacts and may require a Conditional Letter of Map Revision and Letter of Map Revision.

Wells

Seven wells were identified along the US 24 corridor through a survey of Geographic Information Services (GIS) data from the Colorado Division of Water Resources and the Colorado Oil and Gas Conservation Commission. The Recommended Alternative may potentially impact the wells located along the existing US 24 alignment.

Impacts by the Recommended Alternative to water supply wells protected by water rights should be mitigated. Implementation of project elements of the Recommended Alternative may require a dewatering permit, depending on the local groundwater levels and ground disturbance. Groundwater monitoring may also be necessary to confirm no contamination has occurred. This would require obtaining a well permit from the Division of Water Resources.

Next steps for water well resources during future project development would likely include an analysis of the project impacts to existing water wells; a plan for avoidance of existing wells during and after construction; identification of the necessary permits for construction activities; assessment of the need for groundwater monitoring; and coordination with local city and El Paso County officials.

Wetlands and Waters of the U.S.

Numerous sources of data were reviewed to gain a general understanding of the ecology of the study area. These sources included the National Wetland Inventory (NWI) website, Web Soil Survey, Google Earth, and other relevant data. The study area was driven on June 28 and July 6, 2016 to identify and coarsely map potential wetlands and other waters of the U.S. For the purposes of this report, other waters of the U.S. include perennial, intermittent, or ephemeral streams and rivers, ditches, ponds, lakes, and other similar water features.



The study area contains dozens of wetland areas. By far, the majority of the wetlands in the study area occur near the middle of the corridor (between and around Falcon and Peyton). They are mainly found in depressions, topographic swales, and/or along creeks; and appear to be primarily supported by high groundwater. In many locations the wetlands are situated in roadside ditches (topographic swales parallel to the road) which appear to be intercepting and ponding much of this groundwater (and associated surface water flows).

Some wetlands in the study area are sustained primarily by stormwater runoff from urban areas. These wetlands are mostly found in and around urban areas, especially Falcon. They are typically less biologically diverse than those wetlands associated with groundwater discharge (mainly due to the unnatural hydrologic regime), but often still provide some wildlife habitat and good water quality improvement.

Although a detailed examination may reveal additional potential other waters of the U.S. in the study area, seven most-defined drainages were identified within the study area that may be impacted by the Recommended Alternative. The creeks and other drainages tend to flow roughly perpendicular to US 24 and all of them flow south except for one unnamed drainage near the east end of the study area, which flows north. Black Squirrel Creek is the only drainage that likely has perennial (year-round) flow. All the others are assumed to flow seasonally or only after precipitation events.

Wetland delineations should be completed during the next phase of project development in the areas that could be impacted by project-related activities. Impacts to wetlands should be avoided where feasible. Due to their importance, impacts to water-related resources, specifically waters of the U.S. including wetlands, should be avoided and minimized. If avoidance is not feasible, best management practices should be implemented to reduce direct and indirect impacts to these resources.

If waters of the U.S. in the area of the Recommended Alternative are considered to be USACE jurisdictional, impacts would likely be permitted under a USACE Section 404 Nationwide Permit. Only the USACE has the authority to make final determinations regarding jurisdiction, permitting, and mitigation. CDOT mitigates all wetland impacts at a 1:1 ratio (up to or equal to USACE mitigation, not in addition) regardless of USACE jurisdictional status, or mitigation requirements.

If the project disturbs one acre or greater of land, or are part of a larger common plan of development, a Colorado Discharge Permit System Construction Stormwater Permit will be required from the CDPHE Water Quality Control Division and a Stormwater Management Plan. The Stormwater Management Plan is prepared during the final design phase of a project prior to the submission of Colorado Discharge Permit System construction permit application. If applicable, this would be obtained under CDOT's Municipal Separate Storm Sewer System permit.

Barrier Effect

One of the consequences of building and maintaining roadways is often the diminished connectivity of wildlife habitats, which results in fragmentation that limits the natural movement of wildlife to support their life-cycle requirements (FHWA, 2002). The presence of these impediments (either physical or non-physical) is known as the "barrier effect."



Other than vehicular traffic, there are no major physical impediments to wildlife movement present. Other than additional lanes with highway widening, the Recommended Alternative does not include additional infrastructure that would increase the barrier effect, such as concrete medians or substantial areas of elevated roadway sections.

Further consideration is needed to understand any potential changes to the barrier effect for the proposed improvements to the study area. The *Wildlife-Vehicle Collision Reduction Study: Best Practices Manual* includes design considerations for minimizing wildlife-vehicle collisions (FHWA, 2008). The intent is to help wildlife get across transportation corridors safely, whereby reducing the barrier effect.

Critical Habitat and Threatened and Endangered Species

Impacts associated with transportation improvement projects have the potential for critical habitat loss and effects to threatened and endangered species. There are state and federal regulations that protect habitat for threatened and endangered species and other wildlife, including: the Endangered Species Act of 1973, administered by the USFWS; the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, both administered by the USFWS; and the Colorado Non-game, Endangered, and Threatened Species Conservation Act, administered by CPW.

CPW's preference is to maintain the existing right-of-way throughout the US 24 corridor. Maintenance of the existing corridor right-of-way will be the best way to mitigate the expansion of the highway and to minimize additional impacts to wildlife.

For this study, threatened and endangered species (TES) include those listed by USFWS as endangered, threatened, proposed, experimental, or candidate. Prior to conducting a field visit, numerous sources of data were reviewed to gain a general understanding of the ecology of the study area. These sources included the CPW, Colorado Natural Heritage Program (CNHP), and USFWS websites, aerial photographs, topographic maps, soil survey, and other relevant data.

According to the USFWS website there are six TES that may be affected by projects in this part of El Paso County, including two mammals, one bird, two fish, and one plant (USFWS, 2016a). No critical habitat is present in the study area. Of the six TES listed, three have suitable habitat within the study area, the Preble's meadow jumping mouse, and Ute ladies'-tresses.

While there is no critical habitat for Preble's in the area adjacent to the US 24 corridor, there is designated critical habitat about nine miles to the northwest of Falcon at Kettle Creek in the northern Colorado Springs area. Additionally, according to local USFWS personnel, Preble's was captured near the study area in 1998 to the west of Peyton on Black Squirrel Creek (USFWS, 2016b). Thus, occurrence of Preble's is possible along the US 24 corridor to the east of MP 234.

Although occurrence of Ute ladies'-tresses is unlikely, there is ample suitable habitat associated with the wetlands along the US 24 study corridor and occurrence is possible. The possibility of occurrence was confirmed by the local USFWS personnel (USFWS, 2016b).



During subsequent NEPA processes and project development, the compiled special-status species lists will be reviewed with possible consultation with the USFWS and CPW. A survey for suitable habitat for the federally and state-listed species should be conducted during an on-site reconnaissance survey. Depending on the presence of habitat and potential impacts to those habitats, consultation with the USFWS may be required.

A noxious weed survey should be completed during an on-site reconnaissance survey. The survey should map noxious weed populations, and if recommended based on the results of the survey, an Integrated Noxious Weed Management Plan may need to be prepared for the project.

Migratory Birds and Raptors

Most migratory birds, including raptors, are protected by the Migratory Bird Treaty Act (MBTA). The MBTA makes it illegal for anyone to “take, possess, import, export, transport, sell, purchase barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations (USFWS, 2016a).” The MBTA is enforced by the USFWS.

In addition, Bald and Golden Eagles are also protected by the Bald and Golden Eagle Protection Act (BGEA). The BGEA prohibits “taking eagles, including their parts, nests, or eggs” without a permit issued by the Secretary of the Interior (USFWS, 2016b). The BGEA also provides criminal penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any eagle, alive or dead, or any part, nest, or egg thereof.” The BGEA defines “take” to include disturbing the birds, which means “to agitate or bother” to a degree that “causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” The BGEA is also enforced by the USFWS.

In order to comply with these Acts, preconstruction and during construction surveys for nesting birds (including eagles and other raptors) should be done if any ground-disturbing activities are planned during the nesting season. The nesting season varies by species, but is generally from April 1 to August 31 for neotropical birds. If active nests are present, no-work buffers or other restrictions will likely be required around the nest during construction activities. The size of the buffer will be determined in coordination with CPW, USFWS, and CDOT biologists. For raptors, the buffer distances generally adhere to those presented in Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors (CPW, 2002). If eagles are expected to be present, additional surveys may be required to identify winter roosting sites which may also require no-work buffers or other restrictions. Further guidance on required surveys can be found in Section 240 Protection of Migratory Birds of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2016)

One raptor species that has potential habitat in the study area is the Burrowing Owl, which is listed as threatened by the State of Colorado. The owls are usually associated with prairie dog colonies and nest below ground. CPW recommends conducting presence/absence surveys in any prairie dog colonies that may be disturbed between February 1 and October 31. If owls are found, no work areas will be required per CPW policy.



Cumulative Impacts

During future NEPA processes, additional analysis and agency coordination will need to be performed to determine cumulative impacts. Additional coordination with the resource agencies will be conducted to determine a study area for each resource. Resources that may be cumulatively impacted by future projects when combined with other past, present, and reasonably foreseeable future projects may include noise impacts to local residents, floodplain impacts, and direct/indirect loss of wetlands due to surface disturbance and increased impervious surface area. Wildlife habitat loss may also occur due to planned development along the US 24 corridor.



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ACTION PLAN

The PEL process is intended to provide the framework for the long-term implementation of the Recommended Alternative improvements as funding is available and to be used as a resource for future NEPA documentation. It is anticipated that funding for the all of the recommended corridor improvements will not be available at one time. Potential separate projects to implement the study recommendations were identified in coordination with CDOT and the Technical Advisory Committee.

Identification of Projects

To implement separate projects, care must be taken to ensure that the area transportation system operates acceptably at the conclusion of each separate project. The ability of each separate project to operate on its own is referred to as “independent utility”. Also, mitigation measures needed in response to overall area impacts must be implemented with the project in which the impacts occur, and not deferred to a later phase of the ultimate planned transportation system.

The separate projects should meet the following criteria:

- ✦ Independent Utility - Each project should have independent utility to the extent that the project provides a functional transportation system even in the absence of other elements of the Recommended Alternative.
- ✦ Elements of the Purpose and Need - Each separate project should contribute to meeting the Purpose and Need for the overall Recommended Alternative.
- ✦ Environmental Impacts - Each separate project should avoid the introduction of substantial additional environmental impacts that cannot be mitigated.
- ✦ Mitigation Directly Related to Impacts - Each separate project should include appropriate mitigation measures to match the environmental impacts of that project phase of the overall Recommended Alternative.

The opportunities to construct the overall Recommended Alternative corridor improvements with a series of separate projects were evaluated based on independent utility, benefits to traffic operations and safety, ease of implementation (considering criteria such as right-of-way availability and streamlined environmental clearance), and cost. Projects were broken into infrastructure, system management, and technology projects.

The intersections along the corridor and the roadway segments between them create opportunities to construct the infrastructure improvements in separate, smaller projects that are able to tie into existing cross-sections, if needed. The projects were identified to individually provide traffic operations and safety benefits to the overall transportation



corridor. However, adjacent projects could be linked for more cost-effectiveness and less repeated impacts to the traveling public and surrounding area residents during construction.

Project Implementation

The identified projects are not required to be built in succession and they may be constructed in any order. The projects were qualitatively evaluated to identify the contribution to meeting the project Purpose and Need (regional mobility, traffic operations, and safety), as well as the ability of the project to be implemented relatively quickly and effectively.

The projects were evaluated and prioritized to identify the relative priority and recommended timeframe for further project development and implementation. The project prioritization matrix is included in **Appendix F**. The matrix applies prioritization criteria to the identified projects utilizing a simple scoring system with a scale of one to three with the higher points applied to the more favorable results for each criterion. The resulting projects implementation plans are summarized in the **Tables 8 through 10**. As shown, each of the projects would contribute to meeting the Purpose and Need with potential environmental resources that will need to be considered with further project development scoping noted.

Table 8. Infrastructure Project Implementation Plan

PRIORITY / TIMEFRAME	TRANSPORTATION IMPROVEMENT PROJECT	BENEFITS		PURPOSE AND NEED ELEMENTS	POTENTIAL ENVIRONMENTAL RESOURCES AFFECTED	ESTIMATED CONSTRUCTION COST ⁽¹⁾
		OPERATIONS	SAFETY			
High < 5 years	US 24/Judge Orr Intersection Improvements (with realignment of Blue Gill to Judge Orr)	Reduces delay and maintains highway speeds for through traffic	Reduces intersection crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$6 - 7 M
High < 5 years	US 24 Intersections at Ramah	Maintains highway speeds for through traffic	Reduces intersection crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Addresses safety concerns 	No expected impacts	\$2 - 3 M
High < 5 years	US 24 Widening to Four Lanes - Garrett through Woodmen (with intersection improvements)	Reduces delay and queuing	Reduces crashes due to congestion and merging from four- to two-lane sections	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$38 - 42 M
High < 5 years	Eastbound Passing Lane - east of Calhan	Improves highway speeds	Reduces passing-related crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Addresses safety concerns 	No expected impacts	\$2 - 4 M
High < 5 years	Westbound Passing Lane - west of Ramah	Improves highway speeds	Reduces passing-related crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Addresses safety concerns 	No expected impacts	\$2 - 4 M
High 10 years	Westbound Passing Lane - west of Calhan	Improves highway speeds	Reduces passing-related crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Addresses safety concerns 	No expected impacts	\$2 - 4 M



US 24 Planning and Environmental Linkages Study



PRIORITY / TIMEFRAME	TRANSPORTATION IMPROVEMENT PROJECT	BENEFITS		PURPOSE AND NEED ELEMENTS	POTENTIAL ENVIRONMENTAL RESOURCES AFFECTED	ESTIMATED CONSTRUCTION COST ⁽¹⁾
		OPERATIONS	SAFETY			
High 10 years	Eastbound Passing Lane - east of Peyton	Improves highway speeds	Reduces passing-related crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Addresses safety concerns 	No expected impacts	\$2 - 4 M
High 10 years	US 24 Widening to Four Lanes - Woodmen through Stapleton (with intersection improvements)	Reduces delay and queuing	Reduces crashes due to congestion	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$20 - 23 M
Moderate 10 years	US 24/Marksheffel Interchange	Removes bottleneck and improves highway operations	Eliminated intersection-related highway crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$17 - 22 M
Moderate 15 years	US 24/CO 94 Interchange	Removes bottleneck and improves highway operations	Eliminated intersection-related highway crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$21 - 24 M
Moderate 15 years	US 24/Harrisville Rd Intersection Improvements	Improves intersection operations and highway speeds	Reduces crashes with turning vehicles	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Wetlands » Waters of the US 	\$2 - 4 M
Moderate 20 years	US 24/Constitution Interchange	Removes bottleneck and improves highway operations	Eliminated intersection-related highway crashes	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$18 - 22 M
Low 20 years	US 24 widening to Six Lanes - Powers through CO 94	Reduces delays and queuing	Reduces crashes due to congestion	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$62 - 73 M
Low 20 years	US 24 widening to Six Lanes - CO 94 to Woodmen	Reduces delays and queuing	Reduces crashes due to congestion	<ul style="list-style-type: none"> » Improves regional and local mobility » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites » Wetlands 	\$90 - 95 M
Low 20 years	US 24 through Calhan - median, sidewalks, intersections	Improves highway operations	Reduces intersection conflicts and improves pedestrian safety	<ul style="list-style-type: none"> » Improves traffic operations » Addresses safety concerns 	<ul style="list-style-type: none"> » Noise » Hazardous material sites 	\$5 - 7 M

⁽¹⁾ Costs in 2017 dollars



Table 9. System Management Program Implementation Plan

PRIORITY	SYSTEM MANAGEMENT PROGRAM	SEGMENT				
		POWERS TO CONSTITUTION	CONSTITUTION TO FALCON	FALCON TO PEYTON	PEYTON TO CALHAN	CALHAN TO RAMAH
High	Access Control Plan	(exists)	(exists)	■	■	■
High	Enhanced Intersection Signage				■	■
High	Incident Management Plan	■	■	■	■	■
Moderate	Specialized Transportation Service Expansion	■	■	■	■	■
Moderate	Vanpool	■	■			
Low	Carpool Park-n-Ride		(planned by others)		■	
Low	Flextime Incentives	■	■			
Low	Stationless Bike Sharing System	■	■			
Low	Falcon to Colorado Springs Transit Service	■	■			

Table 10. Technology Implementation Plan

PRIORITY	TECHNOLOGY	SEGMENT				
		POWERS TO CONSTITUTION	CONSTITUTION TO FALCON	FALCON TO PEYTON	PEYTON TO CALHAN	CALHAN TO RAMAH
High	Queue Warning System	■	■	■		
High	Variable Speed Limits	■	■	■	■	■
High	Variable Message Signs		■	■	■	■
High	Enhanced Signal Detection	■	■	■		
Moderate	Enhanced Lane Markings	■	■	■	■	■
Moderate	Adaptive Signal Control	■	■	■		

Although this implementation plan provides recommendations for project priorities and timeframes, projects can be implemented with priority given to projects that leverage available funding sources, existing facilities, and other project opportunities most effectively. Operations and safety along US 24 should be monitored to identify issues that would trigger a need for an improvement project at specific locations, whether a specific project is noted in this implementation plan or not. Traffic counts may be collected to calculate the levels of



service and identify intersections that operate at LOS F consistently over a reasonable period of time, triggering a prioritized need for operational improvements. Crash data may also be monitored and analyzed to prioritize recommendations to address safety concerns.

Other infrastructure improvement projects to be implemented if significant safety or operational issues arise or if another maintenance or improvement project is constructed in the area:

- ✦ Rock Island Trail improvements/extension east of Peyton
- ✦ Bridge widening/replacements and shoulder widening along US 24 east of Stapleton Road
- ✦ Separated multi-use path between Falcon and Peterson Road interchange
- ✦ Intersection improvements and added turn lanes at:
 - ✦ Soap Weed Road
 - ✦ 8th Street (in Calhan)
 - ✦ Yoder Street (in Calhan)
 - ✦ Blasingame Road

Short-Term Improvements

The following small-scale improvements identified by public and/or agency comments may occur prior to study project recommendations:

- ✦ Adjust traffic signal timing to optimize traffic progression along US 24 for time-of-day peak volume patterns
- ✦ Install blue square indicator signs for identification of median crossovers along divided highway segments of US 24, to provide safer and more efficient response by emergency responders
- ✦ Provide an eastbound right turn lane on US 24 at Judge Orr Road
- ✦ Improve signing and striping across side streets for existing crossings of Rock Island Trail
- ✦ Conduct speed study along US 24 to verify or adjust speed limits, particularly approaching and leaving the areas of Ramah and Calhan.

NEPA Requirements

Funding for the recommended improvements has not been identified at this time, except for the development of the US 24 Access Control Plan, east of Elbert Road. Identification of a Recommended Alternative for the entire corridor in this PEL study is consistent with the FHWA's objective of analyzing and selecting transportation solutions on a broad enough scale to provide meaningful analysis and to avoid segmentation. However, the requirements of fiscal constraint must be satisfied for FHWA and CDOT to approve further NEPA documentation.



Individual projects may be initiated as funding becomes available for elements of the corridor Recommended Alternative improvements. These projects may move forward with individual NEPA processes with this PEL study providing the documentation of the intent to implement the full improvements over time.

Next Steps

FHWA developed a standard questionnaire to summarize the planning process and ease the transition from planning to a NEPA analysis. That questionnaire, to be attached at the beginning of this report, summarizes the information that was analyzed with the PEL study and identifies the issues a future project team should be aware of to efficiently move forward in future project development and NEPA processes. Letters of agency support for the recommended improvements are included in **Appendix G**.

The next steps in the project development include:

- ✦ Secure necessary funding to move projects forward into project development
- ✦ Complete NEPA analyses of the Recommended Alternative or separate project phases
- ✦ Complete design
- ✦ Obtain right-of-way
- ✦ Obtain permits for utility relocation and/or environmental clearances
- ✦ Complete Intergovernmental Agreement with local agencies regarding maintenance, if needed
- ✦ Complete construction

These steps will be coordinated with FHWA and the appropriate agency stakeholders to ensure consistency with the NEPA process for the Recommended Alternative, short-term improvements, or separate projects phases.



APPENDIX A



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



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



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



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	



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	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	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	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	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	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	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 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



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



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.



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	Property impacts to 4 potential hazardous material sites Potential impacts to World Golf & Sand Creek Golf Course
	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.	Intersection improvements provide opportunity for at-grade crossing improvements. Interchange options provide grade-separated crossing of US 24.
Multimodal Connectivity	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	1	2	3	4	5
		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
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	1	2	3	4	5
		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
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
	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.
Multimodal Connectivity	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.
	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.
Implementability	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



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


Level 2 Screening Matrix - Peyton to Calhan Segment

4/6/17

Level 2 Evaluation Criteria		NA	1	2
		No Action	Two Lanes plus New Auxiliary Lanes	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.


Level 2 Screening Matrix - Calhan to Ramah Segment

4/6/17

Level 2 Evaluation Criteria		NA	1	2
		No Action	Two Lanes plus New Auxiliary Lanes	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.



Level 3 Evaluation

9/12/17

Level 3 Evaluation Criteria		Powers to Constitution Segment				Constitution to Falcon (Woodmen Rd) Segment		
		NA	2	4	5	NA	3	5
		No Action	Four Lanes with Peak Period Shoulder Lanes	Six Lanes	Eight Lanes	No Action	Four Lanes with Peak Period Shoulder Lanes	Six Lanes
Traffic Operations	Intersection Level of Service (LOS) and delay during future AM/PM peak hours	NB Powers Ramp: LOS F in 5-10 yrs CO 94: LOS F in 5-10 yrs Marksheffel: LOS F in 10 yrs Constitution: LOS F in 10 yrs	NB Powers Ramp: LOS B in 25 yrs CO 94 (at-grade): LOS F in 20 yrs Marksheffel (at-grade): LOS F in 10 yrs Constitution (at-grade): LOS F in 25 yrs	NB Powers Ramp: LOS B in 25 yrs CO 94 (at-grade): LOS F in 20 yrs Marksheffel (at-grade): LOS F in 10 yrs Constitution (at-grade): LOS F in 25 yrs	NB Powers Ramp: LOS B in 25 yrs CO 94 (at-grade): LOS F in 25 yrs Marksheffel (at-grade): LOS F in 25 yrs Constitution (at-grade): LOS D in 25 yrs	Carefree: LOS F in 10 yrs Barnes: LOS F in 10 yrs Garrett: LOS F in 10 yrs Falcon Hwy: LOS F in 10 yrs Meridian: LOS F in 5-10 yrs Woodmen: LOS F in 10 yrs	Carefree: LOS C in 25 yrs Barnes: LOS E in 25 yrs Garrett: LOS F in 20 yrs Falcon Hwy: LOS C in 25 yrs Meridian: LOS D in 25 yrs Woodmen: LOS D in 25 yrs	Carefree: LOS C in 25 yrs Barnes: LOS E in 25 yrs Garrett: LOS F in 20 yrs Falcon Hwy: LOS C in 25 yrs Meridian: LOS D in 25 yrs Woodmen: LOS D in 25 yrs
	Average travel speeds along US 24 during 2040 AM/PM peak hours	US 24 Eastbound: 27/13 mph US 24 Westbound: 14/19 mph	US 24 Eastbound: 42/26 mph US 24 Westbound: 28/37 mph	At-grade intersections US 24 Eastbound: 42/26 mph US 24 Westbound: 28/37 mph Interchanges at CO 94 & Marksheffel US 24 Eastbound: 45/35 mph US 24 Westbound: 35/41 mph	with at-grade intersections US 24 Eastbound: 44/30 mph US 24 Westbound: 35/38 mph	US 24 Eastbound: 27/13 mph US 24 Westbound: 14/19 mph	US 24 Eastbound: 42/26 mph US 24 Westbound: 28/37 mph	US 24 Eastbound: 42/26 mph US 24 Westbound: 28/37 mph
Safety	Anticipated crash reduction for identified predominant crash patterns	Non-intersection = 87 crashes CO 94 intersection = 33 crashes Marksheffel intersection = 32 crashes CO 94 rear-end = 19 crashes Marksheffel rear-end = 16 crashes	Non-intersection = 97 crashes CO 94 intersection = 33 crashes Marksheffel intersection = 32 crashes CO 94 rear-end = 14 crashes Marksheffel rear-end = 12 crashes	At-grade intersections CO 94 intersection = 33 crashes Marksheffel intersection = 32 crashes Interchanges at CO 94 & Marksheffel CO 94 interchange = 25 crashes Marksheffel interchange = 24 crashes	Non-intersection = 65 crashes CO 94 rear-end = 14 crashes Marksheffel rear-end = 12 crashes At-grade intersections CO 94 intersection = 33 crashes Marksheffel intersection = 32 crashes Interchanges at CO 94 & Marksheffel CO 94 interchange = 25 crashes Marksheffel interchange = 24 crashes	Non-intersection = 89 crashes Meridian rear-end = 24 crashes Woodmen rear-end = 25 crashes Garrett rear-end = 9 crashes Falcon Hwy rear-end = 9 crashes	Non-intersection = 99 crashes Meridian rear-end = 18 crashes Woodmen rear-end = 19 crashes Garrett rear-end = 5 crashes Falcon Hwy rear-end = 5 crashes	Non-intersection = 66 crashes Meridian rear-end = 18 crashes Woodmen rear-end = 19 crashes Garrett rear-end = 5 crashes Falcon Hwy rear-end = 5 crashes
Community	Acres of potential residential and business properties impacted	None	Approximately 9 acres	Approximately 13 acres	Approximately 24 acres	None	Approximately 69 acres	Approximately 79 acres
	General public and agency support and concerns	Congestion and operational issues not acceptable for agency and public stakeholders	Increased peak period capacity with at-grade intersections supported by public and agency stakeholders	Increased capacity supported by public and agency stakeholders	Concern from local agency for widening impacts	Congestion and operational issues not acceptable for agency and public stakeholders	Increased peak period capacity supported by public and agency stakeholders	Increased capacity supported by public and agency stakeholders
Environmental Resources	Potential impacts on environmental resources within the built and natural environment	None	Noise sensitive sites in neighborhood west of Constitution Avenue One recreational area Historic railroad alignment crossing Five potential hazardous materials sites	Noise sensitive sites in neighborhood west of Constitution Avenue Three recreational areas Historic railroad alignment crossing Five potential hazardous materials sites	Noise sensitive sites in neighborhood west of Constitution Avenue Three recreational areas Historic railroad alignment crossing Five potential hazardous materials sites	None	Noise sensitive sites between Garrett and Woodmen Two recreational areas Five historic railroad alignment crossings Two potential hazardous materials sites	Noise sensitive sites between Garrett and Woodmen Two recreational areas Five historic railroad alignment crossings Two potential hazardous materials sites
Multimodal Connectivity	Enhancements to regional multimodal transportation options by providing infrastructure or operational improvements for pedestrians and bicyclists	Continued congestion and lack of pedestrian, bicyclist, and transit facilities do not accommodate additional multimodal options	Separated multi-use path provided along US 24 with connection to new sidewalk and improved pedestrian/bicyclist crossings at Peterson interchange for connection to Peterson Air Force Base	Separated multi-use path provided along US 24 with connection to new sidewalk and improved pedestrian/bicyclist crossings at Peterson interchange for connection to Peterson Air Force Base Interchanges would provide additional grade separation of US 24 for pedestrians/bicyclists	Separated multi-use path provided along US 24 with connection to new sidewalk and improved pedestrian/bicyclist crossings at Peterson interchange for connection to Peterson Air Force Base Eight-lane highway acts as substantial barrier for walking and biking	Continued congestion and lack of pedestrian, bicyclist, and transit facilities do not accommodate additional multimodal options	Separated multi-use path provided along US 24 and a multimodal grade separation in area of Woodmen intersection to enhance connections to Falcon and Rock Island Trail	Separated multi-use path provided along US 24 and a multimodal grade separation in area of Woodmen intersection to enhance connections to Falcon and Rock Island Trail
	Enhancements to freight mobility along US 24 by providing infrastructure to optimize freight movement and safety	No enhancements for freight mobility along the corridor and continued congestion and operational issues reduce freight mobility and safety	Freight mobility and safety enhanced with wider shoulders, signal technology, variable message signs, and enhanced lane markings	Freight mobility and safety enhanced with wider shoulders, more lanes for passing, interchanges, signal technology, variable message signs, and enhanced lane markings	Freight mobility and safety enhanced with wider shoulders, more lanes for passing, interchanges, signal technology, variable message signs, and enhanced lane markings	No enhancements for freight mobility along the corridor and continued congestion and operational issues reduce freight mobility and safety	Freight mobility and safety enhanced with wider shoulders, signal technology, variable message signs, and enhanced lane markings	Freight mobility and safety enhanced with wider shoulders, signal technology, variable message signs, and enhanced lane markings
Implementability	Conceptual level probable costs	None	Relatively moderate cost	with at-grade intersections Relatively moderate cost with interchanges Relatively high cost	with at-grade intersections Relatively moderate cost with interchanges Relatively high cost	None	Relatively moderate cost	Relatively moderate cost
SUMMARY OF RESULTS		CARRIED FORWARD	RECOMMENDED	RECOMMENDED	NOT RECOMMENDED	CARRIED FORWARD	RECOMMENDED	RECOMMENDED
Notes		Further analysis required as the No Action Alternative in NEPA process for comparison to improvement alternatives.	This alternative is recommended for consideration as a short-term phase of six lane widening because the alternative reduces congestion and improves intersection operations under short-term traffic conditions.	This alternative, with interchanges, is recommended for consideration as the Recommended Alternative in NEPA process because the alternative reduces congestion and provides mobility and safety benefits while minimizing impacts to the community and environmental resources.	This alternative is not recommended for further consideration because the alternative would result in more community impacts, reduced multimodal mobility, and higher cost without substantially better operations or safety benefits.	Further analysis required as the No Action Alternative in NEPA process for comparison to improvement alternatives.	This alternative is recommended for consideration as a short-term phase of six lane widening because the alternative reduces congestion and improves intersection operations under short-term traffic conditions.	This alternative is recommended for consideration as the Recommended Alternative in NEPA process because the alternative reduces congestion and provides mobility and safety benefits while minimizing impacts to the community and environmental resources.

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 RED = Comparatively minor benefits and/or major impacts



Level 3 Evaluation

9/12/17

Level 3 Evaluation Criteria		Falcon (Woodmen Rd) to Peyton Segment		Peyton to Calhan Segment		Calhan to Ramah Segment	
		NA	4	NA	2	NA	2
		No Action	Four Lanes to Rex Rd and New Passing Lanes to Peyton	No Action	Two Lanes with New Passing Lanes	No Action	Two Lanes with New Passing Lanes
Traffic Operations	Intersection Level of Service (LOS) and delay during 2040 AM/PM peak hours	Judge Orr: LOS F in 10 yrs Stapleton: LOS F in 10 yrs Elbert: LOS F in 25 yrs Bradshaw: LOS F in 25 yrs Peyton Hwy: LOS F in 25 yrs	Judge Orr: LOS C in 25 yrs Stapleton: LOS C in 25 yrs Elbert: LOS F in 25 yrs Bradshaw: LOS F in 25 yrs Peyton Hwy: LOS F in 25 yrs	Ellicott: LOS C in 25 yrs Calhan Hwy: LOS D in 25 yrs	Ellicott: LOS C in 25 yrs Calhan Hwy: LOS D in 25 yrs	Ramah Rd: LOS B in 25 yrs	Ramah Rd: LOS B in 25 yrs
	Average travel speeds along US 24 during 2040 AM/PM peak hours	US 24 Eastbound: 44/35 mph US 24 Westbound: 44/35 mph	US 24 Eastbound: 46/36 mph US 24 Westbound: 46/36 mph	US 24 Eastbound: 48/49 mph US 24 Westbound: 49/49 mph	US 24 Eastbound: 49/50 mph US 24 Westbound: 50/50 mph	US 24 Eastbound: 52/52 mph US 24 Westbound: 53/53 mph	US 24 Eastbound: 52/52 mph US 24 Westbound: 53/53 mph
Safety	Anticipated crash reduction for identified predominant crash patterns	Non-Intersection = 46 crashes Judge Orr intersection = 20 crashes	Non-Intersection = 33 crashes Judge Orr intersection = 14 crashes	Non-Intersection = 12 crashes Calhan intersection-related = 8 crashes	Non-intersection = 9 crashes Calhan intersection-related = 6 crashes	Non-intersection = 2 crashes Harrisville intersection = 2 crashes	Non-intersection = 1 crash Harrisville intersection = 1 crash
Community	Acres of potential residential and business properties impacted	None	Approximately 28 acres	None	Approximately 50 acres	None	Approximately 52 acres
	General public and agency support and concerns	Congestion and operational issues not acceptable for agency and public stakeholders	Increased capacity and passing lanes supported by public and agency stakeholders	Congestion and operational issues not acceptable for agency and public stakeholders	Increased passing lanes supported by public and agency stakeholders	Congestion and operational issues not acceptable for agency and public stakeholders	Increased passing lanes supported by public and agency stakeholders
Environmental Resources	Potential impacts on environmental resources within the built and natural environment	None	Potential noise sensitive sites throughout segment One historic railroad alignment crossing Two potential hazardous materials sites	None	Potential noise sensitive areas with mix of homes and community centers One recreational area Six potential hazardous materials sites	None	Potential noise sensitive area of residential areas near Ramah Two recreational areas
Multimodal Connectivity	Enhancements to regional multimodal transportation options by providing infrastructure or operational improvements for pedestrians and bicyclists	Lack of pedestrian and bicyclist facility improvements do not enhance connections to adjacent planned facilities	Pedestrian/bicyclist crossing improvements at signalized intersections, Rock Island Trail improvements, and wider shoulders enhance multimodal connections	Lack of pedestrian and bicyclist facilities do not enhance connections to adjacent planned facilities	Rock Island Trail extension, sidewalk connections and crossing improvements in Calhan, and wider shoulders enhance multimodal connections	Lack of pedestrian and bicyclist facilities do not enhance connections to adjacent planned facilities	Rock Island Trail extension enhances multimodal connections
	Enhancements to freight mobility along US 24 by providing infrastructure to optimize freight movement and safety	No enhancements for freight mobility and safety along the corridor	Freight mobility and safety enhanced with wider shoulders, passing lanes, signal technology, variable message signs, and enhanced lane markings	No enhancements for freight mobility and safety along the corridor	Freight mobility and safety enhanced with wider shoulders, passing lanes, variable message signs, and enhanced lane markings	No enhancements for freight mobility and safety along the corridor	Freight mobility and safety enhanced with wider shoulders, passing lanes, variable message signs, and enhanced lane markings
Implementability	Conceptual level probable costs	None	Relatively moderate cost	None	Relatively moderate cost	None	Relatively moderate cost
SUMMARY OF RESULTS		CARRIED FORWARD	RECOMMENDED	CARRIED FORWARD	RECOMMENDED	CARRIED FORWARD	RECOMMENDED
Notes		Further analysis required as the No Action Alternative in NEPA process for comparison to improvement alternatives.	This alternative is recommended for consideration as the Recommended Alternative in NEPA process because the alternative reduces congestion and provides mobility and safety benefits while minimizing impacts to the community and environmental resources.	Further analysis required as the No Action Alternative in NEPA process for comparison to improvement alternatives.	This alternative is recommended for consideration as the Recommended Alternative in NEPA process because the alternative provides mobility and safety benefits while minimizing impacts to the community and environmental resources.	Further analysis required as the No Action Alternative in NEPA process for comparison to improvement alternatives.	This alternative is recommended for consideration as the Recommended Alternative in NEPA process because the alternative provides mobility and safety benefits while minimizing impacts to the community and environmental resources.

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



APPENDIX B

US 24 PEL Study - Resource Agency Contact Tracking

Agency Name	1st Outreach - Project Intro Letter Sent	Agency Comments	2nd Outreach - Environmental Scan Report Review Request	Agency Response Received?	Reminder Email Requesting Report Review	Agency Comments	3rd Outreach - Final Alternatives Report and Draft Study Recommendations Review Request	Agency Response Received?	Agency Comments
U.S. Environmental Protection Agency Region 8	6/2/16, to Carol Anderson		10/31/16, to Carol Anderson	11/14/16, via email to project	11/14/2016	I am sorry, but I have not had any time to look at this study. Because this is pre-NEPA, I generally only get involved at this time when I have the time. And I have not had the time.	11/9/17, to Lisa Lloyd		
Colorado Department of Public Health and Environment Air Pollution Control Division	6/2/16, to Kent Kuster for dist.		10/31/16, to Kent Kuster for dist.	11/10/16, via letter from Kent Kuster to Andrew Stecklein	N/A	None	11/9/17, to Kent Kuster for dist.		
Colorado Department of Public Health and Environment Hazardous Materials and Waste Management Division	6/2/16, to Kent Kuster for dist.		10/31/16, to Kent Kuster for dist.	11/10/16, via letter from Kent Kuster to Andrew Stecklein	N/A	An abandoned landfill exists south of Don's Garden Center and north of Peterson AFB near the intersection of US 24 and Powers Blvd. This Facility is the Wilde Landfill and we can provide additional information if needed.	11/9/17, to Kent Kuster for dist.		
Colorado Department of Public Health and Environment Water Quality Control Division	6/2/16, to Kent Kuster for dist.		10/31/16, to Kent Kuster for dist.	11/10/16, via letter from Kent Kuster to Andrew Stecklein	N/A	There are a fair number of tributaries in the Fountain Creek drainage area on the State's 303 (d) list of impaired waters for E. coli. CDPHE would recommend that these impairments be taken into account for this project.	11/9/17, to Kent Kuster for dist.		
Colorado Parks and Wildlife	6/2/16, to Dan Prenzlöw		10/31/16, to Dan Prenzlöw	11/17/2016, via letter from Frank McGee to Andrew Stecklein	11/14/2016	See letter dated 11/15/16 for specific comments.	11/9/17, to Dan Prenzlöw	12/28/2017	No further comments. Recommendations considered previous input.
Colorado Historical Society	6/2/16, to Lisa Schoch for dist. To Steve Turner; 6/17/16 from Jane Hann to Steve Turner		10/31/16, to Lisa Schoch for dist.	12/15/16, via email from Lisa Schoch	12/9/2016	From Steve Turner, SHPO, on 12/9/16: We look forward to working with you as this project proceeds and additional information regarding the APE and cultural resources is gathered.	11/9/17, to Lisa Schoch for dist.		
US Army Corps of Engineers Regulatory Division	6/2/16, to Pueblo Office		10/31/16, to Pueblo Office		11/14/2016		11/9/17, to Pueblo Office		
US Fish and Wildlife Service - CFO	6/2/16, to Allison Deans Michael		10/31/16, to Alison Deans Michael	11/14/16, via email to project	11/14/2016	I looked at the Critical Habitat and TES section. The Service has approved a PMJM Block Clearance zone in Colorado Springs that extends to mp 324. A block-cleared area basically means that even if there is suitable habitat, we don't think that the species occupies it because of the area's current or historic land use as well as its trapping history. That said, there is an historic PMJM capture near mp 329 as well as upstream of the highway on Black Squirrel Creek, both of which are outside of the block-cleared area. I did not see a discussion of migratory birds, including eagles, in the document, and that should be included.	11/9/17, to Alison Deans Michael		
Paint Brush Hills Metropolitan District	6/2/16, to Kim Griffin		10/31/16, to Kim Griffin		11/14/2016		11/9/17, to Kim Griffin		
Cherokee Metropolitan District	6/2/16, to Sean Chambers	via email on 6/7/16 to Andy Stecklein from Kurt Schlegel, Interim General Manager: The Cherokee Metropolitan District is in a state of flux at this time and I am in place as the Interim General manager until such time that a permanent replacement is appointed or hired. Please address all future correspondence to the attention of the "General Manager", and all will be routed appropriately.	10/31/16, to Kurt Schlegel		11/14/2016		11/9/17, to Kurt Schlegel	11/28/2017	None of the recommended alternatives will adversely impact the delivery of service to our customers. The District supports the efforts to alleviate traffic issues and congestion in the area and stands ready to be an active partner when and where required.
Fountain Creek Watershed	6/2/16, to Larry Small		10/31/16, to Larry Small	11/14/16, via email to project	11/14/2016	I did review the document. I have no comments other than it is well done and accurately reflects the corridor.	11/9/17, to Larry Small		
Upper Black Squirrel Creek Ground Water Management District	6/2/16, to Donald Booker		10/31/16, to Donald Booker		11/14/2016		11/9/17, to Donald Booker		
Town of Ramah	6/2/16, to Louis Nordine		10/31/16, to Louis Nordine		11/14/2016		11/9/17, to Louis Nordine		
Town of Calhan	N/A		N/A		N/A		11/9/17, to John Hogeboom		
Colorado State Land Board	6/2/16, to Sue Black		10/31/16, to Sue Black		11/14/2016		11/9/17, to Sue Black		



APPENDIX C



Calhan Summer Fest Event Summary

July 15, 2016

Project team staff participated in the Calhan Summer Fest on July 15, 2016 in downtown Calhan, Colorado. The annual event is hosted by the Town of Calhan and is typically attended by 1,500 people. A booth was set up with study information and a map of the study area for gathering public comments. The booth was staffed from 3:00 - 7:00 PM. Project staff discussed the study with over 40 people who frequently drive the US 24 corridor, including residents of areas around Colorado Springs, Calhan, and Ramah, as well as areas further east of the corridor study area. Following is a summary of comments received by project staff during one-on-one conversations with attendees during the event.

Comments regarding the current conditions and operations of the US 24 study corridor:

- ✦ Traffic slows down approaching Colorado Springs
- ✦ Westbound traffic backs up in the morning around Meridian Road and sometimes extends back to Judge Orr Road
- ✦ Very large hole, “bigger than a pothole”, at Judge Orr Road and Davenport
- ✦ Unsafe passing movements in the 2-lane sections
- ✦ The highway is good - it’s the drivers that cause the issues (3 comments)
- ✦ Blind intersection at US 24 and Bradshaw Road (south)
- ✦ Excessive speeding:
 - » Drivers passing way over 65 mph (3 comments)
 - » Speeding through towns (3 comments)
- ✦ Passing lanes seem short sometimes
- ✦ West of Calhan (MP 37 - 38), snow drifts and icing at top of hill create safety issues
- ✦ Pedestrian crossings in Calhan are difficult with traffic, especially in the summer.
- ✦ Major increase in traffic noticed between Colorado Springs and I-70

Comments regarding needed improvements along US 24 study corridor:

- ✦ There needs to be a separate right turn lane for eastbound US 24 at Judge Orr Road intersection. (5 comments)
- ✦ More passing lanes are needed all along the corridor
- ✦ Four lanes are needed from Colorado Springs to Peyton (10 comments)
- ✦ Need 4 lanes to Calhan (2 comments)
- ✦ Need 4 lanes all the way to Simla
- ✦ There is congestion around Falcon, so there needs to be more lanes in that area
- ✦ The speed limit should be stepped down through the towns
- ✦ Need acceleration/deceleration lanes in Peyton



- ✦ The bridges east of Peyton need replaced
 - » Old bridges east of Peyton need replaced because they are safety issues with narrow road
- ✦ Need signs on US 24 for no semi trucks on bridges on Calhan Highway and Judge Orr Road, to stop truck drivers before they turn onto the roads
- ✦ Westbound passing lane needed east of Harrisville
 - » Lots of near-misses with drivers passing vehicles waiting to turn onto Harrisville. A turn lane would help.
- ✦ More advance signs for turn to Ramah Reservoir Wildlife Area would help the highway
- ✦ There needs to be more bus service between Colorado Springs and the eastern towns along US 24
 - » If there is bus service, more people need to know about it

Comments regarding other area roadways:

- ✦ Grading of neighborhood dirt roads is not being done as often as previous years (Ellicott Road near SH 94)
- ✦ Too many potholes on local dirt roads



Public Meetings Summary #1

August 2016

Two public meetings were held in August 2016. The first meeting was held in Falcon at the Meridian Ranch Recreation Center on August 16. The second meeting was held in Peyton at the Career Technical Education Facility on August 23. Both meetings were held from 5:00 - 7:00 PM in an open house format, with the same information presented at each meeting. Attendees were invited to review study overview and existing and forecasted conditions information, as well as the draft project Purpose and Need. Over 70 members of the public attended the meetings.

Following is a summary of comments submitted by meeting attendees on comment sheets, recorded by open house staff during one-on-one conversations with attendees, and submitted via the project web page, voicemail, and telephone conversations prior to the meetings. This summary includes comments received through September 14, 2016.

Comments

How do you use the US 24 corridor, between Powers Boulevard (SH 21) and Ramah?

- ✘ I live here (10)
- ✘ I work/shop here (2)
- ✘ I commute along corridor (5)

What are your highest priorities for this transportation corridor?

- ✘ Vehicular mobility - congestion and delay (8)
- ✘ Access to properties along the corridor (1)
- ✘ Transit connections (1)
- ✘ Pedestrian/bicycle accessibility and facilities (3)
- ✘ Safety (8)
- ✘ Other (1)
 - » Saving my property and its value

Do you agree with the Draft Purpose and Need for projects along the corridor?

What do you think the purpose of any transportation improvements recommended by this study should be?

- ✘ Better transportation corridor for both local and through traffic.
- ✘ Yes, the project is needed due to population growth which will continue. Improve the traffic flow through the Falcon area.
- ✘ Safety (2)
- ✘ Noise reduction to residents.
- ✘ Yes! Improved traffic congestion/safety.



- ✘ Vehicular mobility, Park N Ride, pedestrian access safety.
- ✘ Traffic flow.
- ✘ Saving people's property values and their land on the southern side of Highway 24. The focus should be to make improvements on the north side of 24 which would not impact all of the homeowners who live on the southern side. The northern side has no homes like on the southern side, i.e. Prairie Vista Meadow.
- ✘ Consider pedestrians.
- ✘ Yes. To help the residents get to where they are going in a reasonable amount of time, without too much delay.

What ideas do you have to reduce traffic congestion, improve corridor and intersection operations, and enhance safety for all users along US 24 between Powers Boulevard (SH 21) and Ramah?

Widening

- ✘ More lanes.
- ✘ Multiple attendees specifically requested increased passing lanes and that they be systematically planned and constructed, including signing so that drivers knew "Next Passing Lane X Miles".
- ✘ Widen towards trail - no one uses it.
- ✘ Focus efforts on the north side of 24. Why would you negatively impact so many on the southern side? That's the side with the majority of the structures. I'm concerned this will be another project that discounts the people that live right there. Look at Highway 25 between Monument and Castle Rock. That should have been widened a decade or more ago. Only now is that a priority.
- ✘ Widen between Garrett and Falcon Highway to start, then to Meridian Road.
- ✘ Add lane northbound and southbound between Garrett and Woodmen.
- ✘ Widen US 24 between Garrett and Woodmen intersection.
- ✘ Would be nice to have 2 lanes each way from northeast of Woodmen south to connect where there are already 2 lanes each way.
- ✘ There will be lots of impacts from widening between Falcon Highway and Woodmen.
- ✘ The highway needs widened through Falcon.
- ✘ In Falcon in the morning to Colorado Springs is bad. Falcon to Garrett needs to have expansion.
- ✘ Widen from Garrett to Judge Orr Road.
- ✘ Four lanes from Garrett to Judge Orr/Stapleton would help greatly. I feel this should have already happened with the amount of housing that has been added to an already stressed area.
- ✘ The worst congestion is between Garret and Woodmen. It would be good to widen until Judge Orr if possible.



- ✘ Please widen the road until Garrett (but to Judge Orr would be great).
- ✘ Extend four lanes to Judge Orr. If this is the only thing you do, do this!
- ✘ Need passing lane just east of Falcon.
- ✘ From Stapleton west should be four lanes ASAP.
- ✘ Top priority: four lanes from Garrett to Elbert Highway.
- ✘ Expand the road from two lanes to four lanes from Garrett Road to at least Elbert Road. The expansion would include the necessary thru lanes and if necessary merge lanes.
- ✘ Four lanes from Garrett to (at least) Peyton.
- ✘ US 24 should be widened no less than four lanes each way from Powers Boulevard out to Peyton, then three lanes each way to Ramah or just past to the county line.
- ✘ Put in passing lanes east and westbound between MP 325 and 327 (between Falcon and Peyton).
- ✘ Add passing lanes for westbound and eastbound US 24 east of Peyton (around MP 332 - 336).
- ✘ Double lanes between Falcon and Peyton would be nice. Congested in morning commute.
- ✘ Don't want widening in Calhan. Buying a home in the next month adjacent to US 24 will be major impacts to the home if widen to four lanes.
- ✘ Widening through Calhan would be very impactful.

Intersections

- ✘ Need better signing informing drivers of upcoming streets (e.g., "Peyton Hwy 1 Mile").
- ✘ Warning lights are great for warning of signals (flashing) and prevent crashes.
- ✘ Flashing yellow light warning about to hit red light helps!
- ✘ More stop lights and traffic calming features.
- ✘ More turn lanes.
- ✘ Throughout the corridor there needs to be more turn lanes and acceleration lanes.
- ✘ Concern about a confusing solution like the Fillmore and I-25 divergent diamond being implemented here.
- ✘ Eastbound at Garrett, people go around to turn right.
- ✘ Issue of people turning right at Garrett - need right turn only here.
- ✘ More turn lanes, signalized intersections or grade separated intersection of Highway 24 and Stapleton and grade separated intersection at Old Meridian/24.
- ✘ Driveways on US 24 near Woodmen/Meridian area need left turn lanes or frontage road for driveways.
- ✘ South to west turn lane badly needed at Meridian.



- ✘ Problems at US 24 and Meridian - merge lane is too short. Needs wider shoulder here because it's really bad in the winter.
- ✘ Need a merge lane from W. Woodmen to turn left on Meridian.
- ✘ Add second lane to Woodmen Road from the west side of Falcon.
- ✘ Woodmen Road should go over US 24 as an interchange with connections to properties via frontage roads.
- ✘ Woodmen headed east at Rio Lane is a problem (it dead-ends on 24). Drivers try to make a left turn into Rio from US 24 and it's dangerous. Maybe lower the speed limit?
- ✘ Eliminate the Blue Gill Drive intersection at Highway 24.
- ✘ Westbound lane at Blue Gill - move access to somewhere else.
- ✘ Move Blue Gill access to Judge Orr.
- ✘ Connect Blue Gill Drive to Judge Orr rather than directly to US 24.
- ✘ Add auxiliary lanes at Judge Orr.
- ✘ At night on eastbound US 24 at Judge Orr, people are sometimes forced into the median to avoid a rear-end crash. Please add a turn lane here.
- ✘ Need turning lane after bridge just east of Peyton.
- ✘ Soapweed Road needs a westbound turn lane instead of turning from passing lane.
- ✘ Need left turn lane on eastbound US 24 onto Commercial Street in Ramah. Crashes are bad!
- ✘ Calhan Highway needs turn lanes. The existing short turn lane doesn't work well.
- ✘ Since new guardrail was installed at curve just east of Calhan, there is no longer a good shoulder. People used the shoulder as a turn lane. Should move intersection of Harrisville and US 24 300 yards to east to put it on top of the hill. That would also provide room for a turn lane.
- ✘ Need turn lane to access Ramah Wildlife Area.

Multimodal Transportation

- ✘ The new Park N Ride would be very welcome.
- ✘ Adding an east-west crosswalk on McLaughlin would be excellent - between Woodmen and Old Meridian Road.
- ✘ Calhan has a large senior citizen population. Need handicap access and resources. Bus stops and a bus route would be more appropriate than biking.
- ✘ No bikes on roads without shoulders. Need to have shoulders on all roads out here to provide a safe place for people to pull over.
- ✘ Curb and gutter and sidewalks would be nice through Calhan.
- ✘ Continue Rock Island Trail to Constitution.



Speeds

- ✘ Lower speed limits.
- ✘ Step down speed limit near Woodmen/Meridian area and around Stapleton intersection.
- ✘ Lower speed limit coming in and out of Falcon.
- ✘ Reduce speed limit gradually for eastbound US 24 into Calhan. The roadway goes downhill into Calhan and helps people speed into town.
- ✘ Increase speed limit from Ramah to Ramah Reservoir, from 55 mph to 65 mph.

Other Ideas

- ✘ Open Tamlin Road and connect to Dublin near Marksheffel alternate route.
- ✘ Would be great to extend roads throughout the area, including Tamlin.
- ✘ The roads division needs to build North Carefree, Barnes, Stetson Hills and Dublin Boulevards out to the highway with traffic lights/intersections to ease congestion.
- ✘ Realignment.
- ✘ Realign US 24 around Calhan to the south of town.
- ✘ Create a new Meridian connection further to the west side of Falcon.
- ✘ Peyton Junction shopping center needs some type of visual exposure from US 24. It's a historic area.
- ✘ Community signage.
- ✘ Need to have more safety improvements along the corridor since crashes are a real concern.
- ✘ As far as improvements go, please address issues where population and employment growth is happening.
- ✘ Use Homestead Ranch Regional Park. Sitting 9 months because of weather.
- ✘ Please don't forget to repair the road in addition to all these improvements that might be a result of this project.
- ✘ No street lighting! Don't need it because headlights these days are sufficient. Light pollution is already a problem. (Yard lights contribute to this as well.)

Please share your thoughts regarding existing transportation conditions and/or issues along US 24 between Powers Boulevard (SH 21) and Ramah.

Congestion

- ✘ When US 24 goes from four lanes to two lanes at Garrett Road, it gets very interesting during rush hour and even many times during the day due to volume. This is a very unsafe area at Garrett Road.
- ✘ Sometimes traffic cuts through on Garrett to avoid traffic on US 24.



- ✘ Woodmen is too busy to cross and the intersection of Old Meridian and McLaughlin is too dangerous.
- ✘ The congestion on the highway has gotten to a point of frustration for many who travel the road every day. Drivers do not obey the traffic laws; they drive SLOW in the left lane and drive 90 mph in the right lane all the time. I live right off of the highway near Falcon. I see this problem day in and day out.
- ✘ Conditions become unsafe during high volume “road rage” etc. because too many cars now. Some of the projects are 5-10 years late so may want to re-think future plans to cover high volume.
- ✘ During high traffic and road hazards like snow and ice, if you are traveling west from east of Judge Orr, you will not get through Falcon without long delays.

Traffic Conditions

- ✘ Nice thing is there are not a lot of trucks in the morning and that helps with traffic and makes things safer.
- ✘ There is an interesting dichotomy of types of drivers along the corridor. Yuppies in their fancy cars driving fast and old farmers driving slowly.
- ✘ Truckers use US 24 from I-70 to avoid Denver. Get truckers off US 24.
- ✘ Lots of car rollovers happen at the turn south of Garrett.
- ✘ Intersection at Meridian is the worst in this area. All movements are happening! At least there is a light.
- ✘ Meridian bottle neck.
- ✘ Westbound AM big backup at Judge Orr, reverse in PM.
- ✘ U-turns for access to Scott Road are dangerous.
- ✘ From Woodmen Road to Peyton can be deadly during the winter due to snowfall.
- ✘ Passing between Falcon and Calhan can be hazardous or worse. Vehicles drive fast and pass on hills.
- ✘ On August 17, after the PEL Study meeting, my wife picked me up in Calhan. As we approached Ramah she slowed to 55 mph in the 55 mph zone. There are two bridges shortly before Ramah. After crossing the first one, she put on her left turn signal. 200 yards later a large pickup truck passed us on our left just before we turned.

Speed Limit/Speeding

- ✘ Speed limit between Falcon and Peyton (55 mph) is too high for people turning left onto US 24.
- ✘ Need more police presence in Calhan to hold people to traffic laws. Speeding on US 24 through town is a problem.
- ✘ Issue with speeding in Calhan. Town does not ticket or pull people over. State Troopers don't come out.



- ✘ Why the 55 mph speed trap just west of Ramah? Speed limit is 65 mph at city limits on the east side of Ramah.
- ✘ You have to go really fast to pass anyone on US 24.

Access

- ✘ Too many access connections.
- ✘ Tough for side roads to turn onto US 24. No safe breaks in traffic.
- ✘ The problem is all the commuters turning right from Woodmen/US 24 and from Meridian/US 24. The amount of cars will stack up and not allow any traffic from the east to get through the lights at Woodmen and Meridian. If there would be a right turn light that held them back so the flow would be fair that would help. As it is, some cars will turn right on Woodmen, go over to Meridian, and jump back on - as weird as it seems, it is faster.
- ✘ The accesses for two houses on US 24 at Meridian are extremely dangerous.
- ✘ Access concern for property on south side of US 24, just west of Falcon.
- ✘ School buses stop on US 24 in the Peyton and Calhan areas, and in some cases seem to turn onto local streets just further up the road. Can we ask the school districts to consider moving bus stops to safer locations off the highway?
- ✘ A couple attendees noted the "passing lane" at MP 332.2 (Plains Heating and Air Conditioning access east of Peyton). This is only about 1/4 mile in length, so it is not likely intended to be a passing lane. It seems it must be meant as auxiliary lanes for the business access, although it seems to be striped with just regular skips rather than striping appropriate for auxiliary lanes. The fact that there is a crest vertical on the east edge of the 1/4 mile length hides the end of the lane and probably makes drivers believe the "passing lane" continues beyond the crest of the hill the usual 1 mile in length. The attendees also stated anecdotes of seeing large trucks in the left EB lane taking wide turns into the Plains Heating access. This could indicate an inadequate access design for the intended usage.
- ✘ Concerns about driveway access for properties along the corridor (just east of Log Road east of Peyton).

Roadway Features

- ✘ Accel lanes at Woodmen and Meridian are not sufficient.
- ✘ Shoulder is really wide at Judge Orr, so people use it as a turn lane and that's a problem with crashes.
- ✘ Safety improvements at Peyton worked! No fatal accidents since 2010.
- ✘ The access at McClelland (MP 333.8) had very poor sight distance due to the crest vertical curve just west of the intersection.
- ✘ Bridges need repair—they are only on a pile of wood sometimes. Need to have concrete and allow for expansion as well.



- ✘ Check sufficiency rating of bridge on Calhan Highway just south of town. Windmill trucks drive it a lot.
- ✘ No shoulder on bridges near Smith Ranch Road. When people pull out in front of you there's nowhere to go.
- ✘ A lot of truck traffic from I-70 to Colorado Springs. Narrow bridges cause everyone with trailers/equipment to have to move to center of road to get around.
- ✘ Very rough road between Peyton and Ellicott Highway. Needs repaved - not just chip sealed.

Environmental and Community Resources

- ✘ A couple attendees stated they lived near the stretch of US 24 from Constitution to Garrett and that highway noise was significant and a major concern for them.
- ✘ Rental properties along US 24 south of Woodmen (Falcon Vista duplexes) are very popular. People want to live in the area. Congestion will get worse.
- ✘ Property owner of business lot on Rio Lane has experienced major drainage issues over the last 15-20 years (affecting septic system and property value). The development on the north side sent drainage across the highway to the south and it's a major issue for properties along the south side of US 24. There was a meeting with the County 5-10 years ago and nothing has happened, even though the County talked about putting detention on the north side.

Pedestrian/Bicycle/Transit Travel

- ✘ Safety of cyclists southbound on US 24 south of Woodmen needs considered.

Please provide general suggestions and comments regarding the transportation study below.

- ✘ Thank you for looking at this.
- ✘ The planned projects are a good step in the right direction.
- ✘ The coordination between Colorado Springs, El Paso County, Peyton, Calhan, and Ramah is very important to CDOT to make this study useful to government and the population that uses this road.
- ✘ Consider how this will impact the property/homeowners on the south side of US 24.
- ✘ There is concern about access from 24 to private land/houses.
- ✘ Frontage road - what is the status?
- ✘ Will US 24 become an interstate?
- ✘ When did US 24 become a US Highway?
- ✘ Would like to see the Access Control Plan on display. Interested in what the typical cross section of a future US 24 east of Peyton would look like. Concerned that if the ROW take was more than roughly 50-feet, water well permitting could be difficult (because the smaller the parcel is, the more difficult it is to get the permit).



- ✦ Would like the Access Control Plan posted on the project web page.
- ✦ Multiple attendees requested that the meeting displays be made available online.
- ✦ Including current and future traffic count displays on the same graphics would be helpful, for comparison purposes.
- ✦ Bridges (and flooding) were priority for previous County Commissioners.
- ✦ Slocum bridge closed (County bridge).
- ✦ Is the mill levy that brings businesses here included in the modeling?
- ✦ Family has been here six decades.
- ✦ Town of Simla will be voting on legal marijuana which could impact highway safety and congestion.
- ✦ Where is an example of a channelized T and what does it look like?



Public Meeting #2 Summary

March 2017

The US 24 PEL Study's second public meeting was held on March 2, 2017 at Falcon Legacy Campus in Peyton. This meeting was held from 5:00 - 7:00 PM in an open house format, with a presentation by the consultant Project Manager at 5:30 PM. Attendees were invited to review the Level 1 and Level 2 alternatives and evaluation completed to date. Feedback was requested regarding the alternatives being considered, which will be considered by the project team while determining Level 2 alternatives screening results and moving forward into alternatives refinement. Approximately 55 members of the public attended the meeting.

Following is a summary of comments submitted by meeting attendees on comment sheets and maps, recorded by open house staff during one-on-one conversations with attendees, submitted via the project web page, and recorded during telephone conversations prior to the public meeting. This summary includes comments received through March 23, 2017.

Comments

Please provide feedback regarding the Level 1 and 2 alternatives screening. Do you agree with the evaluation completed to date?

- ✘ Roundabouts are counterproductive to stated goal of improving freight flow.

What are your specific comments regarding alternatives being considered in each corridor segment? What should the project team consider as alternatives are screened and design layouts are further developed and refined?

Powers Boulevard to Constitution Avenue Segment:

- ✘ Roadway Cross-section Preference
 - » Go with four lanes and shoulder for rush hour (Alternative 2).
 - » Four lanes.
- ✘ Signs automated to lower speed limits during fog and snow/black ice.
- ✘ Overhead digital warning equipment.
- ✘ Perimeter lighting on sides of roads.
- ✘ Underground wildlife crossings needed.
- ✘ Define truck lanes (normally to the right).
- ✘ Peterson Air Force Base (AFB)
 - » At Peterson Road intersection traveling west: Extend queue line for safety for Peterson AFB Gate traffic backups.
 - » Pedestrian connection at east leg of Peterson/US 24 intersection.



Constitution Avenue to Falcon (Woodmen Road) Segment:

- ✦ Roadway Cross-section Preference
 - » Alternative 1 (Four Lanes with Accel/Decel Lanes).
 - » Four lanes.
 - » US 24 just west of Falcon Highway needs minimum of 3 lanes!!
 - *Another person wrote to add on to this comment: with eastbound merge lane.*
 - » Alternative 3 - Four lanes with Peak Period Shoulder Lanes.
 - » Consider four lanes thru Falcon.
- ✦ Paving improvements needed.
- ✦ Signs automated to lower speed limits during fog and snow/black ice.
- ✦ Overhead digital warning equipment.
- ✦ Perimeter lighting on sides of roads.
- ✦ Underground wildlife crossings needed.
- ✦ Define truck lanes (normally to the right).
- ✦ From Dodge and Garrett, speed limit should be 45 mph to Woodmen Road.
- ✦ Recommend more roundabouts to slow traffic down and prevent accidents at: US 24/Garrett, Garrett Road/Meridian, Falcon Highway/Meridian and US 24/Meridian.
- ✦ Garrett Road intersection
 - » At intersection US 24 and Garrett, should be right turn only! Lots of cars on right lane speed past cars in left lane only to crowd into one lane, which causes possible crashes.
 - » On northbound US 24 at Garrett Road, thru-right allows people to pass on the right, then cut in front of other cars (*another person wrote "agree" next to this comment*).
 - » At Garrett, huge power lines are staggered on both sides of the road. Xcel has very wide easement and a Diamond Shamrock gas line. These utilities would constrain US 24 widening.
 - » Like the US 24 northbound to eastbound Garrett right turn lane.
 - » Right turn in and acceleration lane off of Garrett.
 - » Consider bridge over with jug handle.

Falcon (Woodmen Road) to Peyton Segment:

- ✦ Roadway Cross-section Preference
 - » Alternative 1 (*Two Lanes plus New Auxiliary Lanes*).
 - » Four lanes.



- ✦ Are you allowing for increased transport—semis?
- ✦ Plan to have the future development north at Curtis to tie into Elbert instead of US 24.
- ✦ The plan should consider traffic count effects of the 2040 Mobility Plan for connection of Briargate to Stapleton.
- ✦ Recommend more roundabouts to slow traffic down at US 24/Woodman and US 24/Judge Orr.
- ✦ Rio Road - utilize frontage roads for access rather than right turn only.
- ✦ Old Meridian/New Meridian intersections (*one person's comments below*)
 - » The planned closure of the Old Meridian/US 24 intersection (allowing right turns only) will surely hurt the Falcon area, will hurt the businesses that are on Old Meridian and McLaughlin up to Woodmen, and the businesses on the other side of US 24, and it will of course hurt the people who use these businesses.
 - » The New Meridian Road that was put in many years ago will be a real game changer. It should have all the attributes of Woodman meeting US 24 (acceleration lane, blinking yellow arrows).
 - » Glad there will be a way for people to get to the Farmers State Bank or Diamond Shamrock or any of the other businesses along old Meridian and McLaughlin. People will just have to drive an extra half mile. Extra time extra money for the people of the Falcon area.
 - » Those visitors from out of state will not know how to get to Diamond Shamrock and this could be a real problem at two o'clock in the morning.
 - » This new Meridian extension will also have a park-and-ride attached to it, maybe even a bus stop. If you travel Woodmen you know how well park and ride parking lots do and maybe you remember how well the test bus service did a few years ago in Falcon. What a waste of money.
 - » With the new Meridian extension to the Old Meridian, the amount of traffic will be just about the same as it is at the Old Meridian/US 24 intersection for east west traffic. This means traffic on US 24 will be stopped with a red light about the same. This means the eastward traffic that is turning left onto new Meridian will have to stop. It will not have the flashing yellow arrows to continue on, but a red stop light. If the new Meridian were designed like the Woodman intersection and the Old Meridian/US 24 was allowed to still be an intersection, traffic could continue to turn onto new Meridian even though there was a red light at the Old Meridian/US 24 intersection. The five o'clock rush will keep moving. Why can't we have a stoplight at both intersections? The answer is you are not to have stoplights so close together on a major US 24. However, is the new stoplight that would be at the new Meridian really a stop light? The only time that the light would turn red at new Meridian/US 24 would be when someone traveling on the new Meridian wanted to turn left onto US 24, that is go east. Think about it, who would do this? Somebody maybe who was lost or somebody who just remembered they wanted to get gas at Diamond Shamrock. How many can that be in a day? The afternoon traffic going east is bad enough as it is. CDOT's plan will make it even worse.



- ✦ Meridian Road and Woodmen Road intersections area
 - » So many accidents at Falcon and Meridian.
 - » From Woodmen turning east - barely across bridge and people start turning right at next dirt road to the south causing cars behind to slam on brakes.
- ✦ Judge Orr Road intersection
 - » There was a head-on collision near Judge Orr this week.
- ✦ Stapleton Road intersection
 - » The westbound traffic at Stapleton/US 24 has very poor visibility.
 - » Intersection at Curtis Road has very poor visibility for westbound traffic looking north/east.
 - » There are serious problems with the northerly sight-line for eastbound Stapleton at US 24. At that location the eastbound stop bar for Stapleton is quite far back from the intersection. The problem is that from the stop bar on Stapleton there is an obstructed view of southbound US 24. The obstruction is an elevated anchor point for power lines. Vehicles stop at the bar, look north, and then have to move forward to see far enough to turn left or cross US 24. Once they do this, with their attention directed northward, they pose a hazard to northbound vehicles on US 24 turning left and cutting the corner.
 - » The El Paso County Commissioners resolution 06-183 calls for a grade separated trail crossing at Stapleton & US 24. This should be integrated to each alternative.
 - » Comments associated with Jug handle intersection or Junior interchange at planned roadway east of Stapleton Road (present on all alternatives)
 - Revise to have a traffic light?
 - What is planned for managing this traffic from planned development?
 - Possible to move this to Elbert Road instead? Why on US 24? Already too congested.
- ✦ Elbert Road intersection
 - » Can't turn left at Elbert - take life in hands.
 - » In the seventeen years since I moved south of the intersection of Elbert Road and East US 24, the traffic has increased dramatically. At several times during the day it is very difficult to make a left turn from Elbert Road and go west on US 24.
- ✦ Bradshaw Road intersection
 - » Turning right from US 24 south on Bradshaw very narrow shoulder!
 - » It is dangerous to turn left off US 24 to south Bradshaw. Even though I signal far in advance, cars going west almost rear-end me.



Peyton to Calhan Segment:

- ✦ Roadway Cross-section Preference
 - » We need four lanes. No current way to pass slow drivers.
- ✦ Additional Turn Lanes
 - » Would like additional turn lanes at Soapweed.
 - » Turn lanes needed for Fairplay Road.
- ✦ Should do truck parking in Peyton.
- ✦ Poles or some type of roadside lineation to help in blowing snow at Peyton and Calhan.
- ✦ The truck and semi traffic on this 65 mph highway in front of our house is tremendous and increasing in volume every year - so is the damage to our vehicles in driving from our home to anywhere in Colorado Springs. That 35-mile trip in the best or worst weather is a challenge when one considers this is an INTERSTATE HIGHWAY! The huge increase in all traffic since the developments have occurred in Falcon is further proof that we need a four lane highway from Colorado Springs to not only our home in Calhan, but even further east! We have at least a 40-mile trip when going east from Calhan to Limon, and what makes that an even more dangerous trip than going west toward Colorado Springs is the fact that there are NO SHOULDERS on US 24 in that direction, and absolutely no means of assistance on that stretch in the event of an accident or car trouble of any kind. WE ARE ENTIRELY ON OUR OWN! But instead of improving the stretch of US 24 from Colorado Springs in an easterly direction ANYWHERE, all we hear and know about is the decision to widen I-25 north to Denver. How about some highway improvement consideration to our part of CO? It seems obvious that we residents of “Podunk” are second class citizens to the citizens of Colorado Springs and Denver! Highway US 24 is the major east/west interstate highway in this part of Colorado and should be given more attention and improvement project priority than it is. It not just us living in Podunk....it's everyone having to travel east in this part of Colorado!
- ✦ At Ellicott Highway intersection: Thank you for the widening of this intersection!
- ✦ Vertical sight distance issues between Peyton and Calhan.
- ✦ Hill blocks visibility of road at McClelland Road.
- ✦ Straighten curve and lower speed in Peyton.
- ✦ Concern with Roundabouts
 - » No roundabouts.
 - » Roundabouts NOT desirable in Calhan.
 - » We oppose a roundabout in Calhan. After experiencing such in Colorado Springs they are very dangerous.
 - » Calhan roundabouts not logical for trucking. Consider truck route bypass and let passenger cars go thru town.



- » At Palomino Drive intersection (just east of Ellicott Highway): Residential left turn for westbound traffic with hill to the east. Recorded fatality at this location.
- » Roundabouts in Calhan not a good idea. Harder for semi-trucks, RV's, trucks pulling stock trailer to go through.
- ✦ Highway through Calhan
 - » At 8th Street and Yoder Street intersections: Speed bars (rumble strips).
 - » Enforcement of speed limit between Calhan and Peyton is needed. US 24 is dangerous in Peyton because of speeding.
 - » Calhan may need to look at eventual bypass for through traffic if they want to change the highway through town to more of a Main Street setting. Same with each community.

Calhan to Ramah Segment:

- ✦ Roadway Cross-section Preference
 - » We need four lanes. No current way to pass slow drivers.
- ✦ Eliminate center exit.
- ✦ Plan for conduit connections.
- ✦ Concern with Roundabouts
 - » No roundabouts.
 - » At Yoder Street intersection: Roundabout not easy for trucks and livestock trailers coming from fairgrounds.
 - » No roundy circle in my town you!! Rabble rabble rabble!
 - » We oppose a roundabout in Calhan. After experiencing such in Colorado Springs they are very dangerous.
- ✦ Intersections in Ramah
 - » Possibly keep eastern intersection open and improve it but close western ones.
 - » Suggest frontage road/combined access.

Please provide general suggestions and comments regarding the transportation study.

- ✦ Roadway Cross-section Needs
 - » Need shoulder along entire corridor.
 - » Partially US 24 is an interstate highway - needs four lanes.
 - » Don't think reversible lanes are a long-term solution if going to trouble to add one lane, should add two.
 - » No suicide lane changing direction at different times.



- ✦ Wildlife Crossings
 - » Wildlife bridges are a significantly better alternative to fencing or signs. Frequently the fences trap the animals in the highway corridor area used.
 - » Have you considered wildlife crossings?
- ✦ Street Lighting
 - » No street lights along US 24.
 - » No street lights on the corridor because they ruin the skyline.
- ✦ Bike/Trail Facilities
 - » Rock Island Trail improvements to keep bicyclists off US 24.
 - » Fully support extension/improvement of separated multi-modal trail all the way to Ramah.
 - » Fully support extension of multi-modal trail to Ramah and associated improvements.
 - » Strongly opposed to bike lanes on the road. Separated trail is better.
- ✦ Safety
 - » Prioritize improvements on areas/intersections where the most accidents/fatalities have occurred.
 - » Don't limit improvements to US 24. Improvements for safety on other roads are also needed.
 - » Get rid of all small and narrow wooden bridges where accidents are numerous. New bridges could be widened out to accommodate for future four lane, acceleration lanes and turn lanes.
 - » The entire corridor is a safety disaster, with distracted drivers, cars following too close, speeding, passing on the right and running people off the road, and many accidents.
 - » 65 mph is too high of a speed limit. It causes accidents.
 - » Yellow-flashing warning lights for pending red light signals are excellent.
 - » The flashing yellow lights alerting motorists of a future red light are excellent! They reduce red-light runners.
- ✦ Weather
 - » Weather information on VMS signs.
 - » Improve ability to see striping and lane direction during fog or snow.
- ✦ Concern about Roundabouts
 - » Roundabouts will be a disaster. They would have to be too large and impactful.
 - » Roundabouts are silly.



- » Roundabouts would need to accommodate livestock trucks. Would be so large they would impact the properties around it.
- » Prefer turn lanes and not roundabout.
- » Too much truck traffic for roundabouts.
- » This corridor has potential for significant freight increases coming off of I-70 and I-76 as I-25 continues to become more congested. Any design should take into account for large trucks and to keep the corridor free flowing as an alternative to I-25 as the area grows to the east in population and need for freight and commuters. Roundabouts are not good for trucks and through traffic on a major corridor.
- ✦ Current eastbound traffic from Falcon to Calhan is drastically dense during morning and evening rush hour.
- ✦ Every major intersection needs to be done similar to Elbert Road and Ellicott Highway.
- ✦ How would high speed rail effect this corridor?
- ✦ Driver education would be helpful. Help people understand and deal with left turns, speed limits, right turns.
- ✦ Planned developments should be made public.
- ✦ At least ten major projects are planned between Falcon and Ramah and developers would cooperate more at this time, build in extra road space and be more willing to work with CDOT if the original drawings and specs could be done all at one time. This would save thousands of dollars of architect's time and legal fees. A lot of highway frontage could be acquired at very low costs or free if small reciprocal concessions can be done by CDOT.
- ✦ I really do not understand why US 24 is not an interstate highway from Limon to Colorado Springs. El Paso County has the largest population in the state, yet has to fight for any highway funds. There never seems to be a lack of money for road projects in the Denver six-county area. Let's get things rolling in El Paso County, it is overdue.
- ✦ All designs need to allow for easy movement of goods in, out and through the communities from I-70 to I-25 or at least Powers. US 24 should have strict access control implemented to keep it free flowing with only major intersections allowed from Calhan to Colorado Springs. Hwy 34 in Greeley is a good model to look at.
- ✦ Glad to hear the study is being done. I can tell CDOT is serious about making improvements to US 24 and that is nice to see.



Public Meeting #3 Summary

September 2017

The US 24 PEL Study's third public meeting was held on September 28, 2017 at the Meridian Point Church in Falcon. This meeting was held from 5:00 - 7:00 PM in an open house format, with a presentation by the consultant Project Manager at 5:30 PM. Attendees were invited to review and comment on the Level 3 alternatives and evaluation, and the draft study recommendations. In addition, the recommended revisions to the existing Access Control Plan were presented for comment. Approximately 40 members of the public attended the meeting.

Following is a summary of comments submitted by meeting attendees on comment sheets and maps, recorded by open house staff during one-on-one conversations with attendees, and submitted via the project web page and email. This summary includes comments received through October 11, 2017.

Comments

What are your specific comments regarding the proposed improvements in each corridor segment? What should CDOT consider as the study recommendations are finalized?

Powers Boulevard to Constitution Avenue Segment:

- ✦ None received.

Constitution Avenue to Falcon (Woodmen Road) Segment:

Garrett

- ✦ There are many accidents north of Garrett, near the lane drop, where cars run off the road and into the ditch. *[team member notes from public meeting]*
- ✦ I drive US 24 from Powers to Falcon Highway every week day for work. The biggest problem that I see through there is when it goes down to one lane before the Garrett intersection. There is a right turn only lane but many drivers go straight through the light to get ahead of traffic. I have seen many times where accidents almost happen when the cars are trying to get back into the through lane. big dump truck did this the other day and tried to run another car off the road getting back in the lane that goes straight through. It seems to me there is an easy fix for this. At the end of the right turn only lane there could be a cement piece put up that makes the traffic turn onto Garrett. The cement part of US 24 on the westbound side is nice and I like what was done at Garrett to get the traffic from Garrett onto the westbound lanes.
- ✦ At US 24/Garrett move the light change warning light further back than it is. There isn't enough notice with eastbound traffic.
- ✦ I would have been hit three times since this intersection change. Please add a turn lane onto Garrett. Add a turn lane from Garrett to eastbound US 24.



- ✘ After the construction at Garrett, the intersection is worse than it was before. The new configuration causes dangerous problems, and I often hear horns honking and brakes squeaking.
- ✘ The new intersection project at Garrett was a great improvement for US 24 westbound in the AM rush.
- ✘ Check signal timing at Garrett. Also, check the sensor for the signal off Garrett turning left onto US 24 - it doesn't change in the AM.
- ✘ The repaving at Constitution to Garrett was unnecessary and a waste of money. The concrete is bumpier than it was before.
- ✘ It is hard to know what to do with my property (fix, sell, etc.) when I don't know when the frontage road will be implemented. There isn't enough room to fit a frontage road between US 24 and my property, so if it is implemented it will go through my property. It will greatly impact many properties. I would rather have my property acquired than "avoided" with a backage road. Backage roads would cause double the noise.

Meridian

- ✘ A possible interim design for Meridian is to connect Meridian to US 24 and to keep both New Meridian and Old Meridian as signalized intersections. (See detailed comments in attached letter provided during the meeting.)
- ✘ Please complete the Meridian Road to US 24 connection. The road has been completed for 10 years except for the final 50 feet to actually connect to US 24.
- ✘ Concerned about the proposed right-in/right-outs at Meridian. At similar locations, the drivers will take a left onto the main road and drivers will do the same at Meridian.
- ✘ The intersection at US 24 and Meridian could use just a bit of help. By the fire station when turning right onto US 24 westbound there needs to be a longer right turn lane. Right now it's very short and many people are using the side of the road to get around and turn right. That part is very bumpy. It wouldn't take much to make that little spot better but don't know if that falls with you guys or someone else.
- ✘ Improve road at Meridian/US 24 by fire station. Add second lane by fire station on Meridian. People make a second lane going south by driving over potholes in dirt.
- ✘ At the current intersection at Meridian and US 24, the fire station corner, there are two turn and straight sign, but only one paved lane. Pave the second lane.
- ✘ Median crossover for emergency vehicles at right-in/right-out will not prevent non-authorized vehicles from attempting to make the crossover.
- ✘ The Falcon Highway and Meridian Road intersection is very dangerous.
- ✘ Accidents at Falcon Hwy and Meridian Road intersection.
- ✘ CDOT should use the money for the park-and-ride project in Falcon for US 24 instead. A park-and-ride will inspire a lot of vandalism and stolen cars. The park-n-ride is not needed.
- ✘ Meridian Road great to connect to US 24 going west.



- ✦ Keep median through the intersection at Meridian Road and US 24.

Other

- ✦ It seems like there needs to be four lanes of traffic between Garrett and Woodmen Road. This gets really bogged down trying to get all the traffic into Falcon and past, especially in the afternoon traffic.
- ✦ Four lanes are greatly needed from Garrett Road to Woodman Road.
- ✦ The speed limit should be 65 mph.
- ✦ The roads in Falcon need help. It's hard to get from one area to another.
- ✦ The Rock Island Regional Trail travels along Highway 24. As the road is widened or improved, we'd [Trails and Open Space Coalition] like to see the trail connect under the highway to neighborhoods or parks. Eventually there will be a trail in the Jimmy Camp Creek area - again it would be good for the highway to plan for that connection and allow for it. East Sand Creek is another example of a primary trail that should be considered in future Highway 24 plans. CDOT has done an excellent job of planning road improvement projects with a trail component that serve recreational and commuter needs. We look forward to the same level of excellence in this project and will help in any way we can. Thank you!
- ✦ On 11125 Hwy 24 the well is about 60 feet from the highway property line. This is a very good water well. I do not want to lose the good water. The well on 11135 Hwy 24 is further back but water has iron and is not good.
- ✦ Sidewalks all along south side of US 24 (between Falcon Hwy and Pikes Peak Community College - Falcon Campus).
- ✦ Access to Walmart Super Center southern access point (across from Flower Road) should have full movement at the intersection (currently it is right turn only).
- ✦ Add paved turn lane southbound on Old Meridian Road to westbound on US 24.

Falcon (Woodmen Road) to Peyton Segment:

- ✦ Tonight's presentation of a new "draft" realignment of Judge Orr/US 24 is an ambush to impacted landowners who have not been individually contacted or recognized as stakeholders in PEL. Presenting details tonight, the last/third public meeting in PEL, in no way/shape/form satisfies the requirement for public input on this very significant proposed change to the US 24 Access Plan.
- ✦ Extremely dangerous to get on US 24 from Rio Lane, Blue Gill, and Cottontail Drive.
- ✦ Consider pedestrian culvert crossing at Rio Lane across US 24.
- ✦ Regular traffic signal at Blue Gill Drive (just west of Rio Lane) or Cotton Tail Drive.
- ✦ Make sure turning radius works for turning from eastbound US 24 to Cotton Tail Drive.
- ✦ Consider pedestrian culvert crossing just east of Blue Gill Drive near Judge Orr Road.



Peyton to Calhan Segment:

- ✦ Since it is legal in Colorado, there are many semis with three trailers that travel this corridor and the roundabouts in Calhan need to be able to accommodate these trucks with three trailers.
- ✦ Adjust the decrease in speed to begin before the curve into Calhan in the northbound direction.

Calhan to Ramah Segment:

- ✦ None received.

Construction funding for corridor improvements has not yet been identified. Therefore, improvements will be constructed as separate projects, and implemented as funding becomes available. Which improvements should be highest priority?

- ✦ US 24 needs to be widened and/or additional passing lanes added. I have noticed that the amount of traffic over the last 10 years has increased tremendously. In a perfect world two lanes each eastbound and westbound from Falcon to Calhan at a minimum would really help alleviate the issue. Understand the cost involved may be challenging but the traffic is only going to get worse over time.
- ✦ Meridian/US 24 in Falcon.

Please provide general suggestions and comments regarding the transportation study.

- ✦ Does CDOT have street sweepers? I've been here 1.5 years and I've never seen one or the results of it being used. In some places the build-up is so high it's like there's trash lining the streets.
- ✦ Concerned about the complete lack of contact by CDOT or its retained consultant, given the magnitude of the impact to my client's property that will occur if the proposed design is implemented. Interestingly, the actual design has been proposed but is not available on your website. My client was not invited to attend, even though its property will be directly and significantly impacted by the proposed plan, in particular a realignment of an adjacent roadway. We are concerned that CDOT would prefer to get through the "public process" by seeking input from the community in more general terms, and then later, ambushing adjacent property owners (through condemnation or otherwise) who are directly impacted by the actual design of the corridor so there is less opposition shown during the "public process." It sure doesn't seem right or proper to blindside those owners directly affected by the design and not seek their input from the start. That appears to have happened during this process.
- ✦ I must have received 14 notices about this meeting. I heard about it a few times from you, and got the notice from multiple groups I belong to.
- ✦ There will be a new Catholic Church in Falcon (St. Benedicts) on October 8th.
Use microphone for questions and answers.

ALWAYS RIGHT WILL BE WRONG

CDOT and El Paso County plan to close the intersection at Old Meridian and US Highway 24 and make it **right turns only**. The intersection that for many years defined the town of Falcon. Falcon was just a wide spot in the road, but look at it now, 8,000 people in the Falcon area. This intersection closure will surely hurt the Falcon area, it will hurt the businesses that are on Old Meridian and McLaughlin up to Woodmen and the businesses on the other side of 24 and it will of course hurt the people who use these businesses. Two of the oldest businesses in the area Diamond Shamrock and the Farmers State Bank will be hurt but also the smaller businesses such as the Windshield Guy , Bartlett Hay & Feed, Espresso Coffee, Smith Farms Stand and the many other businesses along this stretch of road. If you are on the East side of US 24, think old Meridian south, Falcon Hwy, Garret Rd, or coming from the Springs and want to go to say Farmers State Bank , you will not have a direct route to get to the bank because there is no longer an intersection, only right turn in and right turn out.. If you want to go for gas, a cup of coffee, or a melon and you're on Old Meridian headed toward 24, all you can do is turn right because the intersection is no longer. Maybe then you go to Colorado Springs to do business.

Now for the good news, the new Meridian Road that was put in many years ago will now connect to US Highway 24. This will be a real game changer. It should have all the attributes of Woodman meeting US 24. People wanting to go west on US 24 will have a acceleration lane and will not have to stop to get on 24. People coming from the Springs who want to turn on to the new Meridian will have blinking yellow arrows meaning they can go when traffic allows. The main difference between the Woodman intersection and new Meridian intersection will be there will be very little traffic turning east on the new Meridian intersection whereas the Woodman intersection has a heavy load of people going east.

Now for the bad news of the good news of the new Meridian meeting 24. CDOT and El Paso County are going to continue on east with a new road connecting US 24 and old Meridian. In other words this new connection to 24 will become a full intersection with a stoplight on US 24 to take the place of the old intersection of old Meridian and 24. This means there will be a way for people to get to the Farmers State Bank or Diamond Shamrock or any of the other businesses along old Meridian and McLaughlin. People will just have to drive an extra half mile. Extra time extra money for the people of the Falcon area.

As an extra bonus all those people from eastern Colorado traveling west on Highway 24, will also get to do the extra time extra money to get to Diamond Shamrock. Those visitors from out of state will not know how to get to Diamond Shamrock and this could be a real problem at two o'clock In the morning.

This new Meridian extension will also have a park-and-ride attached to it, maybe even a bus stop. If you travel Woodmen you know how well park and ride parking lots do and maybe you remember how well the test bus service did a few years ago in Falcon. What a waste of money.

With the new Meridian extension to the Old Meridian, the amount of traffic will be just about the same as it is at the Old Meridian/US 24 intersection for east west traffic. This means traffic on US 24 will be stopped with a red light about the same. This means the **eastward traffic that is turning left onto new Meridian will have to stop.** It will not have the flashing yellow arrows to continue on, but a red stop light. If the new Meridian were designed like the Woodman intersection and the old Meridian/24 was allowed to still be an intersection, **traffic could continue to turn onto the new Meridian even though there was a red light at the Old Meridian/24 intersection.** The five o'clock rush will keep moving. Why can't we have a stoplight at both intersections? The answer is you are not to have stoplights so close together on a major US Highway. However, is the new stoplight that would be at the new Meridian really a stop light? The only time that the light would turn red at new Meridian/24 would be when someone traveling on the new Meridian wanted to turn left onto 24, that is go east. Think about it, who would do this? Somebody maybe who was lost or somebody who just remembered they wanted to get gas at Diamond Shamrock. How many can that be in a day? **The afternoon traffic going east is bad enough as it is. CDOT's plan will make it even worse.**

A review.

One: Harm businesses and the people of Falcon and people from points east that use these businesses.

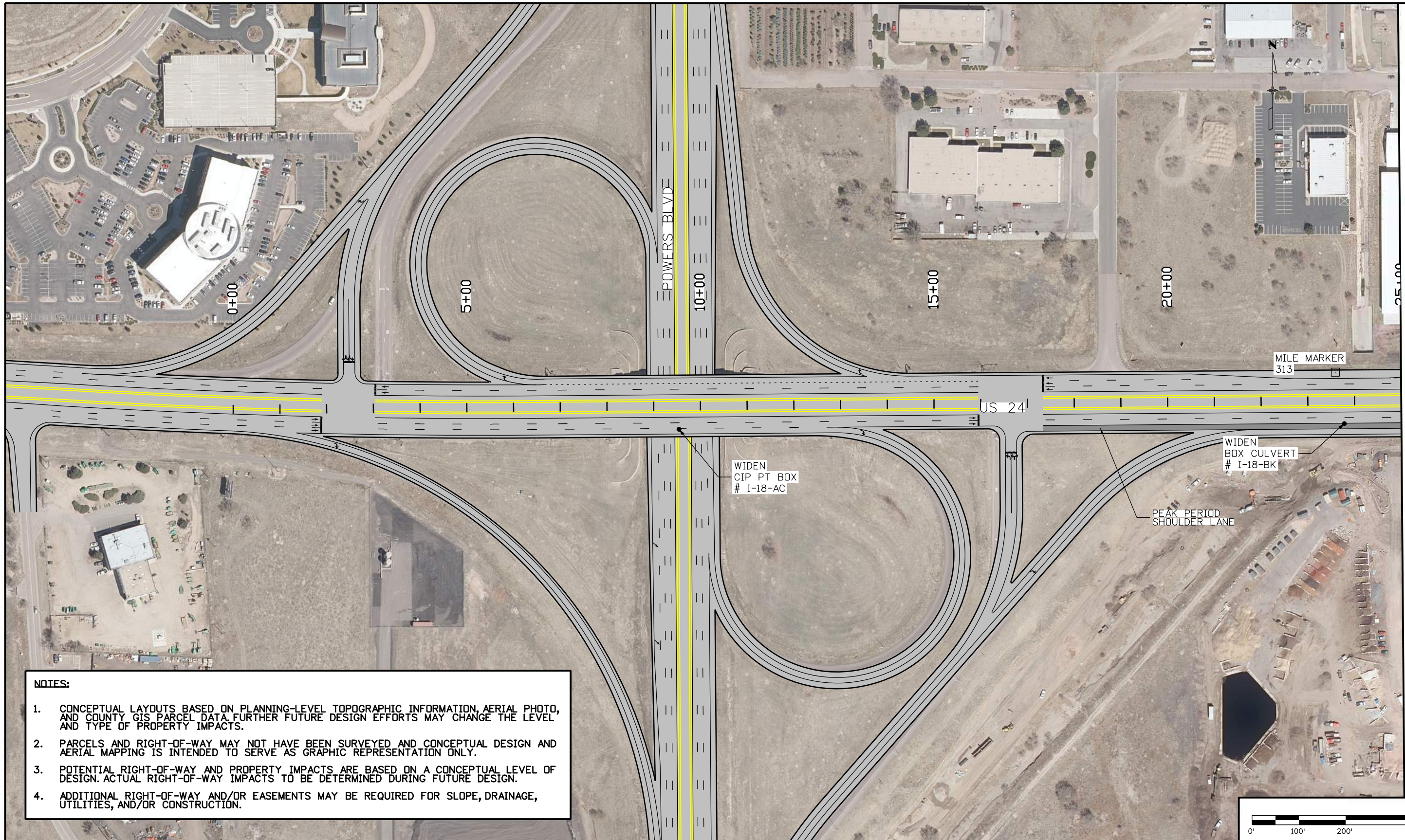
Two: Waste money building a new road and parking lot.

Three: Design that makes traffic worse on US 24 at the new Meridian.



APPENDIX D

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MATCHLINE 25+00
HCL US 24

- NOTES:**
1. CONCEPTUAL LAYOUTS BASED ON PLANNING-LEVEL TOPOGRAPHIC INFORMATION, AERIAL PHOTO, AND COUNTY GIS PARCEL DATA. FURTHER FUTURE DESIGN EFFORTS MAY CHANGE THE LEVEL AND TYPE OF PROPERTY IMPACTS.
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Colorado Department of Transportation

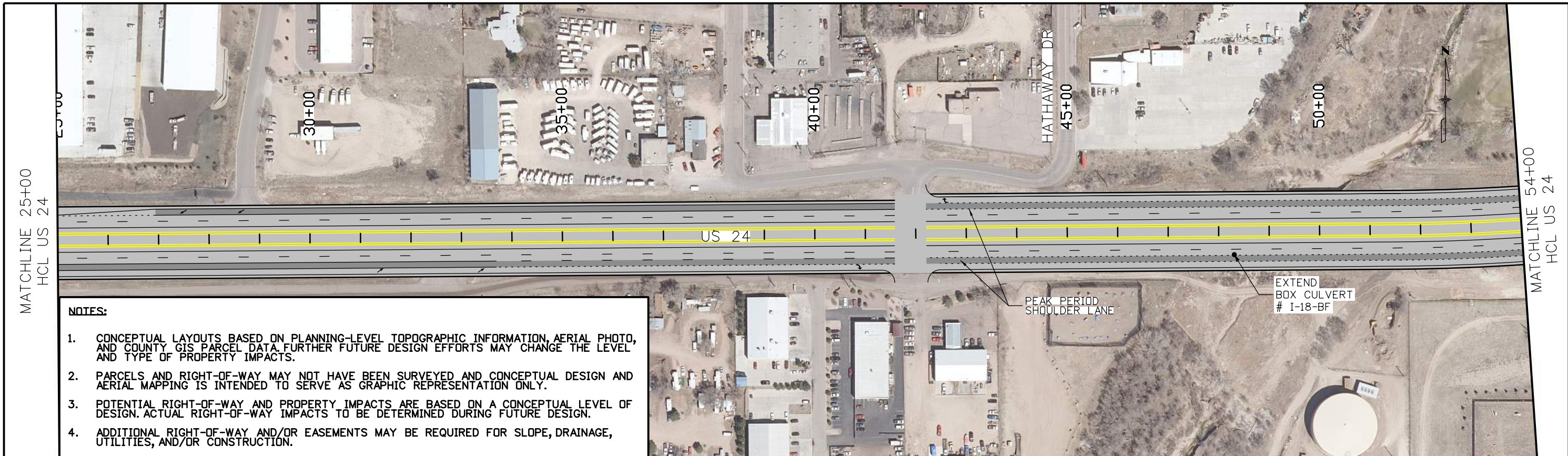
905 Erie Avenue
Pueblo, CO 81002
Phone: 719-546-5408

Region 2

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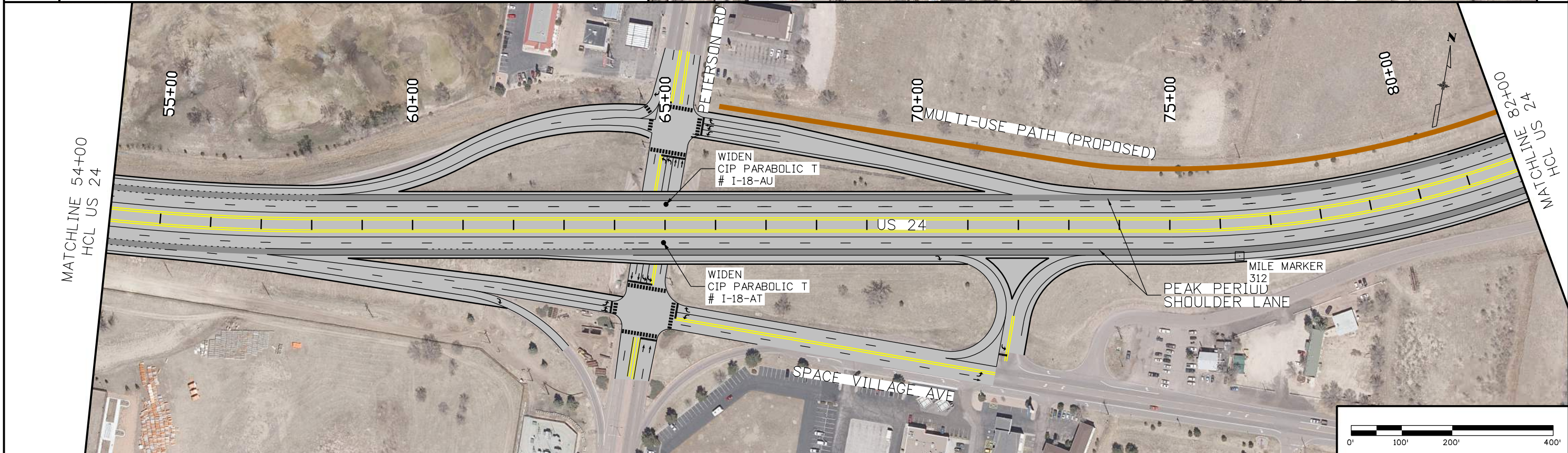
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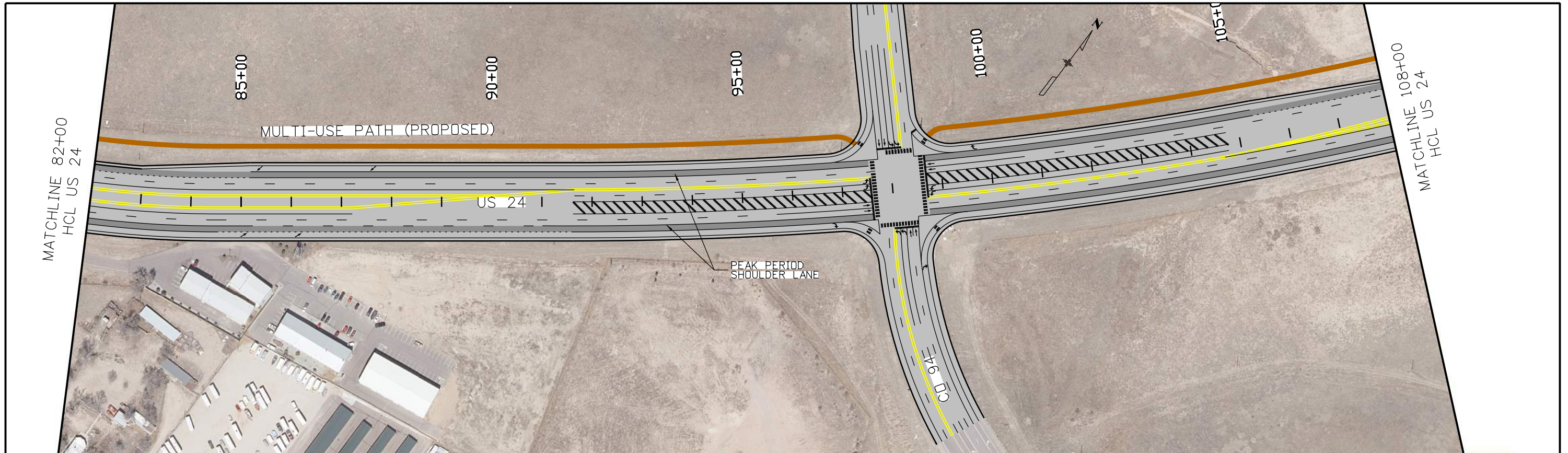
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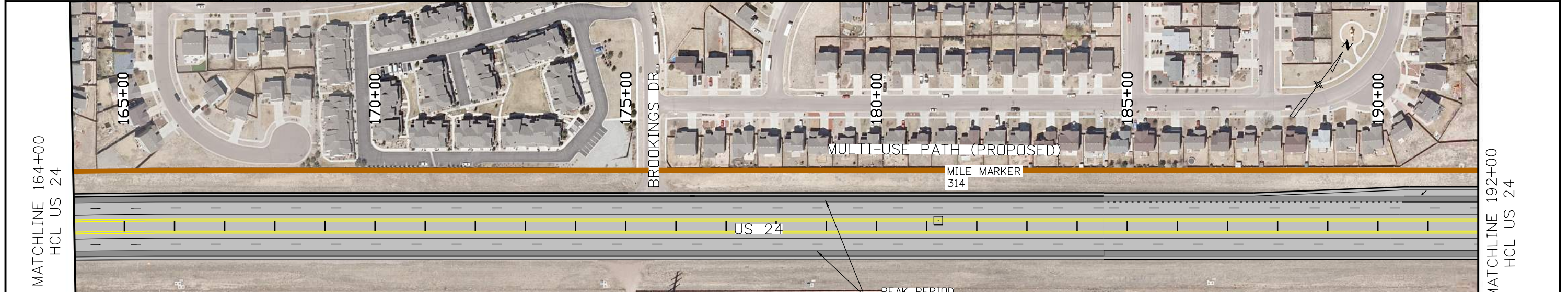
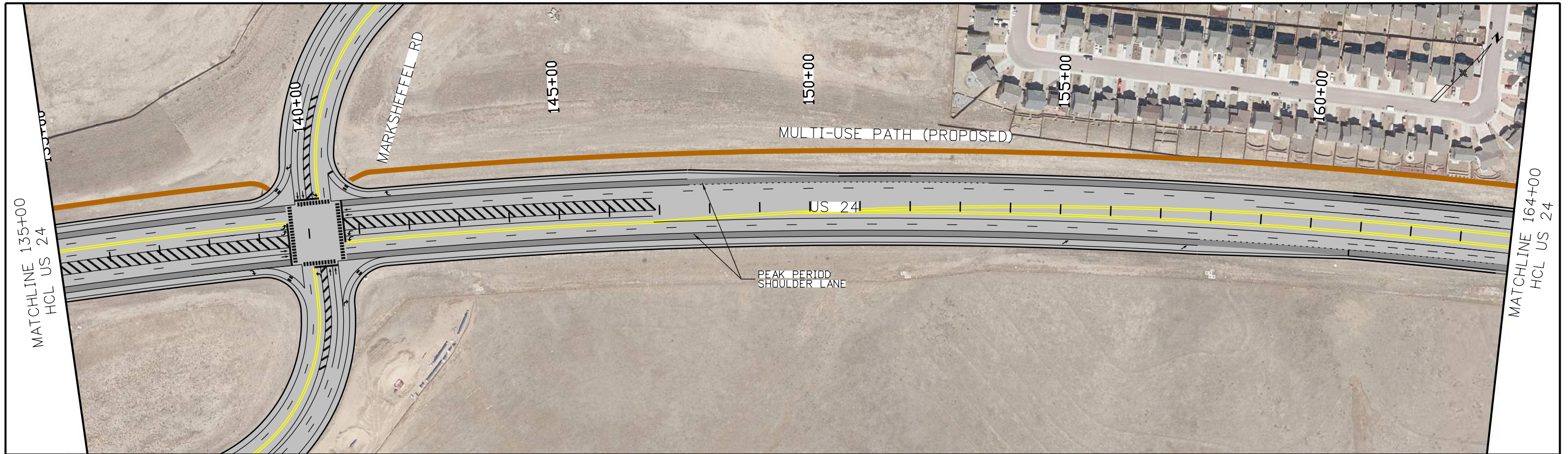


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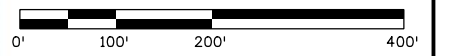


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Unit Information Unit Leader Initials	DAVID EVANS AND ASSOCIATES INC. 1600 Broadway Suite 800 Denver Colorado 80202 Phone: 720.948.0969			Void:	Detailer:	Sheet Subset: RDWY Subset Sheets: of -
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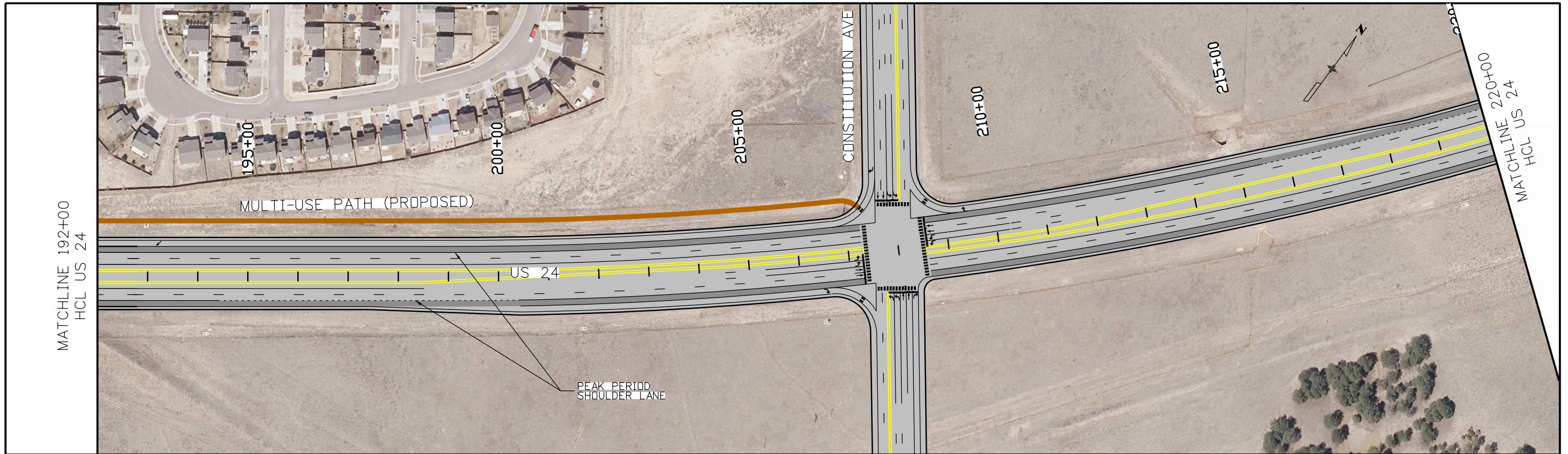
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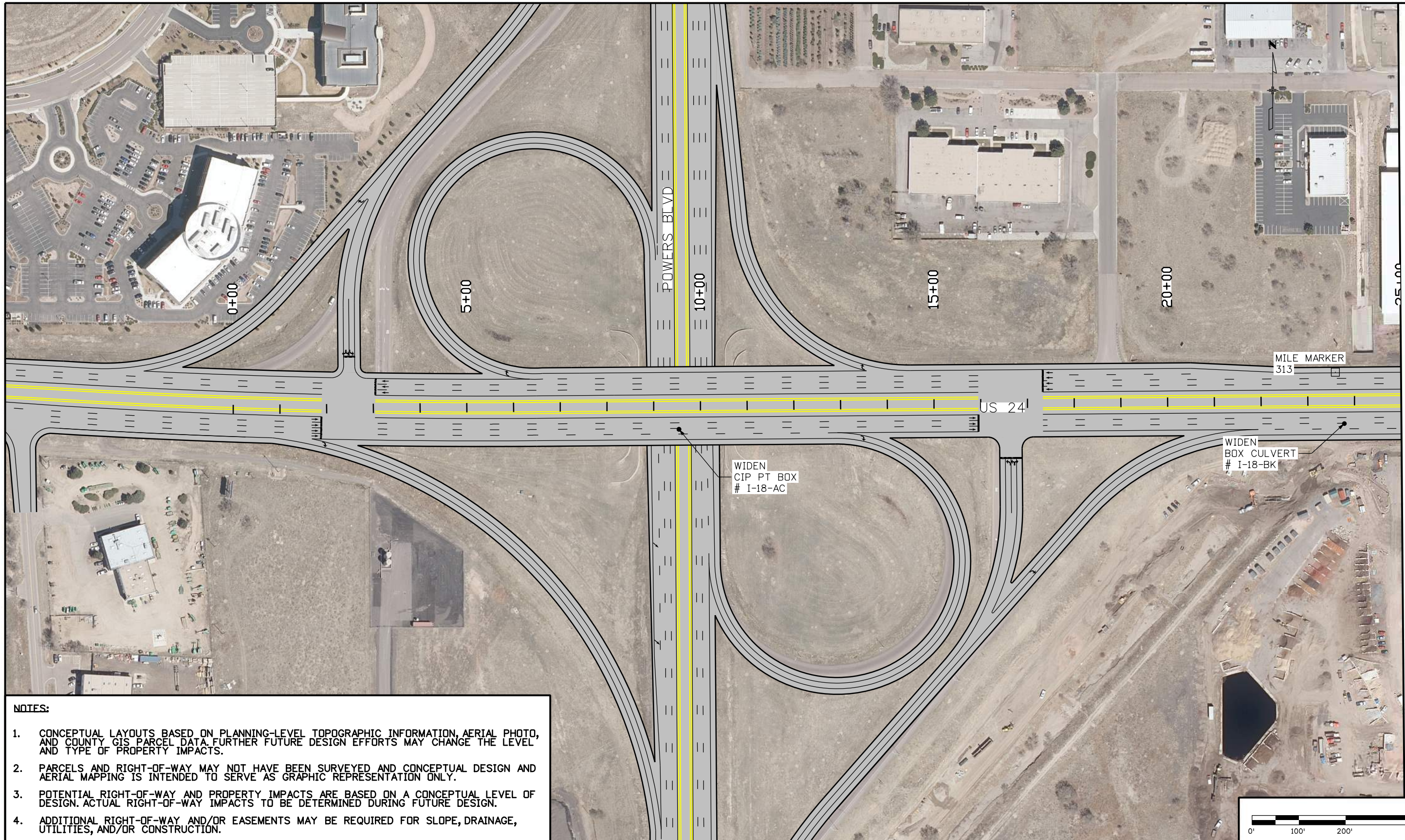
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MATCHLINE 25+00
HCL US 24

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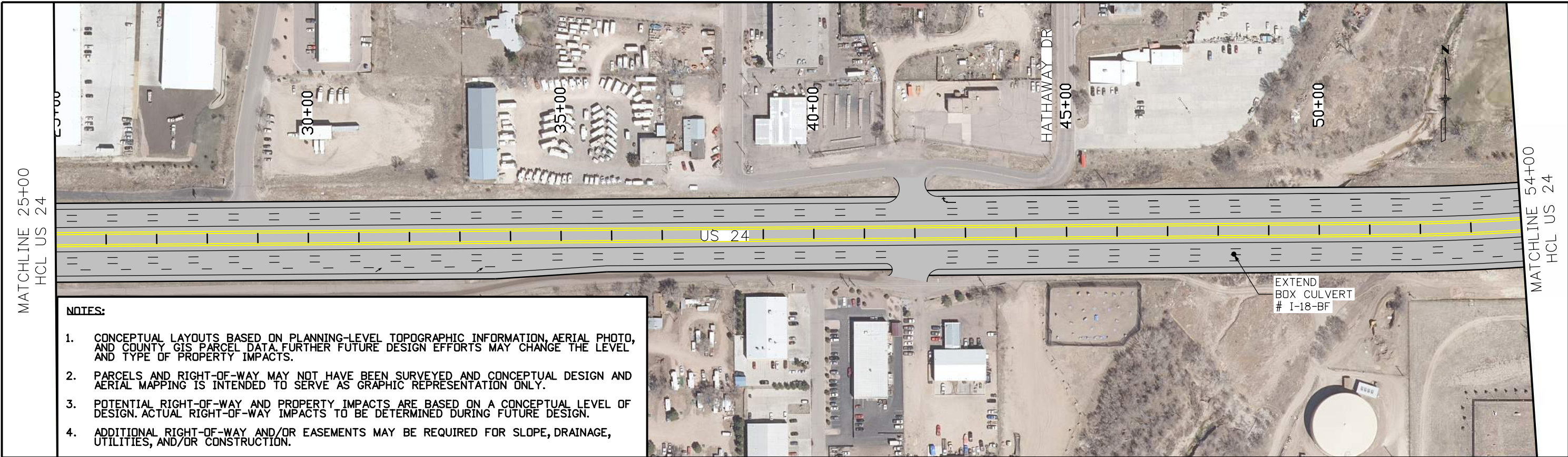
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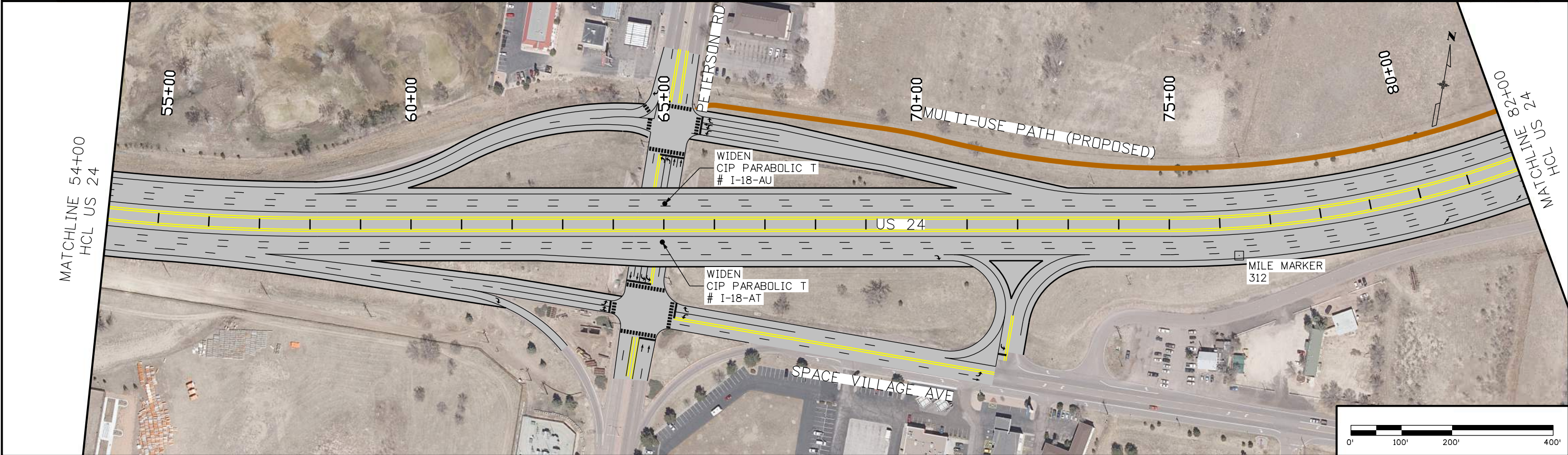
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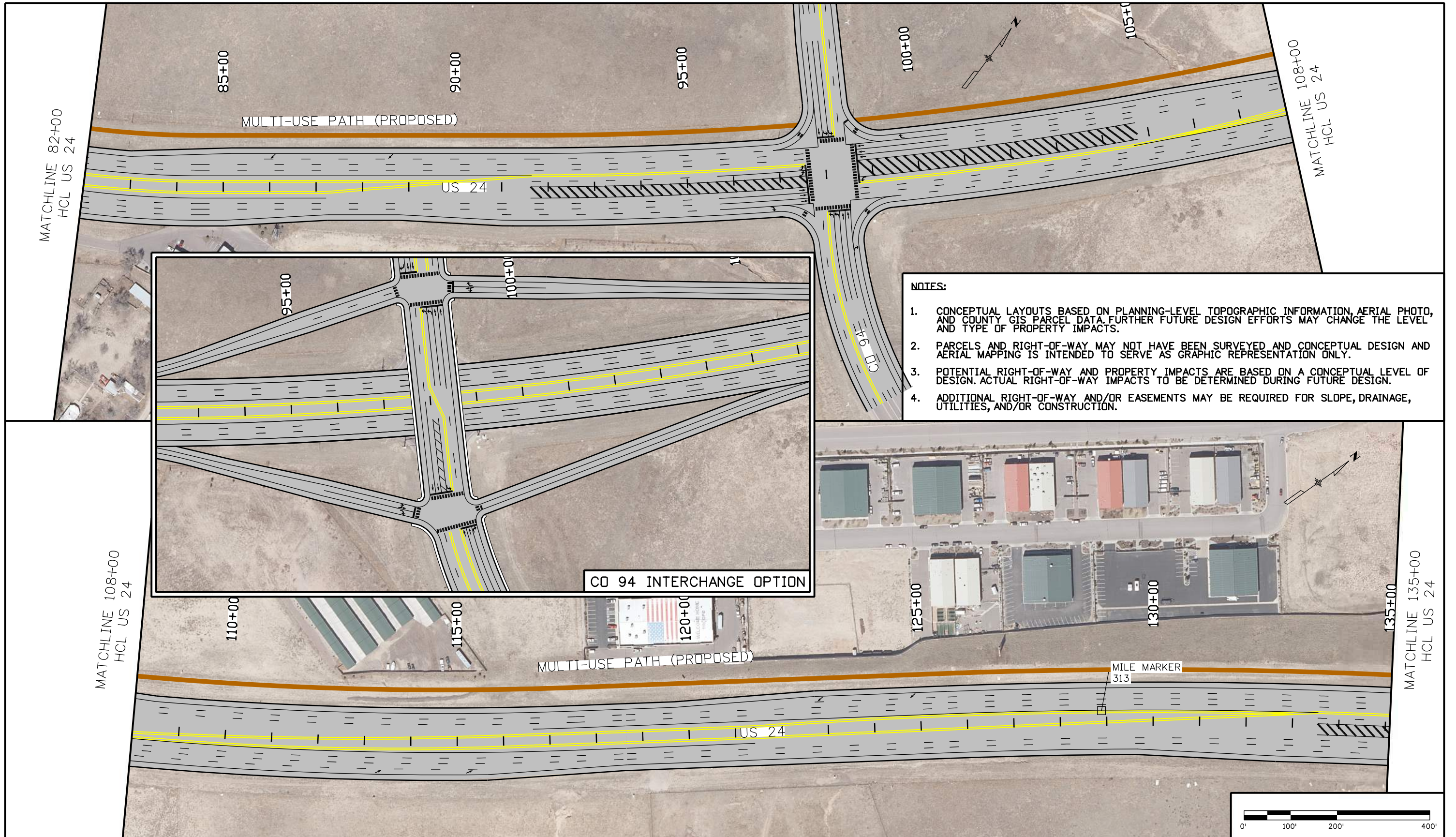
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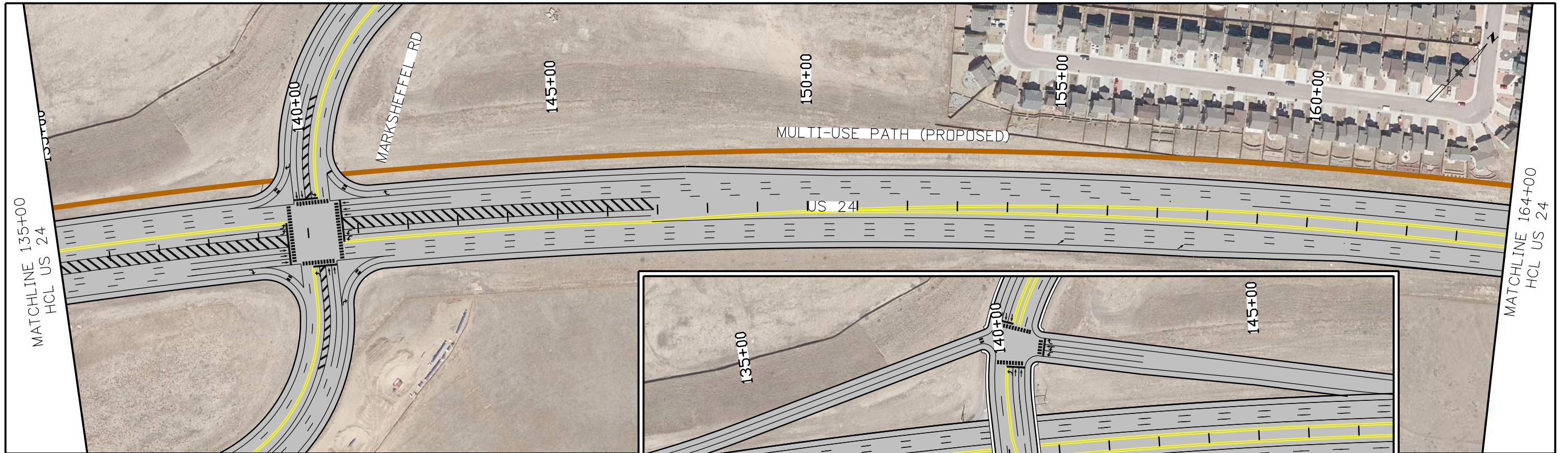
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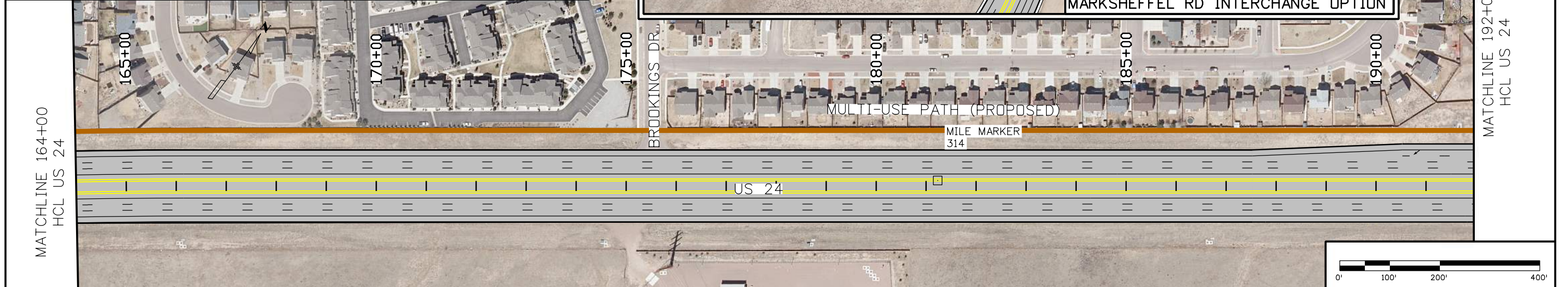
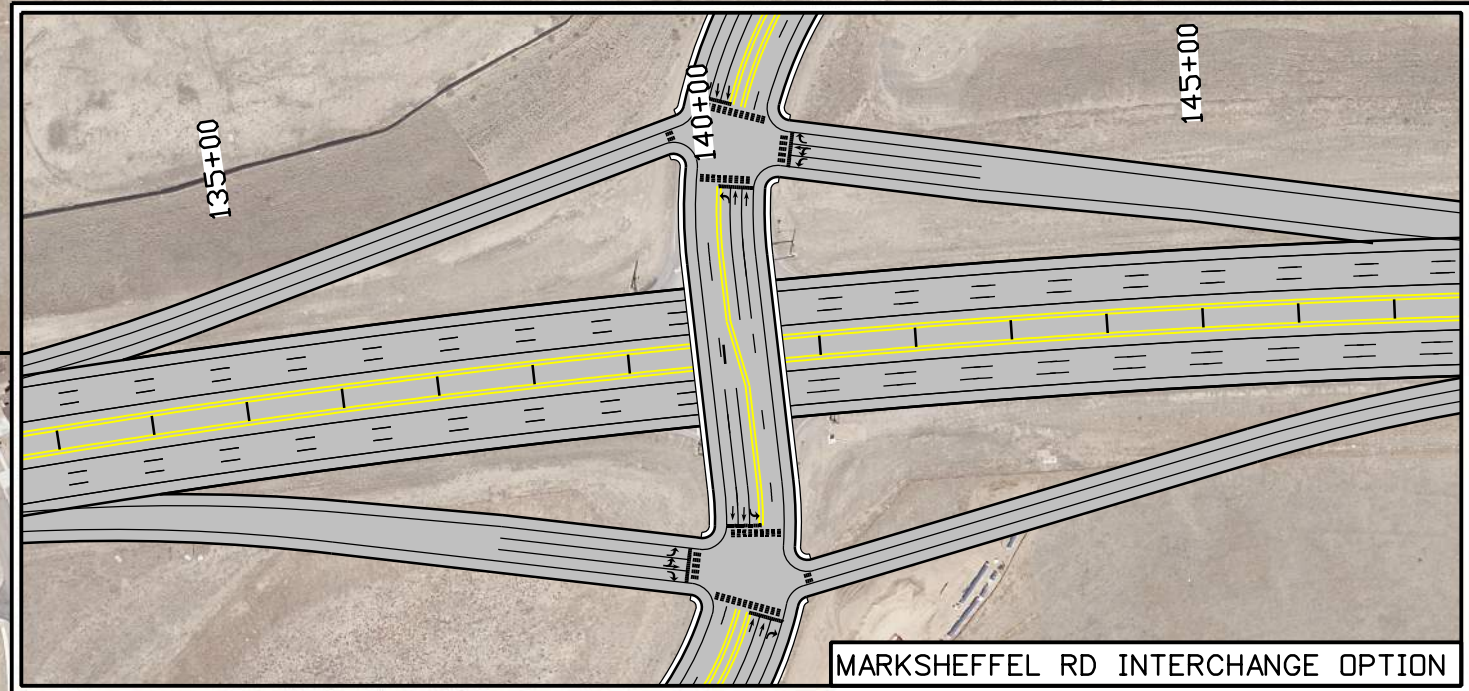
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Region 2

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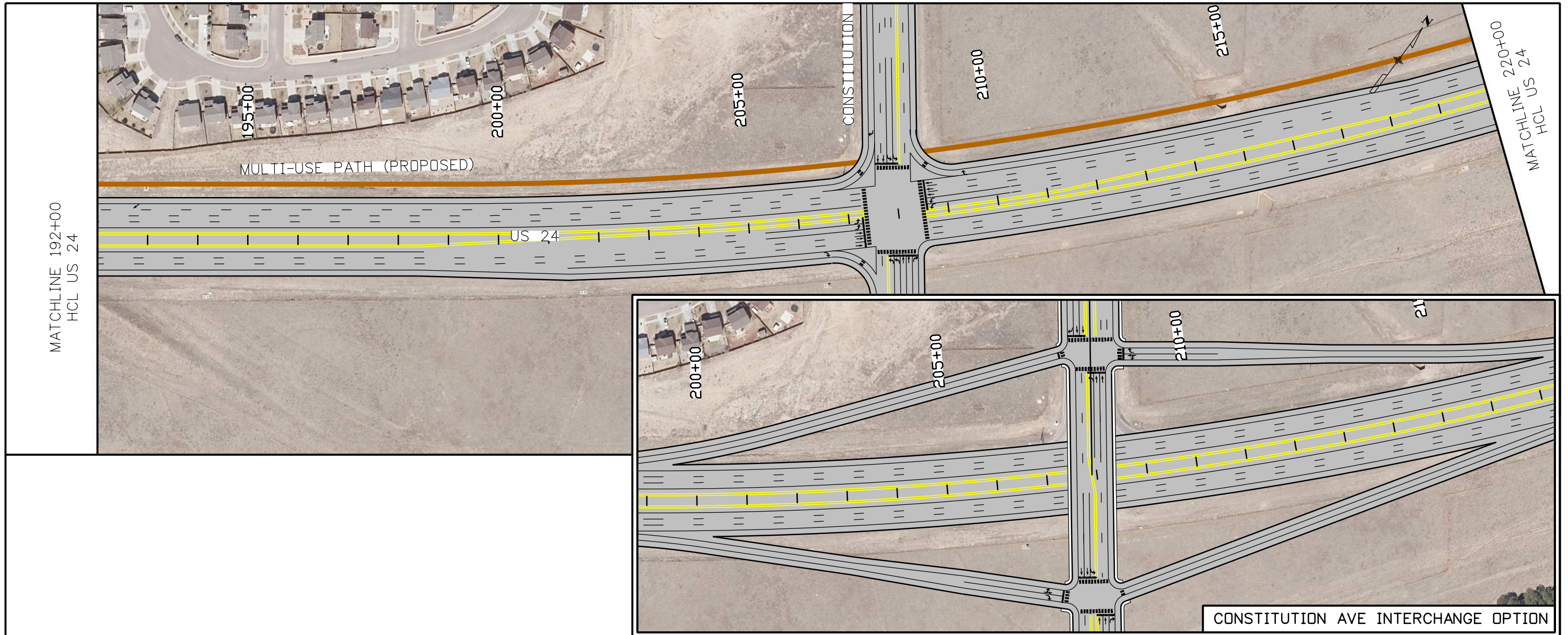
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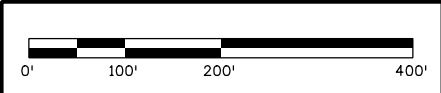
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Region 2

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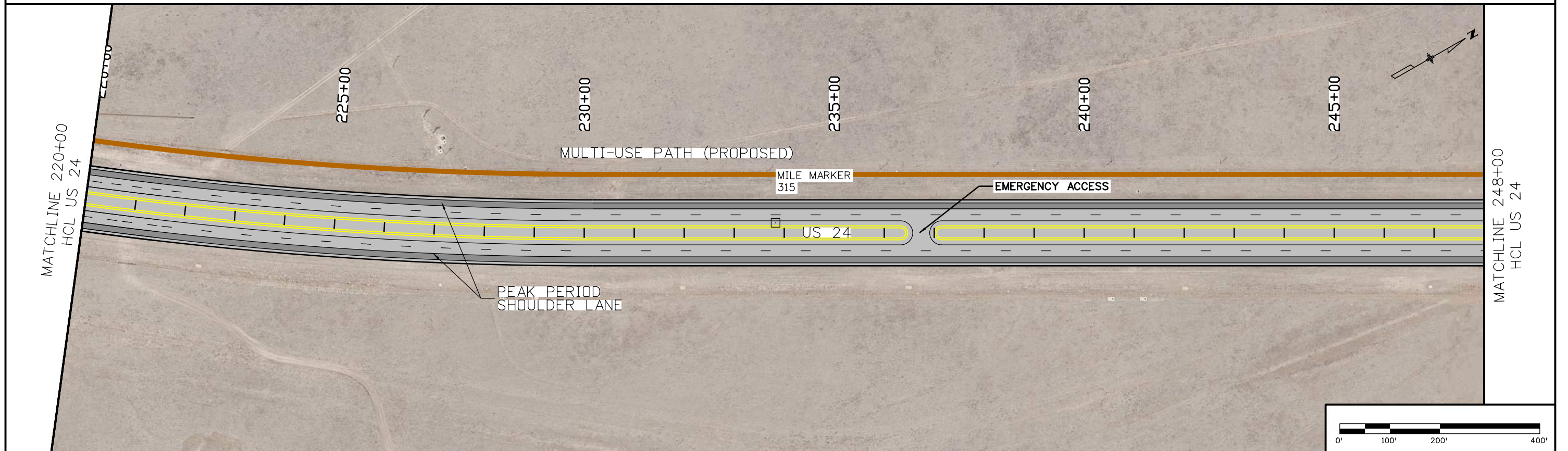
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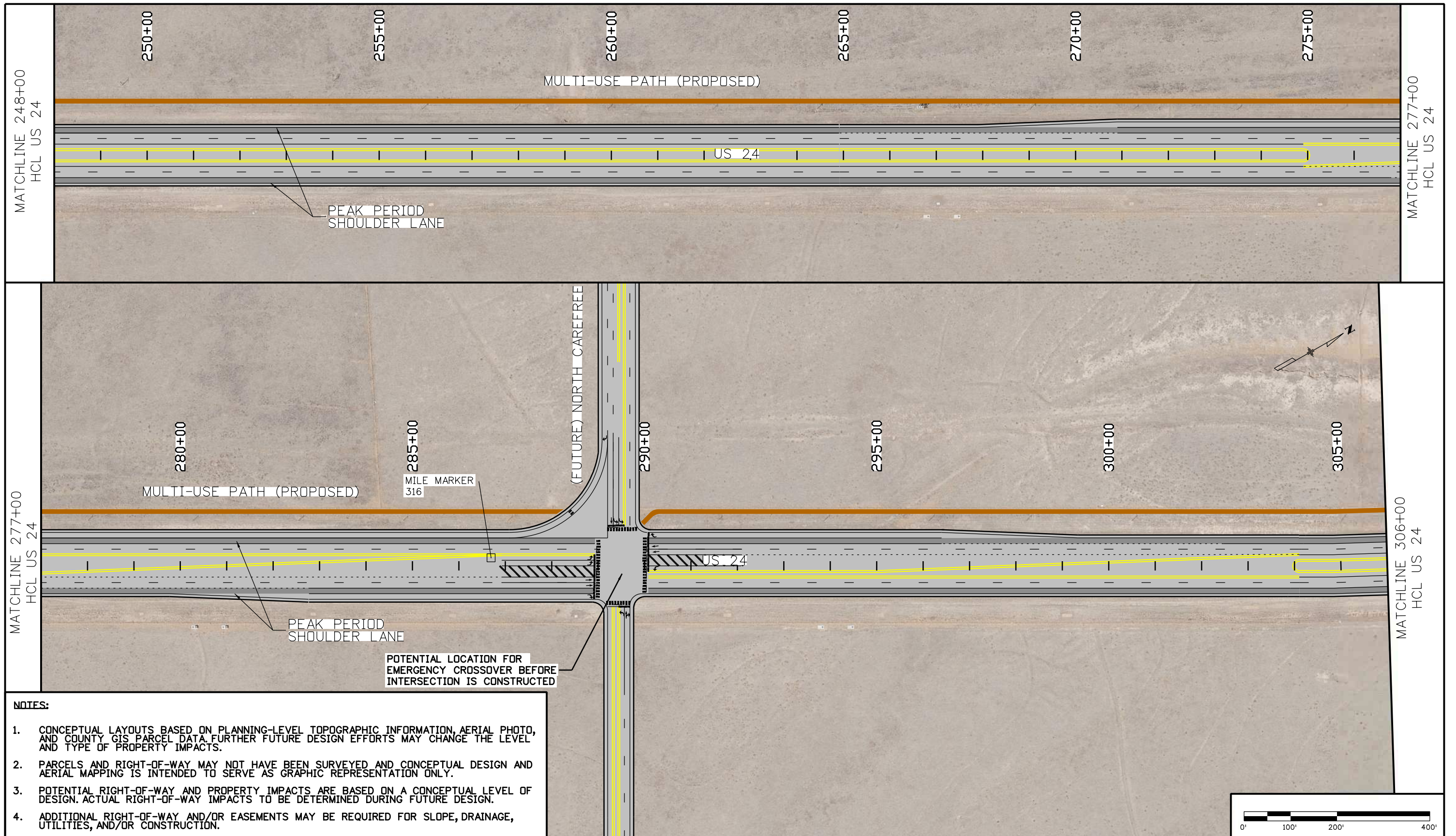
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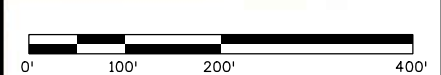
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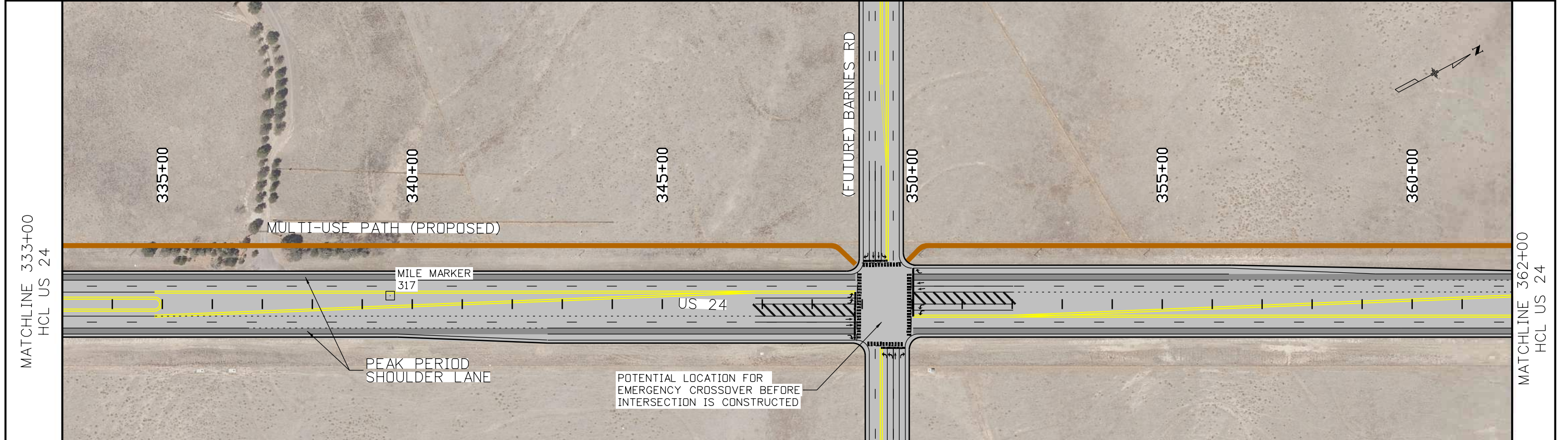
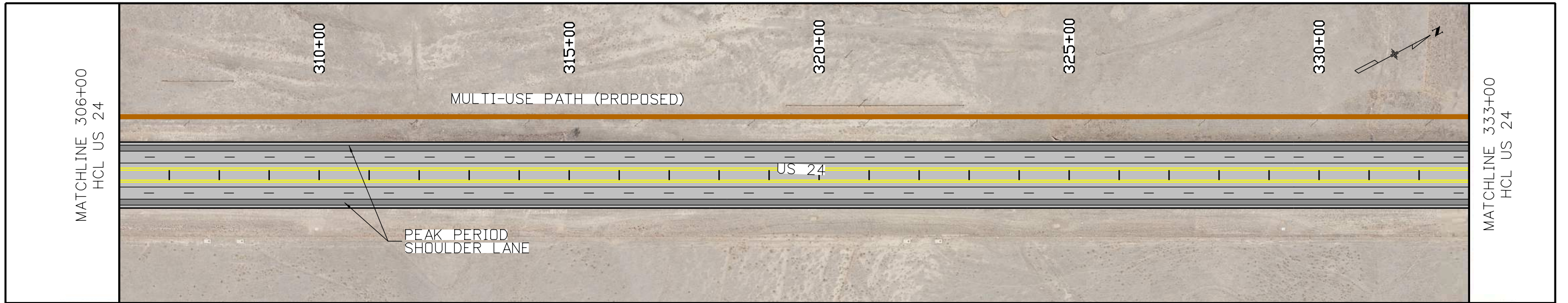


- NOTES:**
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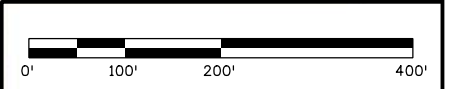



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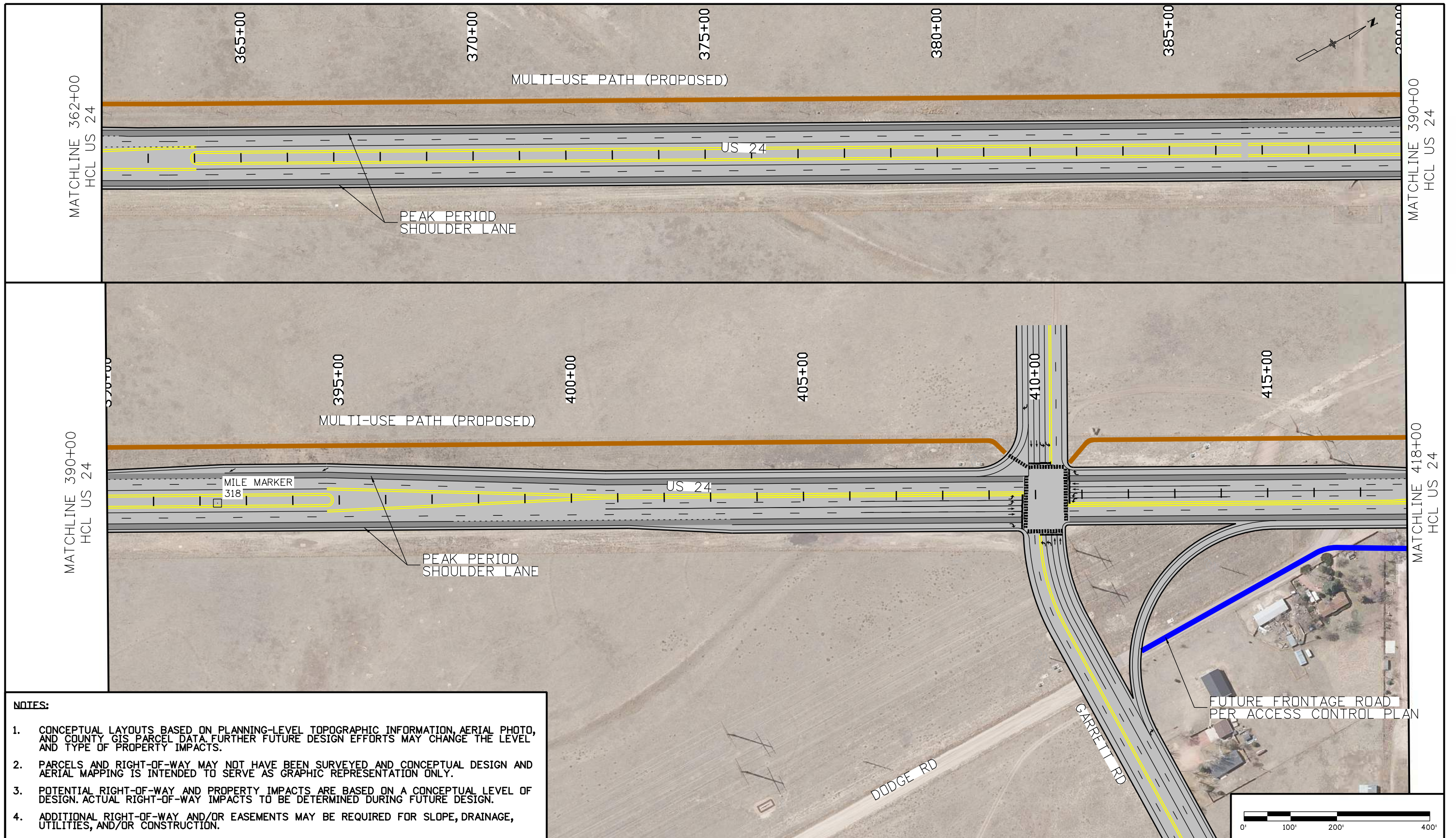


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 DAVID EVANS AND ASSOCIATES INC. 1600 Broadway Suite 800 Denver Colorado 80202 Phone: 720.948.0969		 Region 2		US 24 - CONSTITUTION TO FALCON PEAK PERIOD SHOULDER LANES STA 308+00 TO STA 362+00										

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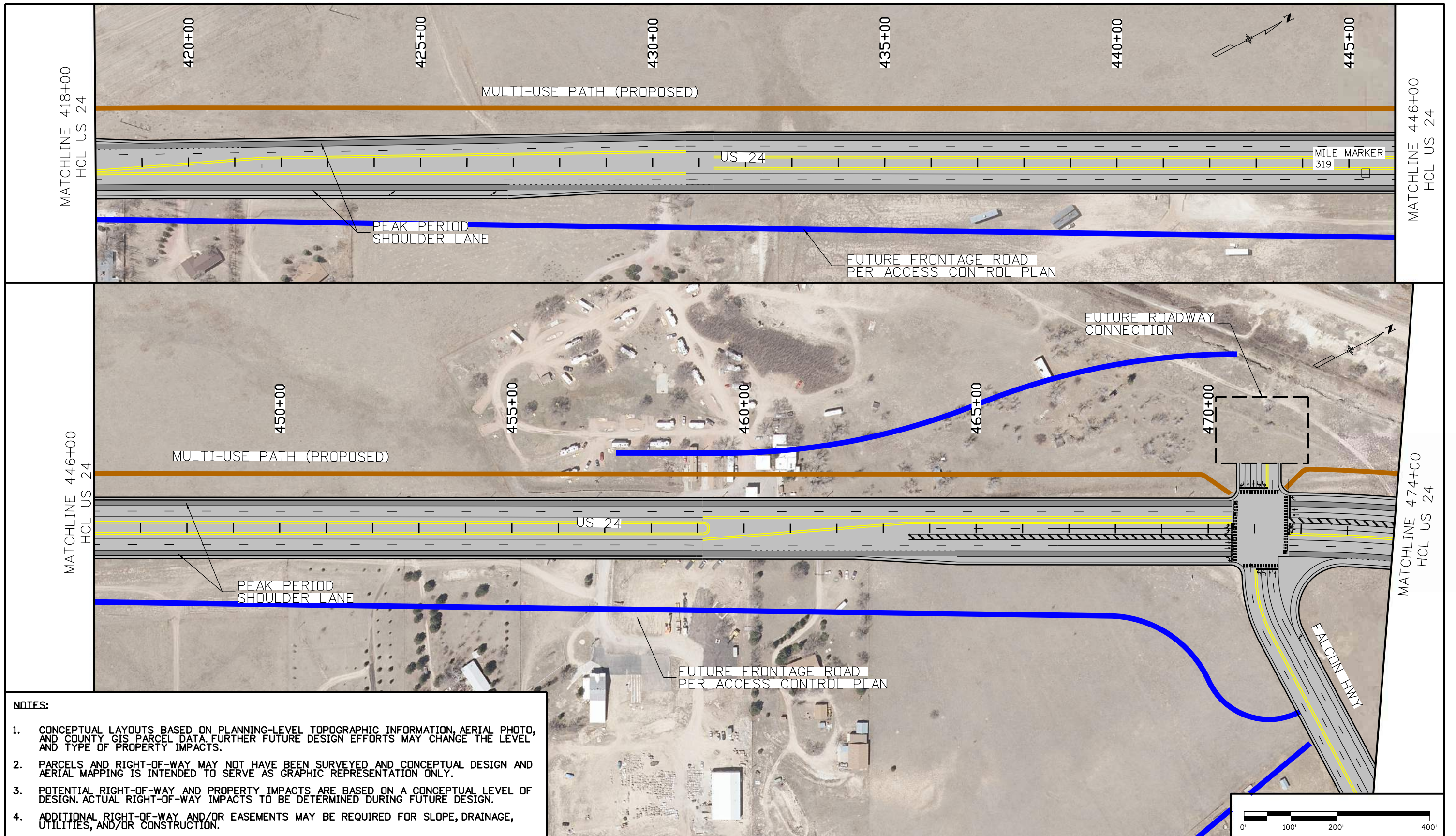
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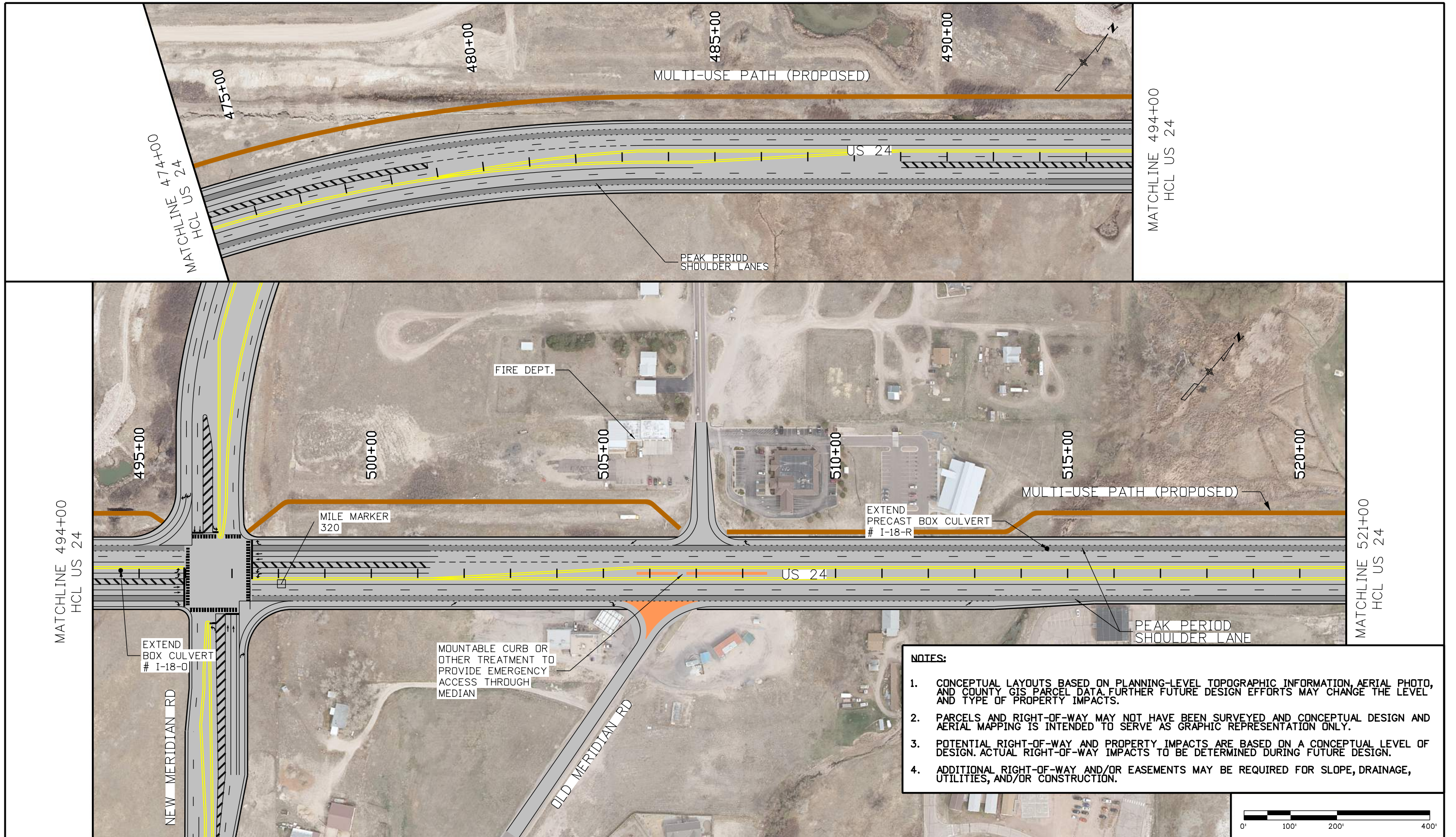
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Region 2

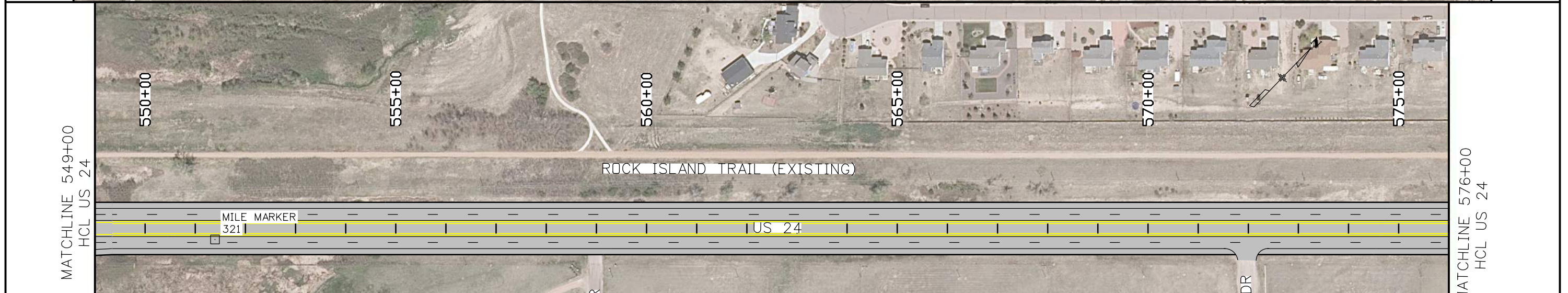
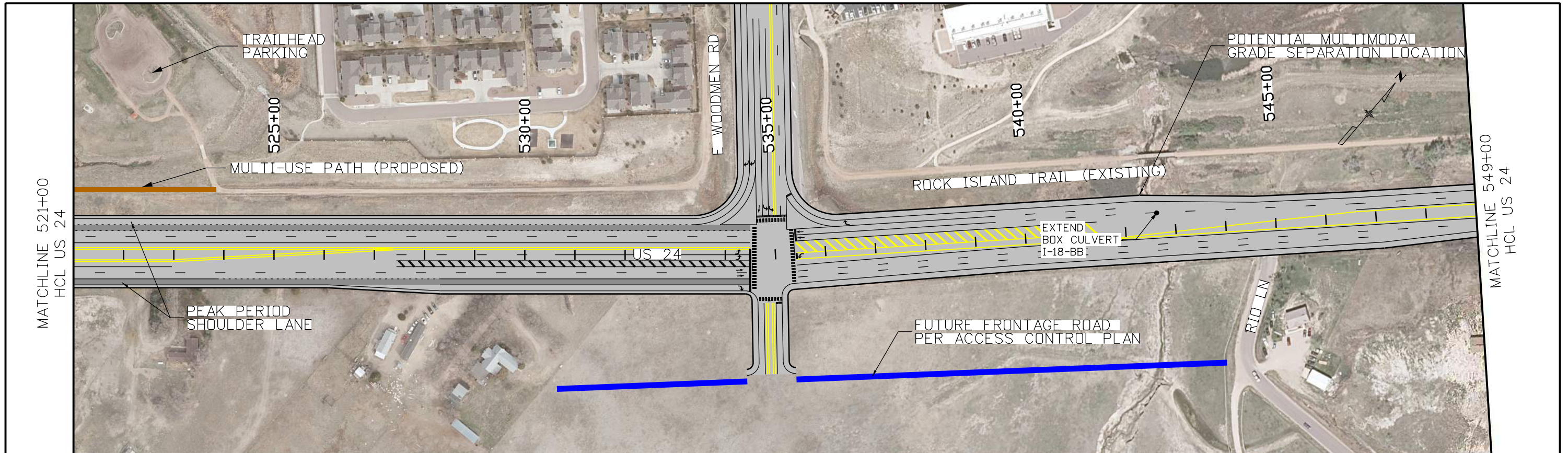
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US 24 - CONSTITUTION TO FALCON
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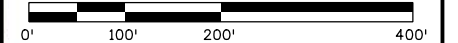
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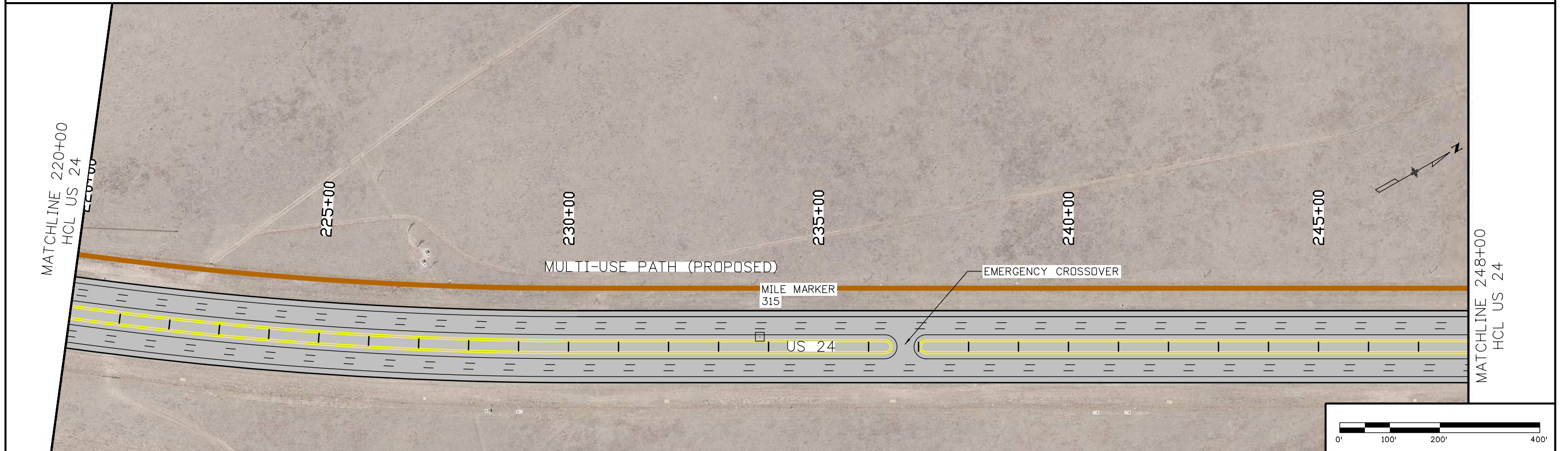
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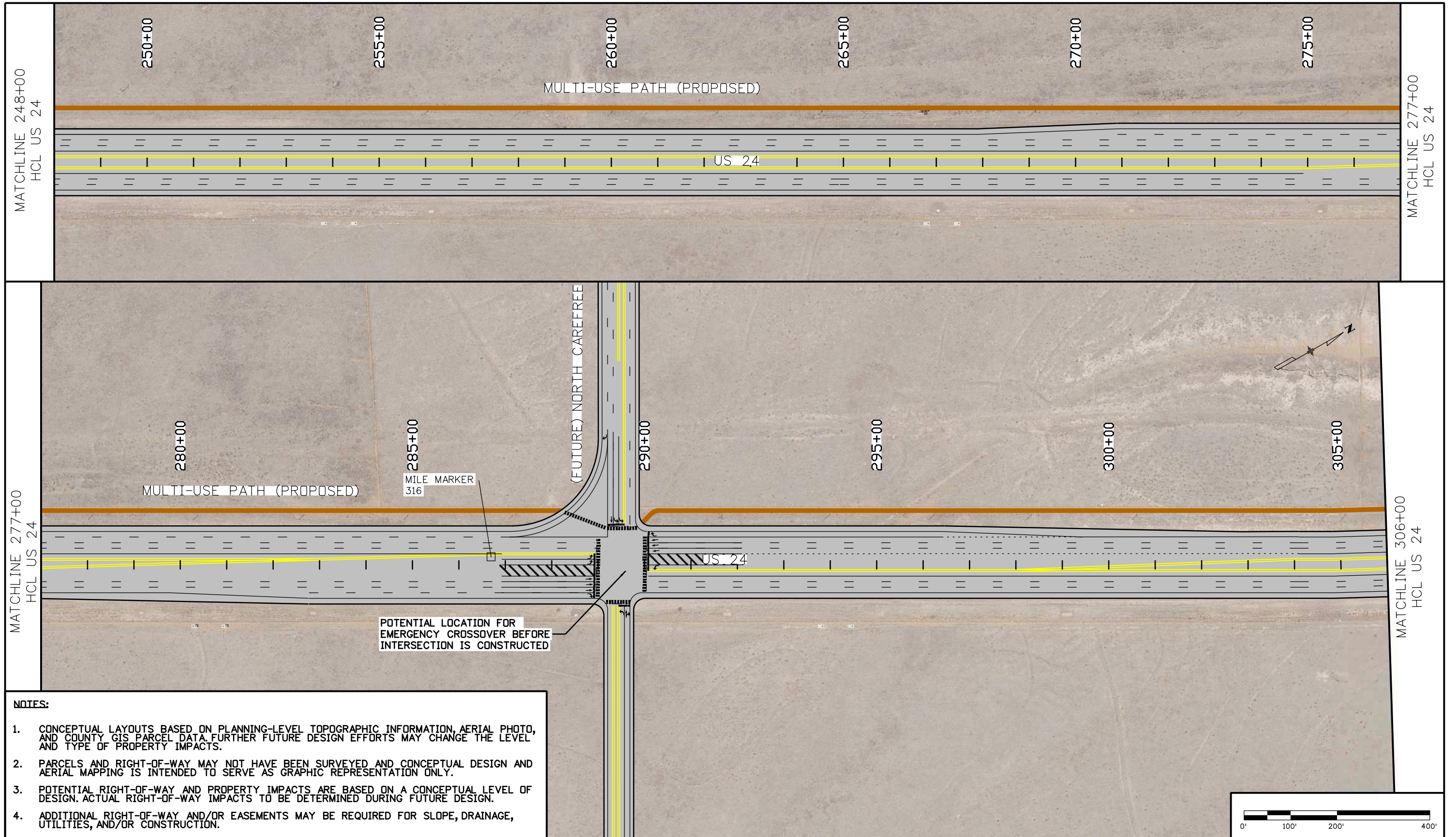
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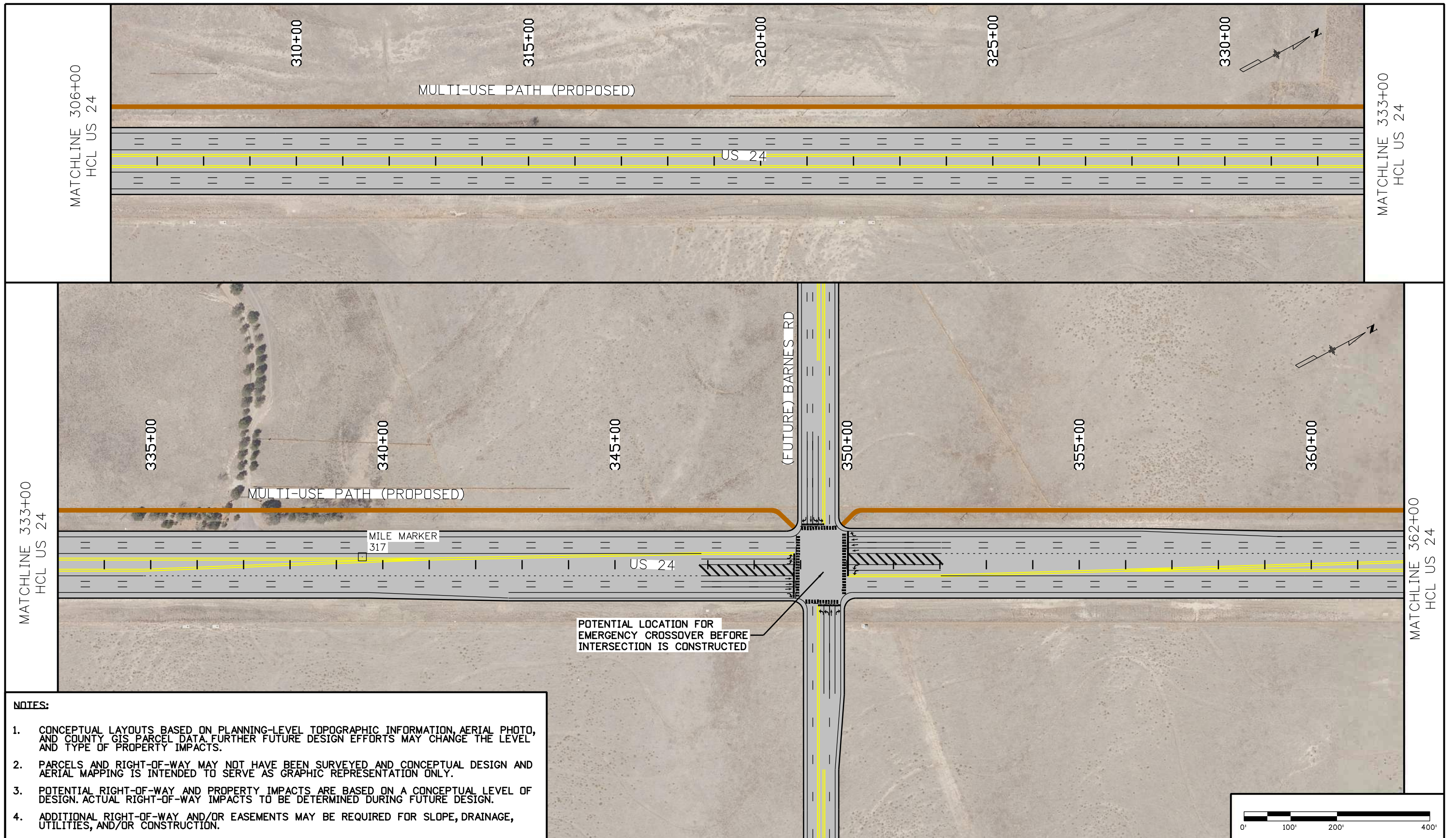
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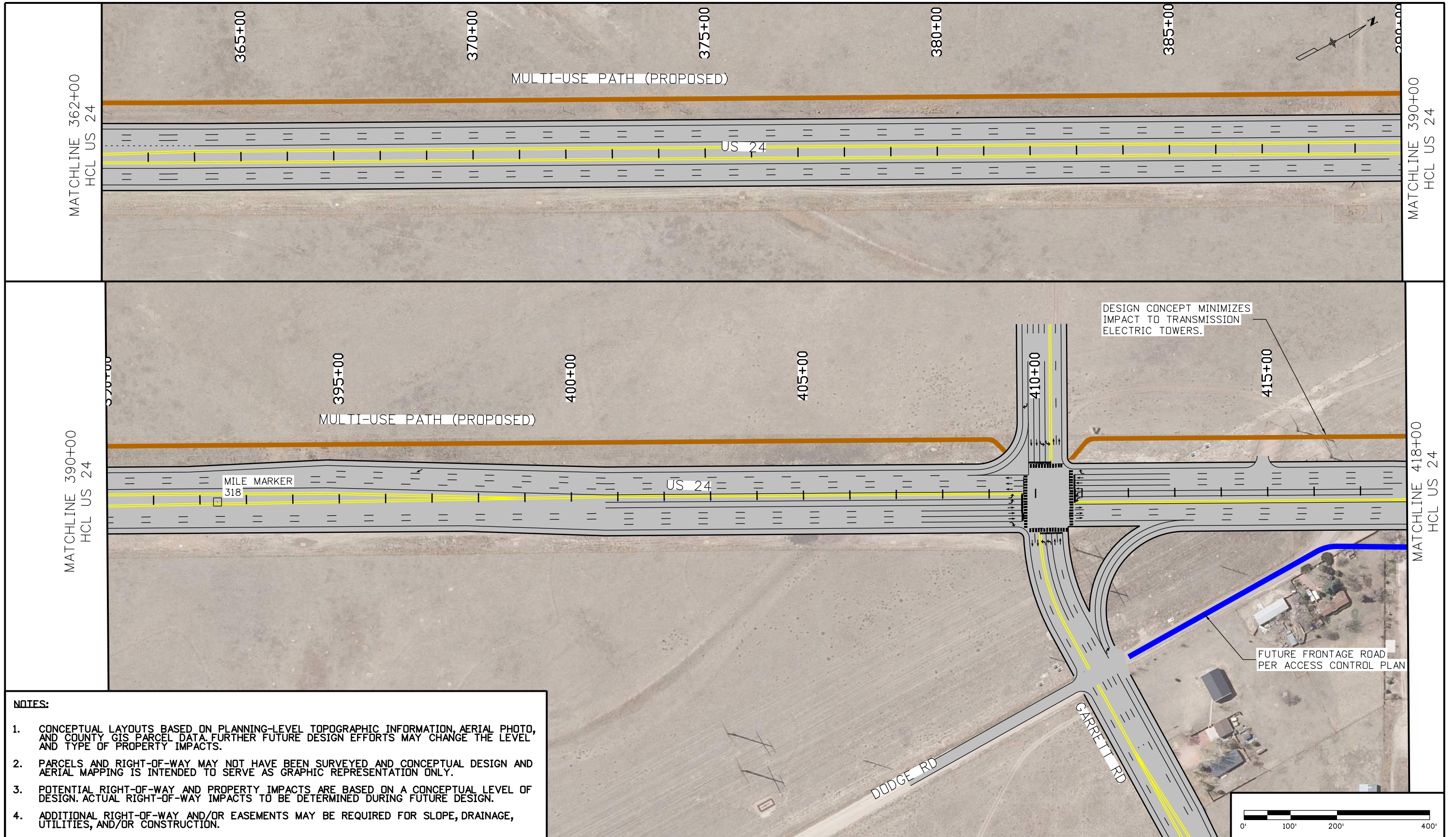
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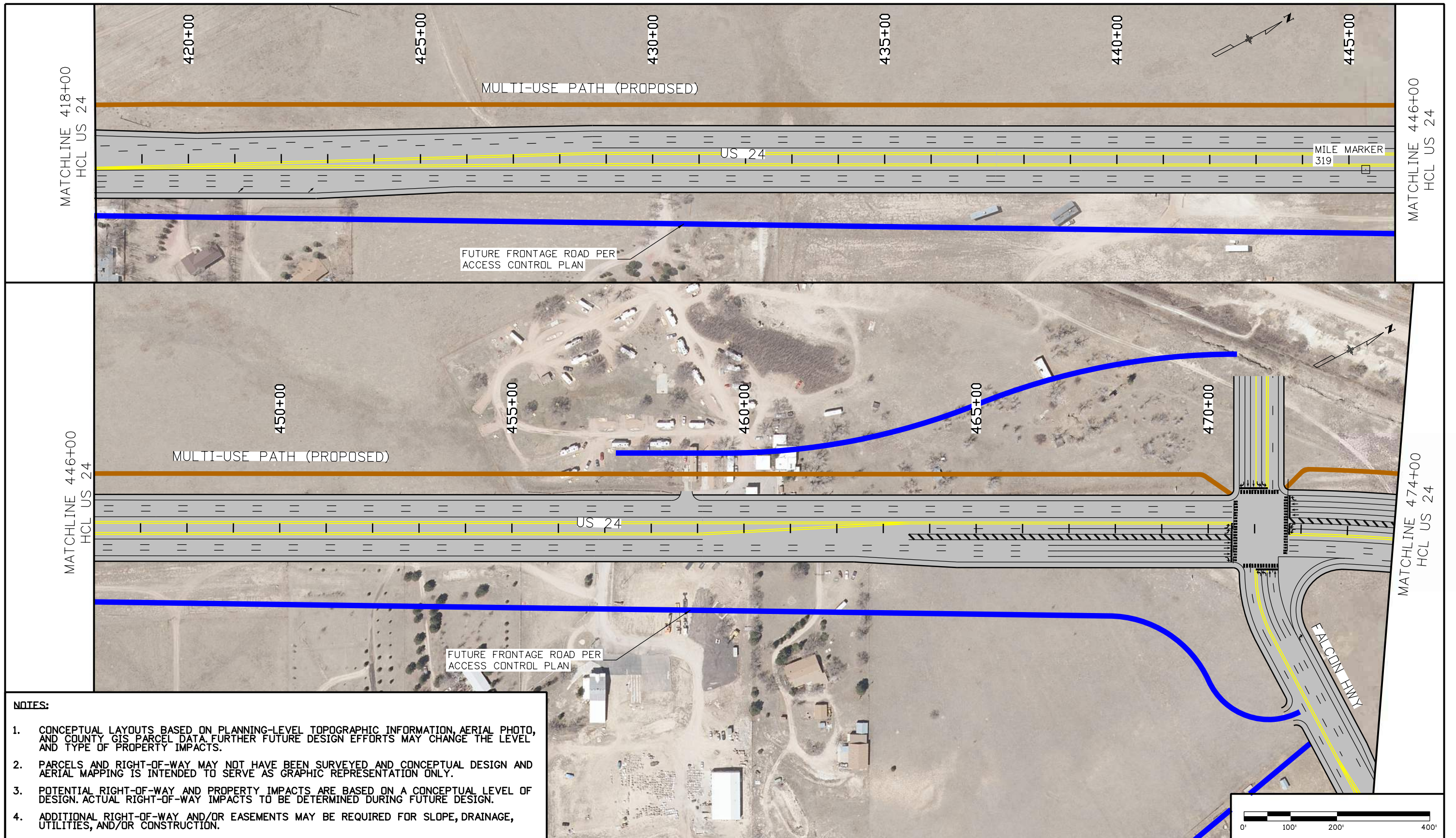
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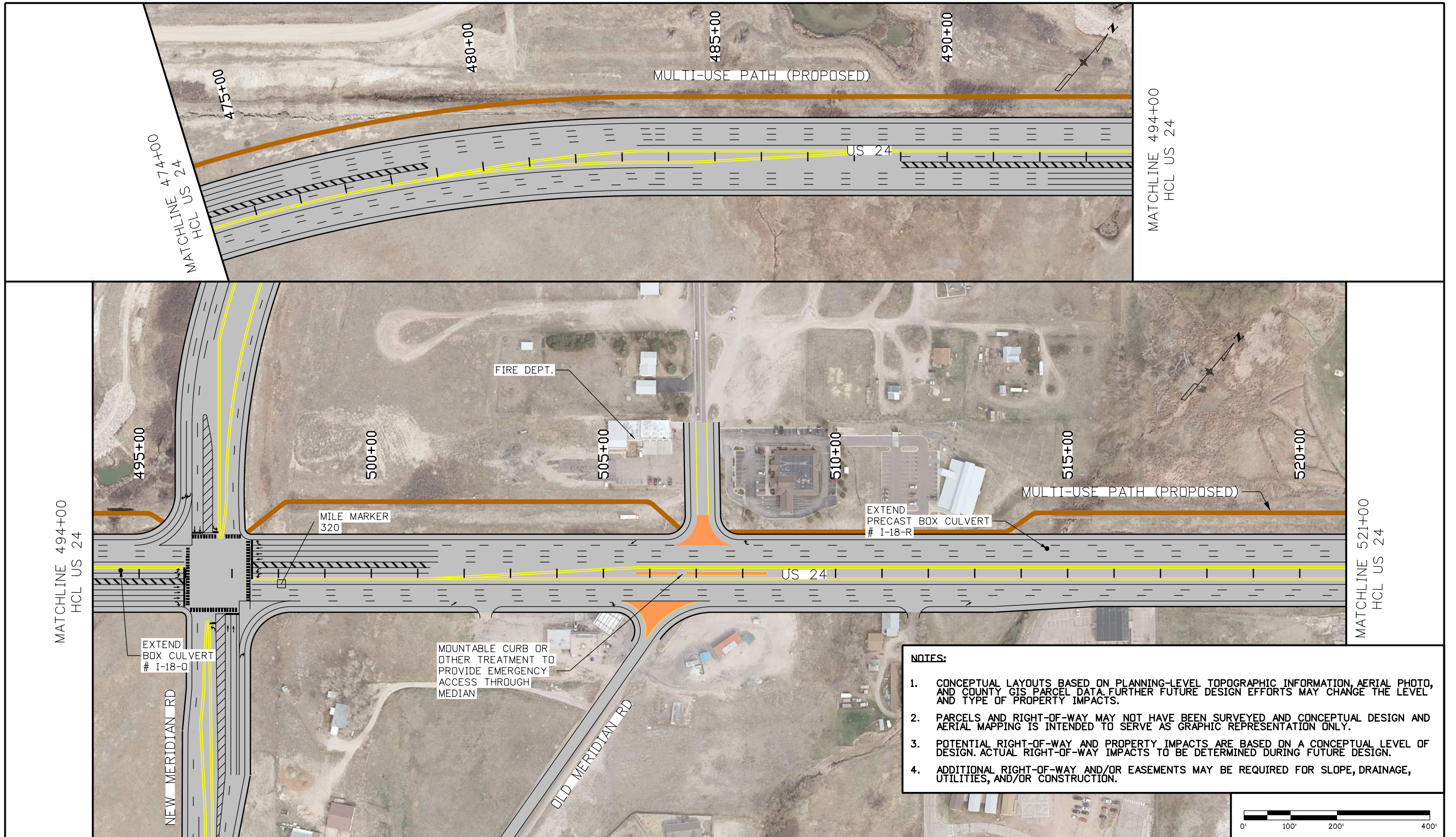
905 Erie Avenue
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 Region 2

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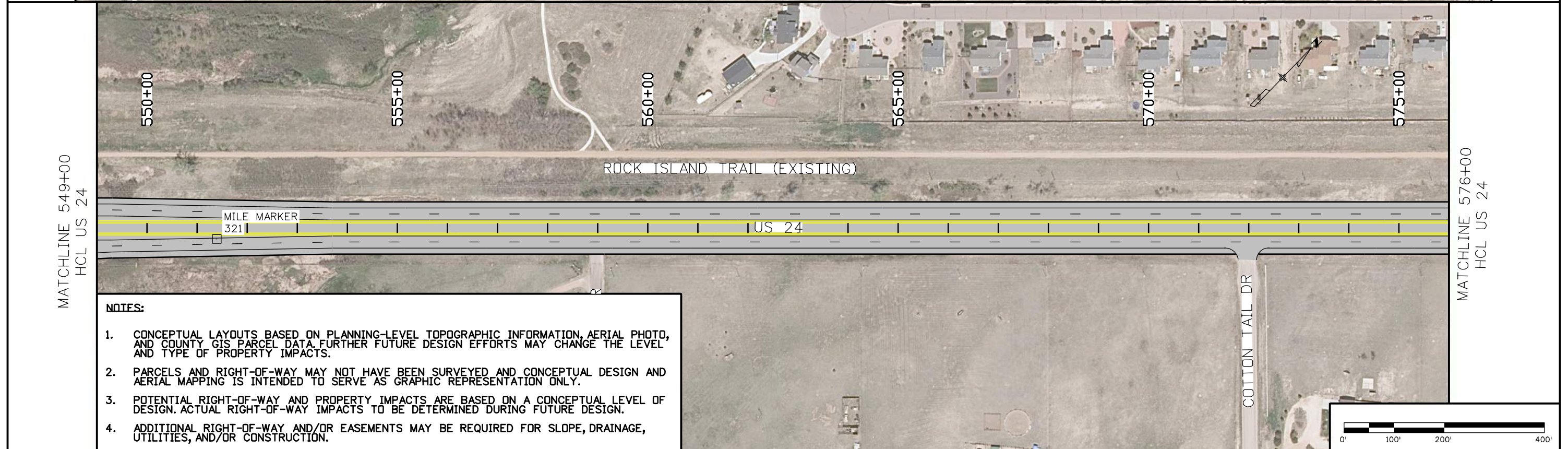
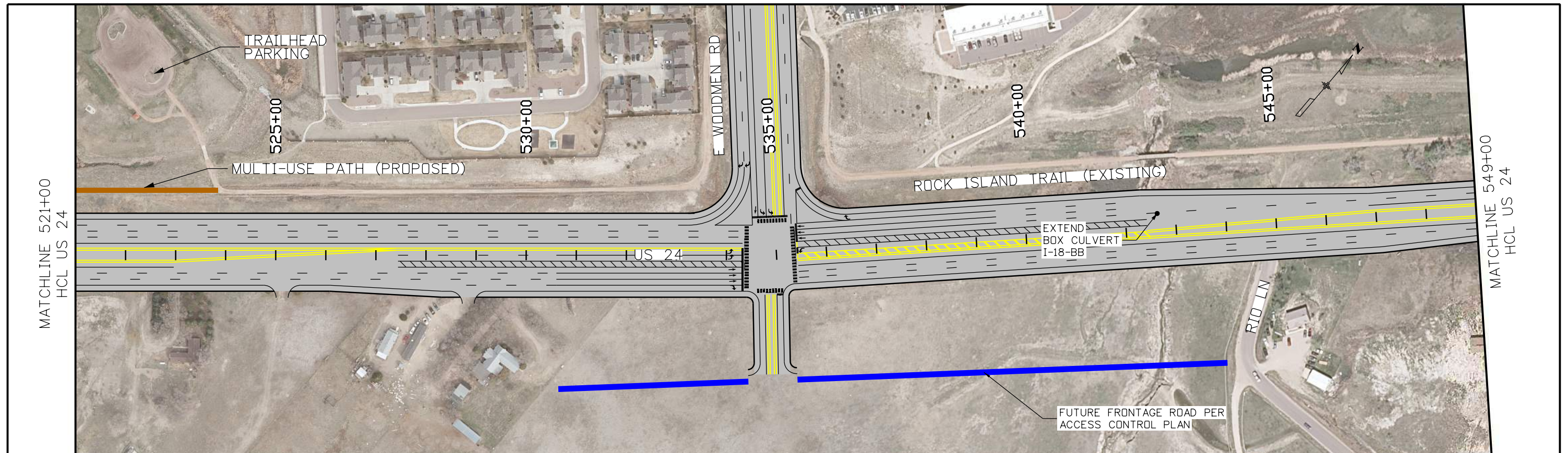
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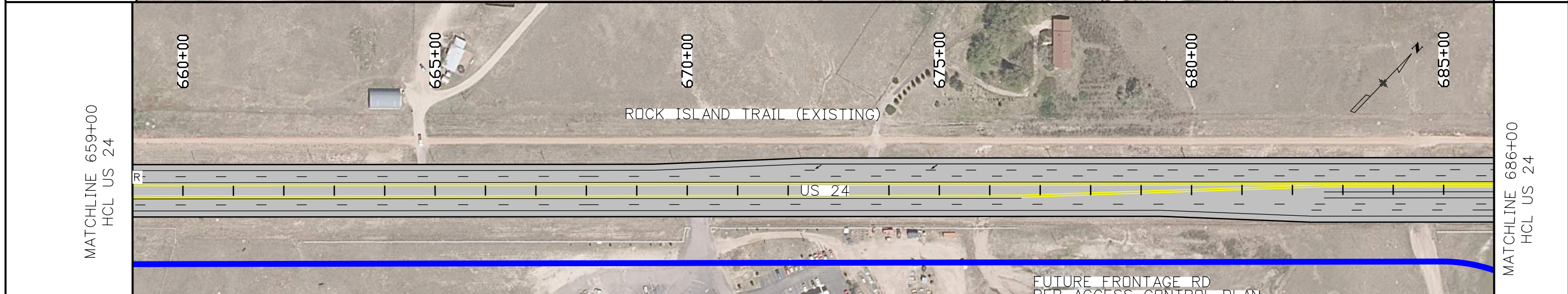
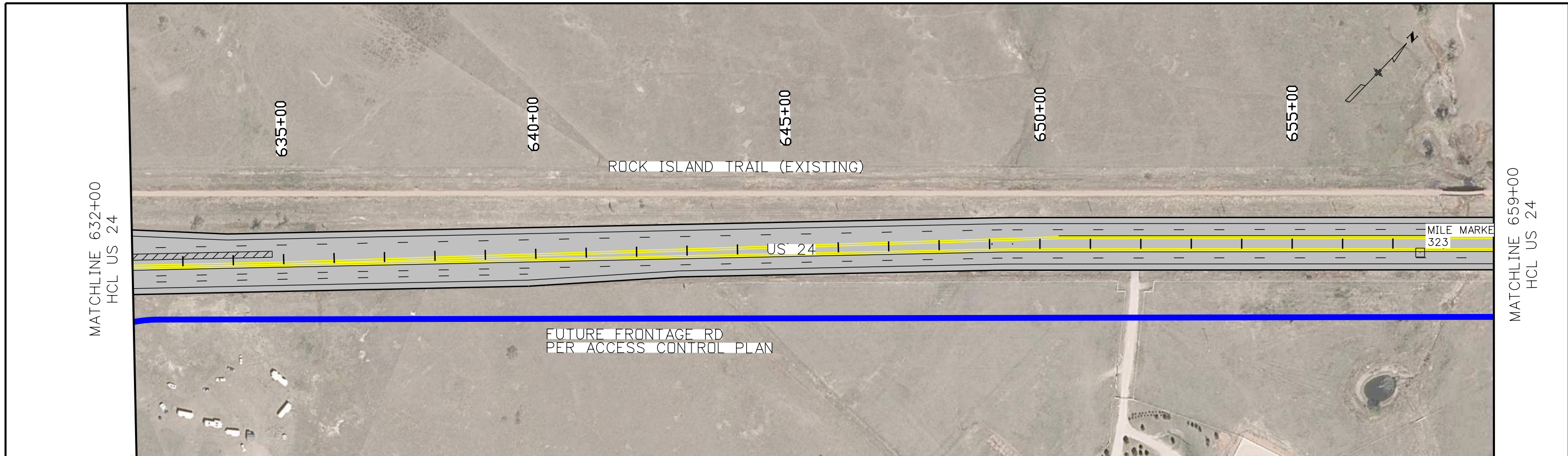


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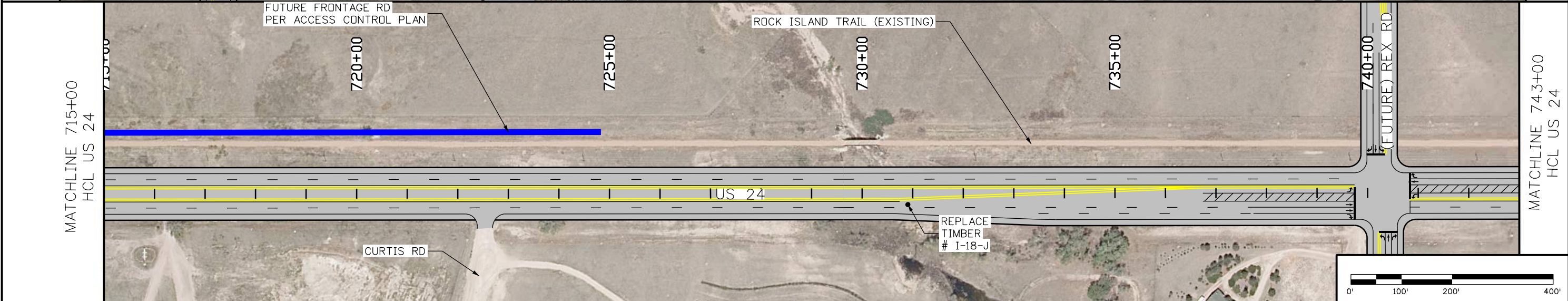
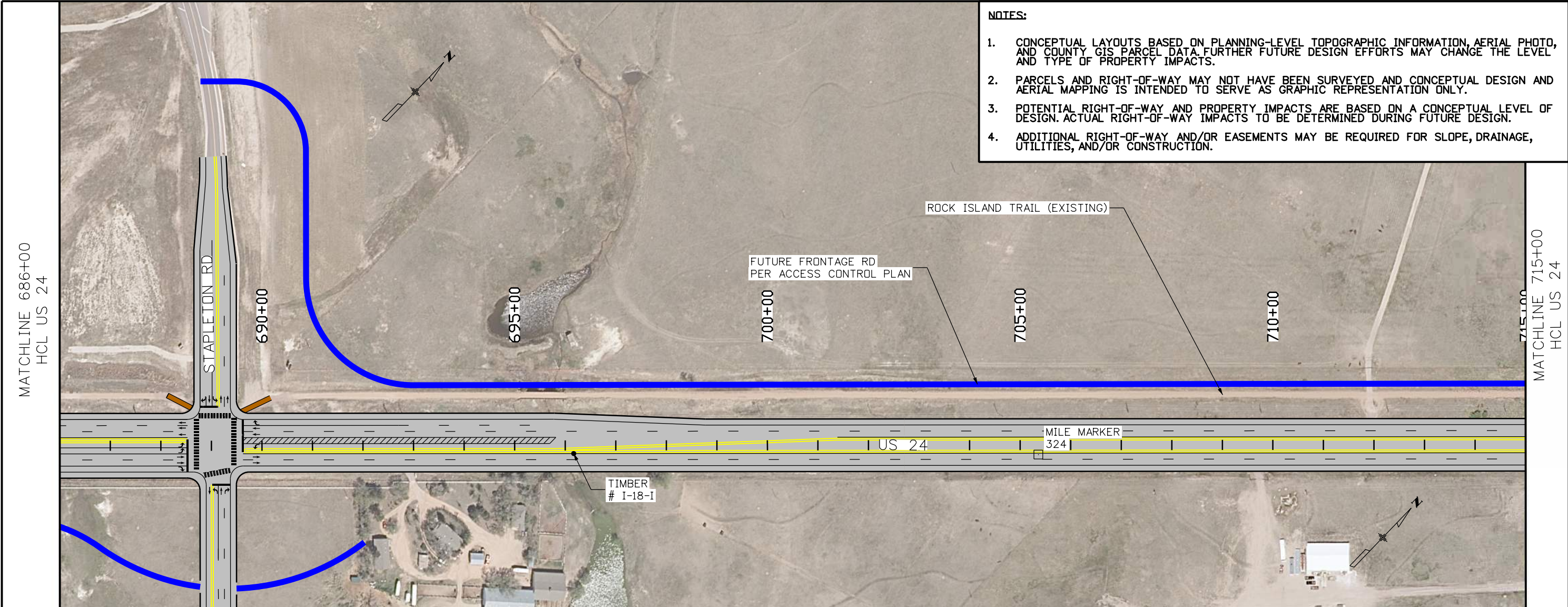
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Unit Information Unit Leader Initials												
 DAVID EVANS AND ASSOCIATES INC. 1600 Broadway Suite 800 Denver Colorado 80202 Phone: 720.946.0969				 Region 2		No Revisions: Revised: Void:		Sheet Number				

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- NOTES:**
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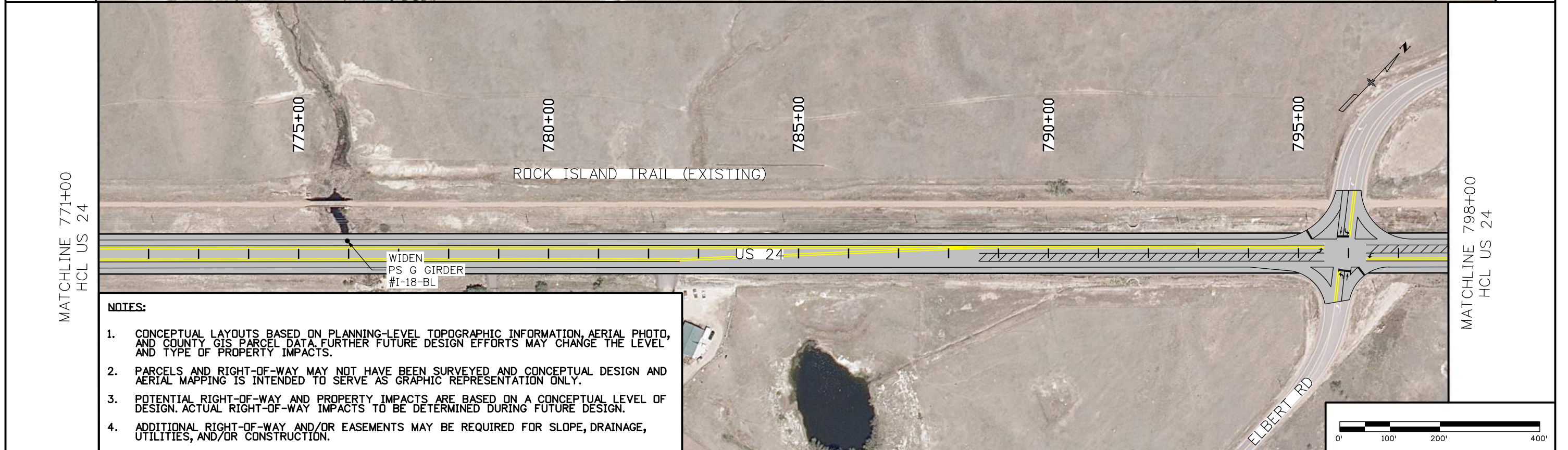
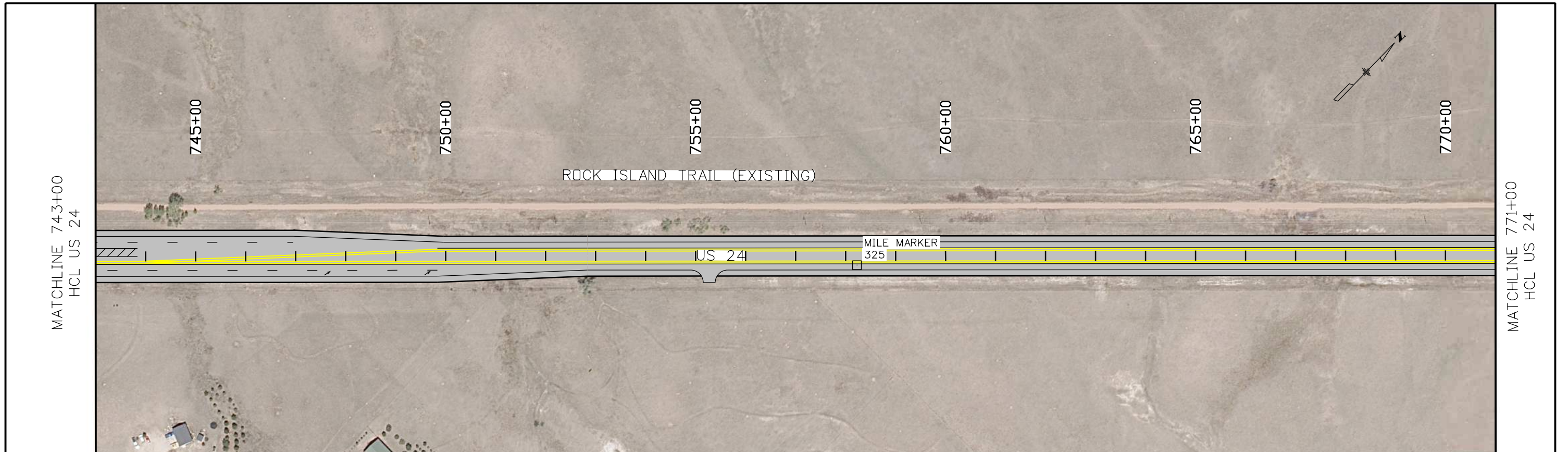
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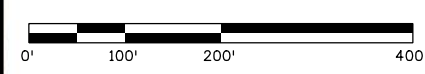
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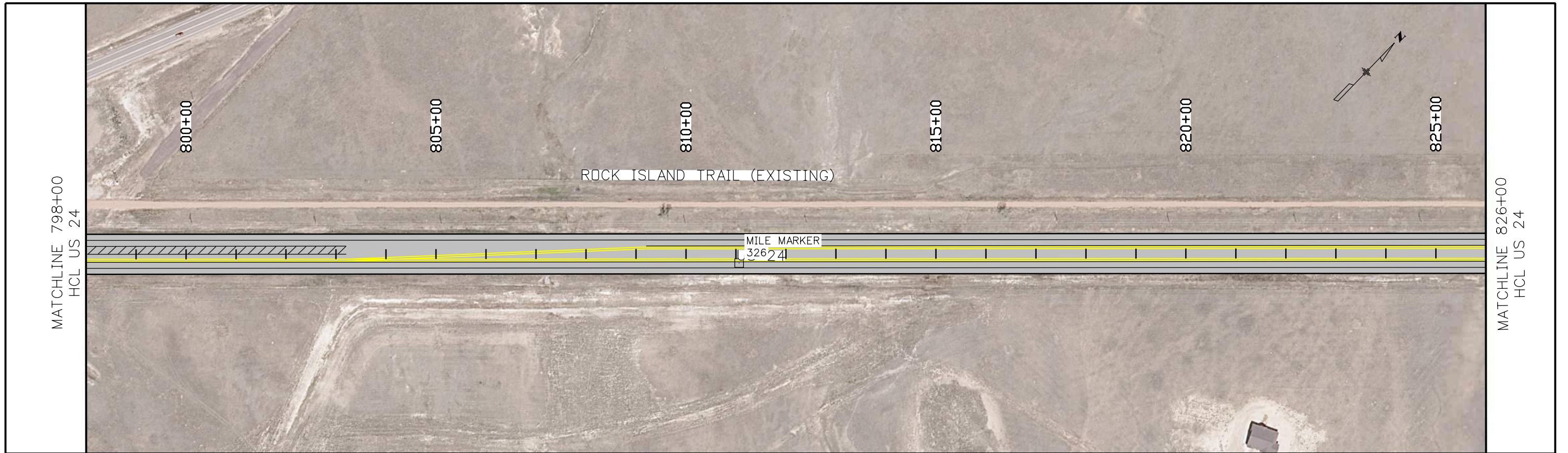


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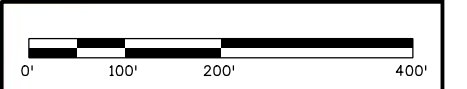




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 <small>DAVID EVANS AND ASSOCIATES INC. 1600 Broadway Suite 800 Denver Colorado 80202 Phone: 720.948.0969</small>		 <small>CDOT 905 Erie Avenue Pueblo, CO 81002 Phone: 719-546-5408</small>		 <small>Region 2</small>							

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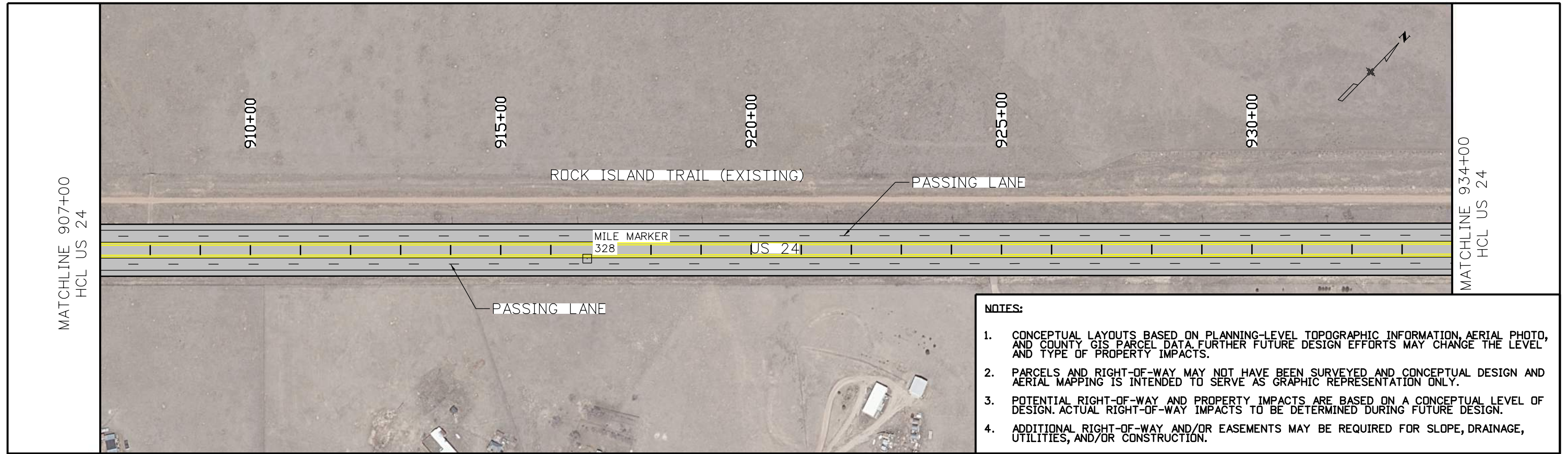


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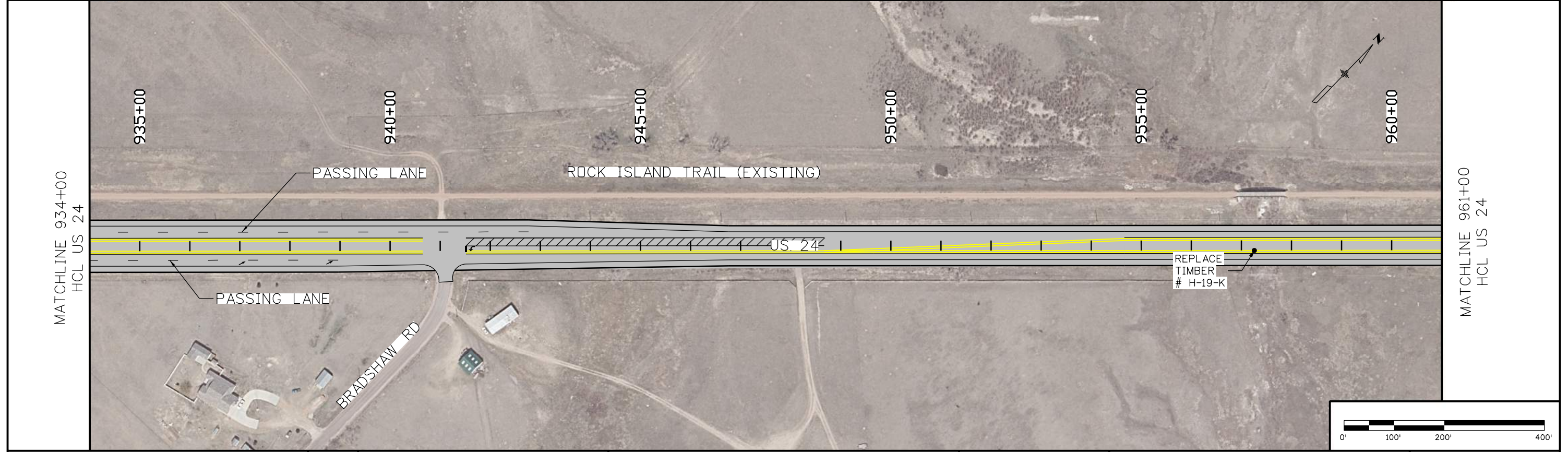


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**US 24
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 STA 907+00 TO STA 961+00**

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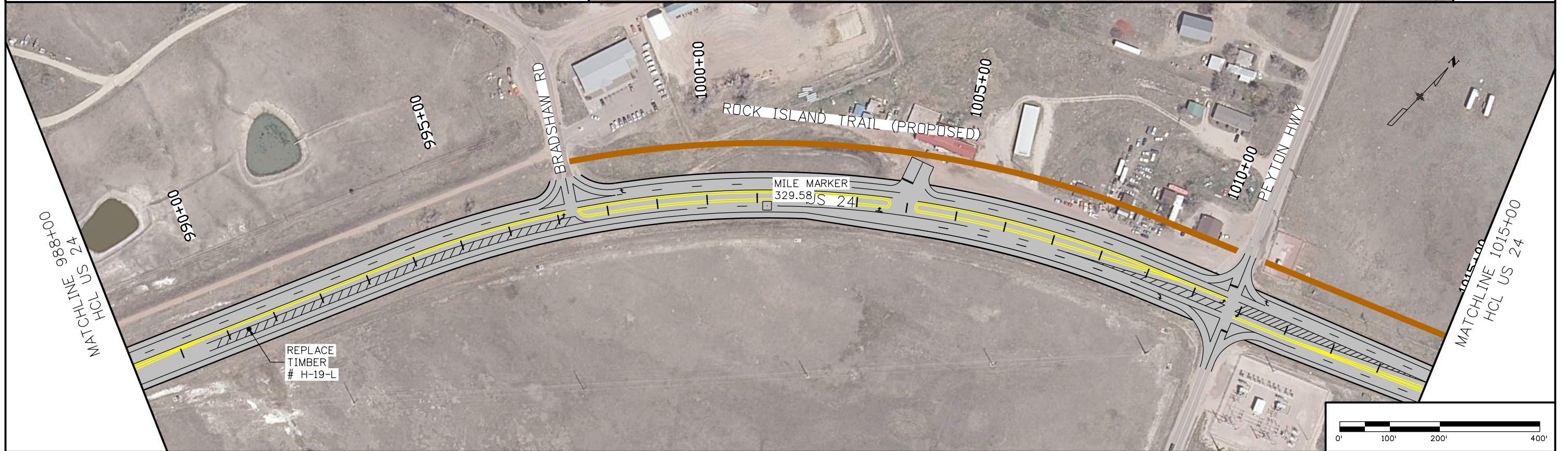
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Sheet Revisions		
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Region 2

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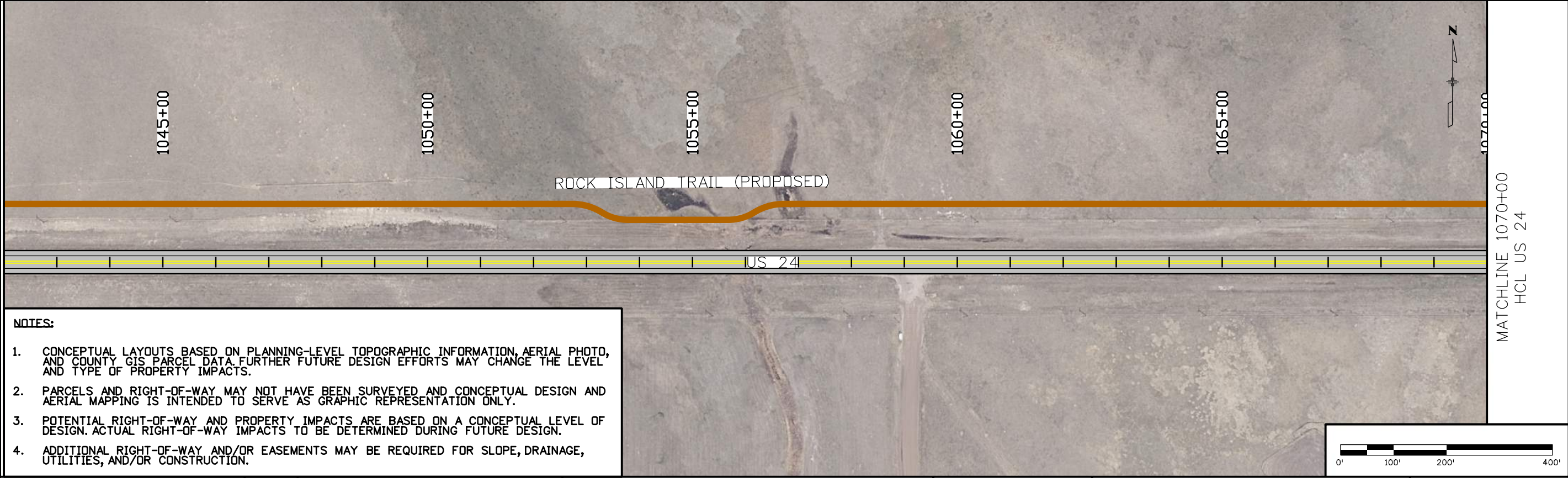
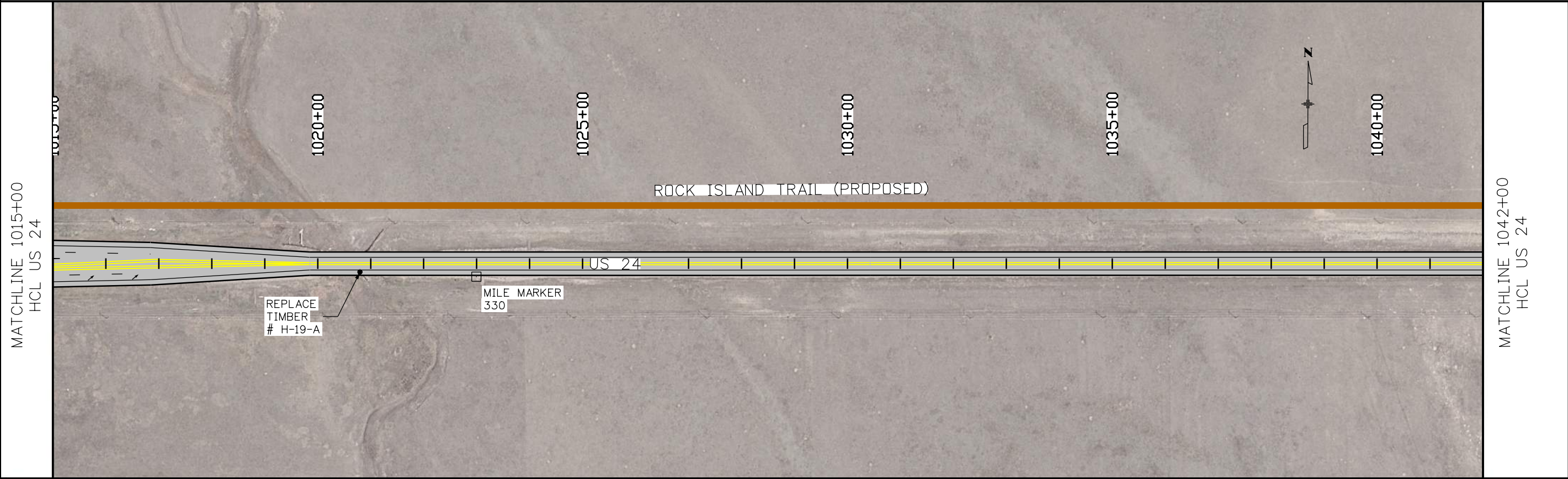
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- NOTES:**
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 DAVID EVANS

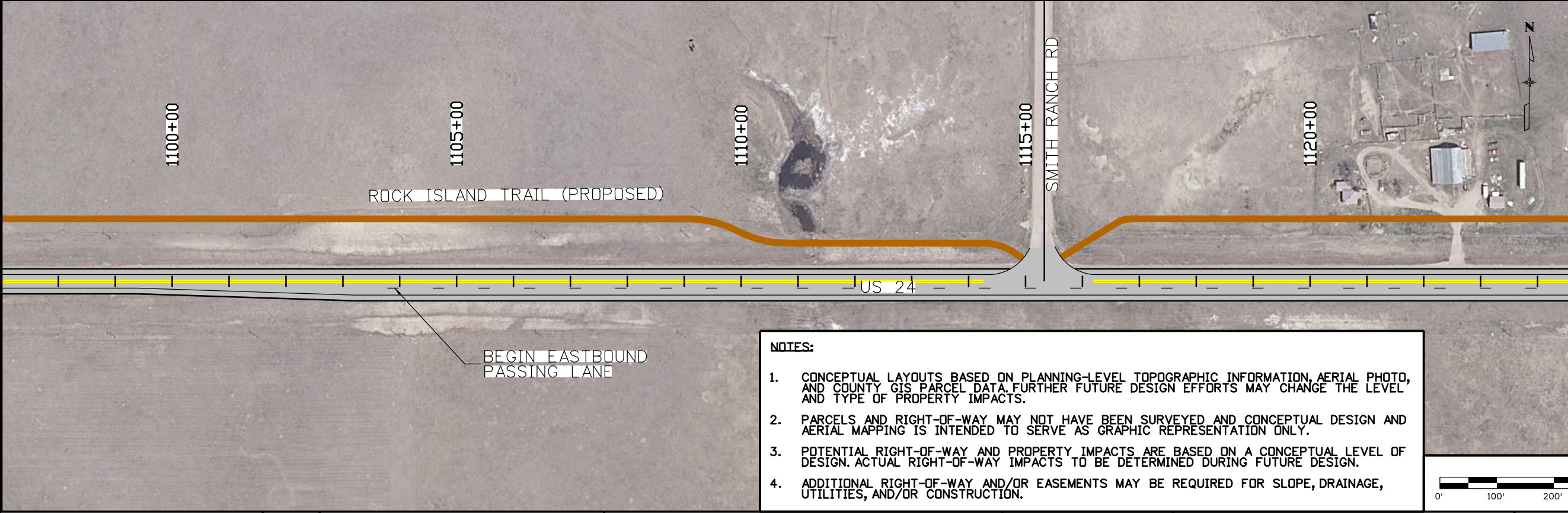
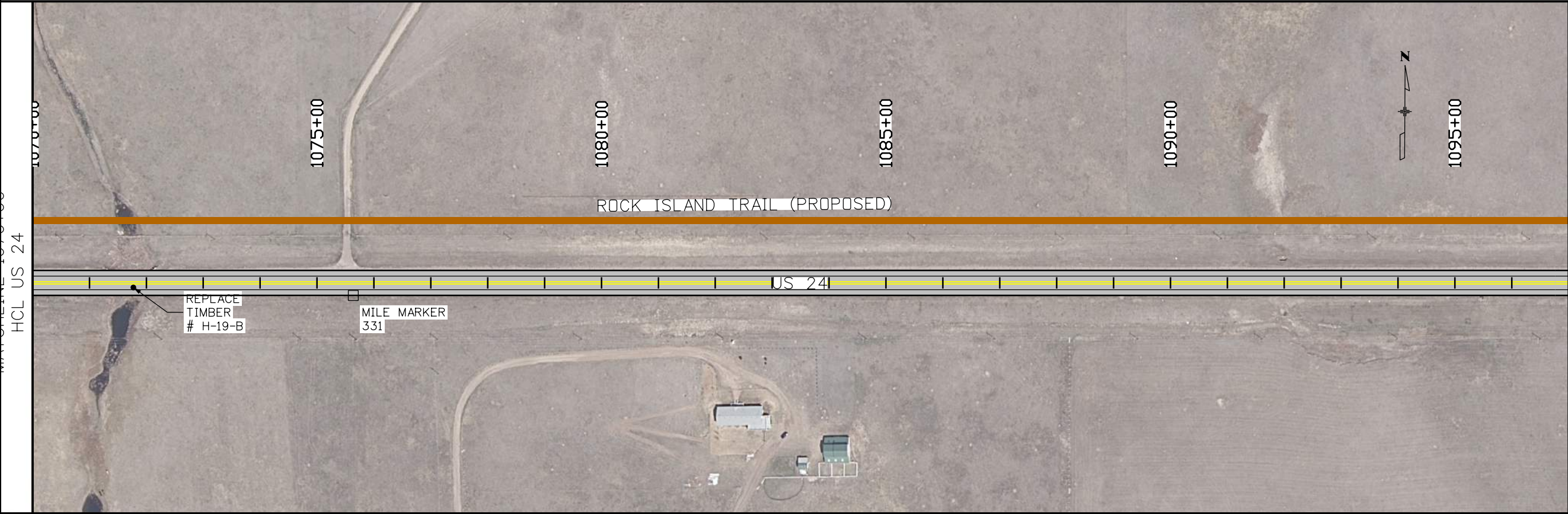
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US 24
 PEYTON TO CALHAN
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Project No./Code
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 Unit Leader Initials
DAVID EVANS

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Colorado Department of Transportation
 905 Erie Avenue
 Pueblo, CO 81002
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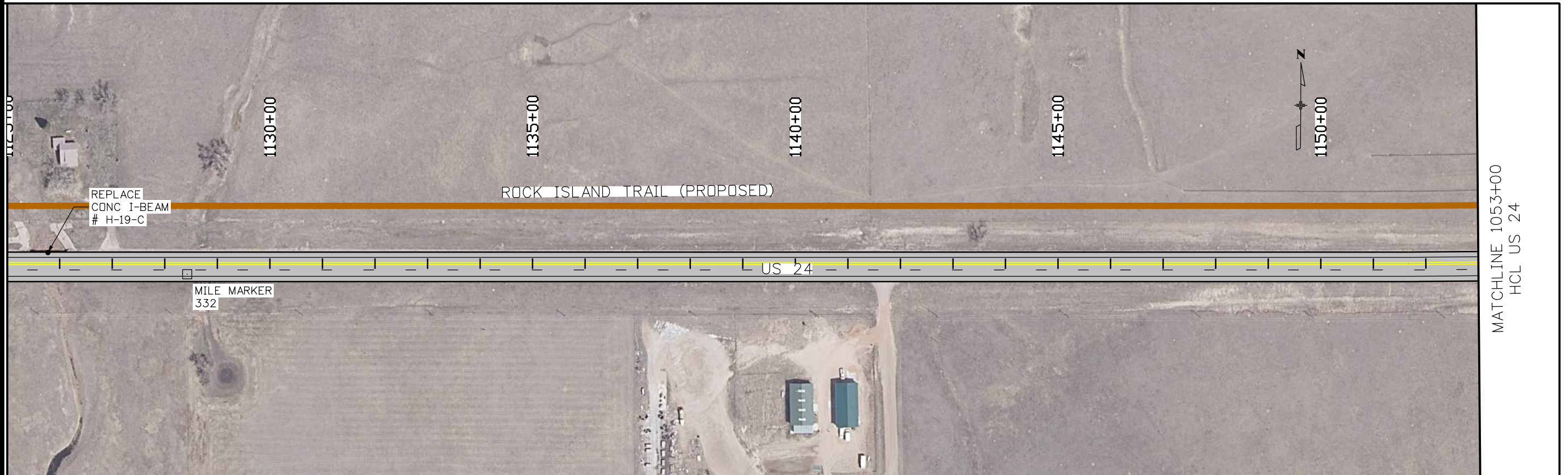
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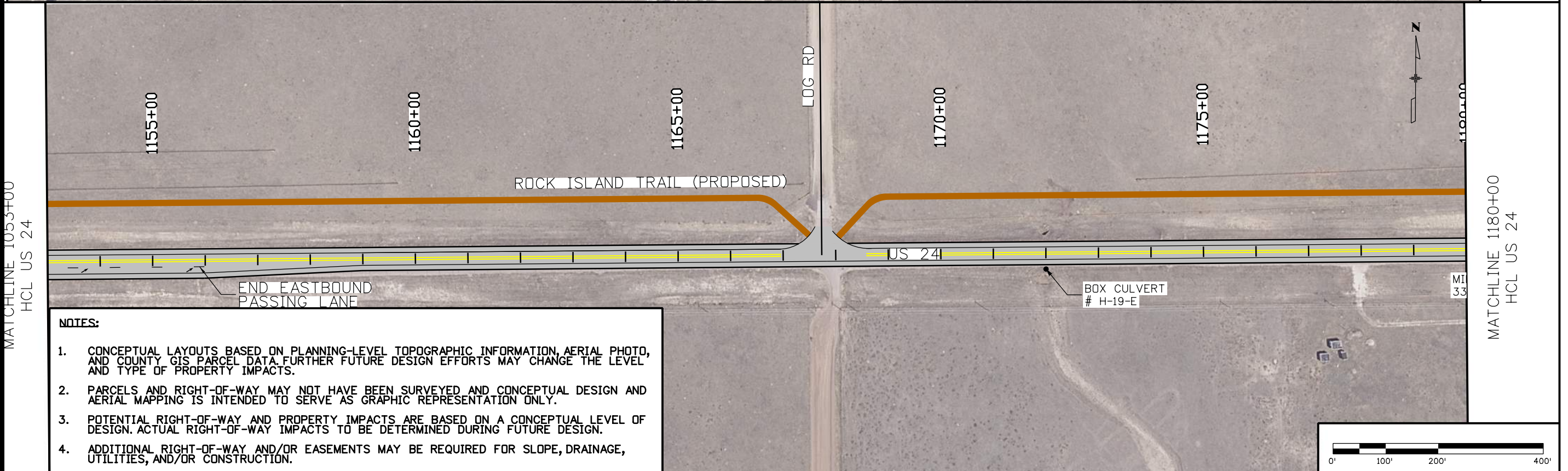
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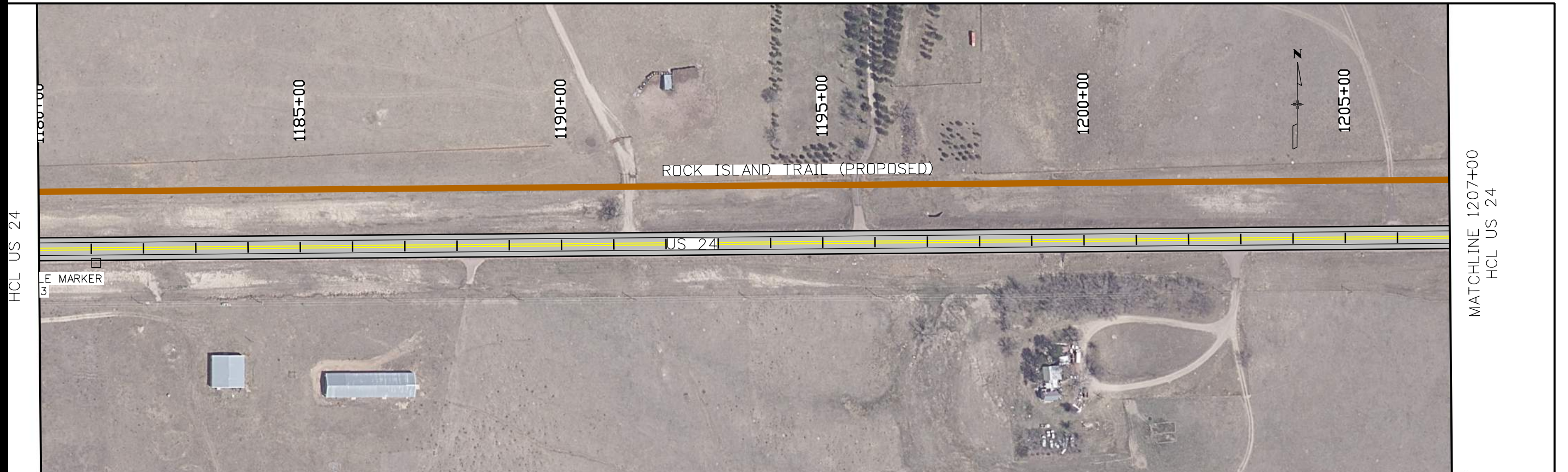
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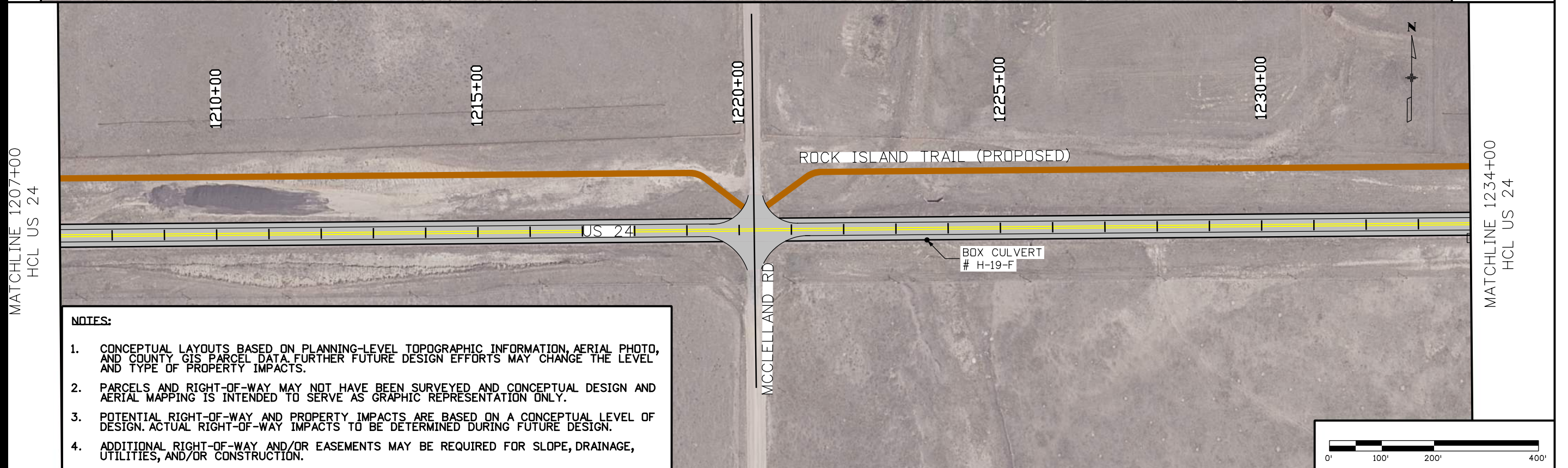
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 Structure Numbers:

Project No./Code
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HCL US 24

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MATCHLINE 1207+00
HCL US 24

MATCHLINE 1234+00
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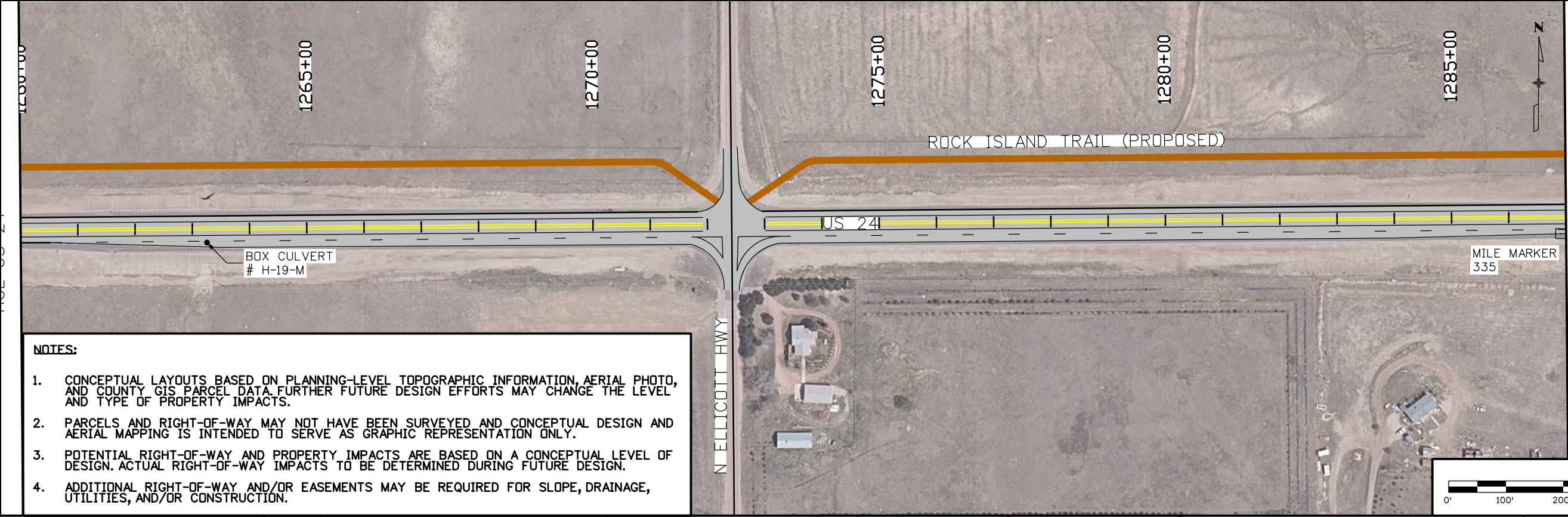
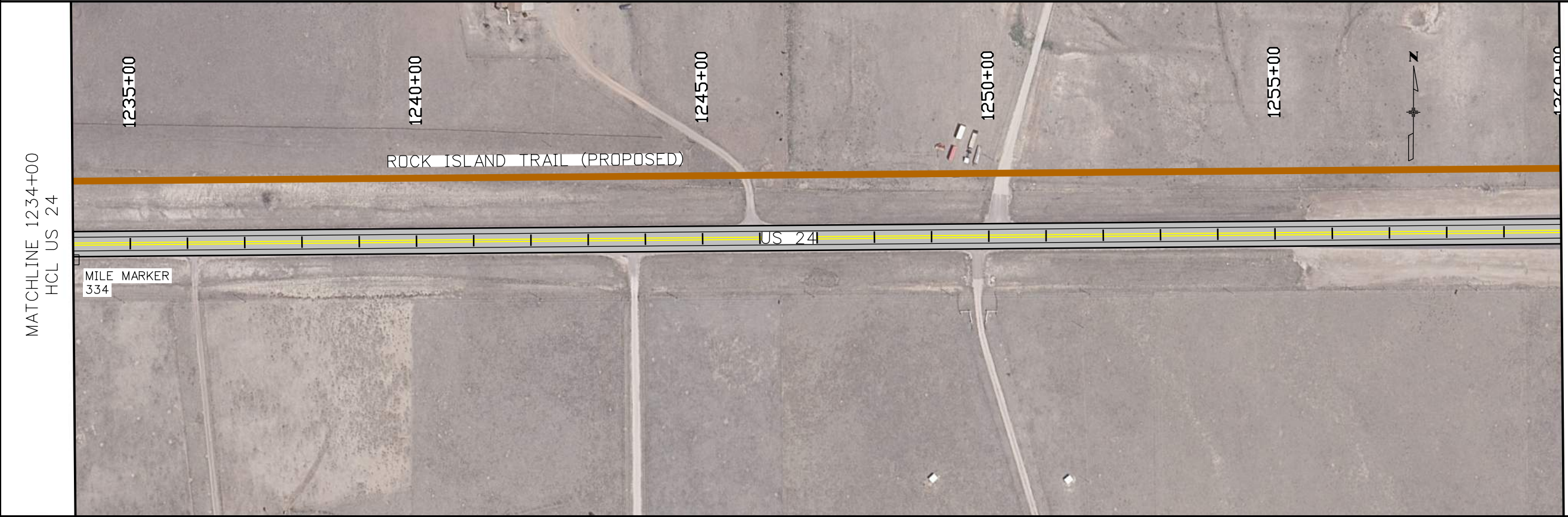
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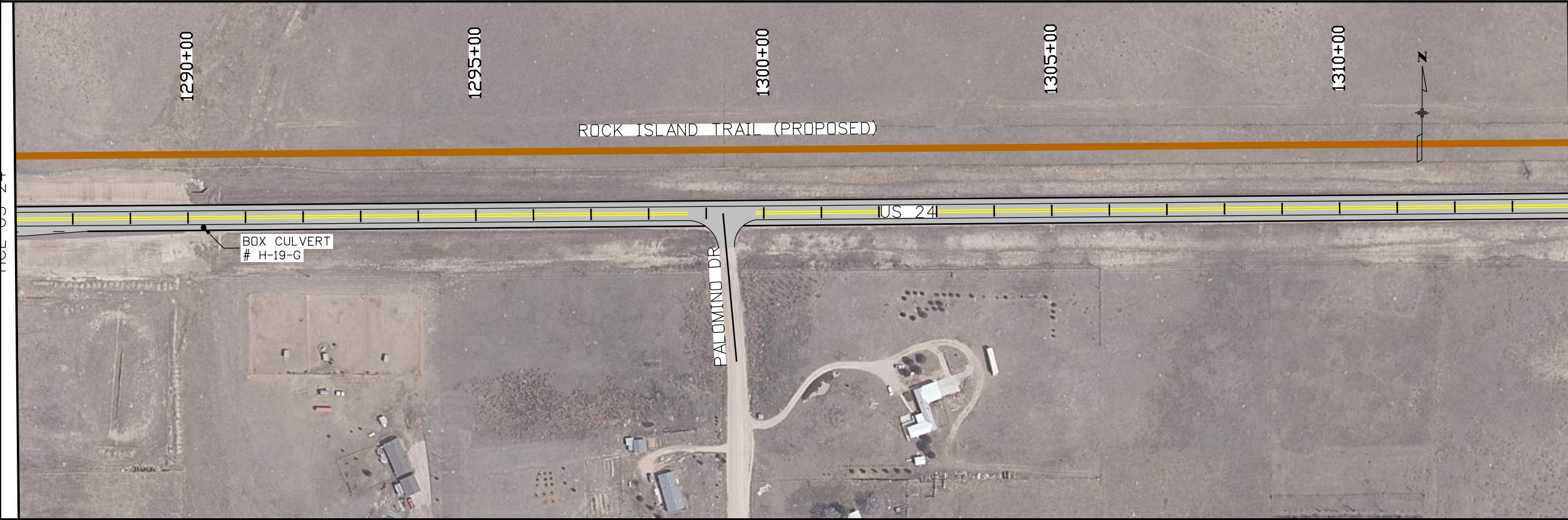
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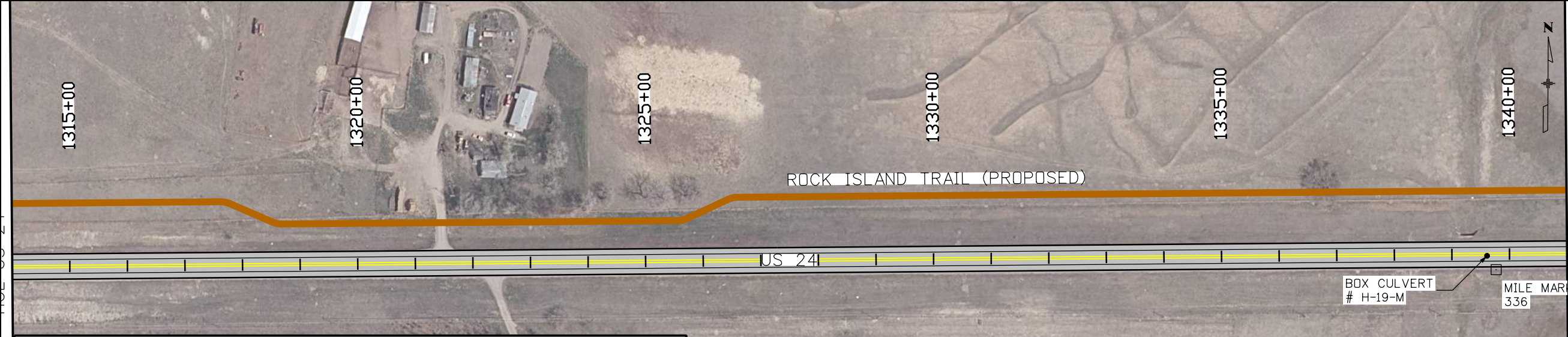
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 Structure Numbers:

Project No./Code
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MATCHLINE 1314+00
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MATCHLINE 1341+00
HCL US 24

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DAVID EVANS

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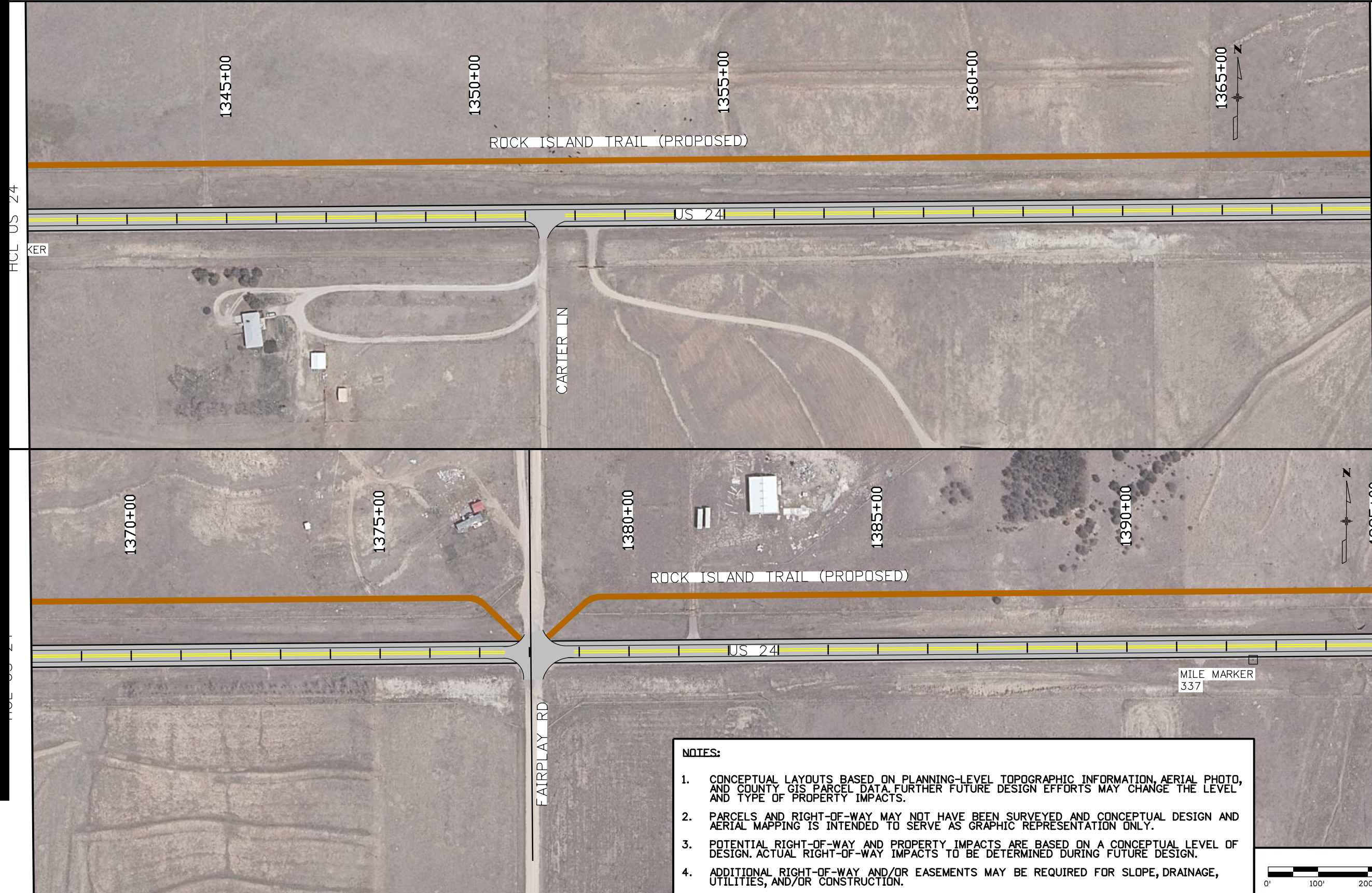
Colorado Department of Transportation
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Pueblo, CO 81002
Phone: 719-546-5408



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STA 1287+00 TO STA 1341+00
Designer:
Structure Numbers

Project No./Code
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MATCHLINE 1368+00
HCL US 24

MATCHLINE 1395+00
HCL US 24

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Region 2

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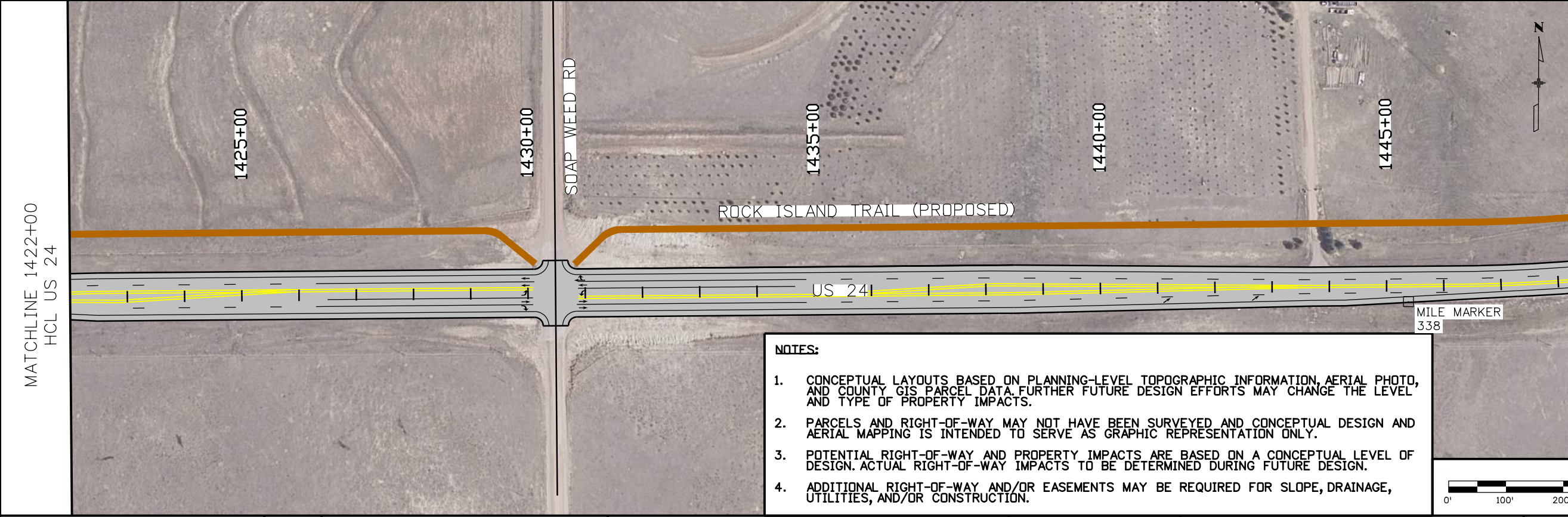
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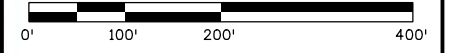
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- NOTES:**
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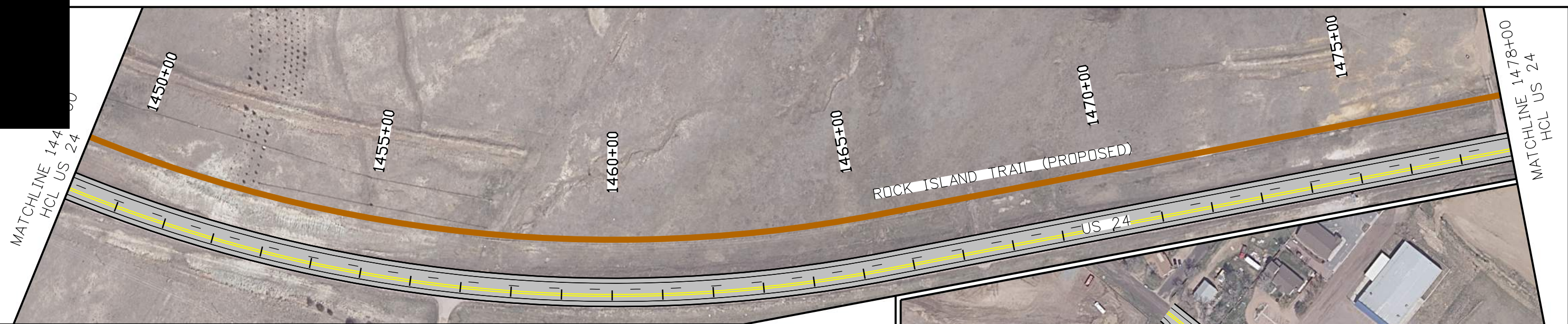
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 Pueblo, CO 81002
 Phone: 719-546-5408
 Region 2

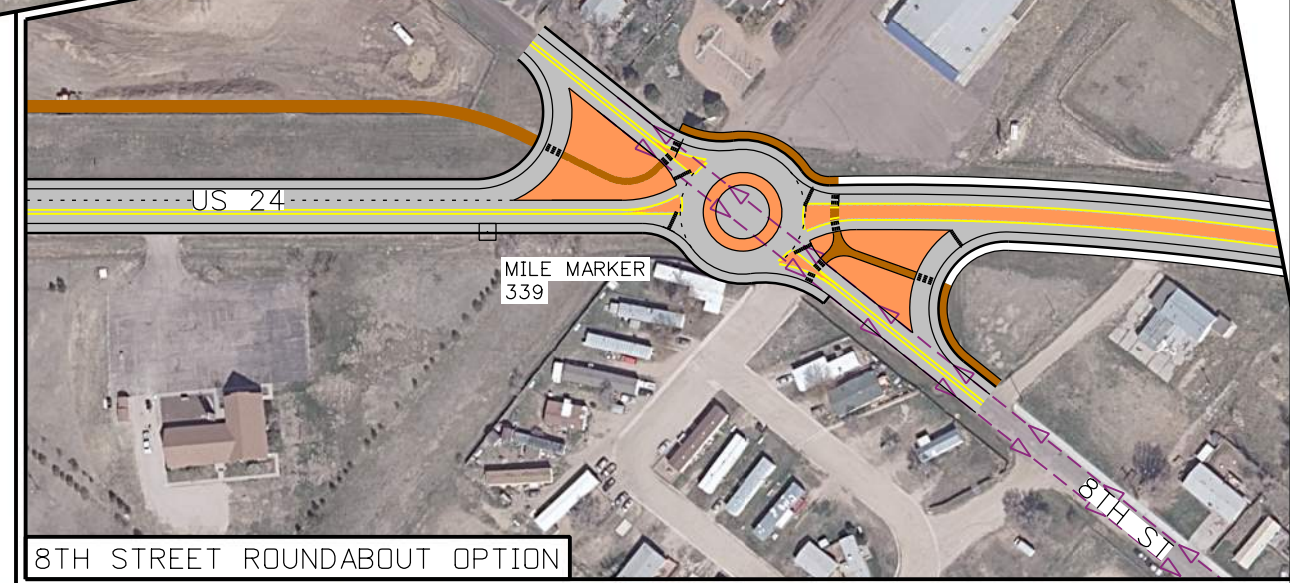
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 Structure Numbers:
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Project No./Code
 Sheet Number



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 905 Erie Avenue
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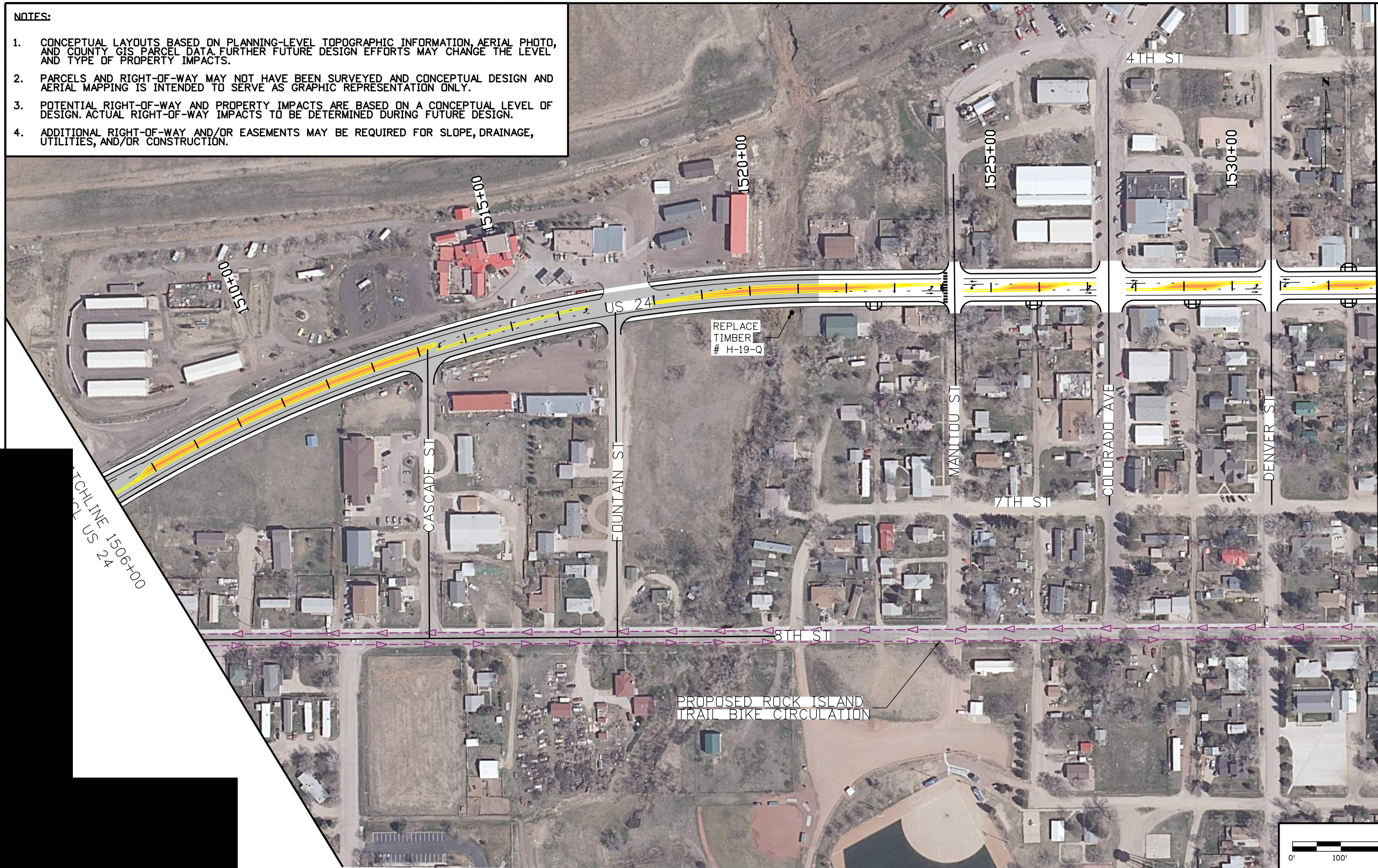
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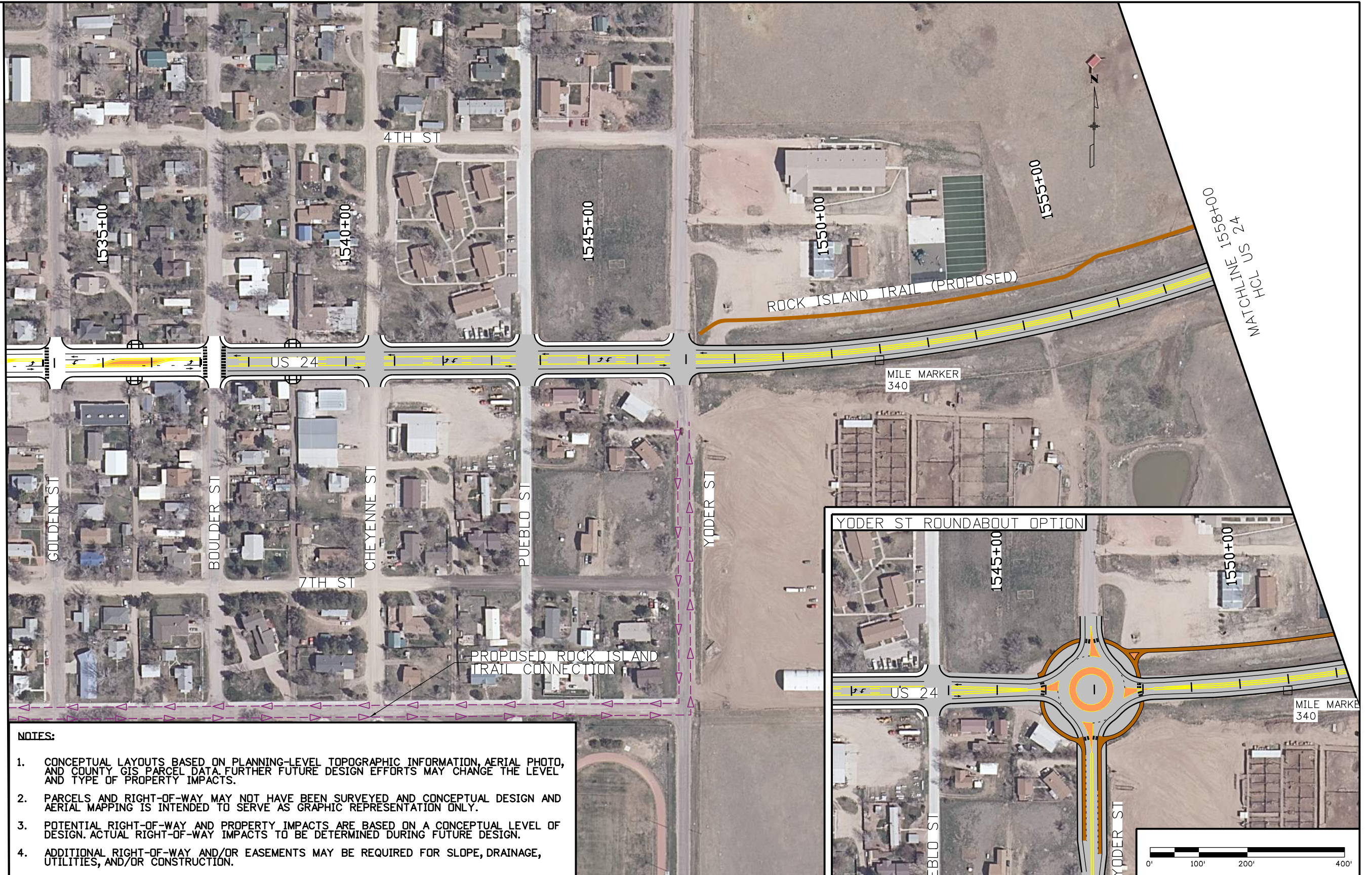
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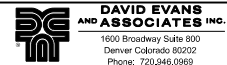
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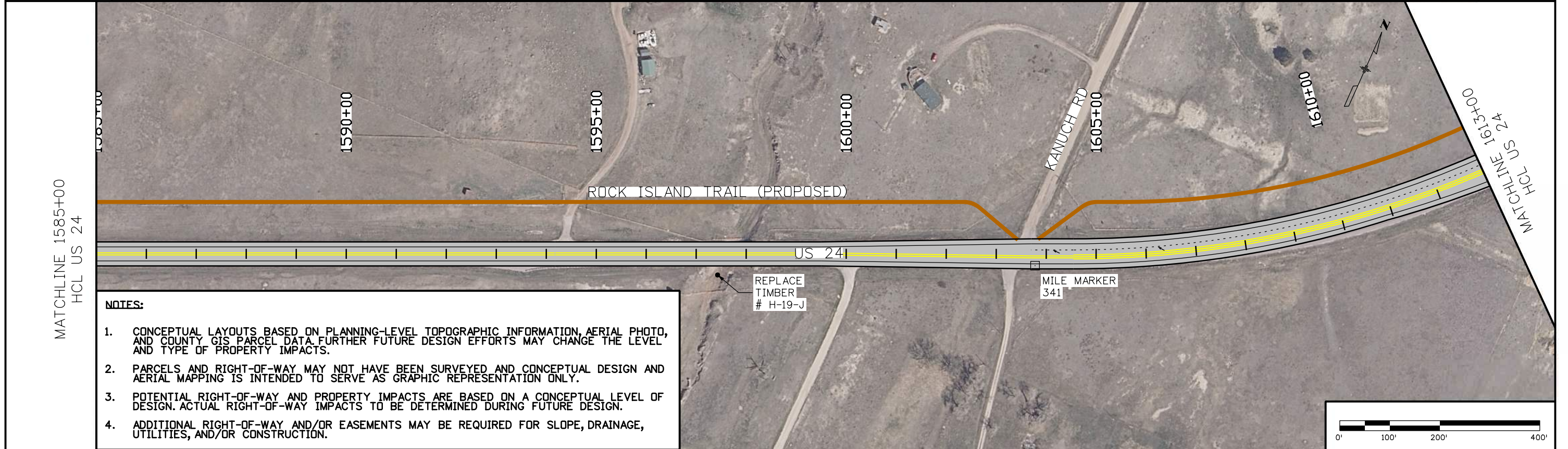
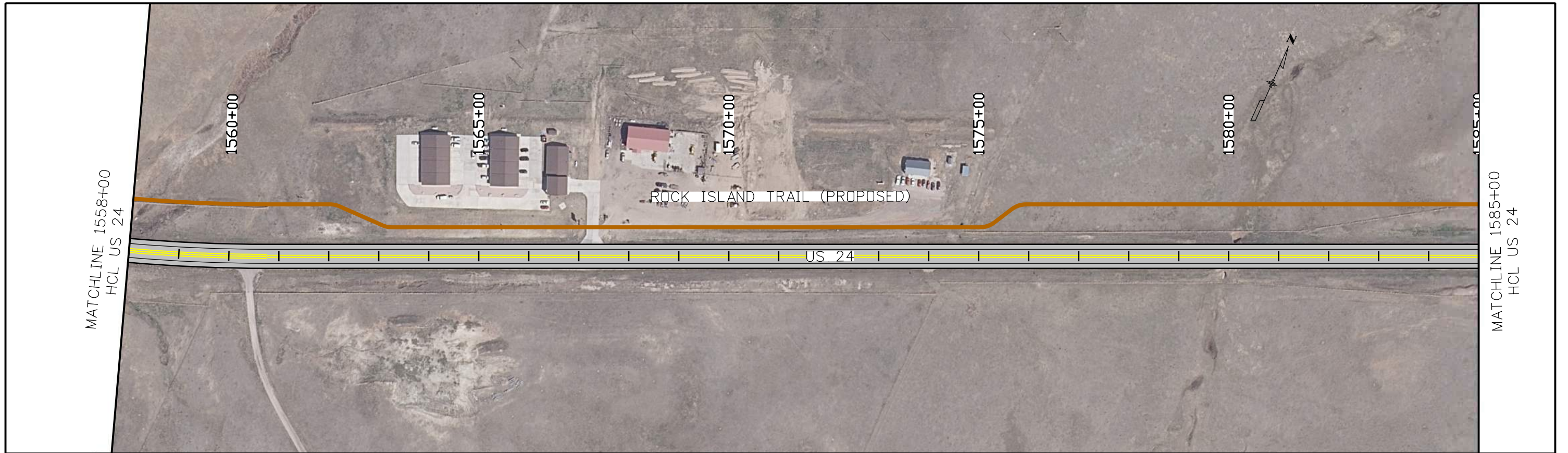
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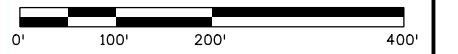
1600 Broadway Suite 800
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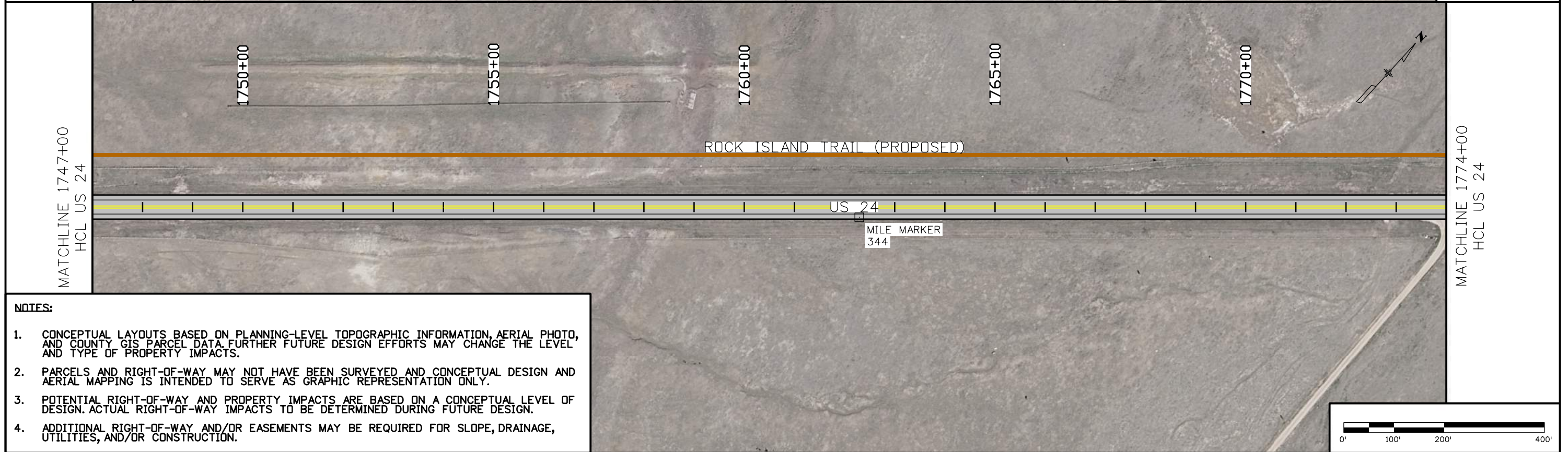
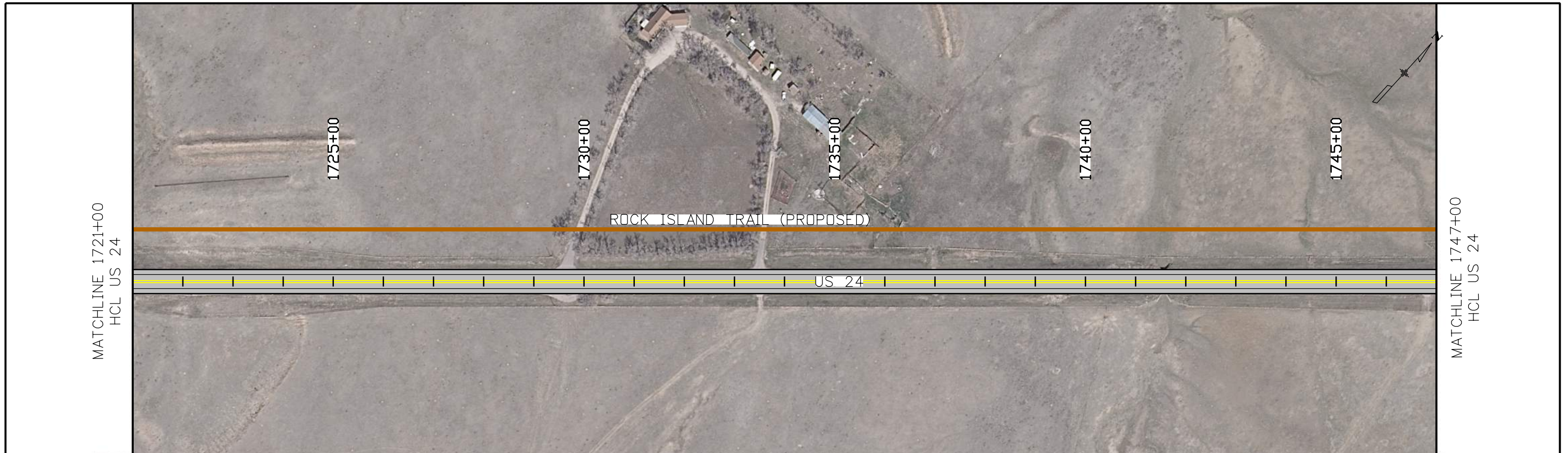
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DAVID EVANS AND ASSOCIATES INC. 1600 Broadway Suite 800 Denver Colorado 80202 Phone: 720.948.0969			Region 2			Sheet Number

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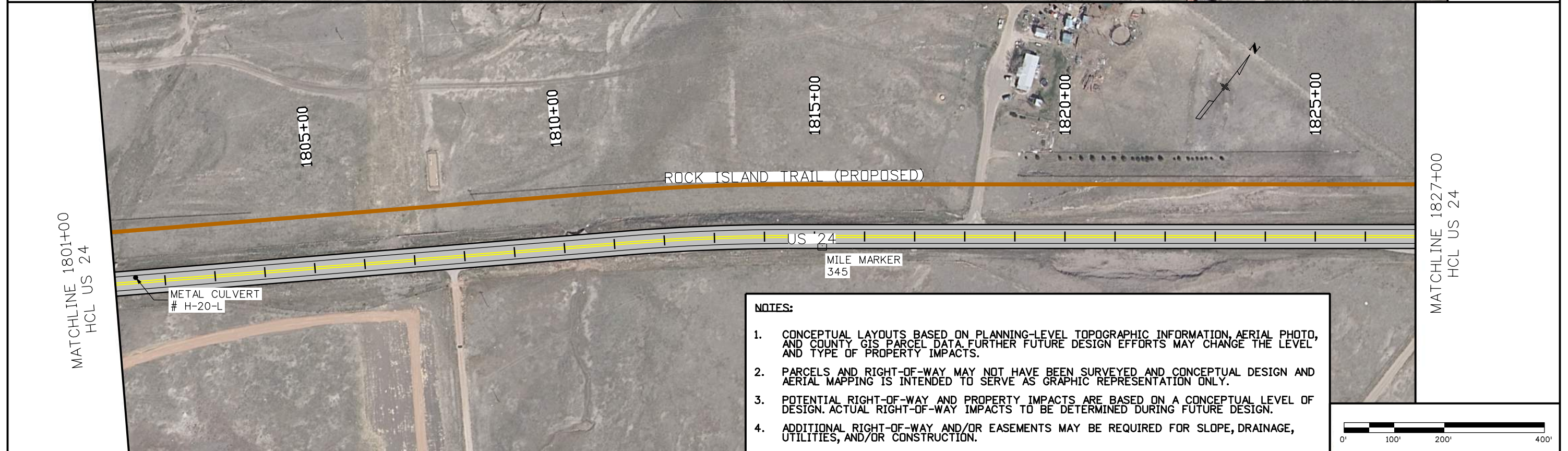
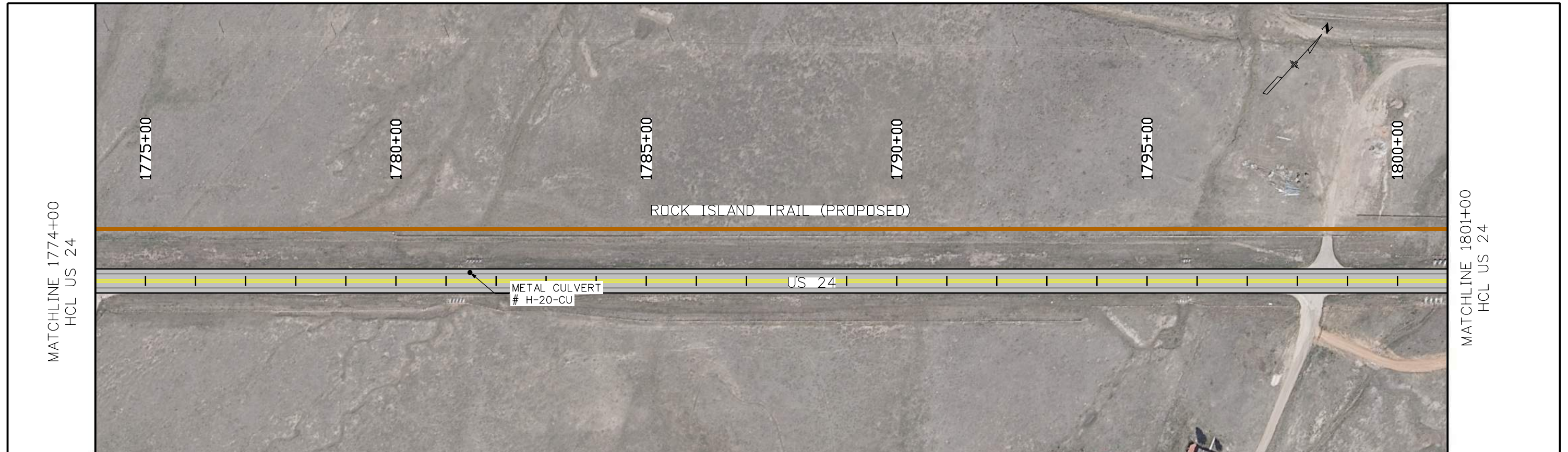


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 <small>DAVID EVANS AND ASSOCIATES INC. 1600 Broadway Suite 800 Denver Colorado 80202 Phone: 720.948.0969</small>		 <small>CDOT</small>		 <small>Region 2</small>		<small>905 Erie Avenue Pueblo, CO 81002 Phone: 719-546-5408</small>					

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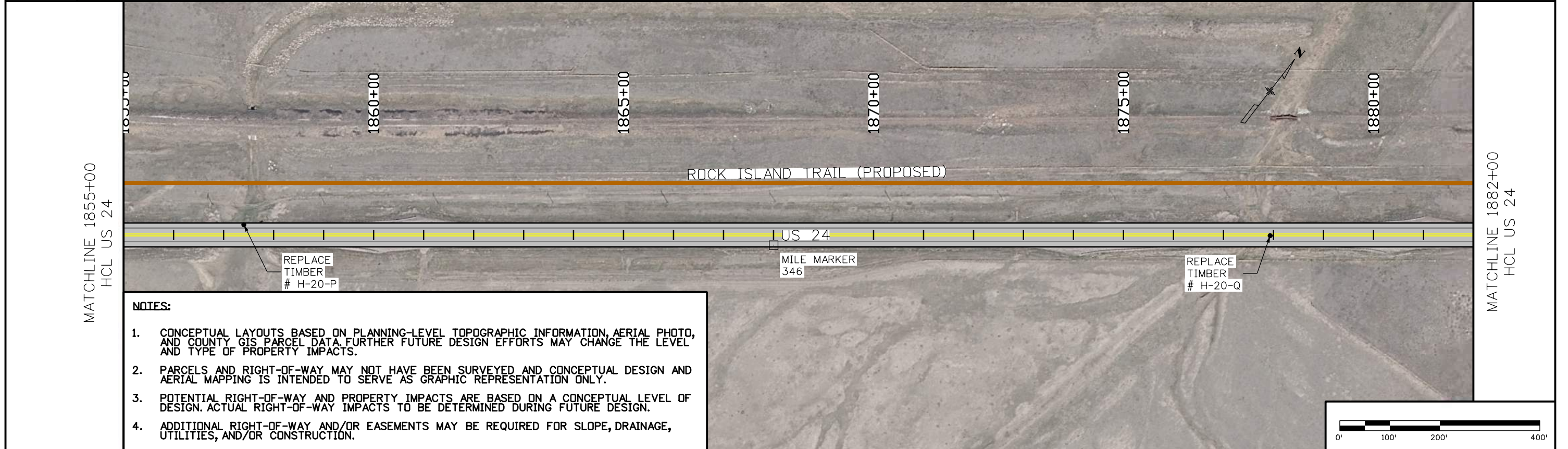
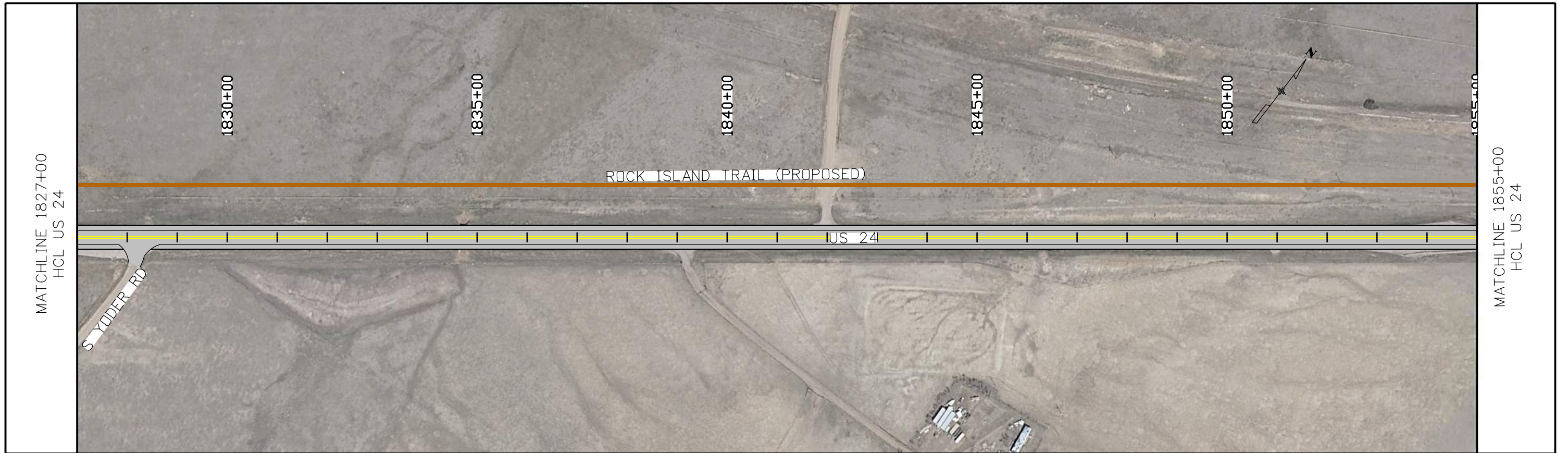
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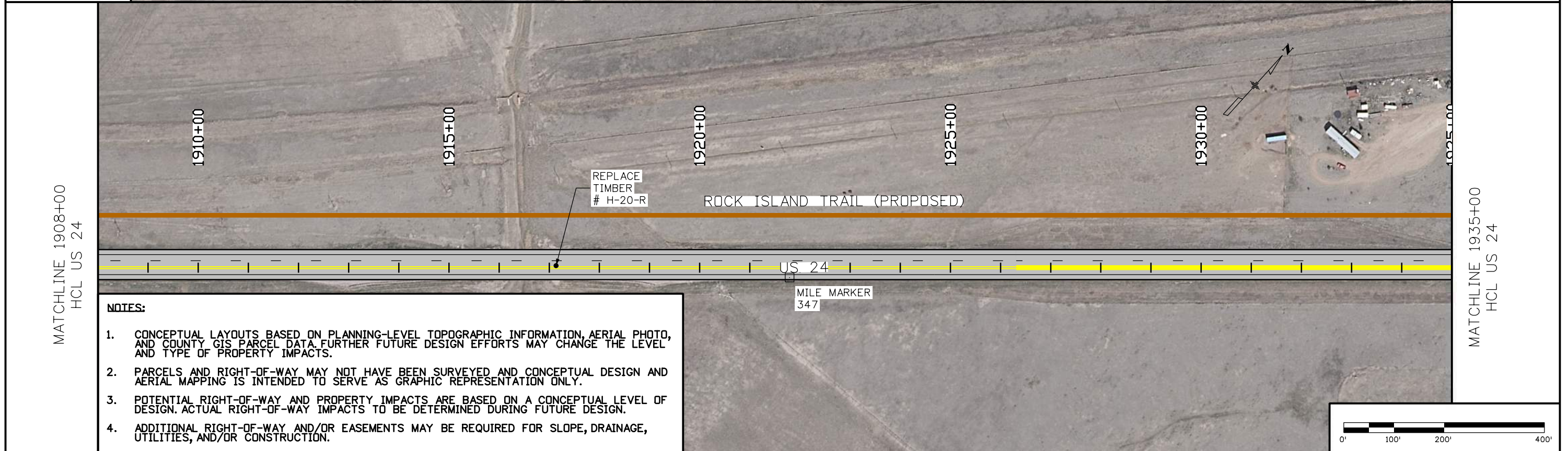
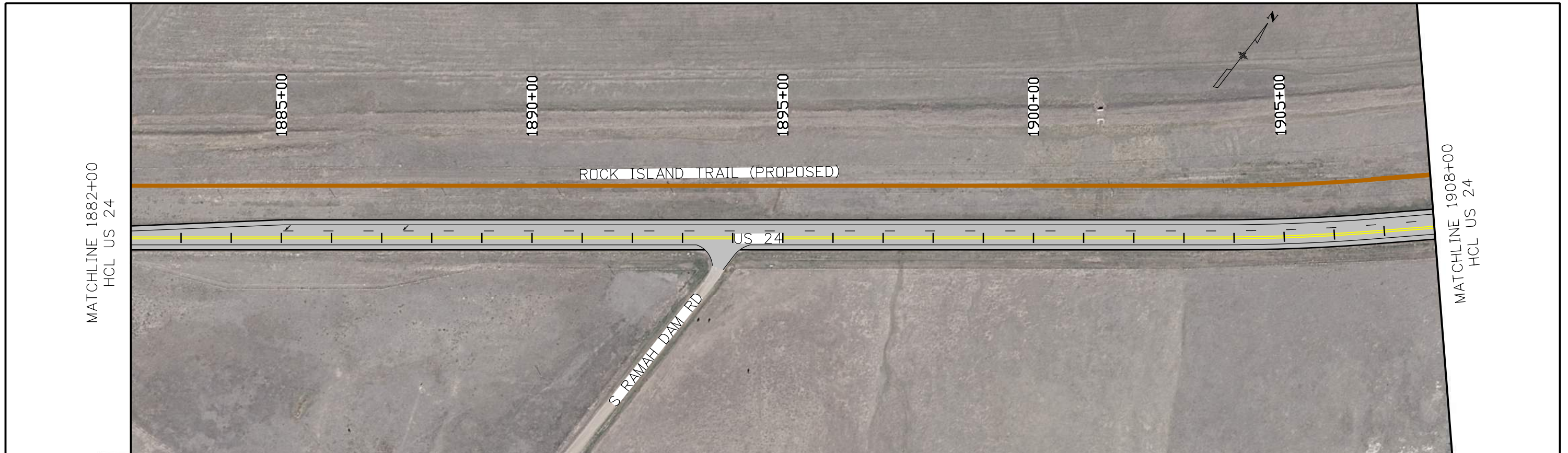


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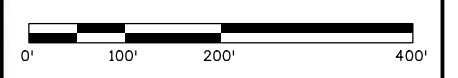


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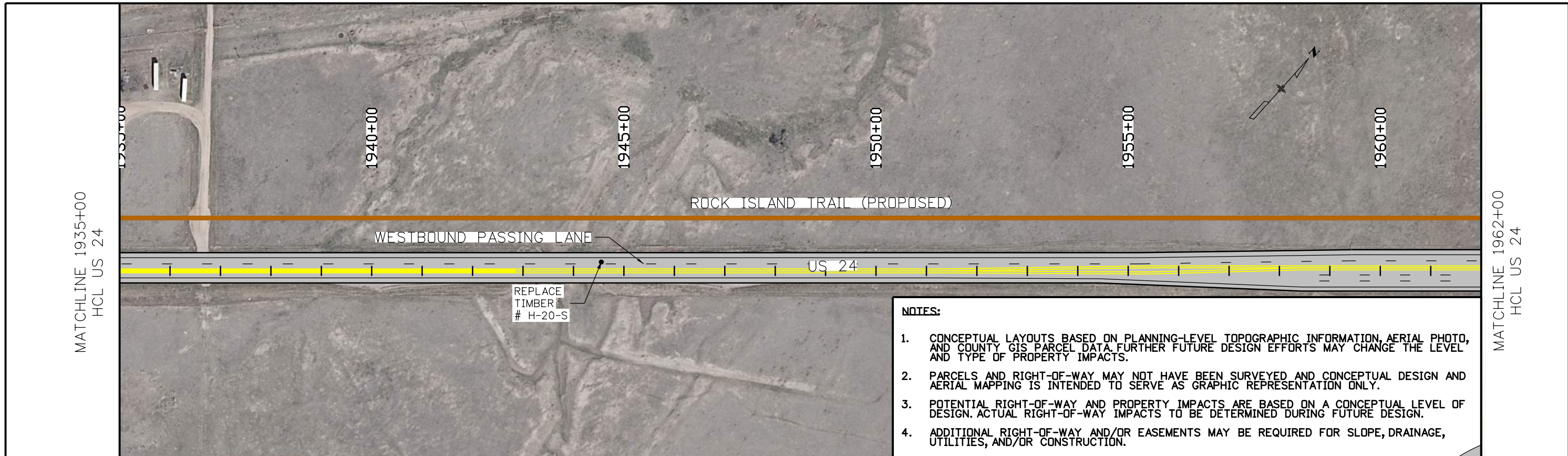


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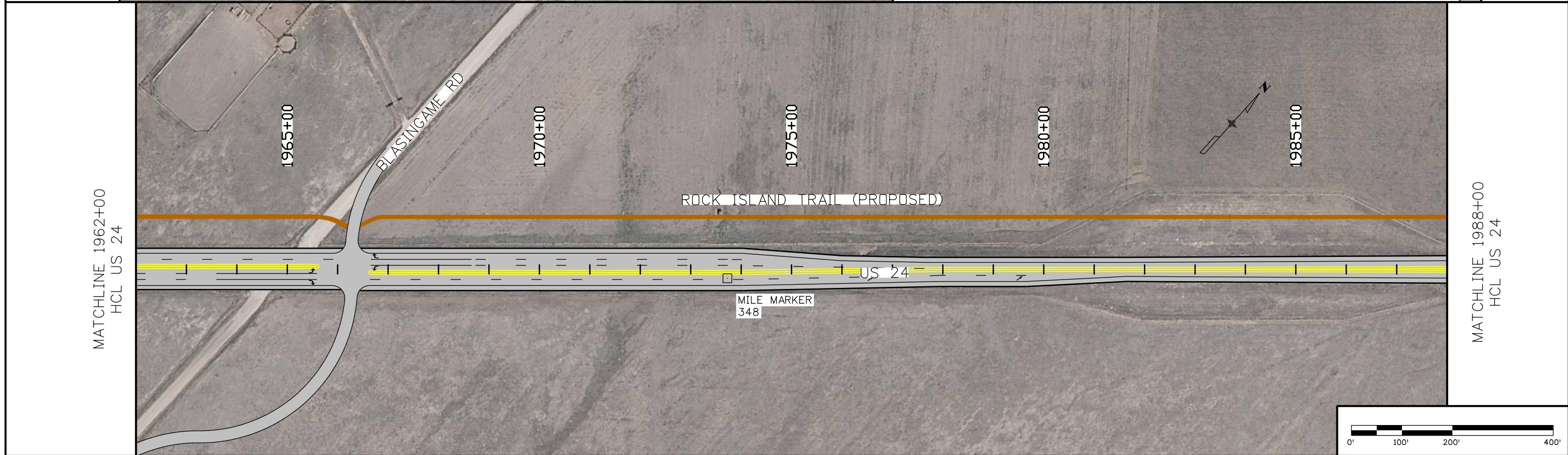


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- NOTES:**
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- NOTES:**
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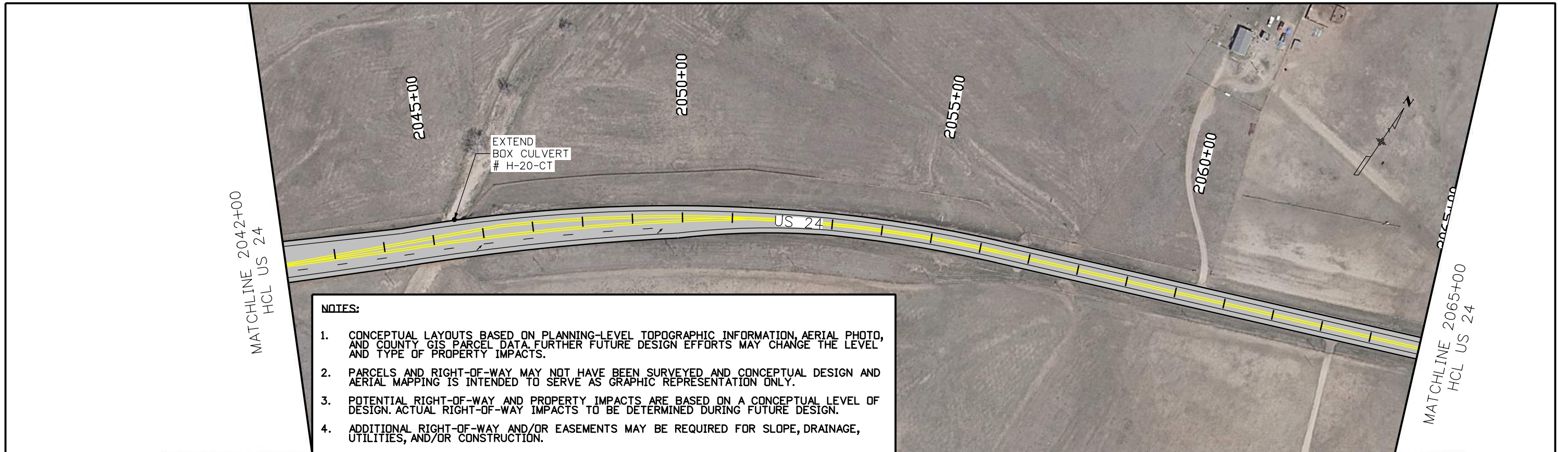
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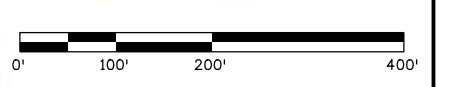
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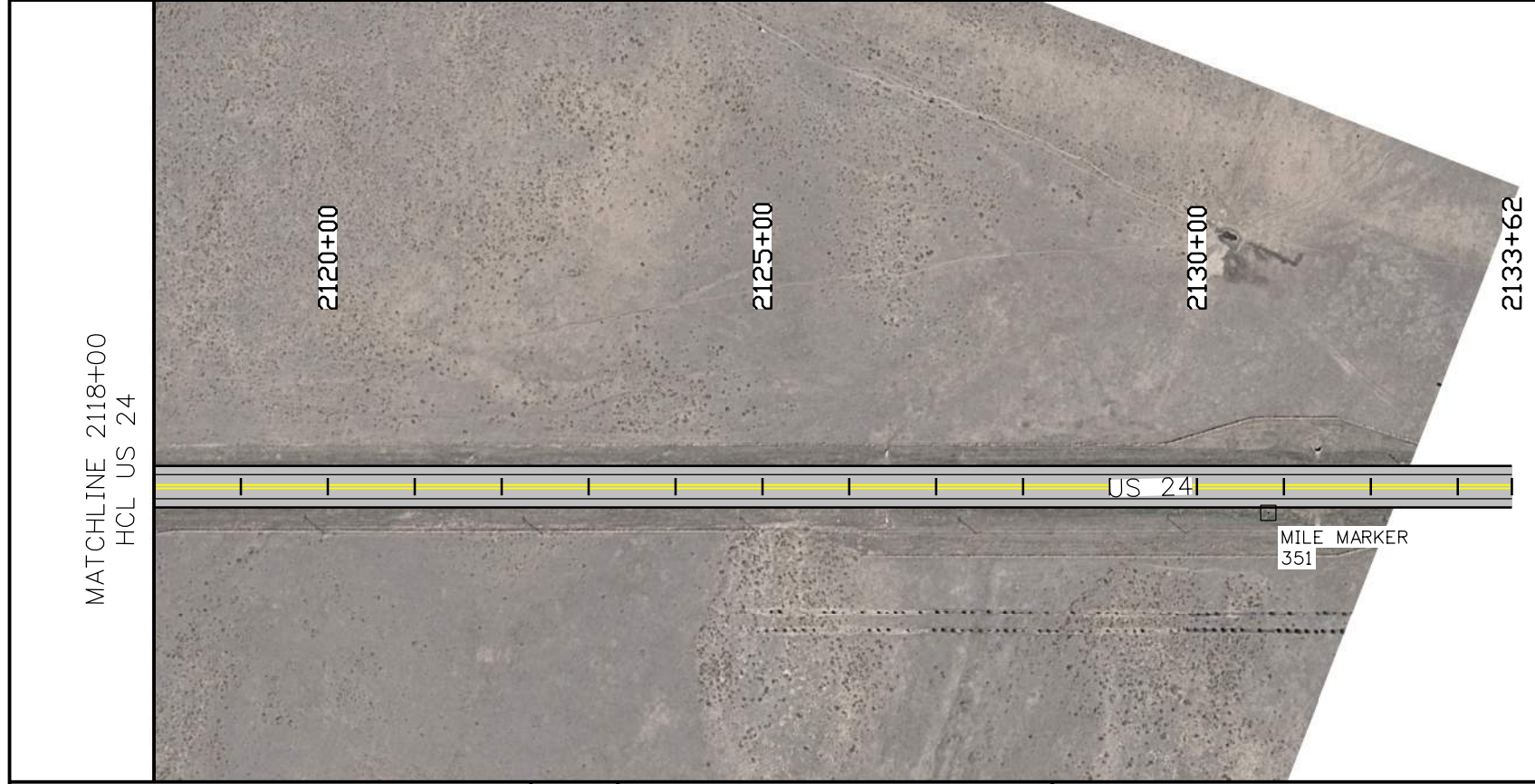
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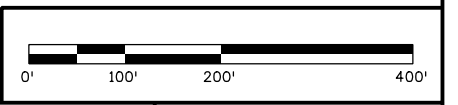


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- NOTES:**
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APPENDIX E



US 24 Centerline Radii

10/16/17

As part of the subject project, the design team evaluated the existing centerline radii of US 24. Changes to the centerline design radii are to be made so that the centerline meets requirements for the appropriate design speed and a superelevation of 6% maximum.

The only curve that is inadequate in the existing condition is just east of Calhan and in between Kanuch Road and Harrisville Road. The existing radius is approximately 1725 feet, and the design team has concluded that a radius of 2040 feet with a 6% super elevation and a 70 mph design speed is required according to AASHTO's *A Policy on Geometric Design of Highways and Streets*, Table 3-7. See attached exhibit for the referenced centerline revision.

US 24 CENTERLINE RADII DESIGN CHANGE

EXISTING BRIDGE
(TIMBER)
#H-19-P

HARRISVILLE RD

PROPOSED ALIGNMENT

EXISTING ALIGNMENT



SCALE: 1"=200'





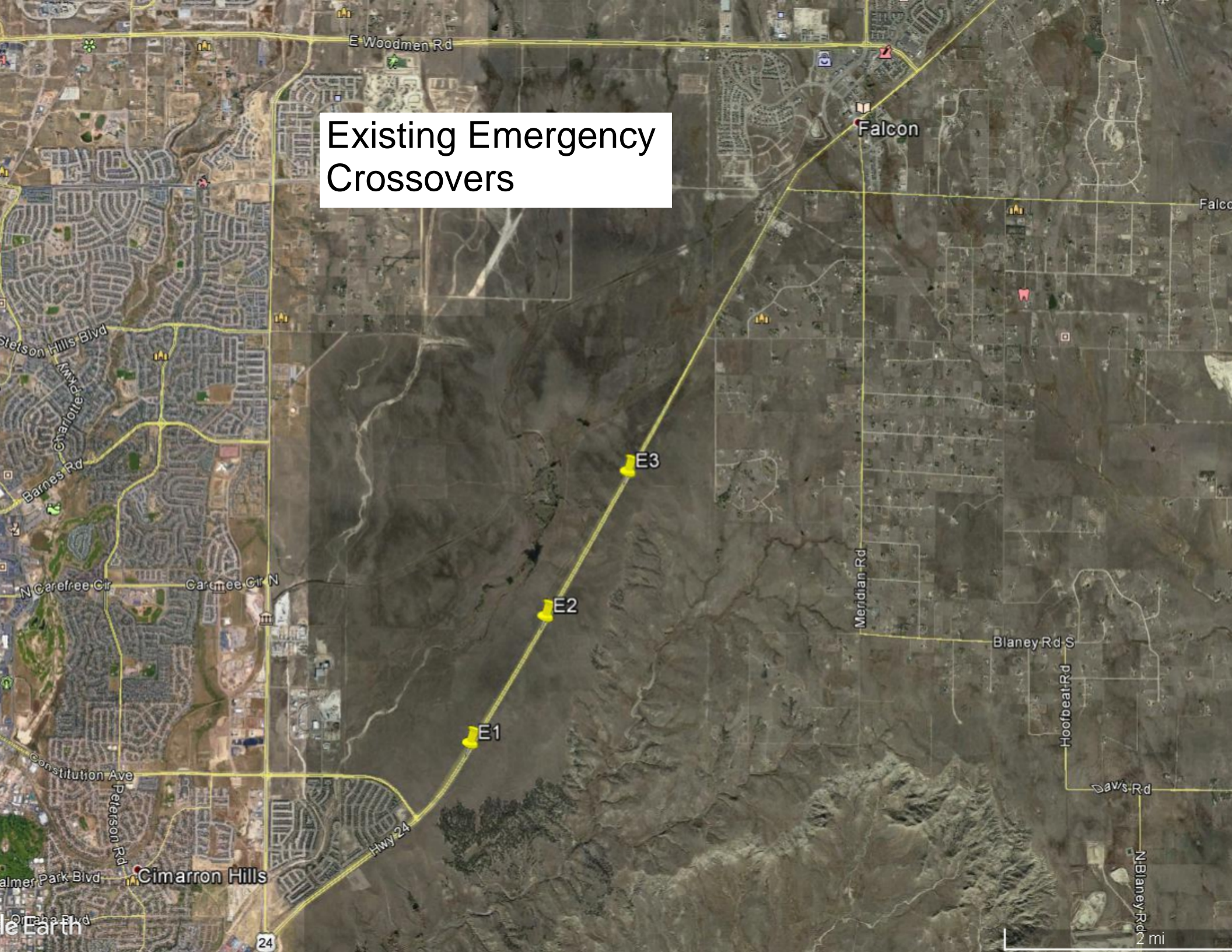
Emergency Crossover Locations

10/16/17

As part of the conceptual design of the Recommended Alternative for the US 24 PEL Study, emergency crossovers were identified at locations described below to either maintain existing conditions or to respond to stakeholder requests during this study. See attached exhibit for existing emergency crossover locations.

- ✦ Emergency access placed per request:
 - » Emergency access added to the intersection with Old Meridian (approximately STA 505+00). There is a fire station just north of US 24 near Old Meridian that will need access at this intersection. Design plans from the Meridian Road Improvements project include this access.
- ✦ Emergency crossovers placed per existing conditions:
 - » Emergency crossover provided at approximately STA 235+00 to maintain the existing condition.
 - » A crossover exists near the location of (future) North Carefree, so an emergency crossover was not added. A crossover is recommended in the interim condition in this location before North Carefree is built.
 - » A crossover exists near the location of (future) Barnes Road, so an emergency crossover was not added. A crossover is recommended in the interim condition in this location before Barnes Road is built.
- ✦ Consideration for additional locations:
 - » According to *CDOT Roadway Design Guide (2005)*, Section 8.2.2, “Emergency crossovers on rural freeways are normally provided where interchange spacing exceeds 5 miles. Between interchanges, emergency crossovers are spaced at 3 to 4-mile intervals.” There are no existing emergency crossovers throughout the rest of the corridor. Because the design provides access more frequently than three to four miles, the team has not proposed any additional emergency crossovers.

Existing Emergency Crossovers





Passing Lane Locations

10/16/17

As part of the conceptual design of the Recommended Alternative for the US 24 PEL Study, the design team evaluated potential locations for planned vehicular passing lanes within the study area. The team consulted a variety of published resources to develop the recommendations for location and length of these passing lanes:

- ✦ Highway Capacity Manual
- ✦ State Highway Access Code
- ✦ Texas DOT Roadway Design Guide
- ✦ Texas Transportation Institute Project Summary Report 4064-S

Passing lane recommendations are generally based on Average Daily Traffic and (design/posted) speed. Published guidance also provides information regarding the spacing of passing lanes within a specific length of highway where geometric considerations (e.g. steep grades) are not present.

The design team's research indicated that individual passing lanes would be appropriate within the Falcon to Peyton segment, within the Peyton to Calhan segment, and within the Calhan to Ramah segment.

- ✦ Between Falcon and Peyton
 - » Limits: 1 mile EB MP327.42-MP328.42 and WB MP327.49-MP328.49
 - » Passing Lanes location designated per previous CDOT *Passing Lane Prioritization Study*.
- ✦ Between Peyton and Calhan
 - » Limits: 1 mile EB MP331.52-MP332.52
 - » Passing lane placed in same location as existing passing lanes but was extended to about 1 mile long.
 - » Limits: 1 mile WB MP337.86-MP339.86
 - » Passing lane placed between Soapweed and Hahn Rd. This locations has 2 WB lanes in the existing condition.
- ✦ Between Calhan and Ramah
 - » Limits: 0.75 mile EB MP341.61-MP342.36
 - » Passing lane to be placed after the required distance for a vehicle to accelerate going EB on US 24 from Harrisville Road.
 - » Limits: 0.75 mile WB MP346.30-MP347.05
 - » Passing lane to be placed after the required distance for a vehicle to accelerate going WB on US 24 from Blasingame Rd.



Roundabout Design

10/16/17

As part of the conceptual design of the Recommended Alternative for the US 24 PEL Study, the design team evaluated roundabout intersections with US 24 at 8th Street and Yoder Street in the Town of Calhan. Below are the listed standards and references utilized in this layout.

Design Vehicle	WB-67	Per CDOT request
Site Category	Rural single lane	Per FHWA Roundabout Guide, Exhibit 6-19
Inscribed Circle Diameter	115'-130'	Per FHWA Roundabout Guide, Exhibit 6-19
Entry Width	20'	Per FHWA Roundabout Guide, Section 6.3.2
Circulatory Roadway Width	20'-24'	Per FHWA Roundabout Guide, Section 6.3.3
Entry Radii	33-98'	Per FHWA Roundabout Guide, Section 6.3.5.1
	65' max	Per FHWA Roundabout Guide, Section 6.3.5.0
Approach Curves:	not warranted	Per FHWA Roundabout Guide, Section 6.3.5.1
Exit Radii	50' min	Per FHWA Roundabout Guide, Section 6.3.6.1
Pedestrian Crossings		Per FHWA Roundabout Guide, Section 6.3.7
Splitter Island		Per FHWA Roundabout Guide, Section 6.3.8
Apron width	3-13'	Per FHWA Roundabout Guide, Section 6.3.4

These two proposed roundabouts were evaluated in AutoTurn for a WB-67 design vehicle, as shown below. The turning movements considered were a left turn through a roundabout, as well as, the right turn with the sharpest radius if the intersection is skewed. A WB-67 is able to conduct all of these movements through the two roundabouts as conceptually designed.



US 24 Planning and Environmental Linkage Study

Alternative 2

Alternative 3

Alternative 4

Alternative 5

Segment	Structure Number	Final Recommendation	Cost of Recommendation	Final Recommendation	Cost of Recommendation	Final Recommendation	Cost of Recommendation	Final Recommendation	Cost of Recommendation
Powers to Constitution	I-18-AC	Widen	\$ 1,177,930	N/A	N/A	Widen	\$ 957,600	Widen	\$ 1,785,600
	I-18-BK	No Action Required	\$ -	N/A	N/A	No Action Required	\$ -	No Action Required	-
	I-18-BF	Lengthen CBC	\$ 142,229	N/A	N/A	Lengthen CBC	\$ 742,065	Lengthen CBC	\$ 2,250,929
	I-18-AT	Widen	\$ 885,000	N/A	N/A	Widen	\$ 367,200	Widen	\$ 835,200
	I-18-AU	Widen	\$ 885,000	N/A	N/A	Widen	\$ 367,200	Widen	\$ 835,200
Constitution to Falcon	I-18-O	N/A	N/A	Lengthen CBC	\$ 1,222,980	N/A	N/A	Lengthen CBC	\$ 1,222,980
	I-18-R	N/A	N/A	Lengthen Precast CBC	\$ 861,861	N/A	N/A	Lengthen Precast CBC	\$ 783,510
	I-18-BB	N/A	N/A	Lengthen CBC	\$ 1,536,900	N/A	N/A	Lengthen CBC	\$ 966,525
Falcon to Peyton	I-18-BQ	N/A	N/A	N/A	N/A	Lengthen CBC	\$ 3,737	N/A	N/A
	I-18-J	N/A	N/A	N/A	N/A	Replace	\$ 1,513,800	N/A	N/A
	I-18-BL	N/A	N/A	N/A	N/A	Widen	\$ 480,000	N/A	N/A
	H-18-AD	N/A	N/A	N/A	N/A	Widen	\$ 480,000	N/A	N/A
	H-19-K	N/A	N/A	N/A	N/A	Replace	\$ 612,000	N/A	N/A
Peyton to Calhan	H-19-A	Replace	\$ 685,260	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-L	Replace	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-B	Replace	\$ 583,740	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-C	Replace	\$ 724,140	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-E	No Action Required	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-F	No Action Required	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-G	No Action Required	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-M	No Action Required	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-Q	Replace	\$ 659,880	N/A	N/A	N/A	N/A	N/A	N/A
Calhan to Ramah	H-19-J	Replace	\$ 598,980	N/A	N/A	N/A	N/A	N/A	N/A
	H-19-P	Replace	\$ 1,244,880	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-CU	No Action Required	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-L	No Action Required	\$ -	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-P	Replace	\$ 566,820	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-Q	Replace	\$ 385,920	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-R	Replace	\$ 450,300	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-S	Replace	\$ 1,082,616	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-T	Replace	\$ 869,316	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-U	Replace	\$ 869,316	N/A	N/A	N/A	N/A	N/A	N/A
	H-20-CT	Lengthen CBC	Lengthen CBC	N/A	N/A	N/A	N/A	N/A	N/A

Notes

1 CBC Cost based on 8' tall CBC - Replacement is CIP @ \$300/sf for widening and \$225 for replacement and new is Precast

2 I-18 AC PT Box cost \$170/sf for widening and \$150/sf for replacement

3 All other bridges assumed BT Girders at \$140/sf for widening and \$120/sf for replacement



US 24 Hydrology and Hydraulics Conceptual Design Workflow

9/16/17

This memorandum provides the basis of design for the hydrology and hydraulics work completed as part of the US 24 PEL Study.

Background Hydrology

The design team delineated the major basins within the project limits and correlated these basins, as applicable, with the major structures identified as a part of the Existing Conditions Report. The contour data was obtained from the United States Geological Survey (USGS) mapping with 10 foot interval. These basins and the mileposts for the major structures are shown on the attached Drainage Basin Map.

The team also obtained soils information from the United States Department of Agriculture (USDA) Web Soil Survey, reviewed existing drainage studies, and determined curve numbers and other hydrologic parameters for the major basins. HEC-HMS was then utilized to analyze the basins with the SCS (NRCS) method. The analysis was generally completed at this conceptual level within the parameters established by previous studies and local (City of Colorado Springs) criteria, as applicable.

The USGS divided the state into five distinct hydrologic regions (Mountain, Rio Grande, Southwest, Northwest, and Plains). This project is located in the Plains region. Per the Colorado Floodplain and Stormwater Criteria Manual, the USGS regression for Mountain, Rio Grande, Southwest, and Northwest have standard error of estimates ranging from 41 to 85 percent. These equations have an acceptable percent of standard error. However, the regression equations for the Plains region has an error of estimates ranging from 204 to 306 percent due to a lack of gage data. For these reasons the Colorado Water Conservation Board recommends not to use the regression equation for the Plains region. Regression equation discharge numbers are not included with the summary table. Included in the summary table are the SCS Method discharge number and any associated discharge from a previous approved study.

Hydraulic Calculations

The existing conditions of each of the major drainage crossings was studied to determine if each had the hydraulic capacity for the existing basin runoff. For the bridges, a Bentley Systems Flowmaster cross section with piers was input with associated basin runoff to establish water surface elevations for the 100-year storm event. For the culverts, the Federal Highway Administration HY-8 Culvert Analysis Program was used to obtain the 100-year water surface elevation. The channel inverts were obtained using a combination of USGS contour data, as-built data provided by CDOT, field photos, and inspection sketches. The hydraulic capacity and amount of existing freeboard at the crossings will be used to develop conceptual level structural recommendations for the structures along with conceptual cost estimates.

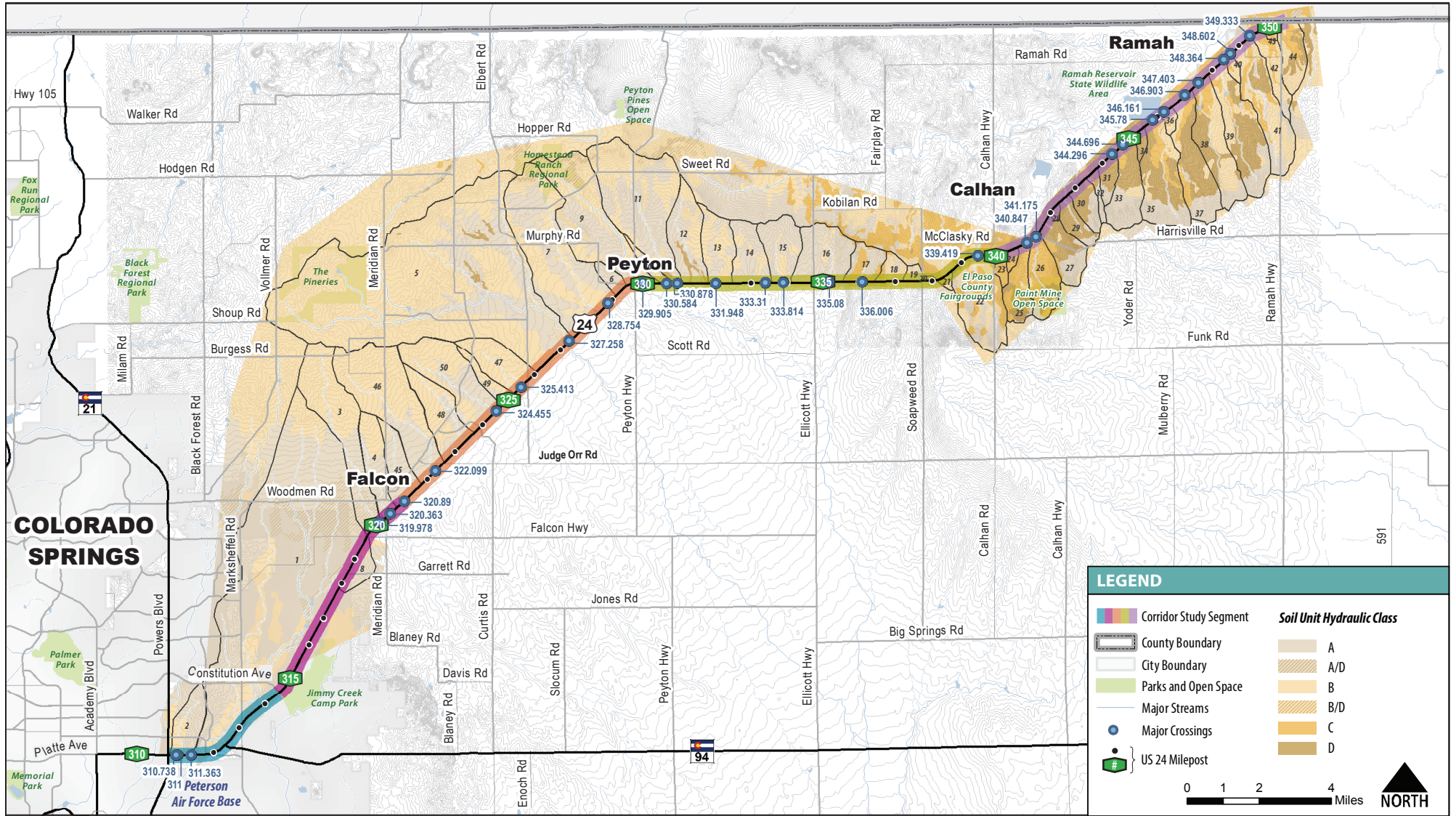


Results

The summary table provided includes the hydrologic and hydraulic results for the major drainageway crossings. In coordination with the structures team, the low chord elevation for the structures was determined. In the summary table the existing freeboard for each crossings is shown along with the required freeboard by CDOT. Some structures may contain the 100-year storm event discharge but not have the required freeboard.



DRAINAGE BASINS



LEGEND

Corridor Study Segment	Soil Unit Hydraulic Class A
County Boundary	Soil Unit Hydraulic Class A/D
City Boundary	Soil Unit Hydraulic Class B
Parks and Open Space	Soil Unit Hydraulic Class B/D
Major Streams	Soil Unit Hydraulic Class C
Major Crossings	Soil Unit Hydraulic Class D
US 24 Milepost	

0 1 2 4 Miles

US 24 Drainage Crossing Summary

August 23, 2017



COLORADO
DEPARTMENT OF
TRANSPORTATION



DAVID EVANS
AND ASSOCIATES INC.

		Crossing Information																														
SEG	MEN	Year Built	Basin ID	Route Carried	Feature Intersected	Milepoint	Drainage Area (ACRES)	Drainage Area (MI ²)	Predominant Soils Classification	Impervious Percent	Elevation - High Point	Elevation Low Point	Distance	Slope	Curve Number (CN)	T.O.C.	Lag Time	Lag Time Minutes	Structure Type	PEAK FLOW (SCS/NRCS)				PEAK FLOW (Previous Studies)				Assumed Channel Invert	100-YR Water Surface Elevation	Existing Freeboard (ft)	Required Freeboard (CDDT)	100-Year Flowrate Contained in Culvert/Bridge?
																				10-year	50-year	100-year	500-year	10-year	50-year	100-year	500-year					
SEGMENT 1: Powers to Constitution	I-18-BK	1995	2	US 24 ML	Sand Creek Center Trib	310.944	806.82	1.26	A/B	85%	6,540.00	6,220.00	11,801.00	2.71%	82	2.17	1.30	78.2	CBC	583.3	885.4	1037.6	1448.4	960.0		1680					Yes	
	I-18-BF	2000	1	US 24 ML	East Fork Sand Creek	311.363	15,605.56	24.38	A	45%	7,505.00	6,260.00	68,993.70	1.80%	70	15.56	9.34	560.3	CBC	1595.1	2680.3	3264	4915.5	3,230.0		6860					Yes	
				8				446.82	0.70	A	2%	6,900.00	6,730.00	5,392.22	3.15%	61	1.94	1.16	69.8		32.3	117.1	174.5	360.6								
SEGMENT 2: Cons	I-18-O	1999	3	US 24 ML	Falcon West Trib	319.973	2,368.00	3.70	A	90%	7,285.00	6,822.00	20,563.50	2.25%	61	6.69	4.01	240.9	CBC	739.3	1108.3	1295.6	1805.4	390.0		1100					Yes	
SEGMENT 3: Falcon to Peyton	I-18-R	2000	4	US 24 ML	Falcon Middle Trib	320.363	972.80	1.52	A	45%	7,220.00	6,820.00	15,507.20	2.58%	56	5.66	3.40	203.8	PCBC	176.8	290.1	354.5	545.5	490.0		1200					Yes	
	I-18-BB	1999	45	US 24 ML	Falcon East Trib	320.89	1,139.20	1.78	A	45%	7,140.00	6,860.00	13,078.50	2.14%	66	4.20	2.52	151.2	CBC	288	490.1	601.8	923	81.0		390					Yes	
	I-18-BQ	2010	46	US 24 ML	Bennett Channel	322.099	3,052.80	4.77	B	25%	7,440.00	6,885.00	24,753.80	2.24%	70	6.15	3.69	221.4	CBC	442.9	841.6	1065.6	1715.3			1073					Yes	
				48				1,276.66	1.99	B	15%	7,220.00	6,890.00	14,835.90	2.22%	72	3.88	2.33	139.7		226.2	467.3	603	995.1								
	I-18-J	1932	50	US 24 ML	Draw	324.455	2,060.88	3.22	A/B	2%	7,300.00	6,880.00	17,500.50	2.40%	50	7.52	4.51	270.8	TTS	17.4	85.7	140.2	340.9		6869.13	6869.87	1.26	0.51		Yes		
				49				350.77	0.55	A/B	2%	7,145.00	6,870.00	11,580.20	2.37%	64	3.81	2.29	137.2		23	69.7	99.5	193.1								
	I-18-BL	1995	47	US 24 ML	Draw	325.413	1,070.31	1.67	B	2%	7,150.00	6,860.00	12,380.90	2.34%	64	4.05	2.43	145.7	CPG	67.3	202.6	288.9	559.9		6853.68	6854.83	3.85	0.61		Yes		
H-18-AD	2012	5	US 24 ML	Black Squirrel Creek	327.258	15,354.78	23.99	B/A	2%	7,700.00	6,805.00	52,972.50	1.69%	78	10.37	6.22	373.5	CPGC	1402.8	2894.7	3712.8	6037		6825.27	6828.58	1.69	1.45		Yes			
H-19-K	1935	7	US 24 ML	Draw	328.754	4,161.24	6.50	A/B	2%	7,400.00	6,810.00	25,610.30	2.30%	60	8.09	4.85	291.2	TTS	115.8	370.7	539.3	1086.7		6795.13	6796.62	4.51	0.75		Yes			
			6				253.19	0.40	A	5%	6,900.00	6,790.00	5,193.48	2.12%	50	3.03	1.82	109.1		8.1	24	37.8	89.4									
SEGMENT 4: Peyton to Calhan	H-19-A	1935	9	US 24 ML	Brakett Creek	329.905	3,076.77	4.81	A/B	2%	7,400.00	6,760.00	26,019.90	2.46%	57	8.55	5.13	307.9	TTS	60.5	214.1	319.9	674		6759.21	6760.69	2.52	0.65		Yes		
	H-19-L	1935	10	US 24 ML	Draw	330.584	235.08	0.37	A	10%	6,900.00	6,730.00	9,386.15	1.81%	55	4.64	2.78	166.9	TTS	12.9	31.7	44.7	88.2		6726.46	6727.22	2.24	0.35		Yes		
	H-19-B	1935	11	US 24 ML	Draw	330.878	3,682.59	5.75	A/B	2%	7,320.00	6,720.00	23,518.80	2.55%	57	7.74	4.65	278.8	TTS	76.2	273.4	409.8	867.6		6714.04	6715.76	1.28	0.71		Yes		
				12				1,383.35	2.16	A	2%	7,160.00	6,690.00	17,166.70	2.74%	50	6.94	4.16	249.7		12.1	60.2	99	242.1								
	H-19-C	1935	13	US 24 ML	Draw	331.948	1,018.34	1.59	A/B	2%	7,060.00	6,685.00	12,730.20	2.95%	65	3.60	2.16	129.5	CI	76.1	224	317.3	606.7		6676.7	6678.14	4.56	0.65		Yes		
	H-19-E	1959	14	US 24 ML	Draw	333.31	954.39	1.49	A	2%	6,940.00	6,670.00	10,724.10	2.52%	54	4.49	2.69	161.5	CBC	17.6	79	125.3	289.1								Yes	
	H-19-F	1959	15	US 24 ML	Draw	333.814	1,051.26	1.64	A	2%	6,880.00	6,650.00	10,437.10	2.20%	54	4.69	2.82	168.9	CBC	19	84.6	133.8	307.9								Yes	
	H-19-G	1959	16	US 24 ML	Draw	335.08	1,416.23	2.21	A	2%	6,880.00	6,645.00	9,204.30	2.55%	54	3.94	2.37	141.9	CBC	27.7	127.3	203	471.9								Yes	
	H-19-M	1959	17	US 24 ML	Draw	336.006	574.21	0.90	A/C	2%	6,820.00	6,630.00	6,370.37	2.98%	70	1.80	1.08	64.8	CBC	108.6	284.1	386.5	690.1								Yes	
				18				303.01	0.47	B	2%	6,800.00	6,660.00	4,840.20	2.89%	74	1.31	0.79	47.3		98.1	228.3	300.9	511.5								
				19				127.83	0.20	A/B	2%	6,760.00	6,655.00	2,855.45	3.68%	65	0.97	0.58	35.1		22.6	72.2	103.6	199								
				20				27.29	0.04	C	2%	6,750.00	6,690.00	1,468.58	4.09%	82	0.33	0.20	12.0		32.9	62.9	78.6	121.5								
				21				77.60	0.12	B/C	2%	6,750.00	6,640.00	3,037.06	3.62%	77	0.74	0.44	26.7		45.9	98.9	127.7	208.8								
	H-19-Q	1935	22	US 24 ML	Draw	339.419	1,885.01	2.95	C/A/B	5%	6,920.00	6,505.00	15,352.80	2.70%	75	3.33	2.00	119.7	TTS	357.5	780.6	1015.5	1690.5		6501.78	6504.8	6.98	1.01		Yes		
			23				163.06	0.25	C	5%	6,670.00	6,490.00	5,193.97	3.47%	84	0.93	0.56	33.6		127.3	235.1	290.9	443.2									
			24				102.37	0.16	C	2%	6,600.00	6,475.00	3,720.10	3.36%	84	0.73	0.44	26.1		94.3	174.9	216.5	329.9									
SEGMENT 5: Calhan to Ramah	H-19-J	1935	25	US 24 ML	Draw	340.847	756.08	1.18	C/D	2%	6,850.00	6,455.00	12,883.30	3.07%	85	1.98	1.19	71.3	TTS	362.7	665.4	822.2	1249		6447.29	6449.84	9.45	0.92		Yes		
	H-19-P	1935	26	US 24 ML	Draw	341.175	976.71	1.53	C/D	2%	6,830.00	6,425.00	13,190.20	3.07%	85	2.02	1.21	72.6	TTS	64.4	851.1	1050.8	1597.3		6431.29	6433.54	7.75	0.95		Yes		
				27				908.10	1.42	D/A	2%	6,770.00	6,405.00	11,105.70	3.29%	70	2.68	1.61	96.3		129.5	333.9	454.1	810.3								
				28				58.26	0.09	D/A	2%	6,480.00	6,400.00	1,845.59	4.33%	70	0.55	0.33	20.0		24.2	63.5	86	151.7								
				29				465.29	0.73	D/A	2%	6,800.00	6,385.00	8,306.33	5.00%	70	1.72	1.03	61.9		91.1	238.3	324.6	578.5								
				30				485.63	0.76	D/A	2%	6,800.00	6,335.00	8,403.91	5.53%	70	1.65	0.99	59.4		97.6	255.4	347.8	621.4								
				32				175.23	0.27	A/D	2%	6,795.00	6,335.00	7,449.85	6.17%	60	1.84	1.10	66.2		11.3	43.4	65.6	138.2								
	H-20-CU	1990	31	US 24 ML	Draw	344.696	346.09	0.54	D/A	2%	6,720.00	6,260.00	7,723.13	5.96%	70	1.49	0.89	53.5	CMP	74.7	196	267.1	476.1								Yes	
	H-20-L	1990	33	US 24 ML	Draw	344.296	1,130.18	1.77	A/D	2%	6,800.00	6,240.00	12,970.20	4.32%	60	3.43	2.06	123.4	CMP	51.8	183.7	273.6	568.5								Yes	
				34				138.88	0.22	D/A	2%	6,365.00	6,220.00	4,564.92	3.18%	70	1.34	0.80	48.1		32.8	86.3	117.5	209								
	H-20-P	1935	35	US 24 ML	Draw	345.78	1,859.04	2.90	D/C/B/A	2%	6,740.00	6,195.00	16,121.80	3.38%	80	2.66	1.60	95.9	TTS	538.8	1088.7	1383.										



APPENDIX F



Prioritization of Recommended Corridor Infrastructure Improvements

TRANSPORTATION IMPROVEMENT PROJECT	PURPOSE AND NEED				TIMING AND EFFECTIVENESS				PRIORITY SUMMARY	
	OPERATIONAL IMPROVEMENTS		CRASH REDUCTION		EASE OF IMPLEMENTATION		COST			
	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE
US 24/Judge Orr Intersection Improvements (with realignment of Blue Gill to Judge Orr)	High	3	High	3	Moderate	2	Moderate	2	High	10
US 24 Intersections at Ramah	Moderate	2	Moderate	2	Easy	3	Low	3	High	10
US 24 Widening to Four Lanes – Garrett through Woodmen (with intersection improvements)	High	3	High	3	Difficult	1	Moderate	2	High	9
Eastbound Passing Lane – east of Calhan	Moderate	2	Moderate	2	Easy	3	Moderate	2	High	9
Westbound Passing Lane – west of Ramah	Moderate	2	Moderate	2	Easy	3	Moderate	2	High	9
Westbound Passing Lane – west of Calhan	Low	1	Moderate	2	Easy	3	Low	3	High	9
Eastbound Passing Lane – east of Peyton	Low	1	Moderate	2	Easy	3	Low	3	High	9
US 24 Widening to Four Lanes – Woodmen through Stapleton (with intersection improvements)	High	3	High	3	Difficult	1	Moderate	2	High	9
US 24/Marksheffel Interchange	High	3	High	3	Difficult	1	High	1	Moderate	8
US 24/CO 94 Interchange	High	3	High	3	Difficult	1	High	1	Moderate	8
US 24/Constitution Interchange	High	3	High	3	Difficult	1	High	1	Moderate	8
US 24 and Harrisville Road Intersection Improvements	Moderate	2	Moderate	2	Moderate	2	Moderate	2	Moderate	8
US 24 widening to Six Lanes – Powers through CO 94	High	3	Moderate	2	Difficult	1	High	1	Low	7
US 24 widening to Six Lanes – CO 94 to Woodmen	High	3	Moderate	2	Difficult	1	High	1	Low	7
US 24 through Calhan – median, sidewalks, intersections	Moderate	2	Low	1	Moderate	2	Moderate	2	Low	7

Scoring:

3 = Most Favorable

2 = Moderately Favorable

1 = Least Favorable



Prioritization of Recommended System Management Improvements

TRANSPORTATION IMPROVEMENT PROJECT	OPERATIONAL IMPROVEMENTS		CRASH REDUCTION		EASE OF IMPLEMENTATION		COST		PRIORITY SUMMARY	
	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE
Access Control Plan	High	3	High	3	Easy	3	Low	3	High	12
Enhanced Intersection Signage	Moderate	2	Low	1	Easy	3	Low	3	High	9
Incident Management Plan	Moderate	2	Moderate	2	Moderate	2	Low	3	High	9
Specialized Transportation Service Expansion	Low	1	Low	1	Easy	3	Low	3	Moderate	8
Vanpool	Low	1	Low	1	Moderate	2	Low	3	Moderate	7
Carpool Park-n-Ride	Low	1	Low	1	Moderate	2	Moderate	2	Low	6
Flextime Incentives	Low	1	Low	1	Moderate	2	Moderate	2	Low	6
Stationless Bike Sharing System	Low	1	Low	1	Moderate	2	Moderate	2	Low	6
Falcon to Colorado Springs Transit Service	Moderate	2	Low	1	Difficult	1	High	1	Low	5

Scoring:

3 = Most Favorable

2 = Moderately Favorable

1 = Least Favorable

Prioritization of Recommended Technology Improvements

TRANSPORTATION IMPROVEMENT PROJECT	OPERATIONAL IMPROVEMENTS		CRASH REDUCTION		EASE OF IMPLEMENTATION		COST		PRIORITY SUMMARY	
	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE	EVALUATION	SCORE
Queue Warning System	High	3	High	3	Easy	3	Low	3	High	12
Variable Speed Limits	High	3	High	3	Easy	3	Low	3	High	12
Variable Message Signs	High	3	Moderate	2	Easy	3	Low	3	High	11
Enhanced Signal Detection	High	3	Moderate	2	Easy	3	Low	3	High	11
Enhanced Lane Markings	Moderate	2	High	3	Moderate	2	Low	3	High	10
Adaptive Signal Control	High	3	Moderate	2	Difficult	1	Moderate	2	Moderate	8

Scoring:

3 = Most Favorable

2 = Moderately Favorable

1 = Least Favorable



APPENDIX G



APPENDIX H



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GEOL_DESC	AGE	SOURCE	SCALE	AUTHOR	YEAR	MILES
af: Artificial fill - Sand, silt, clay, and rock debris emplaced for roadbeds, railroads, parking lots, dikes, embankments, earthen dams, and construction sites for residential and commercial buildings (late Holocene).	late Holocene	Geologic Map of the Elsmere Quadrangle, El Paso County, Colorado	1:24,000	Richard F. Madole and Jon P. Thorson	2003	1.271511
af: Artificial fill (late Holocene).	Late Holocene	Geologic Map of the Falcon NW Quadrangle, El Paso County, Colorado	1:24,000	Richard F. Madole	2003	0.34362
ags: Alluvial sand, silt, clay and gravel. Louviers and Slocum Alluviums, undivided (late middle Pleistocene).	Late middle Pleistocene	Generalized Surficial Map of the Denver 1°x2° Quadrangle, Colorado	1:250,000	Moore, David W. et al	2001	2.336318
asa: Alluvial sand, silt, clay, and gravel. Post-Piney Creek alluvium, Piney Creek alluvium, and pre-Piney Creek alluvium (Holocene and Late Pleistocene).	Holocene and Late Pleistocene	Generalized Surficial Map of the Denver 1°x2° Quadrangle, Colorado	1:250,000	Moore, David W. et al	2001	9.483515
cac: Arkosic loamy colluvium and sheetwash alluvium (Holocene).	Holocene	Generalized Surficial Map of the Denver 1°x2° Quadrangle, Colorado	1:250,000	Moore, David W. et al	2001	11.92141
Old alluvium two - Sediment is similar to that of Qao1 and is distinguished from it solely on the basis of position in the landscape and height above stream level (middle and early? Pleistocene).	Middle and early Pleistocene	Geologic Map of the Elsmere Quadrangle, El Paso County, Colorado	1:24,000	Richard F. Madole and Jon P. Thorson	2003	0.033425
Qam: Middle alluvium -Lightbrownish-gray, pale-brown, lightyellowish-brown, and grayish-brown, poorly sorted sand, silty and clayey sand and, in most places, subordinate amounts of fine gravel (late Pleistocene).	Late Pleistocene	Geologic Map of the Elsmere Quadrangle, El Paso County, Colorado	1:24,000	Richard F. Madole and Jon P. Thorson	2003	0.105047
Qes: Eolian sand (Holocene and Pleistocene?).	Holocene and Pleistocene	Geologic Map of the Falcon NW Quadrangle, El Paso County, Colorado	1:24,000	Richard F. Madole	2003	2.824626
Qp: Piney Creek Alluvium - Sandy to gravelly humus-rich alluvium along all valleys (Holocene).	Holocene	Geologic Map of the Pueblo 1°x2° Quadrangle, South-Central Colorado	1:250,000	Scott, Glenn R.	1978	2.924955
TKc: Poison Canyon Formation - Medium-grained sandstone, and in lower part conglomerate. Partly volcaniclastic (Paleocene).	Paleocene	Geologic Map of the Pueblo 1°x2° Quadrangle, South-Central Colorado	1:250,000	Scott, Glenn R.	1978	0.285601



GEOL_DESC	AGE	SOURCE	SCALE	AUTHOR	YEAR	MILES
TKd: Dawson Formation - Arkosic and andesitic coarse-grained sandstone, siltstone, and claystone about 1,800 feet thick (Paleocene and upper Cretaceous).	Paleocene and upper Cretaceous	Geologic Map of the Pueblo 1°x2° Quadrangle, South-Central Colorado	1:250,000	Scott, Glenn R.	1978	4.889953
Young alluvium two -Sediment is similar to that of Qay1, except that it includes several thin beds and lenses of dark-grayish-brown to very dark-grayish-brown sediment, some of which are silty and clayey (late and middle? Holocene).	Late and middle Holocene	Geologic Map if the Elsmere Quadrangle, El Paso County, Colorado	1:24,000	Richard F. Madole and Jon P. Thorson	2003	3.273566

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